

ISOLOK VALVE ACCEPTANCE TESTING FOR DWPF SME SAMPLING PROCESS

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EXECUTIVE SUMMARY

Evaluation of the Defense Waste Processing Facility (DWPF) Chemical Process Cell (CPC) cycle time identified several opportunities to improve the CPC processing time. Of the opportunities, a focus area related to optimizing the equipment and efficiency of the sample turnaround time for the DWPF Analytical Laboratory was identified. The Mechanical Systems & Custom Equipment Development (MS&CED) Section of the Savannah River National Laboratory (SRNL) evaluated the possibility of using an Isolok® sampling valve as an alternative to the Hydragard® valve for taking process samples. Previous viability testing was conducted with favorable results using the Isolok sampler and is reported in SRNL-STI-2010-00749 (1). This task has the potential to improve operability, reduce maintenance time and decrease CPC cycle time. This report summarizes the results from acceptance testing which was requested in Task Technical Request (TTR) HLW-DWPF-TTR-2010-0036 (2) and which was conducted as outlined in Task Technical and Quality Assurance Plan (TTQAP) SRNL-RP-2011-00145 (3).

The objective of this study was to qualify the Isolok for use in sampling the Slurry Mix Evaporator (SME) tank at the DWPF. The purpose of SME sampling is to obtain representative samples of the contents of the SME tank. The obtained samples are vitrified, and the compositions of the vitrified samples are measured analytically with the resulting measured glass compositions being assessed for acceptability through the use of DWPF's Product Composition Control System (PCCS). For the acceptability decision process to be reliably conducted, the contents of the SME need to be well-mixed and the samples need to be representative. Therefore RW-0333P QA requirements apply to this task.

The primary metric used in making comparisons between two sampling systems (e.g., low Coliwasa versus high Coliwasa or HFR 3mL Isolok versus combined Coliwasa) was the % difference between the averages of the two sets of measurements. Table A provides the percent differences between the mean of the screened measurements of the samples from the indicated sampling mechanism and the mean of the corresponding screened measurements from the Coliwasa samples for the reportable elements. Entries with % differences (in absolute value) less than 5% are shaded green. The vast majority of the entries in this table are shaded, and the % differences of the Isolok were comparable to % differences of the Hydragard, which was the primary method by which the performance of the Isolok was assessed for this study. Specifically, while the Hydragard had 8 entries with % differences greater than 5%, the Isolok had only 3.

Table A. Percent Differences for Screened Oxide Measurements for All Test Phases

Test Phase/Sampler	Al ₂ O ₃	B ₂ O ₃	CaO	Fe ₂ O ₃	Li ₂ O	MgO	MnO	Na ₂ O	NiO	SiO ₂
1st/Hydragard - HFR	3.3	-0.7	3.2	2.4	0.4	1.7	2.1	0.8	not reportable	-0.9
1st/Hydragard-LFR	3	3.8	4	2.8	2.8	4.2	3.3	2.4	not reportable	0.5
1st/Isolok-HFR-12mL	-0.2	2.8	0.3	-0.9	-0.1	-0.9	-0.8	-2.9	not reportable	1.4
1st/Isolok-HFR-3mL	-1.5	1.5	-0.5	-0.6	2	-0.8	-0.7	-3	not reportable	2
1st/Isolok-LFR-12mL	2.8	4.9	4.6	3.4	0.8	3.7	3.9	2.2	not reportable	0.8
1st/Isolok-LFR-3mL	1.5	-3.4	1.7	1.6	-0.1	1.6	2	-0.5	not reportable	0
2nd/Hydragard - HFR	4.5	-5.4	2.1	5.8	-2.3	not reportable	4.2	-0.9	5.8	-2.2
2nd/Hydragard-LFR	1.4	-2.9	0.3	0.9	-0.2	not reportable	0	0.1	-0.6	-0.8
2nd/Isolok-HFR-12mL	-0.4	-5.2	-1.3	-0.2	0.7	not reportable	-2	-0.4	-1.8	1.2
2nd/Isolok-HFR-3mL	-0.3	-1.1	-1.8	0.1	1.9	not reportable	0.5	-0.7	1.2	1.3
2nd/Isolok-LFR-12mL	2.1	-4.7	1.3	1.9	0.7	not reportable	1.7	1.3	1	-2
2nd/Isolok-LFR-3mL	3.6	-2.4	2.3	3.3	0.2	not reportable	4.6	0.4	3.1	1
3rd/Hydragard - HFR	4.7	-5.1	5.1	5.1	-2.2	5.5	5.2	0	not reportable	-1.9
3rd/Hydragard-LFR	2	-1.8	2.2	1.5	-2.5	1.3	0.9	3	not reportable	-2.3
3rd/Isolok-HFR-12mL	-2.3	-1.4	-3.1	-2.8	1	-3.6	-3.7	-0.3	not reportable	-0.6
3rd/Isolok-HFR-3mL	-0.7	-2.1	-0.8	-1.5	1.8	-2.1	-2.1	1.5	not reportable	1.1
3rd/Isolok-LFR-12mL	-2.9	-0.8	-3.1	-4.4	4.1	-6.1	-5.8	1.9	not reportable	0.9
3rd/Isolok-LFR-3mL	-1.2	-0.9	-2.7	-1.6	-0.1	-2.5	-2.5	-0.5	not reportable	0.6

Based on the acceptance testing data and discussions with the DWPF Laboratory improvement team, SRNL recommends proceeding with the design and installation of the Isolok system for the SME sampling process. Based on the success of the Isolok testing to date, SRNL recommends testing to acquire a smaller 1–1.5 mL sample size. A smaller sample size used in conjunction with the cesium carbonate fusion would allow the elimination of the grinding step for the glass, thus further reducing analytical cycle time.

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1.0 INTRODUCTION

Evaluation of the Defense Waste Processing Facility (DWPF) Chemical Process Cell (CPC) cycle time identified several opportunities to improve the CPC processing time. Of the opportunities, a focus area related to optimizing the equipment and efficiency of the sample turnaround time for DWPF Analytical Laboratory was identified. The Mechanical Systems & Custom Equipment Development (MS&CED) Section of the Savannah River National Laboratory (SRNL) evaluated the possibility of using an Isolok® sampling valve as an alternative to the Hydragard® valve for taking process samples. Previous viability testing was conducted with favorable results using the Isolok sampler and reported in SRNL-STI-2010-00749 (1). This task has the potential to improve operability, reduce maintenance time and decrease CPC cycle time. This report summarizes the results from acceptance testing which was requested in Task Technical Request (TTR) HLW-DWPF-TTR-2010-0036 (2) and which was conducted as outlined in Task Technical and Quality Assurance Plan (TTQAP) SRNL-RP-2011-00145 (3). The Isolok to be tested is the same model which was tested, qualified, and installed in the Sludge Receipt Adjustment Tank (SRAT) sample system. RW-0333P QA requirements apply to this task.

This task was to qualify the Isolok sampler for use in the DWPF Slurry Mix Evaporator (SME) sampling process. The Hydragard, which is the current baseline sampling method, was used for comparison to the Isolok sampling data. The Isolok sampler is an air powered grab sampler used to “pull” a sample volume from a process line. The operation of the sampler is shown in Figure 1. The image on the left shows the Isolok’s spool extended into the process line and the image on the right shows the sampler retracted and then dispensing the liquid into the sampling container.

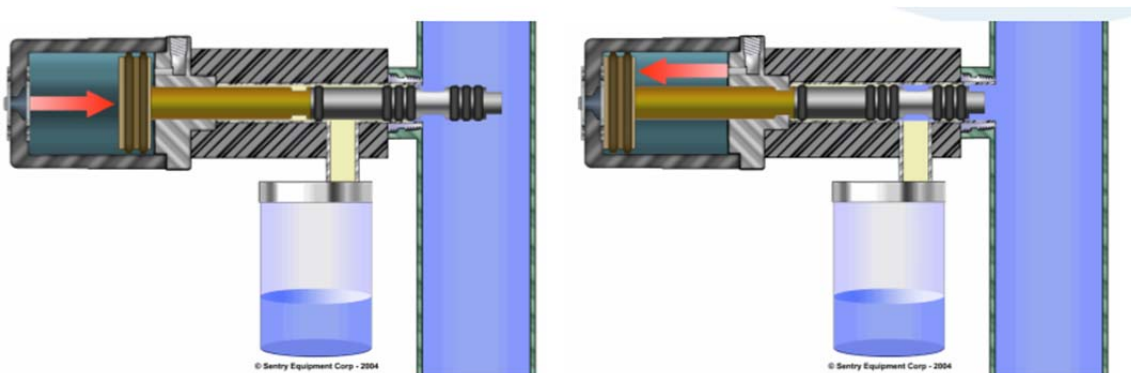


Figure 1. Isolok Sampler Operation

To determine tank homogeneity, a Coliwasa sampler was used to grab samples at a high and low location within the mixing tank. Data from the two locations were compared to determine if the contents of the tank were well mixed. The Coliwasa sampler is a tube with a stopper at the bottom and is designed to obtain grab samples from specific locations within the drum contents. A position paper (4) was issued to address the prototypic flow loop issues and simulant selections. A statistically designed plan (5) was issued to address the total number of samples each sampler needed to pull, to provide the random order in which samples were pulled and to group samples for elemental analysis. The TTR required that the Isolok sampler perform as well as the Hydragard sampler during these tests to ensure the acceptability of the Isolok sampler for use in the DWPF sampling cells. Procedure #L9.4-5015 was used to document the sample parameters and process steps. Completed procedures are located in R&D Engineering job folder 23269.

2.0 APPROACH

2.1 Acceptance Testing

This acceptance testing was conducted in Building 723-A using a combined simulant from SRNL 22L SME runs, the same simulant from 22L runs but diluted, and Sludge Batch 6H (SB6H) melter feed simulant. Figure 2 below shows the piping setup for the test. All simulants were pumped from a 1/6 scale SME vessel through a mockup flow loop of the SME process piping. Drawing EES-23269-R1-005 is an assembly drawing of the acceptance test piping setup. The Isolok was positioned in series below a Hydragard sampler. A drum mixer with dual 9" propellers was used to mix the simulant and ensure simulant homogeneity. The simulant was mixed for approximately 30 minutes prior to sampling and continued to mix while the samples were taken during the acceptance testing.

Rheology data for the three simulants tested are shown in Table 2-1, particle size data are provided in Figure 3 and Figure 4, and the measured compositions of the simulants are given in Table 2-2 and Table 2-3. For the tests, the 3 mL Isolok samples were pulled in platinum crucibles, 12 mL Isolok and Hydragard samples in p-nut vials and the Coliwasa samples in 60 mL plastic bottles. Additional samples for density measurements were pulled in p-nut vials of known weight and volume. The samples were dried at 110 °C and vitrified at 1050 °C to obtain glass wafers that were cracked to produce glass shards. The weight percent (wt%) dried solids and the wt% vitrified solids were recorded and are included in the measurements evaluated as part of this study. The shards were dissolved by fusing them at 1050 °C with a mixture of cesium carbonate and germanium dioxide per ADS-2502 procedure (6) and detailed in lab notebook SRNL-NB-2011-00016 page 27 (7). The fusion residue was dissolved with sequential additions of a dilute hydrogen peroxide solution and a dilute nitric acid solution. The solutions were analyzed for elemental composition by inductively coupled plasma-optical emission spectroscopy (ICP-OES) techniques.

A Coliwasa sampler was used to take dip samples at two locations (high and low) in the tank. The Coliwasa sample measurements were used to ensure homogeneity of the simulant material within the mixing tank and to serve as a basis for comparison for both Hydragard and Isolok sampling systems. During the sampling, the Coliwasa sampler was closed as it was inserted and positioned into the tank, and then the sampler was opened to remove a sample at the proper tank location.

In addition to testing the Isolok's ability to pull a representative sample, flush and cycling tests were also requested in the TTR. Flush water testing was conducted at the end of the first test to determine the amount of strokes required to clean the inner surfaces of the Isolok. Water was pumped through the Isolok flush ports, and the Isolok was cycled in and out to flush the needle and overflow port. After completion of the flushing, the system was dismantled and visually inspected to verify the Isolok was clean.

After the completion of the third test, the acceptance test system was aligned and setup for cycle testing. For this test the Isolok was actuated for two seconds in the stream then three seconds retracted. This was repeated for a number of cycles; then stopped for 1 minute and the Isolok needle inspected for leakage at the needle. If the Isolok was beginning to fail, drips of liquid would drop from the Isolok needle. These steps were repeated until a point was reached that represented an acceptable life span for the Isolok. The Isolok controller was programmed to count the number of cycles, and that number was then recorded into the laboratory notebook (8). The low rheology simulant was used for this test.

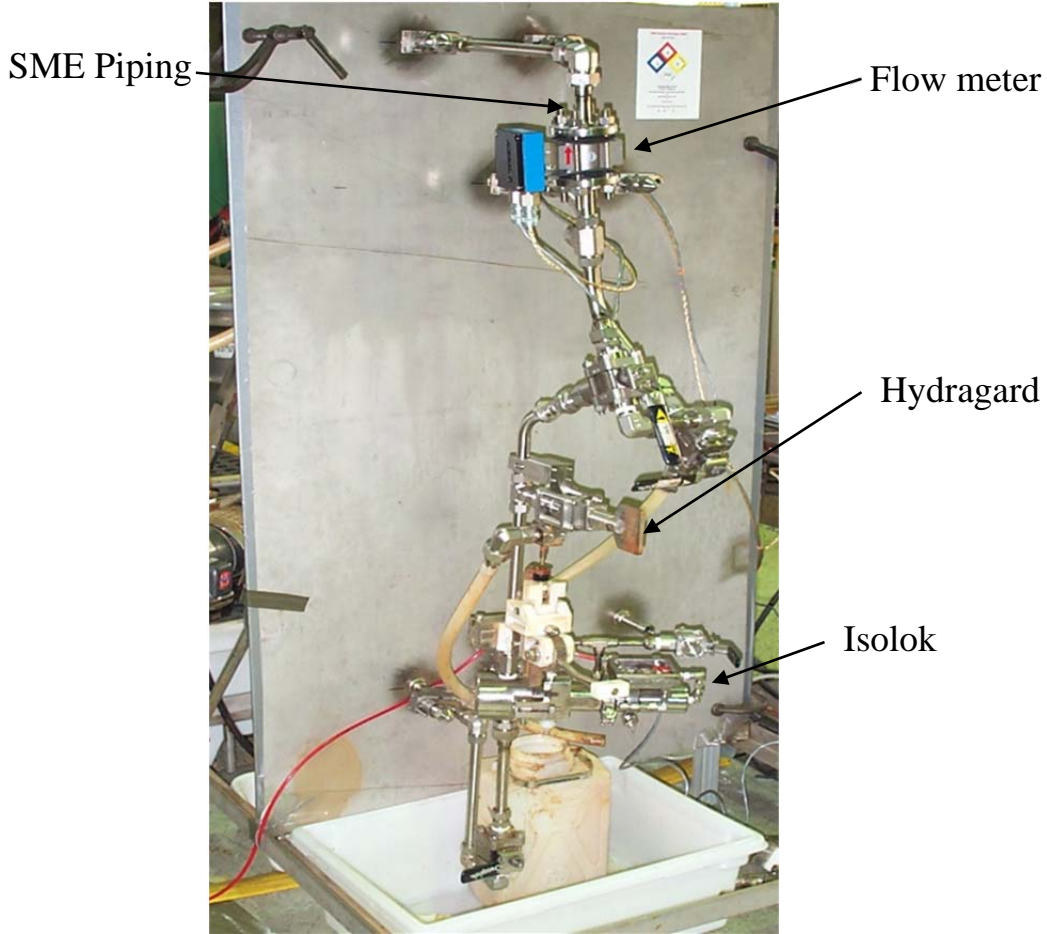



Figure 2. Test Setup

Table 2-1. Simulant Rheology Properties Data

Low Rheology Simulant		
Total Solids	31.7	Wt%
Insoluble Solids	27.35	Wt%
pH	8.47	
Yield Stress (Up Curve)	3.15	Pascal
Consistency (Up Curve)	9.8	cP
Density	1.2186	g/mL

Mid Rheology Simulant		
Total Solids	36.75	Wt%
Insoluble Solids	31.75	Wt%
pH	8.37	
Yield Stress (Up Curve)	5	Pascal
Consistency (Up Curve)	17	cP
Density	1.27	g/mL

High Rheology Simulant		
Total Solids	41.8	Wt%
Insoluble Solids	30.7	Wt%
pH	3.46	
Yield Stress (Up Curve)	23	Pascal
Consistency (Up Curve)	51	cP
Density	1.233	g/mL

- Particle Size Analysis -		
 10.3.0	SB6H SME Isolok Testing	
	S3000/S3500 S3754	

Data Item	Value
MV(um):	140.9
MN(um):	0.391
MA(um):	3.94
CS:	1.521
SD:	85.15

Size(um)	%Tilt
0.800	9.18

%Tilt	Size(um)
10.00	0.928
16.00	42.30
25.00	99.11
40.00	135.2
50.00	152.0
60.00	167.5
70.00	183.8
75.00	192.8
90.00	231.7
95.00	258.0

Dia	Vol%	Width
164.1	84.5	108.00
0.856	15.5	1.84

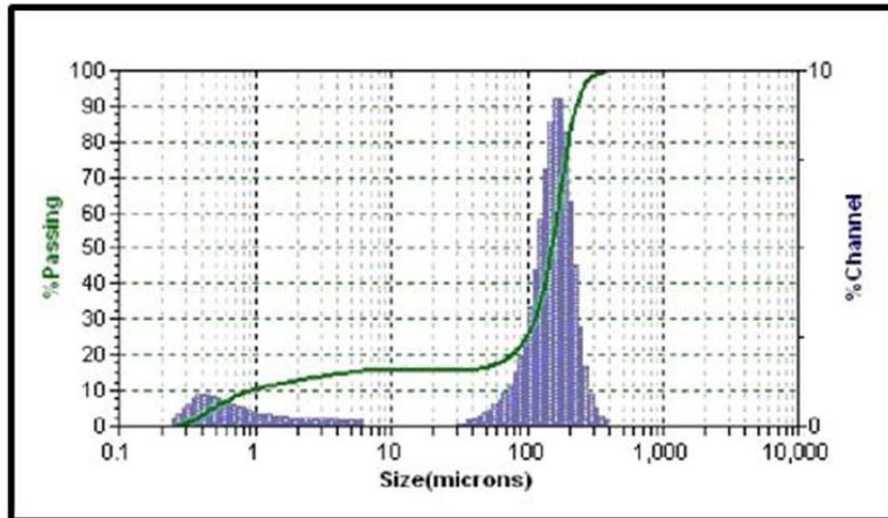



Figure 3. High Rheology Particle Size Data.

- Particle Size Analysis -

 10.3.0	SME Simulant 22L Runs	
		S3000/S3500 S3754

Data Item	Value
MV(um):	120.6
MN(um):	0.648
MA(um):	5.81
CS:	1.033
SD:	96.59

Size(um)	%Tilt
0.800	3.95

%Tilt	Size(um)
10.00	1.417
16.00	3.01
25.00	58.36
40.00	111.6
50.00	130.3
60.00	147.1
70.00	164.8
75.00	174.6
90.00	216.6
95.00	245.6

Dia	Vol%	Width
143.7	84.0	121.50
1.184	16.0	1.35

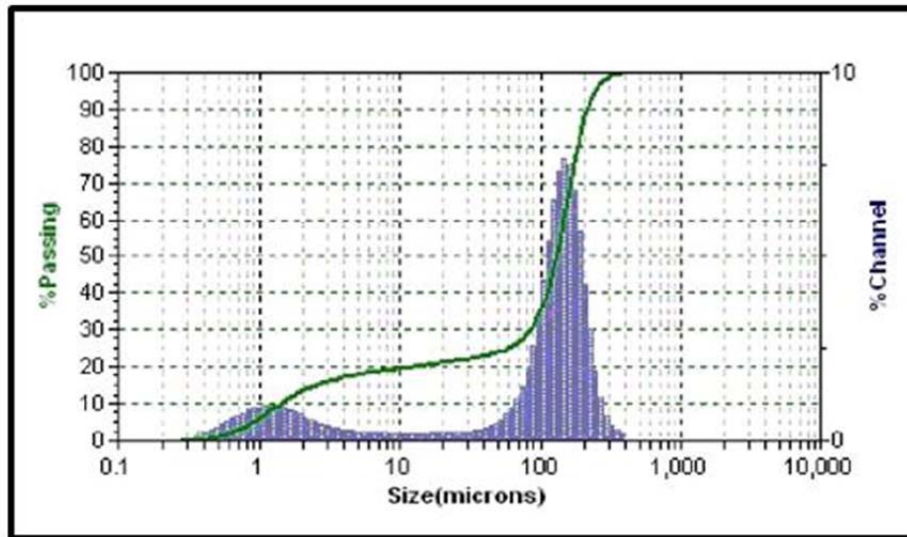



Figure 4. Mid and Low Rheology Particle Size Data.

Table 2-2. High Rheology Simulant Elemental Composition



Process Science Analytical Laboratory
Customer: Mike Stone
Date: 7/11/11
Sample ID: SB6H SME Isolok Testing High Rheology Data
Lab ID: 11-1596


elemental wt%-dried 1100C		Al	B	Ba	Ca	Cr	Fe	Gd	K	Li	Mg	Mn	Na	Ni	Pb	S	Si	Ti	Zn	Zr
Sample ID	Lab ID																			
SB6H SME Isolok Testing (A)	11-1596	5.51	1.52	<0.010	0.347	0.018	6.87	<0.010	0.058	2.22	0.160	2.12	9.28	0.774	<0.010	0.126	23.5	0.011	<0.010	0.076
SB6H SME Isolok Testing (B)	11-1596	5.47	1.48	<0.010	0.337	0.018	6.85	<0.010	0.056	2.21	0.158	2.11	9.14	0.760	<0.010	0.126	23.3	0.010	<0.010	0.075

oxide wt% - calcined 1100C		Al2O3	B2O3	BaO	CaO	Cr2O3	Fe2O3	Gd2O3	K2O	Li2O	MgO	MnO2	Na2O	NiO	PbO2	SO4	SiO2	TiO2	ZnO	ZrO2	Totals
Sample ID	Lab ID																				
SB6H SME Isolok Testing (A)	11-1596	10.4	4.91	0.00	0.485	0.026	9.82	0.00	0.069	4.78	0.266	3.34	12.5	0.983	0.000	0.379	50.3	0.018	0.00	0.103	98.4
SB6H SME Isolok Testing (B)	11-1596	10.3	4.76	0.00	0.472	0.026	9.80	0.00	0.067	4.76	0.262	3.33	12.3	0.965	0.000	0.377	49.9	0.017	0.00	0.101	97.5

Units: mg/Kg

Sample ID	Lab ID	F	Cl	NO2	NO3	SO4	C2O4	HCO2	PO4
SB6H SME Isolok Testing (A)	11-1596	<100	423	<100	35000	1000	308	68700	<100
SB6H SME Isolok Testing (B)	11-1596	<100	424	<100	35300	989	294	68000	<100

Table 2-3. Mid & Low Rheology Simulant Elemental Composition



Process Science Analytical Laboratory
Customer: Mike Stone
Date: 4/26/11
Sample ID: SME Simulant 4/1/2011
Lab ID: 11-1100

elemental wt%-calcined 1100C		Al	B	Ba	Ca	Cr	Fe	K	Li	Mg	Mn	Na	Ni	P	Pb	S	Si	Ti	Zn	Zr
Sample ID	Lab ID																			
SME Simulant 4/1/2011 (A)	11-1098	5.49	1.45	0.084	0.757	0.068	7.41	0.128	2.14	0.557	1.31	8.0	0.382	<0.100	<0.010	0.101	24.9	0.070	0.071	0.257
SME Simulant 4/1/2011 (B)	11-1098	5.49	1.44	0.085	0.767	0.067	7.39	0.133	2.14	0.555	1.31	8.1	0.383	<0.100	<0.010	0.101	24.9	0.069	0.071	0.256

oxide wt% - calcined 1100C		Al2O3	B2O3	BaO	CaO	Cr2O3	Fe2O3	K2O	Li2O	MnO	MnO2	Na2O	NiO	P2O5	PbO	SO4	SiO2	TiO2	ZnO	ZrO2	Totals
Sample ID	Lab ID																				
SME Simulant 4/1/2011 (A)	11-1098	10.4	4.67	0.094	1.06	0.099	10.6	0.154	4.60	0.925	2.07	10.8	0.485	0.000	0.000	0.303	53.3	0.117	0.088	0.347	100.1
SME Simulant 4/1/2011 (B)	11-1098	10.4	4.64	0.095	1.07	0.098	10.6	0.160	4.60	0.921	2.07	10.9	0.486	0.000	0.000	0.303	53.3	0.115	0.088	0.346	100.1

Units: mg/Kg

Sample ID	Lab ID	F	Cl	NO2	NO3	SO4	C2O4	HCO2	PO4
SME Simulant 4/1/2011 (A)	11-1098	<100	460	<100	12400	955	338	19800	<100
SME Simulant 4/1/2011 (B)	11-1098	<100	461	<100	12300	959	337	19800	<100

3.0 RESULTS

The objective of this study was to qualify the Isolok for use in sampling the SME for acceptability decisions at the DWPF. The purpose of SME sampling is to obtain representative samples of the contents of the SME tank. The samples are vitrified, and the compositions of the vitrified samples are measured analytically with the resulting measured glass compositions being assessed for acceptability through the use of DWPF's Product Composition Control System (PCCS). For the acceptability decision process to be reliably conducted, the contents of the SME need to be well-mixed and the samples need to be representative.

A well-mixed tank was also of critical importance for each phase of the testing conducted at 723-A. The question of the tank being well-mixed for one of the test phases was addressed using the Coliwas samples, specifically, by comparing the samples taken at the low location in the tank to those taken at the high location in the tank during the test phase. The samples for the low location were considered to be the base-line (BL) samples as these comparisons were conducted. After the contents of the tank were established to be well-mixed, both sets (those taken from the low location in the tank and those taken from the high location) of Coliwas samples were used to "represent" the contents of the tank and, thus, become the BL for other comparisons. That is, the performance

of each of the other sampling mechanisms was assessed based upon how well its samples compared to those from the Coliwasa.

What types of comparisons were made between the BL measurements of an analyte of interest and the measurements from a sampling mechanism in question? There were two: (1) a comparison of the variances of the two sets of measurements and (2) a comparison of the means of the two sets of measurements. Tests for the statistical significance of the differences determined for the variances of the measurements and for the means were conducted as part of the investigations of this study. A difference between the means of the two sets of measurements represents a bias between the sampling mechanism and the BL. While some of these biases may be found to be statistically significant, their practical impact was also assessed as part of the conclusions of this study.

Information provided in DWPF's Waste Form Qualification Report, specifically, in Table 2 of WSRC-IM-91-116-2, Revision 4 (9) was used to facilitate the assessment of the comparisons conducted as part of this testing. The information provided in this table indicated that, in general, biases up to ~ 4.6% on a relative basis had been determined for the errors in the reported chemical composition for slurry sampling during DWPF's Startup Test Program. Thus, in evaluating the performance of the Hydragard and Isolok sampler relative to the Coliwasa, the goal was that the biases seen in this testing would be less than 5% for the elements at concentrations in the simulant that would be considered reportable by the DWPF. From the discussion in Section 4 of WSRC-IM-91-116-2, Revision 4 (9), an element at a concentration of 0.5 wt% or more is considered to be reportable.

The sampler currently utilized to support the SME acceptability process at DWPF is the Hydragard sampler, and the performance of the Isolok sampler for the testing conducted here was judged as acceptable if its performance was comparable to the performance of the Hydragard during the testing. The performance of the Hydragard was quantified for each test phase using statistical comparisons of the measurements of its samples to the measurements of the Coliwasa samples for analytes of interest. Similarly, the performance of the Isolok was quantified for each test phase using statistical comparisons of the measurements of its samples to the measurements of the Coliwasa samples for the analytes of interest. With these results in hand, the relative performance of the Isolok to that of the Hydragard was evaluated.

Assessments of the performance of the Hydragard and Isolok relative to the Coliwasa BL were made for the testing system under two different flow rates for the sample loop piping: a low flow rate (4 to 5 gallons per minute) and a high flow rate (9 to 10 gallons per minute). In addition, while the Hydragard system was used to provide sample volumes of approximately 12 mL, the Isolok system was used to yield 3 mL and 12 mL sample volumes. The 3 mL samples were taken in platinum crucibles and the 12 mL samples were taken in p-nut vials (an insufficient number of crucibles was available to dispense all of the Isolok samples directly into crucibles, hence the need to take the 12 mL Isolok samples in p-nut vials). The Hydragard samples were taken in p-nut vials as is done now in the DWPF. Evaluations of the performance of the Hydragard samples, of the 3 mL Isolok samples, and of the 12 mL Isolok samples were conducted. Note that the 3 mL Isolok system was not used to provide measurements of density, one of the analytes of interest in this study, since the measurement protocol for density currently relies on the use of p-nut vials.

JMP Version 7.0.2 from SAS Institute, Inc. (10) was used to support this investigation and to make the comparisons between the samplers. In comparing two samplers, JMP was used to make a statistical comparison between the means of the two sets of measurements. In the discussion that follows the difference in the means and the percent difference relative to the mean of the BL set of measurements are presented. The statistical significance of the difference in the means was

assessed based upon the standard deviations of the two sets of measurements. The JMP results include Levene's test which provides a comparison of the standard deviations of the two sets of measurements. Specifically, this test was used to assess the statistical significance of the difference between the variability of the two sets. If the p-value from Levene's test is 5% or smaller, the null hypothesis of equal variances for the two sets of measurements was rejected in favor of the alternative hypothesis of a difference in the variances.

The outcome of Levene's test provided guidance as to which of two t-tests was used to assess the statistical significance of the difference in the means for the two sets of measurements. Specifically, each set of JMP results included a t-test for a significant difference in the means under the assumption of equal variances for the two sets of measurements and a t-test for a significant difference in the means under the assumption of unequal variances. Both of these t-tests are presented as part of each set of JMP results, and the outcome from Levene's test was used to select the appropriate t-test. If the p-value for the selected t-test was 5% or smaller, then there was a statistically significant difference between the means of the two sets of measurements at the 5% significance level.

Regardless of the statistical significance of the difference in the means, a bound on the difference was determined (with greater than 95% confidence) from the 95% confidence interval for the difference in the means from the selected t-test. Confidence intervals for the difference in the means were provided by JMP for both t-tests. The values of the endpoints of each interval were determined at 95% confidence, and the larger endpoint-value (in absolute value) provides a bound on the difference in the means of the two sets of measurements with at least 95% confidence.

Some comments regarding the analytes of this study are provided. The elemental compositions of the vitrified samples were determined by ICP-OES and reported in μg of element per g of glass. As these elemental measurements were converted to wt% oxide measurements (using the appropriate gravimetric factors), any elemental concentration value below the detection limit of the analytical process was reduced by half during the conversion. Also, please note that the values of two ratios, specifically, the ratio of Al_2O_3 to B_2O_3 (i.e., Al/B) and the ratio of Fe_2O_3 to Li_2O (i.e., Fe/Li) were included as analytes in these investigations. These ratios helped track the relationship between the sludge and frit components of the SME simulant for the samplers. And, finally, the sum of oxides for each vitrified sample was determined and included as an analyte for this study even though this analyte is more of a reflection of the analytical process than of the sampling.

The statistical comparisons and significance tests outlined in the paragraphs above were repeatedly and consistently applied in making comparisons between samplers using the measurements generated by the three test phases. The results from these comparisons and tests are presented in sections 3.1 through 3.3 for each phase of testing. An effort was made to provide a consistent format for presenting the investigations into the measurements for each test phase. Section 3.4 provides a summary of the results across all test phases, and, finally, Section 3.5 provides results from the cycle testing of the Isolok.

3.1 Mid-Rheology Simulant (Phase 1) Testing

A mid-rheology simulant was used for Phase 1 of this testing. The density measurements, wt% dried solids, wt% vitrified solids, and elemental measurements (in two parts) for the Phase 1 testing are provided in Tables A1, A2, and A3, respectively, in Appendix A. In addition to the elemental measurement of the simulant, the two parts of Table A3 provide measurements of samples of the

Analytical Reference Glass -1 (ARG-1) that were included in the analytical plan (5).^f The elemental concentrations were converted to oxide concentrations yielding the measurements in Table A4 of Appendix A. Table A5 in Appendix A provides the reference composition of the Phase 1 SME simulant.

To provide a general overview of the measurements from this phase of testing, plots of the density, solids, and oxide measurements are presented in Exhibit A1 in Appendix A. The groupings for these measurements include the two flow rates, and the sample IDs are also shown.

The JMP results for the statistical comparisons of these measurements as outlined above for each of the analytes of interest are provided in Exhibit A2 of Appendix A. Comparisons between the low and high located Coliwasa samples were conducted as well as comparisons between the collection of Coliwasa samples and samples from the other sampling mechanisms (at low and high flow rates for both the Hydragard and Isolok and using 3-and 12-mL sample volumes for the Isolok as described above).

A plot of the two sets of measurements is provided for each analyte as part of the JMP results in Exhibit A2. Superimposed on each set of measurements is a box plot. These boxplots served as the basis for screening the data for potential outliers. An immediate concern, as one works with real data, is the potential for the presence of one or more outliers in the data and the possible impact of such outliers on the conclusions being made about the data. Using the boxplots, those measurements for an analyte that are beyond the distances given by:

upper quartile + 1.5*(interquartile range) and lower quartile - 1.5*(interquartile range),

(based upon the quartiles computed from the set of measurements with the interquartile range being the difference between the 1st quartile and 3rd quartile) were considered as questionable points (i.e., potential outliers). These are the points that fall beyond the “whiskers” (the lines extended from the boxes) of the boxplots. Some points were considered as potential outliers based upon this approach, and these were excluded from the screened data for an analyte in the analyses below. The statistical comparisons were repeated for those situations where potential outliers were identified, and the JMP results from these investigations for the screened measurements are provided in Exhibit A3 of Appendix A.

A summary of the results from the JMP output of Exhibit A2 and Exhibit A3 is provided in Table A6, Table A7, Table A8, and Table A9 in Appendix A. The format for each of these tables is very similar. The means of the measurements for each set of samples is given, the difference between the sampler in question and the BL is given, the % difference (relative to the BL mean) is given, a column used to flag a statistically significant difference (i.e., a bias at the 5% significance level) between the means is provided, the sample standard deviation for the measurements for the sampler in question is given, the sample standard deviation of the BL samples is given, a column used to flag a statistically significant difference (at the 5% significance level) between the variances is provided, a bound on the bias (at a 95% confidence level) is given, the bound is also provided expressed as a percentage of the BL sample mean, the number of observations (n sampler) for the sampler in question is given, and, finally, the number of observations for the BL sampler (n BL) is given.

Table A6 provides the results of the comparisons for density, wt% dried solids, and wt% vitrified solids for all of the measurements and for the screened (scrnd) measurements. The % differences

^f A statistical evaluation of the ARG-1 results is to be provided in a separate report: SRNL-STI-2011-00711.

for the means of the high- and low-located Coliwasa samples for density, wt% dried solids, and wt% vitrified solids were 0.9%, 0.9%, and 1.0%, respectively. While the differences in the solids means were statistically significant at the 5% level, the bounds (at 95% confidence) on these differences and on the difference in the means of the density measurements were all less than 2%. The results from these comparisons for density and solids between the high- and low-located Coliwasa samples suggested no issues with the tank being well-mixed. Comparisons for density and for solids between the Coliwasa (using the collection of both the high- and low-located samples as BL) and the other sampling mechanisms shown in Table A6 yielded % differences (in absolute value) of no more than 1.1% for density, 1.5% for dried solids, and 2.6% for vitrified solids. Over all of these results, the performance of the Isolok sampler was comparable to that of the Hydragard. See Table 3-1 for a summary of the % differences.

Table 3-1. % Differences for the Screened Density and Solids Measurements from Phase 1 Testing

Comparison	Density	wt% dried solids	wt% vitrified solids
Coliwasa High Location vs Coliwasa Low Location (BL)	0.9%	0.9%	1.0%
Hydragard (HF) vs Coliwasa	0.3%	-1.1%	-2.6%
Hydragard (LF) vs Coliwasa	0.7%	-1.0%	-2.1%
Isolok (12; LF) vs Coliwasa	-0.2%	-1.5%	-2.2%
Isolok (12; HF) vs Coliwasa	0.8%	0.2%	-0.1%
Isolok (3; LF) vs Coliwasa	na	-1.4%	-2.1%
Isolok (3; HF) vs Coliwasa	na	0.6%	0.1%

Table A7 provides comparisons of the oxide measurements from the low-located and high-located Coliwasa samples for all of the data and for the screened data. The analytical plan stipulated that the Coliwasa samples that were prepared (using the cesium carbonate fusion dissolution method) were to be measured in each of six different analytical blocks. The oxide measurements were averaged over the six analytical blocks to provide the data for comparing the high- and low-located Coliwasa results. All of the % differences (in absolute value) were less than 5% except for Cr₂O₃ (5.5% for all of the data) and for the Fe/Li (5.0% for the screened data). The results from these comparisons for the oxide measurements between the high- and low-located Coliwasa samples suggested no issues with the tank being well-mixed.

Tables A8 and A9 provide comparisons between the Coliwasa measurements and the other sampler mechanisms arranged by analytical block for all of the measurements and for the screened measurements, respectively. For each ICP-OES block, measurements were made of the Coliwasa samples (both the high- and low-located samples) and of a set of samples from a sampler mechanism in question. The JMP comparisons were conducted using the ICP-OES analytical blocks for grouping the measurements to be compared. For example, analytical block 1 involved the Coliwasa samples and the 3 mL samples from the Isolok under low flow rate conditions. Table A10 in Appendix A provides the same information as Table A9, but with the results grouped by analyte and sorted by the size of the bound (from the largest to the smallest) on the bias between the two sampling systems. The entries for the % bias and for % relative bias bound that are less than 5% are shaded in green in this table. See Table 3-2 for a summary of the % differences determined for the oxide measurements from Phase 1. There are very few values for the % differences that are 5% or more.

Table 3-2. % Differences for Screened Oxide Measurements from Phase 1 Testing

Oxide	High vs Low Coliwasa	Isolok-LFR-3mL	Hydragard - HFR	Isolok-LFR-12mL	Isolok-HFR-12mL	Isolok-HFR-3mL	Hydragard-LFR
Al/B	-1.2%	5.9%	4.9%	-0.3%	-2.4%	-2.1%	0.4%
Al ₂ O ₃	-3.6%	1.5%	3.3%	2.8%	-0.2%	-1.5%	3.0%
B ₂ O ₃	-1.5%	-3.4%	-0.7%	4.9%	2.8%	1.5%	3.8%
BaO	-3.1%	2.2%	2.1%	4.0%	0.6%	-0.6%	2.9%
CaO	-4.3%	1.7%	3.2%	4.6%	0.3%	-0.5%	4.0%
Cr ₂ O ₃	-5.5%	-1.9%	1.2%	2.2%	0.2%	-3.8%	-0.4%
CuO	-2.4%	1.3%	0.1%	4.3%	7.2%	1.2%	1.3%
Fe/Li	-5.0%	2.2%	1.8%	1.4%	-1.4%	-3.4%	0.6%
Fe ₂ O ₃	-3.5%	1.6%	2.4%	3.4%	-0.9%	-0.6%	2.8%
K ₂ O	-1.1%	1.5%	0.4%	4.2%	5.4%	1.2%	1.9%
Li ₂ O	0.4%	-0.1%	0.4%	0.8%	-0.1%	2.0%	2.8%
MgO	-3.3%	1.6%	1.7%	3.7%	-0.9%	-0.8%	4.2%
MnO	-3.6%	2.0%	2.1%	3.9%	-0.8%	-0.7%	3.3%
Na ₂ O	-1.9%	-0.5%	0.8%	2.2%	-2.9%	-3.0%	2.4%
NiO	-3.8%	1.7%	2.8%	3.5%	-1.7%	-1.3%	2.5%
SiO ₂	2.2%	0.0%	-0.9%	0.8%	1.4%	2.0%	0.5%
TiO ₂	1.4%	-0.6%	-1.0%	0.4%	0.0%	2.0%	0.3%
ZnO	-4.2%	0.8%	2.7%	4.8%	0.1%	-0.6%	3.3%
ZrO ₂	-1.8%	0.7%	1.7%	2.3%	-0.7%	0.2%	2.0%
Sum	-0.4%	0.1%	0.2%	2.7%	0.1%	1.0%	1.3%

3.2 High-Rheology Simulant (Phase 2) Testing

The investigations into the measurements of the Phase 2, high-rheology, testing followed the same pattern as that conducted for the Phase 1 results. The density measurements, wt% dried solids, wt% vitrified solids, and elemental measurements (in two parts) for the Phase 2 testing are provided in Tables B1, B2, and B3, respectively, in Appendix B. In addition to the oxide measurement of the simulant, the two parts of Table B3 provide measurements of the ARG-1 samples that were included in the analytical plan (5).^f The elemental concentrations were converted to oxide concentrations yielding the measurements in Table B4 of Appendix B. Table B5 in Appendix B provides the reference composition of the Phase 2 SME simulant.

To provide a general overview of the measurements from this phase of testing, plots of the density, solids, and oxide measurements are presented in Exhibit B1 in Appendix B. The groupings for these measurements include the two flow rates, and the sample IDs are also shown.

The JMP results for the statistical comparisons of these measurements as outlined above for each of the analytes of interest are provided in Exhibit B2 of Appendix B. As for the Phase 1 results, comparisons between the low and high located Coliwasa samples are conducted as well as comparisons between the collection of Coliwasa samples and samples from the other sampling mechanisms (at low and high flow rates for both the Hydragard and Isolok and using 3- and 12-mL sample volumes for the Isolok as described above). Box plots are included in the JMP results, and these are used to conduct a screening process for outliers as was done for the Phase 1 results.

A summary of the results from the JMP output is provided in Table B6, Table B7, Table B8, and Table B9 in Appendix B. The format for each of these tables is similar the tables prepared for the Phase 1 results. Table B6 provides the results of the comparisons for density, wt% dried solids, and

^f A statistical evaluation of the ARG-1 results is to be provided in a separate report: SRNL-STI-2011-00711.

wt% vitrified solids for all of the measurements and for the screened (scrnd) measurements. The % differences for the means of the high- and low-located Coliwasa samples for density, wt% dried solids, and wt% vitrified solids are -0.2%, -0.3%, and -0.4%, respectively. While the differences in the solids means are statistically significant at the 5% level, the bounds (at 95% confidence) on these differences and on the difference in the means of the density measurements are all less than 2%. The results from these comparisons for density and solids between the high- and low-located Coliwasa samples suggested no issues with the tank being well-mixed. Comparisons for density and for solids between the Coliwasa (using the collection of both the high- and low-located samples as BL) and the other sampling mechanisms shown in Table B6 yields % differences (in absolute value) of no more than 0.7% for density, 2.4% for dried solids, and 1.8% for vitrified solids. Over all of these results, the performance of the Isolok sampler is comparable to that of the Hydragard. See Table 3-3 for a complete listing of these % differences.

Table 3-3. % Differences for the Screened Density and Solids Measurements from Phase 2 Testing

Comparison	Density	wt% dried solids	wt% vitrified solids
Coliwasa High Location vs Coliwasa Low Location (BL)	-0.2%	-0.3%	-0.4%
Hydragard (HF) vs Coliwasa	0.0%	-1.2%	-1.6%
Hydragard (LF) vs Coliwasa	0.4%	-0.2%	0.0%
Isolok (12; LF) vs Coliwasa	-0.4%	0.8%	-0.4%
Isolok (12; HF) vs Coliwasa	0.5%	1.9%	1.5%
Isolok (3; LF) vs Coliwasa	na	-0.1%	-0.9%
Isolok (3; HF) vs Coliwasa	na	2.3%	1.7%

Table B7 provides comparisons of the oxide measurements from the low-located and high-located Coliwasa samples for all of the data and for the screened data. The analytical plan stipulated that the Coliwasa samples that were prepared (using the cesium carbonate fusion dissolution method) were to be measured in each of six different analytical blocks. The oxide measurements were averaged over the six analytical blocks to provide the data for comparing the high- and low-located Coliwasa results. All of the % differences (in absolute value) are less than 5% except for TiO₂ (6.6% for the screened) and for the ZnO (10.9% for all the data). The results from these comparisons for the oxide measurements between the high- and low-located Coliwasa samples suggested no issues with the tank being well-mixed.

Tables B8 and B9 provide comparisons between the Coliwasa measurements and the other sampler mechanisms arranged by analytical block for all of the measurements and for the screened measurements, respectively. For each ICP-OES block, measurements were made of the Coliwasa samples (both the high- and low-located samples) and of a set of samples from a sampler mechanism in question. The JMP comparisons were conducted using the ICP-OES analytical blocks for grouping the measurements to be compared. For example, analytical block 1 involved the Coliwasa samples and the 3 mL samples from the Isolok under low flow rate conditions. Table B10 in Appendix B provides the same information as Table B9, but with the results grouped by analyte and sorted by the size of the bound (from the largest to the smallest) on the bias between the two sampling systems. The entries for the % bias and for % relative bias bound that are less than 5% are shaded in green in this table. See Table 3-4 for a summary of the % differences determined for the oxide measurements from Phase 1. There are very few values for the % differences that are 5% or more. While there are a few large entries in this table, these entries are associated with oxides that are at very low concentrations (less than 0.25 wt%) in the Phase 2 simulant.

Table 3-4. % Differences for Screened Oxide Measurements from Phase 2 Testing

Oxide	High vs Low Coliwasa	Isolok-LFR-3mL	Hydragard - HFR	Isolok-LFR-12mL	Isolok-HFR-12mL	Isolok-HFR-3mL	Hydragard-LFR
Al/B	-0.3%	6.9%	9.5%	6.0%	4.6%	0.6%	5.0%
Al ₂ O ₃	-1.8%	3.6%	4.5%	2.1%	-0.4%	-0.3%	1.4%
B ₂ O ₃	-1.5%	-2.4%	-5.4%	-4.7%	-5.2%	-1.1%	-2.9%
BaO	0.3%	0.0%	2.3%	201.3%	132.1%	1.8%	113.5%
CaO	-1.6%	2.3%	2.1%	1.3%	-1.3%	-1.8%	0.3%
Cr ₂ O ₃	2.2%	3.2%	19.3%	1.9%	32.0%	14.4%	-6.6%
CuO	-3.8%	-3.9%	-0.1%	-2.5%	-6.3%	-5.2%	-1.1%
Fe/Li	-2.3%	3.5%	7.8%	0.4%	-0.9%	-1.2%	0.3%
Fe ₂ O ₃	-1.8%	3.3%	5.8%	1.9%	-0.2%	0.1%	0.9%
K ₂ O	0.9%	-3.0%	-1.5%	-0.9%	-3.7%	-0.1%	-0.6%
Li ₂ O	0.5%	0.2%	-2.3%	0.7%	0.7%	1.9%	-0.2%
MgO	-2.2%	4.1%	2.9%	1.5%	-1.6%	-0.6%	0.6%
MnO	-1.6%	4.6%	4.2%	1.7%	-2.0%	0.5%	0.0%
Na ₂ O	-1.3%	0.4%	-0.9%	1.3%	-0.4%	-0.7%	0.1%
NiO	-1.2%	3.1%	5.8%	1.0%	-1.8%	1.2%	-0.6%
SiO ₂	0.0%	1.0%	-2.2%	-2.0%	1.2%	1.3%	-0.8%
TiO ₂	6.6%	-3.7%	9.7%	-1.4%	-1.4%	1.5%	-1.6%
ZnO	0.4%	-3.0%	-1.0%	-0.6%	-3.6%	-1.1%	-1.0%
ZrO ₂	0.1%	4.0%	4.6%	0.6%	0.1%	-1.1%	0.4%
Sum	-0.7%	1.1%	-0.3%	0.0%	0.1%	0.7%	-0.6%

3.3 Low-Rheology Simulant (Phase 3) Testing

The investigations into the measurements of the Phase 3, low-rheology, testing followed the same pattern as that conducted for the results from the other two phases. The density measurements, wt% dried solids, wt% vitrified solids, and elemental measurements (in two parts) for the Phase 3 testing are provided in Tables C1, C2, and C3, respectively, in Appendix C. In addition to the oxide measurement of the simulant, the two parts of Table C3 provide measurements of the ARG-1 samples that were included in the analytical plan (5).^f The elemental concentrations were converted to oxide concentrations yielding the measurements in Table C4 of Appendix C. Table C5 in Appendix C provides the reference composition of the Phase 3 SME simulant.

To provide a general overview of the measurements from this phase of testing, plots of the density, solids, and oxide measurements are presented in Exhibit C1 in Appendix C. The groupings for these measurements include the two flow rates, and the sample IDs are also shown.

The JMP results for the statistical comparisons of these measurements as outlined above for each of the analytes of interest are provided in Exhibit C2 of Appendix C. As for the results for the earlier phases, comparisons between the low and high located Coliwasa samples were conducted as well as comparisons between the collection of Coliwasa samples and samples from the other sampling mechanisms (at low and high flow rates for both the Hydragard and Isolok and using 3- and 12-mL sample volumes for the Isolok as described above). Box plots are included in the JMP results, and these are used to conduct a screening process for outliers as was done for the previous phases.

^f A statistical evaluation of the ARG-1 results is to be provided in a separate report: SRNL-STI-2011-00711.

A summary of the results from the JMP output is provided in Table C6, Table C7, Table C8, and Table C9 in Appendix C. The format for each of these tables is similar the tables prepared for the results from the earlier phases. Table C6 provides the results of the comparisons for density, wt% dried solids, and wt% vitrified solids for all of the measurements and for the screened (scrnd) measurements. The % differences for the means of the high- and low-located Coliwasa samples for density, wt% dried solids, and wt% vitrified solids were -0.7%, -0.2%, and -0.2%, respectively. The bounds (at 95% confidence) on these differences and on the difference in the means of the density measurements are all no more than 1.5%. The results from these comparisons for density and solids between the high- and low-located Coliwasa samples suggested no issues with the tank being well-mixed. Comparisons for density and for solids between the Coliwasa (using the collection of both the high- and low-located samples as BL) and the other sampling mechanisms shown in Table C6 yielded % differences (in absolute value) of no more than 0.4% for density, 2.6% for dried solids, and 3.2% for vitrified solids. Over all of these results, the performance of the Isolok sampler was comparable to that of the Hydragard. See Table 3-5 for a complete listing of these % differences.

Table 3-5. % Differences for the Screened Density and Solids Measurements from Phase 3 Testing

Comparison	Density	wt% dried solids	wt% vitrified solids
Coliwasa High Location vs Coliwasa Low Location (BL)	-0.7%	-0.2%	-0.2%
Hydragard (HF) vs Coliwasa	0.0%	-2.6%	-3.2%
Hydragard (LF) vs Coliwasa	-0.4%	-2.2%	-3.0%
Isolok (12; LF) vs Coliwasa	0.2%	0.1%	0.0%
Isolok (12; HF) vs Coliwasa	-0.4%	-0.1%	0.0%
Isolok (3; LF) vs Coliwasa	na	0.2%	0.2%
Isolok (3; HF) vs Coliwasa	na	0.0%	0.6%

Table C7 provides comparisons of the oxide measurements from the low-located and high-located Coliwasa samples for all of the data and for the screened data. The analytical plan stipulated that the Coliwasa samples that were prepared (using the cesium carbonate fusion dissolution method) were to be measured in each of six different analytical blocks. The oxide measurements were averaged over the six analytical blocks to provide the data for comparing the high- and low-located Coliwasa results. All of the % differences (in absolute value) are less than 5% except for Cr₂O₃ (-6.2% for all of the data) and for the K₂O (-5.0% for the screened data). The results from these comparisons for the oxide measurements between the high- and low-located Coliwasa samples suggested no issues with the tank being well-mixed.

Tables C8 and C9 provide comparisons between the Coliwasa measurements and the other sampler mechanisms arranged by analytical block for all of the measurements and for the screened measurements, respectively. For each ICP-OES block, measurements were made of the Coliwasa samples (both the high- and low-located samples) and of a set of samples from a sampler mechanism in question. The JMP comparisons were conducted using the ICP-OES analytical blocks for grouping the measurements to be compared. For example, analytical block 1 involved the Coliwasa samples and the 3 mL samples from the Isolok under low flow rate conditions. Table C10 in Appendix C provides the same information as Table C9, but with the results grouped by analyte and sorted by the size of the bound (from the largest to the smallest) on the bias between the two sampling systems. The entries for the % bias and for % relative bias bound that are less than 5% are shaded in green in this table. See Table 3-6 for a summary of the % differences determined for the oxide measurements from Phase 3. There are very few values for the %

differences that are 5% or more with the Hydragard results for the high flow rate testing being above the 5% value most often.

Table 3-6. % Differences for Screened Oxide Measurements from Phase 3 Testing

Oxide	High vs Low Coliwasa	Isolok-LFR-3mL	Hydragard - HFR	Isolok-LFR-12mL	Isolok-HFR-12mL	Isolok-HFR-3mL	Hydragard-LFR
Al/B	-0.7%	-0.1%	8.9%	-1.7%	0.6%	1.4%	3.8%
Al ₂ O ₃	0.1%	-1.2%	4.7%	-2.9%	-2.3%	-0.7%	2.0%
B ₂ O ₃	0.9%	-0.9%	-5.1%	-0.8%	-1.4%	-2.1%	-1.8%
BaO	-0.4%	-2.4%	4.2%	-4.0%	-2.7%	-0.5%	1.4%
CaO	0.3%	-2.7%	5.1%	-3.1%	-3.1%	-0.8%	2.2%
Cr ₂ O ₃	-6.2%	-14.3%	8.3%	-3.8%	10.3%	-5.2%	1.8%
CuO	-2.2%	5.3%	1.9%	6.0%	4.0%	5.2%	-4.3%
Fe/Li	-1.2%	-1.0%	7.5%	-8.0%	-2.0%	-3.2%	4.1%
Fe ₂ O ₃	-0.4%	-1.6%	5.1%	-4.4%	-2.8%	-1.5%	1.5%
K ₂ O	-5.0%	1.5%	-1.1%	1.4%	-0.9%	1.9%	-0.5%
Li ₂ O	1.8%	-0.1%	-2.2%	4.1%	1.0%	1.8%	-2.5%
MgO	0.4%	-2.5%	5.5%	-6.1%	-3.6%	-2.1%	1.3%
MnO	-0.1%	-2.5%	5.2%	-5.8%	-3.7%	-2.1%	0.9%
Na ₂ O	0.6%	-0.5%	0.0%	1.9%	-0.3%	1.5%	3.0%
NiO	-0.3%	-2.4%	5.0%	-2.8%	-0.2%	-1.9%	2.8%
SiO ₂	-0.1%	0.6%	-1.9%	0.9%	-0.6%	1.1%	-2.3%
TiO ₂	0.4%	2.0%	-1.7%	0.5%	0.7%	2.0%	-2.5%
ZnO	0.2%	-2.8%	4.9%	-4.6%	-3.2%	-0.9%	2.2%
ZrO ₂	-0.4%	-0.6%	1.2%	-3.5%	-2.8%	0.1%	-3.2%
Sum	0.2%	-0.2%	0.1%	-0.3%	-0.3%	0.5%	-0.6%

3.4 Overall Comparisons

The results from each phase of this testing were reviewed in turn with DWPF personnel as the study progressed; the intent of the review was to identify any problems as early as possible so that a decision could be made on the merit of continuing the testing if an unsuccessful outcome had been seen during the early test phases. However, as shown by the results of the comparisons presented in the previous three sections, there were no major issues identified as the study progressed through the three phases of testing. In this section, a more global view of the results is presented to confirm that no pattern evolved in the outcomes of the comparisons among the samplers that raised concerns regarding the ability of the samplers to provide a representative sample of a well-mixed tank.

The primary metric used in making comparisons between two sampling systems (e.g., low Coliwasa versus high Coliwasa or HFR 3mL Isolok versus combined Coliwasa) was the % difference between the averages of the two sets of measurements. And as indicated in the discussion above, the goal was that the biases seen in this testing would be less than 5% for the elements at concentrations in the simulant that would be considered reportable by the DWPF. Table 3-7 provides the % differences between the mean of the screened measurements of the samples from the indicated sampling mechanism and the mean of the corresponding screened measurements from the Coliwasa samples for those oxides whose elemental concentrations were at least 0.5 wt% in the simulant tested. Entries with % differences (in absolute value) less than 5% are shaded. The vast majority of the entries in this table are shaded, and, once again, the % differences of the Isolok were comparable to % differences of the Hydragard, which was the primary method by which the

performance of the Isolok was assessed for this study. Specifically, note that while the Hydragard has 8 entries in Table 3-7 with % differences greater than 5%, the Isolok has only 3.

Figure 5 provides additional help in the overall assessment of the test results for the reportable elements. Figure 5 provides a plot of the % relative differences for the sets of Hydragard and Isolok samples grouped by oxide for the major oxides. Once again, the vast majority of these % differences (in absolute value) were less than 5% with a few of the Hydragard and a few of the Isolok differences falling beyond $\pm 5\%$. Thus, no problems were seen in the performance of the Isolok relative to the performance of the Hydragard during this testing. Also, there were no issues associated with flow rate and no issues associated with the use of a 3 mL sample volume versus a 12 mL sample volume for the Isolok.

Table 3-7. % Differences for Screened Oxide Measurements for All Test Phases

Test Phase/Sampler	Al ₂ O ₃	B ₂ O ₃	CaO	Fe ₂ O ₃	Li ₂ O	MgO	MnO	Na ₂ O	NiO	SiO ₂
1st/Hydragard - HFR	3.3	-0.7	3.2	2.4	0.4	1.7	2.1	0.8	not reportable	-0.9
1st/Hydragard-LFR	3	3.8	4	2.8	2.8	4.2	3.3	2.4	not reportable	0.5
1st/Isolok-HFR-12mL	-0.2	2.8	0.3	-0.9	-0.1	-0.9	-0.8	-2.9	not reportable	1.4
1st/Isolok-HFR-3mL	-1.5	1.5	-0.5	-0.6	2	-0.8	-0.7	-3	not reportable	2
1st/Isolok-LFR-12mL	2.8	4.9	4.6	3.4	0.8	3.7	3.9	2.2	not reportable	0.8
1st/Isolok-LFR-3mL	1.5	-3.4	1.7	1.6	-0.1	1.6	2	-0.5	not reportable	0
2nd/Hydragard - HFR	4.5	-5.4	2.1	5.8	-2.3	not reportable	4.2	-0.9	5.8	-2.2
2nd/Hydragard-LFR	1.4	-2.9	0.3	0.9	-0.2	not reportable	0	0.1	-0.6	-0.8
2nd/Isolok-HFR-12mL	-0.4	-5.2	-1.3	-0.2	0.7	not reportable	-2	-0.4	-1.8	1.2
2nd/Isolok-HFR-3mL	-0.3	-1.1	-1.8	0.1	1.9	not reportable	0.5	-0.7	1.2	1.3
2nd/Isolok-LFR-12mL	2.1	-4.7	1.3	1.9	0.7	not reportable	1.7	1.3	1	-2
2nd/Isolok-LFR-3mL	3.6	-2.4	2.3	3.3	0.2	not reportable	4.6	0.4	3.1	1
3rd/Hydragard - HFR	4.7	-5.1	5.1	5.1	-2.2	5.5	5.2	0	not reportable	-1.9
3rd/Hydragard-LFR	2	-1.8	2.2	1.5	-2.5	1.3	0.9	3	not reportable	-2.3
3rd/Isolok-HFR-12mL	-2.3	-1.4	-3.1	-2.8	1	-3.6	-3.7	-0.3	not reportable	-0.6
3rd/Isolok-HFR-3mL	-0.7	-2.1	-0.8	-1.5	1.8	-2.1	-2.1	1.5	not reportable	1.1
3rd/Isolok-LFR-12mL	-2.9	-0.8	-3.1	-4.4	4.1	-6.1	-5.8	1.9	not reportable	0.9
3rd/Isolok-LFR-3mL	-1.2	-0.9	-2.7	-1.6	-0.1	-2.5	-2.5	-0.5	not reportable	0.6

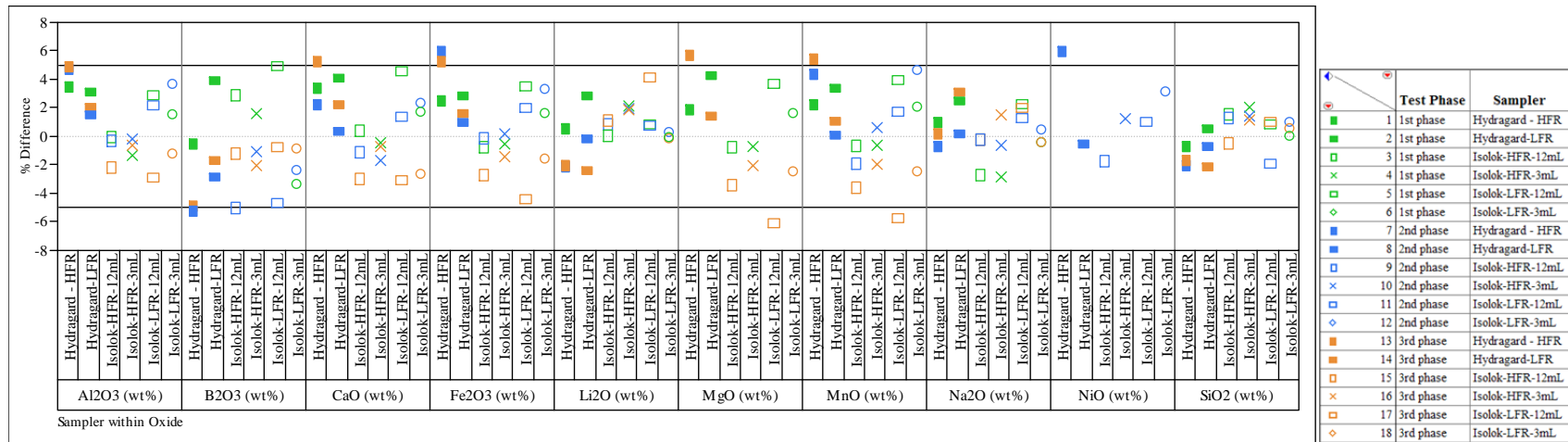


Figure 5. % Differences for Screen Measurements of Major Oxides.

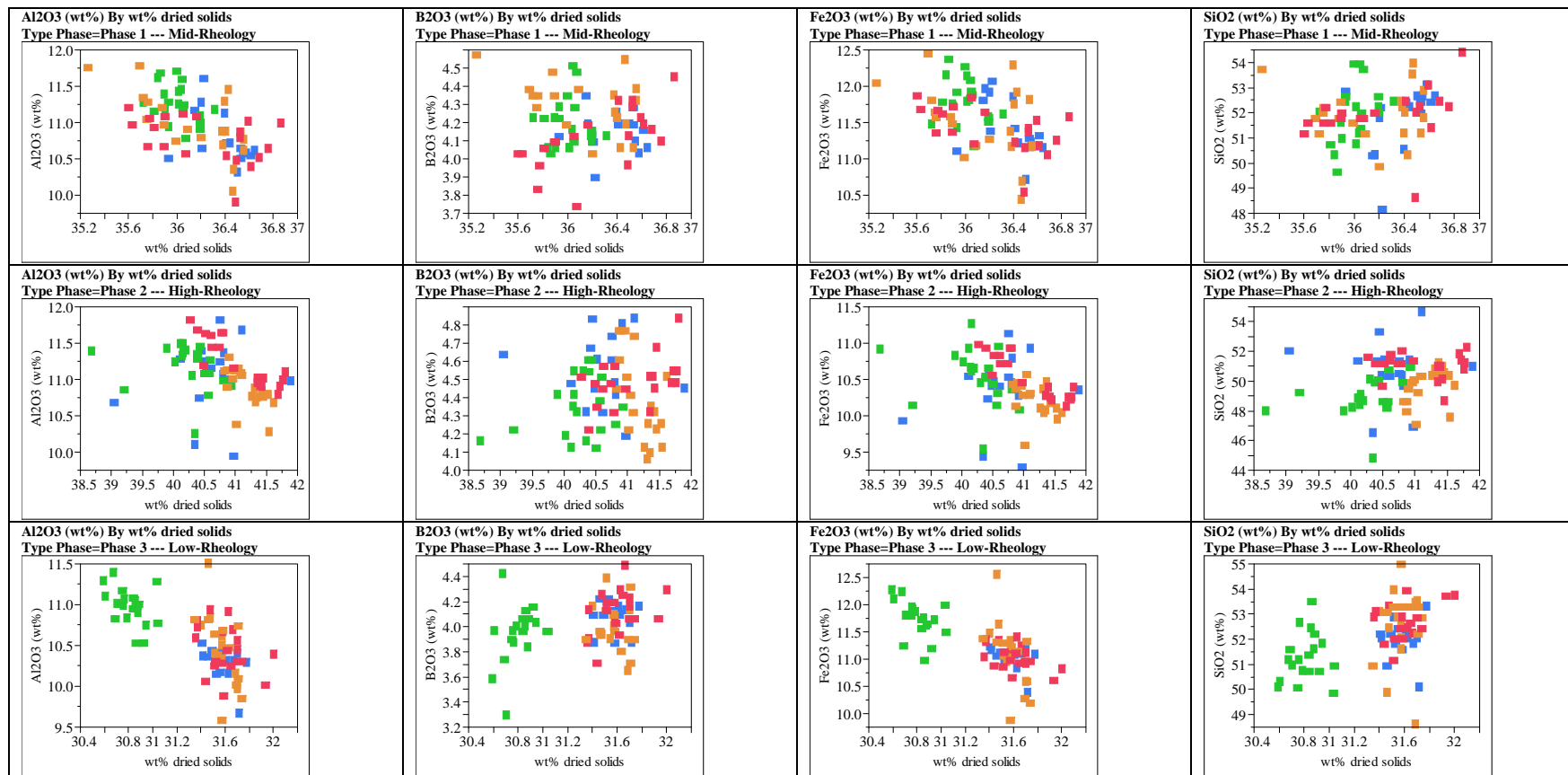
One other metric considered as part of the evaluation of a sampler mechanism during the course of these three phases of testing was the bound on the % bias of the sampling mechanism relative to the Coliwasa. As described in the discussion above, these bounds were taken from the JMP analyses and were determined at a 95% confidence level. Tables A10, B10, and C10 provide a summary of these values in a manner that facilitates comparisons between the performance of the Isolok and that of the Hydragard for this metric. The values of these bounds from these tables are summarized in Table 3-8 for the reportable elements. The entries with values less than 5% are shaded in green. Most all of these bounding values are less than 10%, and they indicate that, relative to this metric, the performance of the Isolok was comparable to that of the Hydragard for this testing.

Table 3-8. % Relative Bias Bounds for Screened Oxide Measurements for All Test Phases

Test Phase	Sampler	Al ₂ O ₃	B ₂ O ₃	CaO	Fe ₂ O ₃	Li ₂ O	MgO ^f	MnO	Na ₂ O	NiO	SiO ₂
1st phase	Hydragard - HFR	5.2	2.4	5.4	4.8	1.8	4.3	5.0	3.4	nr	2.6
1st phase	Hydragard-LFR	6.2	6.6	7.6	6.0	5.7	7.4	7.0	5.5	nr	2.9
1st phase	Isolok-HFR-12mL	2.7	5.2	3.6	4.2	1.7	4.3	4.4	5.5	nr	3.5
1st phase	Isolok-HFR-3mL	4.1	4.3	3.4	2.7	5.7	2.5	3.0	6.1	nr	4.1
1st phase	Isolok-LFR-12mL	6.1	7.8	8.0	6.8	4.4	7.3	7.8	5.7	nr	2.7
1st phase	Isolok-LFR-3mL	3.8	5.5	4.1	4.0	2.1	3.6	4.8	4.3	nr	1.4
2nd phase	Hydragard - HFR	6.1	7.8	5.1	8.1	4.8	nr	9.0	3.0	13.0	3.5
2nd phase	Hydragard-LFR	3.1	6.0	2.6	2.8	2.0	nr	2.9	2.5	5.7	2.2
2nd phase	Isolok-HFR-12mL	2.0	7.9	4.1	2.4	2.7	nr	5.1	2.2	6.2	2.3
2nd phase	Isolok-HFR-3mL	1.7	3.5	3.8	1.4	3.7	nr	3.1	2.8	5.1	2.8
2nd phase	Isolok-LFR-12mL	3.5	7.9	3.3	3.5	3.4	nr	5.1	3.9	6.3	3.5
2nd phase	Isolok-LFR-3mL	6.3	5.2	5.0	5.1	2.5	nr	8.0	3.2	8.5	1.9
3rd phase	Hydragard - HFR	5.8	8.3	7.6	6.5	4.1	7.4	7.1	1.5	nr	3.1
3rd phase	Hydragard-LFR	3.9	4.7	5.8	3.7	4.4	4.5	3.6	5.2	nr	3.6
3rd phase	Isolok-HFR-12mL	4.3	4.8	5.4	5.0	2.6	6.4	6.6	4.1	nr	2.9
3rd phase	Isolok-HFR-3mL	1.8	5.8	2.8	2.8	3.6	3.3	3.2	3.7	nr	1.9
3rd phase	Isolok-LFR-12mL	5.9	4.2	5.7	8.0	7.4	10.9	10.7	4.3	nr	2.3
3rd phase	Isolok-LFR-3mL	2.3	2.6	4.2	2.6	2.2	3.5	3.6	3.1	nr	1.7

Figure 6 was prepared as an additional check on the overall performance of the sampling mechanisms. The plots provided in this figure offer an opportunity to investigate an important aspect of sampling SME material. Since this material consisted of sludge components and heavier frit components, the question arises: Was there an indication that samples that have higher dried solids contained more frit and less sludge, and vice versa: with lower dried solids was there a tendency toward less frit and more sludge? Figure 6 plots values for Al₂O₃ (sludge), B₂O₃ (frit), Fe₂O₃ (sludge), and SiO₂ (frit) versus values for wt% dried solids for the three phases of this testing with different colors representing the different sampling mechanisms (see the legend). Note that the most obvious clustering and greatest tendency for trending is seen for the Hydragard sampler during the low-rheology (phase 3) testing. While this was not considered to be so severe as to indicate a failure of the Hydragard, it does reveal the need for this type of investigation into the performance of samplers of SME material. Also, note that this behavior was not seen in performance of the Isolok sampler.

^f nr – not reportable



Color	Sampler Mechanism
Blue	1 Coliwasa
Green	2 Hydragard - HF
Light Green	3 Hydragard - LF
Orange	4 Isolok - 12 mL - HF
Yellow	5 Isolok - 12 mL - LF
Red	6 Isolok - 3 mL - HF
Pink	7 Isolok - 3 mL - LF

Figure 6. Sludge and Frit Components versus wt% dried solids.

3.5 Cycle and Flushing Tests

The Isolok sampler was cycled a total of 10,000 times during the test. This does not include the 540 strokes for the three simulant tests or any of the strokes used for flushing the system. The testing was stopped since there was no wear indicated by the Isolok. The total cycles correspond to approximately one year of facility operation if for each SME sample run, thirty-five 12mL samples (4 strokes with the 3mL Isolok) are pulled, and the SME is sampled six times per month for twelve months.

Results for the flushing show that extending and then retracting the Isolok 30 times as water is pumped through the Isolok will visually clean the inner spool of any simulant. The Isolok was cycled 10 times by holding the spool extended and then retracting for 2 seconds each time, and then it was visually inspected to determine if further flushing was required. After three sets of 10 cycles the Isolok was cleaned of any simulant.

4.0 CONCLUSIONS

A total of three tests were performed for the Isolok acceptance testing. Simulant rheology ranged from low, medium and high yield stress and consistency values. Data from the acceptance testing show that the Isolok sampler typically pulls samples with bias errors less than 5% and that the performance of the Isolok in providing representative samples during this testing was comparable to that of the Hydragard sampler. Wear test of the Viton O-rings located on the Isolok inner spool show that it can with-stand the abrasiveness of the frit and last for at least 1 years of operation (10,000 cycles). Flushing of the Isolok showed that cycling it 30 times as flush water is pumped through the flush ports is sufficient to clean the internal spool. Visual verification could also be used by watching the water as it is flushed and letting it run until the water becomes clear.

5.0 RECOMMENDATIONS/PATH FORWARD

Based on the acceptance testing data and discussions with the DWPF Laboratory improvement team, SRNL recommends proceeding with the design and installation of the Isolok system for the SME sampling process. Based on the success of the Isolok testing to date, SRNL recommends testing to acquire a smaller 1–1.5 mL sample size. A smaller sample size used in conjunction with the cesium carbonate fusion would allow the elimination of the grinding step for the glass, thus further reducing analytical cycle time.

6.0 REFERENCES

1. **Hera, Kevin R.** *Isolok Valve Viability Testing for DWPF SME Sampling Process*. Savannah River Site, Aiken, SC, 29808 : s.n., 2011. SRNL-STI-2010-00749.
2. **Bovan, Perry L.** *SME Isolok Acceptance Testing*. Savannah River Site, Aiken, SC, 29808 : s.n., 2010. HLW-DWPF-TTR-2010-0036.
3. **Hera, Kevin R.** *Task Technical and Quality Assurance Plan for SME Isolok Acceptance Testing Requirements*. Savannah River Site, Aiken, SC 29808 : s.n., 2011. SRNL-RP-2011-00145.
4. **Stone, Mike E.** *Position on Isolok SME Testing Programs*. Savannah River Site, Aiken, SC, 29809 : s.n., 2010. SRNL-L3100-2011-00044.
5. **Edwards, Thomas B.** *Sampling and Analytical Plan Supporting the SME Acceptance Testing of the Isolok Sampler*. Savannah River Site, Aiken, SC, 29808 : s.n., 2011. SRNL-RP-2011-00294.
6. *Alkali Fusion Dissolutions of Sludge and Glass for Elemental and Anion Analysis (U)*. Savannah River Site, Aiken, SC, 29808 : s.n., 2008. L16.1 ADS-2502 Rev. 6.
7. **Coleman, Charles J.** *Lab Notebook*. 2011. SRNL-NB-2011-00016 Pg 27.
8. **Hera, Kevin R.** *Isolok Valve Testing*. 2008. WSRC-NB-2008-00007.
9. **Ray, J.W., A.V. Staub, S.L. Marra, C.J. Coleman, and M.J. Plodinec.** *Reporting the Chemical Composition of the DWPF Product (U)*. Aiken, SC : Washington Savannah River Company, 2006. WSRC-IM-91-116-2, Revision 4.
10. **SAS, Institute.** *JMP Version 7.0.2*. Cary NC : s.n., 1989-2007.

Appendix A.

Supplemental Tables and Exhibits for Mid-Rheology (Phase 1) Simulant Testing

Table A1. Density Measurements for Phase 1

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	Sample Density (g/mL)
Coliwasa	LF	Coliwasa Low	DCL01	1.2911
Coliwasa	LF	Coliwasa Low	DCL02	1.2717
Coliwasa	LF	Coliwasa Low	DCL03	1.2900
Coliwasa	LF	Coliwasa Low	DCL04	1.2668
Coliwasa	HF	Coliwasa Low	DCL05	1.2909
Coliwasa	HF	Coliwasa Low	DCL06	1.3028
Coliwasa	HF	Coliwasa Low	DCL07	1.3082
Coliwasa	HF	Coliwasa Low	DCL08	1.2844
Coliwasa	LF	Coliwasa High	DCH01	1.3000
Coliwasa	LF	Coliwasa High	DCH02	1.3160
Coliwasa	LF	Coliwasa High	DCH03	1.2883
Coliwasa	LF	Coliwasa High	DCH04	1.3039
Coliwasa	HF	Coliwasa High	DCH05	1.2982
Coliwasa	HF	Coliwasa High	DCH06	1.2928
Coliwasa	HF	Coliwasa High	DCH07	1.2962
Coliwasa	HF	Coliwasa High	DCH08	1.2987
Hydragard	LF	Hydragard	DLHY01	1.3065
Hydragard	LF	Hydragard	DLHY02	1.2982
Hydragard	LF	Hydragard	DLHY03	1.3016
Hydragard	LF	Hydragard	DLHY04	1.3089
Hydragard	LF	Hydragard	DLHY05	1.3114
Hydragard	LF	Hydragard	DLHY06	1.2997
Hydragard	LF	Hydragard	DLHY07	1.2891
Hydragard	LF	Hydragard	DLHY08	1.3072
Hydragard	LF	Hydragard	DLHY09	1.3085
Hydragard	LF	Hydragard	DLHY10	1.3022
Hydragard	HF	Hydragard	DHHY01	1.2989
Hydragard	HF	Hydragard	DHHY02	1.3189
Hydragard	HF	Hydragard	DHHY03	1.2842
Hydragard	HF	Hydragard	DHHY04	1.2943
Hydragard	HF	Hydragard	DHHY05	1.2954
Hydragard	HF	Hydragard	DHHY06	1.4033
Hydragard	HF	Hydragard	DHHY07	1.2912
Hydragard	HF	Hydragard	DHHY08	1.3047
Hydragard	HF	Hydragard	DHHY09	1.2876
Hydragard	HF	Hydragard	DHHY10	1.3030
Isolok	LF	Isolok	DLIB01	1.2810
Isolok	LF	Isolok	DLIB02	1.2908
Isolok	LF	Isolok	DLIB03	1.3007
Isolok	LF	Isolok	DLIB04	1.2580
Isolok	LF	Isolok	DLIB05	1.2877
Isolok	LF	Isolok	DLIB06	1.2980
Isolok	LF	Isolok	DLIB07	1.2887
Isolok	LF	Isolok	DLIB08	1.2993
Isolok	LF	Isolok	DLIB09	1.2839
Isolok	LF	Isolok	DLIB10	1.2892
Isolok	HF	Isolok	DHIB01	1.2995
Isolok	HF	Isolok	DHIB02	1.3285
Isolok	HF	Isolok	DHIB03	1.3112
Isolok	HF	Isolok	DHIB04	1.2932
Isolok	HF	Isolok	DHIB05	1.2948
Isolok	HF	Isolok	DHIB06	1.3079
Isolok	HF	Isolok	DHIB07	1.2857
Isolok	HF	Isolok	DHIB08	1.3191
Isolok	HF	Isolok	DHIB09	1.2954
Isolok	HF	Isolok	DHIB10	1.3025

Table A2. Solids Measurements for Phase 1

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	wt% dried solids	wt% vitrified solids
Coliwasa	LF	Coliwasa Low	CL01	36.2	30.88
Coliwasa	LF	Coliwasa Low	CL02	36.14	30.79
Coliwasa	LF	Coliwasa Low	CL03	36.21	30.74
Coliwasa	LF	Coliwasa Low	CL04	35.92	30.51
Coliwasa	HF	Coliwasa Low	CL05	36.2	30.8
Coliwasa	HF	Coliwasa Low	CL06	36.39	31.01
Coliwasa	HF	Coliwasa Low	CL07	36.5	31.11
Coliwasa	HF	Coliwasa Low	CL08	36.16	30.76
Coliwasa	LF	Coliwasa High	CH01	36.52	31.17
Coliwasa	LF	Coliwasa High	CH02	36.4	31.05
Coliwasa	LF	Coliwasa High	CH03	36.6	31.18
Coliwasa	LF	Coliwasa High	CH04	36.52	31.11
Coliwasa	HF	Coliwasa High	CH05	36.57	31.23
Coliwasa	HF	Coliwasa High	CH06	36.54	31.15
Coliwasa	HF	Coliwasa High	CH07	36.64	31.22
Coliwasa	HF	Coliwasa High	CH08	36.44	31.02
Hydragard	LF	Hydragard	LHY01	36.05	30.41
Hydragard	LF	Hydragard	LHY02	36.06	30.39
Hydragard	LF	Hydragard	LHY03	35.92	30.25
Hydragard	LF	Hydragard	LHY04	35.8	30.16
Hydragard	LF	Hydragard	LHY05	36.04	30.39
Hydragard	LF	Hydragard	LHY06	36.03	30.38
Hydragard	LF	Hydragard	LHY07	35.85	30.19
Hydragard	LF	Hydragard	LHY08	36.18	30.48
Hydragard	LF	Hydragard	LHY09	35.99	30.2
Hydragard	LF	Hydragard	LHY10	36.18	30.47
Hydragard	HF	Hydragard	HHY01	35.84	30.04
Hydragard	HF	Hydragard	HHY02	35.89	30.13
Hydragard	HF	Hydragard	HHY03	36.01	30.26
Hydragard	HF	Hydragard	HHY04	35.72	29.89
Hydragard	HF	Hydragard	HHY05	35.9	30.07
Hydragard	HF	Hydragard	HHY06	36.31	30.58
Hydragard	HF	Hydragard	HHY07	36.01	30.18
Hydragard	HF	Hydragard	HHY08	36.19	30.44
Hydragard	HF	Hydragard	HHY09	35.93	30.09
Hydragard	HF	Hydragard	HHY10	36.03	30.2
Isolok (3 mL)	LF	Isolok (3 mL)	LIS01	35.89	30.45
Isolok (3 mL)	LF	Isolok (3 mL)	LIS02	35.62	30.16
Isolok (3 mL)	LF	Isolok (3 mL)	LIS03	35.75	30.32
Isolok (3 mL)	LF	Isolok (3 mL)	LIS04	36.06	30.52
Isolok (3 mL)	LF	Isolok (3 mL)	LIS05	35.88	30.43
Isolok (3 mL)	LF	Isolok (3 mL)	LIS06	35.59	30.08
Isolok (3 mL)	LF	Isolok (3 mL)	LIS07	35.76	30.13
Isolok (3 mL)	LF	Isolok (3 mL)	LIS08	35.8	30.2
Isolok (3 mL)	LF	Isolok (3 mL)	LIS09	36.15	30.6
Isolok (3 mL)	LF	Isolok (3 mL)	LIS10	36.04	30.54
Isolok (3 mL)	HF	Isolok (3 mL)	HIS01	36.41	30.86
Isolok (3 mL)	HF	Isolok (3 mL)	HIS02	36.68	31.06
Isolok (3 mL)	HF	Isolok (3 mL)	HIS03	36.75	31.2
Isolok (3 mL)	HF	Isolok (3 mL)	HIS04	36.48	30.93
Isolok (3 mL)	HF	Isolok (3 mL)	HIS05	36.49	31
Isolok (3 mL)	HF	Isolok (3 mL)	HIS06	36.52	30.96
Isolok (3 mL)	HF	Isolok (3 mL)	HIS07	36.86	31.21
Isolok (3 mL)	HF	Isolok (3 mL)	HIS08	36.59	31.03
Isolok (3 mL)	HF	Isolok (3 mL)	HIS09	36.52	31.02
Isolok (3 mL)	HF	Isolok (3 mL)	HIS10	36.61	31.02
Isolok (12 mL)	LF	Isolok (12 mL)	LIB01	35.25	29.83
Isolok (12 mL)	LF	Isolok (12 mL)	LIB02	35.87	30.38
Isolok (12 mL)	LF	Isolok (12 mL)	LIB03	35.98	30.47
Isolok (12 mL)	LF	Isolok (12 mL)	LIB04	35.88	30.38
Isolok (12 mL)	LF	Isolok (12 mL)	LIB05	35.68	30.18
Isolok (12 mL)	LF	Isolok (12 mL)	LIB06	35.71	30.12
Isolok (12 mL)	LF	Isolok (12 mL)	LIB07	35.74	30.22
Isolok (12 mL)	LF	Isolok (12 mL)	LIB08	35.75	30.23

Table A2. Solids Measurements for Phase 1

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	wt% dried solids	wt% vitrified solids
Isolok (12 mL)	LF	Isolok (12 mL)	LIB09	36.08	30.5
Isolok (12 mL)	LF	Isolok (12 mL)	LIB10	36.19	30.64
Isolok (12 mL)	HF	Isolok (12 mL)	HIB01	36.38	30.9
Isolok (12 mL)	HF	Isolok (12 mL)	HIB02	36.37	30.88
Isolok (12 mL)	HF	Isolok (12 mL)	HIB03	36.42	30.93
Isolok (12 mL)	HF	Isolok (12 mL)	HIB04	36.4	30.91
Isolok (12 mL)	HF	Isolok (12 mL)	HIB05	36.53	31.09
Isolok (12 mL)	HF	Isolok (12 mL)	HIB06	36.55	31.07
Isolok (12 mL)	HF	Isolok (12 mL)	HIB07	36.55	31.02
Isolok (12 mL)	HF	Isolok (12 mL)	HIB08	36.46	30.84
Isolok (12 mL)	HF	Isolok (12 mL)	HIB09	36.39	30.84
Isolok (12 mL)	HF	Isolok (12 mL)	HIB10	36.47	30.9

Table A3. Phase 1 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	24000	25500	804	10400	< 437	663	< 318	97600	22700	< 182	14800
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	56400	11900	939	8570	< 564	718	< 410	79400	< 2770	< 235	22000
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	58600	12700	953	8900	< 530	750	< 386	81900	< 2610	< 221	22200
SME Simulant	Coliwasa	LF	20	1	2	1	4	CL02	59100	13500	956	9030	< 546	718	< 397	82500	< 2690	< 227	22100
SME Simulant	Coliwasa	LF	38	1	16	1	5	CH03	55800	12900	919	8810	< 569	712	< 414	79100	< 2800	< 237	22300
SME Simulant	Coliwasa	LF	63	1	13	1	6	CH04	56300	13300	927	8480	< 562	715	< 409	78900	< 2760	< 234	21900
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	58500	12300	938	8660	< 553	681	< 402	81600	< 2720	< 230	21900
SME Simulant	Coliwasa	HF	23	1	28	1	8	CH06	56000	12700	906	8490	< 523	719	< 381	78400	< 2570	< 218	22900
SME Simulant	Coliwasa	LF	21	1	14	1	9	CH02	56700	13000	924	8440	< 577	722	< 419	79800	< 2830	< 240	21800
SME Simulant	Coliwasa	HF	3	1	20	1	10	CL05	58400	12800	932	8690	< 498	744	< 362	82500	< 2450	< 207	21600
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	58000	12500	940	8700	< 519	702	< 377	81700	< 2550	< 216	21600
SME Simulant	Coliwasa	LF	40	1	19	1	12	CL03	61400	12100	964	8960	< 592	777	< 430	84400	< 2910	< 246	20400
SME Simulant	Coliwasa	HF	18	1	26	1	13	CL06	58800	13200	960	8830	< 589	809	< 428	82800	< 2900	< 245	21800
SME Simulant	Coliwasa	HF	1	1	22	1	14	CH05	55900	12500	910	8370	< 588	712	< 427	78100	< 2890	< 245	21400
ARG-1	None	0	0	1	15	1	15	ARG-1B12	24100	25200	809	10400	< 445	656	< 324	97500	22100	< 185	14800
SME Simulant	Coliwasa	HF	36	1	21	1	16	CL07	54500	13000	908	7920	< 562	692	< 409	74800	< 2670	< 234	24000
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	56400	12700	927	8550	< 591	704	< 430	79500	< 2910	< 246	21700
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	58800	12800	959	8900	< 554	739	< 403	82800	< 2720	< 231	21500
SME Simulant	Coliwasa	HF	63	1	5	1	19	CL08	58600	13000	975	8920	< 508	749	< 369	83600	< 2500	< 211	22500
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	55900	11600	906	8460	< 551	668	< 401	78300	< 2710	< 229	22300
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	59300	12500	971	8930	< 556	719	< 405	83000	< 2730	< 232	21600
SME Simulant	Coliwasa	HF	65	1	6	1	22	CH08	56600	13000	905	8360	< 555	707	< 404	78300	< 2730	< 231	21800
SME Simulant	Coliwasa	HF	34	1	18	1	23	CH07	56100	12600	922	8550	< 515	697	< 374	77900	< 2530	< 214	21300
SME Simulant	Coliwasa	LF	1	1	12	1	24	CH01	55600	13000	905	8450	< 511	691	< 372	78000	< 2510	< 213	22100
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	58600	13000	948	8860	< 587	699	< 427	81400	< 2880	< 244	21300
SME Simulant	Coliwasa	LF	4	1	10	1	26	CL01	56300	12700	916	8630	< 572	716	< 416	79600	< 2810	< 238	22600
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	57800	12600	952	8790	< 577	688	< 420	81200	< 2840	< 240	22400
SME Simulant	Coliwasa	LF	65	1	23	1	28	CL04	55600	12800	902	8410	< 553	738	< 402	77600	< 2720	< 230	21600
ARG-1	None	0	0	1	29	1	29	ARG-1B13	24900	24400	820	10600	< 556	651	< 404	98000	21800	< 231	14900
ARG-1	None	0	0	2	1	2	1	ARG-1B21	24700	24100	810	10400	< 381	686	< 277	98000	22300	< 159	15100
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	60200	13100	944	9030	< 561	736	< 408	82100	< 2760	< 233	22200
SME Simulant	Coliwasa	HF	36	1	21	2	3	CL07	55500	12800	885	8110	< 562	715	< 409	75100	< 2760	< 234	24500
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	59600	13100	949	8920	< 607	761	< 442	80200	< 2990	< 253	22300
SME Simulant	Coliwasa	HF	1	1	22	2	5	CH05	56800	12600	926	8400	< 588	772	< 427	78100	< 2890	< 245	21700
SME Simulant	Coliwasa	HF	3	1	20	2	6	CL05	59600	12800	966	8910	533	785	< 362	83200	< 2450	< 207	22200
SME Simulant	Coliwasa	HF	23	1	28	2	7	CH06	57000	12800	930	8530	< 523	761	< 381	78900	< 2570	< 218	22700
SME Simulant	Coliwasa	LF	1	1	12	2	8	CH01	56400	13000	925	8570	< 511	733	< 372	78800	< 2510	< 213	22500
SME Simulant	Coliwasa	LF	20	1	2	2	9	CL02	60700	13400	992	8980	< 546	751	< 397	83400	< 2690	< 227	22000
SME Simulant	Coliwasa	HF	63	1	5	2	10	CL08	59200	13100	961	8920	< 508	800	< 369	84100	< 2500	< 211	22900
SME Simulant	Coliwasa	HF	65	1	6	2	11	CH08	57200	13200	920	8410	< 555	718	< 404	78500	< 2730	< 231	22000
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	59500	12600	953	8810	< 490	792	< 356	82400	< 2410	< 204	21900
SME Simulant	Coliwasa	LF	4	1	10	2	13	CL01	57900	13000	959	8720	< 572	762	< 416	80500	< 2810	< 238	22800
SME Simulant	Coliwasa	HF	18	1	26	2	14	CL06	59600	13200	987	8940	< 589	869	< 428	82800	< 2800	< 245	22100
ARG-1	None	0	0	2	12	2	15	ARG-1B22	25400	23500	820	10600	< 402	665	< 292	98300	20300	< 167	15100
SME Simulant	Coliwasa	LF	65	1	23	2	16	CL04	57000	12700	947	8600	< 553	760	< 402	78200	< 2720	< 230	21800
SME Simulant	Coliwasa	LF	40	1	19	2	17	CL03	63500	11800	1000	9010	< 592	777	< 430	84700	< 2910	< 246	20900
SME Simulant	Coliwasa	LF	38	1	16	2	18	CH03	56700	12500	931	8650	< 569	724	< 414	78800	< 2800	< 237	22600
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	57800	13300	948	8820	< 494	768	< 359	79800	< 2430	< 205	22400

Table A3. Phase 1 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
SME Simulant	Coliwasa	LF	21	1	14	2	20	CH02	58100	13000	947	8560	< 577	746	< 419	80100	< 2830	< 240	22500
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	61400	12600	1010	9280	< 596	759	< 434	84900	< 2930	< 248	21600
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	60400	12600	993	9200	< 567	767	< 412	84800	< 2790	< 236	22100
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	58600	12700	965	8880	646	749	< 415	80900	< 2810	< 238	22300
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	59100	12800	964	8690	< 577	758	< 420	81100	< 2840	< 240	22300
SME Simulant	Coliwasa	HF	34	1	18	2	25	CH07	57000	12900	943	8560	< 515	738	< 374	78800	< 2530	< 214	21700
SME Simulant	Coliwasa	LF	63	1	13	2	26	CH04	57100	12900	946	8600	< 562	726	< 409	78800	< 2760	< 234	22400
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	59100	12600	962	8660	< 545	771	< 396	81900	< 2680	< 227	22600
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	60500	12900	991	9020	565	739	< 370	82500	< 2500	< 212	22300
ARG-1	None	0	0	2	23	2	29	ARG-1B23	25100	24300	838	10600	< 501	679	< 365	97900	21100	< 209	15100
ARG-1	None	0	0	3	1	3	1	ARG-1B31	24800	26300	828	10500	< 557	714	< 343	98100	22100	< 196	15100
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	59300	13900	948	8890	< 672	753	< 414	81000	< 2800	< 237	21900
SME Simulant	Coliwasa	HF	36	1	21	3	3	CL07	54900	13200	874	7950	< 664	681	< 409	73900	< 2760	< 234	24100
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	58000	13500	964	8890	< 652	741	< 401	80300	< 2710	< 229	22600
SME Simulant	Coliwasa	HF	1	1	22	3	5	CH05	54800	12300	879	8100	< 694	695	< 427	74700	< 2890	< 245	20800
SME Simulant	Coliwasa	HF	3	1	20	3	6	CL05	59700	13400	956	8930	< 589	790	< 362	82500	< 2450	< 207	22000
SME Simulant	Coliwasa	HF	23	1	28	3	7	CH06	58300	12500	925	8560	< 618	750	< 381	78300	< 2570	< 218	22600
SME Simulant	Coliwasa	LF	1	1	12	3	8	CH01	57700	12900	924	8710	< 604	717	< 372	78300	< 2510	< 213	22400
SME Simulant	Coliwasa	LF	20	1	2	3	9	CL02	60900	13600	972	9010	< 646	746	< 397	82500	< 2690	< 227	21700
SME Simulant	Coliwasa	HF	63	1	5	3	10	CL08	60000	13000	965	9030	< 600	790	< 369	83700	< 2500	< 211	22800
SME Simulant	Coliwasa	HF	65	1	6	3	11	CH08	57300	13500	915	8400	< 656	707	< 404	77900	< 2730	< 231	21900
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	58400	13300	950	8990	< 682	757	< 419	81400	14600	< 240	21800
SME Simulant	Coliwasa	LF	4	1	10	3	13	CL01	58100	12800	942	8720	< 676	745	< 416	79200	< 2810	< 238	22400
SME Simulant	Coliwasa	HF	18	1	26	3	14	CL06	60000	13400	976	8970	< 696	833	< 428	82200	< 2900	< 245	21800
ARG-1	None	0	0	3	12	3	15	ARG-1B32	25000	24700	811	10500	< 575	654	< 354	97200	21000	< 202	14900
SME Simulant	Coliwasa	LF	65	1	23	3	16	CL04	56400	13200	911	8420	< 654	772	< 402	76600	< 2720	< 230	21300
SME Simulant	Coliwasa	LF	40	1	19	3	17	CL03	61300	12000	944	8580	< 699	771	< 430	81400	< 2910	< 246	20100
SME Simulant	Coliwasa	LF	38	1	16	3	18	CH03	57300	13100	931	8670	< 672	736	< 414	78900	< 2800	< 237	22500
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	57700	13600	939	8680	< 700	754	< 431	78200	< 2910	< 246	21600
SME Simulant	Coliwasa	LF	21	1	14	3	20	CH02	53800	12600	868	7980	< 682	699	< 419	74100	< 2830	< 240	20600
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	62200	14200	992	9290	< 695	772	< 428	84200	< 2890	< 245	22900
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	56800	13000	923	8360	< 715	721	< 440	77000	< 2970	< 252	20800
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	59700	13500	977	8920	< 710	776	< 437	80900	< 2950	< 250	22100
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	60000	13500	981	9380	< 687	805	< 423	82500	< 2860	< 242	22400
SME Simulant	Coliwasa	HF	34	1	18	3	25	CH07	55900	12400	905	8420	< 608	702	< 374	76500	< 2530	< 214	20900
SME Simulant	Coliwasa	LF	63	1	13	3	26	CH04	53900	13000	874	8080	< 664	704	< 409	74300	< 2760	< 234	21000
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	62300	13600	1010	9320	< 629	769	< 387	87000	< 2620	< 222	23000
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	57100	12500	915	8510	< 649	710	< 399	78800	< 2700	< 228	20800
ARG-1	None	0	0	3	23	3	29	ARG-1B33	25700	25600	834	10700	< 508	690	< 313	100000	22800	< 179	15400
ARG-1	None	0	0	4	1	4	1	ARG-1B41	24600	24800	809	10400	< 482	659	< 351	98000	22800	< 201	15000
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	57500	13500	939	8720	< 539	721	< 392	79500	< 2650	< 224	22100
SME Simulant	Coliwasa	HF	36	1	21	4	3	CL07	55000	12700	877	8050	< 562	679	< 409	75500	< 2760	< 234	24900
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	57500	13100	949	8650	< 605	775	< 440	82100	3170	< 252	22200
SME Simulant	Coliwasa	HF	1	1	22	4	5	CH05	56800	12500	914	8340	< 588	730	< 427	78700	< 2890	< 245	21500
SME Simulant	Coliwasa	HF	3	1	20	4	6	CL05	59100	13100	953	8830	< 498	779	< 362	83600	< 2450	< 207	22500
SME Simulant	Coliwasa	HF	23	1	28	4	7	CH06	56500	12500	916	8470	< 523	726	< 381	79100	< 2590	< 218	22900
SME Simulant	Coliwasa	LF	1	1	12	4	8	CH01	56200	13100	920	8560	< 511	698	< 372	78500	< 2510	< 213	22600
SME Simulant	Coliwasa	LF	20	1	2	4	9	CL02	59800	13300	966	8920	< 546	730	< 397	83300	< 2690	< 227	21900

Table A3. Phase 1 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
SME Simulant	Coliwasa	HF	63	1	5	4	10	CL08	58400	12700	940	8710	< 508	751	< 369	84000	< 2500	< 211	22700
SME Simulant	Coliwasa	HF	65	1	6	4	11	CH08	56400	13200	903	8180	< 555	694	< 404	78800	< 2730	< 231	21800
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	12	HIB07	56900	13400	921	8570	< 614	723	< 447	78100	< 3020	< 256	21500
SME Simulant	Coliwasa	LF	4	1	10	4	13	CL01	57200	13000	938	8620	< 572	747	< 416	80400	< 2810	< 238	22400
SME Simulant	Coliwasa	HF	18	1	26	4	14	CL06	58500	12900	960	8920	< 589	816	< 428	82800	< 2900	< 245	21700
ARG-1	None	0	0	4	7	4	15	ARG-1B42	24300	25100	804	10300	< 469	659	< 341	97700	23700	< 195	14900
SME Simulant	Coliwasa	LF	65	1	23	4	16	CL04	56400	13100	908	8410	< 553	752	< 402	78000	< 2720	< 230	21900
SME Simulant	Coliwasa	LF	40	1	19	4	17	CL03	62200	12100	967	9040	< 592	776	< 430	84300	< 2910	< 246	20600
SME Simulant	Coliwasa	LF	38	1	16	4	18	CH03	56100	12600	916	8470	< 569	689	< 414	79100	< 2800	< 237	22500
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	19	HIB09	59700	13100	1000	9190	< 588	790	< 427	85900	< 2890	< 245	22000
SME Simulant	Coliwasa	LF	21	1	14	4	20	CH02	56900	13000	921	8310	< 577	714	< 419	79700	3290	< 240	22000
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	21	HIB01	56500	13200	911	8240	< 599	732	< 436	78000	< 2950	< 249	22500
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	22	HIB03	60500	12600	983	9330	< 578	784	< 420	83200	< 2840	< 241	22000
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	23	HIB08	53100	14100	900	8120	< 609	667	< 443	72900	< 3000	< 254	23600
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	24	HIB06	56100	13600	906	8400	< 497	709	< 362	78000	< 2450	< 207	22700
SME Simulant	Coliwasa	HF	34	1	18	4	25	CH07	56600	12900	921	8540	< 515	699	< 374	78500	< 2530	< 214	22000
SME Simulant	Coliwasa	LF	63	1	13	4	26	CH04	56700	13100	925	8550	< 562	720	< 409	79100	< 2760	< 234	22600
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	27	HIB05	57400	12600	930	8520	< 604	761	< 439	82500	< 2970	< 251	22200
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	28	HIB10	54700	13000	896	8070	< 584	668	< 424	74700	< 2870	< 243	22500
ARG-1	None	0	0	4	13	4	29	ARG-1B43	24700	24400	810	10200	< 486	644	< 354	97900	21900	< 202	15000
ARG-1	None	0	0	2	1	5	1	ARG-1B21	24400	24100	797	10500	< 381	662	< 277	96800	22800	< 159	15200
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	56200	12700	924	8500	< 637	713	< 463	78600	< 3130	< 265	22800
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	55700	13400	912	8390	< 510	676	< 371	78400	< 2510	< 212	22500
SME Simulant	Coliwasa	LF	20	1	2	5	4	CL02	58500	13000	954	8830	< 546	720	< 397	81500	< 2690	< 227	21400
SME Simulant	Coliwasa	LF	38	1	16	5	5	CH03	57900	13000	945	9040	< 569	723	< 414	81400	< 2800	< 237	23500
SME Simulant	Coliwasa	LF	63	1	13	5	6	CH04	54000	12500	882	8220	< 562	698	< 409	75600	< 2760	< 234	21300
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	58100	13800	931	8840	< 580	730	< 422	80900	< 2850	< 241	22700
SME Simulant	Coliwasa	HF	23	1	28	5	8	CH06	54800	12200	883	8270	< 523	722	< 381	76200	< 2570	< 218	21900
SME Simulant	Coliwasa	LF	21	1	14	5	9	CH02	58500	13000	944	8740	< 577	744	< 419	82000	< 2830	< 240	22600
SME Simulant	Coliwasa	HF	3	1	20	5	10	CL05	56600	12500	910	8680	< 498	750	< 362	80000	< 2450	< 207	21600
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	55600	12900	895	8430	< 544	700	< 395	77200	< 2670	< 226	22100
SME Simulant	Coliwasa	LF	40	1	19	5	12	CL03	60800	12000	951	8640	< 592	777	< 430	83300	< 2910	< 246	20100
SME Simulant	Coliwasa	HF	18	1	26	5	13	CL06	58000	13200	952	9000	< 589	810	< 428	81900	< 2900	< 245	21300
SME Simulant	Coliwasa	HF	1	1	22	5	14	CH05	55800	12600	904	7990	< 588	721	< 427	77400	< 2890	< 245	21100
ARG-1	None	0	0	2	12	5	15	ARG-1B22	22600	22700	743	9770	< 402	613	< 292	90000	20700	< 167	14100
SME Simulant	Coliwasa	HF	36	1	21	5	16	CL07	54100	12800	886	8270	< 562	690	< 409	74300	< 2760	< 234	24800
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	55400	12800	917	8470	< 571	691	< 415	77900	< 2810	< 238	22000
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	54900	13000	912	8650	< 530	709	< 386	78100	< 2610	< 221	22100
SME Simulant	Coliwasa	HF	63	1	5	5	19	CL08	58300	12900	939	9070	< 508	753	< 369	83000	< 2500	< 211	22900
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	52300	12300	866	8070	< 550	669	< 400	73600	< 2710	< 229	20900
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	57000	13400	915	8810	< 529	724	< 384	79400	< 2600	< 220	23300
SME Simulant	Coliwasa	HF	65	1	6	5	22	CH08	56500	13500	907	8420	< 555	701	< 404	78300	< 2730	< 231	21900
SME Simulant	Coliwasa	HF	34	1	18	5	23	CH07	56500	13200	930	8610	< 515	727	< 374	78500	< 2530	< 214	21600
SME Simulant	Coliwasa	LF	1	1	12	5	24	CH01	55200	12800	891	8400	< 511	686	< 372	76900	< 2510	< 213	21700
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	57400	13300	917	8900	< 580	717	< 422	79700	< 2850	< 241	22700
SME Simulant	Coliwasa	LF	4	1	10	5	26	CL01	58300	13300	960	8880	< 572	753	< 416	81900	< 2810	< 238	23000
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	58200	13100	933	8660	< 545	730	< 397	80500	< 2680	< 227	22000
SME Simulant	Coliwasa	LF	65	1	23	5	28	CL04	56700	13300	924	8810	< 553	763	< 402	78800	< 2720	< 230	21600

Table A3. Phase 1 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	24500	24000	812	10300	< 501	661	< 365	98000	22200	< 209	14900
ARG-1	None	0	0	3	1	6	1	ARG-1B31	24500	24700	797	10300	< 471	656	< 343	97700	22400	< 196	14700
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	59700	13100	953	9100	< 555	717	< 404	83300	< 2730	< 231	23400
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	59500	13300	957	8830	< 594	725	< 432	83100	< 2920	< 247	21700
SME Simulant	Coliwasa	LF	20	1	2	6	4	CL02	60000	13300	959	9090	< 546	728	< 397	83400	< 2690	< 227	22300
SME Simulant	Coliwasa	LF	38	1	16	6	5	CH03	57000	12800	928	8700	< 569	719	< 414	79900	< 2800	< 237	22700
SME Simulant	Coliwasa	LF	63	1	13	6	6	CH04	56400	12900	917	8480	< 562	715	< 409	79000	< 2760	< 234	21800
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	61800	12500	971	9240	< 609	757	< 443	86500	< 3000	< 254	22200
SME Simulant	Coliwasa	HF	23	1	28	6	8	CH06	57100	12300	911	8480	< 523	722	< 381	79700	< 2570	< 218	22300
SME Simulant	Coliwasa	LF	21	1	14	6	9	CH02	54400	12100	867	8030	< 577	681	< 419	76400	< 2830	< 240	20700
SME Simulant	Coliwasa	HF	3	1	20	6	10	CL05	60400	13000	972	9100	< 498	773	380	85500	< 2450	< 207	22700
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	57000	13900	893	8230	< 599	682	< 436	78100	< 2950	< 249	23100
SME Simulant	Coliwasa	LF	40	1	19	6	12	CL03	63700	12100	984	8990	< 592	790	< 430	86800	< 2910	< 246	20900
SME Simulant	Coliwasa	HF	18	1	26	6	13	CL06	58600	12500	947	8910	< 589	795	< 428	82600	< 2900	< 245	21500
SME Simulant	Coliwasa	HF	1	1	22	6	14	CH05	57500	12500	926	8480	< 588	738	< 427	80000	< 2890	< 245	21800
ARG-1	None	0	0	3	12	6	15	ARG-1B32	24100	24700	783	10200	< 486	653	< 354	95600	21800	< 202	14400
SME Simulant	Coliwasa	HF	36	1	21	6	16	CL07	55300	12400	879	8050	< 562	670	< 409	75900	< 2760	< 234	24400
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	59200	12700	949	8870	< 530	754	< 386	83400	< 2610	< 221	22000
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	58200	12900	939	8990	< 570	691	< 415	80900	< 2800	< 237	23300
SME Simulant	Coliwasa	HF	63	1	5	6	19	CL08	60500	13000	957	8930	< 508	766	< 369	85700	< 2500	< 211	22500
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	59000	13100	942	8940	< 559	716	< 407	82400	< 2750	< 233	23200
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	61300	14000	978	9290	< 575	746	< 418	84500	< 2830	< 239	23500
SME Simulant	Coliwasa	HF	65	1	6	6	22	CH08	55100	12600	875	8070	< 555	663	< 404	76600	< 2730	< 231	21400
SME Simulant	Coliwasa	HF	34	1	18	6	23	CH07	58700	13200	955	9000	< 515	742	< 374	81900	< 2530	< 214	23200
SME Simulant	Coliwasa	LF	1	1	12	6	24	CH01	55300	12600	887	8410	< 511	678	< 372	76800	< 2510	< 213	22000
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	61900	13500	1010	9610	< 513	772	< 373	85800	< 2520	< 214	23800
SME Simulant	Coliwasa	LF	4	1	10	6	26	CL01	57300	12700	924	8810	< 572	727	< 416	80400	< 2810	< 238	23100
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	57700	12800	934	8730	< 511	703	< 372	80400	< 2510	< 213	21600
SME Simulant	Coliwasa	LF	65	1	23	6	28	CL04	57300	13200	920	8620	< 553	760	< 402	79000	< 2720	< 230	22200
ARG-1	None	0	0	3	23	6	29	ARG-1B33	23200	24000	762	9910	< 430	618	< 313	92300	21900	< 179	14500

Table A3. Phase 1 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	5170	14300	85500	8130	848	< 813	< 649	226000	6920	194	985
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	6420	13500	89000	3590	< 417	< 1050	855	241000	486	832	2710
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	6490	13900	78600	3640	< 392	< 985	1190	243000	496	825	2820
SME Simulant	Coliwasa	LF	20	1	2	1	4	CL02	6640	14000	84000	3650	< 404	< 1020	1680	235000	486	828	2800
SME Simulant	Coliwasa	LF	38	1	16	1	5	CH03	6370	13600	83900	3560	< 421	< 1060	1420	245000	509	816	2730
SME Simulant	Coliwasa	LF	63	1	13	1	6	CH04	6310	13400	83800	3520	< 415	< 1040	1540	243000	511	817	2720
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	6510	14000	80900	3560	< 409	< 1030	< 821	244000	488	804	2770
SME Simulant	Coliwasa	HF	23	1	28	1	8	CH06	6280	13300	80700	3490	< 387	< 972	1070	246000	511	782	2780
SME Simulant	Coliwasa	LF	21	1	14	1	9	CH02	6370	13500	82900	3560	< 426	< 1070	1430	245000	497	804	2750
SME Simulant	Coliwasa	HF	3	1	20	1	10	CL05	6600	14100	82100	3750	< 368	< 926	1590	239000	486	825	2790
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	6530	13800	83100	3630	< 384	< 964	1160	241000	489	828	2800
SME Simulant	Coliwasa	LF	40	1	19	1	12	CL03	6690	14100	86900	3670	< 437	< 1100	1290	225000	458	860	2800
SME Simulant	Coliwasa	HF	18	1	26	1	13	CL06	6620	14200	88600	3720	< 436	< 1090	1730	236000	500	833	2800
SME Simulant	Coliwasa	HF	1	1	22	1	14	CH05	6220	13200	82300	3490	< 434	< 1090	1410	248000	479	795	2720
ARG-1	None	0	0	1	15	1	15	ARG-1B12	5180	14400	86100	8140	881	< 827	764	226000	6900	198	985
SME Simulant	Coliwasa	HF	36	1	21	1	16	CL07	5910	12400	84200	3080	< 415	< 1040	1610	246000	499	783	2640
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	6380	13500	88200	3520	< 437	< 1100	1250	242000	474	800	2720
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	6610	14100	78600	3670	< 410	< 1030	952	242000	500	829	2800
SME Simulant	Coliwasa	HF	63	1	5	1	19	CL08	6650	14500	84800	4040	< 376	1270	1640	235000	462	882	2720
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	6310	13300	88600	3460	< 407	< 1020	1180	242000	486	790	2670
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	6610	14200	84500	3710	< 411	< 1030	843	239000	491	843	2800
SME Simulant	Coliwasa	HF	65	1	6	1	22	CH08	6230	13200	86700	3440	< 411	< 1030	1460	244000	490	785	2760
SME Simulant	Coliwasa	HF	34	1	18	1	23	CH07	6250	13300	79600	3450	< 381	< 957	1440	246000	478	801	2760
SME Simulant	Coliwasa	LF	1	1	12	1	24	CH01	6270	13300	83300	3460	< 378	< 949	1360	245000	502	795	2730
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	6430	14000	78000	3670	< 434	< 1090	1520	243000	498	818	2820
SME Simulant	Coliwasa	LF	4	1	10	1	26	CL01	6410	13600	80700	3580	< 423	< 1060	1190	244000	501	809	2750
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	6540	14000	81200	3630	< 427	< 1070	1240	241000	482	816	2770
SME Simulant	Coliwasa	LF	65	1	23	1	28	CL04	6250	13200	80700	3340	< 409	< 1030	1380	247000	499	771	2750
ARG-1	None	0	0	1	29	1	29	ARG-1B13	5210	14400	86700	8060	876	< 1030	< 825	226000	6940	191	1010
ARG-1	None	0	0	2	1	2	1	ARG-1B21	5240	14600	86300	8390	902	< 709	< 566	227000	6940	193	1000
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	6660	14100	85900	3730	< 415	< 1040	1290	241000	495	827	2740
SME Simulant	Coliwasa	HF	36	1	21	2	3	CL07	6000	12600	84600	3080	< 415	< 1040	1290	246000	499	760	2650
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	6380	13700	84600	3680	466	< 1130	1350	243000	524	834	2780
SME Simulant	Coliwasa	HF	1	1	22	2	5	CH05	6270	13400	81800	3540	< 434	< 1090	1160	248000	502	795	2710
SME Simulant	Coliwasa	HF	3	1	20	2	6	CL05	6710	14500	82200	3860	< 368	1070	1210	242000	490	825	2780
SME Simulant	Coliwasa	HF	23	1	28	2	7	CH06	6370	13600	81000	3590	< 387	< 972	1000	247000	497	814	2760
SME Simulant	Coliwasa	LF	1	1	12	2	8	CH01	6390	13700	82900	3520	< 378	< 949	1290	247000	485	805	2720
SME Simulant	Coliwasa	LF	20	1	2	2	9	CL02	6770	14400	84900	3760	< 404	< 1020	1450	238000	493	850	2840
SME Simulant	Coliwasa	HF	63	1	5	2	10	CL08	6740	14700	85100	4050	< 376	< 944	1570	237000	489	862	2750
SME Simulant	Coliwasa	HF	65	1	6	2	11	CH08	6320	13300	87100	3520	< 411	< 1030	1180	244000	486	808	2740
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	6440	14000	80300	3960	< 362	< 910	1270	244000	508	841	2810
SME Simulant	Coliwasa	LF	4	1	10	2	13	CL01	6540	14000	81000	3680	< 423	< 1060	1100	247000	504	832	2750
SME Simulant	Coliwasa	HF	18	1	26	2	14	CL06	6700	14300	89000	3820	< 436	< 1090	1800	237000	492	869	2750
ARG-1	None	0	0	2	12	2	15	ARG-1B22	5280	14700	86800	8090	917	1170	< 596	229000	6950	187	1000
SME Simulant	Coliwasa	LF	65	1	23	2	16	CL04	6340	13500	81000	3430	< 409	1640	1510	248000	484	805	2680
SME Simulant	Coliwasa	LF	40	1	19	2	17	CL03	6780	14500	88200	3730	< 437	1570	1140	228000	446	884	2810
SME Simulant	Coliwasa	LF	38	1	16	2	18	CH03	6410	13700	84500	3540	< 421	< 1060	954	245000	506	816	2680
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	6440	13800	83200	3620	< 365	< 918	1340	245000	499	838	2760

Table A3. Phase 1 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
SME Simulant	Coliwasa	LF	21	1	14	2	20	CH02	6470	13800	84100	3650	< 426	< 1070	1280	246000	493	827	2730
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	6890	14700	87900	3710	< 441	1130	1230	235000	494	868	2840
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	6840	14700	84400	3900	< 419	1250	1530	237000	473	870	2740
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	6470	13800	84800	3620	< 422	1210	1650	244000	480	842	2780
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	6490	13900	80700	3720	< 427	1530	1480	245000	493	828	2750
SME Simulant	Coliwasa	HF	34	1	18	2	25	CH07	6380	13600	80500	3580	< 381	1040	1340	249000	496	811	2750
SME Simulant	Coliwasa	LF	63	1	13	2	26	CH04	6390	13600	84600	3510	< 415	1260	1570	244000	507	817	2710
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	6580	14200	88000	3840	< 403	1370	1100	238000	473	859	2760
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	6630	14200	85800	3760	< 376	1620	1810	239000	462	852	2830
ARG-1	None	0	0	2	23	2	29	ARG-1B23	5240	14700	87200	8290	952	< 932	< 745	227000	6960	192	983
ARG-1	None	0	0	3	1	3	1	ARG-1B31	5250	14700	86600	8420	876	< 876	< 700	229000	7000	190	980
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	6560	14000	82800	3600	< 421	< 1060	850	242000	506	839	2780
SME Simulant	Coliwasa	HF	36	1	21	3	3	CL07	5910	12300	82900	3000	< 415	< 1040	1100	243000	499	760	2630
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	6610	14000	81700	3670	< 408	< 1020	1180	245000	501	847	2700
SME Simulant	Coliwasa	HF	1	1	22	3	5	CH05	6010	12800	77800	3340	< 434	< 1090	< 872	239000	487	760	2620
SME Simulant	Coliwasa	HF	3	1	20	3	6	CL05	6660	14300	81400	3860	< 368	< 926	1420	241000	503	845	2790
SME Simulant	Coliwasa	HF	23	1	28	3	7	CH06	6370	13600	80600	3570	< 387	1440	1480	247000	518	814	2730
SME Simulant	Coliwasa	LF	1	1	12	3	8	CH01	6380	13600	82400	3480	< 378	1620	1550	247000	506	815	2690
SME Simulant	Coliwasa	LF	20	1	2	3	9	CL02	6710	14300	84100	3700	< 404	< 1020	1510	235000	508	839	2800
SME Simulant	Coliwasa	HF	63	1	5	3	10	CL08	6740	14700	84500	4020	< 376	1120	1450	237000	482	862	2750
SME Simulant	Coliwasa	HF	65	1	6	3	11	CH08	6260	13300	85800	3500	< 411	< 1030	1550	243000	494	797	2750
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	6650	14200	116000	3680	3740	< 1070	5090	243000	489	827	2770
SME Simulant	Coliwasa	LF	4	1	10	3	13	CL01	6430	13800	79800	3650	< 423	1440	1730	244000	508	832	2700
SME Simulant	Coliwasa	HF	18	1	26	3	14	CL06	6640	14200	87300	3780	< 436	1450	1840	237000	500	857	2770
ARG-1	None	0	0	3	12	3	15	ARG-1B32	5220	14600	85900	8090	934	1870	806	226000	6890	187	963
SME Simulant	Coliwasa	LF	65	1	23	3	16	CL04	6230	13300	79000	3440	< 409	< 1030	1120	244000	503	783	2670
SME Simulant	Coliwasa	LF	40	1	19	3	17	CL03	6510	13900	84100	3590	< 437	< 1100	1310	219000	454	837	2720
SME Simulant	Coliwasa	LF	38	1	16	3	18	CH03	6410	13700	83500	3600	< 421	< 1060	885	244000	517	804	2720
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	6300	13600	83800	3590	< 438	1230	1440	239000	514	825	2690
SME Simulant	Coliwasa	LF	21	1	14	3	20	CH02	5960	12700	76800	3370	< 426	< 1070	874	227000	478	746	2600
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	6770	14600	88900	3800	< 435	< 1090	1220	251000	535	879	2930
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	6160	13300	77800	3560	< 447	1880	1420	241000	477	807	2680
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	6500	14000	86900	3680	< 444	2440	1500	244000	473	861	2780
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	6730	14400	83800	3700	< 430	1300	1570	239000	470	858	2740
SME Simulant	Coliwasa	HF	34	1	18	3	25	CH07	6180	13300	77300	3410	< 381	1360	1460	242000	478	780	2640
SME Simulant	Coliwasa	LF	63	1	13	3	26	CH04	6000	12800	79300	3340	< 415	< 1040	1020	230000	454	760	2550
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	7110	15100	85800	3850	< 394	1160	1240	242000	484	893	2830
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	6300	13500	79700	3500	< 406	1150	1280	233000	499	810	2670
ARG-1	None	0	0	3	23	3	29	ARG-1B33	5350	15000	88400	8350	877	< 799	< 638	234000	7090	182	1030
ARG-1	None	0	0	4	1	4	1	ARG-1B41	5210	14500	85000	7970	798	< 897	< 716	225000	6910	185	973
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	6400	13500	79000	3350	< 398	< 1000	1130	245000	497	813	2700
SME Simulant	Coliwasa	HF	36	1	21	4	3	CL07	5940	12400	82800	2980	< 415	< 1040	1660	244000	512	764	2640
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	6460	13900	84100	3900	546	< 1120	1840	243000	495	835	2730
SME Simulant	Coliwasa	HF	1	1	22	4	5	CH05	6210	13200	80500	3470	< 434	< 1090	1260	246000	513	799	2640
SME Simulant	Coliwasa	HF	3	1	20	4	6	CL05	6670	14300	81100	3800	< 368	< 926	1350	239000	494	846	2740
SME Simulant	Coliwasa	HF	23	1	28	4	7	CH06	6320	13400	79400	3450	< 387	< 972	1510	244000	505	803	2720
SME Simulant	Coliwasa	LF	1	1	12	4	8	CH01	6330	13400	81300	3450	< 378	< 949	1300	244000	498	802	2650
SME Simulant	Coliwasa	LF	20	1	2	4	9	CL02	6690	14200	83300	3630	< 404	< 1020	1460	234000	482	838	2770

Table A3. Phase 1 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
SME Simulant	Coliwasa	HF	63	1	5	4	10	CL08	6660	14500	82800	3900	< 376	< 944	1580	233000	493	840	2700
SME Simulant	Coliwasa	HF	65	1	6	4	11	CH08	6250	13200	85200	3390	< 411	< 1030	1230	242000	501	792	2740
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	12	HIB07	6200	13300	76300	3360	< 454	< 1140	1360	247000	490	808	2700
SME Simulant	Coliwasa	LF	4	1	10	4	13	CL01	6450	13700	79500	3640	< 423	< 1060	1090	244000	501	832	2720
SME Simulant	Coliwasa	HF	18	1	26	4	14	CL06	6580	14000	86800	3650	< 436	< 1090	1440	234000	479	834	2690
ARG-1	None	0	0	4	7	4	15	ARG-1B42	5190	14400	85000	7910	847	< 872	< 696	225000	6930	198	982
SME Simulant	Coliwasa	LF	65	1	23	4	16	CL04	6260	13200	78900	3330	< 409	< 1030	1300	245000	506	779	2700
SME Simulant	Coliwasa	LF	40	1	19	4	17	CL03	6660	14200	85700	3640	< 437	< 1100	1480	223000	482	870	2700
SME Simulant	Coliwasa	LF	38	1	16	4	18	CH03	6350	13500	82300	3460	< 421	< 1060	1120	243000	517	797	2690
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	19	HIB09	6940	14700	74700	3740	< 434	< 1090	1130	239000	494	878	2690
SME Simulant	Coliwasa	LF	21	1	14	4	20	CH02	6370	13500	81500	3510	< 426	< 1070	1190	241000	506	797	2680
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	21	HIB01	6190	13200	83600	3410	< 443	< 1110	978	244000	512	781	2730
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	22	HIB03	6630	14100	79600	3590	< 427	< 1070	1090	235000	499	840	2760
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	23	HIB08	5830	12400	78200	3130	< 451	< 1130	< 905	250000	512	788	2540
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	24	HIB06	6300	13300	82000	3400	< 368	< 925	1150	242000	498	800	2650
SME Simulant	Coliwasa	HF	34	1	18	4	25	CH07	6280	13400	78800	3420	< 381	< 957	1440	245000	500	786	2740
SME Simulant	Coliwasa	LF	63	1	13	4	26	CH04	6320	13400	83200	3380	< 415	< 1040	1270	241000	493	792	2660
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	27	HIB05	6490	13900	80800	3730	< 447	< 1120	1360	239000	495	819	2630
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	28	HIB10	5930	12600	79000	3190	< 432	< 1080	1170	252000	498	755	2660
ARG-1	None	0	0	4	13	4	29	ARG-1B43	5180	14400	85500	7900	765	< 904	< 722	225000	6930	190	981
ARG-1	None	0	0	2	1	5	1	ARG-1B21	5110	14200	85000	7980	755	< 709	< 566	223000	6840	196	976
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	6160	13200	80000	3520	< 471	< 1180	< 945	244000	508	805	2650
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	6200	13200	85400	3490	< 377	< 949	< 758	245000	503	798	2690
SME Simulant	Coliwasa	LF	20	1	2	5	4	CL02	6480	13800	82400	3570	< 404	< 1020	1420	230000	474	818	2660
SME Simulant	Coliwasa	LF	38	1	16	5	5	CH03	6480	13900	85800	3590	< 421	< 1060	1320	251000	523	820	2740
SME Simulant	Coliwasa	LF	63	1	13	5	6	CH04	6010	12800	79900	3290	< 415	< 1040	1400	231000	473	760	2540
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	6310	13500	81600	3540	< 429	< 1080	919	254000	513	809	2780
SME Simulant	Coliwasa	HF	23	1	28	5	8	CH06	6060	13000	78100	3350	< 387	< 972	1120	237000	488	763	2620
SME Simulant	Coliwasa	LF	21	1	14	5	9	CH02	6460	13700	84500	3600	< 426	< 1070	1230	250000	503	820	2740
SME Simulant	Coliwasa	HF	3	1	20	5	10	CL05	6320	13600	78400	3630	< 368	< 926	1110	230000	475	808	2600
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	6110	13100	73800	3370	< 402	< 1010	979	245000	502	777	2700
SME Simulant	Coliwasa	LF	40	1	19	5	12	CL03	6500	13900	85300	3610	< 437	< 1100	1170	221000	468	856	2670
SME Simulant	Coliwasa	HF	18	1	26	5	13	CL06	6470	13800	86800	3660	< 436	< 1090	1640	232000	484	841	2690
SME Simulant	Coliwasa	HF	1	1	22	5	14	CH05	6110	13000	80800	3410	< 434	< 1090	1040	245000	486	782	2650
ARG-1	None	0	0	2	12	5	15	ARG-1B22	4760	13200	79700	7360	686	< 746	< 596	209000	6370	180	905
SME Simulant	Coliwasa	HF	36	1	21	5	16	CL07	5850	12200	84000	3010	< 415	< 1040	1230	242000	518	767	2570
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	6180	13200	77000	3430	< 422	< 1060	< 847	243000	495	802	2600
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	6390	13500	82100	3380	< 392	< 985	1070	240000	503	798	2570
SME Simulant	Coliwasa	HF	63	1	5	5	19	CL08	6560	14300	84000	3890	< 376	< 944	1160	234000	486	828	2680
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	5880	12500	76500	3270	< 407	< 1020	< 817	227000	483	749	2540
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	6280	13300	84500	3450	< 391	< 983	1340	244000	496	790	2730
SME Simulant	Coliwasa	HF	65	1	6	5	22	CH08	6180	13100	87000	3430	< 411	< 1030	1380	243000	517	781	2700
SME Simulant	Coliwasa	HF	34	1	18	5	23	CH07	6250	13300	80100	3490	< 381	< 957	1280	247000	504	791	2720
SME Simulant	Coliwasa	LF	1	1	12	5	24	CH01	6100	13000	81100	3360	< 378	< 949	1290	238000	473	778	2570
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	6260	13400	81300	3520	< 429	< 1080	< 861	244000	522	864	2740
SME Simulant	Coliwasa	LF	4	1	10	5	26	CL01	6540	14000	82800	3720	< 423	< 1060	1190	250000	505	849	2780
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	6270	13500	79900	3580	< 403	< 1010	842	248000	493	820	2710
SME Simulant	Coliwasa	LF	65	1	23	5	28	CL04	6270	13300	81400	3420	< 409	< 1030	1320	249000	492	807	2720

Table A3. Phase 1 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	5150	14400	86900	7980	697	< 932	< 745	226000	6920	204	974
ARG-1	None	0	0	3	1	6	1	ARG-1B31	5050	14100	85400	7960	673	< 876	< 700	224000	6760	192	959
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	6570	14000	85800	3630	< 411	< 1030	919	246000	485	829	2740
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	6490	13800	83800	3660	< 439	< 1100	1260	243000	493	844	2730
SME Simulant	Coliwasa	LF	20	1	2	6	4	CL02	6570	14000	84600	3680	< 404	< 1020	1290	237000	469	840	2720
SME Simulant	Coliwasa	LF	38	1	16	6	5	CH03	6260	13300	84000	3600	< 421	< 1060	1030	246000	493	824	2660
SME Simulant	Coliwasa	LF	63	1	13	6	6	CH04	6200	13200	83700	3450	< 415	< 1040	1390	243000	486	798	2630
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	6800	14400	94700	3730	< 451	< 1130	1160	232000	454	881	2700
SME Simulant	Coliwasa	HF	23	1	28	6	8	CH06	6230	13300	81300	3500	< 387	< 972	1010	248000	489	802	2690
SME Simulant	Coliwasa	LF	21	1	14	6	9	CH02	5950	12600	79200	3350	< 426	< 1070	986	233000	462	758	2530
SME Simulant	Coliwasa	HF	3	1	20	6	10	CL05	6670	14300	84600	3900	< 368	< 926	1250	246000	478	872	2770
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	5900	12800	85200	3500	< 443	< 1110	1370	251000	503	785	2670
SME Simulant	Coliwasa	LF	40	1	19	6	12	CL03	6700	14300	89600	3770	< 437	< 1100	1280	231000	466	883	2770
SME Simulant	Coliwasa	HF	18	1	26	6	13	CL06	6430	13700	88400	3700	< 436	< 1090	1550	235000	474	840	2680
SME Simulant	Coliwasa	HF	1	1	22	6	14	CH05	6210	13200	84000	3550	< 434	< 1090	1200	253000	485	808	2650
ARG-1	None	0	0	3	12	6	15	ARG-1B32	4960	13800	84700	7840	720	< 904	< 722	221000	6620	187	971
SME Simulant	Coliwasa	HF	36	1	21	6	16	CL07	5840	12200	85700	3030	< 415	< 1040	1310	246000	480	771	2560
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	6500	13900	83400	3770	< 392	< 985	1580	240000	462	846	2690
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	6380	13600	83700	3500	< 422	< 1060	1560	246000	477	829	2720
SME Simulant	Coliwasa	HF	63	1	5	6	19	CL08	6640	14400	86800	4040	< 376	< 944	1340	240000	480	878	2690
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	6430	13800	84400	3630	< 414	< 1040	1460	237000	471	843	2660
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	6600	14000	91100	3710	< 425	< 1070	1140	252000	503	877	2820
SME Simulant	Coliwasa	HF	65	1	6	6	22	CH08	5930	12500	85000	3320	< 411	< 1030	1180	237000	478	762	2620
SME Simulant	Coliwasa	HF	34	1	18	6	23	CH07	6400	13700	83500	3600	< 381	< 957	1080	258000	506	830	2780
SME Simulant	Coliwasa	LF	1	1	12	6	24	CH01	6050	12800	81900	3370	< 378	< 949	940	240000	476	777	2590
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	6820	14500	87100	3790	< 380	< 954	1370	252000	502	868	2870
SME Simulant	Coliwasa	LF	4	1	10	6	26	CL01	6300	13500	81800	3610	< 423	< 1060	1060	246000	494	806	2770
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	6350	13500	82500	3520	< 378	< 950	1250	243000	481	812	2710
SME Simulant	Coliwasa	LF	65	1	23	6	28	CL04	6200	13200	82300	3400	< 409	< 1030	986	250000	494	788	2750
ARG-1	None	0	0	3	23	6	29	ARG-1B33	4790	13400	82500	7650	649	< 799	< 638	214000	6420	178	949

Table A4. Phase 1 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	4.535	8.211	0.090	1.455	0.097	0.020	13.954	2.734	3.186
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	10.657	3.832	0.105	1.199	0.105	0.026	11.352	0.167	4.736
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	11.072	4.089	0.106	1.245	0.110	0.024	11.709	0.157	4.779
SME Simulant	Coliwasa - low	LF	20	1	2	1	4	CL02	11.167	4.347	0.107	1.263	0.105	0.025	11.795	0.162	4.758
SME Simulant	Coliwasa - high	LF	38	1	16	1	5	CH03	10.543	4.154	0.103	1.233	0.104	0.026	11.309	0.169	4.801
SME Simulant	Coliwasa - high	LF	63	1	13	1	6	CH04	10.638	4.282	0.103	1.187	0.105	0.026	11.280	0.166	4.715
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	11.054	3.960	0.105	1.212	0.100	0.025	11.666	0.164	4.715
SME Simulant	Coliwasa - high	HF	23	1	28	1	8	CH06	10.581	4.089	0.101	1.188	0.105	0.024	11.209	0.155	4.930
SME Simulant	Coliwasa - high	LF	21	1	14	1	9	CH02	10.713	4.186	0.103	1.181	0.106	0.026	11.409	0.170	4.693
SME Simulant	Coliwasa - low	HF	3	1	20	1	10	CL05	11.035	4.121	0.104	1.216	0.109	0.023	11.795	0.148	4.650
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	10.959	4.025	0.105	1.217	0.103	0.024	11.681	0.154	4.650
SME Simulant	Coliwasa - low	LF	40	1	19	1	12	CL03	11.602	3.896	0.108	1.254	0.114	0.027	12.067	0.175	4.392
SME Simulant	Coliwasa - low	HF	18	1	26	1	13	CL06	11.110	4.250	0.107	1.235	0.118	0.027	11.838	0.175	4.693
SME Simulant	Coliwasa - high	HF	1	1	22	1	14	CH05	10.562	4.025	0.102	1.171	0.104	0.027	11.166	0.174	4.607
ARG-1	None	0	0	1	15	1	15	ARG-1B12	4.554	8.114	0.090	1.455	0.096	0.020	13.940	2.662	3.186
SME Simulant	Coliwasa - low	HF	36	1	21	1	16	CL07	10.298	4.186	0.101	1.108	0.101	0.026	10.694	0.161	5.167
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	10.657	4.089	0.103	1.196	0.103	0.027	11.366	0.175	4.672
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	11.110	4.121	0.107	1.245	0.108	0.025	11.838	0.164	4.629
SME Simulant	Coliwasa - low	HF	63	1	5	1	19	CL08	11.072	4.186	0.109	1.248	0.109	0.023	11.952	0.151	4.844
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	10.562	3.735	0.101	1.184	0.098	0.025	11.195	0.163	4.801
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	11.205	4.025	0.108	1.249	0.105	0.025	11.867	0.164	4.650
SME Simulant	Coliwasa - high	HF	65	1	6	1	22	CH08	10.695	4.186	0.101	1.170	0.103	0.025	11.195	0.164	4.693
SME Simulant	Coliwasa - high	HF	34	1	18	1	23	CH07	10.600	4.057	0.103	1.196	0.102	0.023	11.137	0.152	4.586
SME Simulant	Coliwasa - high	LF	1	1	12	1	24	CH01	10.506	4.186	0.101	1.182	0.101	0.023	11.152	0.151	4.758
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	11.072	4.186	0.106	1.240	0.102	0.027	11.638	0.173	4.586
SME Simulant	Coliwasa - low	LF	4	1	10	1	26	CL01	10.638	4.089	0.102	1.208	0.105	0.026	11.380	0.169	4.866
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	10.921	4.057	0.106	1.230	0.101	0.026	11.609	0.171	4.822
SME Simulant	Coliwasa - low	LF	65	1	23	1	28	CL04	10.506	4.121	0.101	1.177	0.108	0.025	11.094	0.164	4.650
ARG-1	None	0	0	1	29	1	29	ARG-1B13	4.705	7.857	0.092	1.483	0.095	0.025	14.011	2.626	3.208
ARG-1	None	0	0	2	1	2	1	ARG-1B21	4.667	7.760	0.090	1.455	0.100	0.017	14.011	2.686	3.251
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	11.375	4.218	0.105	1.263	0.108	0.026	11.738	0.166	4.779
SME Simulant	Coliwasa - low	HF	36	1	21	2	3	CL07	10.487	4.121	0.099	1.135	0.105	0.026	10.737	0.166	5.275
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	11.261	4.218	0.106	1.248	0.111	0.028	11.466	0.180	4.801
SME Simulant	Coliwasa - high	HF	1	1	22	2	5	CH05	10.732	4.057	0.103	1.175	0.113	0.027	11.166	0.174	4.672
SME Simulant	Coliwasa - low	HF	3	1	20	2	6	CL05	11.261	4.121	0.108	1.247	0.115	0.023	11.895	0.148	4.779
SME Simulant	Coliwasa - high	HF	23	1	28	2	7	CH06	10.770	4.121	0.104	1.194	0.111	0.024	11.280	0.155	4.887
SME Simulant	Coliwasa - high	LF	1	1	12	2	8	CH01	10.657	4.186	0.103	1.199	0.107	0.023	11.266	0.151	4.844
SME Simulant	Coliwasa - low	LF	20	1	2	2	9	CL02	11.469	4.315	0.111	1.256	0.110	0.025	11.924	0.162	4.736
SME Simulant	Coliwasa - low	HF	63	1	5	2	10	CL08	11.186	4.218	0.107	1.248	0.117	0.023	12.024	0.151	4.930
SME Simulant	Coliwasa - high	HF	65	1	6	2	11	CH08	10.808	4.250	0.103	1.177	0.105	0.025	11.223	0.164	4.736
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	11.243	4.057	0.106	1.233	0.116	0.022	11.781	0.145	4.715
SME Simulant	Coliwasa - low	LF	4	1	10	2	13	CL01	10.940	4.186	0.107	1.220	0.111	0.026	11.509	0.169	4.909
SME Simulant	Coliwasa - low	HF	18	1	26	2	14	CL06	11.261	4.250	0.110	1.251	0.127	0.027	11.838	0.169	4.758
ARG-1	None	0	0	2	12	2	15	ARG-1B22	4.799	7.567	0.092	1.483	0.097	0.018	14.054	2.445	3.251
SME Simulant	Coliwasa - low	LF	65	1	23	2	16	CL04	10.770	4.089	0.106	1.203	0.111	0.025	11.180	0.164	4.693
SME Simulant	Coliwasa - low	LF	40	1	19	2	17	CL03	11.998	3.799	0.112	1.261	0.114	0.027	12.110	0.175	4.500
SME Simulant	Coliwasa - high	LF	38	1	16	2	18	CH03	10.713	4.025	0.104	1.210	0.106	0.026	11.266	0.169	4.866
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	10.921	4.282	0.106	1.234	0.112	0.022	11.409	0.146	4.822

Table A4. Phase 1 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
SME Simulant	Coliwasa - high	LF	21	1	14	2	20	CH02	10.978	4.186	0.106	1.198	0.109	0.026	11.452	0.170	4.844
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	11.602	4.057	0.113	1.298	0.111	0.027	12.138	0.176	4.650
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	11.413	4.057	0.111	1.287	0.112	0.026	12.124	0.168	4.758
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	11.072	4.089	0.108	1.242	0.109	0.026	11.566	0.169	4.801
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	11.167	4.121	0.108	1.216	0.111	0.026	11.595	0.171	4.801
SME Simulant	Coliwasa - high	HF	34	1	18	2	25	CH07	10.770	4.154	0.105	1.198	0.108	0.023	11.266	0.152	4.672
SME Simulant	Coliwasa - high	LF	63	1	13	2	26	CH04	10.789	4.154	0.106	1.203	0.106	0.026	11.266	0.166	4.822
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	11.167	4.057	0.107	1.212	0.113	0.025	11.709	0.161	4.866
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	11.431	4.154	0.111	1.262	0.108	0.023	11.795	0.151	4.801
ARG-1	None	0	0	2	23	2	29	ARG-1B23	4.743	7.824	0.094	1.483	0.099	0.023	13.997	2.542	3.251
ARG-1	None	0	0	3	1	3	1	ARG-1B31	4.686	8.468	0.092	1.469	0.104	0.021	14.025	2.662	3.251
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	11.205	4.476	0.106	1.244	0.110	0.026	11.581	0.169	4.715
SME Simulant	Coliwasa - low	HF	36	1	21	3	3	CL07	10.373	4.250	0.098	1.112	0.100	0.026	10.565	0.166	5.188
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	10.959	4.347	0.108	1.244	0.108	0.025	11.480	0.163	4.866
SME Simulant	Coliwasa - high	HF	1	1	22	3	5	CH05	10.354	3.960	0.098	1.133	0.102	0.027	10.680	0.174	4.478
SME Simulant	Coliwasa - low	HF	3	1	20	3	6	CL05	11.280	4.315	0.107	1.249	0.115	0.023	11.795	0.148	4.736
SME Simulant	Coliwasa - high	HF	23	1	28	3	7	CH06	11.016	4.025	0.103	1.198	0.110	0.024	11.195	0.155	4.866
SME Simulant	Coliwasa - high	LF	1	1	12	3	8	CH01	10.902	4.154	0.103	1.219	0.105	0.023	11.195	0.151	4.822
SME Simulant	Coliwasa - low	LF	20	1	2	3	9	CL02	11.507	4.379	0.109	1.261	0.109	0.025	11.795	0.162	4.672
SME Simulant	Coliwasa - low	HF	63	1	5	3	10	CL08	11.337	4.186	0.108	1.263	0.115	0.023	11.967	0.151	4.909
SME Simulant	Coliwasa - high	HF	65	1	6	3	11	CH08	10.827	4.347	0.102	1.175	0.103	0.025	11.137	0.164	4.715
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	11.035	4.282	0.106	1.258	0.111	0.026	11.638	0.179	4.693
SME Simulant	Coliwasa - low	LF	4	1	10	3	13	CL01	10.978	4.121	0.105	1.220	0.109	0.026	11.323	0.169	4.822
SME Simulant	Coliwasa - low	HF	18	1	26	3	14	CL06	11.337	4.315	0.109	1.255	0.122	0.027	11.752	0.175	4.693
ARG-1	None	0	0	3	12	3	15	ARG-1B32	4.724	7.953	0.091	1.469	0.096	0.022	13.897	2.530	3.208
SME Simulant	Coliwasa - low	LF	65	1	23	3	16	CL04	10.657	4.250	0.102	1.178	0.113	0.025	10.952	0.164	4.586
SME Simulant	Coliwasa - low	LF	40	1	19	3	17	CL03	11.583	3.864	0.105	1.201	0.113	0.027	11.638	0.175	4.327
SME Simulant	Coliwasa - high	LF	38	1	16	3	18	CH03	10.827	4.218	0.104	1.213	0.108	0.026	11.280	0.169	4.844
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	10.902	4.379	0.105	1.215	0.110	0.027	11.180	0.175	4.650
SME Simulant	Coliwasa - high	LF	21	1	14	3	20	CH02	10.166	4.057	0.097	1.117	0.102	0.026	10.594	0.170	4.435
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	11.753	4.572	0.111	1.300	0.113	0.027	12.038	0.174	4.930
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	10.732	4.186	0.103	1.170	0.105	0.028	11.009	0.179	4.478
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	11.280	4.347	0.109	1.248	0.113	0.027	11.566	0.178	4.758
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	11.337	4.347	0.110	1.312	0.118	0.026	11.795	0.172	4.822
SME Simulant	Coliwasa - high	HF	34	1	18	3	25	CH07	10.562	3.993	0.101	1.178	0.103	0.023	10.937	0.152	4.500
SME Simulant	Coliwasa - high	LF	63	1	13	3	26	CH04	10.184	4.186	0.098	1.131	0.103	0.026	10.623	0.166	4.521
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	11.772	4.379	0.113	1.304	0.112	0.024	12.438	0.158	4.952
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	10.789	4.025	0.102	1.191	0.104	0.025	11.266	0.163	4.478
ARG-1	None	0	0	3	23	3	29	ARG-1B33	4.856	8.243	0.093	1.497	0.101	0.020	14.297	2.746	3.315
ARG-1	None	0	0	4	1	4	1	ARG-1B41	4.648	7.985	0.090	1.455	0.096	0.022	14.011	2.746	3.229
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	10.865	4.347	0.105	1.220	0.105	0.025	11.366	0.160	4.758
SME Simulant	Coliwasa - low	HF	36	1	21	4	3	CL07	10.392	4.089	0.098	1.126	0.099	0.026	10.794	0.166	5.361
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	10.865	4.218	0.106	1.210	0.113	0.028	11.738	0.382	4.779
SME Simulant	Coliwasa - high	HF	1	1	22	4	5	CH05	10.732	4.025	0.102	1.167	0.107	0.027	11.252	0.174	4.629
SME Simulant	Coliwasa - low	HF	3	1	20	4	6	CL05	11.167	4.218	0.106	1.235	0.114	0.023	11.952	0.148	4.844
SME Simulant	Coliwasa - high	HF	23	1	28	4	7	CH06	10.676	4.025	0.102	1.185	0.106	0.024	11.309	0.156	4.930
SME Simulant	Coliwasa - high	LF	1	1	12	4	8	CH01	10.619	4.218	0.103	1.198	0.102	0.023	11.223	0.151	4.866
SME Simulant	Coliwasa - low	LF	20	1	2	4	9	CL02	11.299	4.282	0.108	1.248	0.107	0.025	11.909	0.162	4.715

Table A4. Phase 1 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
SME Simulant	Coliwasa - low	HF	63	1	5	4	10	CL08	11.035	4.089	0.105	1.219	0.110	0.023	12.009	0.151	4.887
SME Simulant	Coliwasa - high	HF	65	1	6	4	11	CH08	10.657	4.250	0.101	1.145	0.101	0.025	11.266	0.164	4.693
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	12	HIB07	10.751	4.315	0.103	1.199	0.106	0.028	11.166	0.182	4.629
SME Simulant	Coliwasa - low	LF	4	1	10	4	13	CL01	10.808	4.186	0.105	1.206	0.109	0.026	11.495	0.169	4.822
SME Simulant	Coliwasa - low	HF	18	1	26	4	14	CL06	11.054	4.154	0.107	1.248	0.119	0.027	11.838	0.175	4.672
ARG-1	None	0	0	4	7	4	15	ARG-1B42	4.591	8.082	0.090	1.441	0.096	0.021	13.968	2.855	3.208
SME Simulant	Coliwasa - low	LF	65	1	23	4	16	CL04	10.657	4.218	0.101	1.177	0.110	0.025	11.152	0.164	4.715
SME Simulant	Coliwasa - low	LF	40	1	19	4	17	CL03	11.753	3.896	0.108	1.265	0.113	0.027	12.052	0.175	4.435
SME Simulant	Coliwasa - high	LF	38	1	16	4	18	CH03	10.600	4.057	0.102	1.185	0.101	0.026	11.309	0.169	4.844
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	19	HIB09	11.280	4.218	0.112	1.286	0.115	0.027	12.281	0.174	4.736
SME Simulant	Coliwasa - high	LF	21	1	14	4	20	CH02	10.751	4.186	0.103	1.163	0.104	0.026	11.395	0.396	4.736
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	21	HIB01	10.676	4.250	0.102	1.153	0.107	0.027	11.152	0.178	4.844
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	22	HIB03	11.431	4.057	0.110	1.305	0.115	0.026	11.895	0.171	4.736
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	23	HIB08	10.033	4.540	0.100	1.136	0.097	0.028	10.423	0.181	5.081
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	24	HIB06	10.600	4.379	0.101	1.175	0.104	0.023	11.152	0.148	4.887
SME Simulant	Coliwasa - high	HF	34	1	18	4	25	CH07	10.695	4.154	0.103	1.195	0.102	0.023	11.223	0.152	4.736
SME Simulant	Coliwasa - high	LF	63	1	13	4	26	CH04	10.713	4.218	0.103	1.196	0.105	0.026	11.309	0.166	4.866
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	27	HIB05	10.846	4.057	0.104	1.192	0.111	0.027	11.795	0.179	4.779
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	28	HIB10	10.336	4.186	0.100	1.129	0.098	0.027	10.680	0.173	4.844
ARG-1	None	0	0	4	13	4	29	ARG-1B43	4.667	7.857	0.090	1.427	0.094	0.022	13.997	2.638	3.229
ARG-1	None	0	0	2	1	5	1	ARG-1B21	4.610	7.760	0.089	1.469	0.097	0.017	13.839	2.746	3.272
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	10.619	4.089	0.103	1.189	0.104	0.029	11.237	0.189	4.909
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	10.525	4.315	0.102	1.174	0.099	0.023	11.209	0.151	4.844
SME Simulant	Coliwasa - low	LF	20	1	2	5	4	CL02	11.054	4.186	0.107	1.235	0.105	0.025	11.652	0.162	4.607
SME Simulant	Coliwasa - high	LF	38	1	16	5	5	CH03	10.940	4.186	0.106	1.265	0.106	0.026	11.638	0.169	5.059
SME Simulant	Coliwasa - high	LF	63	1	13	5	6	CH04	10.203	4.025	0.098	1.150	0.102	0.026	10.809	0.166	4.586
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	10.978	4.443	0.104	1.237	0.107	0.026	11.566	0.172	4.887
SME Simulant	Coliwasa - high	HF	23	1	28	5	8	CH06	10.354	3.928	0.099	1.157	0.106	0.024	10.894	0.155	4.715
SME Simulant	Coliwasa - high	LF	21	1	14	5	9	CH02	11.054	4.186	0.105	1.223	0.109	0.026	11.724	0.170	4.866
SME Simulant	Coliwasa - low	HF	3	1	20	5	10	CL05	10.695	4.025	0.102	1.215	0.110	0.023	11.438	0.148	4.650
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	10.506	4.154	0.100	1.180	0.102	0.025	11.037	0.161	4.758
SME Simulant	Coliwasa - low	LF	40	1	19	5	12	CL03	11.488	3.864	0.106	1.209	0.114	0.027	11.909	0.175	4.327
SME Simulant	Coliwasa - low	HF	18	1	26	5	13	CL06	10.959	4.250	0.106	1.259	0.118	0.027	11.709	0.175	4.586
SME Simulant	Coliwasa - high	HF	1	1	22	5	14	CH05	10.543	4.057	0.101	1.118	0.105	0.027	11.066	0.174	4.543
ARG-1	None	0	0	2	12	5	15	ARG-1B22	4.270	7.309	0.083	1.367	0.090	0.018	12.867	2.494	3.036
SME Simulant	Coliwasa - low	HF	36	1	21	5	16	CL07	10.222	4.121	0.099	1.157	0.101	0.026	10.623	0.166	5.339
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	10.468	4.121	0.102	1.185	0.101	0.026	11.137	0.169	4.736
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	10.373	4.186	0.102	1.210	0.104	0.024	11.166	0.157	4.758
SME Simulant	Coliwasa - low	HF	63	1	5	5	19	CL08	11.016	4.154	0.105	1.269	0.110	0.023	11.867	0.151	4.930
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	9.882	3.960	0.097	1.129	0.098	0.025	10.523	0.163	4.500
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	10.770	4.315	0.102	1.233	0.106	0.024	11.352	0.157	5.016
SME Simulant	Coliwasa - high	HF	65	1	6	5	22	CH08	10.676	4.347	0.101	1.178	0.102	0.025	11.195	0.164	4.715
SME Simulant	Coliwasa - high	HF	34	1	18	5	23	CH07	10.676	4.250	0.104	1.205	0.106	0.023	11.223	0.152	4.650
SME Simulant	Coliwasa - high	LF	1	1	12	5	24	CH01	10.430	4.121	0.099	1.175	0.100	0.023	10.994	0.151	4.672
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	10.846	4.282	0.102	1.245	0.105	0.026	11.395	0.172	4.887
SME Simulant	Coliwasa - low	LF	4	1	10	5	26	CL01	11.016	4.282	0.107	1.242	0.110	0.026	11.709	0.169	4.952
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	10.997	4.218	0.104	1.212	0.107	0.025	11.509	0.161	4.736
SME Simulant	Coliwasa - low	LF	65	1	23	5	28	CL04	10.713	4.282	0.103	1.233	0.112	0.025	11.266	0.164	4.650

Table A4. Phase 1 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	4.629	7.728	0.091	1.441	0.097	0.023	14.011	2.674	3.208
ARG-1	None	0	0	3	1	6	1	ARG-1B31	4.629	7.953	0.089	1.441	0.096	0.021	13.968	2.698	3.165
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	11.280	4.218	0.106	1.273	0.105	0.025	11.909	0.164	5.038
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	11.243	4.282	0.107	1.235	0.106	0.027	11.881	0.176	4.672
SME Simulant	Coliwasa - low	LF	20	1	2	6	4	CL02	11.337	4.282	0.107	1.272	0.106	0.025	11.924	0.162	4.801
SME Simulant	Coliwasa - high	LF	38	1	16	6	5	CH03	10.770	4.121	0.104	1.217	0.105	0.026	11.423	0.169	4.887
SME Simulant	Coliwasa - high	LF	63	1	13	6	6	CH04	10.657	4.154	0.102	1.187	0.105	0.026	11.295	0.166	4.693
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	11.677	4.025	0.108	1.293	0.111	0.028	12.367	0.181	4.779
SME Simulant	Coliwasa - high	HF	23	1	28	6	8	CH06	10.789	3.960	0.102	1.187	0.106	0.024	11.395	0.155	4.801
SME Simulant	Coliwasa - high	LF	21	1	14	6	9	CH02	10.279	3.896	0.097	1.124	0.100	0.026	10.923	0.170	4.457
SME Simulant	Coliwasa - low	HF	3	1	20	6	10	CL05	11.413	4.186	0.109	1.273	0.113	0.048	12.224	0.148	4.887
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	10.770	4.476	0.100	1.152	0.100	0.027	11.166	0.178	4.973
SME Simulant	Coliwasa - low	LF	40	1	19	6	12	CL03	12.036	3.896	0.110	1.258	0.115	0.027	12.410	0.175	4.500
SME Simulant	Coliwasa - low	HF	18	1	26	6	13	CL06	11.072	4.025	0.106	1.247	0.116	0.027	11.809	0.175	4.629
SME Simulant	Coliwasa - high	HF	1	1	22	6	14	CH05	10.865	4.025	0.103	1.187	0.108	0.027	11.438	0.174	4.693
ARG-1	None	0	0	3	12	6	15	ARG-1B32	4.554	7.953	0.087	1.427	0.095	0.022	13.668	2.626	3.100
SME Simulant	Coliwasa - low	HF	36	1	21	6	16	CL07	10.449	3.993	0.098	1.126	0.098	0.026	10.851	0.166	5.253
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	11.186	4.089	0.106	1.241	0.110	0.024	11.924	0.157	4.736
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	10.997	4.154	0.105	1.258	0.101	0.026	11.566	0.169	5.016
SME Simulant	Coliwasa - low	HF	63	1	5	6	19	CL08	11.431	4.186	0.107	1.249	0.112	0.023	12.253	0.151	4.844
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	11.148	4.218	0.105	1.251	0.105	0.025	11.781	0.166	4.801
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	11.583	4.508	0.109	1.300	0.109	0.026	12.081	0.170	5.059
SME Simulant	Coliwasa - high	HF	65	1	6	6	22	CH08	10.411	4.057	0.098	1.129	0.097	0.025	10.952	0.164	4.607
SME Simulant	Coliwasa - high	HF	34	1	18	6	23	CH07	11.091	4.250	0.107	1.259	0.108	0.023	11.709	0.152	4.995
SME Simulant	Coliwasa - high	LF	1	1	12	6	24	CH01	10.449	4.057	0.099	1.177	0.099	0.023	10.980	0.151	4.736
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	11.696	4.347	0.113	1.345	0.113	0.023	12.267	0.152	5.124
SME Simulant	Coliwasa - low	LF	4	1	10	6	26	CL01	10.827	4.089	0.103	1.233	0.106	0.026	11.495	0.169	4.973
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	10.902	4.121	0.104	1.222	0.103	0.023	11.495	0.151	4.650
SME Simulant	Coliwasa - low	LF	65	1	23	6	28	CL04	10.827	4.250	0.103	1.206	0.111	0.025	11.295	0.164	4.779
ARG-1	None	0	0	3	23	6	29	ARG-1B33	4.384	7.728	0.085	1.387	0.090	0.020	13.196	2.638	3.122

Table A4. Phase 1 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	0.857	1.846	11.525	1.035	48.348	1.154	0.024	0.133	99.2052
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	1.065	1.743	11.997	0.457	51.557	0.081	0.104	0.366	99.5477
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	1.076	1.795	10.595	0.463	51.985	0.083	0.103	0.381	99.7739
SME Simulant	Coliwasa - low	LF	20	1	2	1	4	CL02	1.101	1.808	11.323	0.464	50.274	0.081	0.103	0.378	99.2611
SME Simulant	Coliwasa - high	LF	38	1	16	1	5	CH03	1.056	1.756	11.310	0.453	52.413	0.085	0.102	0.369	99.9841
SME Simulant	Coliwasa - high	LF	63	1	13	1	6	CH04	1.046	1.730	11.296	0.448	51.985	0.085	0.102	0.367	99.5620
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	1.080	1.808	10.905	0.453	52.199	0.081	0.100	0.374	100.0003
SME Simulant	Coliwasa - high	HF	23	1	28	1	8	CH06	1.041	1.717	10.878	0.444	52.627	0.085	0.097	0.376	99.6483
SME Simulant	Coliwasa - high	LF	21	1	14	1	9	CH02	1.056	1.743	11.175	0.453	52.413	0.083	0.100	0.371	99.9826
SME Simulant	Coliwasa - low	HF	3	1	20	1	10	CL05	1.094	1.821	11.067	0.477	51.129	0.081	0.103	0.377	99.3496
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	1.083	1.782	11.202	0.462	51.557	0.082	0.103	0.378	99.5654
SME Simulant	Coliwasa - low	LF	40	1	19	1	12	CL03	1.109	1.821	11.714	0.467	48.134	0.076	0.107	0.378	97.4403
SME Simulant	Coliwasa - low	HF	18	1	26	1	13	CL06	1.098	1.834	11.943	0.473	50.487	0.083	0.104	0.378	99.9549
SME Simulant	Coliwasa - high	HF	1	1	22	1	14	CH05	1.031	1.704	11.094	0.444	53.055	0.080	0.099	0.367	99.8128
ARG-1	None	0	0	1	15	1	15	ARG-1B12	0.859	1.859	11.606	1.036	48.348	1.151	0.025	0.133	99.1348
SME Simulant	Coliwasa - low	HF	36	1	21	1	16	CL07	0.980	1.601	11.350	0.392	52.627	0.083	0.097	0.357	99.3292
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	1.058	1.743	11.889	0.448	51.771	0.079	0.100	0.367	99.8444
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	1.096	1.821	10.595	0.467	51.771	0.083	0.103	0.378	99.6627
SME Simulant	Coliwasa - low	HF	63	1	5	1	19	CL08	1.103	1.872	11.431	0.514	50.274	0.077	0.110	0.367	99.4427
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	1.046	1.717	11.943	0.440	51.771	0.081	0.098	0.361	99.3221
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	1.096	1.834	11.391	0.472	51.129	0.082	0.105	0.378	99.8858
SME Simulant	Coliwasa - high	HF	65	1	6	1	22	CH08	1.033	1.704	11.687	0.438	52.199	0.082	0.098	0.373	99.9457
SME Simulant	Coliwasa - high	HF	34	1	18	1	23	CH07	1.036	1.717	10.730	0.439	52.627	0.080	0.100	0.373	99.0590
SME Simulant	Coliwasa - high	LF	1	1	12	1	24	CH01	1.040	1.717	11.229	0.440	52.413	0.084	0.099	0.369	99.5504
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	1.066	1.808	10.514	0.467	51.985	0.083	0.102	0.381	99.5358
SME Simulant	Coliwasa - low	LF	4	1	10	1	26	CL01	1.063	1.756	10.878	0.456	52.199	0.084	0.101	0.371	99.4904
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	1.085	1.808	10.946	0.462	51.557	0.080	0.102	0.374	99.4573
SME Simulant	Coliwasa - low	LF	65	1	23	1	28	CL04	1.036	1.704	10.878	0.425	52.841	0.083	0.096	0.371	99.3817
ARG-1	None	0	0	1	29	1	29	ARG-1B13	0.864	1.859	11.687	1.026	48.348	1.158	0.024	0.136	99.2035
ARG-1	None	0	0	2	1	2	1	ARG-1B21	0.869	1.885	11.633	1.068	48.562	1.158	0.024	0.135	99.3722
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	1.104	1.821	11.579	0.475	51.557	0.083	0.103	0.370	100.8701
SME Simulant	Coliwasa - low	HF	36	1	21	2	3	CL07	0.995	1.627	11.404	0.392	52.627	0.083	0.095	0.358	99.7302
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	1.058	1.769	11.404	0.468	51.985	0.087	0.104	0.376	100.6707
SME Simulant	Coliwasa - high	HF	1	1	22	2	5	CH05	1.040	1.730	11.027	0.450	53.055	0.084	0.099	0.366	100.0700
SME Simulant	Coliwasa - low	HF	3	1	20	2	6	CL05	1.113	1.872	11.081	0.491	51.771	0.082	0.103	0.376	100.5846
SME Simulant	Coliwasa - high	HF	23	1	28	2	7	CH06	1.056	1.756	10.919	0.457	52.841	0.083	0.101	0.373	100.2320
SME Simulant	Coliwasa - high	LF	1	1	12	2	8	CH01	1.060	1.769	11.175	0.448	52.841	0.081	0.100	0.367	100.3774
SME Simulant	Coliwasa - low	LF	20	1	2	2	9	CL02	1.123	1.859	11.445	0.478	50.915	0.082	0.106	0.384	100.4999
SME Simulant	Coliwasa - low	HF	63	1	5	2	10	CL08	1.118	1.898	11.471	0.515	50.701	0.082	0.107	0.371	100.2682
SME Simulant	Coliwasa - high	HF	65	1	6	2	11	CH08	1.048	1.717	11.741	0.448	52.199	0.081	0.101	0.370	100.2969
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	1.068	1.808	10.824	0.504	52.199	0.085	0.105	0.380	100.3894
SME Simulant	Coliwasa - low	LF	4	1	10	2	13	CL01	1.085	1.808	10.919	0.468	52.841	0.084	0.104	0.371	100.8567
SME Simulant	Coliwasa - low	HF	18	1	26	2	14	CL06	1.111	1.846	11.997	0.486	50.701	0.082	0.108	0.371	100.4949
ARG-1	None	0	0	2	12	2	15	ARG-1B22	0.876	1.898	11.701	1.029	48.990	1.159	0.023	0.135	99.6178
SME Simulant	Coliwasa - low	LF	65	1	23	2	16	CL04	1.051	1.743	10.919	0.436	53.055	0.081	0.100	0.362	100.0895
SME Simulant	Coliwasa - low	LF	40	1	19	2	17	CL03	1.124	1.872	11.889	0.475	48.776	0.074	0.110	0.380	98.7956
SME Simulant	Coliwasa - high	LF	38	1	16	2	18	CH03	1.063	1.769	11.391	0.450	52.413	0.084	0.102	0.362	100.1184
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	1.068	1.782	11.215	0.461	52.413	0.083	0.104	0.373	100.5553

Table A4. Phase 1 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
SME Simulant	Coliwasa - high	LF	21	1	14	2	20	CH02	1.073	1.782	11.337	0.464	52.627	0.082	0.103	0.369	100.9056
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	1.143	1.898	11.849	0.472	50.274	0.082	0.108	0.384	100.3821
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	1.134	1.898	11.377	0.496	50.701	0.079	0.108	0.370	100.2199
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	1.073	1.782	11.431	0.461	52.199	0.080	0.105	0.376	100.6897
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	1.076	1.795	10.878	0.473	52.413	0.082	0.103	0.371	100.5083
SME Simulant	Coliwasa - high	HF	34	1	18	2	25	CH07	1.058	1.756	10.851	0.456	53.269	0.083	0.101	0.371	100.3930
SME Simulant	Coliwasa - high	LF	63	1	13	2	26	CH04	1.060	1.756	11.404	0.447	52.199	0.085	0.102	0.366	100.0558
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	1.091	1.834	11.862	0.489	50.915	0.079	0.107	0.373	100.1665
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	1.099	1.834	11.566	0.478	51.129	0.077	0.106	0.382	100.5075
ARG-1	None	0	0	2	23	2	29	ARG-1B23	0.869	1.898	11.755	1.055	48.562	1.161	0.024	0.133	99.5114
ARG-1	None	0	0	3	1	3	1	ARG-1B31	0.871	1.898	11.674	1.071	48.990	1.168	0.024	0.132	100.6075
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	1.088	1.808	11.161	0.458	51.771	0.084	0.104	0.376	100.4807
SME Simulant	Coliwasa - low	HF	36	1	21	3	3	CL07	0.980	1.588	11.175	0.382	51.985	0.083	0.095	0.355	98.5219
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	1.096	1.808	11.013	0.467	52.413	0.084	0.105	0.365	100.6507
SME Simulant	Coliwasa - high	HF	1	1	22	3	5	CH05	0.997	1.653	10.487	0.425	51.129	0.081	0.095	0.354	96.2275
SME Simulant	Coliwasa - low	HF	3	1	20	3	6	CL05	1.104	1.846	10.973	0.491	51.557	0.084	0.105	0.377	100.3061
SME Simulant	Coliwasa - high	HF	23	1	28	3	7	CH06	1.056	1.756	10.865	0.454	52.841	0.086	0.101	0.369	100.2188
SME Simulant	Coliwasa - high	LF	1	1	12	3	8	CH01	1.058	1.756	11.108	0.443	52.841	0.084	0.101	0.363	100.4286
SME Simulant	Coliwasa - low	LF	20	1	2	3	9	CL02	1.113	1.846	11.337	0.471	50.274	0.085	0.104	0.378	99.6256
SME Simulant	Coliwasa - low	HF	63	1	5	3	10	CL08	1.118	1.898	11.391	0.512	50.701	0.080	0.107	0.371	100.2369
SME Simulant	Coliwasa - high	HF	65	1	6	3	11	CH08	1.038	1.717	11.566	0.445	51.985	0.082	0.099	0.371	99.9011
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	1.103	1.834	15.637	0.468	51.985	0.082	0.103	0.374	106.4928
SME Simulant	Coliwasa - low	LF	4	1	10	3	13	CL01	1.066	1.782	10.757	0.464	52.199	0.085	0.104	0.365	99.6962
SME Simulant	Coliwasa - low	HF	18	1	26	3	14	CL06	1.101	1.834	11.768	0.481	50.701	0.083	0.107	0.374	100.2337
ARG-1	None	0	0	3	12	3	15	ARG-1B32	0.866	1.885	11.579	1.029	48.348	1.149	0.023	0.130	98.9989
SME Simulant	Coliwasa - low	LF	65	1	23	3	16	CL04	1.033	1.717	10.649	0.438	52.199	0.084	0.097	0.361	98.6042
SME Simulant	Coliwasa - low	LF	40	1	19	3	17	CL03	1.080	1.795	11.337	0.457	46.851	0.076	0.104	0.367	95.0982
SME Simulant	Coliwasa - high	LF	38	1	16	3	18	CH03	1.063	1.769	11.256	0.458	52.199	0.086	0.100	0.367	100.0869
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	1.045	1.756	11.296	0.457	51.129	0.086	0.103	0.363	98.9787
SME Simulant	Coliwasa - high	LF	21	1	14	3	20	CH02	0.988	1.640	10.353	0.429	48.562	0.080	0.093	0.351	93.2595
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	1.123	1.885	11.984	0.484	53.696	0.089	0.109	0.396	104.7834
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	1.022	1.717	10.487	0.453	51.557	0.080	0.100	0.362	97.7680
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	1.078	1.808	11.714	0.468	52.199	0.079	0.107	0.376	101.4555
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	1.116	1.859	11.296	0.471	51.129	0.078	0.107	0.370	100.4668
SME Simulant	Coliwasa - high	HF	34	1	18	3	25	CH07	1.025	1.717	10.420	0.434	51.771	0.080	0.097	0.357	97.4499
SME Simulant	Coliwasa - high	LF	63	1	13	3	26	CH04	0.995	1.653	10.690	0.425	49.204	0.076	0.095	0.344	94.5180
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	1.179	1.950	11.566	0.490	51.771	0.081	0.111	0.382	102.7817
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	1.045	1.743	10.744	0.445	49.846	0.083	0.101	0.361	96.5094
ARG-1	None	0	0	3	23	3	29	ARG-1B33	0.887	1.937	11.916	1.063	50.060	1.183	0.023	0.139	102.3755
ARG-1	None	0	0	4	1	4	1	ARG-1B41	0.864	1.872	11.458	1.014	48.134	1.153	0.023	0.131	98.9339
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	1.061	1.743	10.649	0.426	52.413	0.083	0.101	0.365	99.7916
SME Simulant	Coliwasa - low	HF	36	1	11	4	3	CL07	0.985	1.601	11.161	0.379	52.199	0.085	0.095	0.357	99.0146
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	1.071	1.795	11.337	0.496	51.985	0.083	0.104	0.369	100.6782
SME Simulant	Coliwasa - high	HF	1	1	22	4	5	CH05	1.030	1.704	10.851	0.442	52.627	0.086	0.099	0.357	99.4097
SME Simulant	Coliwasa - low	HF	3	1	20	4	6	CL05	1.106	1.846	10.932	0.484	51.129	0.082	0.105	0.370	99.8627
SME Simulant	Coliwasa - high	HF	23	1	28	4	7	CH06	1.048	1.730	10.703	0.439	52.199	0.084	0.100	0.367	99.1839
SME Simulant	Coliwasa - high	LF	1	1	12	4	8	CH01	1.050	1.730	10.959	0.439	52.199	0.083	0.100	0.358	99.4206
SME Simulant	Coliwasa - low	LF	20	1	2	4	9	CL02	1.109	1.834	11.229	0.462	50.060	0.080	0.104	0.374	99.1076

Table A4. Phase 1 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
SME Simulant	Coliwasa - low	HF	63	1	5	4	10	CL08	1.104	1.872	11.161	0.496	49.846	0.082	0.105	0.365	98.6592
SME Simulant	Coliwasa - high	HF	65	1	6	4	11	CH08	1.036	1.704	11.485	0.431	51.771	0.084	0.099	0.370	99.3834
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	12	HIB07	1.028	1.717	10.285	0.428	52.841	0.082	0.101	0.365	99.3241
SME Simulant	Coliwasa - low	LF	4	1	10	4	13	CL01	1.070	1.769	10.717	0.463	52.199	0.084	0.104	0.367	99.6982
SME Simulant	Coliwasa - low	HF	18	1	26	4	14	CL06	1.091	1.808	11.701	0.464	50.060	0.080	0.104	0.363	99.0636
ARG-1	None	0	0	4	7	4	15	ARG-1B42	0.861	1.859	11.458	1.007	48.134	1.156	0.025	0.133	98.9849
SME Simulant	Coliwasa - low	LF	65	1	23	4	16	CL04	1.038	1.704	10.636	0.424	52.413	0.084	0.097	0.365	99.0792
SME Simulant	Coliwasa - low	LF	40	1	19	4	17	CL03	1.104	1.834	11.552	0.463	47.706	0.080	0.108	0.365	97.0378
SME Simulant	Coliwasa - high	LF	38	1	16	4	18	CH03	1.053	1.743	11.094	0.440	51.985	0.086	0.099	0.363	99.2570
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	19	HIB09	1.151	1.898	10.070	0.476	51.129	0.082	0.109	0.363	99.5084
SME Simulant	Coliwasa - high	LF	21	1	14	4	20	CH02	1.056	1.743	10.986	0.447	51.557	0.084	0.099	0.362	99.1957
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	21	HIB01	1.026	1.704	11.269	0.434	52.199	0.085	0.097	0.369	99.6726
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	22	HIB03	1.099	1.821	10.730	0.457	50.274	0.083	0.105	0.373	98.7883
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	23	HIB08	0.967	1.601	10.541	0.398	53.483	0.085	0.098	0.343	99.1358
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	24	HIB06	1.045	1.717	11.054	0.433	51.771	0.083	0.100	0.358	99.1282
SME Simulant	Coliwasa - high	HF	34	1	18	4	25	CH07	1.041	1.730	10.622	0.435	52.413	0.083	0.098	0.370	99.1767
SME Simulant	Coliwasa - high	LF	63	1	13	4	26	CH04	1.048	1.730	11.215	0.430	51.557	0.082	0.099	0.359	99.2237
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	27	HIB05	1.076	1.795	10.892	0.475	51.129	0.083	0.102	0.355	98.9973
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	28	HIB10	0.983	1.627	10.649	0.406	53.910	0.083	0.094	0.359	99.6837
ARG-1	None	0	0	4	13	4	29	ARG-1B43	0.859	1.859	11.525	1.005	48.134	1.156	0.024	0.133	98.7171
ARG-1	None	0	0	2	1	5	1	ARG-1B21	0.847	1.834	11.458	1.015	47.706	1.141	0.024	0.132	98.0589
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	1.022	1.704	10.784	0.448	52.199	0.085	0.100	0.358	99.1682
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	1.028	1.704	11.512	0.444	52.413	0.084	0.099	0.363	100.0890
SME Simulant	Coliwasa - low	LF	20	1	2	5	4	CL02	1.075	1.782	11.108	0.454	49.204	0.079	0.102	0.359	97.2952
SME Simulant	Coliwasa - high	LF	38	1	16	5	5	CH03	1.075	1.795	11.566	0.457	53.696	0.087	0.102	0.370	102.6416
SME Simulant	Coliwasa - high	LF	63	1	13	5	6	CH04	0.997	1.653	10.771	0.419	49.418	0.079	0.095	0.343	94.9378
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	1.046	1.743	11.000	0.450	54.338	0.086	0.101	0.376	102.6601
SME Simulant	Coliwasa - high	HF	23	1	28	5	8	CH06	1.005	1.679	10.528	0.426	50.701	0.081	0.095	0.354	96.3011
SME Simulant	Coliwasa - high	LF	21	1	14	5	9	CH02	1.071	1.769	11.391	0.458	53.483	0.084	0.102	0.370	102.1898
SME Simulant	Coliwasa - low	HF	3	1	20	5	10	CL05	1.048	1.756	10.568	0.462	49.204	0.079	0.101	0.351	95.9725
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	1.013	1.691	9.948	0.429	52.413	0.084	0.097	0.365	98.0616
SME Simulant	Coliwasa - low	LF	40	1	19	5	12	CL03	1.078	1.795	11.498	0.459	47.279	0.078	0.107	0.361	95.8739
SME Simulant	Coliwasa - low	HF	18	1	26	5	13	CL06	1.073	1.782	11.701	0.466	49.632	0.081	0.105	0.363	98.3914
SME Simulant	Coliwasa - high	HF	1	1	22	5	14	CH05	1.013	1.679	10.892	0.434	52.413	0.081	0.097	0.358	98.7008
ARG-1	None	0	0	2	12	5	15	ARG-1B22	0.789	1.704	10.744	0.937	44.711	1.063	0.022	0.122	91.6261
SME Simulant	Coliwasa - low	HF	36	1	21	5	16	CL07	0.970	1.575	11.323	0.383	51.771	0.086	0.095	0.347	98.4060
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	1.025	1.704	10.380	0.436	51.985	0.083	0.100	0.351	98.1106
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	1.060	1.743	11.067	0.430	51.343	0.084	0.099	0.347	98.2538
SME Simulant	Coliwasa - low	HF	63	1	5	5	19	CL08	1.088	1.846	11.323	0.495	50.060	0.081	0.103	0.362	98.9820
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	0.975	1.614	10.312	0.416	48.562	0.081	0.093	0.343	92.7730
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	1.041	1.717	11.391	0.439	52.199	0.083	0.098	0.369	100.4113
SME Simulant	Coliwasa - high	HF	65	1	6	5	22	CH08	1.025	1.691	11.728	0.436	51.985	0.086	0.097	0.365	99.9170
SME Simulant	Coliwasa - high	HF	34	1	18	5	23	CH07	1.036	1.717	10.797	0.444	52.841	0.084	0.098	0.367	99.7759
SME Simulant	Coliwasa - high	LF	1	1	12	5	24	CH01	1.012	1.679	10.932	0.428	50.915	0.079	0.097	0.347	97.2554
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	1.038	1.730	10.959	0.448	52.199	0.087	0.108	0.370	99.9996
SME Simulant	Coliwasa - low	LF	4	1	10	5	26	CL01	1.085	1.808	11.161	0.473	53.483	0.084	0.106	0.376	102.1891
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	1.040	1.743	10.771	0.456	53.055	0.082	0.102	0.366	100.6832
SME Simulant	Coliwasa - low	LF	65	1	23	5	28	CL04	1.040	1.717	10.973	0.435	53.269	0.082	0.100	0.367	100.5321

Table A4. Phase 1 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	0.854	1.859	11.714	1.015	48.348	1.154	0.025	0.132	99.0037
ARG-1	None	0	0	3	1	6	1	ARG-1B31	0.837	1.821	11.512	1.013	47.920	1.128	0.024	0.130	98.4454
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	1.090	1.808	11.566	0.462	52.627	0.081	0.103	0.370	102.2257
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	1.076	1.782	11.296	0.466	51.985	0.082	0.105	0.369	100.8899
SME Simulant	Coliwasa - low	LF	20	1	2	6	4	CL02	1.090	1.808	11.404	0.468	50.701	0.078	0.105	0.367	100.0375
SME Simulant	Coliwasa - high	LF	38	1	16	6	5	CH03	1.038	1.717	11.323	0.458	52.627	0.082	0.103	0.359	100.5302
SME Simulant	Coliwasa - high	LF	63	1	13	6	6	CH04	1.028	1.704	11.283	0.439	51.985	0.081	0.099	0.355	99.3586
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	1.128	1.859	12.766	0.475	49.632	0.076	0.110	0.365	100.9777
SME Simulant	Coliwasa - high	HF	23	1	28	6	8	CH06	1.033	1.717	10.959	0.445	53.055	0.082	0.100	0.363	100.2720
SME Simulant	Coliwasa - high	LF	21	1	14	6	9	CH02	0.987	1.627	10.676	0.426	49.846	0.077	0.094	0.342	95.1458
SME Simulant	Coliwasa - low	HF	3	1	20	6	10	CL05	1.106	1.846	11.404	0.496	52.627	0.080	0.109	0.374	102.4415
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	0.978	1.653	11.485	0.445	53.696	0.084	0.098	0.361	101.7410
SME Simulant	Coliwasa - low	LF	40	1	19	6	12	CL03	1.111	1.846	12.078	0.480	49.418	0.078	0.110	0.374	100.0219
SME Simulant	Coliwasa - low	HF	18	1	26	6	13	CL06	1.066	1.769	11.916	0.471	50.274	0.079	0.105	0.362	99.2470
SME Simulant	Coliwasa - high	HF	1	1	22	6	14	CH05	1.030	1.704	11.323	0.452	54.124	0.081	0.101	0.358	101.7918
ARG-1	None	0	0	3	12	6	15	ARG-1B32	0.823	1.782	11.418	0.998	47.279	1.104	0.023	0.131	97.0899
SME Simulant	Coliwasa - low	HF	36	1	21	6	16	CL07	0.968	1.575	11.552	0.386	52.627	0.080	0.096	0.346	99.6906
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	1.078	1.795	11.242	0.480	51.343	0.077	0.105	0.363	100.0575
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	1.058	1.756	11.283	0.445	52.627	0.080	0.103	0.367	101.1105
SME Simulant	Coliwasa - low	HF	63	1	5	6	19	CL08	1.101	1.859	11.701	0.514	51.343	0.080	0.109	0.363	101.4270
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	1.066	1.782	11.377	0.462	50.701	0.079	0.105	0.359	99.5310
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	1.094	1.808	12.280	0.472	53.910	0.084	0.109	0.381	105.0844
SME Simulant	Coliwasa - high	HF	65	1	6	6	22	CH08	0.983	1.614	11.458	0.422	50.701	0.080	0.095	0.354	97.2481
SME Simulant	Coliwasa - high	HF	34	1	18	6	23	CH07	1.061	1.769	11.256	0.458	55.194	0.084	0.103	0.376	103.9971
SME Simulant	Coliwasa - high	LF	1	1	12	6	24	CH01	1.003	1.653	11.040	0.429	51.343	0.079	0.097	0.350	97.7659
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	1.131	1.872	11.741	0.482	53.910	0.084	0.108	0.388	104.8953
SME Simulant	Coliwasa - low	LF	4	1	10	6	26	CL01	1.045	1.743	11.027	0.459	52.627	0.082	0.100	0.374	100.4790
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	1.053	1.743	11.121	0.448	51.985	0.080	0.101	0.366	99.6694
SME Simulant	Coliwasa - low	LF	65	1	23	6	28	CL04	1.028	1.704	11.094	0.433	53.483	0.082	0.098	0.371	101.0537
ARG-1	None	0	0	3	23	6	29	ARG-1B33	0.794	1.730	11.121	0.973	45.781	1.071	0.022	0.128	94.2701

**Table A5. Reference Calcine Oxide Concentrations for Mid-Rheology SME Simulant
(Phase 1 Testing)**

Oxide	Targeted wt%
Al ₂ O ₃ (wt%)	10.869
B ₂ O ₃ (wt%)	4.259
BaO (wt%)	0.0919
CaO (wt%)	1.1462
Cr ₂ O ₃ (wt%)	0.0998
CuO (wt%)	0.0504
Fe ₂ O ₃ (wt%)	11.462
K ₂ O (wt%)	0.1591
Li ₂ O (wt%)	4.674
MgO (wt%)	1.014
MnO (wt%)	1.779
Na ₂ O (wt%)	11.659
NiO (wt%)	0.41
SiO ₂ (wt%)	50.985
TiO ₂ (wt%)	0.0711
ZnO (wt%)	0.0958
ZrO ₂ (wt%)	0.3547
Sum of Oxides (wt%)	99.553

Shaded rows indicate oxides that are at reportable concentrations and that are considered critical in the comparisons conducted as part of this study.

Table A6. Comparisons for Density and Solids from Mid-Rheology (Phase 1) Testing

Density

	Sampler Mean	BL Mean	Difference	Difference	Statistically			Statistically	g/mL	% of BL		
	(g/mL)	(g/mL)	(g/mL)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Different	Bound on	Bound on	n sampler	n BL
	(g/mL)	(g/mL)	(g/mL)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Variations	Bias (95%)	Bias (95%)	n sampler	n BL
Coliwasa High Location vs Coliwasa Low Location (BL)	1.29927	1.28822	0.011	0.9%	no	0.0082421	0.0140021	no	0.02337	1.8%	8	8
Hydragard (LF) vs Coliwasa	1.30334	1.29374	0.010	0.7%	yes	0.0066311	0.0124792	no	0.018477	1.4%	10	16
Hydragard (HF) vs Coliwasa	1.30816	1.29374	0.014	1.1%	no	0.0348372	0.0124792	no	0.03397	2.6%	10	16
Hydragard (HF-scrnd) vs Coliwasa	1.29759	1.29374	0.004	0.3%	no	0.0104389	0.0124792	no	0.01403	1.1%	9	16
Isolok (LF) vs Coliwasa	1.28772	1.29374	-0.006	-0.5%	no	0.0123206	0.0124792	no	0.01635	1.3%	10	16
Isolok (LF - scrnd) vs Coliwasa	1.29103	1.29374	-0.003	-0.2%	no	0.0069123	0.0124792	no	0.01209	0.9%	9	16
Isolok (HF) vs Coliwasa	1.30378	1.29374	0.010	0.8%	no	0.0130293	0.0124792	no	0.0206	1.6%	10	16

Dried wt% Solids

	Sampler Mean	BL Mean	Difference	Difference	Statistically			Statistically	g/mL	% of BL		
	(g/mL)	(g/mL)	(g/mL)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Different	Bound on	Bound on	n sampler	n BL
	(g/mL)	(g/mL)	(g/mL)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Variations	Bias (95%)	Bias (95%)	n sampler	n BL
Coliwasa High Location vs Coliwasa Low Location (BL)	36.5288	36.2150	0.314	0.9%	yes	0.079181	0.172378	no	0.45759	1.3%	8	8
Hydragard (HF) vs Coliwasa	35.9830	36.3719	-0.389	-1.1%	yes	0.170428	0.207468	no	0.55062	1.5%	10	16
Hydragard (LF) vs Coliwasa	36.0100	36.3719	-0.362	-1.0%	yes	0.125344	0.207468	yes	0.4966	1.4%	10	16
Isolok (12; LF) vs Coliwasa	35.8130	36.3719	-0.559	-1.5%	yes	0.258974	0.207468	no	0.74869	2.1%	10	16
Isolok (12; HF) vs Coliwasa	36.4520	36.3719	0.080	0.2%	no	0.070836	0.207468	yes	0.19799	0.5%	10	16
Isolok (3; LF) vs Coliwasa	35.8540	36.3719	-0.518	-1.4%	yes	0.186679	0.207468	no	0.68421	1.9%	10	16
Isolok (3; HF) vs Coliwasa	36.5910	36.3719	0.219	0.6%	yes	0.137957	0.207468	no	0.372623	1.0%	10	16

Vitrified wt% Solids

	Sampler Mean	BL Mean	Difference	Difference	Statistically			Statistically	g/mL	% of BL		
	(g/mL)	(g/mL)	(g/mL)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Different	Bound on	Bound on	n sampler	n BL
	(g/mL)	(g/mL)	(g/mL)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Variations	Bias (95%)	Bias (95%)	n sampler	n BL
Coliwasa High Location vs Coliwasa Low Location (BL)	31.1413	30.8250	0.316	1.0%	yes	0.076052	0.1811659	no	0.46559	1.5%	8	8
Hydragard (HF) vs Coliwasa	30.1880	30.9831	-0.795	-2.6%	yes	0.200044	0.211588	no	0.96762	3.1%	10	16
Hydragard (LF) vs Coliwasa	30.3320	30.9831	-0.651	-2.1%	yes	0.120167	0.211588	no	0.80317	2.6%	10	16
Isolok (12; LF) vs Coliwasa	30.2950	30.9831	-0.688	-2.2%	yes	0.229988	0.211588	no	0.87005	2.8%	10	16
Isolok (12; HF) vs Coliwasa	30.9380	30.9831	-0.045	-0.1%	no	0.090406	0.211588	yes	0.16985	0.5%	10	16
Isolok (3; LF) vs Coliwasa	30.3430	30.9831	-0.640	-2.1%	yes	0.189798	0.211588	no	0.80959	2.6%	10	16
Isolok (3; HF) vs Coliwasa	31.0290	30.9831	0.046	0.1%	no	0.109082	0.211588	yes	0.17638	0.6%	10	16

Table A7. Oxide Comparisons between the Low and High Coliwasa Samples from the Mid-Rheology (Phase 1) Testing

All Data													
Analytical Block	Oxide	Mean(Measured wt%) Coliwasa - low location	Mean(Measured wt%) Coliwasa - high location	Diff	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa - low location	Std Dev(Measured wt%) Coliwasa - high location	Sig. Diff	n low	n high
avg	Al/B	2.668	2.585	-0.083	-3.1%	No	0.2102	7.88	0.1600	0.0535	No	8	8
avg	Al2O3 (wt%)	11.054	10.657	-0.397	-3.6%	Yes	0.7446	6.74	0.4117	0.0698	Yes	8	8
avg	B2O3 (wt%)	4.150	4.125	-0.025	-0.6%	No	0.1338	3.22	0.1243	0.0721	No	8	8
avg	BaO (wt%)	0.105	0.102	-0.003	-3.1%	Yes	0.0059	5.64	0.0032	0.0010	Yes	8	8
avg	CaO (wt%)	1.222	1.183	-0.039	-3.2%	Yes	0.0758	6.20	0.0430	0.0217	No	8	8
avg	Cr2O3 (wt%)	0.111	0.105	-0.006	-5.5%	Yes	0.0106	9.56	0.0057	0.0018	No	8	8
avg	CuO (wt%)	0.026	0.025	-0.001	-2.4%	No	0.0020	7.91	0.0013	0.0013	No	8	8
avg	Fe/Li	2.435	2.366	-0.068	-2.8%	No	0.2208	9.07	0.1971	0.0408	No	8	8
avg	Fe2O3 (wt%)	11.610	11.201	-0.409	-3.5%	Yes	0.7990	6.88	0.4646	0.0893	Yes	8	8
avg	K2O (wt%)	0.163	0.168	0.004	2.5%	No	0.0199	12.18	0.0100	0.0183	No	8	8
avg	Li2O (wt%)	4.785	4.735	-0.050	-1.0%	No	0.2497	5.22	0.2448	0.0963	No	8	8
avg	MgO (wt%)	1.072	1.037	-0.035	-3.3%	No	0.0723	6.74	0.0437	0.0109	Yes	8	8
avg	MnO (wt%)	1.782	1.718	-0.064	-3.6%	No	0.1385	7.78	0.0888	0.0218	Yes	8	8
avg	Na2O (wt%)	11.292	11.080	-0.212	-1.9%	No	0.5530	4.90	0.3546	0.2758	No	8	8
avg	NiO (wt%)	0.460	0.442	-0.018	-3.8%	No	0.0485	10.55	0.0368	0.0059	Yes	8	8
avg	SiO2 (wt%)	51.009	52.132	1.123	2.2%	No	2.4407	4.78	1.6023	0.6723	No	8	8
avg	Sum of Oxides (wt%)	99.393	99.253	-0.139	-0.1%	No	1.0470	1.05	0.9004	0.7885	No	8	8
avg	TiO2 (wt%)	0.081	0.083	0.001	1.4%	No	0.0030	3.71	0.0021	0.0013	No	8	8
avg	ZnO (wt%)	0.103	0.099	-0.004	-3.9%	Yes	0.0076	7.36	0.0042	0.0010	Yes	8	8
avg	ZrO2 (wt%)	0.368	0.363	-0.005	-1.2%	No	0.0105	2.86	0.0063	0.0047	No	8	8
Screened Data													
Analytical Block	Oxide	Mean(Measured wt%) Coliwasa - low location	Mean(Measured wt%) Coliwasa - high location	Diff	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa - low location	Std Dev(Measured wt%) Coliwasa - high location	Sig. Diff	n low	n high
avg	Al/B	2.615	2.585	-0.030	-1.2%	No	0.0943	3.60	0.0640	0.0535	No	7	8
avg	Al2O3 (wt%)	11.054	10.657	-0.397	-3.6%	Yes	0.7446	6.74	0.4117	0.0698	Yes	8	8
avg	B2O3 (wt%)	4.190	4.125	-0.065	-1.5%	No	0.1374	3.28	0.0551	0.0721	No	7	8
avg	BaO (wt%)	0.105	0.102	-0.003	-3.1%	Yes	0.0059	5.64	0.0032	0.0010	Yes	8	8
avg	CaO (wt%)	1.236	1.183	-0.053	-4.3%	Yes	0.0767	6.21	0.0210	0.0217	No	7	8
avg	Cr2O3 (wt%)	0.111	0.105	-0.006	-5.5%	Yes	0.0106	9.56	0.0057	0.0018	No	8	8
avg	CuO (wt%)	0.026	0.025	-0.001	-2.4%	No	0.0020	7.91	0.0013	0.0013	No	8	8
avg	Fe/Li	2.492	2.366	-0.125	-5.0%	Yes	0.2208	8.86	0.1222	0.0408	No	7	8
avg	Fe2O3 (wt%)	11.610	11.201	-0.409	-3.5%	Yes	0.7990	6.88	0.4646	0.0893	Yes	8	8
avg	K2O (wt%)	0.163	0.162	-0.002	-1.1%	No	0.0124	7.56	0.0100	0.0089	No	8	7
avg	Li2O (wt%)	4.717	4.735	0.018	0.4%	No	0.1644	3.49	0.1621	0.0963	No	7	8
avg	MgO (wt%)	1.072	1.037	-0.035	-3.3%	No	0.0723	6.74	0.0437	0.0109	Yes	8	8
avg	MnO (wt%)	1.782	1.718	-0.064	-3.6%	No	0.1385	7.78	0.0888	0.0218	Yes	8	8
avg	Na2O (wt%)	11.292	11.080	-0.212	-1.9%	No	0.5530	4.90	0.3546	0.2758	No	8	8
avg	NiO (wt%)	0.460	0.442	-0.018	-3.8%	No	0.0485	10.55	0.0368	0.0059	Yes	8	8
avg	SiO2 (wt%)	51.009	52.132	1.123	2.2%	No	2.4407	4.78	1.6023	0.6723	No	8	8
avg	Sum of Oxides (wt%)	99.681	99.253	-0.427	-0.4%	No	1.1471	1.15	0.4155	0.7885	No	7	8
avg	TiO2 (wt%)	0.081	0.083	0.001	1.4%	No	0.0030	3.71	0.0021	0.0013	No	8	8
avg	ZnO (wt%)	0.103	0.099	-0.004	-4.2%	Yes	0.0079	7.64	0.0042	0.0005	Yes	8	7
avg	ZrO2 (wt%)	0.370	0.363	-0.007	-1.8%	Yes	0.0108	2.93	0.0026	0.0047	Yes	7	8

Table A8. Oxide Comparisons between Samplers for the Mid-Rheology (Phase 1) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Difference	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Al/B	2.598	2.725	0.128	4.9%	Yes	0.2121	8.17	0.1166	0.0702	No	16	10
1	Isolok-LFR-3mL	Al ₂ O ₃ (wt%)	10.767	10.927	0.160	1.5%	No	0.4089	3.80	0.3358	0.2234	No	16	10
1	Isolok-LFR-3mL	B ₂ O ₃ (wt%)	4.148	4.012	-0.136	-3.3%	Yes	0.2345	5.65	0.1066	0.1368	No	16	10
1	Isolok-LFR-3mL	BaO (wt%)	0.103	0.105	0.002	1.8%	No	0.0039	3.73	0.0027	0.0020	No	16	10
1	Isolok-LFR-3mL	CaO (wt%)	1.201	1.222	0.021	1.7%	No	0.0495	4.12	0.0397	0.0236	No	16	10
1	Isolok-LFR-3mL	Cr ₂ O ₃ (wt%)	0.106	0.103	-0.003	-2.7%	No	0.0064	6.02	0.0046	0.0037	No	16	10
1	Isolok-LFR-3mL	CuO (wt%)	0.025	0.025	0.000	1.3%	No	0.0014	5.58	0.0014	0.0010	No	16	10
1	Isolok-LFR-3mL	Fe/Li	2.411	2.465	0.054	2.2%	No	0.1544	6.40	0.1414	0.0750	No	16	10
1	Isolok-LFR-3mL	Fe ₂ O ₃ (wt%)	11.405	11.592	0.188	1.6%	No	0.4594	4.03	0.3770	0.2191	No	16	10
1	Isolok-LFR-3mL	K ₂ O (wt%)	0.163	0.165	0.002	1.5%	No	0.0094	5.74	0.0092	0.0068	No	16	10
1	Isolok-LFR-3mL	Li ₂ O (wt%)	4.738	4.704	-0.034	-0.7%	No	0.1528	3.22	0.1703	0.0794	No	16	10
1	Isolok-LFR-3mL	MgO (wt%)	1.058	1.075	0.017	1.6%	No	0.0382	3.61	0.0351	0.0162	Yes	16	10
1	Isolok-LFR-3mL	MnO (wt%)	1.750	1.786	0.035	2.0%	No	0.0836	4.78	0.0670	0.0385	No	16	10
1	Isolok-LFR-3mL	Na ₂ O (wt%)	11.249	11.198	-0.051	-0.5%	No	0.4892	4.35	0.3356	0.5824	Yes	16	10
1	Isolok-LFR-3mL	NiO (wt%)	0.452	0.459	0.007	1.6%	No	0.0253	5.61	0.0262	0.0097	No	16	10
1	Isolok-LFR-3mL	SiO ₂ (wt%)	51.731	51.728	-0.003	0.0%	No	0.7290	1.41	1.3262	0.2992	Yes	16	10
1	Isolok-LFR-3mL	Sum (wt%)	99.450	99.660	0.210	0.2%	No	0.6234	0.63	0.6067	0.2124	No	16	10
1	Isolok-LFR-3mL	TiO ₂ (wt%)	0.082	0.082	0.000	-0.6%	No	0.0021	2.55	0.0027	0.0013	Yes	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.101	0.102	0.001	0.8%	No	0.0035	3.44	0.0037	0.0020	No	16	10
1	Isolok-LFR-3mL	ZrO ₂ (wt%)	0.371	0.374	0.002	0.7%	No	0.0075	2.03	0.0056	0.0069	No	16	10
2	Hydragard - HFR	Al/B	2.654	2.728	0.074	2.8%	No	0.1778	6.70	0.1433	0.0845	No	16	10
2	Hydragard - HFR	Al ₂ O ₃ (wt%)	10.975	11.265	0.291	2.6%	Yes	0.5596	5.10	0.3792	0.1971	No	16	10
2	Hydragard - HFR	B ₂ O ₃ (wt%)	4.140	4.131	-0.008	-0.2%	No	0.0966	2.33	0.1176	0.0832	No	16	10
2	Hydragard - HFR	BaO (wt%)	0.106	0.108	0.002	2.1%	No	0.0048	4.51	0.0033	0.0025	No	16	10
2	Hydragard - HFR	CaO (wt%)	1.211	1.250	0.039	3.2%	Yes	0.0657	5.43	0.0347	0.0285	No	16	10
2	Hydragard - HFR	Cr ₂ O ₃ (wt%)	0.111	0.111	0.000	0.2%	No	0.0041	3.71	0.0056	0.0024	No	16	10
2	Hydragard - HFR	CuO (wt%)	0.025	0.025	0.000	0.1%	No	0.0014	5.42	0.0014	0.0019	No	16	10
2	Hydragard - HFR	Fe/Li	2.388	2.455	0.067	2.8%	No	0.1651	6.91	0.1360	0.0768	No	16	10
2	Hydragard - HFR	Fe ₂ O ₃ (wt%)	11.463	11.732	0.270	2.4%	No	0.5518	4.81	0.3843	0.2465	No	16	10
2	Hydragard - HFR	K ₂ O (wt%)	0.163	0.163	0.001	0.4%	No	0.0092	5.62	0.0088	0.0123	No	16	10
2	Hydragard - HFR	Li ₂ O (wt%)	4.808	4.779	-0.028	-0.6%	No	0.1417	2.95	0.1662	0.0600	No	16	10
2	Hydragard - HFR	MgO (wt%)	1.074	1.091	0.018	1.7%	No	0.0458	4.27	0.0361	0.0288	No	16	10
2	Hydragard - HFR	MnO (wt%)	1.785	1.822	0.037	2.1%	No	0.0889	4.98	0.0708	0.0457	No	16	10
2	Hydragard - HFR	Na ₂ O (wt%)	11.311	11.399	0.088	0.8%	No	0.3822	3.38	0.3543	0.3518	No	16	10
2	Hydragard - HFR	NiO (wt%)	0.460	0.478	0.018	3.8%	No	0.0370	8.04	0.0274	0.0145	No	16	10
2	Hydragard - HFR	SiO ₂ (wt%)	52.052	51.579	-0.473	-0.9%	No	1.3620	2.62	1.2095	0.7776	No	16	10
2	Hydragard - HFR	Sum (wt%)	100.236	100.496	0.260	0.3%	No	0.5996	0.60	0.4877	0.2163	No	16	10
2	Hydragard - HFR	TiO ₂ (wt%)	0.082	0.082	0.000	-0.3%	No	0.0025	3.05	0.0024	0.0031	No	16	10
2	Hydragard - HFR	ZnO (wt%)	0.103	0.105	0.003	2.7%	Yes	0.0055	5.32	0.0038	0.0019	No	16	10

Table A8. Oxide Comparisons between Samplers for the Mid-Rheology (Phase 1) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Difference	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
2	Hydragard - HFR	ZrO2 (wt%)	0.370	0.375	0.006	1.5%	Yes	0.0105	2.83	0.0065	0.0049	No	16	10
3	Isolok-LFR-12mL	Al/B	2.613	2.580	-0.033	-1.3%	No	0.1290	4.94	0.1363	0.0672	No	16	10
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.868	11.176	0.308	2.8%	No	0.6640	6.11	0.4601	0.3672	No	16	10
3	Isolok-LFR-12mL	B2O3 (wt%)	4.164	4.334	0.170	4.1%	Yes	0.2949	7.08	0.1500	0.1496	No	16	10
3	Isolok-LFR-12mL	BaO (wt%)	0.103	0.107	0.004	4.0%	Yes	0.0073	7.10	0.0040	0.0011	No	16	10
3	Isolok-LFR-12mL	CaO (wt%)	1.194	1.249	0.055	4.6%	Yes	0.0960	8.04	0.0510	0.0479	No	16	10
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.108	0.110	0.002	2.2%	No	0.0069	6.40	0.0062	0.0013	No	16	10
3	Isolok-LFR-12mL	CuO (wt%)	0.025	0.026	0.001	4.3%	No	0.0022	8.57	0.0014	0.0011	No	16	10
3	Isolok-LFR-12mL	Fe/Li	2.393	2.450	0.058	2.4%	No	0.1506	6.29	0.1367	0.0470	No	16	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	11.214	11.599	0.385	3.4%	Yes	0.7611	6.79	0.4704	0.4200	No	16	10
3	Isolok-LFR-12mL	K2O (wt%)	0.163	0.329	0.166	101.5%	No	0.5251	321.72	0.0092	0.5024	Yes	16	10
3	Isolok-LFR-12mL	Li2O (wt%)	4.695	4.734	0.040	0.8%	No	0.2057	4.38	0.2169	0.1672	No	16	10
3	Isolok-LFR-12mL	MgO (wt%)	1.051	1.089	0.038	3.7%	Yes	0.0763	7.26	0.0455	0.0457	No	16	10
3	Isolok-LFR-12mL	MnO (wt%)	1.748	1.817	0.069	3.9%	Yes	0.1356	7.76	0.0862	0.0697	No	16	10
3	Isolok-LFR-12mL	Na2O (wt%)	11.008	11.690	0.682	6.2%	No	1.4743	13.39	0.4252	1.4556	No	16	10
3	Isolok-LFR-12mL	NiO (wt%)	0.451	0.466	0.016	3.5%	No	0.0369	8.18	0.0306	0.0136	No	16	10
3	Isolok-LFR-12mL	SiO2 (wt%)	51.062	51.750	0.687	1.3%	No	1.8869	3.70	1.6529	0.9955	No	16	10
3	Isolok-LFR-12mL	Sum (wt%)	98.401	101.037	2.636	2.7%	Yes	4.8331	4.91	2.3685	3.0410	No	16	10
3	Isolok-LFR-12mL	TiO2 (wt%)	0.082	0.083	0.000	0.4%	No	0.0031	3.71	0.0033	0.0034	No	16	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.100	0.105	0.005	4.8%	Yes	0.0084	8.40	0.0047	0.0035	No	16	10
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.364	0.372	0.008	2.3%	No	0.0167	4.60	0.0097	0.0108	No	16	10
4	Isolok-HFR-12mL	Al/B	2.622	2.534	-0.088	-3.3%	No	0.2036	7.77	0.1211	0.1656	No	16	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.851	10.768	-0.082	-0.8%	No	0.3852	3.55	0.3358	0.4071	No	16	10
4	Isolok-HFR-12mL	B2O3 (wt%)	4.142	4.257	0.115	2.8%	Yes	0.2161	5.22	0.1031	0.1470	No	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.104	0.104	0.001	0.6%	No	0.0033	3.21	0.0028	0.0039	No	16	10
4	Isolok-HFR-12mL	CaO (wt%)	1.197	1.201	0.003	0.3%	No	0.0425	3.55	0.0386	0.0587	No	16	10
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.107	0.107	0.000	0.2%	No	0.0052	4.82	0.0055	0.0065	No	16	10
4	Isolok-HFR-12mL	CuO (wt%)	0.025	0.026	0.001	5.5%	Yes	0.0026	10.56	0.0014	0.0017	No	16	10
4	Isolok-HFR-12mL	Fe/Li	2.396	2.367	-0.029	-1.2%	No	0.1552	6.48	0.1472	0.1598	No	16	10
4	Isolok-HFR-12mL	Fe2O3 (wt%)	11.468	11.365	-0.103	-0.9%	No	0.4822	4.20	0.3692	0.5708	No	16	10
4	Isolok-HFR-12mL	K2O (wt%)	0.177	0.193	0.015	8.6%	No	0.0670	37.78	0.0591	0.0673	No	16	10
4	Isolok-HFR-12mL	Li2O (wt%)	4.797	4.807	0.011	0.2%	No	0.1520	3.17	0.1940	0.1201	No	16	10
4	Isolok-HFR-12mL	MgO (wt%)	1.061	1.051	-0.010	-0.9%	No	0.0455	4.29	0.0346	0.0541	No	16	10
4	Isolok-HFR-12mL	MnO (wt%)	1.755	1.742	-0.013	-0.8%	No	0.0770	4.39	0.0690	0.0893	No	16	10
4	Isolok-HFR-12mL	Na2O (wt%)	11.063	10.748	-0.315	-2.9%	Yes	0.6128	5.54	0.3266	0.4041	No	16	10
4	Isolok-HFR-12mL	NiO (wt%)	0.446	0.443	-0.003	-0.7%	No	0.0274	6.13	0.0268	0.0320	No	16	10
4	Isolok-HFR-12mL	SiO2 (wt%)	51.370	52.113	0.743	1.4%	No	1.7839	3.47	1.3254	1.1148	No	16	10
4	Isolok-HFR-12mL	Sum (wt%)	99.111	99.471	0.360	0.4%	No	0.8499	0.86	0.6183	0.5364	No	16	10
4	Isolok-HFR-12mL	TiO2 (wt%)	0.083	0.083	0.000	0.0%	No	0.0014	1.69	0.0019	0.0012	No	16	10

Table A8. Oxide Comparisons between Samplers for the Mid-Rheology (Phase 1) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Difference	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
4	Isolok-HFR-12mL	ZnO (wt%)	0.101	0.101	0.000	0.1%	No	0.0033	3.31	0.0036	0.0043	No	16	10
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.365	0.362	-0.003	-0.7%	No	0.0082	2.25	0.0052	0.0085	No	16	10
5	Isolok-HFR-3mL	Al/B	2.599	2.518	-0.080	-3.1%	No	0.1631	6.28	0.1191	0.0537	No	16	10
5	Isolok-HFR-3mL	Al2O3 (wt%)	10.752	10.596	-0.156	-1.5%	No	0.4420	4.11	0.3507	0.3315	No	16	10
5	Isolok-HFR-3mL	B2O3 (wt%)	4.146	4.208	0.062	1.5%	No	0.1794	4.33	0.1340	0.1375	No	16	10
5	Isolok-HFR-3mL	BaO (wt%)	0.103	0.102	-0.001	-1.1%	No	0.0033	3.21	0.0031	0.0022	Yes	16	10
5	Isolok-HFR-3mL	CaO (wt%)	1.206	1.199	-0.006	-0.5%	No	0.0411	3.41	0.0454	0.0352	No	16	10
5	Isolok-HFR-3mL	Cr2O3 (wt%)	0.107	0.103	-0.004	-3.8%	Yes	0.0077	7.13	0.0049	0.0032	No	16	10
5	Isolok-HFR-3mL	CuO (wt%)	0.025	0.025	0.000	1.2%	No	0.0015	6.14	0.0014	0.0016	No	16	10
5	Isolok-HFR-3mL	Fe/Li	2.402	2.335	-0.067	-2.8%	No	0.1717	7.15	0.1554	0.0452	No	16	10
5	Isolok-HFR-3mL	Fe2O3 (wt%)	11.357	11.213	-0.144	-1.3%	No	0.4490	3.95	0.4035	0.2946	No	16	10
5	Isolok-HFR-3mL	K2O (wt%)	0.163	0.165	0.002	1.2%	No	0.0101	6.16	0.0092	0.0106	No	16	10
5	Isolok-HFR-3mL	Li2O (wt%)	4.740	4.803	0.063	1.3%	No	0.2359	4.98	0.2398	0.1404	No	16	10
5	Isolok-HFR-3mL	MgO (wt%)	1.043	1.029	-0.014	-1.4%	No	0.0384	3.68	0.0364	0.0232	Yes	16	10
5	Isolok-HFR-3mL	MnO (wt%)	1.733	1.710	-0.023	-1.3%	No	0.0675	3.89	0.0708	0.0386	Yes	16	10
5	Isolok-HFR-3mL	Na2O (wt%)	11.141	10.812	-0.329	-3.0%	No	0.6819	6.12	0.3820	0.4867	No	16	10
5	Isolok-HFR-3mL	NiO (wt%)	0.446	0.440	-0.006	-1.3%	No	0.0241	5.41	0.0260	0.0120	No	16	10
5	Isolok-HFR-3mL	SiO2 (wt%)	51.210	52.071	0.861	1.7%	No	2.3405	4.57	1.9433	1.4621	No	16	10
5	Isolok-HFR-3mL	Sum (wt%)	98.710	99.021	0.311	0.3%	No	2.3698	2.40	2.3880	2.6127	No	16	10
5	Isolok-HFR-3mL	TiO2 (wt%)	0.082	0.084	0.002	2.0%	No	0.0036	4.40	0.0030	0.0018	Yes	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.100	0.100	0.000	-0.4%	No	0.0035	3.53	0.0038	0.0037	No	16	10
5	Isolok-HFR-3mL	ZrO2 (wt%)	0.360	0.361	0.001	0.2%	No	0.0090	2.49	0.0094	0.0106	No	16	10
6	Hydragard-LFR	Al/B	2.672	2.654	-0.018	-0.7%	No	0.1239	4.64	0.1292	0.1243	No	16	10
6	Hydragard-LFR	Al2O3 (wt%)	10.919	11.248	0.329	3.0%	No	0.6749	6.18	0.4633	0.3202	No	16	10
6	Hydragard-LFR	B2O3 (wt%)	4.089	4.244	0.155	3.8%	Yes	0.2692	6.58	0.1222	0.1605	No	16	10
6	Hydragard-LFR	BaO (wt%)	0.103	0.106	0.003	2.9%	No	0.0062	5.97	0.0040	0.0034	No	16	10
6	Hydragard-LFR	CaO (wt%)	1.208	1.257	0.049	4.0%	Yes	0.0917	7.59	0.0515	0.0519	No	16	10
6	Hydragard-LFR	Cr2O3 (wt%)	0.107	0.106	0.000	-0.4%	No	0.0050	4.68	0.0060	0.0044	No	16	10
6	Hydragard-LFR	CuO (wt%)	0.027	0.026	-0.001	-4.0%	No	0.0049	18.47	0.0057	0.0016	No	16	10
6	Hydragard-LFR	Fe/Li	2.413	2.427	0.014	0.6%	No	0.1250	5.18	0.1466	0.1077	No	16	10
6	Hydragard-LFR	Fe2O3 (wt%)	11.523	11.844	0.320	2.8%	No	0.6939	6.02	0.4939	0.3626	No	16	10
6	Hydragard-LFR	K2O (wt%)	0.163	0.166	0.003	1.9%	No	0.0112	6.86	0.0092	0.0104	No	16	10
6	Hydragard-LFR	Li2O (wt%)	4.783	4.885	0.101	2.1%	No	0.2594	5.42	0.1980	0.1753	No	16	10
6	Hydragard-LFR	MgO (wt%)	1.042	1.075	0.033	3.1%	No	0.0693	6.65	0.0444	0.0431	No	16	10
6	Hydragard-LFR	MnO (wt%)	1.729	1.786	0.057	3.3%	No	0.1215	7.03	0.0854	0.0618	No	16	10
6	Hydragard-LFR	Na2O (wt%)	11.343	11.616	0.272	2.4%	No	0.6274	5.53	0.3577	0.5221	No	16	10
6	Hydragard-LFR	NiO (wt%)	0.452	0.464	0.011	2.5%	No	0.0330	7.29	0.0310	0.0138	No	16	10
6	Hydragard-LFR	SiO2 (wt%)	51.998	52.242	0.243	0.5%	No	1.5168	2.92	1.5942	1.4183	No	16	10
6	Hydragard-LFR	Sum (wt%)	100.032	101.618	1.586	1.6%	No	3.2932	3.29	2.0987	1.9700	No	16	10

Table A8. Oxide Comparisons between Samplers for the Mid-Rheology (Phase 1) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Difference	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
6	Hydragard-LFR	TiO ₂ (wt%)	0.080	0.081	0.000	0.3%	No	0.0022	2.69	0.0019	0.0029	No	16	10
6	Hydragard-LFR	ZnO (wt%)	0.101	0.105	0.003	3.3%	No	0.0071	7.00	0.0050	0.0037	No	16	10
6	Hydragard-LFR	ZrO ₂ (wt%)	0.362	0.369	0.007	2.0%	No	0.0154	4.26	0.0107	0.0089	No	16	10

Table A9. Oxide Comparisons between Samplers for the Mid-Rheology (Phase 1) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Al/B	2.572	2.725	0.153	5.9%	Yes	0.2069	8.04	0.0597	0.0702	No	15	10
1	Isolok-LFR-3mL	Al2O3 (wt%)	10.767	10.927	0.160	1.5%	No	0.4089	3.80	0.3358	0.2234	No	16	10
1	Isolok-LFR-3mL	B2O3 (wt%)	4.151	4.012	-0.139	-3.4%	Yes	0.2283	5.50	0.0720	0.1368	No	14	10
1	Isolok-LFR-3mL	BaO (wt%)	0.103	0.106	0.002	2.2%	Yes	0.0043	4.14	0.0027	0.0015	No	16	9
1	Isolok-LFR-3mL	CaO (wt%)	1.201	1.222	0.021	1.7%	No	0.0495	4.12	0.0397	0.0236	No	16	10
1	Isolok-LFR-3mL	Cr2O3 (wt%)	0.105	0.103	-0.002	-1.9%	No	0.0050	4.73	0.0034	0.0037	No	15	10
1	Isolok-LFR-3mL	CuO (wt%)	0.025	0.025	0.000	1.3%	No	0.0014	5.58	0.0014	0.0010	No	16	10
1	Isolok-LFR-3mL	Fe/Li	2.412	2.465	0.053	2.2%	No	0.1171	4.86	0.0734	0.0750	No	14	10
1	Isolok-LFR-3mL	Fe2O3 (wt%)	11.405	11.592	0.188	1.6%	No	0.4594	4.03	0.3770	0.2191	No	16	10
1	Isolok-LFR-3mL	K2O (wt%)	0.163	0.165	0.002	1.5%	No	0.0094	5.74	0.0092	0.0068	No	16	10
1	Isolok-LFR-3mL	Li2O (wt%)	4.709	4.704	-0.005	-0.1%	No	0.1007	2.14	0.1306	0.0794	No	15	10
1	Isolok-LFR-3mL	MgO (wt%)	1.058	1.075	0.017	1.6%	No	0.0382	3.61	0.0351	0.0162	Yes	16	10
1	Isolok-LFR-3mL	MnO (wt%)	1.750	1.786	0.035	2.0%	No	0.0836	4.78	0.0670	0.0385	No	16	10
1	Isolok-LFR-3mL	Na2O (wt%)	11.249	11.198	-0.051	-0.5%	No	0.4892	4.35	0.3356	0.5824	Yes	16	10
1	Isolok-LFR-3mL	NiO (wt%)	0.452	0.459	0.008	1.7%	No	0.0187	4.14	0.0148	0.0097	No	14	10
1	Isolok-LFR-3mL	SiO2 (wt%)	51.731	51.728	-0.003	0.0%	No	0.7290	1.41	1.3262	0.2992	Yes	16	10
1	Isolok-LFR-3mL	Sum (wt%)	99.584	99.660	0.076	0.1%	No	0.3001	0.30	0.2946	0.2124	No	15	10
1	Isolok-LFR-3mL	TiO2 (wt%)	0.082	0.082	0.000	-0.6%	No	0.0021	2.55	0.0027	0.0013	Yes	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.101	0.102	0.001	0.8%	No	0.0035	3.44	0.0037	0.0020	No	16	10
1	Isolok-LFR-3mL	ZrO2 (wt%)	0.371	0.374	0.002	0.7%	No	0.0075	2.03	0.0056	0.0069	No	16	10
2	Hydragard - HFR	Al/B	2.620	2.748	0.128	4.9%	Yes	0.1755	6.70	0.0514	0.0603	No	15	9
2	Hydragard - HFR	Al2O3 (wt%)	10.906	11.265	0.359	3.3%	Yes	0.5665	5.19	0.2723	0.1971	No	15	10
2	Hydragard - HFR	B2O3 (wt%)	4.162	4.131	-0.031	-0.7%	No	0.0985	2.37	0.0774	0.0832	No	15	10
2	Hydragard - HFR	BaO (wt%)	0.106	0.108	0.002	2.1%	No	0.0048	4.51	0.0033	0.0025	No	16	10
2	Hydragard - HFR	CaO (wt%)	1.211	1.250	0.039	3.2%	Yes	0.0657	5.43	0.0347	0.0285	No	16	10
2	Hydragard - HFR	Cr2O3 (wt%)	0.110	0.111	0.001	1.2%	No	0.0041	3.70	0.0038	0.0024	No	15	10
2	Hydragard - HFR	CuO (wt%)	0.025	0.025	0.000	0.1%	No	0.0014	5.42	0.0014	0.0019	No	16	10
2	Hydragard - HFR	Fe/Li	2.411	2.455	0.044	1.8%	No	0.1223	5.07	0.1017	0.0768	No	15	10
2	Hydragard - HFR	Fe2O3 (wt%)	11.463	11.732	0.270	2.4%	No	0.5518	4.81	0.3843	0.2465	No	16	10
2	Hydragard - HFR	K2O (wt%)	0.163	0.163	0.001	0.4%	No	0.0092	5.62	0.0088	0.0123	No	16	10
2	Hydragard - HFR	Li2O (wt%)	4.777	4.794	0.017	0.4%	No	0.0852	1.78	0.1139	0.0417	Yes	14	10
2	Hydragard - HFR	MgO (wt%)	1.074	1.091	0.018	1.7%	No	0.0458	4.27	0.0361	0.0288	No	16	10
2	Hydragard - HFR	MnO (wt%)	1.785	1.822	0.037	2.1%	No	0.0889	4.98	0.0708	0.0457	No	16	10
2	Hydragard - HFR	Na2O (wt%)	11.311	11.399	0.088	0.8%	No	0.3822	3.38	0.3543	0.3518	No	16	10
2	Hydragard - HFR	NiO (wt%)	0.465	0.478	0.013	2.8%	No	0.0289	6.21	0.0212	0.0145	No	15	10
2	Hydragard - HFR	SiO2 (wt%)	52.052	51.579	-0.473	-0.9%	No	1.3620	2.62	1.2095	0.7776	No	16	10
2	Hydragard - HFR	Sum (wt%)	100.332	100.496	0.164	0.2%	No	0.3991	0.40	0.3112	0.2163	No	15	10
2	Hydragard - HFR	TiO2 (wt%)	0.083	0.082	-0.001	-1.0%	No	0.0031	3.71	0.0013	0.0031	Yes	15	10
2	Hydragard - HFR	ZnO (wt%)	0.103	0.105	0.003	2.7%	Yes	0.0055	5.32	0.0038	0.0019	No	16	10
2	Hydragard - HFR	ZrO2 (wt%)	0.369	0.375	0.006	1.7%	Yes	0.0109	2.96	0.0055	0.0049	No	15	10

Table A9. Oxide Comparisons between Samplers for the Mid-Rheology (Phase 1) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
3	Isolok-LFR-12mL	Al/B	2.587	2.580	-0.007	-0.3%	No	0.0781	3.02	0.0928	0.0672	No	15	10
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.868	11.176	0.308	2.8%	No	0.6640	6.11	0.4601	0.3672	No	16	10
3	Isolok-LFR-12mL	B2O3 (wt%)	4.164	4.368	0.205	4.9%	Yes	0.3228	7.75	0.1500	0.1092	No	16	9
3	Isolok-LFR-12mL	BaO (wt%)	0.103	0.107	0.004	4.0%	Yes	0.0073	7.10	0.0040	0.0011	No	16	10
3	Isolok-LFR-12mL	CaO (wt%)	1.194	1.249	0.055	4.6%	Yes	0.0960	8.04	0.0510	0.0479	No	16	10
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.108	0.110	0.002	2.2%	No	0.0069	6.40	0.0062	0.0013	No	16	10
3	Isolok-LFR-12mL	CuO (wt%)	0.025	0.026	0.001	4.3%	No	0.0022	8.57	0.0014	0.0011	No	16	10
3	Isolok-LFR-12mL	Fe/Li	2.417	2.450	0.034	1.4%	No	0.1053	4.36	0.1017	0.0470	No	15	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	11.214	11.599	0.385	3.4%	Yes	0.7611	6.79	0.4704	0.4200	No	16	10
3	Isolok-LFR-12mL	K2O (wt%)	0.163	0.170	0.007	4.2%	No	0.0143	8.74	0.0092	0.0074	No	16	9
3	Isolok-LFR-12mL	Li2O (wt%)	4.695	4.734	0.040	0.8%	No	0.2057	4.38	0.2169	0.1672	No	16	10
3	Isolok-LFR-12mL	MgO (wt%)	1.051	1.089	0.038	3.7%	Yes	0.0763	7.26	0.0455	0.0457	No	16	10
3	Isolok-LFR-12mL	MnO (wt%)	1.748	1.817	0.069	3.9%	Yes	0.1356	7.76	0.0862	0.0697	No	16	10
3	Isolok-LFR-12mL	Na2O (wt%)	11.008	11.251	0.243	2.2%	No	0.6232	5.66	0.4252	0.4690	No	16	9
3	Isolok-LFR-12mL	NiO (wt%)	0.451	0.466	0.016	3.5%	No	0.0369	8.18	0.0306	0.0136	No	16	10
3	Isolok-LFR-12mL	SiO2 (wt%)	51.343	51.750	0.406	0.8%	No	1.3866	2.70	1.2553	0.9955	No	15	10
3	Isolok-LFR-12mL	Sum (wt%)	98.401	101.037	2.636	2.7%	Yes	4.8331	4.91	2.3685	3.0410	No	16	10
3	Isolok-LFR-12mL	TiO2 (wt%)	0.082	0.083	0.000	0.4%	No	0.0031	3.71	0.0033	0.0034	No	16	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.100	0.105	0.005	4.8%	Yes	0.0084	8.40	0.0047	0.0035	No	16	10
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.364	0.372	0.008	2.3%	No	0.0167	4.60	0.0097	0.0108	No	16	10
4	Isolok-HFR-12mL	Al/B	2.596	2.534	-0.061	-2.4%	No	0.1823	7.02	0.0621	0.1656	Yes	15	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.790	10.768	-0.022	-0.2%	No	0.2899	2.69	0.2424	0.4071	No	15	10
4	Isolok-HFR-12mL	B2O3 (wt%)	4.142	4.257	0.115	2.8%	Yes	0.2161	5.22	0.1031	0.1470	No	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.104	0.104	0.001	0.6%	No	0.0033	3.21	0.0028	0.0039	No	16	10
4	Isolok-HFR-12mL	CaO (wt%)	1.197	1.201	0.003	0.3%	No	0.0425	3.55	0.0386	0.0587	No	16	10
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.107	0.107	0.000	0.2%	No	0.0052	4.82	0.0055	0.0065	No	16	10
4	Isolok-HFR-12mL	CuO (wt%)	0.025	0.027	0.002	7.2%	Yes	0.0029	11.69	0.0014	0.0011	No	16	9
4	Isolok-HFR-12mL	Fe/Li	2.400	2.367	-0.033	-1.4%	No	0.1518	6.32	0.0760	0.1598	Yes	14	10
4	Isolok-HFR-12mL	Fe2O3 (wt%)	11.468	11.365	-0.103	-0.9%	No	0.4822	4.20	0.3692	0.5708	No	16	10
4	Isolok-HFR-12mL	K2O (wt%)	0.163	0.172	0.009	5.4%	Yes	0.0175	10.76	0.0093	0.0112	No	15	9
4	Isolok-HFR-12mL	Li2O (wt%)	4.783	4.777	-0.005	-0.1%	No	0.0830	1.73	0.0932	0.0765	No	14	9
4	Isolok-HFR-12mL	MgO (wt%)	1.061	1.051	-0.010	-0.9%	No	0.0455	4.29	0.0346	0.0541	No	16	10
4	Isolok-HFR-12mL	MnO (wt%)	1.755	1.742	-0.013	-0.8%	No	0.0770	4.39	0.0690	0.0893	No	16	10
4	Isolok-HFR-12mL	Na2O (wt%)	11.063	10.748	-0.315	-2.9%	Yes	0.6128	5.54	0.3266	0.4041	No	16	10
4	Isolok-HFR-12mL	NiO (wt%)	0.451	0.443	-0.008	-1.7%	No	0.0295	6.55	0.0208	0.0320	No	15	10
4	Isolok-HFR-12mL	SiO2 (wt%)	51.370	52.113	0.743	1.4%	No	1.7839	3.47	1.3254	1.1148	No	16	10
4	Isolok-HFR-12mL	Sum (wt%)	99.249	99.337	0.088	0.1%	No	0.3591	0.36	0.2867	0.3481	No	15	9
4	Isolok-HFR-12mL	TiO2 (wt%)	0.083	0.083	0.000	0.0%	No	0.0014	1.69	0.0019	0.0012	No	16	10
4	Isolok-HFR-12mL	ZnO (wt%)	0.101	0.101	0.000	0.1%	No	0.0033	3.31	0.0036	0.0043	No	16	10
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.365	0.362	-0.003	-0.7%	No	0.0082	2.25	0.0052	0.0085	No	16	10

Table A9. Oxide Comparisons between Samplers for the Mid-Rheology (Phase 1) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
5	Isolok-HFR-3mL	Al/B	2.574	2.518	-0.055	-2.1%	Yes	0.1078	4.19	0.0672	0.0537	No	15	10
5	Isolok-HFR-3mL	Al2O3 (wt%)	10.752	10.596	-0.156	-1.5%	No	0.4420	4.11	0.3507	0.3315	No	16	10
5	Isolok-HFR-3mL	B2O3 (wt%)	4.146	4.208	0.062	1.5%	No	0.1794	4.33	0.1340	0.1375	No	16	10
5	Isolok-HFR-3mL	BaO (wt%)	0.103	0.102	-0.001	-0.6%	No	0.0024	2.36	0.0031	0.0013	Yes	16	9
5	Isolok-HFR-3mL	CaO (wt%)	1.206	1.199	-0.006	-0.5%	No	0.0411	3.41	0.0454	0.0352	No	16	10
5	Isolok-HFR-3mL	Cr2O3 (wt%)	0.107	0.103	-0.004	-3.8%	Yes	0.0077	7.13	0.0049	0.0032	No	16	10
5	Isolok-HFR-3mL	CuO (wt%)	0.025	0.025	0.000	1.2%	No	0.0015	6.14	0.0014	0.0016	No	16	10
5	Isolok-HFR-3mL	Fe/Li	2.407	2.325	-0.082	-3.4%	Yes	0.1359	5.65	0.0729	0.0324	No	14	9
5	Isolok-HFR-3mL	Fe2O3 (wt%)	11.357	11.290	-0.067	-0.6%	No	0.3096	2.73	0.4035	0.1771	Yes	16	9
5	Isolok-HFR-3mL	K2O (wt%)	0.163	0.165	0.002	1.2%	No	0.0101	6.16	0.0092	0.0106	No	16	10
5	Isolok-HFR-3mL	Li2O (wt%)	4.740	4.837	0.096	2.0%	No	0.2704	5.70	0.2398	0.0969	No	16	9
5	Isolok-HFR-3mL	MgO (wt%)	1.043	1.035	-0.008	-0.8%	No	0.0259	2.48	0.0364	0.0142	Yes	16	9
5	Isolok-HFR-3mL	MnO (wt%)	1.733	1.720	-0.012	-0.7%	No	0.0521	3.01	0.0708	0.0202	Yes	16	9
5	Isolok-HFR-3mL	Na2O (wt%)	11.141	10.812	-0.329	-3.0%	No	0.6819	6.12	0.3820	0.4867	No	16	10
5	Isolok-HFR-3mL	NiO (wt%)	0.446	0.440	-0.006	-1.3%	No	0.0241	5.41	0.0260	0.0120	No	16	10
5	Isolok-HFR-3mL	SiO2 (wt%)	51.210	52.226	1.016	2.0%	No	2.0956	4.09	1.9433	0.4775	Yes	16	8
5	Isolok-HFR-3mL	Sum (wt%)	98.710	99.715	1.005	1.0%	No	2.8345	2.87	2.3880	1.5025	No	16	9
5	Isolok-HFR-3mL	TiO2 (wt%)	0.082	0.084	0.002	2.0%	No	0.0036	4.40	0.0030	0.0018	Yes	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.100	0.100	-0.001	-0.6%	No	0.0029	2.86	0.0038	0.0016	Yes	16	8
5	Isolok-HFR-3mL	ZrO2 (wt%)	0.360	0.361	0.001	0.2%	No	0.0090	2.49	0.0094	0.0106	No	16	10
6	Hydragard-LFR	Al/B	2.644	2.654	0.010	0.4%	No	0.0664	2.51	0.0679	0.0487	No	15	8
6	Hydragard-LFR	Al2O3 (wt%)	10.919	11.248	0.329	3.0%	No	0.6749	6.18	0.4633	0.3202	No	16	10
6	Hydragard-LFR	B2O3 (wt%)	4.089	4.244	0.155	3.8%	Yes	0.2692	6.58	0.1222	0.1605	No	16	10
6	Hydragard-LFR	BaO (wt%)	0.103	0.106	0.003	2.9%	No	0.0062	5.97	0.0040	0.0034	No	16	10
6	Hydragard-LFR	CaO (wt%)	1.208	1.257	0.049	4.0%	Yes	0.0917	7.59	0.0515	0.0519	No	16	10
6	Hydragard-LFR	Cr2O3 (wt%)	0.107	0.106	0.000	-0.4%	No	0.0050	4.68	0.0060	0.0044	No	16	10
6	Hydragard-LFR	CuO (wt%)	0.025	0.026	0.000	1.3%	No	0.0015	6.02	0.0013	0.0016	No	15	10
6	Hydragard-LFR	Fe/Li	2.413	2.427	0.014	0.6%	No	0.0930	3.86	0.0797	0.1077	No	14	10
6	Hydragard-LFR	Fe2O3 (wt%)	11.523	11.844	0.320	2.8%	No	0.6939	6.02	0.4939	0.3626	No	16	10
6	Hydragard-LFR	K2O (wt%)	0.163	0.166	0.003	1.9%	No	0.0112	6.86	0.0092	0.0104	No	16	10
6	Hydragard-LFR	Li2O (wt%)	4.752	4.885	0.133	2.8%	No	0.2725	5.73	0.1587	0.1753	No	15	10
6	Hydragard-LFR	MgO (wt%)	1.042	1.086	0.044	4.2%	Yes	0.0776	7.44	0.0444	0.0280	No	16	9
6	Hydragard-LFR	MnO (wt%)	1.729	1.786	0.057	3.3%	No	0.1215	7.03	0.0854	0.0618	No	16	10
6	Hydragard-LFR	Na2O (wt%)	11.343	11.616	0.272	2.4%	No	0.6274	5.53	0.3577	0.5221	No	16	10
6	Hydragard-LFR	NiO (wt%)	0.452	0.464	0.011	2.5%	No	0.0330	7.29	0.0310	0.0138	No	16	10
6	Hydragard-LFR	SiO2 (wt%)	51.998	52.242	0.243	0.5%	No	1.5168	2.92	1.5942	1.4183	No	16	10
6	Hydragard-LFR	Sum (wt%)	100.357	101.618	1.261	1.3%	No	2.7912	2.78	1.7030	1.9700	No	15	10
6	Hydragard-LFR	TiO2 (wt%)	0.080	0.081	0.000	0.3%	No	0.0022	2.69	0.0019	0.0029	No	16	10
6	Hydragard-LFR	ZnO (wt%)	0.101	0.105	0.003	3.3%	No	0.0071	7.00	0.0050	0.0037	No	16	10
6	Hydragard-LFR	ZrO2 (wt%)	0.362	0.369	0.007	2.0%	No	0.0154	4.26	0.0107	0.0089	No	16	10

Table A10. Phase 1 (Mid-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

Analytical Block	Sampler	Oxide	Mean (Measured wt%) Coliwas	Mean (Measured wt%) Other Sampler	Difference	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev (Measured wt%) Coliwas (low+high)	Std Dev (Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Al/B	2.572	2.725	0.153	5.9%	Yes	0.2069	8.04	0.0597	0.0702	No	15	10
4	Isolok-HFR-12mL	Al/B	2.596	2.534	-0.061	-2.4%	No	0.1823	7.02	0.0621	0.1656	Yes	15	10
2	Hydragard - HFR	Al/B	2.620	2.748	0.128	4.9%	Yes	0.1755	6.70	0.0514	0.0603	No	15	9
5	Isolok-HFR-3mL	Al/B	2.574	2.518	-0.055	-2.1%	Yes	0.1078	4.19	0.0672	0.0537	No	15	10
3	Isolok-LFR-12mL	Al/B	2.587	2.580	-0.007	-0.3%	No	0.0781	3.02	0.0928	0.0672	No	15	10
6	Hydragard-LFR	Al/B	2.644	2.654	0.010	0.4%	No	0.0664	2.51	0.0679	0.0487	No	15	8
6	Hydragard-LFR	Al2O3 (wt%)	10.919	11.248	0.329	3.0%	No	0.6749	6.18	0.4633	0.3202	No	16	10
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.868	11.176	0.308	2.8%	No	0.6640	6.11	0.4601	0.3672	No	16	10
2	Hydragard - HFR	Al2O3 (wt%)	10.906	11.265	0.359	3.3%	Yes	0.5665	5.19	0.2723	0.1971	No	15	10
5	Isolok-HFR-3mL	Al2O3 (wt%)	10.752	10.596	-0.156	-1.5%	No	0.4420	4.11	0.3507	0.3315	No	16	10
1	Isolok-LFR-3mL	Al2O3 (wt%)	10.767	10.927	0.160	1.5%	No	0.4089	3.80	0.3358	0.2234	No	16	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.790	10.768	-0.022	-0.2%	No	0.2899	2.69	0.2424	0.4071	No	15	10
3	Isolok-LFR-12mL	B2O3 (wt%)	4.164	4.368	0.205	4.9%	Yes	0.3228	7.75	0.1500	0.1092	No	16	9
6	Hydragard-LFR	B2O3 (wt%)	4.089	4.244	0.155	3.8%	Yes	0.2692	6.58	0.1222	0.1605	No	16	10
1	Isolok-LFR-3mL	B2O3 (wt%)	4.151	4.012	-0.139	-3.4%	Yes	0.2283	5.50	0.0720	0.1368	No	14	10
4	Isolok-HFR-12mL	B2O3 (wt%)	4.142	4.257	0.115	2.8%	Yes	0.2161	5.22	0.1031	0.1470	No	16	10
5	Isolok-HFR-3mL	B2O3 (wt%)	4.146	4.208	0.062	1.5%	No	0.1794	4.33	0.1340	0.1375	No	16	10
2	Hydragard - HFR	B2O3 (wt%)	4.162	4.131	-0.031	-0.7%	No	0.0985	2.37	0.0774	0.0832	No	15	10
3	Isolok-LFR-12mL	BaO (wt%)	0.103	0.107	0.004	4.0%	Yes	0.0073	7.10	0.0040	0.0011	No	16	10
6	Hydragard-LFR	BaO (wt%)	0.103	0.106	0.003	2.9%	No	0.0062	5.97	0.0040	0.0034	No	16	10
2	Hydragard - HFR	BaO (wt%)	0.106	0.108	0.002	2.1%	No	0.0048	4.51	0.0033	0.0025	No	16	10
1	Isolok-LFR-3mL	BaO (wt%)	0.103	0.106	0.002	2.2%	Yes	0.0043	4.14	0.0027	0.0015	No	16	9
4	Isolok-HFR-12mL	BaO (wt%)	0.104	0.104	0.001	0.6%	No	0.0033	3.21	0.0028	0.0039	No	16	10
5	Isolok-HFR-3mL	BaO (wt%)	0.103	0.102	-0.001	-0.6%	No	0.0024	2.36	0.0031	0.0013	Yes	16	9
3	Isolok-LFR-12mL	CaO (wt%)	1.194	1.249	0.055	4.6%	Yes	0.0960	8.04	0.0510	0.0479	No	16	10
6	Hydragard-LFR	CaO (wt%)	1.208	1.257	0.049	4.0%	Yes	0.0917	7.59	0.0515	0.0519	No	16	10
2	Hydragard - HFR	CaO (wt%)	1.211	1.250	0.039	3.2%	Yes	0.0657	5.43	0.0347	0.0285	No	16	10
1	Isolok-LFR-3mL	CaO (wt%)	1.201	1.222	0.021	1.7%	No	0.0495	4.12	0.0397	0.0236	No	16	10
4	Isolok-HFR-12mL	CaO (wt%)	1.197	1.201	0.003	0.3%	No	0.0425	3.55	0.0386	0.0587	No	16	10
5	Isolok-HFR-3mL	CaO (wt%)	1.206	1.199	-0.006	-0.5%	No	0.0411	3.41	0.0454	0.0352	No	16	10
5	Isolok-HFR-3mL	Cr2O3 (wt%)	0.107	0.103	-0.004	-3.8%	Yes	0.0077	7.13	0.0049	0.0032	No	16	10
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.108	0.110	0.002	2.2%	No	0.0069	6.40	0.0062	0.0013	No	16	10
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.107	0.107	0.000	0.2%	No	0.0052	4.82	0.0055	0.0065	No	16	10
1	Isolok-LFR-3mL	Cr2O3 (wt%)	0.105	0.103	-0.002	-1.9%	No	0.0050	4.73	0.0034	0.0037	No	15	10
6	Hydragard-LFR	Cr2O3 (wt%)	0.107	0.106	0.000	-0.4%	No	0.0050	4.68	0.0060	0.0044	No	16	10
2	Hydragard - HFR	Cr2O3 (wt%)	0.110	0.111	0.001	1.2%	No	0.0041	3.70	0.0038	0.0024	No	15	10
4	Isolok-HFR-12mL	CuO (wt%)	0.025	0.027	0.002	7.2%	Yes	0.0029	11.69	0.0014	0.0011	No	16	9
3	Isolok-LFR-12mL	CuO (wt%)	0.025	0.026	0.001	4.3%	No	0.0022	8.57	0.0014	0.0011	No	16	10
5	Isolok-HFR-3mL	CuO (wt%)	0.025	0.025	0.000	1.2%	No	0.0015	6.14	0.0014	0.0016	No	16	10
6	Hydragard-LFR	CuO (wt%)	0.025	0.026	0.000	1.3%	No	0.0015	6.02	0.0013	0.0016	No	15	10

Table A10. Phase 1 (Mid-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

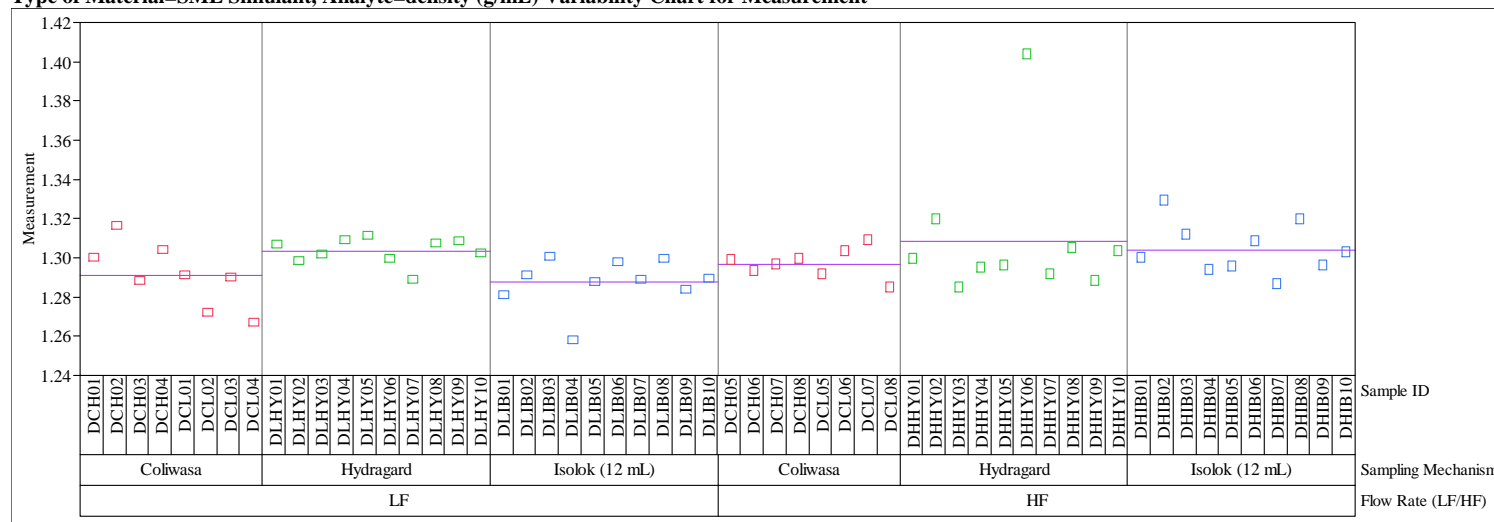
Analytical Block	Sampler	Oxide	Mean (Measured wt%) Coliwasa (low+high)	Mean (Measured wt%) Other Sampler	Difference	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev (Measured wt%) Coliwasa (low+high)	Std Dev (Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	CuO (wt%)	0.025	0.025	0.000	1.3%	No	0.0014	5.58	0.0014	0.0010	No	16	10
2	Hydragard - HFR	CuO (wt%)	0.025	0.025	0.000	0.1%	No	0.0014	5.42	0.0014	0.0019	No	16	10
4	Isolok-HFR-12mL	Fe/Li	2.400	2.367	-0.033	-1.4%	No	0.1518	6.32	0.0760	0.1598	Yes	14	10
5	Isolok-HFR-3mL	Fe/Li	2.407	2.325	-0.082	-3.4%	Yes	0.1359	5.65	0.0729	0.0324	No	14	9
2	Hydragard - HFR	Fe/Li	2.411	2.455	0.044	1.8%	No	0.1223	5.07	0.1017	0.0768	No	15	10
1	Isolok-LFR-3mL	Fe/Li	2.412	2.465	0.053	2.2%	No	0.1171	4.86	0.0734	0.0750	No	14	10
3	Isolok-LFR-12mL	Fe/Li	2.417	2.450	0.034	1.4%	No	0.1053	4.36	0.1017	0.0470	No	15	10
6	Hydragard-LFR	Fe/Li	2.413	2.427	0.014	0.6%	No	0.0930	3.86	0.0797	0.1077	No	14	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	11.214	11.599	0.385	3.4%	Yes	0.7611	6.79	0.4704	0.4200	No	16	10
6	Hydragard-LFR	Fe2O3 (wt%)	11.523	11.844	0.320	2.8%	No	0.6939	6.02	0.4939	0.3626	No	16	10
2	Hydragard - HFR	Fe2O3 (wt%)	11.463	11.732	0.270	2.4%	No	0.5518	4.81	0.3843	0.2465	No	16	10
4	Isolok-HFR-12mL	Fe2O3 (wt%)	11.468	11.365	-0.103	-0.9%	No	0.4822	4.20	0.3692	0.5708	No	16	10
1	Isolok-LFR-3mL	Fe2O3 (wt%)	11.405	11.592	0.188	1.6%	No	0.4594	4.03	0.3770	0.2191	No	16	10
5	Isolok-HFR-3mL	Fe2O3 (wt%)	11.357	11.290	-0.067	-0.6%	No	0.3096	2.73	0.4035	0.1771	Yes	16	9
4	Isolok-HFR-12mL	K2O (wt%)	0.163	0.172	0.009	5.4%	Yes	0.0175	10.76	0.0093	0.0112	No	15	9
3	Isolok-LFR-12mL	K2O (wt%)	0.163	0.170	0.007	4.2%	No	0.0143	8.74	0.0092	0.0074	No	16	9
6	Hydragard-LFR	K2O (wt%)	0.163	0.166	0.003	1.9%	No	0.0112	6.86	0.0092	0.0104	No	16	10
5	Isolok-HFR-3mL	K2O (wt%)	0.163	0.165	0.002	1.2%	No	0.0101	6.16	0.0092	0.0106	No	16	10
1	Isolok-LFR-3mL	K2O (wt%)	0.163	0.165	0.002	1.5%	No	0.0094	5.74	0.0092	0.0068	No	16	10
2	Hydragard - HFR	K2O (wt%)	0.163	0.163	0.001	0.4%	No	0.0092	5.62	0.0088	0.0123	No	16	10
6	Hydragard-LFR	Li2O (wt%)	4.752	4.885	0.133	2.8%	No	0.2725	5.73	0.1587	0.1753	No	15	10
5	Isolok-HFR-3mL	Li2O (wt%)	4.740	4.837	0.096	2.0%	No	0.2704	5.70	0.2398	0.0969	No	16	9
3	Isolok-LFR-12mL	Li2O (wt%)	4.695	4.734	0.040	0.8%	No	0.2057	4.38	0.2169	0.1672	No	16	10
1	Isolok-LFR-3mL	Li2O (wt%)	4.709	4.704	-0.005	-0.1%	No	0.1007	2.14	0.1306	0.0794	No	15	10
2	Hydragard - HFR	Li2O (wt%)	4.777	4.794	0.017	0.4%	No	0.0852	1.78	0.1139	0.0417	Yes	14	10
4	Isolok-HFR-12mL	Li2O (wt%)	4.783	4.777	-0.005	-0.1%	No	0.0830	1.73	0.0932	0.0765	No	14	9
6	Hydragard-LFR	MgO (wt%)	1.042	1.086	0.044	4.2%	Yes	0.0776	7.44	0.0444	0.0280	No	16	9
3	Isolok-LFR-12mL	MgO (wt%)	1.051	1.089	0.038	3.7%	Yes	0.0763	7.26	0.0455	0.0457	No	16	10
4	Isolok-HFR-12mL	MgO (wt%)	1.061	1.051	-0.010	-0.9%	No	0.0455	4.29	0.0346	0.0541	No	16	10
2	Hydragard - HFR	MgO (wt%)	1.074	1.091	0.018	1.7%	No	0.0458	4.27	0.0361	0.0288	No	16	10
1	Isolok-LFR-3mL	MgO (wt%)	1.058	1.075	0.017	1.6%	No	0.0382	3.61	0.0351	0.0162	Yes	16	10
5	Isolok-HFR-3mL	MgO (wt%)	1.043	1.035	-0.008	-0.8%	No	0.0259	2.48	0.0364	0.0142	Yes	16	9
3	Isolok-LFR-12mL	MnO (wt%)	1.748	1.817	0.069	3.9%	Yes	0.1356	7.76	0.0862	0.0697	No	16	10
6	Hydragard-LFR	MnO (wt%)	1.729	1.786	0.057	3.3%	No	0.1215	7.03	0.0854	0.0618	No	16	10
2	Hydragard - HFR	MnO (wt%)	1.785	1.822	0.037	2.1%	No	0.0889	4.98	0.0708	0.0457	No	16	10
1	Isolok-LFR-3mL	MnO (wt%)	1.750	1.786	0.035	2.0%	No	0.0836	4.78	0.0670	0.0385	No	16	10
4	Isolok-HFR-12mL	MnO (wt%)	1.755	1.742	-0.013	-0.8%	No	0.0770	4.39	0.0690	0.0893	No	16	10
5	Isolok-HFR-3mL	MnO (wt%)	1.733	1.720	-0.012	-0.7%	No	0.0521	3.01	0.0708	0.0202	Yes	16	9
5	Isolok-HFR-3mL	Na2O (wt%)	11.141	10.812	-0.329	-3.0%	No	0.6819	6.12	0.3820	0.4867	No	16	10
3	Isolok-LFR-12mL	Na2O (wt%)	11.008	11.251	0.243	2.2%	No	0.6232	5.66	0.4252	0.4690	No	16	9
4	Isolok-HFR-12mL	Na2O (wt%)	11.063	10.748	-0.315	-2.9%	Yes	0.6128	5.54	0.3266	0.4041	No	16	10
6	Hydragard-LFR	Na2O (wt%)	11.343	11.616	0.272	2.4%	No	0.6274	5.53	0.3577	0.5221	No	16	10

Table A10. Phase 1 (Mid-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

Analytical Block	Sampler	Oxide	Mean (Measured wt%) Coliwas	Mean (Measured wt%) Other Sampler	Difference	%Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev (Measured wt%) Coliwas (low+high)	Std Dev (Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Na2O (wt%)	11.249	11.198	-0.051	-0.5%	No	0.4892	4.35	0.3356	0.5824	Yes	16	10
2	Hydragard - HFR	Na2O (wt%)	11.311	11.399	0.088	0.8%	No	0.3822	3.38	0.3543	0.3518	No	16	10
3	Isolok-LFR-12mL	NiO (wt%)	0.451	0.466	0.016	3.5%	No	0.0369	8.18	0.0306	0.0136	No	16	10
6	Hydragard-LFR	NiO (wt%)	0.452	0.464	0.011	2.5%	No	0.0330	7.29	0.0310	0.0138	No	16	10
4	Isolok-HFR-12mL	NiO (wt%)	0.451	0.443	-0.008	-1.7%	No	0.0295	6.55	0.0208	0.0320	No	15	10
2	Hydragard - HFR	NiO (wt%)	0.465	0.478	0.013	2.8%	No	0.0289	6.21	0.0212	0.0145	No	15	10
5	Isolok-HFR-3mL	NiO (wt%)	0.446	0.440	-0.006	-1.3%	No	0.0241	5.41	0.0260	0.0120	No	16	10
1	Isolok-LFR-3mL	NiO (wt%)	0.452	0.459	0.008	1.7%	No	0.0187	4.14	0.0148	0.0097	No	14	10
5	Isolok-HFR-3mL	SiO2 (wt%)	51.210	52.226	1.016	2.0%	No	2.0956	4.09	1.9433	0.4775	Yes	16	8
4	Isolok-HFR-12mL	SiO2 (wt%)	51.370	52.113	0.743	1.4%	No	1.7839	3.47	1.3254	1.1148	No	16	10
6	Hydragard-LFR	SiO2 (wt%)	51.998	52.242	0.243	0.5%	No	1.5168	2.92	1.5942	1.4183	No	16	10
3	Isolok-LFR-12mL	SiO2 (wt%)	51.343	51.750	0.406	0.8%	No	1.3866	2.70	1.2553	0.9955	No	15	10
2	Hydragard - HFR	SiO2 (wt%)	52.052	51.579	-0.473	-0.9%	No	1.3620	2.62	1.2095	0.7776	No	16	10
1	Isolok-LFR-3mL	SiO2 (wt%)	51.731	51.728	-0.003	0.0%	No	0.7290	1.41	1.3262	0.2992	Yes	16	10
3	Isolok-LFR-12mL	Sum (wt%)	98.401	101.037	2.636	2.7%	Yes	4.8331	4.91	2.3685	3.0410	No	16	10
5	Isolok-HFR-3mL	Sum (wt%)	98.710	99.715	1.005	1.0%	No	2.8345	2.87	2.3880	1.5025	No	16	9
6	Hydragard-LFR	Sum (wt%)	100.357	101.618	1.261	1.3%	No	2.7912	2.78	1.7030	1.9700	No	15	10
2	Hydragard - HFR	Sum (wt%)	100.332	100.496	0.164	0.2%	No	0.3991	0.40	0.3112	0.2163	No	15	10
4	Isolok-HFR-12mL	Sum (wt%)	99.249	99.337	0.088	0.1%	No	0.3591	0.36	0.2867	0.3481	No	15	9
1	Isolok-LFR-3mL	Sum (wt%)	99.584	99.660	0.076	0.1%	No	0.3001	0.30	0.2946	0.2124	No	15	10
5	Isolok-HFR-3mL	TiO2 (wt%)	0.082	0.084	0.002	2.0%	No	0.0036	4.40	0.0030	0.0018	Yes	16	10
3	Isolok-LFR-12mL	TiO2 (wt%)	0.082	0.083	0.000	0.4%	No	0.0031	3.71	0.0033	0.0034	No	16	10
2	Hydragard - HFR	TiO2 (wt%)	0.083	0.082	-0.001	-1.0%	No	0.0031	3.71	0.0013	0.0031	Yes	15	10
6	Hydragard-LFR	TiO2 (wt%)	0.080	0.081	0.000	0.3%	No	0.0022	2.69	0.0019	0.0029	No	16	10
1	Isolok-LFR-3mL	TiO2 (wt%)	0.082	0.082	0.000	-0.6%	No	0.0021	2.55	0.0027	0.0013	Yes	16	10
4	Isolok-HFR-12mL	TiO2 (wt%)	0.083	0.083	0.000	0.0%	No	0.0014	1.69	0.0019	0.0012	No	16	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.100	0.105	0.005	4.8%	Yes	0.0084	8.40	0.0047	0.0035	No	16	10
6	Hydragard-LFR	ZnO (wt%)	0.101	0.105	0.003	3.3%	No	0.0071	7.00	0.0050	0.0037	No	16	10
2	Hydragard - HFR	ZnO (wt%)	0.103	0.105	0.003	2.7%	Yes	0.0055	5.32	0.0038	0.0019	No	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.101	0.102	0.001	0.8%	No	0.0035	3.44	0.0037	0.0020	No	16	10
4	Isolok-HFR-12mL	ZnO (wt%)	0.101	0.101	0.000	0.1%	No	0.0033	3.31	0.0036	0.0043	No	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.100	0.100	-0.001	-0.6%	No	0.0029	2.86	0.0038	0.0016	Yes	16	8
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.364	0.372	0.008	2.3%	No	0.0167	4.60	0.0097	0.0108	No	16	10
6	Hydragard-LFR	ZrO2 (wt%)	0.362	0.369	0.007	2.0%	No	0.0154	4.26	0.0107	0.0089	No	16	10
2	Hydragard - HFR	ZrO2 (wt%)	0.369	0.375	0.006	1.7%	Yes	0.0109	2.96	0.0055	0.0049	No	15	10
5	Isolok-HFR-3mL	ZrO2 (wt%)	0.360	0.361	0.001	0.2%	No	0.0090	2.49	0.0094	0.0106	No	16	10
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.365	0.362	-0.003	-0.7%	No	0.0082	2.25	0.0052	0.0085	No	16	10
1	Isolok-LFR-3mL	ZrO2 (wt%)	0.371	0.374	0.002	0.7%	No	0.0075	2.03	0.0056	0.0069	No	16	10

Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=density (g/mL) Variability Chart for Measurement



Type of Material=SME Simulant, Analyte=wt% dried solids Variability Chart for Measurement

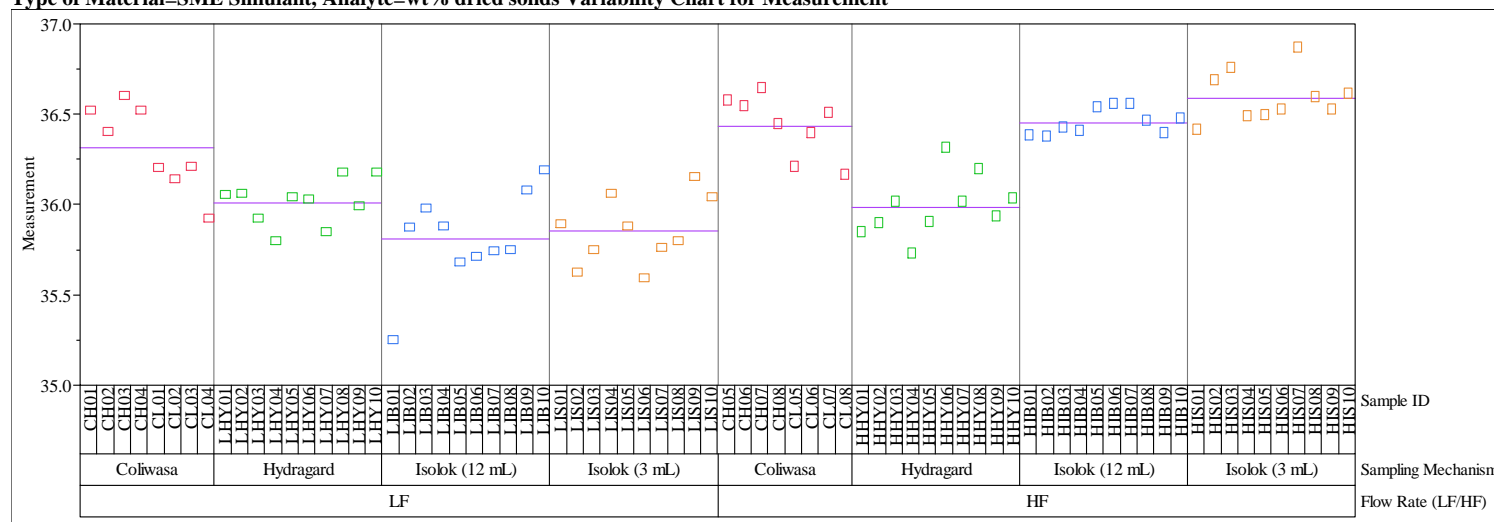
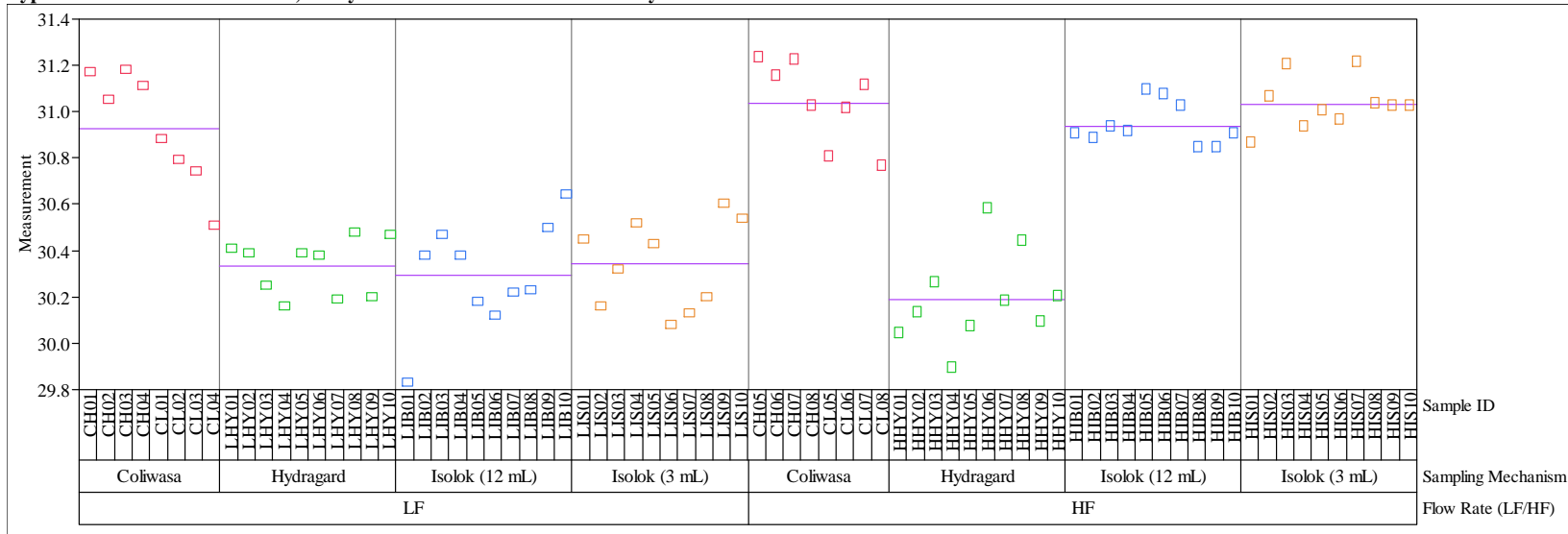


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=wt% vitrified solids Variability Chart for Measurement



Type of Material=SME Simulant, Analyte=Al/B

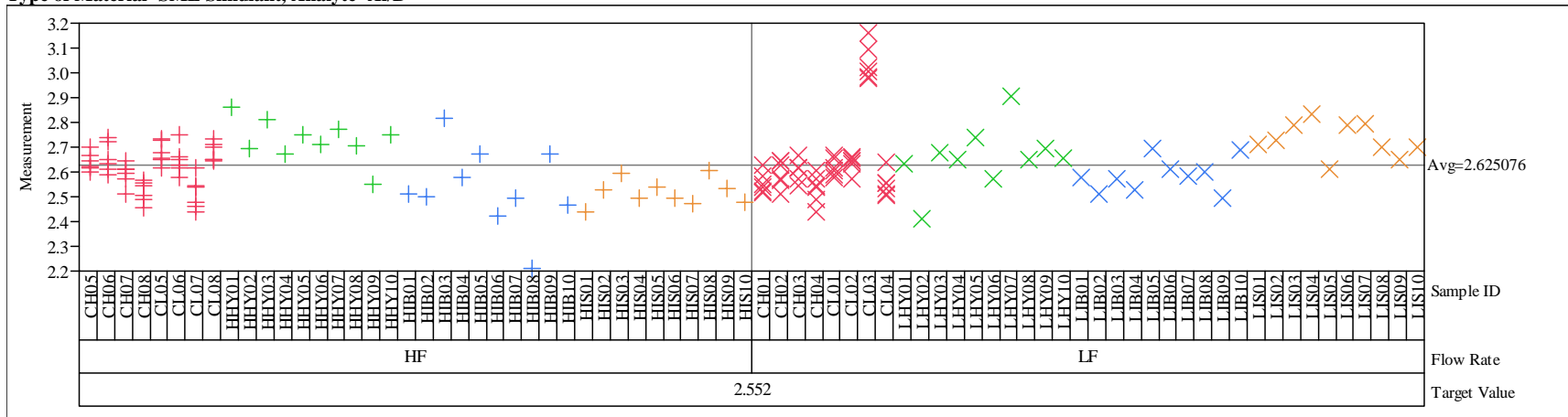
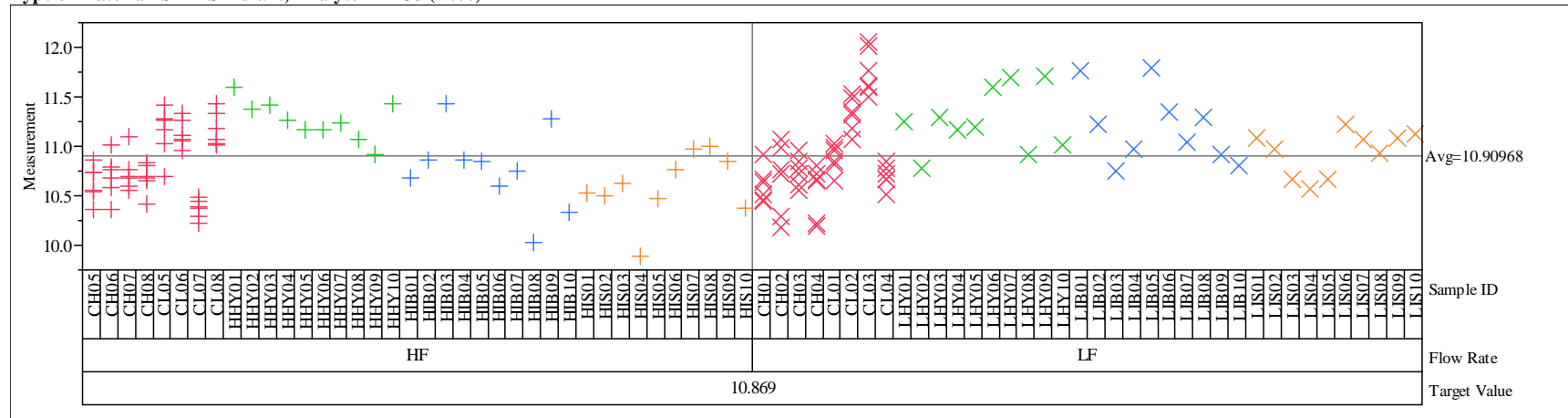


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=Al2O3 (wt%)



Type of Material=SME Simulant, Analyte=B2O3 (wt%)

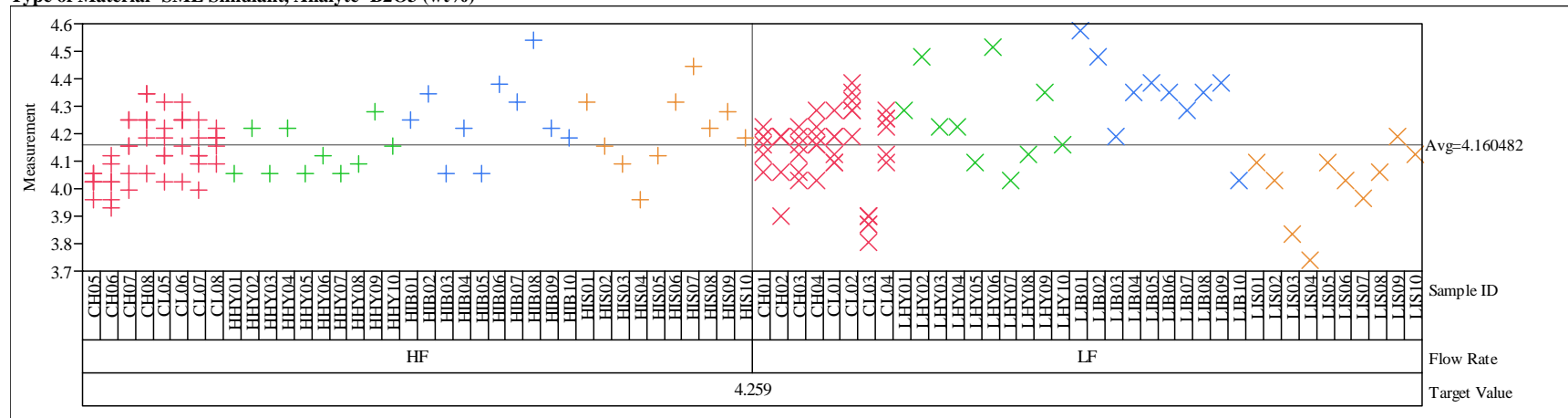
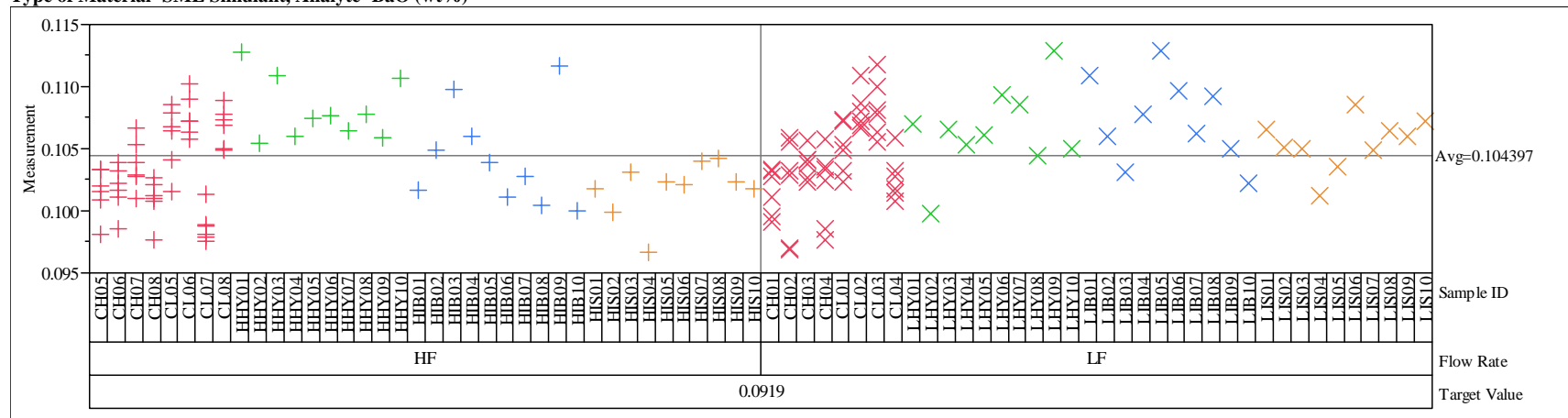


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=BaO (wt%)



Type of Material=SME Simulant, Analyte=CaO (wt%)

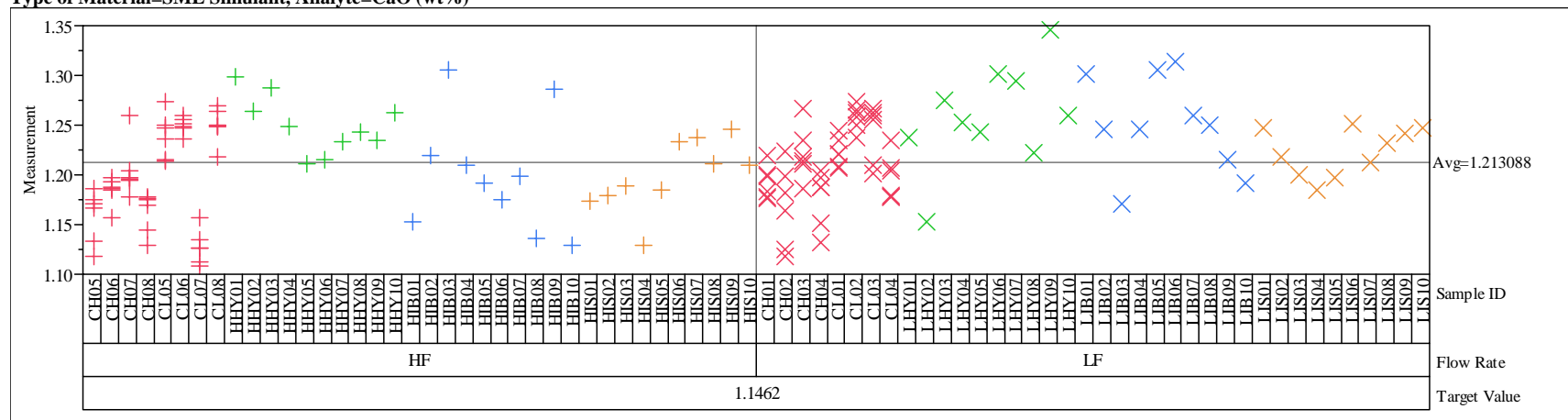
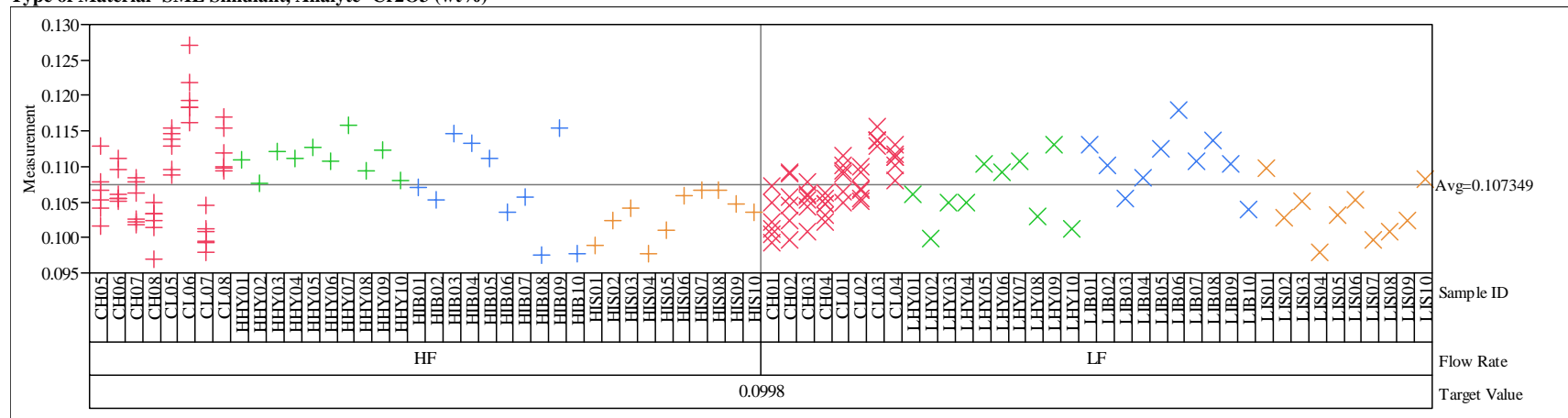


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=Cr2O3 (wt%)



Type of Material=SME Simulant, Analyte=CuO (wt%)

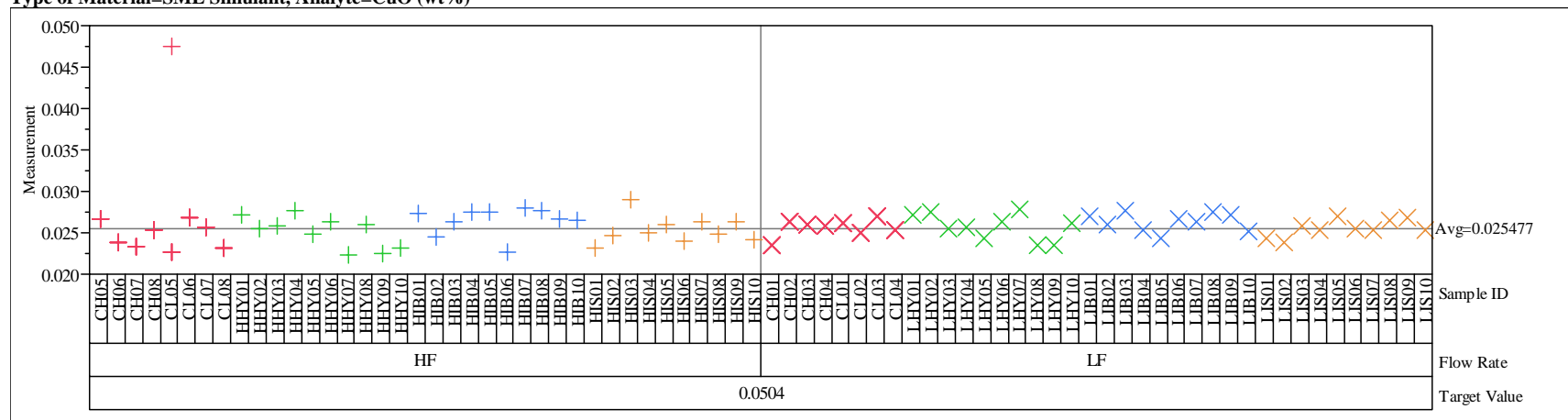
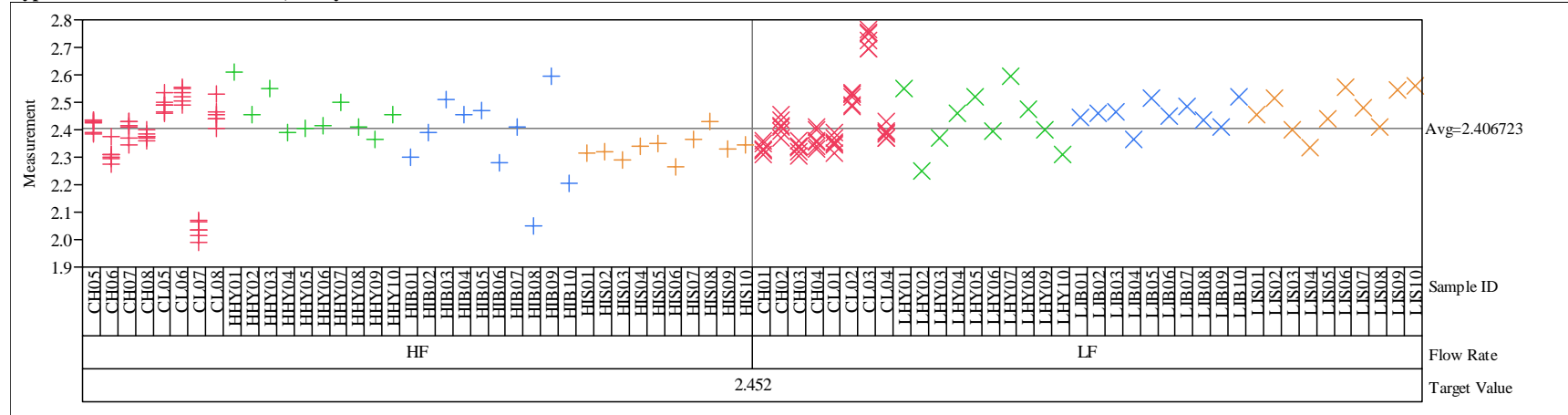


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=Fe/Li



Type of Material=SME Simulant, Analyte=Fe2O3 (wt%)

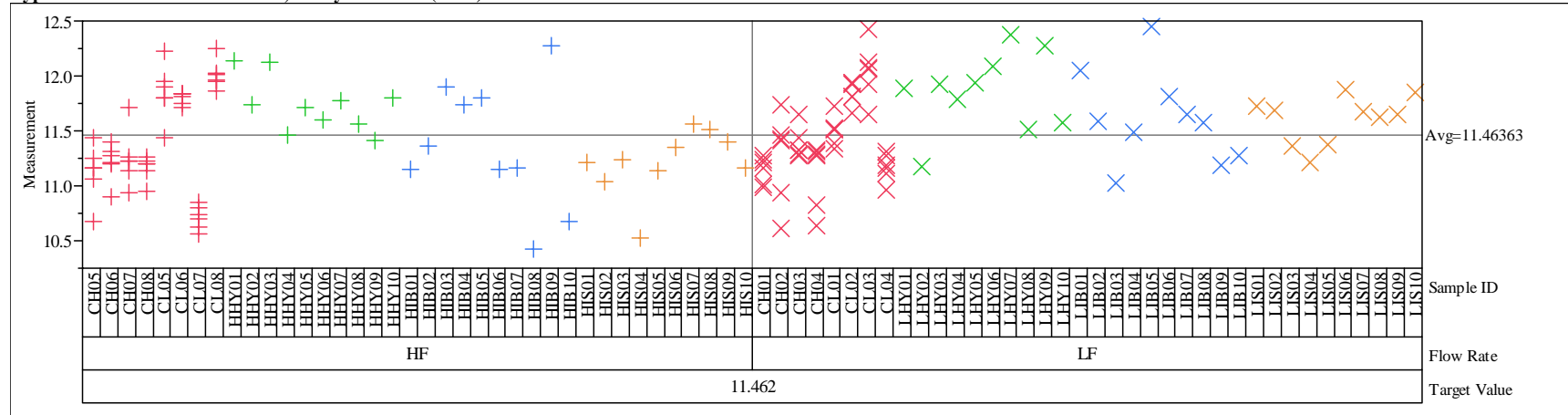
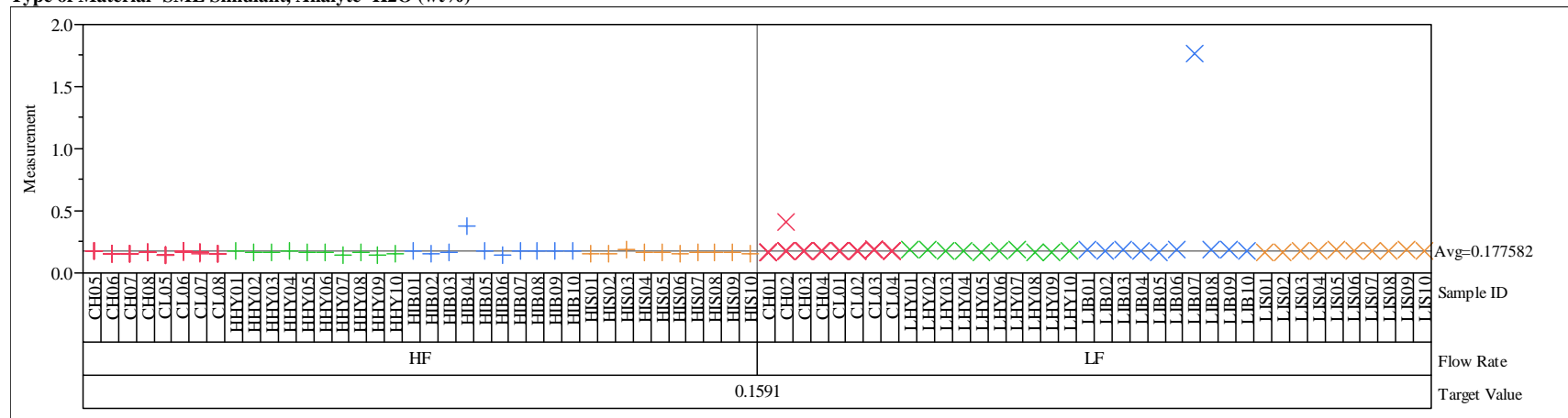


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=K₂O (wt%)



Type of Material=SME Simulant, Analyte=Li₂O (wt%)

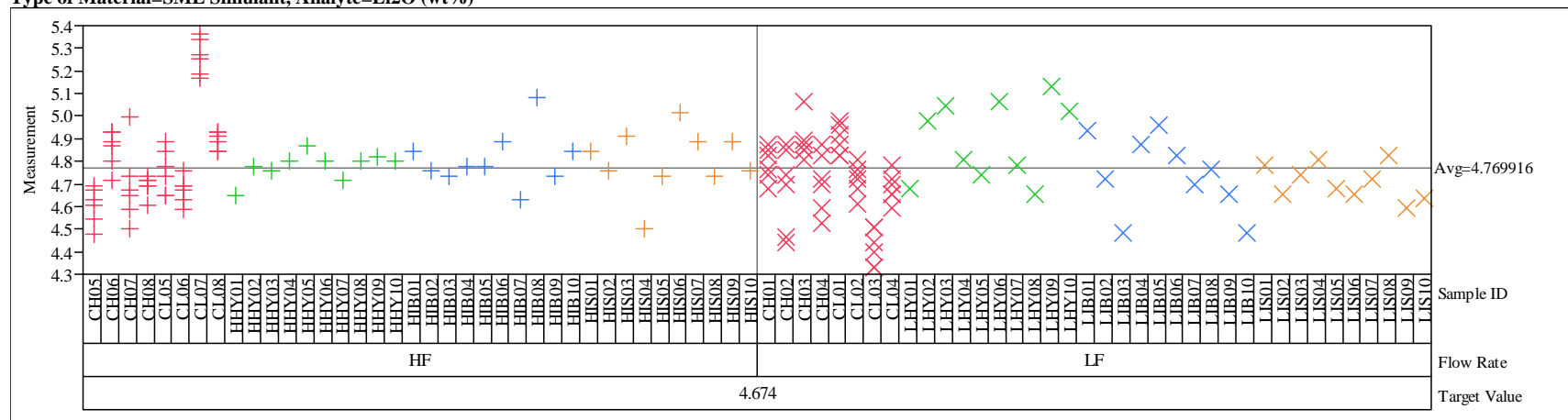
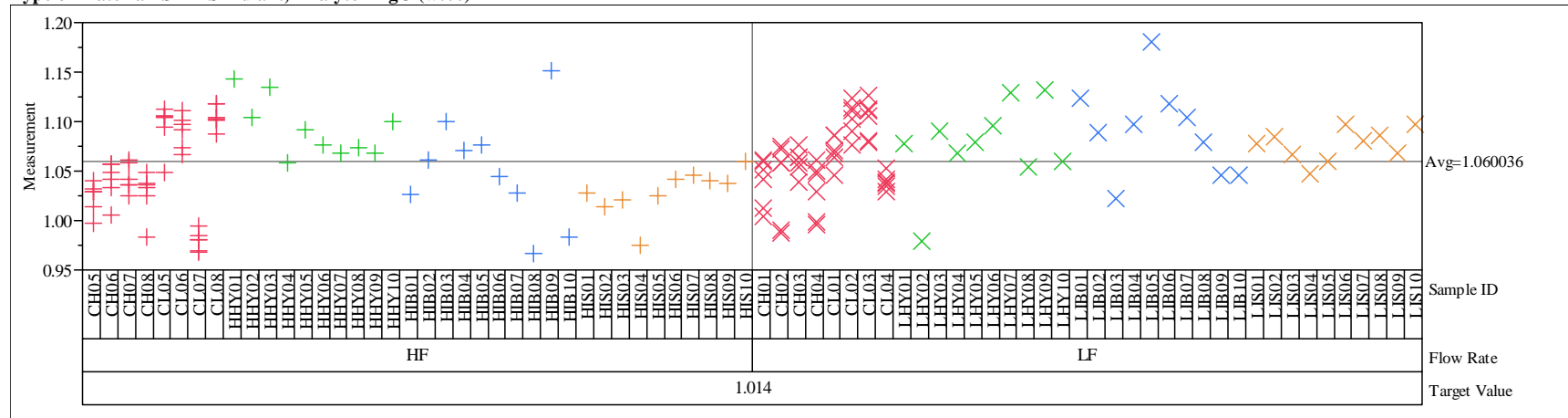


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=MgO (wt%)



Type of Material=SME Simulant, Analyte=MnO (wt%)

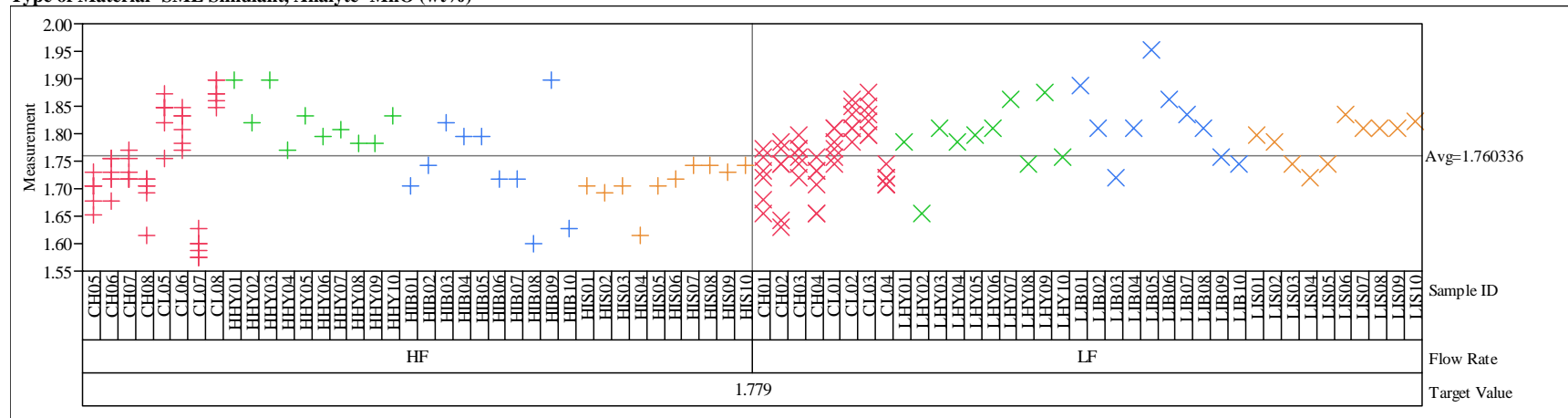
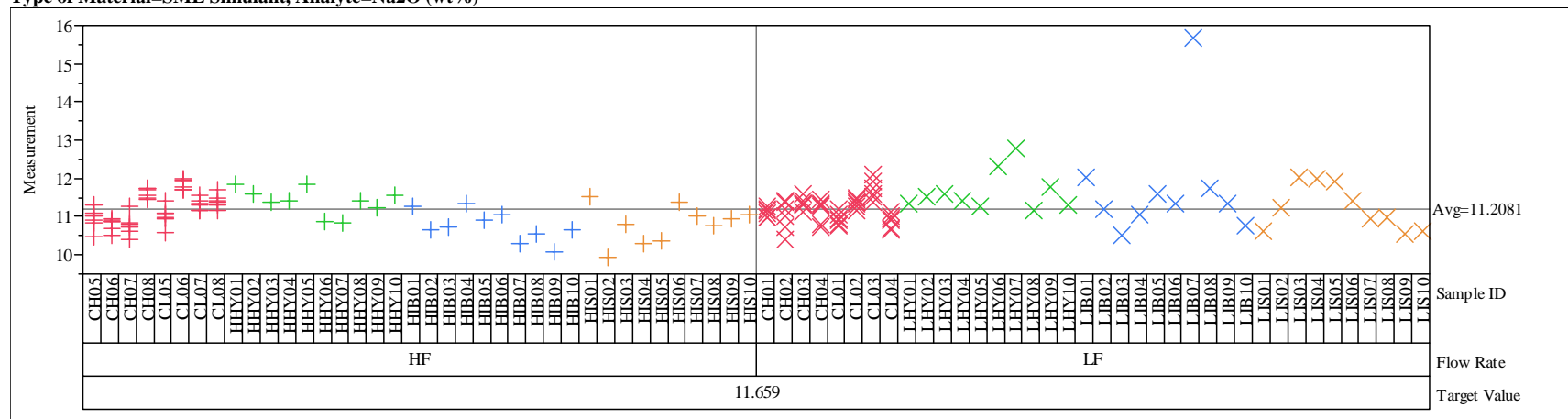


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=Na2O (wt%)



Type of Material=SME Simulant, Analyte=NiO (wt%)

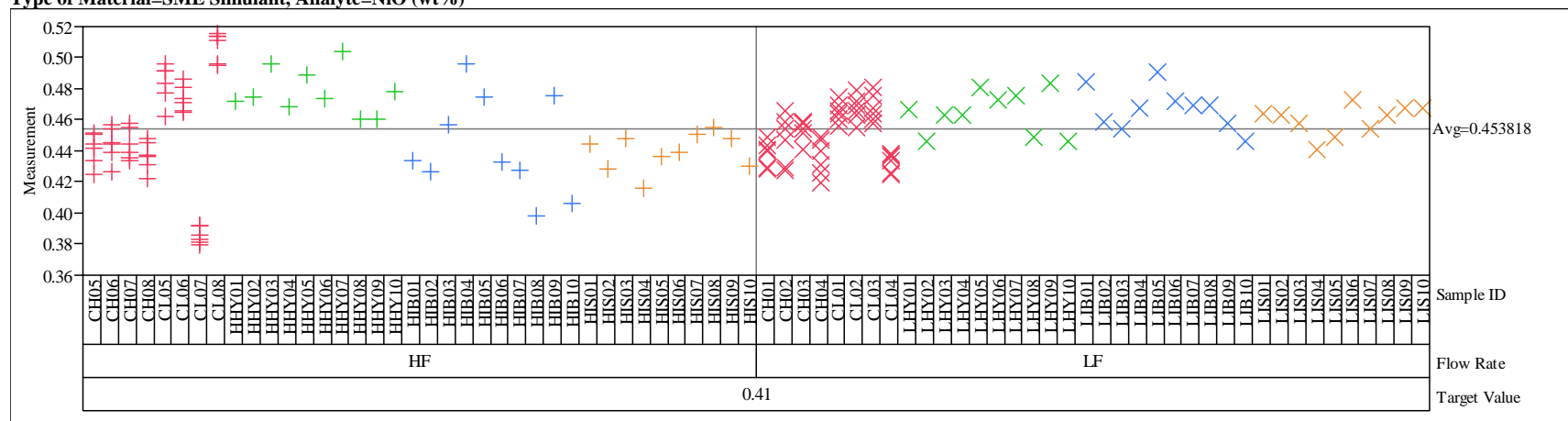
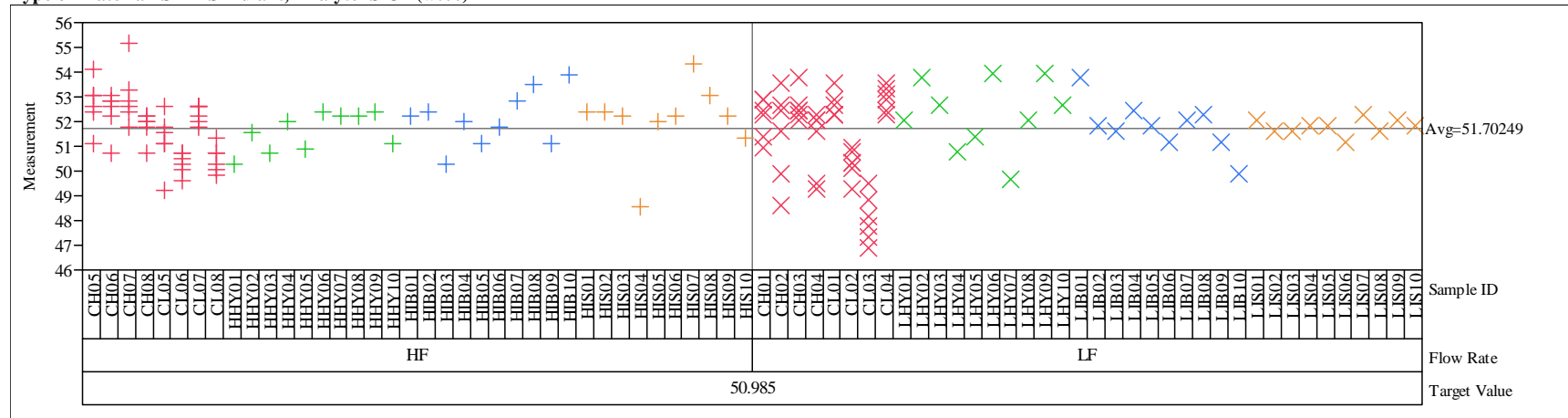


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=SiO2 (wt%)



Type of Material=SME Simulant, Analyte=Sum of Oxides (wt%)

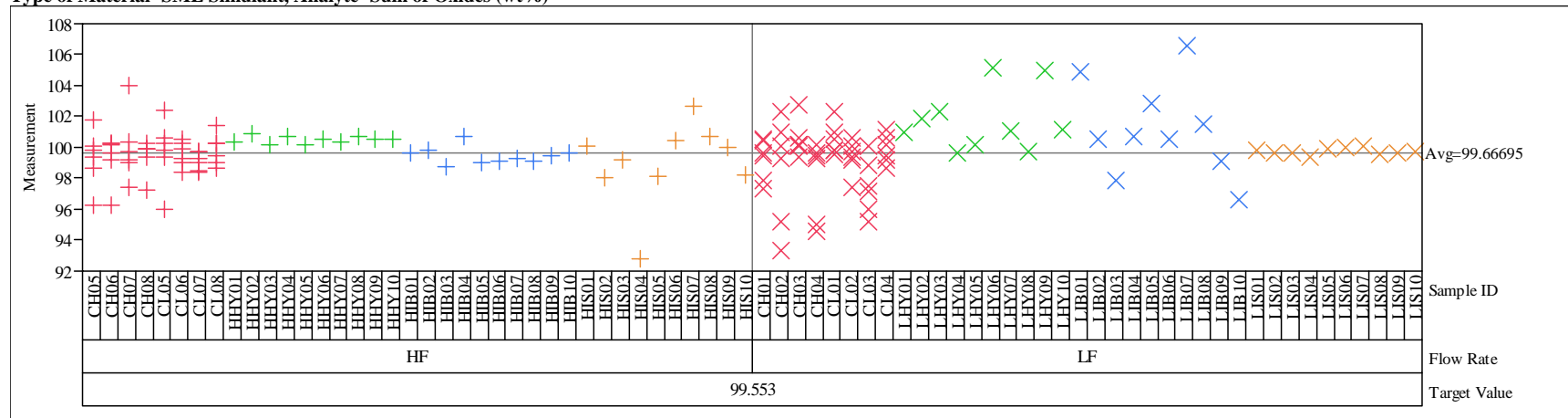
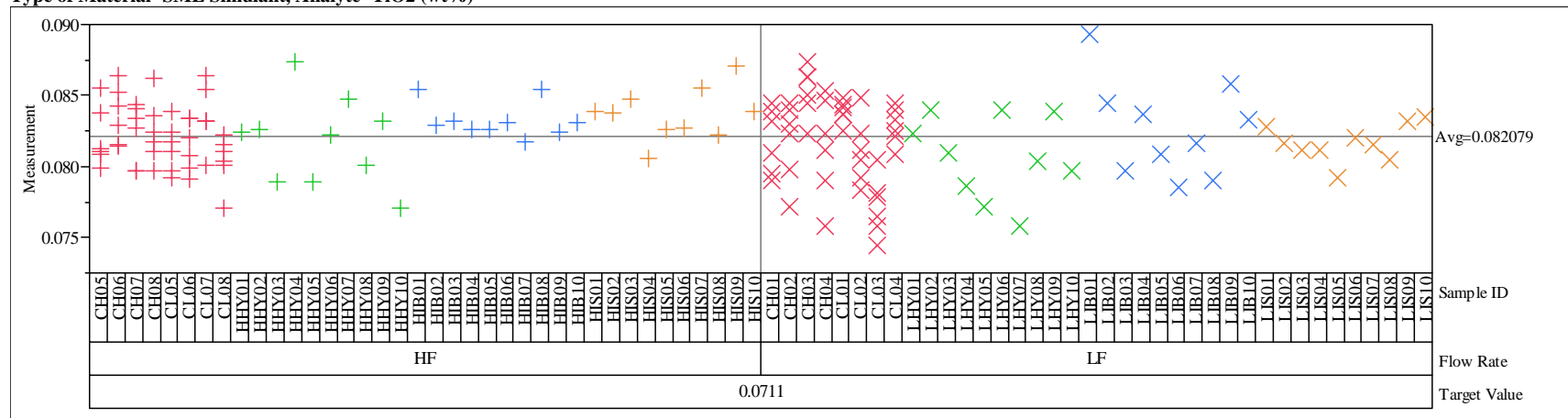


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=TiO2 (wt%)



Type of Material=SME Simulant, Analyte=ZnO (wt%)

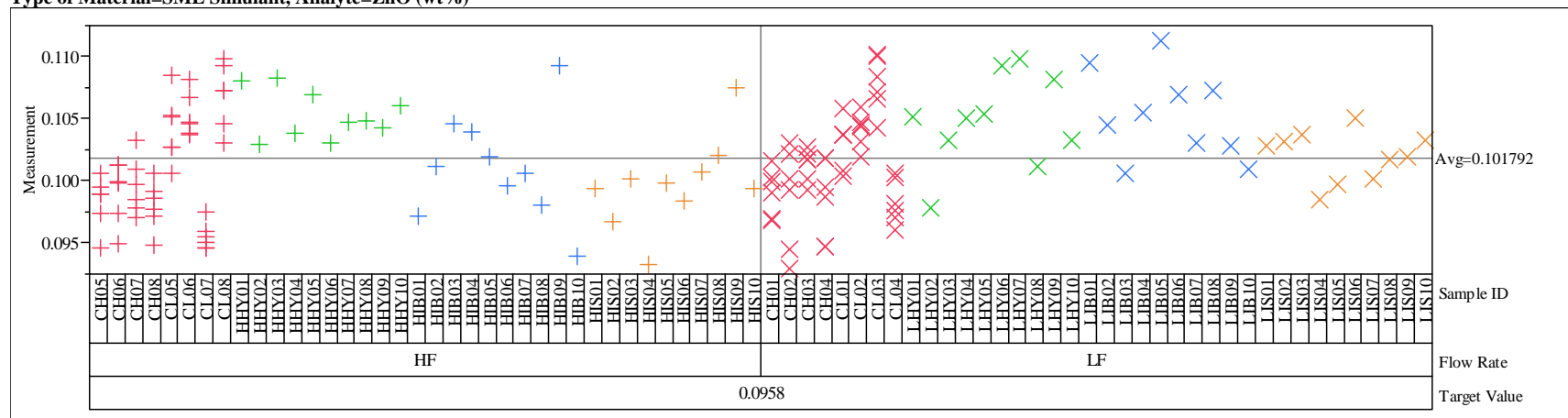


Exhibit A1. Density, Solids, and Oxide Concentration Measurements for the Mid-Rheology (Phase 1) Testing

Type of Material=SME Simulant, Analyte=ZrO2 (wt%)

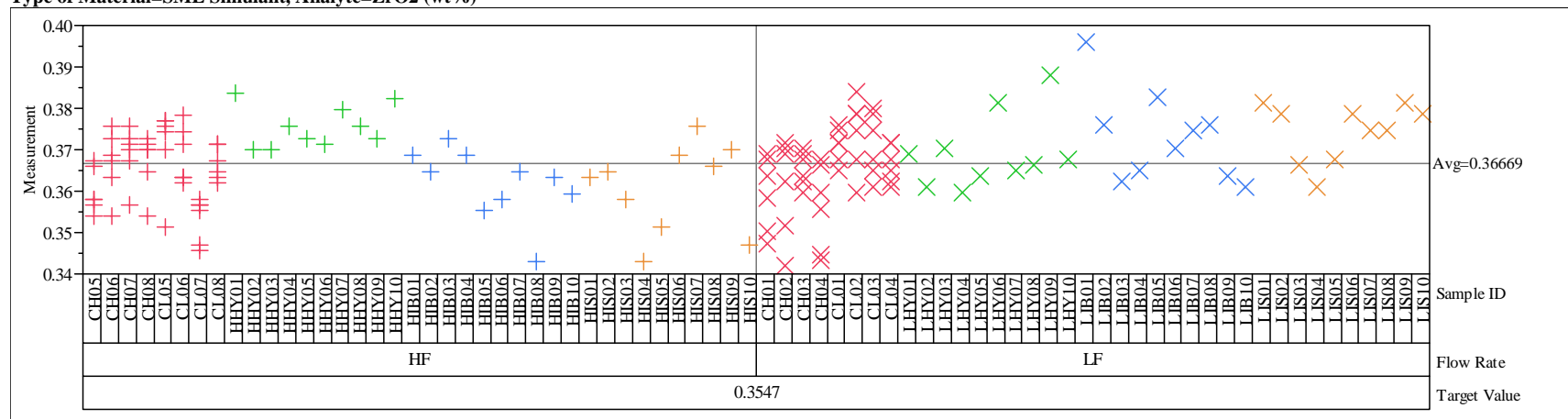
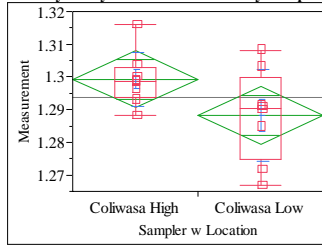


Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler w Location Analyte=density (g/mL)



**Oneway Anova
Summary of Fit**

Rsquare	0.208919
Adj Rsquare	0.152413
Root Mean Square Error	0.011489
Mean of Response	1.293742
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	-0.01105	t Ratio	-1.92284
Std Err Dif	0.00574	DF	14
Upper CL Dif	0.00127	Prob > t	0.0751
Lower CL Dif	-0.02337	Prob > t	0.9625
Confidence	0.95	Prob < t	0.0375

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.00048803	0.000488	3.6973	0.0751
Error	14	0.00184794	0.000132		
C. Total	15	0.00233597			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	1.29927	0.00406	1.2906	1.3080
Coliwasa Low	8	1.28822	0.00406	1.2795	1.2969

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	1.29927	0.008242	0.00291	1.2924	1.3062
Coliwasa Low	8	1.28822	0.014002	0.00495	1.2765	1.2999

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	-0.01105	t Ratio	-1.92284
Std Err Dif	0.00574	DF	11.33094
Upper CL Dif	0.00155	Prob > t	0.0800
Lower CL Dif	-0.02364	Prob > t	0.9600
Confidence	0.95	Prob < t	0.0400

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.0082421	0.0055373	0.0054055
Coliwasa Low	8	0.0140021	0.0104259	0.0099916

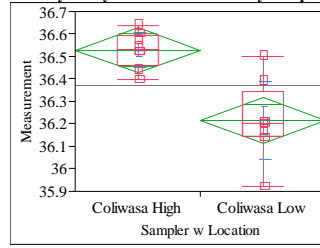
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8785	1	14	0.1921
Brown-Forsythe	1.3710	1	14	0.2612
Levene	1.8257	1	14	0.1981
Bartlett	1.7549	1	.	0.1853
F Test 2-sided	2.8861	7	7	0.1854

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	3.6973	DFNum	1	DFDen	11.331	Prob > F	0.0800
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t Test
1.9228

Oneway Analysis of Measurement By Sampler w Location Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.609866
Adj Rsquare	0.581999
Root Mean Square Error	0.134134
Mean of Response	36.37188
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	-0.31375	t Ratio	-4.67815
Std Err Dif	0.06707	DF	14
Upper CL Dif	-0.16991	Prob > t	0.0004
Lower CL Dif	-0.45759	Prob > t	0.9998
Confidence	0.95	Prob < t	0.0002

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.39375625	0.393756	21.8851	0.0004
Error	14	0.25188750	0.017992		
C. Total	15	0.64564375			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	36.5288	0.04742	36.427	36.630
Coliwasa Low	8	36.2150	0.04742	36.113	36.317

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	36.5288	0.079181	0.02799	36.463	36.595
Coliwasa Low	8	36.2150	0.172378	0.06094	36.071	36.359

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	-0.31375	t Ratio	-4.67815
Std Err Dif	0.06707	DF	9.828061
Upper CL Dif	-0.16396	Prob > t	0.0009
Lower CL Dif	-0.46354	Prob > t	0.9995
Confidence	0.95	Prob < t	0.0005

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.0791811	0.0587500	0.0587500
Coliwasa Low	8	0.1723783	0.1150000	0.1100000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.0041	1	14	0.1787
Brown-Forsythe	1.1377	1	14	0.3042
Levene	1.4956	1	14	0.2415
Bartlett	3.6097	1	.	0.0574
F Test 2-sided	4.7394	7	7	0.0573

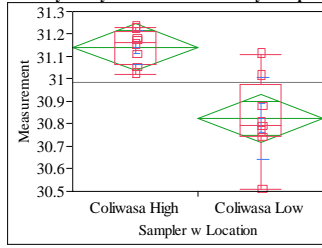
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	21.8851	DFNum	1	DFDen	9.8281	Prob > F	0.0009
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t Test
4.6782

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler w Location Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.595726
Adj Rsquare	0.56685
Root Mean Square Error	0.139255
Mean of Response	30.98313
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	-0.31625	t Ratio	-4.54203
Std Err Dif	0.06963	DF	14
Upper CL Dif	-0.16691	Prob > t	0.0005
Lower CL Dif	-0.46559	Prob > t	0.9998
Confidence	0.95	Prob < t	0.0002

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.40005625	0.400056	20.6300	0.0005
Error	14	0.27148750	0.019392		
C. Total	15	0.67154375			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	31.1413	0.04923	31.036	31.247
Coliwasa Low	8	30.8250	0.04923	30.719	30.931

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	31.1413	0.076052	0.02689	31.078	31.205
Coliwasa Low	8	30.8250	0.181659	0.06423	30.673	30.977

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	-0.31625	t Ratio	-4.54203
Std Err Dif	0.06963	DF	9.380655
Upper CL Dif	-0.15971	Prob > t	0.0013
Lower CL Dif	-0.47279	Prob > t	0.9994
Confidence	0.95	Prob < t	0.0006

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.0760521	0.0609375	0.0587500
Coliwasa Low	8	0.1816590	0.1312500	0.1250000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4139	1	14	0.1426
Brown-Forsythe	1.9070	1	14	0.1889
Levene	2.6629	1	14	0.1250
Bartlett	4.4304	1	.	0.0353
F Test 2-sided	5.7055	7	7	0.0351

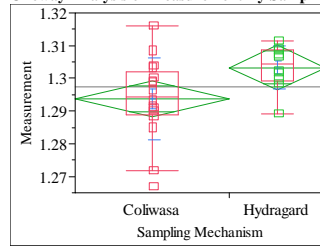
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
20.6300	1	9.3807	0.0013

t Test

4.5420

Hydragard - Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.17193
Adj Rsquare	0.137427
Root Mean Square Error	0.010669
Mean of Response	1.297435
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.009600	t Ratio	2.232274
Std Err Dif	0.004301	DF	24
Upper CL Dif	0.018477	Prob > t	0.0352
Lower CL Dif	0.000724	Prob > t	0.0176
Confidence	0.95	Prob < t	0.9824

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00056718	0.000567	4.9830	0.0352
Error	24	0.00273171	0.000114		
C. Total	25	0.00329888			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.00267	1.2882	1.2992
Hydragard	10	1.30334	0.00337	1.2964	1.3103

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.012479	0.00312	1.2871	1.3004
Hydragard	10	1.30334	0.006631	0.00210	1.2986	1.3081

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.009600	t Ratio	2.553936
Std Err Dif	0.003759	DF	23.59007
Upper CL Dif	0.017366	Prob > t	0.0175
Lower CL Dif	0.001835	Prob > t	0.0088
Confidence	0.95	Prob < t	0.9912

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0124792	0.0092521	0.0092521
Hydragard	10	0.0066311	0.0051731	0.0051731

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9470	1	24	0.1757
Brown-Forsythe	2.2067	1	24	0.1504
Levene	2.2451	1	24	0.1471
Bartlett	3.6899	1	.	0.0547
F Test 2-sided	3.5417	15	9	0.0609

Welch Anova testing Means Equal, allowing Std Devs Not Equal

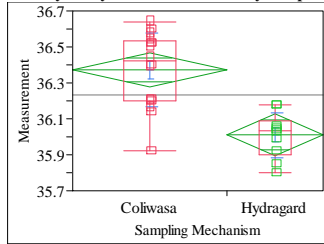
F Ratio	DFNum	DFDen	Prob > F
6.5226	1	23.59	0.0175

t Test

2.5539

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Hydragard – Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.505909
Adj Rsquare	0.485322
Root Mean Square Error	0.18109
Mean of Response	36.23269
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.36188	t Ratio	-4.95722
Std Err Dif	0.07300	DF	24
Upper CL Dif	-0.21121	Prob > t	<.0001
Lower CL Dif	-0.51254	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.8058678	0.805868	24.5740	<.0001
Error	24	0.7870437	0.032793		
C. Total	25	1.5929115			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.04527	36.278	36.465
Hydragard	10	36.0100	0.05727	35.892	36.128

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.207468	0.05187	36.261	36.482
Hydragard	10	36.0100	0.125344	0.03964	35.920	36.100

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.36188	t Ratio	-5.54355
Std Err Dif	0.06528	DF	23.99593
Upper CL Dif	-0.22715	Prob > t	<.0001
Lower CL Dif	-0.49660	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2074679	0.1751562	0.1693750
Hydragard	10	0.1253440	0.0960000	0.0920000

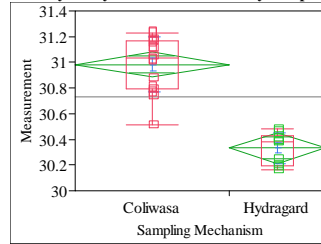
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4347	1	24	0.1318
Brown-Forsythe	3.0841	1	24	0.0918
Levene	4.5361	1	24	0.0436
Bartlett	2.4329	1	.	0.1188
F Test 2-sided	2.7396	15	9	0.1305

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
30.7309	1	23.996	<.0001

t Test
5.5435

Hydragard – Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.76499
Adj Rsquare	0.755198
Root Mean Square Error	0.182746
Mean of Response	30.73269
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.65113	t Ratio	-8.83874
Std Err Dif	0.07367	DF	24
Upper CL Dif	-0.49908	Prob > t	<.0001
Lower CL Dif	-0.80317	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	2.6090078	2.60901	78.1234	<.0001
Error	24	0.8015037	0.03340		
C. Total	25	3.4105115			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.04569	30.889	31.077
Hydragard	10	30.3320	0.05779	30.213	30.451

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.211588	0.05290	30.870	31.096
Hydragard	10	30.3320	0.120167	0.03800	30.246	30.418

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.65113	t Ratio	-9.9971
Std Err Dif	0.06513	DF	23.87802
Upper CL Dif	-0.51666	Prob > t	<.0001
Lower CL Dif	-0.78559	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2115882	0.1773437	0.1693750
Hydragard	10	0.1201666	0.1056000	0.0960000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.6258	1	24	0.1182
Brown-Forsythe	2.4734	1	24	0.1289
Levene	4.0701	1	24	0.0550
Bartlett	3.0128	1	.	0.0826
F Test 2-sided	3.1004	15	9	0.0913

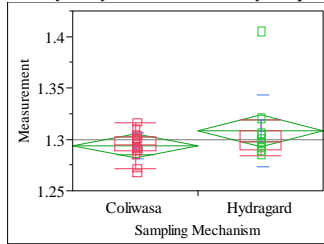
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
99.9420	1	23.878	<.0001

t Test
9.9971

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Hydragard – High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.087973
Adj Rsquare	0.049971
Root Mean Square Error	0.023504
Mean of Response	1.299287
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.01442	t Ratio	1.521512
Std Err Dif	0.00947	DF	24
Upper CL Dif	0.03397	Prob > t	0.1412
Lower CL Dif	-0.00514	Prob > t	0.0706
Confidence	0.95	Prob < t	0.9294

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00127890	0.001279	2.3150	0.1412
Error	24	0.01325862	0.000552		
C. Total	25	0.01453752			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.00588	1.2816	1.3059
Hydragard	10	1.30816	0.00743	1.2928	1.3235

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.012479	0.00312	1.2871	1.3004
Hydragard	10	1.30816	0.034837	0.01102	1.2832	1.3331

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.01442	t Ratio	1.259073
Std Err Dif	0.01145	DF	10.4611
Upper CL Dif	0.03978	Prob > t	0.2354
Lower CL Dif	-0.01094	Prob > t	0.1177
Confidence	0.95	Prob < t	0.8823

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0124792	0.0092521	0.0092521
Hydragard	10	0.0348372	0.0211733	0.0176025

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6653	1	24	0.2092
Brown-Forsythe	1.0291	1	24	0.3205
Levene	2.8342	1	24	0.1052
Bartlett	11.3932	1	.	0.0007
F Test 2-sided	7.7931	9	15	0.0006

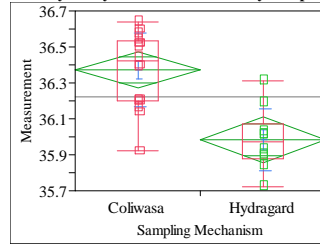
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.5853	1	10.461	0.2354

t Test

1.2591

Hydragard – High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.506409
Adj Rsquare	0.485842
Root Mean Square Error	0.194407
Mean of Response	36.22231
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.38887	t Ratio	-4.96218
Std Err Dif	0.07837	DF	24
Upper CL Dif	-0.22713	Prob > t	<.0001
Lower CL Dif	-0.55062	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.9306078	0.930608	24.6232	<.0001
Error	24	0.9070538	0.037794		
C. Total	25	1.8376615			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.04860	36.272	36.472
Hydragard	10	35.9830	0.06148	35.856	36.110

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.207468	0.05187	36.261	36.482
Hydragard	10	35.9830	0.170428	0.05389	35.861	36.105

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.38887	t Ratio	-5.199
Std Err Dif	0.07480	DF	22.04528
Upper CL Dif	-0.23377	Prob > t	<.0001
Lower CL Dif	-0.54398	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2074679	0.1751562	0.1693750
Hydragard	10	0.1704276	0.1270000	0.1270000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4950	1	24	0.4885
Brown-Forsythe	0.8147	1	24	0.3757
Levene	1.3437	1	24	0.2578
Bartlett	0.4006	1	.	0.5268
F Test 2-sided	1.4819	15	9	0.5597

Welch Anova testing Means Equal, allowing Std Devs Not Equal

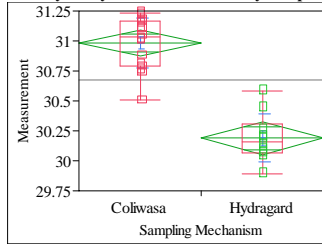
F Ratio	DFNum	DFDen	Prob > F
27.0296	1	22.045	<.0001

t Test

5.1990

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Hydragard – High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.790403
Adj Rsquare	0.781669
Root Mean Square Error	0.207335
Mean of Response	30.67731
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.79513	t Ratio	-9.51342
Std Err Dif	0.08358	DF	24
Upper CL Dif	-0.62263	Prob > t	<.0001
Lower CL Dif	-0.96762	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	3.8906078	3.89061	90.5052	<.0001
Error	24	1.0317037	0.04299		
C. Total	25	4.9223115			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.05183	30.876	31.090
Hydragard	10	30.1880	0.06556	30.053	30.323

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.211588	0.05290	30.870	31.096
Hydragard	10	30.1880	0.200044	0.06326	30.045	30.331

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.79513	t Ratio	-9.64239
Std Err Dif	0.08246	DF	20.09213
Upper CL Dif	-0.62316	Prob > t	<.0001
Lower CL Dif	-0.96709	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2115882	0.1773437	0.1693750
Hydragard	10	0.2000444	0.1456000	0.1440000

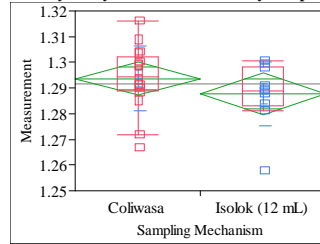
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0401	1	24	0.8429
Brown-Forsythe	0.2268	1	24	0.6382
Levene	0.4702	1	24	0.4995
Bartlett	0.0335	1	.	0.8547
F Test 2-sided	1.1187	15	9	0.8942

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
92.9758	1	20.092	<.0001

t Test
9.6424

Isolok 12 mL – Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.056841
Adj Rsquare	0.017543
Root Mean Square Error	0.01242
Mean of Response	1.291426
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	-0.00602	t Ratio	-1.20266
Std Err Dif	0.00501	DF	24
Upper CL Dif	0.00431	Prob > t	0.2408
Lower CL Dif	-0.01635	Prob > t	0.8796
Confidence	0.95	Prob < t	0.1204

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00022312	0.000223	1.4464	0.2408
Error	24	0.00370215	0.000154		
C. Total	25	0.00392527			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.00310	1.2873	1.3002
Isolok (12 mL)	10	1.28772	0.00393	1.2796	1.2958

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.012479	0.00312	1.2871	1.3004
Isolok (12 mL)	10	1.28772	0.012321	0.00390	1.2789	1.2965

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	-0.00602	t Ratio	-1.20637
Std Err Dif	0.00499	DF	19.44501
Upper CL Dif	0.00441	Prob > t	0.2421
Lower CL Dif	-0.01645	Prob > t	0.8789
Confidence	0.95	Prob < t	0.1211

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0124792	0.0092521	0.0092521
Isolok (12 mL)	10	0.0123206	0.0080711	0.0078740

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0013	1	24	0.9720
Brown-Forsythe	0.1616	1	24	0.6913
Levene	0.1225	1	24	0.7294
Bartlett	0.0018	1	.	0.9666
F Test 2-sided	1.0259	15	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

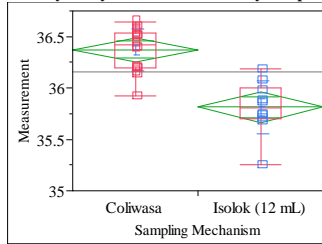
F Ratio	DFNum	DFDen	Prob > F
1.4553	1	19.445	0.2421

t Test
1.2064

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Isolok 12 mL – Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.606082
Adj Rsquare	0.589669
Root Mean Square Error	0.22815
Mean of Response	36.15692
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	-0.55888	t Ratio	-6.07671
Std Err Dif	0.09197	DF	24
Upper CL Dif	-0.36906	Prob > t	<.0001
Lower CL Dif	-0.74869	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.9221001	1.92210	36.9264	<.0001
Error	24	1.2492538	0.05205		
C. Total	25	3.1713538			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.05704	36.254	36.490
Isolok (12 mL)	10	35.8130	0.07215	35.664	35.962

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.207468	0.05187	36.261	36.482
Isolok (12 mL)	10	35.8130	0.258974	0.08189	35.628	35.998

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	-0.55888	t Ratio	-5.76529
Std Err Dif	0.09694	DF	16.11264
Upper CL Dif	-0.35349	Prob > t	<.0001
Lower CL Dif	-0.76426	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2074679	0.1751562	0.1693750
Isolok (12 mL)	10	0.2589745	0.1870000	0.1870000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5065	1	24	0.4835
Brown-Forsythe	0.0960	1	24	0.7593
Levene	0.0507	1	24	0.8238
Bartlett	0.5449	1	.	0.4604
F Test 2-sided	1.5582	9	15	0.4301

Welch Anova testing Means Equal, allowing Std Devs Not Equal

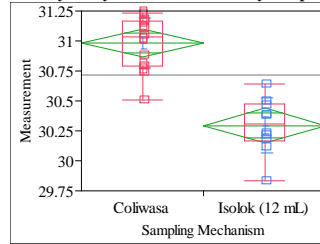
F Ratio	DFNum	DFDen	Prob > F
33.2385	1	16.113	<.0001

t Test

5.7653

Isolok 12 mL – Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.717449
Adj Rsquare	0.705676
Root Mean Square Error	0.21867
Mean of Response	30.71846
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	-0.68813	t Ratio	-7.80642
Std Err Dif	0.08815	DF	24
Upper CL Dif	-0.50620	Prob > t	<.0001
Lower CL Dif	-0.87005	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	2.9139447	2.91394	60.9403	<.0001
Error	24	1.1475937	0.04782		
C. Total	25	4.0615385			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.05467	30.870	31.096
Isolok (12 mL)	10	30.2950	0.06915	30.152	30.438

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.211588	0.05290	30.870	31.096
Isolok (12 mL)	10	30.2950	0.229988	0.07273	30.130	30.460

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	-0.68813	t Ratio	-7.65172
Std Err Dif	0.08993	DF	18.01561
Upper CL Dif	-0.49920	Prob > t	<.0001
Lower CL Dif	-0.87705	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2115882	0.1773437	0.1693750
Isolok (12 mL)	10	0.2299879	0.1790000	0.1790000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0891	1	24	0.7679
Brown-Forsythe	0.0332	1	24	0.8570
Levene	0.0013	1	24	0.9721
Bartlett	0.0758	1	.	0.7831
F Test 2-sided	1.1815	9	15	0.7446

Welch Anova testing Means Equal, allowing Std Devs Not Equal

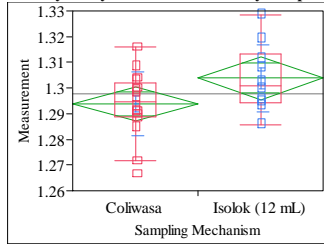
F Ratio	DFNum	DFDen	Prob > F
58.5488	1	18.016	<.0001

t Test

7.6517

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Isolok 12 mL – High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.138345
Adj Rsquare	0.102443
Root Mean Square Error	0.012688
Mean of Response	1.297604
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	0.01004	t Ratio	1.963006
Std Err Dif	0.00511	DF	24
Upper CL Dif	0.02060	Prob > t	0.0613
Lower CL Dif	-0.00052	Prob > t	0.0307
Confidence	0.95	Prob < t	0.9693

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00062037	0.000620	3.8534	0.0613
Error	24	0.00386383	0.000161		
C. Total	25	0.00448420			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.00317	1.2872	1.3003
Isolok (12 mL)	10	1.30378	0.00401	1.2955	1.3121

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.012479	0.00312	1.2871	1.3004
Isolok (12 mL)	10	1.30378	0.013029	0.00412	1.2945	1.3131

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	0.01004	t Ratio	1.94276
Std Err Dif	0.00517	DF	18.60844
Upper CL Dif	0.02087	Prob > t	0.0673
Lower CL Dif	-0.00079	Prob > t	0.0337
Confidence	0.95	Prob < t	0.9663

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0124792	0.0092521	0.0092521
Isolok (12 mL)	10	0.0130293	0.0103153	0.0100603

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0214	1	24	0.8850
Brown-Forsythe	0.0616	1	24	0.8061
Levene	0.1168	1	24	0.7356
Bartlett	0.0202	1	.	0.8871
F Test 2-sided	1.0901	9	15	0.8475

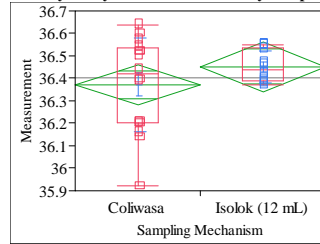
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.7743	1	18.608	0.0673

t Test

1.9428

Isolok 12 mL – High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.054097
Adj Rsquare	0.014685
Root Mean Square Error	0.169657
Mean of Response	36.40269
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	0.08012	t Ratio	1.171574
Std Err Dif	0.06839	DF	24
Upper CL Dif	0.22128	Prob > t	0.2529
Lower CL Dif	-0.06103	Prob > t	0.1264
Confidence	0.95	Prob < t	0.8736

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.03950779	0.039508	1.3726	0.2529
Error	24	0.69080375	0.028783		
C. Total	25	0.73031154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.04241	36.284	36.459
Isolok (12 mL)	10	36.4520	0.05365	36.341	36.563

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.207468	0.05187	36.261	36.482
Isolok (12 mL)	10	36.4520	0.070836	0.02240	36.401	36.503

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	0.08012	t Ratio	1.418206
Std Err Dif	0.05650	DF	19.96014
Upper CL Dif	0.19799	Prob > t	0.1716
Lower CL Dif	-0.03774	Prob > t	0.0858
Confidence	0.95	Prob < t	0.9142

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2074679	0.1751562	0.1693750
Isolok (12 mL)	10	0.0708363	0.0600000	0.0600000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	5.0601	1	24	0.0339
Brown-Forsythe	7.5411	1	24	0.0112
Levene	11.9475	1	24	0.0021
Bartlett	9.2650	1	.	0.0023
F Test 2-sided	8.5781	15	9	0.0027

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.0113	1	19.96	0.1716

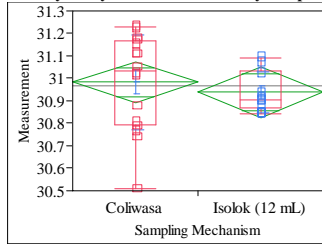
t Test

1.4182

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Isolok 12 mL – High Flow Rate

One-way Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.016539
Adj Rsquare	-0.02444
Root Mean Square Error	0.176199
Mean of Response	30.96577
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	-0.04513	t Ratio	-0.63531
Std Err Dif	0.07103	DF	24
Upper CL Dif	0.10147	Prob > t	0.5312
Lower CL Dif	-0.19172	Prob > t	0.7344
Confidence	0.95	Prob < t	0.2656

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.01253087	0.012531	0.4036	0.5312
Error	24	0.74510375	0.031046		
C. Total	25	0.75763462			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.04405	30.892	31.074
Isolok (12 mL)	10	30.9380	0.05572	30.823	31.053

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.211588	0.05290	30.870	31.096
Isolok (12 mL)	10	30.9380	0.090406	0.02859	30.873	31.003

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	-0.04513	t Ratio	-0.75048
Std Err Dif	0.06013	DF	21.92506
Upper CL Dif	0.07960	Prob > t	0.4609
Lower CL Dif	-0.16985	Prob > t	0.7695
Confidence	0.95	Prob < t	0.2305

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2115882	0.1773437	0.1693750
Isolok (12 mL)	10	0.0904065	0.0732000	0.0660000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.8548	1	24	0.0613
Brown-Forsythe	5.3234	1	24	0.0300
Levene	8.5066	1	24	0.0076
Bartlett	6.2375	1	.	0.0125
F Test 2-sided	5.4775	15	9	0.0141

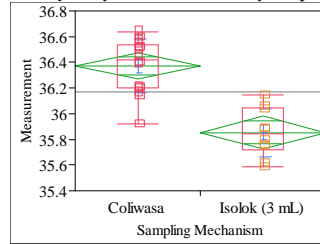
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5632	1	21.925	0.4609

t Test
0.7505

Isolok 3 mL – Low Flow Rate

One-way Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.632418
Adj Rsquare	0.617102
Root Mean Square Error	0.199925
Mean of Response	36.17269
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	-0.51788	t Ratio	-6.42585
Std Err Dif	0.08059	DF	24
Upper CL Dif	-0.35154	Prob > t	<.0001
Lower CL Dif	-0.68421	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.6504278	1.65043	41.2915	<.0001
Error	24	0.9592837	0.03997		
C. Total	25	2.6097115			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.04998	36.269	36.475
Isolok (3 mL)	10	35.8540	0.06322	35.724	35.984

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.207468	0.05187	36.261	36.482
Isolok (3 mL)	10	35.8540	0.186679	0.05903	35.720	35.988

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	-0.51788	t Ratio	-6.59028
Std Err Dif	0.07858	DF	20.81578
Upper CL Dif	-0.35437	Prob > t	<.0001
Lower CL Dif	-0.68138	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2074679	0.1751562	0.1693750
Isolok (3 mL)	10	0.1866786	0.1500000	0.1500000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1821	1	24	0.6734
Brown-Forsythe	0.1764	1	24	0.6782
Levene	0.3840	1	24	0.5413
Bartlett	0.1177	1	.	0.7315
F Test 2-sided	1.2351	15	9	0.7694

Welch Anova testing Means Equal, allowing Std Devs Not Equal

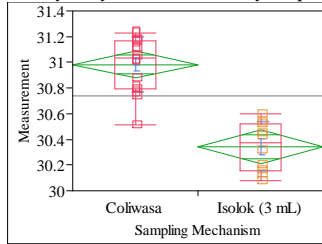
F Ratio	DFNum	DFDen	Prob > F
43.4318	1	20.816	<.0001

t Test
6.5903

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Isolok 3 mL – Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.716903
Adj Rsquare	0.705107
Root Mean Square Error	0.20369
Mean of Response	30.73692
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	-0.64013	t Ratio	-7.79593
Std Err Dif	0.08211	DF	24
Upper CL Dif	-0.47066	Prob > t	<.0001
Lower CL Dif	-0.80959	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	2.5216001	2.52160	60.7765	<.0001
Error	24	0.9957537	0.04149		
C. Total	25	3.5173538			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.05092	30.878	31.088
Isolok (3 mL)	10	30.3430	0.06441	30.210	30.476

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.211588	0.05290	30.870	31.096
Isolok (3 mL)	10	30.3430	0.189798	0.06002	30.207	30.479

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	-0.64013	t Ratio	-8.00129
Std Err Dif	0.08000	DF	20.86008
Upper CL Dif	-0.47368	Prob > t	<.0001
Lower CL Dif	-0.80657	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2115882	0.1773437	0.1693750
Isolok (3 mL)	10	0.1897981	0.1650000	0.1650000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1968	1	24	0.6613
Brown-Forsythe	0.0089	1	24	0.9256
Levene	0.1022	1	24	0.7520
Bartlett	0.1246	1	.	0.7241
F Test 2-sided	1.2428	15	9	0.7618

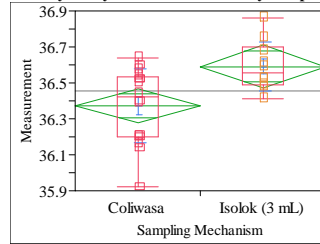
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
64.0207	1	20.86	<.0001

t Test
8.0013

Isolok 3 mL – High Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.265622
Adj Rsquare	0.235023
Root Mean Square Error	0.184496
Mean of Response	36.45615
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	0.219125	t Ratio	2.946303
Std Err Dif	0.074373	DF	24
Upper CL Dif	0.372623	Prob > t	0.0070
Lower CL Dif	0.065627	Prob > t	0.0035
Confidence	0.95	Prob < t	0.9965

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.2954816	0.295482	8.6807	0.0070
Error	24	0.8169338	0.034039		
C. Total	25	1.1124154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.04612	36.277	36.467
Isolok (3 mL)	10	36.5910	0.05834	36.471	36.711

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	36.3719	0.207468	0.05187	36.261	36.482
Isolok (3 mL)	10	36.5910	0.137957	0.04363	36.492	36.690

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	0.219125	t Ratio	3.233141
Std Err Dif	0.067775	DF	23.84258
Upper CL Dif	0.359054	Prob > t	0.0036
Lower CL Dif	0.079196	Prob > t	0.0018
Confidence	0.95	Prob < t	0.9982

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2074679	0.1751562	0.1693750
Isolok (3 mL)	10	0.1379573	0.1072000	0.1070000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.7682	1	24	0.1961
Brown-Forsythe	1.9581	1	24	0.1745
Levene	3.2303	1	24	0.0849
Bartlett	1.6376	1	.	0.2007
F Test 2-sided	2.2616	15	9	0.2182

Welch Anova testing Means Equal, allowing Std Devs Not Equal

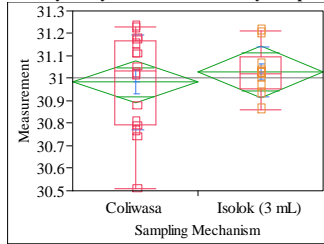
F Ratio	DFNum	DFDen	Prob > F
10.4532	1	23.843	0.0036

t Test
3.2331

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Isolok 3 mL – High Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.016361
Adj Rsquare	-0.02462
Root Mean Square Error	0.18012
Mean of Response	31.00077
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	0.04588	t Ratio	0.631813
Std Err Dif	0.07261	DF	24
Upper CL Dif	0.19573	Prob > t	0.5335
Lower CL Dif	-0.10398	Prob > t	0.2667
Confidence	0.95	Prob < t	0.7333

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.01295087	0.012951	0.3992	0.5335
Error	24	0.77863375	0.032443		
C. Total	25	0.79158462			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.04503	30.890	31.076
Isolok (3 mL)	10	31.0290	0.05696	30.911	31.147

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	30.9831	0.211588	0.05290	30.870	31.096
Isolok (3 mL)	10	31.0290	0.109082	0.03449	30.951	31.107

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	0.04588	t Ratio	0.726439
Std Err Dif	0.06315	DF	23.41336
Upper CL Dif	0.17638	Prob > t	0.4748
Lower CL Dif	-0.08463	Prob > t	0.2374
Confidence	0.95	Prob < t	0.7626

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2115882	0.1773437	0.1693750
Isolok (3 mL)	10	0.1090820	0.0768000	0.0750000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.0137	1	24	0.0954
Brown-Forsythe	4.2814	1	24	0.0495
Levene	6.8982	1	24	0.0148
Bartlett	4.0146	1	.	0.0451
F Test 2-sided	3.7625	15	9	0.0503

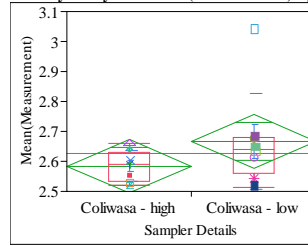
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5277	1	23.413	0.4748

t Test

0.7264

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=A/B, Target=2.552



Oneway Anova
Summary of Fit

Rsquare	0.122687
Adj Rsquare	0.060021
Root Mean Square Error	0.1186
Mean of Response	2.626169
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.08297	t Ratio	1.399218
Std Err Dif	0.05930	DF	14
Upper CL Dif	0.21016	Prob > t	0.1835
Lower CL Dif	-0.04421	Prob > t	0.0918
Confidence	0.95	Prob < t	0.9082

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.02753837	0.027538	1.9578	0.1835
Error	14	0.19692270	0.014066		
C. Total	15	0.22446107			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	2.58468	0.04193	2.4947	2.6746
Coliwasa - low	8	2.66766	0.04193	2.5777	2.7576

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	2.58468	0.050463	0.01784	2.5425	2.6269
Coliwasa - low	8	2.66766	0.159954	0.05655	2.5339	2.8014

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.08297	t Ratio	1.399218
Std Err Dif	0.05930	DF	8.379761
Upper CL Dif	0.21865	Prob > t	0.1977
Lower CL Dif	-0.05270	Prob > t	0.0988
Confidence	0.95	Prob < t	0.9012

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0504631	0.0394613	0.0383357
Coliwasa - low	8	0.1599540	0.0973599	0.0921859

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2833	1	14	0.2763
Brown-Forsythe	1.3077	1	14	0.2720
Levene	1.7281	1	14	0.2098
Bartlett	7.2570	1	.	0.0071
F Test 2-sided	10.0472	7	7	0.0069

Welch Anova testing Means Equal, allowing Std Devs Not Equal

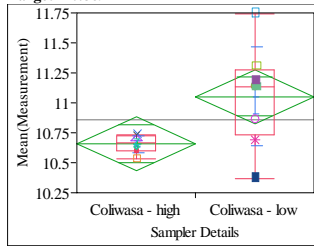
F Ratio	DFNum	DFDen	Prob > F
1.9578	1	8.3798	0.1977

t Test

1.3992

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=Al2O3 (wt%), Target=10.869



Oneway Anova Summary of Fit

Rsquare	0.337188
Adj Rsquare	0.289844
Root Mean Square Error	0.297366
Mean of Response	10.85518
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.396795	t Ratio	2.668733
Std Err Dif	0.148683	DF	14
Upper CL Dif	0.715688	Prob > t	0.0183
Lower CL Dif	0.077902	Prob > t	0.0092
Confidence	0.95	Prob < t	0.9908

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.6297851	0.629785	7.1221	0.0183
Error	14	1.2379704	0.088426		
C. Total	15	1.8677555			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	10.6568	0.10513	10.431	10.882
Coliwasa - low	8	11.0536	0.10513	10.828	11.279

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	10.6568	0.069750	0.02466	10.598	10.715
Coliwasa - low	8	11.0536	0.414714	0.14662	10.707	11.400

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.396795	t Ratio	2.668733
Std Err Dif	0.148683	DF	7.39571
Upper CL Dif	0.744597	Prob > t	0.0305
Lower CL Dif	0.048993	Prob > t	0.0152
Confidence	0.95	Prob < t	0.9848

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0697504	0.0535358	0.0535358
Coliwasa - low	8	0.4147141	0.3086183	0.2889360

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.5588	1	14	0.0801
Brown-Forsythe	5.1389	1	14	0.0398
Levene	8.0422	1	14	0.0132
Bartlett	14.6009	1	.	0.0001
F Test 2-sided	35.3512	7	7	0.0001

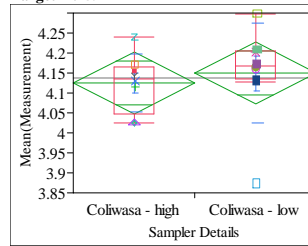
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.1221	1	7.3957	0.0305

t Test

2.6687

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=B2O3 (wt%), Target=4.259



Oneway Anova Summary of Fit

Rsquare	0.016767
Adj Rsquare	-0.05346
Root Mean Square Error	0.101593
Mean of Response	4.137236
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.02482	t Ratio	0.488616
Std Err Dif	0.05080	DF	14
Upper CL Dif	0.13377	Prob > t	0.6327
Lower CL Dif	-0.08413	Prob > t	0.3163
Confidence	0.95	Prob < t	0.6837

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00246414	0.002464	0.2387	0.6327
Error	14	0.14449700	0.010321		
C. Total	15	0.14696114			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	4.12483	0.03592	4.0478	4.2019
Coliwasa - low	8	4.14965	0.03592	4.0726	4.2267

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	4.12483	0.072110	0.02549	4.0645	4.1851
Coliwasa - low	8	4.14965	0.124268	0.04394	4.0458	4.2535

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.02482	t Ratio	0.488616
Std Err Dif	0.05080	DF	11.23402
Upper CL Dif	0.13634	Prob > t	0.6345
Lower CL Dif	-0.08670	Prob > t	0.3173
Confidence	0.95	Prob < t	0.6827

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0721098	0.0521557	0.0516526
Coliwasa - low	8	0.1242683	0.0758018	0.0697645

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.7040	1	14	0.4155
Brown-Forsythe	0.2100	1	14	0.6538
Levene	0.4079	1	14	0.5334
Bartlett	1.8466	1	.	0.1742
F Test 2-sided	2.9698	7	7	0.1743

Welch Anova testing Means Equal, allowing Std Devs Not Equal

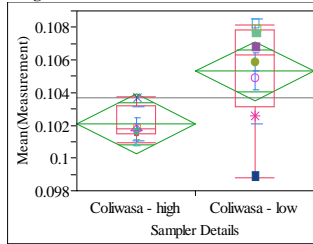
F Ratio	DFNum	DFDen	Prob > F
0.2387	1	11.234	0.6345

t Test

0.4886

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=BaO (wt%), Target=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.341232
Adj Rsquare	0.294178
Root Mean Square Error	0.002387
Mean of Response	0.103709
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.003215	t Ratio	2.692917
Std Err Dif	0.001194	DF	14
Upper CL Dif	0.005775	Prob > t	0.0175
Lower CL Dif	0.000654	Prob > t	0.0087
Confidence	0.95	Prob < t	0.9913

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00004133	0.000041	7.2518	0.0175
Error	14	0.00007980	5.7e-6		
C. Total	15	0.00012113			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.102102	0.00084	0.10029	0.10391
Coliwasa - low	8	0.105316	0.00084	0.10351	0.10713

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.102102	0.001030	0.00036	0.10124	0.10296
Coliwasa - low	8	0.105316	0.003216	0.00114	0.10263	0.10800

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.003215	t Ratio	2.692917
Std Err Dif	0.001194	DF	8.420492
Upper CL Dif	0.005944	Prob > t	0.0262
Lower CL Dif	0.000486	Prob > t	0.0131
Confidence	0.95	Prob < t	0.9869

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0010296	0.0008013	0.0006536
Coliwasa - low	8	0.0032155	0.0024138	0.0022772

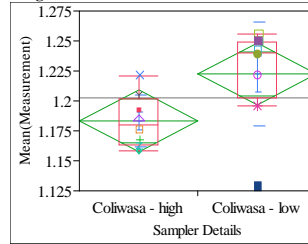
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.3120	1	14	0.1506
Brown-Forsythe	3.3946	1	14	0.0867
Levene	5.1916	1	14	0.0389
Bartlett	7.0986	1	.	0.0077
F Test 2-sided	9.7532	7	7	0.0076

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.2518	1	8.4205	0.0262

t Test
2.6929

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=CaO (wt%), Target=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.274876
Adj Rsquare	0.223081
Root Mean Square Error	0.034063
Mean of Response	1.202846
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.039236	t Ratio	2.3037
Std Err Dif	0.017032	DF	14
Upper CL Dif	0.075765	Prob > t	0.0371
Lower CL Dif	0.002707	Prob > t	0.0185
Confidence	0.95	Prob < t	0.9815

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00615782	0.006158	5.3070	0.0371
Error	14	0.01624440	0.001160		
C. Total	15	0.02240222			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	1.18323	0.01204	1.1574	1.2091
Coliwasa - low	8	1.22246	0.01204	1.1966	1.2483

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	1.18323	0.021737	0.00769	1.1651	1.2014
Coliwasa - low	8	1.22246	0.042990	0.01520	1.1865	1.2584

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.039236	t Ratio	2.3037
Std Err Dif	0.017032	DF	10.35953
Upper CL Dif	0.077007	Prob > t	0.0431
Lower CL Dif	0.001465	Prob > t	0.0216
Confidence	0.95	Prob < t	0.9784

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0217366	0.0172859	0.0172859
Coliwasa - low	8	0.0429901	0.0306877	0.0264973

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0668	1	14	0.3192
Brown-Forsythe	0.4392	1	14	0.5183
Levene	1.5914	1	14	0.2277
Bartlett	2.8287	1	.	0.0926
F Test 2-sided	3.9116	7	7	0.0925

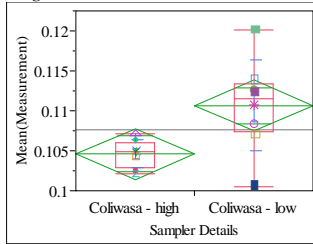
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.3070	1	10.36	0.0431

t Test
2.3037

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=Cr2O3 (wt%), Target=0.0998



Oneway Anova Summary of Fit

Rsquare	0.372373
Adj Rsquare	0.327542
Root Mean Square Error	0.004209
Mean of Response	0.107638
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.006066	t Ratio	2.882055
Std Err Dif	0.002105	DF	14
Upper CL Dif	0.010580	Prob > t	0.0121
Lower CL Dif	0.001552	Prob > t	0.0060
Confidence	0.95	Prob < t	0.9940

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00014717	0.000147	8.3062	0.0121
Error	14	0.00024805	0.000018		
C. Total	15	0.00039522			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.104605	0.00149	0.10141	0.10780
Coliwasa - low	8	0.110671	0.00149	0.10748	0.11386

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.104605	0.001757	0.00062	0.10314	0.10607
Coliwasa - low	8	0.110671	0.005688	0.00201	0.10592	0.11543

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.006066	t Ratio	2.882055
Std Err Dif	0.002105	DF	8.323794
Upper CL Dif	0.010886	Prob > t	0.0196
Lower CL Dif	0.001245	Prob > t	0.0098
Confidence	0.95	Prob < t	0.9902

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0017569	0.0012873	0.0012332
Coliwasa - low	8	0.0056876	0.0040156	0.0040042

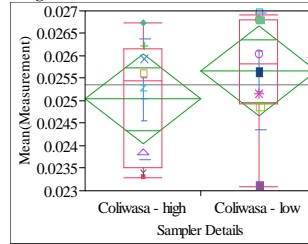
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.4877	1	14	0.1371
Brown-Forsythe	3.7875	1	14	0.0720
Levene	3.9403	1	14	0.0671
Bartlett	7.4837	1	.	0.0062
F Test 2-sided	10.4802	7	7	0.0061

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.3062	1	8.3238	0.0196

t Test
2.8821

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=CuO (wt%), Target=0.0504



Oneway Anova Summary of Fit

Rsquare	0.059524
Adj Rsquare	-0.00765
Root Mean Square Error	0.001319
Mean of Response	0.025346
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.00062	t Ratio	0.94132
Std Err Dif	0.00066	DF	14
Upper CL Dif	0.00203	Prob > t	0.3625
Lower CL Dif	-0.00079	Prob > t	0.1813
Confidence	0.95	Prob < t	0.8187

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00000154	1.541e-6	0.8861	0.3625
Error	14	0.00002435	1.7391e-6		
C. Total	15	0.00002589			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.025036	0.00047	0.02404	0.02604
Coliwasa - low	8	0.025657	0.00047	0.02466	0.02666

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.025036	0.001339	0.00047	0.02392	0.02616
Coliwasa - low	8	0.025657	0.001298	0.00046	0.02457	0.02674

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.00062	t Ratio	0.94132
Std Err Dif	0.00066	DF	13.98652
Upper CL Dif	0.00204	Prob > t	0.3625
Lower CL Dif	-0.00079	Prob > t	0.1813
Confidence	0.95	Prob < t	0.8187

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0013391	0.0011423	0.0010797
Coliwasa - low	8	0.0012981	0.0009806	0.0009806

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0102	1	14	0.9209
Brown-Forsythe	0.0621	1	14	0.8069
Levene	0.2355	1	14	0.6350
Bartlett	0.0063	1	.	0.9367
F Test 2-sided	1.0641	7	7	0.9368

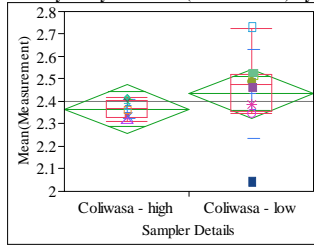
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8861	1	13.987	0.3625

t Test
0.9413

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=Fe/Li, Target=2.452



Oneway Anova
Summary of Fit

Rsquare	0.061505
Adj Rsquare	-0.00553
Root Mean Square Error	0.142336
Mean of Response	2.400486
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.06817	t Ratio	0.957863
Std Err Dif	0.07117	DF	14
Upper CL Dif	0.22081	Prob > t	0.3544
Lower CL Dif	-0.08447	Prob > t	0.1772
Confidence	0.95	Prob < t	0.8228

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.01858820	0.018588	0.9175	0.3544
Error	14	0.28363438	0.020260		
C. Total	15	0.30222258			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	2.36640	0.05032	2.2585	2.4743
Coliwasa - low	8	2.43457	0.05032	2.3266	2.5425

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	2.36640	0.040814	0.01443	2.3323	2.4005
Coliwasa - low	8	2.43457	0.197113	0.06969	2.2698	2.5994

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.06817	t Ratio	0.957863
Std Err Dif	0.07117	DF	7.599124
Upper CL Dif	0.23380	Prob > t	0.3676
Lower CL Dif	-0.09746	Prob > t	0.1838
Confidence	0.95	Prob < t	0.8162

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0408139	0.0344145	0.0344145
Coliwasa - low	8	0.1971127	0.1338859	0.1284505

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.1397	1	14	0.1656
Brown-Forsythe	3.2083	1	14	0.0949
Levene	4.2376	1	14	0.0587
Bartlett	12.0682	1	.	0.0005
F Test 2-sided	23.3246	7	7	0.0005

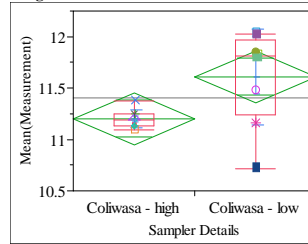
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9175	1	7.5991	0.3676

t Test

0.9579

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=Fe2O3 (wt%), Target=11.462



Oneway Anova
Summary of Fit

Rsquare	0.299223
Adj Rsquare	0.249167
Root Mean Square Error	0.334528
Mean of Response	11.40498
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.408954	t Ratio	2.444957
Std Err Dif	0.167264	DF	14
Upper CL Dif	0.767700	Prob > t	0.0283
Lower CL Dif	0.050208	Prob > t	0.0142
Confidence	0.95	Prob < t	0.9858

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.6689727	0.668973	5.9778	0.0283
Error	14	1.5667292	0.111909		
C. Total	15	2.2357019			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	11.2005	0.11827	10.947	11.454
Coliwasa - low	8	11.6095	0.11827	11.356	11.863

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	11.2005	0.089312	0.03158	11.126	11.275
Coliwasa - low	8	11.6095	0.464588	0.16426	11.221	11.998

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.408954	t Ratio	2.444957
Std Err Dif	0.167264	DF	7.516677
Upper CL Dif	0.799026	Prob > t	0.0421
Lower CL Dif	0.018882	Prob > t	0.0211
Confidence	0.95	Prob < t	0.9789

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0893120	0.0702936	0.0702936
Coliwasa - low	8	0.4645878	0.3689668	0.3219804

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.3259	1	14	0.0896
Brown-Forsythe	3.4172	1	14	0.0857
Levene	11.4025	1	14	0.0045
Bartlett	12.9642	1	.	0.0003
F Test 2-sided	27.0593	7	7	0.0003

Welch Anova testing Means Equal, allowing Std Devs Not Equal

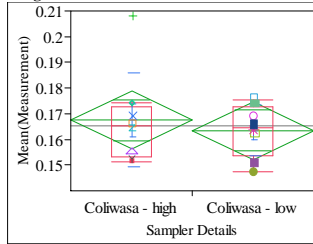
F Ratio	DFNum	DFDen	Prob > F
5.9778	1	7.5167	0.0421

t Test

2.4450

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=K2O (wt%), Target=0.1591



**Oneway Anova
Summary of Fit**

Rsquare	0.021174
Adj Rsquare	-0.04874
Root Mean Square Error	0.014775
Mean of Response	0.165469
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.00407	t Ratio	-0.55032
Std Err Dif	0.00739	DF	14
Upper CL Dif	0.01178	Prob > t	0.5908
Lower CL Dif	-0.01991	Prob > t	0.7046
Confidence	0.95	Prob < t	0.2954

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00006611	0.000066	0.3028	0.5908
Error	14	0.00305628	0.000218		
C. Total	15	0.00312240			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.167502	0.00522	0.15630	0.17871
Coliwasa - low	8	0.163437	0.00522	0.15223	0.17464

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.167502	0.018341	0.00648	0.15217	0.18284
Coliwasa - low	8	0.163437	0.010011	0.00354	0.15507	0.17181

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.00407	t Ratio	-0.55032
Std Err Dif	0.00739	DF	10.83055
Upper CL Dif	0.01223	Prob > t	0.5933
Lower CL Dif	-0.02036	Prob > t	0.7034
Confidence	0.95	Prob < t	0.2966

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0183412	0.0120742	0.0117574
Coliwasa - low	8	0.0100105	0.0075382	0.0074409

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.9128	1	14	0.3556
Brown-Forsythe	0.6707	1	14	0.4265
Levene	0.8027	1	14	0.3854
Bartlett	2.2619	1	.	0.1326
F Test 2-sided	3.3569	7	7	0.1326

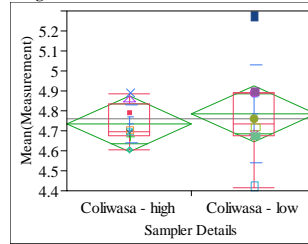
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3028	1	10.831	0.5933

t Test

0.5503

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=Li2O (wt%), Target=4.674



**Oneway Anova
Summary of Fit**

Rsquare	0.020416
Adj Rsquare	-0.04955
Root Mean Square Error	0.185997
Mean of Response	4.760152
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.05023	t Ratio	0.540164
Std Err Dif	0.09300	DF	14
Upper CL Dif	0.24970	Prob > t	0.5976
Lower CL Dif	-0.14923	Prob > t	0.2988
Confidence	0.95	Prob < t	0.7012

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.01009395	0.010094	0.2918	0.5976
Error	14	0.48432628	0.034595		
C. Total	15	0.49442023			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	4.73503	0.06576	4.5940	4.8761
Coliwasa - low	8	4.78527	0.06576	4.6442	4.9263

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	4.73503	0.096318	0.03405	4.6545	4.8156
Coliwasa - low	8	4.78527	0.244770	0.08654	4.5806	4.9899

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.05023	t Ratio	0.540164
Std Err Dif	0.09300	DF	9.117058
Upper CL Dif	0.26020	Prob > t	0.6020
Lower CL Dif	-0.15973	Prob > t	0.3010
Confidence	0.95	Prob < t	0.6990

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0963176	0.0790518	0.0704178
Coliwasa - low	8	0.2447701	0.1723441	0.1655042

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.8496	1	14	0.1953
Brown-Forsythe	1.9757	1	14	0.1816
Levene	2.4777	1	14	0.1378
Bartlett	5.0109	1	.	0.0252
F Test 2-sided	6.4581	7	7	0.0250

Welch Anova testing Means Equal, allowing Std Devs Not Equal

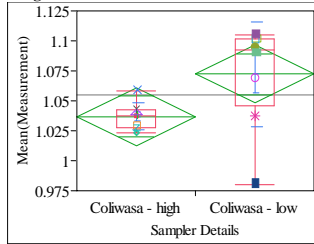
F Ratio	DFNum	DFDen	Prob > F
0.2918	1	9.1171	0.6020

t Test

0.5402

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=MgO (wt%), Target=1.014



Oneway Anova
Summary of Fit

Rsquare	0.260817
Adj Rsquare	0.208018
Root Mean Square Error	0.031865
Mean of Response	1.054765
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.035412	t Ratio	2.22257
Std Err Dif	0.015933	DF	14
Upper CL Dif	0.069584	Prob > t	0.0432
Lower CL Dif	0.001239	Prob > t	0.0216
Confidence	0.95	Prob < t	0.9784

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00501593	0.005016	4.9398	0.0432
Error	14	0.01421571	0.001015		
C. Total	15	0.01923164			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	1.03706	0.01127	1.0129	1.0612
Coliwasa - low	8	1.07247	0.01127	1.0483	1.0966

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	1.03706	0.010898	0.00385	1.0279	1.0462
Coliwasa - low	8	1.07247	0.043727	0.01546	1.0359	1.1090

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.03541	t Ratio	2.22257
Std Err Dif	0.01593	DF	7.866265
Upper CL Dif	0.07226	Prob > t	0.0575
Lower CL Dif	-0.00144	Prob > t	0.0288
Confidence	0.95	Prob < t	0.9712

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0108980	0.0078769	0.0078769
Coliwasa - low	8	0.0437270	0.0327601	0.0283638

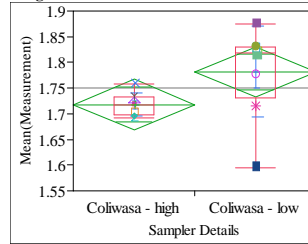
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.1000	1	14	0.1693
Brown-Forsythe	2.2267	1	14	0.1578
Levene	6.7543	1	14	0.0210
Bartlett	9.8849	1	.	0.0017
F Test 2-sided	16.0992	7	7	0.0016

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.9398	1	7.8663	0.0575

t Test
2.2226

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=MnO (wt%), Target=1.779



Oneway Anova
Summary of Fit

Rsquare	0.217501
Adj Rsquare	0.161608
Root Mean Square Error	0.064636
Mean of Response	1.74998
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.06375	t Ratio	1.972663
Std Err Dif	0.03232	DF	14
Upper CL Dif	0.13307	Prob > t	0.0686
Lower CL Dif	-0.00556	Prob > t	0.0343
Confidence	0.95	Prob < t	0.9657

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.01625778	0.016258	3.8914	0.0686
Error	14	0.05849026	0.004178		
C. Total	15	0.07474804			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	1.71810	0.02285	1.6691	1.7671
Coliwasa - low	8	1.78186	0.02285	1.7328	1.8309

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	1.71810	0.021823	0.00772	1.6999	1.7363
Coliwasa - low	8	1.78186	0.088767	0.03138	1.7076	1.8561

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.06375	t Ratio	1.972663
Std Err Dif	0.03232	DF	7.84312
Upper CL Dif	0.13854	Prob > t	0.0847
Lower CL Dif	-0.01103	Prob > t	0.0424
Confidence	0.95	Prob < t	0.9576

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0218234	0.0160727	0.0158710
Coliwasa - low	8	0.0887665	0.0645600	0.0570280

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.0914	1	14	0.1701
Brown-Forsythe	2.3393	1	14	0.1484
Levene	5.7045	1	14	0.0316
Bartlett	10.0426	1	.	0.0015
F Test 2-sided	16.5445	7	7	0.0015

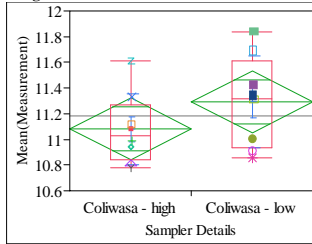
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.8914	1	7.8431	0.0847

t Test
1.9727

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=Na2O (wt%), Target=11.659



Oneway Anova
Summary of Fit

Rsquare	0.113182
Adj Rsquare	0.049838
Root Mean Square Error	0.317661
Mean of Response	11.18587
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.21231	t Ratio	1.336707
Std Err Dif	0.15883	DF	14
Upper CL Dif	0.55297	Prob > t	0.2026
Lower CL Dif	-0.12835	Prob > t	0.1013
Confidence	0.95	Prob < t	0.8987

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.1803021	0.180302	1.7868	0.2026
Error	14	1.4127214	0.100909		
C. Total	15	1.5930235			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	11.0797	0.11231	10.839	11.321
Coliwasa - low	8	11.2920	0.11231	11.051	11.533

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	11.0797	0.275811	0.09751	10.849	11.310
Coliwasa - low	8	11.2920	0.354606	0.12537	10.996	11.588

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.21231	t Ratio	1.336707
Std Err Dif	0.15883	DF	13.2003
Upper CL Dif	0.55491	Prob > t	0.2039
Lower CL Dif	-0.13029	Prob > t	0.1020
Confidence	0.95	Prob < t	0.8980

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.2758109	0.2011469	0.1996725
Coliwasa - low	8	0.3546064	0.2759890	0.2721275

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6466	1	14	0.4348
Brown-Forsythe	0.5586	1	14	0.4672
Levene	0.6539	1	14	0.4322
Bartlett	0.4083	1	.	0.5228
F Test 2-sided	1.6530	7	7	0.5232

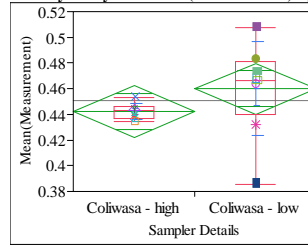
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.7868	1	13.2	0.2039

t Test

1.3367

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=NiO (wt%), Target=0.41



Oneway Anova
Summary of Fit

Rsquare	0.114206
Adj Rsquare	0.050935
Root Mean Square Error	0.026323
Mean of Response	0.451088
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.01768	t Ratio	1.343512
Std Err Dif	0.01316	DF	14
Upper CL Dif	0.04591	Prob > t	0.2005
Lower CL Dif	-0.01055	Prob > t	0.1002
Confidence	0.95	Prob < t	0.8998

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00125068	0.001251	1.8050	0.2005
Error	14	0.00970040	0.000693		
C. Total	15	0.01095107			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.442247	0.00931	0.42229	0.46221
Coliwasa - low	8	0.459929	0.00931	0.43997	0.47989

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.442247	0.005916	0.00209	0.43730	0.44719
Coliwasa - low	8	0.459929	0.036753	0.01299	0.42920	0.49066

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.01768	t Ratio	1.343512
Std Err Dif	0.01316	DF	7.36255
Upper CL Dif	0.04850	Prob > t	0.2190
Lower CL Dif	-0.01313	Prob > t	0.1095
Confidence	0.95	Prob < t	0.8905

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0059164	0.0046658	0.0046658
Coliwasa - low	8	0.0367528	0.0256223	0.0229845

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4698	1	14	0.1384
Brown-Forsythe	3.3225	1	14	0.0898
Levene	5.7540	1	14	0.0309
Bartlett	15.1433	1	.	<.0001
F Test 2-sided	38.5894	7	7	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

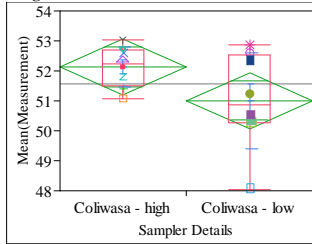
F Ratio	DFNum	DFDen	Prob > F
1.8050	1	7.3626	0.2190

t Test

1.3435

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=SiO2 (wt%), Target=50.985



Oneway Anova
Summary of Fit

Rsquare	0.192728
Adj Rsquare	0.135066
Root Mean Square Error	1.228666
Mean of Response	51.5705
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-1.1231	t Ratio	-1.82821
Std Err Dif	0.6143	DF	14
Upper CL Dif	0.1945	Prob > t	0.0889
Lower CL Dif	-2.4407	Prob > t	0.9555
Confidence	0.95	Prob < t	0.0445

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	5.045706	5.04571	3.3424	0.0889
Error	14	21.134696	1.50962		
C. Total	15	26.180402			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	52.1321	0.43440	51.200	53.064
Coliwasa - low	8	51.0089	0.43440	50.077	51.941

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	52.1321	0.67232	0.23770	51.570	52.694
Coliwasa - low	8	51.0089	1.60226	0.56648	49.669	52.348

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-1.1231	t Ratio	-1.82821
Std Err Dif	0.6143	DF	9.390836
Upper CL Dif	0.2578	Prob > t	0.0994
Lower CL Dif	-2.5041	Prob > t	0.9503
Confidence	0.95	Prob < t	0.0497

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.672315	0.539282	0.539282
Coliwasa - low	8	1.602259	1.243468	1.243468

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.6476	1	14	0.1260
Brown-Forsythe	4.1474	1	14	0.0611
Levene	4.3131	1	14	0.0567
Bartlett	4.4096	1	.	0.0357
F Test 2-sided	5.6796	7	7	0.0355

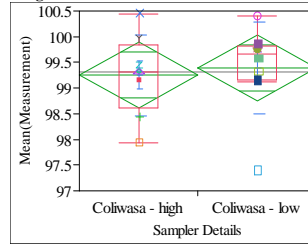
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.3424	1	9.3908	0.0994

t Test

1.8282

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=Sum of Oxides (wt%), Target=99.553



Oneway Anova
Summary of Fit

Rsquare	0.007693
Adj Rsquare	-0.06319
Root Mean Square Error	0.846315
Mean of Response	99.32313
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.1394	t Ratio	0.329446
Std Err Dif	0.4232	DF	14
Upper CL Dif	1.0470	Prob > t	0.7467
Lower CL Dif	-0.7682	Prob > t	0.3733
Confidence	0.95	Prob < t	0.6267

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.077738	0.077738	0.1085	0.7467
Error	14	10.027487	0.716249		
C. Total	15	10.105225			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	99.2534	0.29922	98.612	99.90
Coliwasa - low	8	99.3928	0.29922	98.751	100.03

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	99.2534	0.788505	0.27878	98.594	99.91
Coliwasa - low	8	99.3928	0.900421	0.31835	98.640	100.15

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.1394	t Ratio	0.329446
Std Err Dif	0.4232	DF	13.76042
Upper CL Dif	1.0485	Prob > t	0.7468
Lower CL Dif	-0.7697	Prob > t	0.3734
Confidence	0.95	Prob < t	0.6266

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.7885049	0.5595168	0.5455333
Coliwasa - low	8	0.9004211	0.5951568	0.5522997

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0776	1	14	0.7846
Brown-Forsythe	0.0004	1	14	0.9835
Levene	0.0152	1	14	0.9037
Bartlett	0.1148	1	.	0.7348
F Test 2-sided	1.3040	7	7	0.7351

Welch Anova testing Means Equal, allowing Std Devs Not Equal

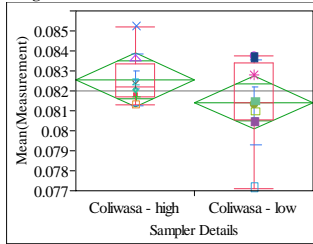
F Ratio	DFNum	DFDen	Prob > F
0.1085	1	13.76	0.7468

t Test

0.3294

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=TiO2 (wt%), Target=0.0711



Oneway Anova Summary of Fit

Rsquare	0.105318
Adj Rsquare	0.041412
Root Mean Square Error	0.001759
Mean of Response	0.081987
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.00113	t Ratio	-1.28375
Std Err Dif	0.00088	DF	14
Upper CL Dif	0.00076	Prob > t	0.2201
Lower CL Dif	-0.00302	Prob > t	0.8900
Confidence	0.95	Prob < t	0.1100

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00000510	5.102e-6	1.6480	0.2201
Error	14	0.00004334	3.0958e-6		
C. Total	15	0.00004844			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.082552	0.00062	0.08122	0.08389
Coliwasa - low	8	0.081423	0.00062	0.08009	0.08276

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.082552	0.001280	0.00045	0.08148	0.08362
Coliwasa - low	8	0.081423	0.002134	0.00075	0.07964	0.08321

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.00113	t Ratio	-1.28375
Std Err Dif	0.00088	DF	11.46272
Upper CL Dif	0.00080	Prob > t	0.2246
Lower CL Dif	-0.00306	Prob > t	0.8877
Confidence	0.95	Prob < t	0.1123

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0012804	0.0009313	0.0008548
Coliwasa - low	8	0.0021336	0.0014699	0.0014699

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.9948	1	14	0.3355
Brown-Forsythe	0.9999	1	14	0.3343
Levene	0.8498	1	14	0.3722
Bartlett	1.6346	1	.	0.2011
F Test 2-sided	2.7770	7	7	0.2012

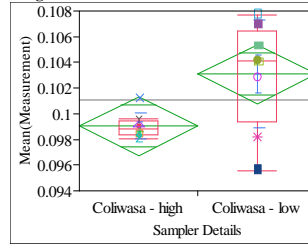
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6480	1	11.463	0.2246

t Test

1.2837

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=ZnO (wt%), Target=0.0958



Oneway Anova Summary of Fit

Rsquare	0.335132
Adj Rsquare	0.287641
Root Mean Square Error	0.00305
Mean of Response	0.101054
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.004051	t Ratio	2.656465
Std Err Dif	0.001525	DF	14
Upper CL Dif	0.007321	Prob > t	0.0188
Lower CL Dif	0.000780	Prob > t	0.0094
Confidence	0.95	Prob < t	0.9906

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00006564	0.000066	7.0568	0.0188
Error	14	0.00013021	9.301e-6		
C. Total	15	0.00019585			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.099029	0.00108	0.09672	0.10134
Coliwasa - low	8	0.103080	0.00108	0.10077	0.10539

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.099029	0.001000	0.00035	0.09819	0.09986
Coliwasa - low	8	0.103080	0.004196	0.00148	0.09957	0.10659

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.004051	t Ratio	2.656465
Std Err Dif	0.001525	DF	7.792623
Upper CL Dif	0.007584	Prob > t	0.0296
Lower CL Dif	0.000518	Prob > t	0.0148
Confidence	0.95	Prob < t	0.9852

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0009999	0.0006963	0.0006898
Coliwasa - low	8	0.0041955	0.0031509	0.0029201

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.8663	1	14	0.0694
Brown-Forsythe	4.1744	1	14	0.0603
Levene	7.1925	1	14	0.0179
Bartlett	10.4039	1	.	0.0013
F Test 2-sided	17.6061	7	7	0.0012

Welch Anova testing Means Equal, allowing Std Devs Not Equal

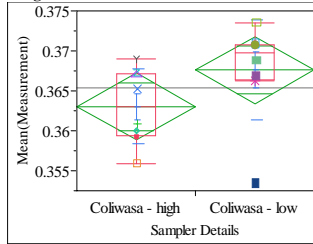
F Ratio	DFNum	DFDen	Prob > F
7.0568	1	7.7926	0.0296

t Test

2.6565

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Analyte=ZrO2 (wt%), Target=0.3547



Oneway Anova Summary of Fit

Rsquare	0.164259
Adj Rsquare	0.104563
Root Mean Square Error	0.005531
Mean of Response	0.365321
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.00459	t Ratio	1.658793
Std Err Dif	0.00277	DF	14
Upper CL Dif	0.01052	Prob > t	0.1194
Lower CL Dif	-0.00134	Prob > t	0.0597
Confidence	0.95	Prob < t	0.9403

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00008417	0.000084	2.7516	0.1194
Error	14	0.00042823	0.000031		
C. Total	15	0.00051240			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.363028	0.00196	0.35883	0.36722
Coliwasa - low	8	0.367615	0.00196	0.36342	0.37181

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.363028	0.004670	0.00165	0.35912	0.36693
Coliwasa - low	8	0.367615	0.006274	0.00222	0.36237	0.37286

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.00459	t Ratio	1.658793
Std Err Dif	0.00277	DF	12.93455
Upper CL Dif	0.01056	Prob > t	0.1212
Lower CL Dif	-0.00139	Prob > t	0.0606
Confidence	0.95	Prob < t	0.9394

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0046700	0.0040524	0.0040524
Coliwasa - low	8	0.0062743	0.0041439	0.0038554

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3079	1	14	0.5877
Brown-Forsythe	0.0101	1	14	0.9214
Levene	0.0029	1	14	0.9575
Bartlett	0.5616	1	.	0.4536
F Test 2-sided	1.8051	7	7	0.4540

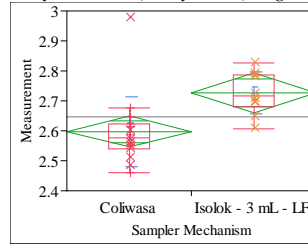
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.7516	1	12.935	0.1212

t Test

1.6588

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Al/B, Target Value=2.552



Oneway Anova Summary of Fit

Rsquare	0.287288
Adj Rsquare	0.257591
Root Mean Square Error	0.101709
Mean of Response	2.646855
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.127525	t Ratio	3.110335
Std Err Dif	0.041000	DF	24
Upper CL Dif	0.212146	Prob > t	0.0048
Lower CL Dif	0.042904	Prob > t	0.0024
Confidence	0.95	Prob < t	0.9976

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.10007762	0.100078	9.6742	0.0048
Error	24	0.24827556	0.010345		
C. Total	25	0.34835318			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.59781	0.02543	2.5453	2.6503
Isolok - 3 mL - LF	10	2.72533	0.03216	2.6589	2.7917

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.59781	0.116601	0.02915	2.5357	2.6599
Isolok - 3 mL - LF	10	2.72533	0.070188	0.02220	2.6751	2.7755

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.127525	t Ratio	3.480626
Std Err Dif	0.036639	DF	23.99343
Upper CL Dif	0.203144	Prob > t	0.0019
Lower CL Dif	0.051906	Prob > t	0.0010
Confidence	0.95	Prob < t	0.9990

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1166014	0.0710113	0.0697292
Isolok - 3 mL - LF	10	0.0701882	0.0565213	0.0560235

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.4756	1	24	0.4970
Brown-Forsythe	0.1897	1	24	0.6670
Levene	0.2286	1	24	0.6369
Bartlett	2.4658	1	.	0.1163
F Test 2-sided	2.7598	15	9	0.1279

Welch Anova testing Means Equal, allowing Std Devs Not Equal

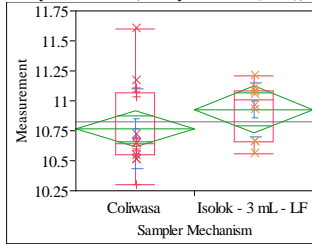
F Ratio	DFNum	DFDen	Prob > F
12.1148	1	23.993	0.0019

t Test

3.4806

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Al2O3 (wt%), Target Value=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.068838
Adj Rsquare	0.03004
Root Mean Square Error	0.29867
Mean of Response	10.82829
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.16037	t Ratio	1.332013
Std Err Dif	0.12040	DF	24
Upper CL Dif	0.40886	Prob > t	0.1954
Lower CL Dif	-0.08812	Prob > t	0.0977
Confidence	0.95	Prob < t	0.9023

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.1582705	0.158271	1.7743	0.1954
Error	24	2.1408900	0.089204		
C. Total	25	2.2991605			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.7666	0.07467	10.613	10.921
Isolok - 3 mL - LF	10	10.9270	0.09445	10.732	11.122

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.7666	0.335830	0.08396	10.588	10.946
Isolok - 3 mL - LF	10	10.9270	0.223400	0.07065	10.767	11.087

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.16037	t Ratio	1.461574
Std Err Dif	0.10973	DF	23.84106
Upper CL Dif	0.38691	Prob > t	0.1569
Lower CL Dif	-0.06617	Prob > t	0.0785
Confidence	0.95	Prob < t	0.9215

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3358295	0.2691061	0.2373684
Isolok - 3 mL - LF	10	0.2234000	0.1821478	0.1757235

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0781	1	24	0.3095
Brown-Forsythe	0.4459	1	24	0.5107
Levene	1.7171	1	24	0.2025
Bartlett	1.6347	1	.	0.2011
F Test 2-sided	2.2598	15	9	0.2187

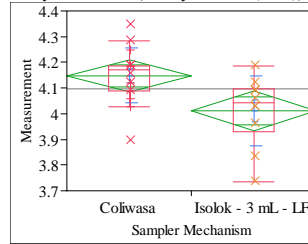
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.1362	1	23.841	0.1569

t Test

1.4616

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=B2O3 (wt%), Target Value=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.250439
Adj Rsquare	0.219207
Root Mean Square Error	0.118824
Mean of Response	4.095465
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.13564	t Ratio	-2.83174
Std Err Dif	0.04790	DF	24
Upper CL Dif	-0.03678	Prob > t	0.0092
Lower CL Dif	-0.23450	Prob > t	0.9954
Confidence	0.95	Prob < t	0.0046

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.11321689	0.113217	8.0187	0.0092
Error	24	0.33885715	0.014119		
C. Total	25	0.45207404			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.14763	0.02971	4.0863	4.2089
Isolok - 3 mL - LF	10	4.01200	0.03758	3.9344	4.0895

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.14763	0.106610	0.02665	4.0908	4.2044
Isolok - 3 mL - LF	10	4.01200	0.136777	0.04325	3.9142	4.1098

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.13564	t Ratio	-2.66978
Std Err Dif	0.05081	DF	15.76823
Upper CL Dif	-0.02781	Prob > t	0.0169
Lower CL Dif	-0.24347	Prob > t	0.9915
Confidence	0.95	Prob < t	0.0085

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1066098	0.0792397	0.0784851
Isolok - 3 mL - LF	10	0.1367773	0.1017488	0.0965970

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.6201	1	24	0.4387
Brown-Forsythe	0.2968	1	24	0.5909
Levene	0.5548	1	24	0.4636
Bartlett	0.6898	1	.	0.4062
F Test 2-sided	1.6460	9	15	0.3781

Welch Anova testing Means Equal, allowing Std Devs Not Equal

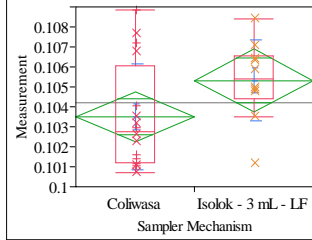
F Ratio	DFNum	DFDen	Prob > F
7.1277	1	15.768	0.0169

t Test

2.6698

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=BaO (wt%), Target Value=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.125783
Adj Rsquare	0.089357
Root Mean Square Error	0.002439
Mean of Response	0.104195
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00183	t Ratio	1.858259
Std Err Dif	0.00098	DF	24
Upper CL Dif	0.00386	Prob > t	0.0754
Lower CL Dif	-0.00020	Prob > t	0.0377
Confidence	0.95	Prob < t	0.9623

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00002054	0.000021	3.4531	0.0754
Error	24	0.00014275	5.948e-6		
C. Total	25	0.00016328			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103493	0.00061	0.10223	0.10475
Isolok - 3 mL - LF	10	0.105319	0.00077	0.10373	0.10691

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103493	0.002663	0.00067	0.10207	0.10491
Isolok - 3 mL - LF	10	0.105319	0.002011	0.00064	0.10388	0.10676

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00183	t Ratio	1.984374
Std Err Dif	0.00092	DF	22.97603
Upper CL Dif	0.00373	Prob > t	0.0593
Lower CL Dif	-7.77e-5	Prob > t	0.0296
Confidence	0.95	Prob < t	0.9704

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0026626	0.0021266	0.0020167
Isolok - 3 mL - LF	10	0.0020111	0.0014849	0.0014849

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.9102	1	24	0.3496
Brown-Forsythe	0.6530	1	24	0.4270
Levene	1.2579	1	24	0.2731
Bartlett	0.8001	1	.	0.3711
F Test 2-sided	1.7529	15	9	0.3980

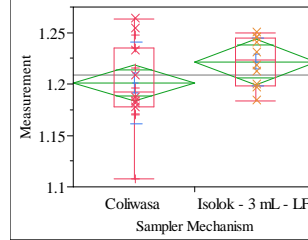
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.9377	1	22.976	0.0593

t Test

1.9844

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=CaO (wt%), Target Value=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.084797
Adj Rsquare	0.046663
Root Mean Square Error	0.034507
Mean of Response	1.209016
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.02074	t Ratio	1.491203
Std Err Dif	0.01391	DF	24
Upper CL Dif	0.04945	Prob > t	0.1489
Lower CL Dif	-0.00797	Prob > t	0.0745
Confidence	0.95	Prob < t	0.9255

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00264786	0.002648	2.2237	0.1489
Error	24	0.02857812	0.001191		
C. Total	25	0.03122598			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.20104	0.00863	1.1832	1.2188
Isolok - 3 mL - LF	10	1.22178	0.01091	1.1993	1.2443

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.20104	0.039654	0.00991	1.1799	1.2222
Isolok - 3 mL - LF	10	1.22178	0.023550	0.00745	1.2049	1.2386

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.02074	t Ratio	1.67295
Std Err Dif	0.01240	DF	23.97922
Upper CL Dif	0.04633	Prob > t	0.1073
Lower CL Dif	-0.00485	Prob > t	0.0537
Confidence	0.95	Prob < t	0.9463

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0396540	0.0311978	0.0306075
Isolok - 3 mL - LF	10	0.0235502	0.0201485	0.0201485

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.6901	1	24	0.2059
Brown-Forsythe	1.4910	1	24	0.2339
Levene	2.0156	1	24	0.1685
Bartlett	2.5886	1	.	0.1076
F Test 2-sided	2.8352	15	9	0.1184

Welch Anova testing Means Equal, allowing Std Devs Not Equal

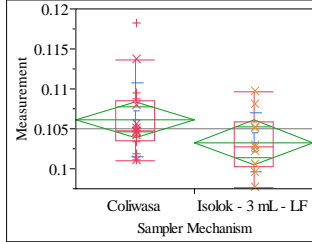
F Ratio	DFNum	DFDen	Prob > F
2.7988	1	23.979	0.1073

t Test

1.6729

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Cr2O3 (wt%), Target Value=0.0998



**Oneway Anova
Summary of Fit**

Rsquare	0.100342
Adj Rsquare	0.062856
Root Mean Square Error	0.004283
Mean of Response	0.105044
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00282	t Ratio	-1.63609
Std Err Dif	0.00173	DF	24
Upper CL Dif	0.00074	Prob > t	0.1149
Lower CL Dif	-0.00639	Prob > t	0.9426
Confidence	0.95	Prob < t	0.0574

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00004910	0.000049	2.6768	0.1149
Error	24	0.00044019	0.000018		
C. Total	25	0.00048928			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.106130	0.00107	0.10392	0.10834
Isolok - 3 mL - LF	10	0.103306	0.00135	0.10051	0.10610

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.106130	0.004593	0.00115	0.10368	0.10858
Isolok - 3 mL - LF	10	0.103306	0.003708	0.00117	0.10065	0.10596

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00282	t Ratio	-1.721
Std Err Dif	0.00164	DF	22.25556
Upper CL Dif	0.00058	Prob > t	0.0991
Lower CL Dif	-0.00623	Prob > t	0.9504
Confidence	0.95	Prob < t	0.0496

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0045929	0.0034051	0.0030511
Isolok - 3 mL - LF	10	0.0037084	0.0028881	0.0028063

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.2914	1	24	0.5943
Brown-Forsythe	0.0363	1	24	0.8506
Levene	0.2305	1	24	0.6355
Bartlett	0.4722	1	.	0.4920
F Test 2-sided	1.5339	15	9	0.5237

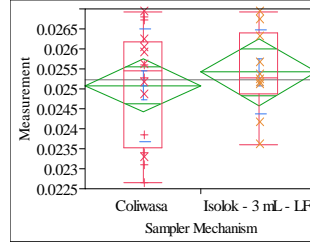
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.9618	1	22.256	0.0991

t Test

1.7210

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=CuO (wt%), Target Value=0.0504



**Oneway Anova
Summary of Fit**

Rsquare	0.016663
Adj Rsquare	-0.02431
Root Mean Square Error	0.001287
Mean of Response	0.025214
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00033	t Ratio	0.637712
Std Err Dif	0.00052	DF	24
Upper CL Dif	0.00140	Prob > t	0.5297
Lower CL Dif	-0.00074	Prob > t	0.2648
Confidence	0.95	Prob < t	0.7352

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000067	6.74e-7	0.4067	0.5297
Error	24	0.00003978	1.6573e-6		
C. Total	25	0.00004045			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.00032	0.02442	0.02575
Isolok - 3 mL - LF	10	0.025418	0.00041	0.02458	0.02626

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.001412	0.00035	0.02433	0.02584
Isolok - 3 mL - LF	10	0.025418	0.001048	0.00033	0.02467	0.02617

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00033	t Ratio	0.683686
Std Err Dif	0.00048	DF	23.1405
Upper CL Dif	0.00133	Prob > t	0.5010
Lower CL Dif	-0.00067	Prob > t	0.2505
Confidence	0.95	Prob < t	0.7495

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0014119	0.0011726	0.0011384
Isolok - 3 mL - LF	10	0.0010475	0.0007836	0.0007699

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.6353	1	24	0.2132
Brown-Forsythe	1.3095	1	24	0.2638
Levene	1.9203	1	24	0.1786
Bartlett	0.9012	1	.	0.3425
F Test 2-sided	1.8166	15	9	0.3680

Welch Anova testing Means Equal, allowing Std Devs Not Equal

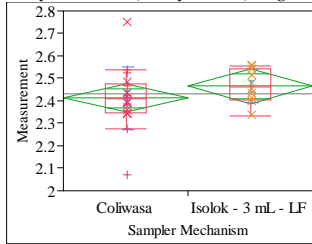
F Ratio	DFNum	DFDen	Prob > F
0.4674	1	23.141	0.5010

t Test

0.6837

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Fe/Li, Target Value=2.452



**Oneway Anova
Summary of Fit**

Rsquare	0.048507
Adj Rsquare	0.008861
Root Mean Square Error	0.120844
Mean of Response	2.432034
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.05388	t Ratio	1.106122
Std Err Dif	0.04871	DF	24
Upper CL Dif	0.15442	Prob > t	0.2796
Lower CL Dif	-0.04666	Prob > t	0.1398
Confidence	0.95	Prob < t	0.8602

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.01786727	0.017867	1.2235	0.2796
Error	24	0.35048041	0.014603		
C. Total	25	0.36834768			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.41131	0.03021	2.3490	2.4737
Isolok - 3 mL - LF	10	2.46519	0.03821	2.3863	2.5441

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.41131	0.141374	0.03534	2.3360	2.4866
Isolok - 3 mL - LF	10	2.46519	0.075042	0.02373	2.4115	2.5189

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.05388	t Ratio	1.265731
Std Err Dif	0.04257	DF	23.58436
Upper CL Dif	0.14183	Prob > t	0.2180
Lower CL Dif	-0.03406	Prob > t	0.1090
Confidence	0.95	Prob < t	0.8910

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1413738	0.0931734	0.0931734
Isolok - 3 mL - LF	10	0.0750424	0.0614741	0.0614741

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.1383	1	24	0.2966
Brown-Forsythe	0.8527	1	24	0.3650
Levene	0.8540	1	24	0.3646
Bartlett	3.7011	1	.	0.0544
F Test 2-sided	3.5492	15	9	0.0605

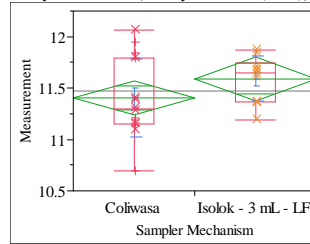
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6021	1	23.584	0.2180

t Test

1.2657

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Fe2O3 (wt%), Target Value=11.462



**Oneway Anova
Summary of Fit**

Rsquare	0.077793
Adj Rsquare	0.039368
Root Mean Square Error	0.326844
Mean of Response	11.47664
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.18747	t Ratio	1.422863
Std Err Dif	0.13176	DF	24
Upper CL Dif	0.45940	Prob > t	0.1676
Lower CL Dif	-0.08446	Prob > t	0.0838
Confidence	0.95	Prob < t	0.9162

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.2162756	0.216276	2.0245	0.1676
Error	24	2.5638497	0.106827		
C. Total	25	2.7801252			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.4045	0.08171	11.236	11.573
Isolok - 3 mL - LF	10	11.5920	0.10336	11.379	11.805

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.4045	0.376990	0.09425	11.204	11.605
Isolok - 3 mL - LF	10	11.5920	0.219096	0.06928	11.435	11.749

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.18747	t Ratio	1.602659
Std Err Dif	0.11697	DF	23.94031
Upper CL Dif	0.42892	Prob > t	0.1221
Lower CL Dif	-0.05398	Prob > t	0.0611
Confidence	0.95	Prob < t	0.9389

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3769899	0.3035879	0.2886207
Isolok - 3 mL - LF	10	0.2190963	0.1727078	0.1601264

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.7845	1	24	0.1082
Brown-Forsythe	2.0254	1	24	0.1676
Levene	3.1987	1	24	0.0863
Bartlett	2.7908	1	.	0.0948
F Test 2-sided	2.9607	15	9	0.1045

Welch Anova testing Means Equal, allowing Std Devs Not Equal

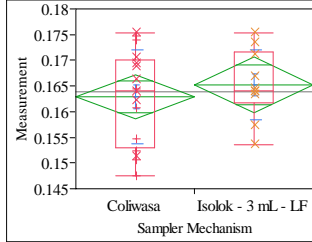
F Ratio	DFNum	DFDen	Prob > F
2.5685	1	23.94	0.1221

t Test

1.6027

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=K2O (wt%), Target Value=0.1591



**Oneway Anova
Summary of Fit**

Rsquare	0.020432
Adj Rsquare	-0.02038
Root Mean Square Error	0.008368
Mean of Response	0.163802
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00239	t Ratio	0.707535
Std Err Dif	0.00337	DF	24
Upper CL Dif	0.00935	Prob > t	0.4860
Lower CL Dif	-0.00458	Prob > t	0.2430
Confidence	0.95	Prob < t	0.7570

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00003505	0.000035	0.5006	0.4860
Error	24	0.00168045	0.000070		
C. Total	25	0.00171550			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.162885	0.00209	0.15857	0.16720
Isolok - 3 mL - LF	10	0.165271	0.00265	0.15981	0.17073

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.162885	0.009190	0.00230	0.15799	0.16778
Isolok - 3 mL - LF	10	0.165271	0.006780	0.00214	0.16042	0.17012

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00239	t Ratio	0.759484
Std Err Dif	0.00314	DF	23.18976
Upper CL Dif	0.00888	Prob > t	0.4552
Lower CL Dif	-0.00411	Prob > t	0.2276
Confidence	0.95	Prob < t	0.7724

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0091897	0.0076087	0.0074911
Isolok - 3 mL - LF	10	0.0067799	0.0051075	0.0049389

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.7561	1	24	0.1976
Brown-Forsythe	1.6689	1	24	0.2087
Levene	1.8731	1	24	0.1838
Bartlett	0.9343	1	.	0.3337
F Test 2-sided	1.8372	15	9	0.3589

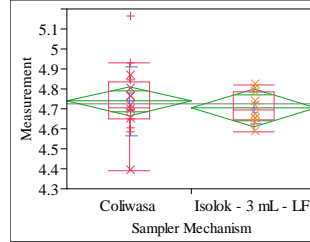
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5768	1	23.19	0.4552

t Test

0.7595

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Li2O (wt%), Target Value=4.674



**Oneway Anova
Summary of Fit**

Rsquare	0.013957
Adj Rsquare	-0.02713
Root Mean Square Error	0.143174
Mean of Response	4.724787
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03364	t Ratio	-0.58284
Std Err Dif	0.05772	DF	24
Upper CL Dif	0.08548	Prob > t	0.5654
Lower CL Dif	-0.15276	Prob > t	0.7173
Confidence	0.95	Prob < t	0.2827

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00696361	0.006964	0.3397	0.5654
Error	24	0.49197399	0.020499		
C. Total	25	0.49893760			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.73773	0.03579	4.6639	4.8116
Isolok - 3 mL - LF	10	4.70409	0.04528	4.6106	4.7975

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.73773	0.170332	0.04258	4.6470	4.8285
Isolok - 3 mL - LF	10	4.70409	0.079427	0.02512	4.6473	4.7609

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03364	t Ratio	-0.68042
Std Err Dif	0.04944	DF	22.67798
Upper CL Dif	0.06871	Prob > t	0.5031
Lower CL Dif	-0.13599	Prob > t	0.7484
Confidence	0.95	Prob < t	0.2516

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1703321	0.1199233	0.1170639
Isolok - 3 mL - LF	10	0.0794275	0.0667399	0.0667399

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.5824	1	24	0.2205
Brown-Forsythe	1.5117	1	24	0.2308
Levene	1.9222	1	24	0.1784
Bartlett	5.1612	1	.	0.0231
F Test 2-sided	4.5989	15	9	0.0260

Welch Anova testing Means Equal, allowing Std Devs Not Equal

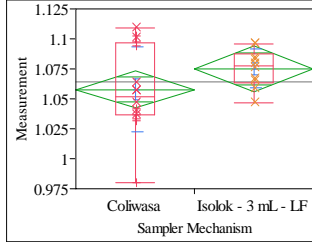
F Ratio	DFNum	DFDen	Prob > F
0.4630	1	22.678	0.5031

t Test

0.6804

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=MgO (wt%), Target Value=1.014



**Oneway Anova
Summary of Fit**

Rsquare	0.080061
Adj Rsquare	0.04173
Root Mean Square Error	0.029496
Mean of Response	1.064501
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.01718	t Ratio	1.445226
Std Err Dif	0.01189	DF	24
Upper CL Dif	0.04172	Prob > t	0.1613
Lower CL Dif	-0.00736	Prob > t	0.0807
Confidence	0.95	Prob < t	0.9193

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00181720	0.001817	2.0887	0.1613
Error	24	0.02088054	0.000870		
C. Total	25	0.02269774			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.05789	0.00737	1.0427	1.0731
Isolok - 3 mL - LF	10	1.07508	0.00933	1.0558	1.0943

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.05789	0.035139	0.00878	1.0392	1.0766
Isolok - 3 mL - LF	10	1.07508	0.016192	0.00512	1.0635	1.0867

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.01718	t Ratio	1.690012
Std Err Dif	0.01017	DF	22.58007
Upper CL Dif	0.03824	Prob > t	0.1048
Lower CL Dif	-0.00387	Prob > t	0.0524
Confidence	0.95	Prob < t	0.9476

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0351386	0.0276470	0.0272583
Isolok - 3 mL - LF	10	0.0161924	0.0130011	0.0127689

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.1455	1	24	0.0888
Brown-Forsythe	3.8169	1	24	0.0625
Levene	4.5514	1	24	0.0433
Bartlett	5.3031	1	.	0.0213
F Test 2-sided	4.7092	15	9	0.0239

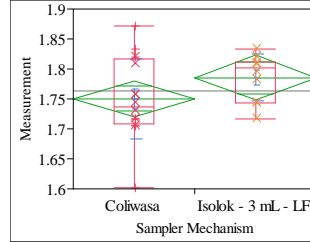
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.8561	1	22.58	0.1048

t Test

1.6900

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=MnO (wt%), Target Value=1.779



**Oneway Anova
Summary of Fit**

Rsquare	0.086987
Adj Rsquare	0.048945
Root Mean Square Error	0.057987
Mean of Response	1.763978
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.03535	t Ratio	1.512145
Std Err Dif	0.02338	DF	24
Upper CL Dif	0.08359	Prob > t	0.1436
Lower CL Dif	-0.01290	Prob > t	0.0718
Confidence	0.95	Prob < t	0.9282

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00768851	0.007689	2.2866	0.1436
Error	24	0.08069861	0.003362		
C. Total	25	0.08838711			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.75038	0.01450	1.7205	1.7803
Isolok - 3 mL - LF	10	1.78573	0.01834	1.7479	1.8236

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.75038	0.067005	0.01675	1.7147	1.7861
Isolok - 3 mL - LF	10	1.78573	0.038520	0.01218	1.7582	1.8133

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.03535	t Ratio	1.706586
Std Err Dif	0.02071	DF	23.91354
Upper CL Dif	0.07810	Prob > t	0.1009
Lower CL Dif	-0.00741	Prob > t	0.0504
Confidence	0.95	Prob < t	0.9496

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0670047	0.0517489	0.0508410
Isolok - 3 mL - LF	10	0.0385202	0.0315053	0.0296976

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.8890	1	24	0.1820
Brown-Forsythe	1.8374	1	24	0.1879
Levene	2.1674	1	24	0.1540
Bartlett	2.8947	1	.	0.0889
F Test 2-sided	3.0257	15	9	0.0981

Welch Anova testing Means Equal, allowing Std Devs Not Equal

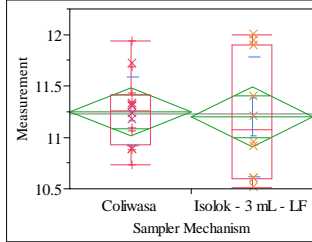
F Ratio	DFNum	DFDen	Prob > F
2.9124	1	23.914	0.1009

t Test

1.7066

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Na2O (wt%), Target Value=11.659



**Oneway Anova
Summary of Fit**

Rsquare	0.003394
Adj Rsquare	-0.03813
Root Mean Square Error	0.4445
Mean of Response	11.22936
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.05122	t Ratio	-0.28587
Std Err Dif	0.17918	DF	24
Upper CL Dif	0.31859	Prob > t	0.7774
Lower CL Dif	-0.42104	Prob > t	0.6113
Confidence	0.95	Prob < t	0.3887

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.0161471	0.016147	0.0817	0.7774
Error	24	4.7419328	0.197581		
C. Total	25	4.7580798			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.2491	0.11113	11.020	11.478
Isolok - 3 mL - LF	10	11.1978	0.14056	10.908	11.488

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.2491	0.335613	0.08390	11.070	11.428
Isolok - 3 mL - LF	10	11.1978	0.582370	0.18416	10.781	11.614

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.05122	t Ratio	-0.25312
Std Err Dif	0.20237	DF	12.79327
Upper CL Dif	0.38670	Prob > t	0.8042
Lower CL Dif	-0.48915	Prob > t	0.5979
Confidence	0.95	Prob < t	0.4021

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3356132	0.2578050	0.2578050
Isolok - 3 mL - LF	10	0.5823696	0.4866280	0.4866280

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	7.3012	1	24	0.0124
Brown-Forsythe	5.2708	1	24	0.0307
Levene	5.9012	1	24	0.0230
Bartlett	3.4122	1	.	0.0647
F Test 2-sided	3.0111	9	15	0.0575

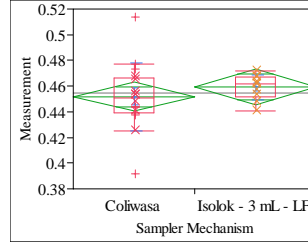
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0641	1	12.793	0.8042

t Test

0.2531

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=NiO (wt%), Target Value=0.41



**Oneway Anova
Summary of Fit**

Rsquare	0.029122
Adj Rsquare	-0.01133
Root Mean Square Error	0.021579
Mean of Response	0.454576
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00738	t Ratio	0.848461
Std Err Dif	0.00870	DF	24
Upper CL Dif	0.02533	Prob > t	0.4046
Lower CL Dif	-0.01057	Prob > t	0.2023
Confidence	0.95	Prob < t	0.7977

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00033521	0.000335	0.7199	0.4046
Error	24	0.01117546	0.000466		
C. Total	25	0.01151067			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.451738	0.00539	0.44060	0.46287
Isolok - 3 mL - LF	10	0.459118	0.00682	0.44503	0.47320

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.451738	0.026239	0.00656	0.43776	0.46572
Isolok - 3 mL - LF	10	0.459118	0.009706	0.00307	0.45217	0.46606

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00738	t Ratio	1.01907
Std Err Dif	0.00724	DF	20.63798
Upper CL Dif	0.02246	Prob > t	0.3200
Lower CL Dif	-0.00770	Prob > t	0.1600
Confidence	0.95	Prob < t	0.8400

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0262394	0.0179741	0.0179741
Isolok - 3 mL - LF	10	0.0097059	0.0076859	0.0071260

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.8841	1	24	0.1826
Brown-Forsythe	3.1021	1	24	0.0909
Levene	2.8866	1	24	0.1022
Bartlett	8.1454	1	.	0.0043
F Test 2-sided	7.3086	15	9	0.0049

Welch Anova testing Means Equal, allowing Std Devs Not Equal

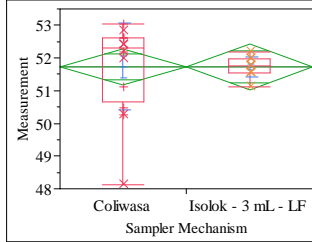
F Ratio	DFNum	DFDen	Prob > F
1.0385	1	20.638	0.3200

t Test

1.0191

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=SiO2 (wt%), Target Value=50.985



**Oneway Anova
Summary of Fit**

Rsquare	1.619e-6
Adj Rsquare	-0.04166
Root Mean Square Error	1.064322
Mean of Response	51.72992
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00267	t Ratio	-0.00623
Std Err Dif	0.42904	DF	24
Upper CL Dif	0.88282	Prob > t	0.9951
Lower CL Dif	-0.88817	Prob > t	0.5025
Confidence	0.95	Prob < t	0.4975

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.000044	0.000044	0.0000	0.9951
Error	24	27.186747	1.13278		
C. Total	25	27.186791			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	51.7309	0.26608	51.182	52.280
Isolok - 3 mL - LF	10	51.7283	0.33657	51.034	52.423

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	51.7309	1.32618	0.33154	51.024	52.438
Isolok - 3 mL - LF	10	51.7283	0.29916	0.09460	51.514	51.942

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00267	t Ratio	-0.00776
Std Err Dif	0.34478	DF	17.35033
Upper CL Dif	0.72363	Prob > t	0.9939
Lower CL Dif	-0.72897	Prob > t	0.5030
Confidence	0.95	Prob < t	0.4970

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	1.326179	1.044580	0.8958319
Isolok - 3 mL - LF	10	0.299162	0.222487	0.2139300

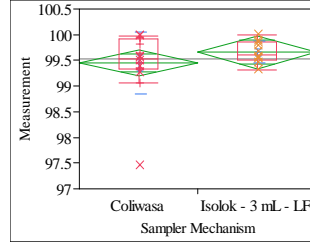
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.3612	1	24	0.1375
Brown-Forsythe	3.5776	1	24	0.0707
Levene	10.8103	1	24	0.0031
Bartlett	15.5400	1	.	<.0001
F Test 2-sided	19.6513	15	9	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0001	1	17.35	0.9939

t Test
0.0078

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=Sum of Oxides (wt%), Target Value=99.553



**Oneway Anova
Summary of Fit**

Rsquare	0.043725
Adj Rsquare	0.003881
Root Mean Square Error	0.49698
Mean of Response	99.5304
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.20987	t Ratio	1.047565
Std Err Dif	0.20034	DF	24
Upper CL Dif	0.62335	Prob > t	0.3053
Lower CL Dif	-0.20361	Prob > t	0.1526
Confidence	0.95	Prob < t	0.8474

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.2710437	0.271044	1.0974	0.3053
Error	24	5.9277347	0.246989		
C. Total	25	6.1987784			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	99.4497	0.12424	99.193	99.706
Isolok - 3 mL - LF	10	99.6596	0.15716	99.335	99.984

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	99.4497	0.606723	0.15168	99.126	99.773
Isolok - 3 mL - LF	10	99.6596	0.212403	0.06717	99.508	99.811

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.20987	t Ratio	1.265125
Std Err Dif	0.16589	DF	20.1671
Upper CL Dif	0.55572	Prob > t	0.2203
Lower CL Dif	-0.13598	Prob > t	0.1101
Confidence	0.95	Prob < t	0.8899

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.6067234	0.3605186	0.3554267
Isolok - 3 mL - LF	10	0.2124031	0.1738794	0.1738794

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8561	1	24	0.3641
Brown-Forsythe	1.3139	1	24	0.2630
Levene	1.4509	1	24	0.2401
Bartlett	8.9111	1	.	0.0028
F Test 2-sided	8.1594	15	9	0.0032

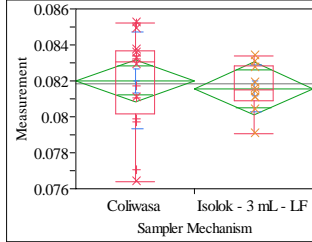
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6005	1	20.167	0.2203

t Test
1.2651

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=TiO2 (wt%), Target Value=0.0711



**Oneway Anova
Summary of Fit**

Rsquare	0.010412
Adj Rsquare	-0.03082
Root Mean Square Error	0.002264
Mean of Response	0.081847
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming equal variances

Difference	-0.00046	t Ratio	-0.50252
Std Err Dif	0.00091	DF	24
Upper CL Dif	0.00143	Prob > t	0.6199
Lower CL Dif	-0.00234	Prob > t	0.6901
Confidence	0.95	Prob < t	0.3099

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000129	1.2948e-6	0.2525	0.6199
Error	24	0.00012306	5.1274e-6		
C. Total	25	0.00012435			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	16	0.082024	0.00057	0.08086	0.08319
Isolok - 3 mL - LF	10	0.081565	0.00072	0.08009	0.08304

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	16	0.082024	0.002681	0.00067	0.08060	0.08345
Isolok - 3 mL - LF	10	0.081565	0.001302	0.00041	0.08063	0.08250

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming unequal variances

Difference	-0.00046	t Ratio	-0.5832
Std Err Dif	0.00079	DF	22.99606
Upper CL Dif	0.00117	Prob > t	0.5654
Lower CL Dif	-0.00209	Prob > t	0.7173
Confidence	0.95	Prob < t	0.2827

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	16	0.0026809	0.0021528	0.0020433
Isolok - 3 mL - LF	10	0.0013016	0.0009674	0.0009674

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.8547	1	24	0.1041
Brown-Forsythe	2.6563	1	24	0.1162
Levene	5.2469	1	24	0.0311
Bartlett	4.6885	1	.	0.0304
F Test 2-sided	4.2427	15	9	0.0340

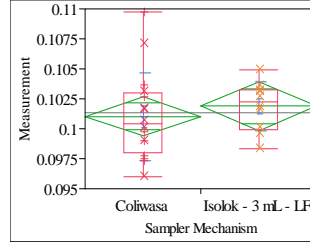
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3401	1	22.996	0.5654

t Test

0.5832

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=ZnO (wt%), Target Value=0.0958



**Oneway Anova
Summary of Fit**

Rsquare	0.018504
Adj Rsquare	-0.02239
Root Mean Square Error	0.003156
Mean of Response	0.10136
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming equal variances

Difference	0.00086	t Ratio	0.672656
Std Err Dif	0.00127	DF	24
Upper CL Dif	0.00348	Prob > t	0.5076
Lower CL Dif	-0.00177	Prob > t	0.2538
Confidence	0.95	Prob < t	0.7462

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000451	4.507e-6	0.4525	0.5076
Error	24	0.00023906	9.961e-6		
C. Total	25	0.00024357			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	16	0.101031	0.00079	0.09940	0.10266
Isolok - 3 mL - LF	10	0.101887	0.00100	0.09983	0.10395

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	16	0.101031	0.003669	0.00092	0.09908	0.10299
Isolok - 3 mL - LF	10	0.101887	0.002031	0.00064	0.10043	0.10334

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming unequal variances

Difference	0.00086	t Ratio	0.764235
Std Err Dif	0.00112	DF	23.78559
Upper CL Dif	0.00317	Prob > t	0.4522
Lower CL Dif	-0.00146	Prob > t	0.2261
Confidence	0.95	Prob < t	0.7739

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	16	0.0036691	0.0027950	0.0027541
Isolok - 3 mL - LF	10	0.0020313	0.0016058	0.0016058

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.7364	1	24	0.2000
Brown-Forsythe	1.9510	1	24	0.1753
Levene	2.3656	1	24	0.1371
Bartlett	3.2662	1	.	0.0707
F Test 2-sided	3.2627	15	9	0.0783

Welch Anova testing Means Equal, allowing Std Devs Not Equal

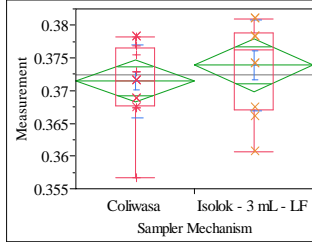
F Ratio	DFNum	DFDen	Prob > F
0.5841	1	23.786	0.4522

t Test

0.7642

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=1, Analyte=ZrO2 (wt%), Target Value=0.3547



**Oneway Anova
Summary of Fit**

Rsquare	0.038675
Adj Rsquare	-0.00138
Root Mean Square Error	0.006138
Mean of Response	0.372405
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00243	t Ratio	0.98262
Std Err Dif	0.00247	DF	24
Upper CL Dif	0.00754	Prob > t	0.3356
Lower CL Dif	-0.00268	Prob > t	0.1678
Confidence	0.95	Prob < t	0.8322

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00003638	0.000036	0.9655	0.3356
Error	24	0.00090430	0.000038		
C. Total	25	0.00094068			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.371470	0.00153	0.36830	0.37464
Isolok - 3 mL - LF	10	0.373901	0.00194	0.36990	0.37791

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.371470	0.005602	0.00140	0.36848	0.37446
Isolok - 3 mL - LF	10	0.373901	0.006941	0.00219	0.36894	0.37887

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00243	t Ratio	0.933884
Std Err Dif	0.00260	DF	16.20924
Upper CL Dif	0.00794	Prob > t	0.3641
Lower CL Dif	-0.00308	Prob > t	0.1820
Confidence	0.95	Prob < t	0.8180

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0056022	0.0040524	0.0040524
Isolok - 3 mL - LF	10	0.0069405	0.0055113	0.0054032

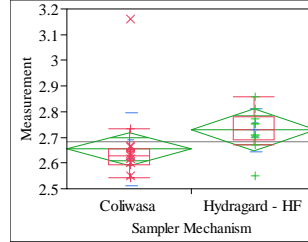
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.4881	1	24	0.4915
Brown-Forsythe	0.6698	1	24	0.4212
Levene	0.9305	1	24	0.3444
Bartlett	0.5082	1	.	0.4759
F Test 2-sided	1.5349	9	15	0.4451

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8721	1	16.209	0.3641

t Test
0.9339

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Al/B, Target Value=2.552



**Oneway Anova
Summary of Fit**

Rsquare	0.083487
Adj Rsquare	0.045299
Root Mean Square Error	0.124529
Mean of Response	2.682538
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.07422	t Ratio	1.478587
Std Err Dif	0.05020	DF	24
Upper CL Dif	0.17783	Prob > t	0.1523
Lower CL Dif	-0.02938	Prob > t	0.0761
Confidence	0.95	Prob < t	0.9239

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.03390294	0.033903	2.1862	0.1523
Error	24	0.37218165	0.015508		
C. Total	25	0.40608459			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.65399	0.03113	2.5897	2.7182
Hydragard - HF	10	2.72821	0.03938	2.6469	2.8095

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.65399	0.143267	0.03582	2.5776	2.7303
Hydragard - HF	10	2.72821	0.084525	0.02673	2.6677	2.7887

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.07422	t Ratio	1.660829
Std Err Dif	0.04469	DF	23.96943
Upper CL Dif	0.16647	Prob > t	0.1098
Lower CL Dif	-0.01802	Prob > t	0.0549
Confidence	0.95	Prob < t	0.9451

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1432669	0.0742898	0.0698653
Hydragard - HF	10	0.0845252	0.0614414	0.0614414

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3603	1	24	0.5540
Brown-Forsythe	0.0392	1	24	0.8446
Levene	0.0991	1	24	0.7557
Bartlett	2.6496	1	.	0.1036
F Test 2-sided	2.8729	15	9	0.1140

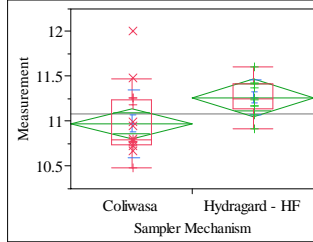
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.7584	1	23.969	0.1098

t Test
1.6608

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Al2O3 (wt%), Target Value=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.171884
Adj Rsquare	0.137379
Root Mean Square Error	0.323155
Mean of Response	11.08628
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.290747	t Ratio	2.231913
Std Err Dif	0.130268	DF	24
Upper CL Dif	0.559607	Prob > t	0.0352
Lower CL Dif	0.021887	Prob > t	0.0176
Confidence	0.95	Prob < t	0.9824

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.5202074	0.520207	4.9814	0.0352
Error	24	2.5063010	0.104429		
C. Total	25	3.0265084			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.9745	0.08079	10.808	11.141
Hydragard - HF	10	11.2652	0.10219	11.054	11.476

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.9745	0.379171	0.09479	10.772	11.176
Hydragard - HF	10	11.2652	0.197129	0.06234	11.124	11.406

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.290747	t Ratio	2.5627
Std Err Dif	0.113453	DF	23.46504
Upper CL Dif	0.525186	Prob > t	0.0172
Lower CL Dif	0.056308	Prob > t	0.0086
Confidence	0.95	Prob < t	0.9914

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3791713	0.2884440	0.2633491
Hydragard - HF	10	0.1971288	0.1519158	0.1511600

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3511	1	24	0.2565
Brown-Forsythe	1.1163	1	24	0.3012
Levene	2.9153	1	24	0.1006
Bartlett	3.9233	1	.	0.0476
F Test 2-sided	3.6997	15	9	0.0531

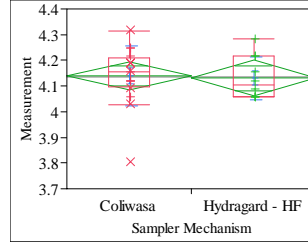
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.5674	1	23.465	0.0172

t Test

2.5627

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=B2O3 (wt%), Target Value=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.001628
Adj Rsquare	-0.03997
Root Mean Square Error	0.105988
Mean of Response	4.136333
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00845	t Ratio	-0.19783
Std Err Dif	0.04272	DF	24
Upper CL Dif	0.07973	Prob > t	0.8448
Lower CL Dif	-0.09663	Prob > t	0.5776
Confidence	0.95	Prob < t	0.4224

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00043963	0.000440	0.0391	0.8448
Error	24	0.26960054	0.011233		
C. Total	25	0.27004017			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.13958	0.02650	4.0849	4.1943
Hydragard - HF	10	4.13113	0.03352	4.0620	4.2003

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.13958	0.117556	0.02939	4.0769	4.2022
Hydragard - HF	10	4.13113	0.083207	0.02631	4.0716	4.1907

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00845	t Ratio	-0.21427
Std Err Dif	0.03945	DF	23.50944
Upper CL Dif	0.07305	Prob > t	0.8322
Lower CL Dif	-0.08996	Prob > t	0.5839
Confidence	0.95	Prob < t	0.4161

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1175558	0.0802459	0.0784851
Hydragard - HF	10	0.0832067	0.0695498	0.0676179

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4553	1	24	0.5063
Brown-Forsythe	0.1291	1	24	0.7225
Levene	0.1430	1	24	0.7087
Bartlett	1.1940	1	.	0.2745
F Test 2-sided	1.9960	15	9	0.2966

Welch Anova testing Means Equal, allowing Std Devs Not Equal

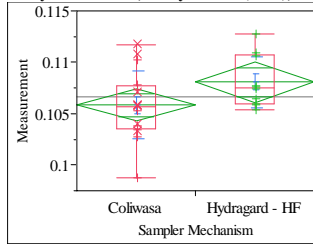
F Ratio	DFNum	DFDen	Prob > F
0.0459	1	23.509	0.8322

t Test

0.2143

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=BaO (wt%), Target Value=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.122875
Adj Rsquare	0.086329
Root Mean Square Error	0.003034
Mean of Response	0.106686
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00224	t Ratio	1.833613
Std Err Dif	0.00122	DF	24
Upper CL Dif	0.00477	Prob > t	0.0791
Lower CL Dif	-0.00028	Prob > t	0.0396
Confidence	0.95	Prob < t	0.9604

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00003095	0.000031	3.3621	0.0791
Error	24	0.00022096	9.207e-6		
C. Total	25	0.00025191			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.105823	0.00076	0.10426	0.10739
Hydragard - HF	10	0.108066	0.00096	0.10609	0.11005

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.105823	0.003310	0.00083	0.10406	0.10759
Hydragard - HF	10	0.108066	0.002508	0.00079	0.10627	0.10986

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00224	t Ratio	1.956712
Std Err Dif	0.00115	DF	22.94631
Upper CL Dif	0.00461	Prob > t	0.0627
Lower CL Dif	-0.00013	Prob > t	0.0313
Confidence	0.95	Prob < t	0.9687

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0033101	0.0024860	0.0024633
Hydragard - HF	10	0.0025079	0.0020164	0.0018646

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7543	1	24	0.3937
Brown-Forsythe	0.5727	1	24	0.4566
Levene	0.3999	1	24	0.5331
Bartlett	0.7831	1	.	0.3762
F Test 2-sided	1.7421	15	9	0.4033

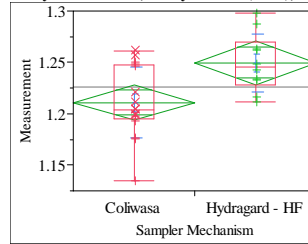
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.8287	1	22.946	0.0627

t Test

1.9567

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=CaO (wt%), Target Value=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.266741
Adj Rsquare	0.236189
Root Mean Square Error	0.032495
Mean of Response	1.225807
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.038705	t Ratio	2.954759
Std Err Dif	0.013099	DF	24
Upper CL Dif	0.065741	Prob > t	0.0069
Lower CL Dif	0.011670	Prob > t	0.0035
Confidence	0.95	Prob < t	0.9965

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00921911	0.009219	8.7306	0.0069
Error	24	0.02534289	0.001056		
C. Total	25	0.03456201			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.21092	0.00812	1.1942	1.2277
Hydragard - HF	10	1.24963	0.01028	1.2284	1.2708

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.21092	0.034678	0.00867	1.1942	1.2294
Hydragard - HF	10	1.24963	0.028488	0.00901	1.2292	1.2700

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.038705	t Ratio	3.095746
Std Err Dif	0.012503	DF	22.04472
Upper CL Dif	0.064631	Prob > t	0.0053
Lower CL Dif	0.012779	Prob > t	0.0026
Confidence	0.95	Prob < t	0.9974

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0346782	0.0271751	0.0261475
Hydragard - HF	10	0.0284882	0.0225551	0.0222473

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4651	1	24	0.5018
Brown-Forsythe	0.2126	1	24	0.6489
Levene	0.3735	1	24	0.5468
Bartlett	0.4004	1	.	0.5269
F Test 2-sided	1.4818	15	9	0.5598

Welch Anova testing Means Equal, allowing Std Devs Not Equal

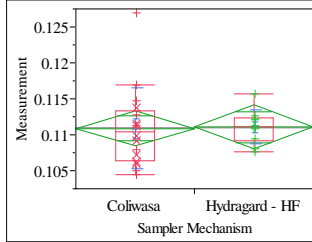
F Ratio	DFNum	DFDen	Prob > F
9.5836	1	22.045	0.0053

t Test

3.0957

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Cr2O3 (wt%), Target Value=0.0998



**Oneway Anova
Summary of Fit**

Rsquare	0.000516
Adj Rsquare	-0.04113
Root Mean Square Error	0.004684
Mean of Response	0.110952
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00021	t Ratio	0.111284
Std Err Dif	0.00189	DF	24
Upper CL Dif	0.00411	Prob > t	0.9123
Lower CL Dif	-0.00369	Prob > t	0.4562
Confidence	0.95	Prob < t	0.5438

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000027	2.717e-7	0.0124	0.9123
Error	24	0.00052646	0.000022		
C. Total	25	0.00052673			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.110871	0.00117	0.10845	0.11329
Hydragard - HF	10	0.111082	0.00148	0.10802	0.11414

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.110871	0.005628	0.00141	0.10787	0.11387
Hydragard - HF	10	0.111082	0.002388	0.00076	0.10937	0.11279

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00021	t Ratio	0.131575
Std Err Dif	0.00160	DF	21.86172
Upper CL Dif	0.00352	Prob > t	0.8965
Lower CL Dif	-0.00310	Prob > t	0.4483
Confidence	0.95	Prob < t	0.5517

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0056282	0.0039737	0.0039737
Hydragard - HF	10	0.0023878	0.0017247	0.0017247

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3544	1	24	0.2560
Brown-Forsythe	3.0211	1	24	0.0950
Levene	3.0608	1	24	0.0930
Bartlett	6.3277	1	.	0.0119
F Test 2-sided	5.5559	15	9	0.0134

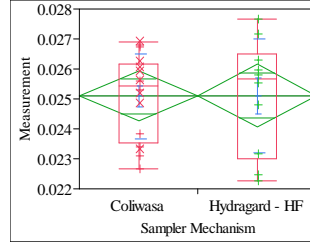
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0173	1	21.862	0.8965

t Test

0.1316

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=CuO (wt%), Target Value=0.0504



**Oneway Anova
Summary of Fit**

Rsquare	0.000058
Adj Rsquare	-0.04161
Root Mean Square Error	0.001611
Mean of Response	0.025096
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	2.425e-5	t Ratio	0.037342
Std Err Dif	0.00065	DF	24
Upper CL Dif	0.00136	Prob > t	0.9705
Lower CL Dif	-0.00132	Prob > t	0.4853
Confidence	0.95	Prob < t	0.5147

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	3.61993e-9	3.6199e-9	0.0014	0.9705
Error	24	0.00006230	2.596e-6		
C. Total	25	0.00006231			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.00040	0.02426	0.02592
Hydragard - HF	10	0.025111	0.00051	0.02406	0.02616

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.001412	0.00035	0.02433	0.02584
Hydragard - HF	10	0.025111	0.001897	0.00060	0.02375	0.02647

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	2.425e-5	t Ratio	0.03484
Std Err Dif	0.00070	DF	15.21311
Upper CL Dif	0.00151	Prob > t	0.9727
Lower CL Dif	-0.00146	Prob > t	0.4863
Confidence	0.95	Prob < t	0.5137

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0014119	0.0011726	0.0011384
Hydragard - HF	10	0.0018975	0.0015497	0.0014646

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.1891	1	24	0.1520
Brown-Forsythe	0.6243	1	24	0.4372
Levene	1.2897	1	24	0.2673
Bartlett	0.9745	1	.	0.3236
F Test 2-sided	1.8062	9	15	0.2992

Welch Anova testing Means Equal, allowing Std Devs Not Equal

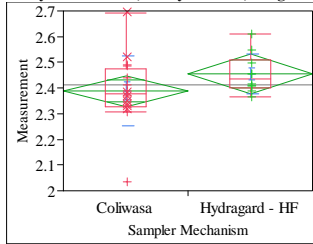
F Ratio	DFNum	DFDen	Prob > F
0.0012	1	15.213	0.9727

t Test

0.0348

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Fe/Li, Target Value=2.452



**Oneway Anova
Summary of Fit**

Rsquare	0.07819
Adj Rsquare	0.039782
Root Mean Square Error	0.117325
Mean of Response	2.413936
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.06748	t Ratio	1.426795
Std Err Dif	0.04730	DF	24
Upper CL Dif	0.16509	Prob > t	0.1665
Lower CL Dif	-0.03013	Prob > t	0.0833
Confidence	0.95	Prob < t	0.9167

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.02802216	0.028022	2.0357	0.1665
Error	24	0.33036159	0.013765		
C. Total	25	0.35838374			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.38798	0.02933	2.3274	2.4485
Hydragard - HF	10	2.45546	0.03710	2.3789	2.5320

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.38798	0.135952	0.03399	2.3155	2.4604
Hydragard - HF	10	2.45546	0.076825	0.02429	2.4005	2.5104

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.06748	t Ratio	1.615221
Std Err Dif	0.04178	DF	23.86176
Upper CL Dif	0.15373	Prob > t	0.1194
Lower CL Dif	-0.01877	Prob > t	0.0597
Confidence	0.95	Prob < t	0.9403

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1359518	0.0887676	0.0880401
Hydragard - HF	10	0.0768246	0.0584781	0.0584781

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9485	1	24	0.3398
Brown-Forsythe	0.7232	1	24	0.4035
Levene	0.7966	1	24	0.3810
Bartlett	3.0619	1	.	0.0801
F Test 2-sided	3.1316	15	9	0.0886

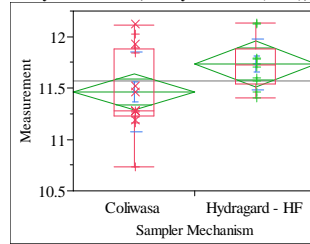
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.6089	1	23.862	0.1194

t Test

1.6152

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Fe2O3 (wt%), Target Value=11.462



**Oneway Anova
Summary of Fit**

Rsquare	0.139274
Adj Rsquare	0.10341
Root Mean Square Error	0.339251
Mean of Response	11.56627
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.26950	t Ratio	1.970643
Std Err Dif	0.13676	DF	24
Upper CL Dif	0.55175	Prob > t	0.0604
Lower CL Dif	-0.01275	Prob > t	0.0302
Confidence	0.95	Prob < t	0.9698

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.4469502	0.446950	3.8834	0.0604
Error	24	2.7621958	0.115091		
C. Total	25	3.2091461			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.4626	0.08481	11.288	11.638
Hydragard - HF	10	11.7321	0.10728	11.511	11.954

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.4626	0.384321	0.09608	11.288	11.667
Hydragard - HF	10	11.7321	0.246455	0.07794	11.556	11.908

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.269498	t Ratio	2.178382
Std Err Dif	0.123715	DF	23.9512
Upper CL Dif	0.524861	Prob > t	0.0395
Lower CL Dif	0.014136	Prob > t	0.0197
Confidence	0.95	Prob < t	0.9803

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3843208	0.3154276	0.2913014
Hydragard - HF	10	0.2464546	0.1830016	0.1830016

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.2188	1	24	0.1494
Brown-Forsythe	1.0534	1	24	0.3150
Levene	3.1004	1	24	0.0910
Bartlett	1.9228	1	.	0.1655
F Test 2-sided	2.4317	15	9	0.1807

Welch Anova testing Means Equal, allowing Std Devs Not Equal

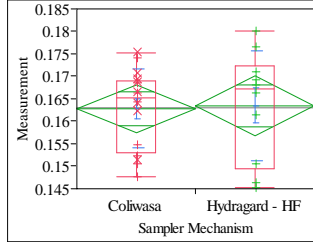
F Ratio	DFNum	DFDen	Prob > F
4.7453	1	23.951	0.0395

t Test

2.1784

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=K2O (wt%), Target Value=0.1591



Oneway Anova
Summary of Fit

Rsquare	0.000926
Adj Rsquare	-0.0407
Root Mean Square Error	0.01027
Mean of Response	0.163084
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00062	t Ratio	0.149119
Std Err Dif	0.00414	DF	24
Upper CL Dif	0.00916	Prob > t	0.8827
Lower CL Dif	-0.00793	Prob > t	0.4414
Confidence	0.95	Prob < t	0.5586

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000235	2.345e-6	0.0222	0.8827
Error	24	0.00253143	0.000105		
C. Total	25	0.00253378			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.162847	0.00257	0.15755	0.16815
Hydragard - HF	10	0.163464	0.00325	0.15676	0.17017

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.162847	0.008824	0.00221	0.15814	0.16755
Hydragard - HF	10	0.163464	0.012308	0.00389	0.15466	0.17227

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00062	t Ratio	0.137991
Std Err Dif	0.00447	DF	14.79527
Upper CL Dif	0.01016	Prob > t	0.8921
Lower CL Dif	-0.00893	Prob > t	0.4461
Confidence	0.95	Prob < t	0.5539

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0088243	0.0073217	0.0070017
Hydragard - HF	10	0.0123082	0.0100705	0.0095163

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.6790	1	24	0.1147
Brown-Forsythe	0.8686	1	24	0.3606
Levene	1.6919	1	24	0.2057
Bartlett	1.2376	1	.	0.2659
F Test 2-sided	1.9455	9	15	0.2446

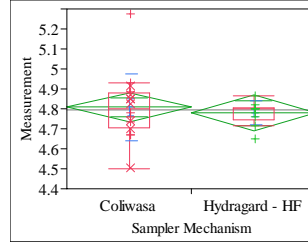
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0190	1	14.795	0.8921

t Test

0.1380

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Li2O (wt%), Target Value=4.674



Oneway Anova
Summary of Fit

Rsquare	0.010884
Adj Rsquare	-0.03033
Root Mean Square Error	0.136405
Mean of Response	4.796827
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.02826	t Ratio	-0.51389
Std Err Dif	0.05499	DF	24
Upper CL Dif	0.08523	Prob > t	0.6120
Lower CL Dif	-0.14174	Prob > t	0.6940
Confidence	0.95	Prob < t	0.3060

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00491352	0.004914	0.2641	0.6120
Error	24	0.44655120	0.018606		
C. Total	25	0.45146472			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.80769	0.03410	4.7373	4.8781
Hydragard - HF	10	4.77944	0.04314	4.6904	4.8685

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.80769	0.166154	0.04154	4.7192	4.8962
Hydragard - HF	10	4.77944	0.060042	0.01899	4.7365	4.8224

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.02826	t Ratio	-0.61869
Std Err Dif	0.04567	DF	20.43592
Upper CL Dif	0.06688	Prob > t	0.5430
Lower CL Dif	-0.12340	Prob > t	0.7285
Confidence	0.95	Prob < t	0.2715

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1661538	0.1143728	0.1143728
Hydragard - HF	10	0.0600415	0.0430580	0.0387522

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.4706	1	24	0.2370
Brown-Forsythe	3.7109	1	24	0.0660
Levene	3.4343	1	24	0.0762
Bartlett	8.4679	1	.	0.0036
F Test 2-sided	7.6580	15	9	0.0041

Welch Anova testing Means Equal, allowing Std Devs Not Equal

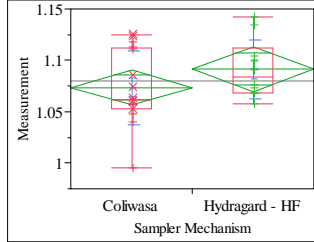
F Ratio	DFNum	DFDen	Prob > F
0.3828	1	20.436	0.5430

t Test

0.6187

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=MgO (wt%), Target Value=1.014



**Oneway Anova
Summary of Fit**

Rsquare	0.068479
Adj Rsquare	0.029665
Root Mean Square Error	0.033526
Mean of Response	1.080446
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.01795	t Ratio	1.328271
Std Err Dif	0.01351	DF	24
Upper CL Dif	0.04584	Prob > t	0.1966
Lower CL Dif	-0.00994	Prob > t	0.0983
Confidence	0.95	Prob < t	0.9017

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00198303	0.001983	1.7643	0.1966
Error	24	0.02697531	0.001124		
C. Total	25	0.02895834			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.07354	0.00838	1.0562	1.0908
Hydragard - HF	10	1.09149	0.01060	1.0696	1.1134

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.07354	0.036052	0.00901	1.0543	1.0928
Hydragard - HF	10	1.09149	0.028827	0.00912	1.0709	1.1121

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.01795	t Ratio	1.400324
Std Err Dif	0.01282	DF	22.37038
Upper CL Dif	0.04451	Prob > t	0.1751
Lower CL Dif	-0.00861	Prob > t	0.0876
Confidence	0.95	Prob < t	0.9124

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0360523	0.0289684	0.0275692
Hydragard - HF	10	0.0288267	0.0229509	0.0228845

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5943	1	24	0.4483
Brown-Forsythe	0.2577	1	24	0.6163
Levene	0.6458	1	24	0.4295
Bartlett	0.5151	1	.	0.4730
F Test 2-sided	1.5641	15	9	0.5040

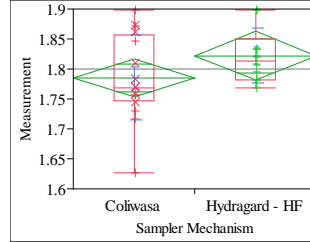
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.9609	1	22.37	0.1751

t Test

1.4003

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=MnO (wt%), Target Value=1.779



**Oneway Anova
Summary of Fit**

Rsquare	0.081423
Adj Rsquare	0.043149
Root Mean Square Error	0.062588
Mean of Response	1.799238
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.03680	t Ratio	1.458555
Std Err Dif	0.02523	DF	24
Upper CL Dif	0.08887	Prob > t	0.1577
Lower CL Dif	-0.01527	Prob > t	0.0788
Confidence	0.95	Prob < t	0.9212

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00833342	0.008333	2.1274	0.1577
Error	24	0.09401326	0.003917		
C. Total	25	0.10234669			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.78508	0.01565	1.7528	1.8174
Hydragard - HF	10	1.82188	0.01979	1.7810	1.8627

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.78508	0.070800	0.01770	1.7474	1.8228
Hydragard - HF	10	1.82188	0.045732	0.01446	1.7892	1.8546

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.03680	t Ratio	1.609987
Std Err Dif	0.02286	DF	23.93453
Upper CL Dif	0.08398	Prob > t	0.1205
Lower CL Dif	-0.01038	Prob > t	0.0603
Confidence	0.95	Prob < t	0.9397

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0708005	0.0556830	0.0532620
Hydragard - HF	10	0.0457319	0.0351206	0.0348624

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.5114	1	24	0.2308
Brown-Forsythe	1.2125	1	24	0.2818
Levene	1.9472	1	24	0.1757
Bartlett	1.8644	1	.	0.1721
F Test 2-sided	2.3968	15	9	0.1878

Welch Anova testing Means Equal, allowing Std Devs Not Equal

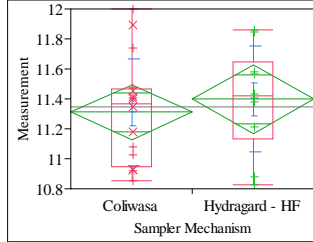
F Ratio	DFNum	DFDen	Prob > F
2.5921	1	23.935	0.1205

t Test

1.6100

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Na2O (wt%), Target Value=11.659



Oneway Anova
Summary of Fit

Rsquare	0.015694
Adj Rsquare	-0.02532
Root Mean Square Error	0.353399
Mean of Response	11.34446
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.08813	t Ratio	0.6186
Std Err Dif	0.14246	DF	24
Upper CL Dif	0.38215	Prob > t	0.5420
Lower CL Dif	-0.20590	Prob > t	0.2710
Confidence	0.95	Prob < t	0.7290

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.0477914	0.047791	0.3827	0.5420
Error	24	2.9973744	0.124891		
C. Total	25	3.0451658			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3106	0.08835	11.128	11.493
Hydragard - HF	10	11.3987	0.11175	11.168	11.629

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3106	0.354346	0.08859	11.122	11.499
Hydragard - HF	10	11.3987	0.351814	0.11125	11.147	11.650

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.08813	t Ratio	0.619667
Std Err Dif	0.14221	DF	19.36073
Upper CL Dif	0.38541	Prob > t	0.5427
Lower CL Dif	-0.20916	Prob > t	0.2714
Confidence	0.95	Prob < t	0.7286

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3543461	0.2855022	0.2822375
Hydragard - HF	10	0.3518139	0.2598944	0.2588160

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0009	1	24	0.9767
Brown-Forsythe	0.0735	1	24	0.7886
Levene	0.0952	1	24	0.7604
Bartlett	0.0006	1	.	0.9812
F Test 2-sided	1.0144	15	9	1.0000

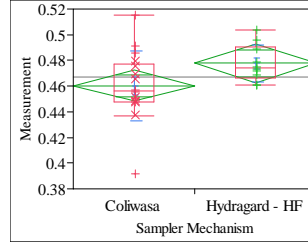
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3840	1	19.361	0.5427

t Test

0.6197

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=NiO (wt%), Target Value=0.41



Oneway Anova
Summary of Fit

Rsquare	0.126022
Adj Rsquare	0.089606
Root Mean Square Error	0.023375
Mean of Response	0.46691
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.01753	t Ratio	1.860277
Std Err Dif	0.00942	DF	24
Upper CL Dif	0.03698	Prob > t	0.0751
Lower CL Dif	-0.00192	Prob > t	0.0376
Confidence	0.95	Prob < t	0.9624

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00189080	0.001891	3.4606	0.0751
Error	24	0.01311298	0.000546		
C. Total	25	0.01500378			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.460168	0.00584	0.44811	0.47223
Hydragard - HF	10	0.477697	0.00739	0.46244	0.49295

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.460168	0.027363	0.00684	0.44559	0.47475
Hydragard - HF	10	0.477697	0.014462	0.00457	0.46735	0.48804

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.017529	t Ratio	2.130238
Std Err Dif	0.008229	DF	23.56049
Upper CL Dif	0.034528	Prob > t	0.0438
Lower CL Dif	0.000529	Prob > t	0.0219
Confidence	0.95	Prob < t	0.9781

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0273627	0.0196641	0.0192466
Hydragard - HF	10	0.0144615	0.0112998	0.0106890

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3805	1	24	0.2515
Brown-Forsythe	1.6814	1	24	0.2071
Levene	1.8290	1	24	0.1888
Bartlett	3.7470	1	.	0.0529
F Test 2-sided	3.5800	15	9	0.0589

Welch Anova testing Means Equal, allowing Std Devs Not Equal

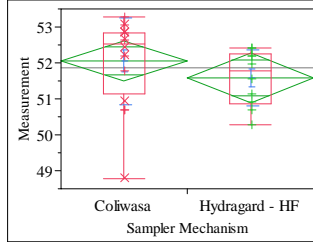
F Ratio	DFNum	DFDen	Prob > F
4.5379	1	23.56	0.0438

t Test

2.1302

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=SiO2 (wt%), Target Value=50.985



**Oneway Anova
Summary of Fit**

Rsquare	0.047933
Adj Rsquare	0.008264
Root Mean Square Error	1.068167
Mean of Response	51.8698
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	-0.4733	t Ratio	-1.09923
Std Err Dif	0.4306	DF	24
Upper CL Dif	0.4154	Prob > t	0.2826
Lower CL Dif	-1.3620	Prob > t	0.8587
Confidence	0.95	Prob < t	0.1413

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	1.378658	1.37866	1.2083	0.2826
Error	24	27.383541	1.14098		
C. Total	25	28.762199			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	52.0518	0.26704	51.501	52.603
Hydragard - HF	10	51.5785	0.33778	50.881	52.276

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	52.0518	1.20946	0.30237	51.407	52.696
Hydragard - HF	10	51.5785	0.77757	0.24589	51.022	52.135

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	-0.4733	t Ratio	-1.21449
Std Err Dif	0.3897	DF	23.94561
Upper CL Dif	0.3311	Prob > t	0.2364
Lower CL Dif	-1.2778	Prob > t	0.8818
Confidence	0.95	Prob < t	0.1182

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	1.209462	0.9242445	0.8423494
Hydragard - HF	10	0.777573	0.6631830	0.6631830

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8793	1	24	0.3577
Brown-Forsythe	0.3057	1	24	0.5854
Levene	1.0803	1	24	0.3090
Bartlett	1.9022	1	.	0.1678
F Test 2-sided	2.4194	15	9	0.1832

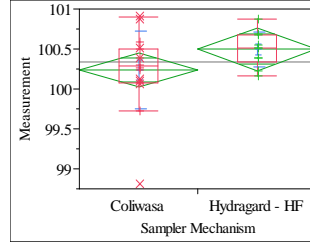
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.4750	1	23.946	0.2364

t Test

1.2145

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=Sum of Oxides (wt%), Target Value=99.553



**Oneway Anova
Summary of Fit**

Rsquare	0.094732
Adj Rsquare	0.057013
Root Mean Square Error	0.407634
Mean of Response	100.3357
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.26041	t Ratio	1.584769
Std Err Dif	0.16432	DF	24
Upper CL Dif	0.59956	Prob > t	0.1261
Lower CL Dif	-0.07873	Prob > t	0.0631
Confidence	0.95	Prob < t	0.9369

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.4173240	0.417324	2.5115	0.1261
Error	24	3.9879754	0.166166		
C. Total	25	4.4052993			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	100.236	0.10191	100.03	100.45
Hydragard - HF	10	100.496	0.12891	100.23	100.76

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	100.236	0.487652	0.12191	99.98	100.50
Hydragard - HF	10	100.496	0.216257	0.06839	100.34	100.65

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.26041	t Ratio	1.862973
Std Err Dif	0.13978	DF	22.25281
Upper CL Dif	0.55012	Prob > t	0.0757
Lower CL Dif	-0.02929	Prob > t	0.0379
Confidence	0.95	Prob < t	0.9621

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.4876524	0.3196610	0.3155839
Hydragard - HF	10	0.2162567	0.1651795	0.1628642

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.1118	1	24	0.3022
Brown-Forsythe	1.5904	1	24	0.2194
Levene	1.6944	1	24	0.2054
Bartlett	5.7714	1	.	0.0163
F Test 2-sided	5.0849	15	9	0.0184

Welch Anova testing Means Equal, allowing Std Devs Not Equal

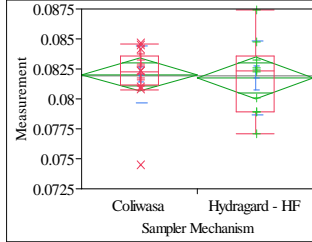
F Ratio	DFNum	DFDen	Prob > F
3.4707	1	22.253	0.0757

t Test

1.8630

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=TiO2 (wt%), Target Value=0.0711



**Oneway Anova
Summary of Fit**

Rsquare	0.002946
Adj Rsquare	-0.0386
Root Mean Square Error	0.002661
Mean of Response	0.081924
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00029	t Ratio	-0.26631
Std Err Dif	0.00107	DF	24
Upper CL Dif	0.00193	Prob > t	0.7923
Lower CL Dif	-0.00250	Prob > t	0.6039
Confidence	0.95	Prob < t	0.3961

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000050	5.0211e-7	0.0709	0.7923
Error	24	0.00016992	7.08e-6		
C. Total	25	0.00017042			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.082034	0.00067	0.08066	0.08341
Hydragard - HF	10	0.081749	0.00084	0.08001	0.08349

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.082034	0.002372	0.00059	0.08077	0.08330
Hydragard - HF	10	0.081749	0.003082	0.00097	0.07954	0.08395

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00029	t Ratio	-0.25036
Std Err Dif	0.00114	DF	15.61492
Upper CL Dif	0.00214	Prob > t	0.8056
Lower CL Dif	-0.00271	Prob > t	0.5972
Confidence	0.95	Prob < t	0.4028

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0023724	0.0014777	0.0014491
Hydragard - HF	10	0.0030821	0.0024153	0.0023185

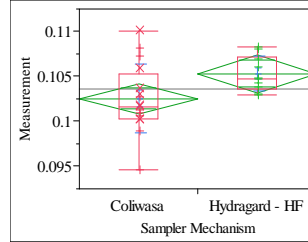
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4305	1	24	0.5180
Brown-Forsythe	1.2920	1	24	0.2669
Levene	1.6937	1	24	0.2055
Bartlett	0.7617	1	.	0.3828
F Test 2-sided	1.6878	9	15	0.3557

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0627	1	15.615	0.8056

t Test
0.2504

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=ZnO (wt%), Target Value=0.0958



**Oneway Anova
Summary of Fit**

Rsquare	0.156168
Adj Rsquare	0.121008
Root Mean Square Error	0.003245
Mean of Response	0.103601
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.002757	t Ratio	2.10753
Std Err Dif	0.001308	DF	24
Upper CL Dif	0.005457	Prob > t	0.0457
Lower CL Dif	0.000057	Prob > t	0.0229
Confidence	0.95	Prob < t	0.9771

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00004678	0.000047	4.4417	0.0457
Error	24	0.00025279	0.000011		
C. Total	25	0.00029957			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.102540	0.00081	0.10087	0.10421
Hydragard - HF	10	0.105298	0.00103	0.10318	0.10742

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.102540	0.003819	0.00095	0.10051	0.10458
Hydragard - HF	10	0.105298	0.001946	0.00062	0.10391	0.10669

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.002757	t Ratio	2.427702
Std Err Dif	0.001136	DF	23.33856
Upper CL Dif	0.005105	Prob > t	0.0233
Lower CL Dif	0.000410	Prob > t	0.0117
Confidence	0.95	Prob < t	0.9883

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0038185	0.0028436	0.0027386
Hydragard - HF	10	0.0019457	0.0016282	0.0015311

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.3015	1	24	0.1423
Brown-Forsythe	1.7174	1	24	0.2024
Levene	2.2514	1	24	0.1465
Bartlett	4.1428	1	.	0.0418
F Test 2-sided	3.8515	15	9	0.0467

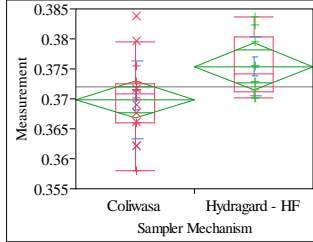
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.8937	1	23.339	0.0233

t Test
2.4277

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=2, Analyte=ZrO2 (wt%), Target Value=0.3547



Oneway Anova
Summary of Fit

Rsquare	0.180331
Adj Rsquare	0.146178
Root Mean Square Error	0.005961
Mean of Response	0.37199
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.005521	t Ratio	2.297848
Std Err Dif	0.002403	DF	24
Upper CL Dif	0.010481	Prob > t	0.0306
Lower CL Dif	0.000562	Prob > t	0.0153
Confidence	0.95	Prob < t	0.9847

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00018760	0.000188	5.2801	0.0306
Error	24	0.00085273	0.000036		
C. Total	25	0.00104034			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.369866	0.00149	0.36679	0.37294
Hydragard - HF	10	0.375387	0.00188	0.37150	0.37928

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.369866	0.006510	0.00163	0.36640	0.37334
Hydragard - HF	10	0.375387	0.004910	0.00155	0.37188	0.37890

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.005521	t Ratio	2.454641
Std Err Dif	0.002249	DF	22.99079
Upper CL Dif	0.010175	Prob > t	0.0221
Lower CL Dif	0.000868	Prob > t	0.0110
Confidence	0.95	Prob < t	0.9890

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0065104	0.0048439	0.0048122
Hydragard - HF	10	0.0049098	0.0039173	0.0039173

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.7532	1	24	0.3941
Brown-Forsythe	0.3310	1	24	0.5704
Levene	0.3915	1	24	0.5374
Bartlett	0.8086	1	.	0.3685
F Test 2-sided	1.7583	15	9	0.3953

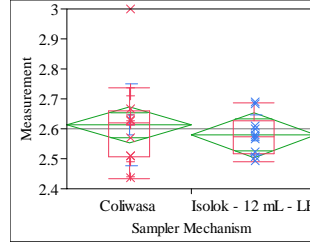
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.0253	1	22.991	0.0221

t Test

2.4546

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Al/B, Target Value=2.552



Oneway Anova
Summary of Fit

Rsquare	0.020675
Adj Rsquare	-0.02013
Root Mean Square Error	0.115318
Mean of Response	2.60009
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03309	t Ratio	-0.71181
Std Err Dif	0.04649	DF	24
Upper CL Dif	0.06285	Prob > t	0.4834
Lower CL Dif	-0.12903	Prob > t	0.7583
Confidence	0.95	Prob < t	0.2417

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00673796	0.006738	0.5067	0.4834
Error	24	0.31916011	0.013298		
C. Total	25	0.32589807			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.61282	0.02883	2.5533	2.6723
Isolok - 12 mL - LF	10	2.57973	0.03647	2.5045	2.6550

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.61282	0.136258	0.03406	2.5402	2.6854
Isolok - 12 mL - LF	10	2.57973	0.067221	0.02126	2.5316	2.6278

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03309	t Ratio	-0.82409
Std Err Dif	0.04015	DF	23.11498
Upper CL Dif	0.04995	Prob > t	0.4183
Lower CL Dif	-0.11613	Prob > t	0.7908
Confidence	0.95	Prob < t	0.2092

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1362576	0.0915971	0.0911937
Isolok - 12 mL - LF	10	0.0672209	0.0505934	0.0499902

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.1916	1	24	0.2858
Brown-Forsythe	1.5456	1	24	0.2258
Levene	1.5586	1	24	0.2239
Bartlett	4.5049	1	.	0.0338
F Test 2-sided	4.1088	15	9	0.0378

Welch Anova testing Means Equal, allowing Std Devs Not Equal

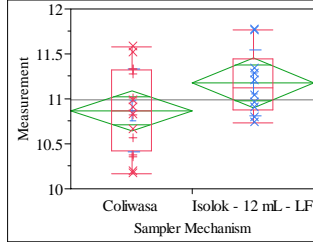
F Ratio	DFNum	DFDen	Prob > F
0.6791	1	23.115	0.4183

t Test

0.8241

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Al2O3 (wt%), Target Value=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.117567
Adj Rsquare	0.080799
Root Mean Square Error	0.427596
Mean of Response	10.98672
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.30822	t Ratio	1.788162
Std Err Dif	0.17237	DF	24
Upper CL Dif	0.66398	Prob > t	0.0864
Lower CL Dif	-0.04753	Prob > t	0.0432
Confidence	0.95	Prob < t	0.9568

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.5846305	0.584631	3.1975	0.0864
Error	24	4.3881231	0.182838		
C. Total	25	4.9727536			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.8682	0.10690	10.648	11.089
Isolok - 12 mL - LF	10	11.1764	0.13522	10.897	11.455

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.8682	0.460057	0.11501	10.623	11.113
Isolok - 12 mL - LF	10	11.1764	0.367172	0.11611	10.914	11.439

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.30822	t Ratio	1.885959
Std Err Dif	0.16343	DF	22.39184
Upper CL Dif	0.64682	Prob > t	0.0723
Lower CL Dif	-0.03037	Prob > t	0.0362
Confidence	0.95	Prob < t	0.9638

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4600570	0.3743572	0.3743572
Isolok - 12 mL - LF	10	0.3671718	0.2928725	0.2928725

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0097	1	24	0.3250
Brown-Forsythe	0.7427	1	24	0.3973
Levene	0.7613	1	24	0.3916
Bartlett	0.5234	1	.	0.4694
F Test 2-sided	1.5699	15	9	0.5003

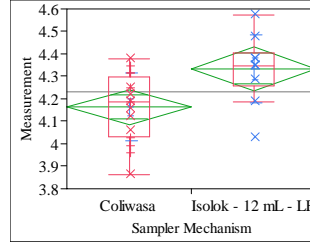
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.5568	1	22.392	0.0723

t Test

1.8860

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=B2O3 (wt%), Target Value=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.248664
Adj Rsquare	0.217359
Root Mean Square Error	0.149855
Mean of Response	4.229215
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.170252	t Ratio	2.818354
Std Err Dif	0.060408	DF	24
Upper CL Dif	0.294929	Prob > t	0.0095
Lower CL Dif	0.045575	Prob > t	0.0048
Confidence	0.95	Prob < t	0.9952

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.17837425	0.178374	7.9431	0.0095
Error	24	0.53895484	0.022456		
C. Total	25	0.71732909			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.16373	0.03746	4.0864	4.2411
Isolok - 12 mL - LF	10	4.33399	0.04739	4.2362	4.4318

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.16373	0.149979	0.03749	4.0838	4.2437
Isolok - 12 mL - LF	10	4.33399	0.149647	0.04732	4.2269	4.4410

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.170252	t Ratio	2.819854
Std Err Dif	0.060376	DF	19.28636
Upper CL Dif	0.296494	Prob > t	0.0108
Lower CL Dif	0.044010	Prob > t	0.0054
Confidence	0.95	Prob < t	0.9946

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1499790	0.1215009	0.1187338
Isolok - 12 mL - LF	10	0.1496474	0.1017488	0.0965970

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0001	1	24	0.9937
Brown-Forsythe	0.3152	1	24	0.5797
Levene	0.2892	1	24	0.5957
Bartlett	0.0001	1	.	0.9942
F Test 2-sided	1.0044	15	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

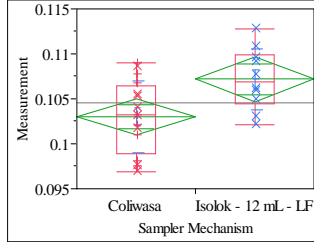
F Ratio	DFNum	DFDen	Prob > F
7.9516	1	19.286	0.0108

t Test

2.8199

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=BaO (wt%), Target Value=0.0919



Oneway Anova
Summary of Fit

Rsquare	0.237292
Adj Rsquare	0.205512
Root Mean Square Error	0.003785
Mean of Response	0.104607
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.004169	t Ratio	2.732547
Std Err Dif	0.001526	DF	24
Upper CL Dif	0.007317	Prob > t	0.0116
Lower CL Dif	0.001020	Prob > t	0.0058
Confidence	0.95	Prob < t	0.9942

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00010694	0.000107	7.4668	0.0116
Error	24	0.00034374	0.000014		
C. Total	25	0.00045068			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103004	0.00095	0.10105	0.10496
Isolok - 12 mL - LF	10	0.107173	0.00120	0.10470	0.10964

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103004	0.003997	0.00100	0.10087	0.10513
Isolok - 12 mL - LF	10	0.107173	0.003401	0.00108	0.10474	0.10961

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.004169	t Ratio	2.839755
Std Err Dif	0.001468	DF	21.59371
Upper CL Dif	0.007216	Prob > t	0.0096
Lower CL Dif	0.001121	Prob > t	0.0048
Confidence	0.95	Prob < t	0.9952

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0039972	0.0032370	0.0032169
Isolok - 12 mL - LF	10	0.0034006	0.0027801	0.0027801

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5544	1	24	0.4637
Brown-Forsythe	0.2745	1	24	0.6051
Levene	0.3120	1	24	0.5816
Bartlett	0.2727	1	.	0.6015
F Test 2-sided	1.3817	15	9	0.6366

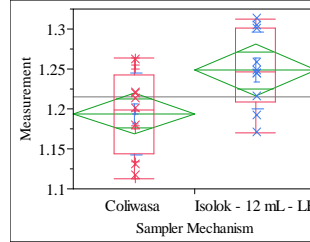
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.0642	1	21.594	0.0096

t Test

2.8398

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=CaO (wt%), Target Value=1.1462



Oneway Anova
Summary of Fit

Rsquare	0.234874
Adj Rsquare	0.202994
Root Mean Square Error	0.049856
Mean of Response	1.214936
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.054551	t Ratio	2.714296
Std Err Dif	0.020098	DF	24
Upper CL Dif	0.096031	Prob > t	0.0121
Lower CL Dif	0.013072	Prob > t	0.0061
Confidence	0.95	Prob < t	0.9939

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.01831289	0.018313	7.3674	0.0121
Error	24	0.05965598	0.002486		
C. Total	25	0.07796887			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.19395	0.01246	1.1682	1.2197
Isolok - 12 mL - LF	10	1.24851	0.01577	1.2160	1.2810

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.19395	0.050999	0.01275	1.1668	1.2211
Isolok - 12 mL - LF	10	1.24851	0.047892	0.01514	1.2142	1.2828

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.054551	t Ratio	2.75554
Std Err Dif	0.019797	DF	20.19216
Upper CL Dif	0.095822	Prob > t	0.0121
Lower CL Dif	0.013281	Prob > t	0.0061
Confidence	0.95	Prob < t	0.9939

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0509988	0.0416590	0.0411890
Isolok - 12 mL - LF	10	0.0478920	0.0360434	0.0359594

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0878	1	24	0.7695
Brown-Forsythe	0.2012	1	24	0.6577
Levene	0.2465	1	24	0.6241
Bartlett	0.0420	1	.	0.8375
F Test 2-sided	1.1339	15	9	0.8768

Welch Anova testing Means Equal, allowing Std Devs Not Equal

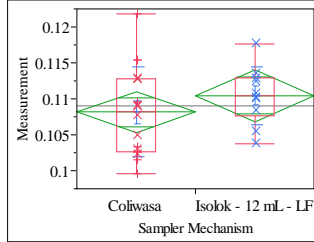
F Ratio	DFNum	DFDen	Prob > F
7.5930	1	20.192	0.0121

t Test

2.7555

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Cr2O3 (wt%), Target Value=0.0998



**Oneway Anova
Summary of Fit**

Rsquare	0.043689
Adj Rsquare	0.003842
Root Mean Square Error	0.005514
Mean of Response	0.109035
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00233	t Ratio	1.047107
Std Err Dif	0.00222	DF	24
Upper CL Dif	0.00692	Prob > t	0.3055
Lower CL Dif	-0.00226	Prob > t	0.1527
Confidence	0.95	Prob < t	0.8473

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00003334	0.000033	1.0964	0.3055
Error	24	0.00072978	0.000030		
C. Total	25	0.00076312			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.108140	0.00138	0.10529	0.11099
Isolok - 12 mL - LF	10	0.110468	0.00174	0.10687	0.11407

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.108140	0.006242	0.00156	0.10481	0.11147
Isolok - 12 mL - LF	10	0.110468	0.004019	0.00127	0.10759	0.11334

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00233	t Ratio	1.156539
Std Err Dif	0.00201	DF	23.942
Upper CL Dif	0.00648	Prob > t	0.2589
Lower CL Dif	-0.00183	Prob > t	0.1294
Confidence	0.95	Prob < t	0.8706

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0062418	0.0050791	0.0050791
Isolok - 12 mL - LF	10	0.0040192	0.0029232	0.0029232

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.8252	1	24	0.1893
Brown-Forsythe	2.9622	1	24	0.0981
Levene	2.9641	1	24	0.0980
Bartlett	1.8894	1	.	0.1693
F Test 2-sided	2.4118	15	9	0.1847

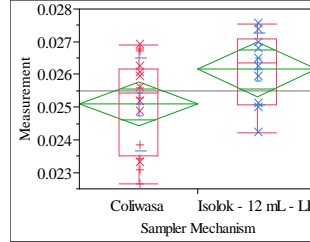
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.3376	1	23.942	0.2589

t Test

1.1565

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=CuO (wt%), Target Value=0.0504



**Oneway Anova
Summary of Fit**

Rsquare	0.147326
Adj Rsquare	0.111798
Root Mean Square Error	0.001303
Mean of Response	0.025498
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00107	t Ratio	2.03636
Std Err Dif	0.00053	DF	24
Upper CL Dif	0.00215	Prob > t	0.0529
Lower CL Dif	-1.45e-5	Prob > t	0.0264
Confidence	0.95	Prob < t	0.9736

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000704	7.039e-6	4.1468	0.0529
Error	24	0.0004074	1.6975e-6		
C. Total	25	0.00004778			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.00033	0.02441	0.02576
Isolok - 12 mL - LF	10	0.026156	0.00041	0.02531	0.02701

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.001412	0.00035	0.02433	0.02584
Isolok - 12 mL - LF	10	0.026156	0.001097	0.00035	0.02537	0.02694

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.001070	t Ratio	2.160636
Std Err Dif	0.000495	DF	22.68546
Upper CL Dif	0.002094	Prob > t	0.0415
Lower CL Dif	0.000045	Prob > t	0.0208
Confidence	0.95	Prob < t	0.9792

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0014119	0.0011726	0.0011384
Isolok - 12 mL - LF	10	0.0010974	0.0008838	0.0008700

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.2802	1	24	0.2690
Brown-Forsythe	0.7167	1	24	0.4056
Levene	1.1272	1	24	0.2989
Bartlett	0.6492	1	.	0.4204
F Test 2-sided	1.6551	15	9	0.4494

Welch Anova testing Means Equal, allowing Std Devs Not Equal

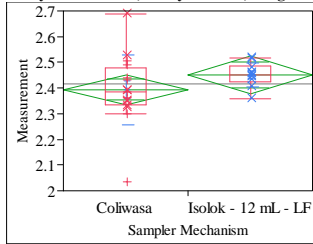
F Ratio	DFNum	DFDen	Prob > F
4.6683	1	22.685	0.0415

t Test

2.1606

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Fe/Li, Target Value=2.452



**Oneway Anova
Summary of Fit**

Rsquare	0.063599
Adj Rsquare	0.024583
Root Mean Square Error	0.111851
Mean of Response	2.415005
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.05757	t Ratio	1.276735
Std Err Dif	0.04509	DF	24
Upper CL Dif	0.15062	Prob > t	0.2139
Lower CL Dif	-0.03549	Prob > t	0.1070
Confidence	0.95	Prob < t	0.8930

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.02039286	0.020393	1.6301	0.2139
Error	24	0.30025351	0.012511		
C. Total	25	0.32064637			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.39286	0.02796	2.3352	2.4506
Isolok - 12 mL - LF	10	2.45043	0.03537	2.3774	2.5234

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.39286	0.136716	0.03418	2.3200	2.4657
Isolok - 12 mL - LF	10	2.45043	0.047006	0.01486	2.4168	2.4841

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.05757	t Ratio	1.544509
Std Err Dif	0.03727	DF	20.01741
Upper CL Dif	0.13531	Prob > t	0.1381
Lower CL Dif	-0.02018	Prob > t	0.0691
Confidence	0.95	Prob < t	0.9309

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1367156	0.0899789	0.0888823
Isolok - 12 mL - LF	10	0.0470062	0.0339728	0.0339728

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.6665	1	24	0.2090
Brown-Forsythe	2.7328	1	24	0.1113
Levene	2.9104	1	24	0.1009
Bartlett	9.1659	1	.	0.0025
F Test 2-sided	8.4591	15	9	0.0028

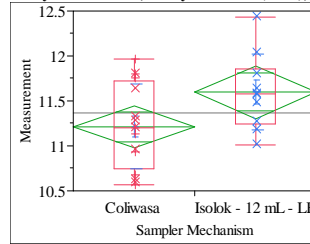
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3855	1	20.017	0.1381

t Test

1.5445

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Fe2O3 (wt%), Target Value=11.462



**Oneway Anova
Summary of Fit**

Rsquare	0.156727
Adj Rsquare	0.121591
Root Mean Square Error	0.452147
Mean of Response	11.36227
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.384947	t Ratio	2.112001
Std Err Dif	0.182266	DF	24
Upper CL Dif	0.761126	Prob > t	0.0453
Lower CL Dif	0.008768	Prob > t	0.0226
Confidence	0.95	Prob < t	0.9774

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.9119014	0.911901	4.4605	0.0453
Error	24	4.9064880	0.204437		
C. Total	25	5.8183894			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.2142	0.11304	10.981	11.448
Isolok - 12 mL - LF	10	11.5992	0.14298	11.304	11.894

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.2142	0.470394	0.11760	10.964	11.465
Isolok - 12 mL - LF	10	11.5992	0.419977	0.13281	11.299	11.900

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.384947	t Ratio	2.17005
Std Err Dif	0.177391	DF	20.92701
Upper CL Dif	0.753929	Prob > t	0.0417
Lower CL Dif	0.015964	Prob > t	0.0208
Confidence	0.95	Prob < t	0.9792

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4703945	0.3813278	0.3788705
Isolok - 12 mL - LF	10	0.4199767	0.3025245	0.2988073

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.2376	1	24	0.6304
Brown-Forsythe	0.5473	1	24	0.4666
Levene	0.5509	1	24	0.4651
Bartlett	0.1355	1	.	0.7128
F Test 2-sided	1.2545	15	9	0.7504

Welch Anova testing Means Equal, allowing Std Devs Not Equal

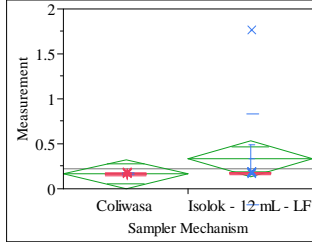
F Ratio	DFNum	DFDen	Prob > F
4.7091	1	20.927	0.0417

t Test

2.1700

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=K2O (wt%), Target Value=0.1591



Oneway Anova
Summary of Fit

Rsquare	0.069181
Adj Rsquare	0.030396
Root Mean Square Error	0.30776
Mean of Response	0.226951
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.16569	t Ratio	1.335565
Std Err Dif	0.12406	DF	24
Upper CL Dif	0.42174	Prob > t	0.1942
Lower CL Dif	-0.09036	Prob > t	0.0971
Confidence	0.95	Prob < t	0.9029

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.1689482	0.168948	1.7837	0.1942
Error	24	2.2731856	0.094716		
C. Total	25	2.4421338			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.07694	0.00443	0.32202
Isolok - 12 mL - LF	10	0.328916	0.09732	0.12805	0.52978

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.009208	0.00230	0.1583	0.16813
Isolok - 12 mL - LF	10	0.328916	0.502429	0.15888	-0.0305	0.68833

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.16569	t Ratio	1.042757
Std Err Dif	0.15890	DF	9.003779
Upper CL Dif	0.52512	Prob > t	0.3242
Lower CL Dif	-0.19374	Prob > t	0.1621
Confidence	0.95	Prob < t	0.8379

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0092082	0.0076040	0.0073782
Isolok - 12 mL - LF	10	0.5024290	0.2859600	0.1640063

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.8393	1	24	0.1877
Brown-Forsythe	1.6132	1	24	0.2162
Levene	7.8675	1	24	0.0098
Bartlett	92.2682	1	.	<.0001
F Test 2-sided	2977.1653	9	15	<.0001

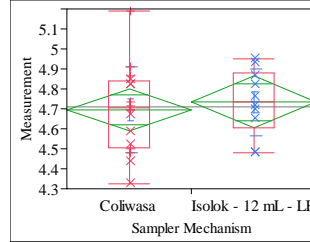
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0873	1	9.0038	0.3242

t Test

1.0428

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Li2O (wt%), Target Value=4.674



Oneway Anova
Summary of Fit

Rsquare	0.009958
Adj Rsquare	-0.03129
Root Mean Square Error	0.199741
Mean of Response	4.709883
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.03956	t Ratio	0.491313
Std Err Dif	0.08052	DF	24
Upper CL Dif	0.20574	Prob > t	0.6277
Lower CL Dif	-0.12662	Prob > t	0.3138
Confidence	0.95	Prob < t	0.6862

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00963050	0.009631	0.2414	0.6277
Error	24	0.95751122	0.039896		
C. Total	25	0.96714173			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.69467	0.04994	4.5916	4.7977
Isolok - 12 mL - LF	10	4.73423	0.06316	4.6039	4.8646

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.69467	0.216930	0.05423	4.5791	4.8103
Isolok - 12 mL - LF	10	4.73423	0.167210	0.05288	4.6146	4.8538

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.03956	t Ratio	0.522283
Std Err Dif	0.07574	DF	22.77367
Upper CL Dif	0.19633	Prob > t	0.6065
Lower CL Dif	-0.11721	Prob > t	0.3033
Confidence	0.95	Prob < t	0.6967

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2169298	0.1681953	0.1681953
Isolok - 12 mL - LF	10	0.1672101	0.1313269	0.1313269

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.6581	1	24	0.4252
Brown-Forsythe	0.6013	1	24	0.4457
Levene	0.6039	1	24	0.4447
Bartlett	0.6918	1	.	0.4056
F Test 2-sided	1.6831	15	9	0.4340

Welch Anova testing Means Equal, allowing Std Devs Not Equal

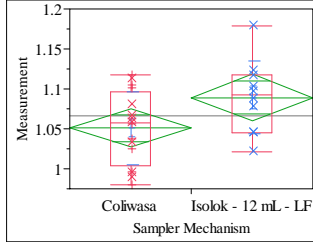
F Ratio	DFNum	DFDen	Prob > F
0.2728	1	22.774	0.6065

t Test

0.5223

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=MgO (wt%), Target Value=1.014



Oneway Anova
Summary of Fit

Rsquare	0.153724
Adj Rsquare	0.118463
Root Mean Square Error	0.045611
Mean of Response	1.065713
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.038390	t Ratio	2.087955
Std Err Dif	0.018386	DF	24
Upper CL Dif	0.076337	Prob > t	0.0476
Lower CL Dif	0.000442	Prob > t	0.0238
Confidence	0.95	Prob < t	0.9762

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00906932	0.009069	4.3596	0.0476
Error	24	0.04992798	0.002080		
C. Total	25	0.05899730			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.05095	0.01140	1.0274	1.0745
Isolok - 12 mL - LF	10	1.08934	0.01442	1.0596	1.1191

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.05095	0.045545	0.01139	1.0267	1.0752
Isolok - 12 mL - LF	10	1.08934	0.045719	0.01446	1.0566	1.1220

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.03839	t Ratio	2.086044
Std Err Dif	0.01840	DF	19.19606
Upper CL Dif	0.07688	Prob > t	0.0506
Lower CL Dif	-0.00010	Prob > t	0.0253
Confidence	0.95	Prob < t	0.9747

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0455454	0.0375709	0.0368972
Isolok - 12 mL - LF	10	0.0457192	0.0339952	0.0339952

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0003	1	24	0.9873
Brown-Forsythe	0.0720	1	24	0.7908
Levene	0.1196	1	24	0.7325
Bartlett	0.0002	1	.	0.9900
F Test 2-sided	1.0076	9	15	0.9500

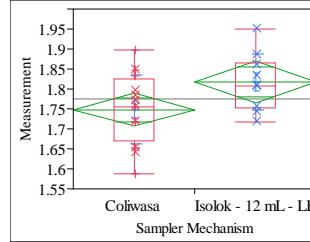
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.3516	1	19.196	0.0506

t Test

2.0860

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=MnO (wt%), Target Value=1.779



Oneway Anova
Summary of Fit

Rsquare	0.158009
Adj Rsquare	0.122926
Root Mean Square Error	0.08037
Mean of Response	1.774407
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.068756	t Ratio	2.122228
Std Err Dif	0.032398	DF	24
Upper CL Dif	0.135623	Prob > t	0.0443
Lower CL Dif	0.001890	Prob > t	0.0222
Confidence	0.95	Prob < t	0.9778

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.02909195	0.029092	4.5039	0.0443
Error	24	0.15502435	0.006459		
C. Total	25	0.18411631			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.74796	0.02009	1.7065	1.7894
Isolok - 12 mL - LF	10	1.81672	0.02542	1.7643	1.8692

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.74796	0.086150	0.02154	1.7021	1.7939
Isolok - 12 mL - LF	10	1.81672	0.069680	0.02203	1.7669	1.8666

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.068756	t Ratio	2.231471
Std Err Dif	0.030812	DF	22.23476
Upper CL Dif	0.132618	Prob > t	0.0360
Lower CL Dif	0.004895	Prob > t	0.0180
Confidence	0.95	Prob < t	0.9820

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0861499	0.0687967	0.0677880
Isolok - 12 mL - LF	10	0.0696796	0.0521645	0.0503568

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.6300	1	24	0.4351
Brown-Forsythe	0.7737	1	24	0.3878
Levene	0.7844	1	24	0.3846
Bartlett	0.4647	1	.	0.4954
F Test 2-sided	1.5286	15	9	0.5273

Welch Anova testing Means Equal, allowing Std Devs Not Equal

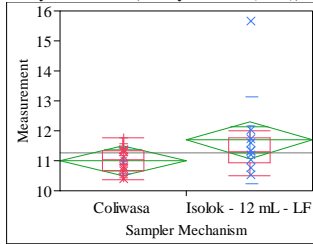
F Ratio	DFNum	DFDen	Prob > F
4.9795	1	22.235	0.0360

t Test

2.2315

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Na2O (wt%), Target Value=11.659



**Oneway Anova
Summary of Fit**

Rsquare	0.116077
Adj Rsquare	0.079247
Root Mean Square Error	0.952637
Mean of Response	11.27032
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.6818	t Ratio	1.775299
Std Err Dif	0.3840	DF	24
Upper CL Dif	1.4743	Prob > t	0.0885
Lower CL Dif	-0.1108	Prob > t	0.0443
Confidence	0.95	Prob < t	0.9557

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	2.860212	2.86021	3.1517	0.0885
Error	24	21.780417	0.90752		
C. Total	25	24.640629			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	11.0081	0.23816	10.517	11.500
Isolok - 12 mL - LF	10	11.6899	0.30125	11.068	12.312

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	11.0081	0.42516	0.10629	10.782	11.235
Isolok - 12 mL - LF	10	11.6899	1.45560	0.46030	10.649	12.731

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.6818	t Ratio	1.443121
Std Err Dif	0.4724	DF	9.968373
Upper CL Dif	1.7348	Prob > t	0.1797
Lower CL Dif	-0.3713	Prob > t	0.0898
Confidence	0.95	Prob < t	0.9102

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.425162	0.3589050	0.3589050
Isolok - 12 mL - LF	10	1.455601	0.8530144	0.7494880

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.8959	1	24	0.1812
Brown-Forsythe	1.4381	1	24	0.2422
Levene	2.8979	1	24	0.1016
Bartlett	15.8528	1	.	<.0001
F Test 2-sided	11.7213	9	15	<.0001

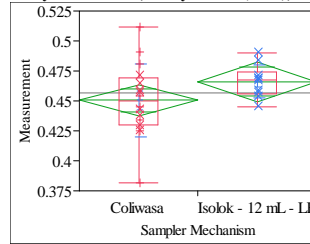
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.0826	1	9.9684	0.1797

t Test

1.4431

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=NiO (wt%), Target Value=0.41



**Oneway Anova
Summary of Fit**

Rsquare	0.086773
Adj Rsquare	0.048721
Root Mean Square Error	0.025581
Mean of Response	0.456534
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.01557	t Ratio	1.510106
Std Err Dif	0.01031	DF	24
Upper CL Dif	0.03686	Prob > t	0.1441
Lower CL Dif	-0.00571	Prob > t	0.0720
Confidence	0.95	Prob < t	0.9280

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00149227	0.001492	2.2804	0.1441
Error	24	0.01570523	0.000654		
C. Total	25	0.01719750			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.450545	0.00640	0.43735	0.46374
Isolok - 12 mL - LF	10	0.466117	0.00809	0.44942	0.48281

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.450545	0.030605	0.00765	0.43424	0.46685
Isolok - 12 mL - LF	10	0.466117	0.013561	0.00429	0.45642	0.47582

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.01557	t Ratio	1.775406
Std Err Dif	0.00877	DF	22.24537
Upper CL Dif	0.03375	Prob > t	0.0895
Lower CL Dif	-0.00261	Prob > t	0.0448
Confidence	0.95	Prob < t	0.9552

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0306052	0.0229845	0.0229845
Isolok - 12 mL - LF	10	0.0135607	0.0102309	0.0100528

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.3401	1	24	0.1392
Brown-Forsythe	3.9370	1	24	0.0588
Levene	3.8710	1	24	0.0608
Bartlett	5.7820	1	.	0.0162
F Test 2-sided	5.0936	15	9	0.0183

Welch Anova testing Means Equal, allowing Std Devs Not Equal

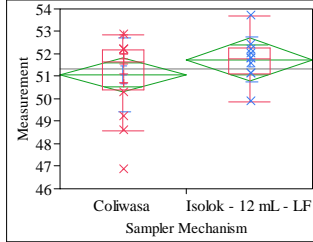
F Ratio	DFNum	DFDen	Prob > F
3.1521	1	22.245	0.0895

t Test

1.7754

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=SiO2 (wt%), Target Value=50.985



**Oneway Anova
Summary of Fit**

Rsquare	0.055041
Adj Rsquare	0.015668
Root Mean Square Error	1.441938
Mean of Response	51.32674
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.6873	t Ratio	1.182338
Std Err Dif	0.5813	DF	24
Upper CL Dif	1.8869	Prob > t	0.2487
Lower CL Dif	-0.5124	Prob > t	0.1243
Confidence	0.95	Prob < t	0.8757

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	2.906540	2.90654	1.3979	0.2487
Error	24	49.900435	2.07918		
C. Total	25	52.806975			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	51.0624	0.36048	50.318	51.806
Isolok - 12 mL - LF	10	51.7497	0.45598	50.809	52.691

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	51.0624	1.65289	0.41322	50.182	51.943
Isolok - 12 mL - LF	10	51.7497	0.99553	0.31482	51.038	52.462

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.6873	t Ratio	1.322953
Std Err Dif	0.5195	DF	23.99386
Upper CL Dif	1.7594	Prob > t	0.1983
Lower CL Dif	-0.3849	Prob > t	0.0992
Confidence	0.95	Prob < t	0.9008

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.652889	1.260181	1.189986
Isolok - 12 mL - LF	10	0.995535	0.667462	0.663183

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.1799	1	24	0.2882
Brown-Forsythe	1.4310	1	24	0.2433
Levene	2.5896	1	24	0.1206
Bartlett	2.4606	1	.	0.1167
F Test 2-sided	2.7566	15	9	0.1283

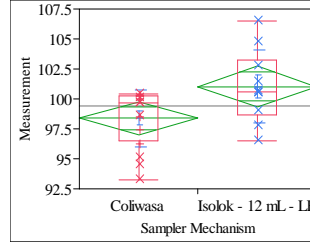
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.7502	1	23.994	0.1983

t Test

1.3230

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=Sum of Oxides (wt%), Target Value=99.553



**Oneway Anova
Summary of Fit**

Rsquare	0.203479
Adj Rsquare	0.170291
Root Mean Square Error	2.640836
Mean of Response	99.41464
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	2.63594	t Ratio	2.476093
Std Err Dif	1.06455	DF	24
Upper CL Dif	4.83307	Prob > t	0.0207
Lower CL Dif	0.43880	Prob > t	0.0104
Confidence	0.95	Prob < t	0.9896

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	42.75792	42.7579	6.1310	0.0207
Error	24	167.37633	6.9740		
C. Total	25	210.13425			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	98.401	0.66021	97.038	99.76
Isolok - 12 mL - LF	10	101.037	0.83511	99.313	102.76

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	98.401	2.36854	0.59214	97.139	99.66
Isolok - 12 mL - LF	10	101.037	3.04095	0.96163	98.861	103.21

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	2.63594	t Ratio	2.334093
Std Err Dif	1.12932	DF	15.7594
Upper CL Dif	5.03296	Prob > t	0.0332
Lower CL Dif	0.23891	Prob > t	0.0166
Confidence	0.95	Prob < t	0.9834

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	2.368543	1.931375	1.737718
Isolok - 12 mL - LF	10	3.040950	2.273268	2.196058

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8920	1	24	0.3543
Brown-Forsythe	0.3151	1	24	0.5798
Levene	0.3082	1	24	0.5839
Bartlett	0.6938	1	.	0.4049
F Test 2-sided	1.6484	9	15	0.3768

Welch Anova testing Means Equal, allowing Std Devs Not Equal

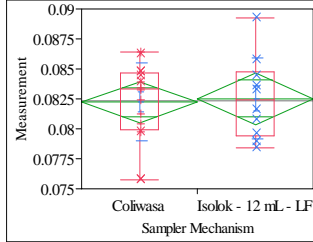
F Ratio	DFNum	DFDen	Prob > F
5.4480	1	15.759	0.0332

t Test

2.3341

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=TiO2 (wt%), Target Value=0.0711



**Oneway Anova
Summary of Fit**

Rsquare	0.001956
Adj Rsquare	-0.03963
Root Mean Square Error	0.003315
Mean of Response	0.082354
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00029	t Ratio	0.216887
Std Err Dif	0.00134	DF	24
Upper CL Dif	0.00305	Prob > t	0.8301
Lower CL Dif	-0.00247	Prob > t	0.4151
Confidence	0.95	Prob < t	0.5849

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000052	5.169e-7	0.0470	0.8301
Error	24	0.00026371	0.000011		
C. Total	25	0.00026423			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.082243	0.00083	0.08053	0.08395
Isolok - 12 mL - LF	10	0.082533	0.00105	0.08037	0.08470

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.082243	0.003267	0.00082	0.08050	0.08398
Isolok - 12 mL - LF	10	0.082533	0.003393	0.00107	0.08011	0.08496

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00029	t Ratio	0.214929
Std Err Dif	0.00135	DF	18.68886
Upper CL Dif	0.00312	Prob > t	0.8322
Lower CL Dif	-0.00254	Prob > t	0.4161
Confidence	0.95	Prob < t	0.5839

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0032672	0.0026141	0.0024707
Isolok - 12 mL - LF	10	0.0033928	0.0027022	0.0027022

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0183	1	24	0.8934
Brown-Forsythe	0.0709	1	24	0.7924
Levene	0.0141	1	24	0.9065
Bartlett	0.0154	1	.	0.9012
F Test 2-sided	1.0784	9	15	0.8615

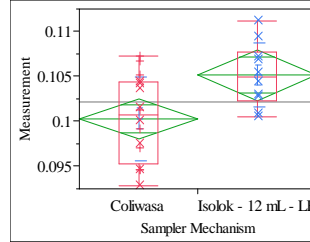
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0462	1	18.689	0.8322

t Test

0.2149

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=ZnO (wt%), Target Value=0.0958



**Oneway Anova
Summary of Fit**

Rsquare	0.245213
Adj Rsquare	0.213763
Root Mean Square Error	0.004303
Mean of Response	0.102155
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.004844	t Ratio	2.792316
Std Err Dif	0.001735	DF	24
Upper CL Dif	0.008424	Prob > t	0.0101
Lower CL Dif	0.001264	Prob > t	0.0051
Confidence	0.95	Prob < t	0.9949

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00014439	0.000144	7.7970	0.0101
Error	24	0.00044443	0.000019		
C. Total	25	0.00058882			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.100292	0.00108	0.09807	0.10251
Isolok - 12 mL - LF	10	0.105136	0.00136	0.10233	0.10794

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.100292	0.004698	0.00117	0.09779	0.10280
Isolok - 12 mL - LF	10	0.105136	0.003549	0.00112	0.10260	0.10767

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.004844	t Ratio	2.981683
Std Err Dif	0.001625	DF	22.97399
Upper CL Dif	0.008205	Prob > t	0.0067
Lower CL Dif	0.001483	Prob > t	0.0033
Confidence	0.95	Prob < t	0.9967

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0046980	0.0039756	0.0039756
Isolok - 12 mL - LF	10	0.0035492	0.0028630	0.0028630

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.7352	1	24	0.2002
Brown-Forsythe	1.6221	1	24	0.2150
Levene	1.6683	1	24	0.2088
Bartlett	0.7989	1	.	0.3714
F Test 2-sided	1.7521	15	9	0.3983

Welch Anova testing Means Equal, allowing Std Devs Not Equal

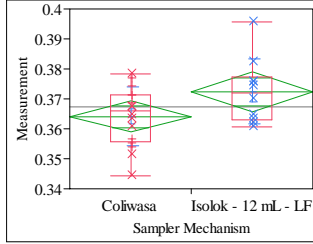
F Ratio	DFNum	DFDen	Prob > F
8.8904	1	22.974	0.0067

t Test

2.9817

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=3, Analyte=ZrO2 (wt%), Target Value=0.3547



Oneway Anova
Summary of Fit

Rsquare	0.145806
Adj Rsquare	0.110214
Root Mean Square Error	0.010161
Mean of Response	0.367314
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00829	t Ratio	2.024019
Std Err Dif	0.00410	DF	24
Upper CL Dif	0.01674	Prob > t	0.0542
Lower CL Dif	-0.00016	Prob > t	0.0271
Confidence	0.95	Prob < t	0.9729

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00042297	0.000423	4.0967	0.0542
Error	24	0.00247796	0.000103		
C. Total	25	0.00290093			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.364125	0.00254	0.35888	0.36937
Isolok - 12 mL - LF	10	0.372416	0.00321	0.36578	0.37905

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.364125	0.009728	0.00243	0.35894	0.36931
Isolok - 12 mL - LF	10	0.372416	0.010845	0.00343	0.36466	0.38017

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00829	t Ratio	1.971958
Std Err Dif	0.00420	DF	17.64993
Upper CL Dif	0.01714	Prob > t	0.0645
Lower CL Dif	-0.00055	Prob > t	0.0322
Confidence	0.95	Prob < t	0.9678

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0097279	0.0079254	0.0078515
Isolok - 12 mL - LF	10	0.0108448	0.0082399	0.0082399

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1503	1	24	0.7017
Brown-Forsythe	0.0255	1	24	0.8745
Levene	0.0184	1	24	0.8932
Bartlett	0.1292	1	.	0.7192
F Test 2-sided	1.2428	9	15	0.6818

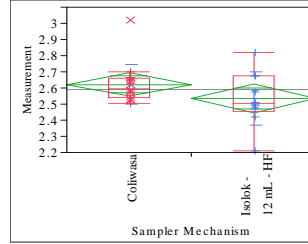
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.8886	1	17.65	0.0645

t Test

1.9720

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Al/B, Target Value=2.552



Oneway Anova
Summary of Fit

Rsquare	0.091841
Adj Rsquare	0.054001
Root Mean Square Error	0.139483
Mean of Response	2.588273
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.08760	t Ratio	-1.55791
Std Err Dif	0.05623	DF	24
Upper CL Dif	0.02845	Prob > t	0.1323
Lower CL Dif	-0.20364	Prob > t	0.9338
Confidence	0.95	Prob < t	0.0662

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.04722023	0.047220	2.4271	0.1323
Error	24	0.46693034	0.019455		
C. Total	25	0.51415057			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	2.62196	0.03487	2.5500	2.6939
Isolok - 12 mL - HF	10	2.53437	0.04411	2.4433	2.6254

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	2.62196	0.121133	0.03028	2.5574	2.6865
Isolok - 12 mL - HF	10	2.53437	0.165608	0.05237	2.4159	2.6528

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.08760	t Ratio	-1.44801
Std Err Dif	0.06050	DF	15.01768
Upper CL Dif	0.04133	Prob > t	0.1682
Lower CL Dif	-0.21653	Prob > t	0.9159
Confidence	0.95	Prob < t	0.0841

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1211327	0.0784021	0.0772495
Isolok - 12 mL - HF	10	0.1656077	0.1207008	0.1161805

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5487	1	24	0.4660
Brown-Forsythe	0.8798	1	24	0.3576
Levene	1.1855	1	24	0.2870
Bartlett	1.0918	1	.	0.2961
F Test 2-sided	1.8691	9	15	0.2731

Welch Anova testing Means Equal, allowing Std Devs Not Equal

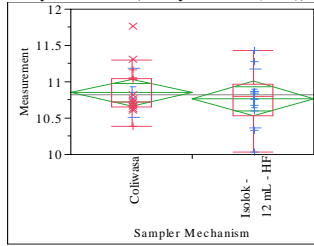
F Ratio	DFNum	DFDen	Prob > F
2.0967	1	15.018	0.1682

t Test

1.4480

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Al2O3 (wt%), Target Value=10.869



Oneway Anova Summary of Fit

Rsquare	0.012895
Adj Rsquare	-0.02823
Root Mean Square Error	0.364146
Mean of Response	10.81884
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.08219	t Ratio	-0.55993
Std Err Dif	0.14679	DF	24
Upper CL Dif	0.22077	Prob > t	0.5807
Lower CL Dif	-0.38516	Prob > t	0.7096
Confidence	0.95	Prob < t	0.2904

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.0415737	0.041574	0.3135	0.5807
Error	24	3.1824497	0.132602		
C. Total	25	3.2240234			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.8505	0.09104	10.663	11.038
Isolok - 12 mL - HF	10	10.7683	0.11515	10.531	11.006

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.8505	0.335779	0.08394	10.672	11.029
Isolok - 12 mL - HF	10	10.7683	0.407055	0.12872	10.477	11.059

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.08219	t Ratio	-0.53485
Std Err Dif	0.15368	DF	16.49311
Upper CL Dif	0.24279	Prob > t	0.5999
Lower CL Dif	-0.40718	Prob > t	0.7001
Confidence	0.95	Prob < t	0.2999

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3357786	0.2568539	0.2243781
Isolok - 12 mL - HF	10	0.4070546	0.2890935	0.2890935

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3348	1	24	0.5682
Brown-Forsythe	0.3416	1	24	0.5643
Levene	0.1189	1	24	0.7332
Bartlett	0.4094	1	.	0.5223
F Test 2-sided	1.4696	9	15	0.4898

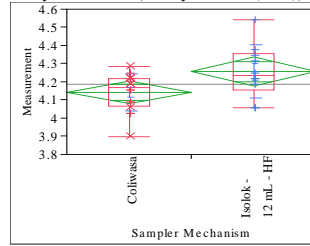
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2861	1	16.493	0.5999

t Test

0.5349

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=B2O3 (wt%), Target Value=4.259



Oneway Anova Summary of Fit

Rsquare	0.187262
Adj Rsquare	0.153398
Root Mean Square Error	0.121433
Mean of Response	4.18587
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.115111	t Ratio	2.351554
Std Err Dif	0.048951	DF	24
Upper CL Dif	0.216142	Prob > t	0.0272
Lower CL Dif	0.014081	Prob > t	0.0136
Confidence	0.95	Prob < t	0.9864

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.08154240	0.081542	5.5298	0.0272
Error	24	0.35390335	0.014746		
C. Total	25	0.43544575			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.14160	0.03036	4.0789	4.2043
Isolok - 12 mL - HF	10	4.25671	0.03840	4.1775	4.3360

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.14160	0.103087	0.02577	4.0867	4.1965
Isolok - 12 mL - HF	10	4.25671	0.147007	0.04649	4.1515	4.3619

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.115111	t Ratio	2.165645
Std Err Dif	0.053153	DF	14.55715
Upper CL Dif	0.228706	Prob > t	0.0474
Lower CL Dif	0.001517	Prob > t	0.0237
Confidence	0.95	Prob < t	0.9763

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1030871	0.0835162	0.0804975
Isolok - 12 mL - HF	10	0.1470068	0.1107646	0.1094766

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.4303	1	24	0.2434
Brown-Forsythe	0.8372	1	24	0.3693
Levene	0.9167	1	24	0.3479
Bartlett	1.4096	1	.	0.2351
F Test 2-sided	2.0336	9	15	0.2156

Welch Anova testing Means Equal, allowing Std Devs Not Equal

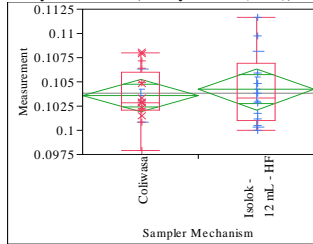
F Ratio	DFNum	DFDen	Prob > F
4.6900	1	14.557	0.0474

t Test

2.1656

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=BaO (wt%), Target Value=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.009739
Adj Rsquare	-0.03152
Root Mean Square Error	0.003242
Mean of Response	0.103835
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00064	t Ratio	0.485831
Std Err Dif	0.00131	DF	24
Upper CL Dif	0.00333	Prob > t	0.6315
Lower CL Dif	-0.00206	Prob > t	0.3157
Confidence	0.95	Prob < t	0.6843

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000248	2.481e-6	0.2360	0.6315
Error	24	0.00025232	0.000011		
C. Total	25	0.00025480			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103590	0.00081	0.10192	0.10526
Isolok - 12 mL - HF	10	0.104225	0.00103	0.10211	0.10634

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103590	0.002756	0.00069	0.10212	0.10506
Isolok - 12 mL - HF	10	0.104225	0.003921	0.00124	0.10142	0.10703

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00064	t Ratio	0.447629
Std Err Dif	0.00142	DF	14.57992
Upper CL Dif	0.00367	Prob > t	0.6610
Lower CL Dif	-0.00240	Prob > t	0.3305
Confidence	0.95	Prob < t	0.6695

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0027558	0.0021929	0.0020585
Isolok - 12 mL - HF	10	0.0039215	0.0030592	0.0029811

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6906	1	24	0.2059
Brown-Forsythe	1.1134	1	24	0.3018
Levene	1.3553	1	24	0.2558
Bartlett	1.3924	1	.	0.2380
F Test 2-sided	2.0249	9	15	0.2183

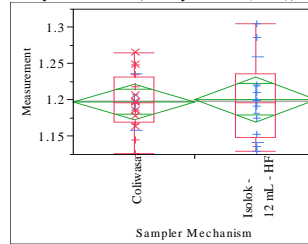
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2004	1	14.58	0.6610

t Test

0.4476

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=CaO (wt%), Target Value=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.001245
Adj Rsquare	-0.04037
Root Mean Square Error	0.047152
Mean of Response	1.19863
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00329	t Ratio	0.172988
Std Err Dif	0.01901	DF	24
Upper CL Dif	0.04252	Prob > t	0.8641
Lower CL Dif	-0.03594	Prob > t	0.4321
Confidence	0.95	Prob < t	0.5679

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00006653	0.000067	0.0299	0.8641
Error	24	0.05336053	0.002223		
C. Total	25	0.05342706			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.19737	0.01179	1.1730	1.2217
Isolok - 12 mL - HF	10	1.20065	0.01491	1.1699	1.2314

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.19737	0.038626	0.00966	1.1768	1.2179
Isolok - 12 mL - HF	10	1.20065	0.058672	0.01855	1.1587	1.2426

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00329	t Ratio	0.157205
Std Err Dif	0.02092	DF	13.92322
Upper CL Dif	0.04817	Prob > t	0.8773
Lower CL Dif	-0.04160	Prob > t	0.4387
Confidence	0.95	Prob < t	0.5613

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0386257	0.0296893	0.0295581
Isolok - 12 mL - HF	10	0.0586717	0.0438229	0.0435151

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4845	1	24	0.1281
Brown-Forsythe	1.3866	1	24	0.2505
Levene	1.4713	1	24	0.2369
Bartlett	1.9608	1	.	0.1614
F Test 2-sided	2.3073	9	15	0.1466

Welch Anova testing Means Equal, allowing Std Devs Not Equal

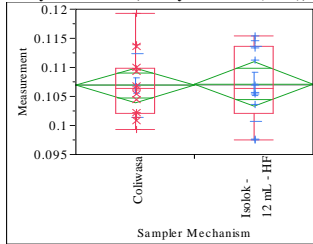
F Ratio	DFNum	DFDen	Prob > F
0.0247	1	13.923	0.8773

t Test

0.1572

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Cr2O3 (wt%), Target Value=0.0998



Oneway Anova Summary of Fit

Rsquare	0.000485
Adj Rsquare	-0.04116
Root Mean Square Error	0.00588
Mean of Response	0.106978
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00026	t Ratio	0.107918
Std Err Dif	0.00237	DF	24
Upper CL Dif	0.00515	Prob > t	0.9150
Lower CL Dif	-0.00464	Prob > t	0.4575
Confidence	0.95	Prob < t	0.5425

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000040	4.026e-7	0.0116	0.9150
Error	24	0.00082966	0.000035		
C. Total	25	0.00083007			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.106880	0.00147	0.10385	0.10991
Isolok - 12 mL - HF	10	0.107135	0.00186	0.10330	0.11097

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.106880	0.005474	0.00137	0.10396	0.10980
Isolok - 12 mL - HF	10	0.107135	0.006500	0.00206	0.10249	0.11179

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00026	t Ratio	0.103583
Std Err Dif	0.00247	DF	16.76903
Upper CL Dif	0.00547	Prob > t	0.9187
Lower CL Dif	-0.00496	Prob > t	0.4594
Confidence	0.95	Prob < t	0.5406

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0054736	0.0042660	0.0042204
Isolok - 12 mL - HF	10	0.0065001	0.0052033	0.0051741

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5081	1	24	0.4828
Brown-Forsythe	0.4680	1	24	0.5005
Levene	0.4846	1	24	0.4930
Bartlett	0.3256	1	.	0.5682
F Test 2-sided	1.4102	9	15	0.5344

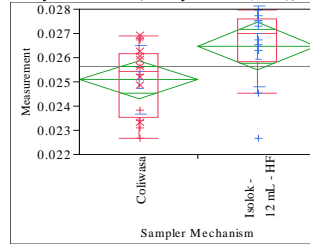
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0107	1	16.769	0.9187

t Test

0.1036

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=CuO (wt%), Target Value=0.0504



Oneway Anova Summary of Fit

Rsquare	0.177577
Adj Rsquare	0.14331
Root Mean Square Error	0.001513
Mean of Response	0.025621
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.001389	t Ratio	2.276416
Std Err Dif	0.000610	DF	24
Upper CL Dif	0.002648	Prob > t	0.0320
Lower CL Dif	0.000130	Prob > t	0.0160
Confidence	0.95	Prob < t	0.9840

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00001187	0.000012	5.1821	0.0320
Error	24	0.00005496	2.29e-6		
C. Total	25	0.00006683			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.00038	0.02431	0.02587
Isolok - 12 mL - HF	10	0.026476	0.00048	0.02549	0.02746

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.001412	0.00035	0.02433	0.02584
Isolok - 12 mL - HF	10	0.026476	0.001669	0.00053	0.02528	0.02767

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.001389	t Ratio	2.18736
Std Err Dif	0.000635	DF	16.83234
Upper CL Dif	0.002729	Prob > t	0.0431
Lower CL Dif	0.000048	Prob > t	0.0216
Confidence	0.95	Prob < t	0.9784

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0014119	0.0011726	0.0011384
Isolok - 12 mL - HF	10	0.0016688	0.0011892	0.0011266

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3105	1	24	0.5825
Brown-Forsythe	0.0008	1	24	0.9781
Levene	0.0022	1	24	0.9632
Bartlett	0.3080	1	.	0.5789
F Test 2-sided	1.3971	9	15	0.5447

Welch Anova testing Means Equal, allowing Std Devs Not Equal

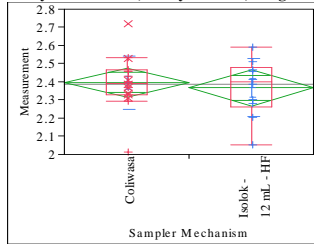
F Ratio	DFNum	DFDen	Prob > F
4.7845	1	16.832	0.0431

t Test

2.1874

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Fe/Li, Target Value=2.452



Oneway Anova Summary of Fit

Rsquare	0.009066
Adj Rsquare	-0.03222
Root Mean Square Error	0.152046
Mean of Response	2.384618
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02872	t Ratio	-0.46859
Std Err Dif	0.06129	DF	24
Upper CL Dif	0.09778	Prob > t	0.6436
Lower CL Dif	-0.15522	Prob > t	0.6782
Confidence	0.95	Prob < t	0.3218

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00507625	0.005076	0.2196	0.6436
Error	24	0.55483237	0.023118		
C. Total	25	0.55990863			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.39566	0.03801	2.3172	2.4741
Isolok - 12 mL - HF	10	2.36694	0.04808	2.2677	2.4662

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.39566	0.147171	0.03679	2.3172	2.4741
Isolok - 12 mL - HF	10	2.36694	0.159841	0.05055	2.2526	2.4813

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02872	t Ratio	-0.4594
Std Err Dif	0.06252	DF	18.02732
Upper CL Dif	0.10261	Prob > t	0.6514
Lower CL Dif	-0.16005	Prob > t	0.6743
Confidence	0.95	Prob < t	0.3257

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1471712	0.0967494	0.0967494
Isolok - 12 mL - HF	10	0.1598408	0.1255358	0.1211468

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0506	1	24	0.8240
Brown-Forsythe	0.3258	1	24	0.5735
Levene	0.4945	1	24	0.4887
Bartlett	0.0743	1	.	0.7851
F Test 2-sided	1.1796	9	15	0.7466

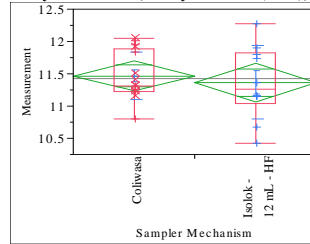
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2110	1	18.027	0.6514

t Test

0.4594

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Fe2O3 (wt%), Target Value=11.462



Oneway Anova Summary of Fit

Rsquare	0.013021
Adj Rsquare	-0.0281
Root Mean Square Error	0.455383
Mean of Response	11.42825
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.10330	t Ratio	-0.5627
Std Err Dif	0.18357	DF	24
Upper CL Dif	0.27558	Prob > t	0.5789
Lower CL Dif	-0.48217	Prob > t	0.7106
Confidence	0.95	Prob < t	0.2894

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.0656617	0.065662	0.3166	0.5789
Error	24	4.9769665	0.207374		
C. Total	25	5.0426283			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.4680	0.11385	11.233	11.703
Isolok - 12 mL - HF	10	11.3647	0.14400	11.067	11.662

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.4680	0.369179	0.09229	11.271	11.665
Isolok - 12 mL - HF	10	11.3647	0.570825	0.18051	10.956	11.773

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.10330	t Ratio	-0.50951
Std Err Dif	0.20274	DF	13.75666
Upper CL Dif	0.33226	Prob > t	0.6185
Lower CL Dif	-0.53885	Prob > t	0.6908
Confidence	0.95	Prob < t	0.3092

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3691793	0.3060452	0.2770044
Isolok - 12 mL - HF	10	0.5708246	0.4503555	0.4503555

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.0731	1	24	0.0924
Brown-Forsythe	1.9964	1	24	0.1705
Levene	2.1210	1	24	0.1583
Bartlett	2.1320	1	.	0.1443
F Test 2-sided	2.3907	9	15	0.1306

Welch Anova testing Means Equal, allowing Std Devs Not Equal

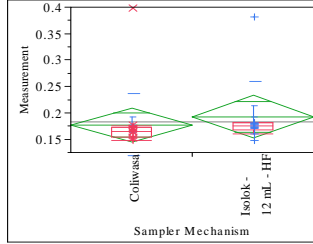
F Ratio	DFNum	DFDen	Prob > F
0.2596	1	13.757	0.6185

t Test

0.5095

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=K2O (wt%), Target Value=0.1591



Oneway Anova Summary of Fit

Rsquare	0.015041
Adj Rsquare	-0.026
Root Mean Square Error	0.062286
Mean of Response	0.183261
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.01520	t Ratio	0.605399
Std Err Dif	0.02511	DF	24
Upper CL Dif	0.06702	Prob > t	0.5506
Lower CL Dif	-0.03662	Prob > t	0.2753
Confidence	0.95	Prob < t	0.7247

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00142189	0.001422	0.3665	0.5506
Error	24	0.09310935	0.003880		
C. Total	25	0.09453123			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.177415	0.01557	0.14528	0.20955
Isolok - 12 mL - HF	10	0.192616	0.01970	0.15196	0.23327

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.177415	0.059053	0.01476	0.14595	0.20888
Isolok - 12 mL - HF	10	0.192616	0.067330	0.02129	0.14445	0.24078

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01520	t Ratio	0.586684
Std Err Dif	0.02591	DF	17.33083
Upper CL Dif	0.06978	Prob > t	0.5650
Lower CL Dif	-0.03938	Prob > t	0.2825
Confidence	0.95	Prob < t	0.7175

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0590532	0.0273623	0.0214193
Isolok - 12 mL - HF	10	0.0673301	0.0378485	0.0275853

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0388	1	24	0.8454
Brown-Forsythe	0.0674	1	24	0.7974
Levene	0.2431	1	24	0.6265
Bartlett	0.1887	1	.	0.6640
F Test 2-sided	1.3000	9	15	0.6277

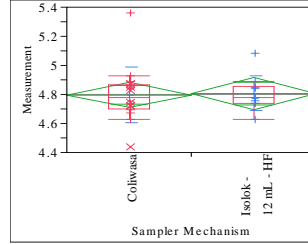
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3442	1	17.331	0.5650

t Test

0.5867

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Li2O (wt%), Target Value=4.674



Oneway Anova Summary of Fit

Rsquare	0.000975
Adj Rsquare	-0.04065
Root Mean Square Error	0.170119
Mean of Response	4.800967
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.01050	t Ratio	0.153045
Std Err Dif	0.06858	DF	24
Upper CL Dif	0.15203	Prob > t	0.8796
Lower CL Dif	-0.13104	Prob > t	0.4398
Confidence	0.95	Prob < t	0.5602

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00067787	0.000678	0.0234	0.8796
Error	24	0.69456890	0.028940		
C. Total	25	0.69524676			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.79693	0.04253	4.7092	4.8847
Isolok - 12 mL - HF	10	4.80743	0.05380	4.6964	4.9185

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.79693	0.194035	0.04851	4.6935	4.9003
Isolok - 12 mL - HF	10	4.80743	0.120104	0.03798	4.7215	4.8933

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01050	t Ratio	0.170356
Std Err Dif	0.06161	DF	23.99739
Upper CL Dif	0.13765	Prob > t	0.8662
Lower CL Dif	-0.11666	Prob > t	0.4331
Confidence	0.95	Prob < t	0.5669

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1940349	0.1305196	0.1305196
Isolok - 12 mL - HF	10	0.1201045	0.0852548	0.0796573

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.6174	1	24	0.4397
Brown-Forsythe	1.0291	1	24	0.3205
Levene	0.8663	1	24	0.3613
Bartlett	2.2195	1	.	0.1363
F Test 2-sided	2.6100	15	9	0.1493

Welch Anova testing Means Equal, allowing Std Devs Not Equal

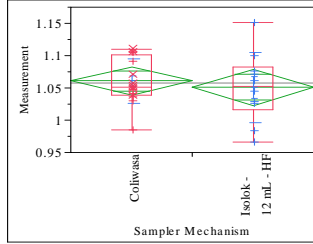
F Ratio	DFNum	DFDen	Prob > F
0.0290	1	23.997	0.8662

t Test

0.1704

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=MgO (wt%), Target Value=1.014



Oneway Anova
Summary of Fit

Rsquare	0.013252
Adj Rsquare	-0.02786
Root Mean Square Error	0.042932
Mean of Response	1.056911
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00983	t Ratio	-0.56773
Std Err Dif	0.01731	DF	24
Upper CL Dif	0.02589	Prob > t	0.5755
Lower CL Dif	-0.04554	Prob > t	0.7123
Confidence	0.95	Prob < t	0.2877

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00059409	0.000594	0.3223	0.5755
Error	24	0.04423543	0.001843		
C. Total	25	0.04482951			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.06069	0.01073	1.0385	1.0828
Isolok - 12 mL - HF	10	1.05086	0.01358	1.0228	1.0789

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.06069	0.034578	0.00864	1.0423	1.0791
Isolok - 12 mL - HF	10	1.05086	0.054058	0.01709	1.0122	1.0895

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00983	t Ratio	-0.51291
Std Err Dif	0.01916	DF	13.65556
Upper CL Dif	0.03136	Prob > t	0.6162
Lower CL Dif	-0.05101	Prob > t	0.6919
Confidence	0.95	Prob < t	0.3081

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0345780	0.0276211	0.0261182
Isolok - 12 mL - HF	10	0.0540585	0.0409600	0.0409600

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.3105	1	24	0.1416
Brown-Forsythe	1.8092	1	24	0.1912
Levene	1.7230	1	24	0.2017
Bartlett	2.2420	1	.	0.1343
F Test 2-sided	2.4442	9	15	0.1214

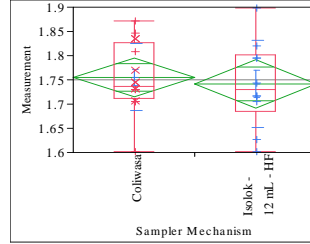
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2631	1	13.656	0.6162

t Test

0.5129

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=MnO (wt%), Target Value=1.779



Oneway Anova
Summary of Fit

Rsquare	0.007645
Adj Rsquare	-0.0337
Root Mean Square Error	0.077285
Mean of Response	1.750073
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.01340	t Ratio	-0.42999
Std Err Dif	0.03115	DF	24
Upper CL Dif	0.05090	Prob > t	0.6710
Lower CL Dif	-0.07770	Prob > t	0.6645
Confidence	0.95	Prob < t	0.3355

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00110436	0.001104	0.1849	0.6710
Error	24	0.14335189	0.005973		
C. Total	25	0.14445625			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.75523	0.01932	1.7153	1.7951
Isolok - 12 mL - HF	10	1.74183	0.02444	1.6914	1.7923

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.75523	0.069047	0.01726	1.7184	1.7920
Isolok - 12 mL - HF	10	1.74183	0.089343	0.02825	1.6779	1.8057

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.01340	t Ratio	-0.40461
Std Err Dif	0.03311	DF	15.66376
Upper CL Dif	0.05691	Prob > t	0.6912
Lower CL Dif	-0.08371	Prob > t	0.6544
Confidence	0.95	Prob < t	0.3456

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0690470	0.0538673	0.0508410
Isolok - 12 mL - HF	10	0.0893430	0.0684336	0.0684336

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8875	1	24	0.3555
Brown-Forsythe	0.7370	1	24	0.3991
Levene	0.6256	1	24	0.4367
Bartlett	0.7383	1	.	0.3902
F Test 2-sided	1.6743	9	15	0.3628

Welch Anova testing Means Equal, allowing Std Devs Not Equal

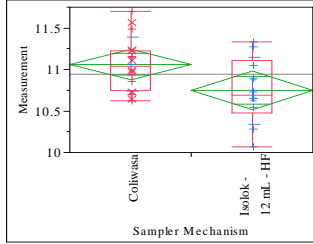
F Ratio	DFNum	DFDen	Prob > F
0.1637	1	15.664	0.6912

t Test

0.4046

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Na2O (wt%), Target Value=11.659



**Oneway Anova
Summary of Fit**

Rsquare	0.16616
Adj Rsquare	0.131417
Root Mean Square Error	0.357618
Mean of Response	10.94161
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.31526	t Ratio	-2.1869
Std Err Dif	0.14416	DF	24
Upper CL Dif	-0.01773	Prob > t	0.0387
Lower CL Dif	-0.61280	Prob > t	0.9806
Confidence	0.95	Prob < t	0.0194

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.6116374	0.611637	4.7825	0.0387
Error	24	3.0693680	0.127890		
C. Total	25	3.6810054			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.0629	0.08940	10.878	11.247
Isolok - 12 mL - HF	10	10.7476	0.11309	10.514	10.981

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.0629	0.326603	0.08165	10.889	11.237
Isolok - 12 mL - HF	10	10.7476	0.404053	0.12777	10.459	11.037

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.31526	t Ratio	-2.07912
Std Err Dif	0.15163	DF	16.22765
Upper CL Dif	0.00582	Prob > t	0.0538
Lower CL Dif	-0.63635	Prob > t	0.9731
Confidence	0.95	Prob < t	0.0269

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3266027	0.2620175	0.2620175
Isolok - 12 mL - HF	10	0.4040529	0.3121968	0.3086920

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8031	1	24	0.3791
Brown-Forsythe	0.3036	1	24	0.5867
Levene	0.3733	1	24	0.5470
Bartlett	0.5014	1	.	0.4789
F Test 2-sided	1.5305	9	15	0.4479

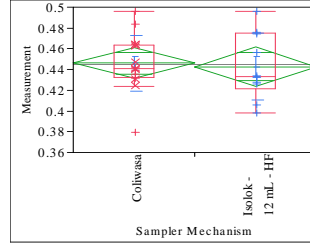
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.3227	1	16.228	0.0538

t Test

2.0791

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=NiO (wt%), Target Value=0.41



**Oneway Anova
Summary of Fit**

Rsquare	0.00342
Adj Rsquare	-0.0381
Root Mean Square Error	0.028873
Mean of Response	0.444886
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00334	t Ratio	-0.28699
Std Err Dif	0.01164	DF	24
Upper CL Dif	0.02068	Prob > t	0.7766
Lower CL Dif	-0.02736	Prob > t	0.6117
Confidence	0.95	Prob < t	0.3883

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00006866	0.000069	0.0824	0.7766
Error	24	0.02000713	0.000834		
C. Total	25	0.02007579			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.446170	0.00722	0.43127	0.46107
Isolok - 12 mL - HF	10	0.442830	0.00913	0.42399	0.46167

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.446170	0.026849	0.00671	0.43186	0.46048
Isolok - 12 mL - HF	10	0.442830	0.031962	0.01011	0.41997	0.46569

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00334	t Ratio	-0.27531
Std Err Dif	0.01213	DF	16.73591
Upper CL Dif	0.02229	Prob > t	0.7865
Lower CL Dif	-0.02897	Prob > t	0.6068
Confidence	0.95	Prob < t	0.3932

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0268489	0.0195050	0.0189284
Isolok - 12 mL - HF	10	0.0319620	0.0264680	0.0246865

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3551	1	24	0.5568
Brown-Forsythe	0.5137	1	24	0.4805
Levene	1.0356	1	24	0.3190
Bartlett	0.3351	1	.	0.5627
F Test 2-sided	1.4171	9	15	0.5290

Welch Anova testing Means Equal, allowing Std Devs Not Equal

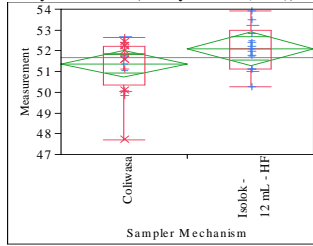
F Ratio	DFNum	DFDen	Prob > F
0.0758	1	16.736	0.7865

t Test

0.2753

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=SiO2 (wt%), Target Value=50.985



**Oneway Anova
Summary of Fit**

Rsquare	0.08308
Adj Rsquare	0.044875
Root Mean Square Error	1.250584
Mean of Response	51.65587
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.7434	t Ratio	1.474644
Std Err Dif	0.5041	DF	24
Upper CL Dif	1.7839	Prob > t	0.1533
Lower CL Dif	-0.2971	Prob > t	0.0767
Confidence	0.95	Prob < t	0.9233

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	3.400945	3.40095	2.1746	0.1533
Error	24	37.535022	1.56396		
C. Total	25	40.935967			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	51.3699	0.31265	50.725	52.015
Isolok - 12 mL - HF	10	52.1133	0.39547	51.297	52.930

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	51.3699	1.32539	0.33135	50.664	52.076
Isolok - 12 mL - HF	10	52.1133	1.11481	0.35253	51.316	52.911

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.7434	t Ratio	1.536571
Std Err Dif	0.4838	DF	21.7437
Upper CL Dif	1.7475	Prob > t	0.1388
Lower CL Dif	-0.2606	Prob > t	0.0694
Confidence	0.95	Prob < t	0.9306

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.325388	1.006140	0.9092025
Isolok - 12 mL - HF	10	1.114810	0.855720	0.8557200

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1856	1	24	0.6705
Brown-Forsythe	0.0200	1	24	0.8887
Levene	0.2384	1	24	0.6298
Bartlett	0.3117	1	.	0.5767
F Test 2-sided	1.4135	15	9	0.6111

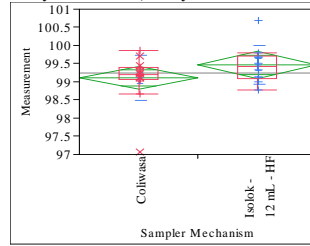
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3611	1	21.744	0.1388

t Test

1.5366

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=Sum of Oxides (wt%), Target Value=99.553



**Oneway Anova
Summary of Fit**

Rsquare	0.087412
Adj Rsquare	0.049387
Root Mean Square Error	0.588922
Mean of Response	99.24931
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.35995	t Ratio	1.516188
Std Err Dif	0.23740	DF	24
Upper CL Dif	0.84992	Prob > t	0.1425
Lower CL Dif	-0.13003	Prob > t	0.0713
Confidence	0.95	Prob < t	0.9287

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.7973004	0.797300	2.2988	0.1425
Error	24	8.3239076	0.346829		
C. Total	25	9.1212081			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.1109	0.14723	98.807	99.415
Isolok - 12 mL - HF	10	99.4708	0.18623	99.086	99.855

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.1109	0.618317	0.15458	98.781	99.440
Isolok - 12 mL - HF	10	99.4708	0.536363	0.16961	99.087	99.855

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.35995	t Ratio	1.568497
Std Err Dif	0.22948	DF	21.3303
Upper CL Dif	0.83674	Prob > t	0.1315
Lower CL Dif	-0.11684	Prob > t	0.0657
Confidence	0.95	Prob < t	0.9343

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.6183171	0.3378880	0.3205276
Isolok - 12 mL - HF	10	0.5363629	0.3960690	0.3960690

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0572	1	24	0.8129
Brown-Forsythe	0.1608	1	24	0.6920
Levene	0.1014	1	24	0.7529
Bartlett	0.2119	1	.	0.6453
F Test 2-sided	1.3289	15	9	0.6815

Welch Anova testing Means Equal, allowing Std Devs Not Equal

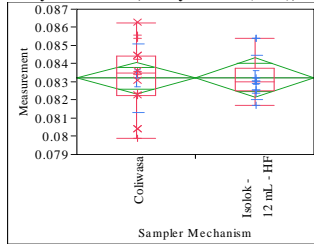
F Ratio	DFNum	DFDen	Prob > F
2.4602	1	21.33	0.1315

t Test

1.5685

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=TiO2 (wt%), Target Value=0.0711



Oneway Anova Summary of Fit

Rsquare	4.023e-5
Adj Rsquare	-0.04162
Root Mean Square Error	0.001664
Mean of Response	0.08322
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	2.085e-5	t Ratio	0.031075
Std Err Dif	0.00067	DF	24
Upper CL Dif	0.00141	Prob > t	0.9755
Lower CL Dif	-0.00136	Prob > t	0.4877
Confidence	0.95	Prob < t	0.5123

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	2.67522e-9	2.6752e-9	0.0010	0.9755
Error	24	0.00006649	2.7703e-6		
C. Total	25	0.00006649			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.083212	0.00042	0.08235	0.08407
Isolok - 12 mL - HF	10	0.083233	0.00053	0.08215	0.08432

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.083212	0.001881	0.00047	0.08221	0.08421
Isolok - 12 mL - HF	10	0.083233	0.001221	0.00039	0.08236	0.08411

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	2.085e-5	t Ratio	0.03427
Std Err Dif	0.00061	DF	23.9226
Upper CL Dif	0.00128	Prob > t	0.9729
Lower CL Dif	-0.00124	Prob > t	0.4865
Confidence	0.95	Prob < t	0.5135

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0018811	0.0014830	0.0014595
Isolok - 12 mL - HF	10	0.0012207	0.0008674	0.0008006

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.0171	1	24	0.1684
Brown-Forsythe	2.3064	1	24	0.1419
Levene	2.3538	1	24	0.1381
Bartlett	1.8275	1	.	0.1764
F Test 2-sided	2.3748	15	9	0.1924

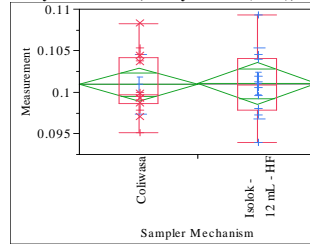
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0012	1	23.923	0.9729

t Test

0.0343

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=ZnO (wt%), Target Value=0.0958



Oneway Anova Summary of Fit

Rsquare	0.000272
Adj Rsquare	-0.04138
Root Mean Square Error	0.003868
Mean of Response	0.100963
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00013	t Ratio	0.080838
Std Err Dif	0.00156	DF	24
Upper CL Dif	0.00334	Prob > t	0.9362
Lower CL Dif	-0.00309	Prob > t	0.4681
Confidence	0.95	Prob < t	0.5319

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	9.77543e-8	9.775e-8	0.0065	0.9362
Error	24	0.00035902	0.000015		
C. Total	25	0.00035912			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.100914	0.00097	0.09892	0.10291
Isolok - 12 mL - HF	10	0.101040	0.00122	0.09852	0.10356

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.100914	0.003594	0.00090	0.09900	0.10283
Isolok - 12 mL - HF	10	0.101040	0.004285	0.00136	0.09798	0.10411

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00013	t Ratio	0.077519
Std Err Dif	0.00163	DF	16.71636
Upper CL Dif	0.00356	Prob > t	0.9391
Lower CL Dif	-0.00331	Prob > t	0.4696
Confidence	0.95	Prob < t	0.5304

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0035942	0.0030478	0.0027930
Isolok - 12 mL - HF	10	0.0042849	0.0031493	0.0031493

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.4172	1	24	0.5245
Brown-Forsythe	0.1165	1	24	0.7358
Levene	0.0137	1	24	0.9078
Bartlett	0.3407	1	.	0.5594
F Test 2-sided	1.4213	9	15	0.5258

Welch Anova testing Means Equal, allowing Std Devs Not Equal

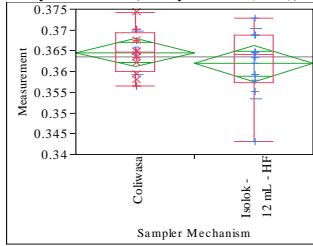
F Ratio	DFNum	DFDen	Prob > F
0.0060	1	16.716	0.9391

t Test

0.0775

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=4, Analyte=ZrO2 (wt%), Target Value=0.3547



Oneway Anova Summary of Fit

Rsquare	0.039698
Adj Rsquare	-0.00031
Root Mean Square Error	0.006644
Mean of Response	0.363521
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00267	t Ratio	-0.99607
Std Err Dif	0.00268	DF	24
Upper CL Dif	0.00286	Prob > t	0.3292
Lower CL Dif	-0.00820	Prob > t	0.8354
Confidence	0.95	Prob < t	0.1646

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00004380	0.000044	0.9922	0.3292
Error	24	0.00105949	0.000044		
C. Total	25	0.00110329			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.364547	0.00166	0.36112	0.36798
Isolok - 12 mL - HF	10	0.361879	0.00210	0.35754	0.36622

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.364547	0.005217	0.00130	0.36177	0.36733
Isolok - 12 mL - HF	10	0.361879	0.008506	0.00269	0.35579	0.36796

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00267	t Ratio	-0.89241
Std Err Dif	0.00299	DF	13.28851
Upper CL Dif	0.00378	Prob > t	0.3880
Lower CL Dif	-0.00911	Prob > t	0.8060
Confidence	0.95	Prob < t	0.1940

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0052171	0.0040735	0.0040524
Isolok - 12 mL - HF	10	0.0085063	0.0063758	0.0060786

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.9045	1	24	0.1803
Brown-Forsythe	1.2781	1	24	0.2694
Levene	2.0203	1	24	0.1681
Bartlett	2.6852	1	.	0.1013
F Test 2-sided	2.6585	9	15	0.0910

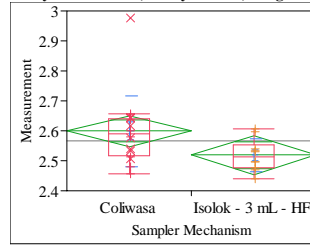
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7964	1	13.289	0.3880

t Test

0.8924

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Al/B, Target Value=2.552



Oneway Anova Summary of Fit

Rsquare	0.142006
Adj Rsquare	0.106256
Root Mean Square Error	0.099752
Mean of Response	2.567809
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.08014	t Ratio	-1.99305
Std Err Dif	0.04021	DF	24
Upper CL Dif	0.00285	Prob > t	0.0577
Lower CL Dif	-0.16314	Prob > t	0.9711
Confidence	0.95	Prob < t	0.0289

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.03952563	0.039526	3.9722	0.0577
Error	24	0.23881173	0.009950		
C. Total	25	0.27833736			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.59863	0.02494	2.5472	2.6501
Isolok - 3 mL - HF	10	2.51849	0.03154	2.4534	2.5836

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.59863	0.119114	0.02978	2.5352	2.6621
Isolok - 3 mL - HF	10	2.51849	0.053739	0.01699	2.4800	2.5569

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.08014	t Ratio	-2.33747
Std Err Dif	0.03429	DF	22.40125
Upper CL Dif	-0.00911	Prob > t	0.0287
Lower CL Dif	-0.15117	Prob > t	0.9856
Confidence	0.95	Prob < t	0.0144

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1191135	0.0778695	0.0778695
Isolok - 3 mL - HF	10	0.0537394	0.0426169	0.0426169

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8695	1	24	0.3604
Brown-Forsythe	1.4617	1	24	0.2384
Levene	1.4846	1	24	0.2349
Bartlett	5.5599	1	.	0.0184
F Test 2-sided	4.9129	15	9	0.0207

Welch Anova testing Means Equal, allowing Std Devs Not Equal

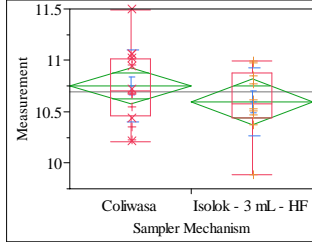
F Ratio	DFNum	DFDen	Prob > F
5.4638	1	22.401	0.0287

t Test

2.3375

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Al2O3 (wt%), Target Value=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.050273
Adj Rsquare	0.010701
Root Mean Square Error	0.343603
Mean of Response	10.69239
Observations (or Sum Wgts)	26

t Test

Isolak - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.15612	t Ratio	-1.12713
Std Err Dif	0.13851	DF	24
Upper CL Dif	0.12975	Prob > t	0.2708
Lower CL Dif	-0.44199	Prob > t	0.8646
Confidence	0.95	Prob < t	0.1354

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.1499904	0.149990	1.2704	0.2708
Error	24	2.8335108	0.118063		
C. Total	25	2.9835011			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.7524	0.08590	10.575	10.930
Isolak - 3 mL - HF	10	10.5963	0.10866	10.372	10.821

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.7524	0.350686	0.08767	10.566	10.939
Isolak - 3 mL - HF	10	10.5963	0.331462	0.10482	10.359	10.833

t Test

Isolak - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.15612	t Ratio	-1.14249
Std Err Dif	0.13665	DF	20.09618
Upper CL Dif	0.12884	Prob > t	0.2667
Lower CL Dif	-0.44108	Prob > t	0.8667
Confidence	0.95	Prob < t	0.1333

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3506855	0.2823917	0.2775203
Isolak - 3 mL - HF	10	0.3314623	0.2456350	0.2456350

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0368	1	24	0.8495
Brown-Forsythe	0.1442	1	24	0.7075
Levene	0.2091	1	24	0.6516
Bartlett	0.0339	1	.	0.8540
F Test 2-sided	1.1194	15	9	0.8935

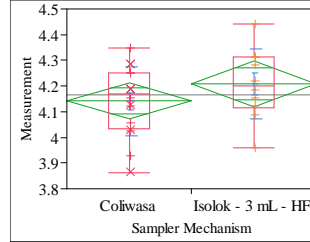
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.3053	1	20.096	0.2667

t Test

1.1425

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=B2O3 (wt%), Target Value=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.058835
Adj Rsquare	0.01962
Root Mean Square Error	0.135314
Mean of Response	4.167294
Observations (or Sum Wgts)	26

t Test

Isolak - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.06681	t Ratio	1.224873
Std Err Dif	0.05455	DF	24
Upper CL Dif	0.17939	Prob > t	0.2325
Lower CL Dif	-0.04577	Prob > t	0.1163
Confidence	0.95	Prob < t	0.8837

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.02747057	0.027471	1.5003	0.2325
Error	24	0.43943734	0.018310		
C. Total	25	0.46690790			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.14160	0.03383	4.0718	4.2114
Isolak - 3 mL - HF	10	4.20841	0.04279	4.1201	4.2967

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.14160	0.133991	0.03350	4.0702	4.2130
Isolak - 3 mL - HF	10	4.20841	0.137491	0.04348	4.1101	4.3068

t Test

Isolak - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.06681	t Ratio	1.217302
Std Err Dif	0.05489	DF	18.86694
Upper CL Dif	0.18175	Prob > t	0.2385
Lower CL Dif	-0.04812	Prob > t	0.1192
Confidence	0.95	Prob < t	0.8808

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1339907	0.1061561	0.1046467
Isolak - 3 mL - HF	10	0.1374914	0.1062567	0.1062567

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0092	1	24	0.9244
Brown-Forsythe	0.0023	1	24	0.9619
Levene	0.0000	1	24	0.9975
Bartlett	0.0072	1	.	0.9324
F Test 2-sided	1.0529	9	15	0.8925

Welch Anova testing Means Equal, allowing Std Devs Not Equal

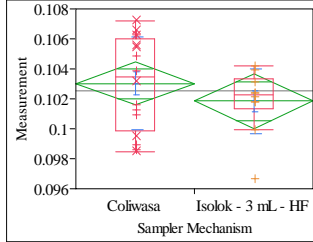
F Ratio	DFNum	DFDen	Prob > F
1.4818	1	18.867	0.2385

t Test

1.2173

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=BaO (wt%), Target Value=0.0919



Oneway Anova Summary of Fit

Rsquare	0.042539
Adj Rsquare	0.002645
Root Mean Square Error	0.002796
Mean of Response	0.102563
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00116	t Ratio	-1.03261
Std Err Dif	0.00113	DF	24
Upper CL Dif	0.00116	Prob > t	0.3121
Lower CL Dif	-0.00349	Prob > t	0.8440
Confidence	0.95	Prob < t	0.1560

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000834	8.3371e-6	1.0663	0.3121
Error	24	0.00018765	7.8188e-6		
C. Total	25	0.00019599			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103011	0.00070	0.10157	0.10445
Isolok - 3 mL - HF	10	0.101847	0.00088	0.10002	0.10367

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103011	0.003111	0.00078	0.10135	0.10467
Isolok - 3 mL - HF	10	0.101847	0.002173	0.00069	0.10029	0.10340

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00116	t Ratio	-1.12155
Std Err Dif	0.00104	DF	23.59437
Upper CL Dif	0.00098	Prob > t	0.2733
Lower CL Dif	-0.00331	Prob > t	0.8633
Confidence	0.95	Prob < t	0.1367

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0031107	0.0027267	0.0027075
Isolok - 3 mL - HF	10	0.0021731	0.0014247	0.0013621

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.1419	1	24	0.1563
Brown-Forsythe	4.6553	1	24	0.0412
Levene	5.1737	1	24	0.0322
Bartlett	1.2818	1	.	0.2576
F Test 2-sided	2.0490	15	9	0.2786

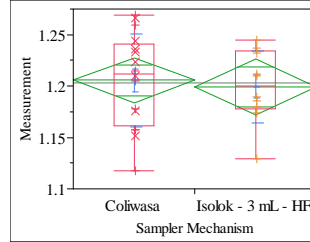
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2579	1	23.594	0.2733

t Test

1.1216

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=CaO (wt%), Target Value=1.1462



Oneway Anova Summary of Fit

Rsquare	0.00573
Adj Rsquare	-0.0357
Root Mean Square Error	0.041884
Mean of Response	1.203258
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00628	t Ratio	-0.37189
Std Err Dif	0.01688	DF	24
Upper CL Dif	0.02857	Prob > t	0.7132
Lower CL Dif	-0.04113	Prob > t	0.6434
Confidence	0.95	Prob < t	0.3566

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00024261	0.000243	0.1383	0.7132
Error	24	0.04210172	0.001754		
C. Total	25	0.04234433			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.20567	0.01047	1.1841	1.2273
Isolok - 3 mL - HF	10	1.19939	0.01324	1.1721	1.2267

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.20567	0.045407	0.01135	1.1815	1.2299
Isolok - 3 mL - HF	10	1.19939	0.035236	0.01114	1.1742	1.2246

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00628	t Ratio	-0.39473
Std Err Dif	0.01591	DF	22.70337
Upper CL Dif	0.02665	Prob > t	0.6967
Lower CL Dif	-0.03921	Prob > t	0.6516
Confidence	0.95	Prob < t	0.3484

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0454075	0.0373958	0.0369913
Isolok - 3 mL - HF	10	0.0352359	0.0279840	0.0279840

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.9645	1	24	0.3359
Brown-Forsythe	0.9245	1	24	0.3459
Levene	1.0998	1	24	0.3048
Bartlett	0.6576	1	.	0.4174
F Test 2-sided	1.6607	15	9	0.4463

Welch Anova testing Means Equal, allowing Std Devs Not Equal

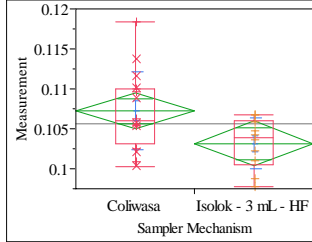
F Ratio	DFNum	DFDen	Prob > F
0.1558	1	22.703	0.6967

t Test

0.3947

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Cr2O3 (wt%), Target Value=0.0998



Oneway Anova
Summary of Fit

Rsquare	0.183623
Adj Rsquare	0.149608
Root Mean Square Error	0.004327
Mean of Response	0.105668
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00405	t Ratio	-2.3234
Std Err Dif	0.00174	DF	24
Upper CL Dif	-0.00045	Prob > t	0.0290
Lower CL Dif	-0.00765	Prob > t	0.9855
Confidence	0.95	Prob < t	0.0145

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00010105	0.000101	5.3982	0.0290
Error	24	0.00044927	0.000019		
C. Total	25	0.00055032			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.107227	0.00108	0.10499	0.10946
Isolok - 3 mL - HF	10	0.103174	0.00137	0.10035	0.10600

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.107227	0.004898	0.00122	0.10462	0.10984
Isolok - 3 mL - HF	10	0.103174	0.003152	0.00100	0.10092	0.10543

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00405	t Ratio	-2.56658
Std Err Dif	0.00158	DF	23.94366
Upper CL Dif	-0.00079	Prob > t	0.0170
Lower CL Dif	-0.00731	Prob > t	0.9915
Confidence	0.95	Prob < t	0.0085

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0048981	0.0039212	0.0038002
Isolok - 3 mL - HF	10	0.0031517	0.0025607	0.0024701

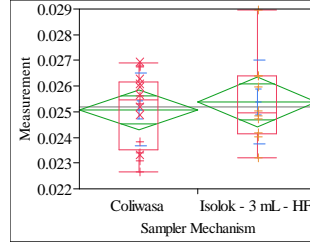
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.5170	1	24	0.2300
Brown-Forsythe	1.3884	1	24	0.2502
Levene	1.9854	1	24	0.1716
Bartlett	1.8952	1	.	0.1686
F Test 2-sided	2.4152	15	9	0.1840

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.5874	1	23.944	0.0170

t Test
2.5666

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=CuO (wt%), Target Value=0.0504



Oneway Anova
Summary of Fit

Rsquare	0.00969
Adj Rsquare	-0.03157
Root Mean Square Error	0.001502
Mean of Response	0.0252
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00029	t Ratio	0.484599
Std Err Dif	0.00061	DF	24
Upper CL Dif	0.00154	Prob > t	0.6324
Lower CL Dif	-0.00096	Prob > t	0.3162
Confidence	0.95	Prob < t	0.6838

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000053	5.2971e-7	0.2348	0.6324
Error	24	0.00005414	2.2557e-6		
C. Total	25	0.00005467			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.00038	0.02431	0.02586
Isolok - 3 mL - HF	10	0.025380	0.00047	0.02440	0.02636

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.001412	0.00035	0.02433	0.02584
Isolok - 3 mL - HF	10	0.025380	0.001641	0.00052	0.02421	0.02655

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00029	t Ratio	0.467488
Std Err Dif	0.00063	DF	17.06273
Upper CL Dif	0.00162	Prob > t	0.6461
Lower CL Dif	-0.00103	Prob > t	0.3230
Confidence	0.95	Prob < t	0.6770

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0014119	0.0011726	0.0011384
Isolok - 3 mL - HF	10	0.0016410	0.0012518	0.0011830

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.2902	1	24	0.5951
Brown-Forsythe	0.0126	1	24	0.9116
Levene	0.0563	1	24	0.8145
Bartlett	0.2487	1	.	0.6180
F Test 2-sided	1.3509	9	15	0.5828

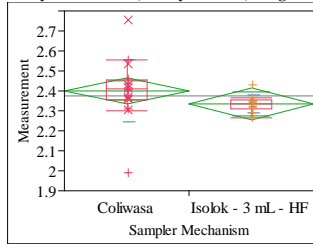
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2185	1	17.063	0.6461

t Test
0.4675

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Fe/Li, Target Value=2.452



Oneway Anova
Summary of Fit

Rsquare	0.06754
Adj Rsquare	0.028688
Root Mean Square Error	0.125919
Mean of Response	2.3763
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.06692	t Ratio	-1.31847
Std Err Dif	0.05076	DF	24
Upper CL Dif	0.03784	Prob > t	0.1998
Lower CL Dif	-0.17169	Prob > t	0.9001
Confidence	0.95	Prob < t	0.0999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.02756278	0.027563	1.7384	0.1998
Error	24	0.38053222	0.015856		
C. Total	25	0.40809500			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.40204	0.03148	2.3371	2.4670
Isolok - 3 mL - HF	10	2.33512	0.03982	2.2529	2.4173

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.40204	0.155378	0.03884	2.3192	2.4848
Isolok - 3 mL - HF	10	2.33512	0.045210	0.01430	2.3028	2.3675

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.06692	t Ratio	-1.61686
Std Err Dif	0.04139	DF	18.76511
Upper CL Dif	0.01978	Prob > t	0.1226
Lower CL Dif	-0.15363	Prob > t	0.9387
Confidence	0.95	Prob < t	0.0613

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1553784	0.0955520	0.0949406
Isolok - 3 mL - HF	10	0.0452099	0.0315824	0.0315824

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.6036	1	24	0.2175
Brown-Forsythe	2.6124	1	24	0.1191
Levene	2.6924	1	24	0.1139
Bartlett	11.6044	1	.	0.0007
F Test 2-sided	11.8118	15	9	0.0008

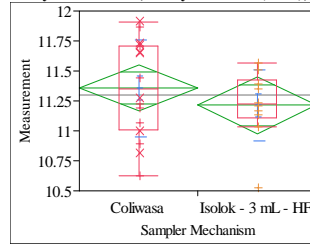
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.6142	1	18.765	0.1226

t Test

1.6169

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Fe2O3 (wt%), Target Value=11.462



Oneway Anova
Summary of Fit

Rsquare	0.038101
Adj Rsquare	-0.00198
Root Mean Square Error	0.366482
Mean of Response	11.30178
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.14404	t Ratio	-0.97501
Std Err Dif	0.14773	DF	24
Upper CL Dif	0.16087	Prob > t	0.3393
Lower CL Dif	-0.44895	Prob > t	0.8304
Confidence	0.95	Prob < t	0.1696

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.1276811	0.127681	0.9506	0.3393
Error	24	3.2234237	0.134309		
C. Total	25	3.3511048			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3572	0.09162	11.168	11.546
Isolok - 3 mL - HF	10	11.2131	0.11589	10.974	11.452

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3572	0.403533	0.10088	11.142	11.572
Isolok - 3 mL - HF	10	11.2131	0.294551	0.09315	11.002	11.424

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.14404	t Ratio	-1.04905
Std Err Dif	0.13731	DF	23.27928
Upper CL Dif	0.13981	Prob > t	0.3049
Lower CL Dif	-0.42790	Prob > t	0.8475
Confidence	0.95	Prob < t	0.1525

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4035327	0.3484894	0.3484894
Isolok - 3 mL - HF	10	0.2945514	0.1987283	0.1987283

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.3405	1	24	0.2583
Brown-Forsythe	3.7352	1	24	0.0652
Levene	3.7413	1	24	0.0650
Bartlett	0.9984	1	.	0.3177
F Test 2-sided	1.8769	15	9	0.3420

Welch Anova testing Means Equal, allowing Std Devs Not Equal

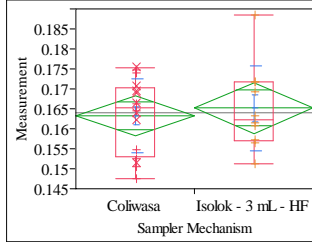
F Ratio	DFNum	DFDen	Prob > F
1.1005	1	23.279	0.3049

t Test

1.0490

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=K2O (wt%), Target Value=0.1591



**Oneway Anova
Summary of Fit**

Rsquare	0.009895
Adj Rsquare	-0.03136
Root Mean Square Error	0.009763
Mean of Response	0.163965
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00193	t Ratio	0.48974
Std Err Dif	0.00394	DF	24
Upper CL Dif	0.01005	Prob > t	0.6288
Lower CL Dif	-0.00620	Prob > t	0.3144
Confidence	0.95	Prob < t	0.6856

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00002286	0.000023	0.2398	0.6288
Error	24	0.00228745	0.000095		
C. Total	25	0.00231031			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.00244	0.15819	0.16826
Isolok - 3 mL - HF	10	0.165151	0.00309	0.15878	0.17152

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.009208	0.00230	0.15832	0.16813
Isolok - 3 mL - HF	10	0.165151	0.010623	0.00336	0.15755	0.17275

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00193	t Ratio	0.473283
Std Err Dif	0.00407	DF	17.16649
Upper CL Dif	0.01051	Prob > t	0.6420
Lower CL Dif	-0.00666	Prob > t	0.3210
Confidence	0.95	Prob < t	0.6790

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0092082	0.0076040	0.0073782
Isolok - 3 mL - HF	10	0.0106228	0.0080949	0.0077094

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.2619	1	24	0.6135
Brown-Forsythe	0.0167	1	24	0.8984
Levene	0.0503	1	24	0.8244
Bartlett	0.2244	1	.	0.6357
F Test 2-sided	1.3309	9	15	0.6001

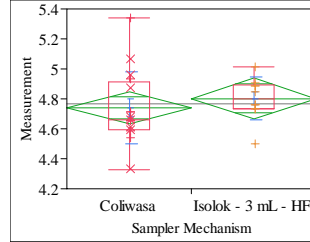
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2240	1	17.166	0.6420

t Test

0.4733

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Li2O (wt%), Target Value=4.674



**Oneway Anova
Summary of Fit**

Rsquare	0.02274
Adj Rsquare	-0.01798
Root Mean Square Error	0.208145
Mean of Response	4.764533
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.06270	t Ratio	0.747304
Std Err Dif	0.08391	DF	24
Upper CL Dif	0.23588	Prob > t	0.4621
Lower CL Dif	-0.11047	Prob > t	0.2311
Confidence	0.95	Prob < t	0.7689

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.0241950	0.024195	0.5585	0.4621
Error	24	1.0397821	0.043324		
C. Total	25	1.0639771			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.74042	0.05204	4.6330	4.8478
Isolok - 3 mL - HF	10	4.80312	0.06582	4.6673	4.9390

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.74042	0.239765	0.05994	4.6127	4.8682
Isolok - 3 mL - HF	10	4.80312	0.140425	0.04441	4.7027	4.9036

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.06270	t Ratio	0.840547
Std Err Dif	0.07460	DF	23.95642
Upper CL Dif	0.21668	Prob > t	0.4089
Lower CL Dif	-0.09127	Prob > t	0.2045
Confidence	0.95	Prob < t	0.7955

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2397650	0.1804736	0.1655042
Isolok - 3 mL - HF	10	0.1404253	0.1054921	0.1054921

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.2595	1	24	0.2728
Brown-Forsythe	0.8998	1	24	0.3523
Levene	2.0384	1	24	0.1663
Bartlett	2.7180	1	.	0.0992
F Test 2-sided	2.9153	15	9	0.1093

Welch Anova testing Means Equal, allowing Std Devs Not Equal

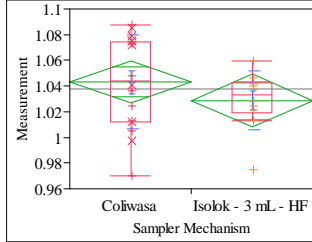
F Ratio	DFNum	DFDen	Prob > F
0.7065	1	23.956	0.4089

t Test

0.8405

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=MgO (wt%), Target Value=1.014



Oneway Anova
Summary of Fit

Rsquare	0.048298
Adj Rsquare	0.008644
Root Mean Square Error	0.032056
Mean of Response	1.037586
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.01426	t Ratio	-1.10362
Std Err Dif	0.01292	DF	24
Upper CL Dif	0.01241	Prob > t	0.2807
Lower CL Dif	-0.04093	Prob > t	0.8596
Confidence	0.95	Prob < t	0.1404

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00125161	0.001252	1.2180	0.2807
Error	24	0.02466273	0.001028		
C. Total	25	0.02591434			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.04307	0.00801	1.0265	1.0596
Isolok - 3 mL - HF	10	1.02881	0.01014	1.0079	1.0497

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.04307	0.036367	0.00909	1.0237	1.0624
Isolok - 3 mL - HF	10	1.02881	0.023153	0.00732	1.0122	1.0454

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.01426	t Ratio	-1.22171
Std Err Dif	0.01167	DF	23.9654
Upper CL Dif	0.00983	Prob > t	0.2337
Lower CL Dif	-0.03836	Prob > t	0.8832
Confidence	0.95	Prob < t	0.1168

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0363668	0.0308858	0.0308858
Isolok - 3 mL - HF	10	0.0231529	0.0162513	0.0162513

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.3124	1	24	0.1414
Brown-Forsythe	4.5476	1	24	0.0434
Levene	4.6800	1	24	0.0407
Bartlett	1.9820	1	.	0.1592
F Test 2-sided	2.4672	15	9	0.1739

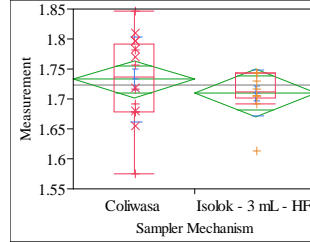
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.4926	1	23.965	0.2337

t Test

1.2217

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=MnO (wt%), Target Value=1.779



Oneway Anova
Summary of Fit

Rsquare	0.035718
Adj Rsquare	-0.00446
Root Mean Square Error	0.060725
Mean of Response	1.723752
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02308	t Ratio	-0.94285
Std Err Dif	0.02448	DF	24
Upper CL Dif	0.02744	Prob > t	0.3552
Lower CL Dif	-0.07360	Prob > t	0.8224
Confidence	0.95	Prob < t	0.1776

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00327813	0.003278	0.8890	0.3552
Error	24	0.08850109	0.003688		
C. Total	25	0.09177922			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.73263	0.01518	1.7013	1.7640
Isolok - 3 mL - HF	10	1.70955	0.01920	1.6699	1.7492

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.73263	0.070756	0.01769	1.6949	1.7703
Isolok - 3 mL - HF	10	1.70955	0.038592	0.01220	1.6819	1.7372

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02308	t Ratio	-1.07397
Std Err Dif	0.02149	DF	23.72088
Upper CL Dif	0.02130	Prob > t	0.2936
Lower CL Dif	-0.06746	Prob > t	0.8532
Confidence	0.95	Prob < t	0.1468

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0707563	0.0589110	0.0589110
Isolok - 3 mL - HF	10	0.0385923	0.0258240	0.0258240

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.2943	1	24	0.1429
Brown-Forsythe	6.0827	1	24	0.0212
Levene	6.1468	1	24	0.0206
Bartlett	3.4179	1	.	0.0645
F Test 2-sided	3.3615	15	9	0.0715

Welch Anova testing Means Equal, allowing Std Devs Not Equal

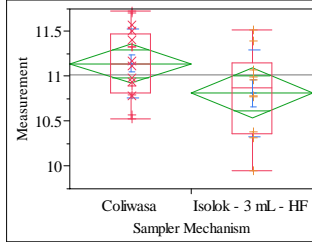
F Ratio	DFNum	DFDen	Prob > F
1.1534	1	23.721	0.2936

t Test

1.0740

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Na2O (wt%), Target Value=11.659



**Oneway Anova
Summary of Fit**

Rsquare	0.133506
Adj Rsquare	0.097402
Root Mean Square Error	0.424307
Mean of Response	11.01472
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.32891	t Ratio	-1.92297
Std Err Dif	0.17104	DF	24
Upper CL Dif	0.02410	Prob > t	0.0664
Lower CL Dif	-0.68193	Prob > t	0.9668
Confidence	0.95	Prob < t	0.0332

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.6657422	0.665742	3.6978	0.0664
Error	24	4.3208734	0.180036		
C. Total	25	4.9866156			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	11.1412	0.10608	10.922	11.360
Isolok - 3 mL - HF	10	10.8123	0.13418	10.535	11.089

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	11.1412	0.382002	0.09550	10.938	11.345
Isolok - 3 mL - HF	10	10.8123	0.486711	0.15391	10.464	11.160

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.32891	t Ratio	-1.81586
Std Err Dif	0.18113	DF	15.85416
Upper CL Dif	0.05536	Prob > t	0.0884
Lower CL Dif	-0.71318	Prob > t	0.9558
Confidence	0.95	Prob < t	0.0442

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.3820020	0.3201500	0.3201500
Isolok - 3 mL - HF	10	0.4867112	0.3733960	0.3733960

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.1159	1	24	0.3013
Brown-Forsythe	0.3166	1	24	0.5789
Levene	0.3254	1	24	0.5737
Bartlett	0.6515	1	.	0.4196
F Test 2-sided	1.6233	9	15	0.3909

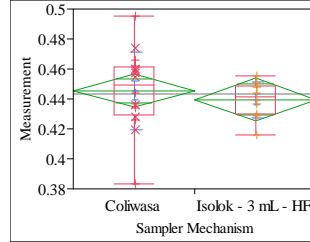
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.2973	1	15.854	0.0884

t Test

1.8159

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=NiO (wt%), Target Value=0.41



**Oneway Anova
Summary of Fit**

Rsquare	0.018842
Adj Rsquare	-0.02204
Root Mean Square Error	0.021796
Mean of Response	0.443319
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00596	t Ratio	-0.6789
Std Err Dif	0.00879	DF	24
Upper CL Dif	0.01217	Prob > t	0.5037
Lower CL Dif	-0.02410	Prob > t	0.7482
Confidence	0.95	Prob < t	0.2518

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00021895	0.000219	0.4609	0.5037
Error	24	0.01140108	0.000475		
C. Total	25	0.01162003			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.445614	0.00545	0.43437	0.45686
Isolok - 3 mL - HF	10	0.439649	0.00689	0.42542	0.45387

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.445614	0.0225951	0.00649	0.43179	0.45944
Isolok - 3 mL - HF	10	0.439649	0.012016	0.00380	0.43105	0.44824

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00596	t Ratio	-0.79335
Std Err Dif	0.00752	DF	22.61989
Upper CL Dif	0.00960	Prob > t	0.4358
Lower CL Dif	-0.02153	Prob > t	0.7821
Confidence	0.95	Prob < t	0.2179

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0259508	0.0199623	0.0199623
Isolok - 3 mL - HF	10	0.0120160	0.0095437	0.0095437

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.0013	1	24	0.1700
Brown-Forsythe	3.6806	1	24	0.0670
Levene	3.8965	1	24	0.0600
Bartlett	5.2455	1	.	0.0220
F Test 2-sided	4.6643	15	9	0.0247

Welch Anova testing Means Equal, allowing Std Devs Not Equal

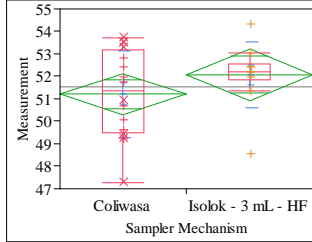
F Ratio	DFNum	DFDen	Prob > F
0.6294	1	22.62	0.4358

t Test

0.7934

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=SiO2 (wt%), Target Value=50.985



Oneway Anova
Summary of Fit

Rsquare	0.056715
Adj Rsquare	0.017411
Root Mean Square Error	1.778189
Mean of Response	51.54067
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.8611	t Ratio	1.201249
Std Err Dif	0.7168	DF	24
Upper CL Dif	2.3405	Prob > t	0.2414
Lower CL Dif	-0.6184	Prob > t	0.1207
Confidence	0.95	Prob < t	0.8793

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	4.562699	4.56270	1.4430	0.2414
Error	24	75.886967	3.16196		
C. Total	25	80.449666			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	51.2095	0.44455	50.292	52.127
Isolok - 3 mL - HF	10	52.0706	0.56231	50.910	53.231

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	51.2095	1.94331	0.48583	50.174	52.245
Isolok - 3 mL - HF	10	52.0706	1.46212	0.46236	51.025	53.116

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.8611	t Ratio	1.28388
Std Err Dif	0.6707	DF	23.01288
Upper CL Dif	2.2484	Prob > t	0.2120
Lower CL Dif	-0.5263	Prob > t	0.1060
Confidence	0.95	Prob < t	0.8940

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.943312	1.657958	1.657958
Isolok - 3 mL - HF	10	1.462116	0.864277	0.812934

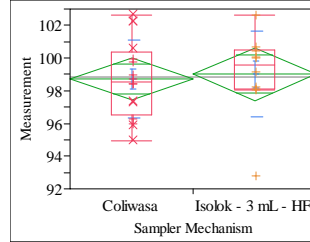
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8770	1	24	0.3584
Brown-Forsythe	4.0959	1	24	0.0543
Levene	3.8073	1	24	0.0628
Bartlett	0.8216	1	.	0.3647
F Test 2-sided	1.7665	15	9	0.3913

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6483	1	23.013	0.2120

t Test
1.2839

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=Sum of Oxides (wt%), Target Value=99.553



Oneway Anova
Summary of Fit

Rsquare	0.004032
Adj Rsquare	-0.03747
Root Mean Square Error	2.474647
Mean of Response	98.82969
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.3109	t Ratio	0.311694
Std Err Dif	0.9976	DF	24
Upper CL Dif	2.3698	Prob > t	0.7580
Lower CL Dif	-1.7479	Prob > t	0.3790
Confidence	0.95	Prob < t	0.6210

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.59495	0.59495	0.0972	0.7580
Error	24	146.97303	6.12388		
C. Total	25	147.56798			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	98.7101	0.61866	97.433	99.99
Isolok - 3 mL - HF	10	99.0210	0.78255	97.406	100.64

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	98.7101	2.38801	0.59700	97.438	99.98
Isolok - 3 mL - HF	10	99.0210	2.61267	0.82620	97.152	100.89

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.3109	t Ratio	0.30504
Std Err Dif	1.0193	DF	17.92069
Upper CL Dif	2.4531	Prob > t	0.7638
Lower CL Dif	-1.8313	Prob > t	0.3819
Confidence	0.95	Prob < t	0.6181

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	2.388008	1.907102	1.905940
Isolok - 3 mL - HF	10	2.612667	1.777035	1.747612

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0771	1	24	0.7837
Brown-Forsythe	0.0598	1	24	0.8088
Levene	0.0437	1	24	0.8362
Bartlett	0.0882	1	.	0.7665
F Test 2-sided	1.1970	9	15	0.7282

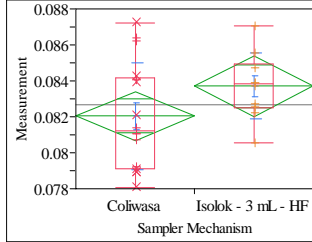
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0930	1	17.921	0.7638

t Test
0.3050

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=TiO2 (wt%), Target Value=0.0711



**Oneway Anova
Summary of Fit**

Rsquare	0.095054
Adj Rsquare	0.057348
Root Mean Square Error	0.002603
Mean of Response	0.082675
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00167	t Ratio	1.587739
Std Err Dif	0.00105	DF	24
Upper CL Dif	0.00383	Prob > t	0.1254
Lower CL Dif	-0.00050	Prob > t	0.0627
Confidence	0.95	Prob < t	0.9373

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00001708	0.000017	2.5209	0.1254
Error	24	0.00016259	6.775e-6		
C. Total	25	0.00017967			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.082034	0.00065	0.08069	0.08338
Isolok - 3 mL - HF	10	0.083700	0.00082	0.08200	0.08540

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.082034	0.002971	0.00074	0.08045	0.08362
Isolok - 3 mL - HF	10	0.083700	0.001832	0.00058	0.08239	0.08501

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00167	t Ratio	1.768626
Std Err Dif	0.00094	DF	23.99891
Upper CL Dif	0.00361	Prob > t	0.0897
Lower CL Dif	-0.00028	Prob > t	0.0448
Confidence	0.95	Prob < t	0.9552

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0029709	0.0024877	0.0024082
Isolok - 3 mL - HF	10	0.0018319	0.0013411	0.0013344

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.2062	1	24	0.0860
Brown-Forsythe	2.7270	1	24	0.1117
Levene	4.2586	1	24	0.0500
Bartlett	2.2524	1	.	0.1334
F Test 2-sided	2.6299	15	9	0.1462

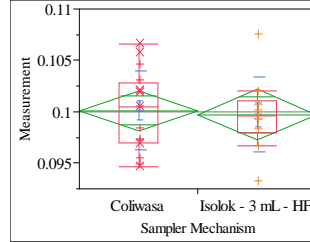
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.1280	1	23.999	0.0897

t Test

1.7686

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=ZnO (wt%), Target Value=0.0958



**Oneway Anova
Summary of Fit**

Rsquare	0.002693
Adj Rsquare	-0.03886
Root Mean Square Error	0.003776
Mean of Response	0.099972
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00039	t Ratio	-0.25456
Std Err Dif	0.00152	DF	24
Upper CL Dif	0.00275	Prob > t	0.8012
Lower CL Dif	-0.00353	Prob > t	0.5994
Confidence	0.95	Prob < t	0.4006

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000092	9.238e-7	0.0648	0.8012
Error	24	0.00034212	0.000014		
C. Total	25	0.00034304			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.100121	0.00094	0.09817	0.10207
Isolok - 3 mL - HF	10	0.099733	0.00119	0.09727	0.10220

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.100121	0.003837	0.00096	0.09808	0.10217
Isolok - 3 mL - HF	10	0.099733	0.003672	0.00116	0.09711	0.10236

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00039	t Ratio	-0.25727
Std Err Dif	0.00151	DF	19.91191
Upper CL Dif	0.00275	Prob > t	0.7996
Lower CL Dif	-0.00353	Prob > t	0.6002
Confidence	0.95	Prob < t	0.3998

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0038367	0.0032394	0.0031976
Isolok - 3 mL - HF	10	0.0036715	0.0023402	0.0023402

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0256	1	24	0.8743
Brown-Forsythe	0.8582	1	24	0.3635
Levene	0.9996	1	24	0.3274
Bartlett	0.0207	1	.	0.8857
F Test 2-sided	1.0920	15	9	0.9254

Welch Anova testing Means Equal, allowing Std Devs Not Equal

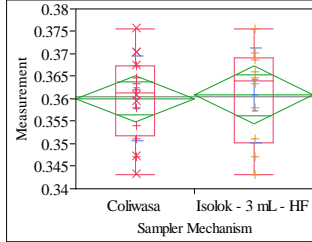
F Ratio	DFNum	DFDen	Prob > F
0.0662	1	19.912	0.7996

t Test

0.2573

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=5, Analyte=ZrO2 (wt%), Target Value=0.3547



Oneway Anova Summary of Fit

Rsquare	0.001382
Adj Rsquare	-0.04023
Root Mean Square Error	0.009883
Mean of Response	0.360352
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00073	t Ratio	0.182236
Std Err Dif	0.00398	DF	24
Upper CL Dif	0.00895	Prob > t	0.8569
Lower CL Dif	-0.00750	Prob > t	0.4285
Confidence	0.95	Prob < t	0.5715

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000324	3.244e-6	0.0332	0.8569
Error	24	0.00234439	0.000098		
C. Total	25	0.00234764			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.360073	0.00247	0.35497	0.36517
Isolok - 3 mL - HF	10	0.360799	0.00313	0.35435	0.36725

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.360073	0.009410	0.00235	0.35506	0.36509
Isolok - 3 mL - HF	10	0.360799	0.010626	0.00336	0.35320	0.36840

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00073	t Ratio	0.177008
Std Err Dif	0.00410	DF	17.46739
Upper CL Dif	0.00936	Prob > t	0.8615
Lower CL Dif	-0.00791	Prob > t	0.4308
Confidence	0.95	Prob < t	0.5692

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0094101	0.0075877	0.0075138
Isolok - 3 mL - HF	10	0.0106257	0.0087532	0.0082399

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3105	1	24	0.5825
Brown-Forsythe	0.0872	1	24	0.7703
Levene	0.3053	1	24	0.5857
Bartlett	0.1617	1	.	0.6876
F Test 2-sided	1.2751	9	15	0.6507

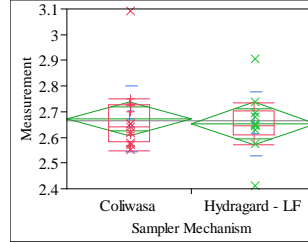
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0313	1	17.467	0.8615

t Test

0.1770

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Al/B, Target Value=2.552



Oneway Anova Summary of Fit

Rsquare	0.005074
Adj Rsquare	-0.03638
Root Mean Square Error	0.127381
Mean of Response	2.664893
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.01797	t Ratio	-0.34987
Std Err Dif	0.05135	DF	24
Upper CL Dif	0.08801	Prob > t	0.7295
Lower CL Dif	-0.12394	Prob > t	0.6353
Confidence	0.95	Prob < t	0.3647

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00198618	0.001986	0.1224	0.7295
Error	24	0.38942422	0.016226		
C. Total	25	0.39141040			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.67180	0.03185	2.6061	2.7375
Hydragard - LF	10	2.65384	0.04028	2.5707	2.7370

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.67180	0.129198	0.03230	2.6030	2.7406
Hydragard - LF	10	2.65384	0.124295	0.03931	2.5649	2.7428

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.01797	t Ratio	-0.35313
Std Err Dif	0.05087	DF	19.83273
Upper CL Dif	0.08821	Prob > t	0.7277
Lower CL Dif	-0.12414	Prob > t	0.6361
Confidence	0.95	Prob < t	0.3639

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1291977	0.0863064	0.0802212
Hydragard - LF	10	0.1242952	0.0772512	0.0759860

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0056	1	24	0.9412
Brown-Forsythe	0.0109	1	24	0.9177
Levene	0.0575	1	24	0.8125
Bartlett	0.0160	1	.	0.8994
F Test 2-sided	1.0804	15	9	0.9392

Welch Anova testing Means Equal, allowing Std Devs Not Equal

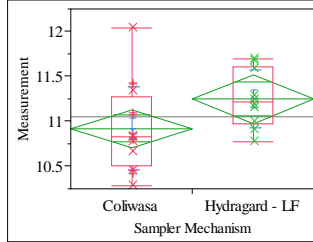
F Ratio	DFNum	DFDen	Prob > F
0.1247	1	19.833	0.7277

t Test

0.3531

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Al2O3 (wt%), Target Value=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.138712
Adj Rsquare	0.102825
Root Mean Square Error	0.415437
Mean of Response	11.04558
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.32925	t Ratio	1.966021
Std Err Dif	0.16747	DF	24
Upper CL Dif	0.67488	Prob > t	0.0610
Lower CL Dif	-0.01639	Prob > t	0.0305
Confidence	0.95	Prob < t	0.9695

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.6670924	0.667092	3.8652	0.0610
Error	24	4.1421044	0.172588		
C. Total	25	4.8091968			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.9189	0.10386	10.705	11.133
Hydragard - LF	10	11.2482	0.13137	10.977	11.519

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.9189	0.463287	0.11582	10.672	11.166
Hydragard - LF	10	11.2482	0.320170	0.10125	11.019	11.477

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.329245	t Ratio	2.140234
Std Err Dif	0.153836	DF	23.6586
Upper CL Dif	0.646990	Prob > t	0.0429
Lower CL Dif	0.011501	Prob > t	0.0214
Confidence	0.95	Prob < t	0.9786

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4632873	0.3584145	0.3401100
Hydragard - LF	10	0.3201698	0.2486582	0.2475245

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0210	1	24	0.3224
Brown-Forsythe	0.6934	1	24	0.4132
Levene	1.2116	1	24	0.2819
Bartlett	1.3566	1	.	0.2441
F Test 2-sided	2.0938	15	9	0.2644

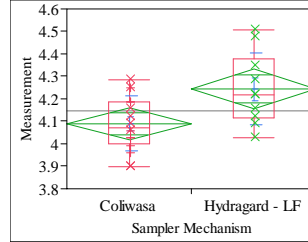
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.5806	1	23.659	0.0429

t Test

2.1402

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=B2O3 (wt%), Target Value=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.243874
Adj Rsquare	0.212369
Root Mean Square Error	0.137805
Mean of Response	4.148717
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.154555	t Ratio	2.782219
Std Err Dif	0.055551	DF	24
Upper CL Dif	0.269207	Prob > t	0.0103
Lower CL Dif	0.039903	Prob > t	0.0052
Confidence	0.95	Prob < t	0.9948

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.14699883	0.146999	7.7407	0.0103
Error	24	0.45576655	0.018990		
C. Total	25	0.60276538			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.08927	0.03445	4.0182	4.1604
Hydragard - LF	10	4.24383	0.04358	4.1539	4.3338

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.08927	0.122187	0.03055	4.0242	4.1544
Hydragard - LF	10	4.24383	0.160493	0.05075	4.1290	4.3586

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.154555	t Ratio	2.609141
Std Err Dif	0.059236	DF	15.48258
Upper CL Dif	0.280472	Prob > t	0.0194
Lower CL Dif	0.028638	Prob > t	0.0097
Confidence	0.95	Prob < t	0.9903

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1221866	0.1006219	0.1006219
Hydragard - LF	10	0.1604933	0.1275080	0.1223562

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.5046	1	24	0.2319
Brown-Forsythe	0.4506	1	24	0.5085
Levene	0.8138	1	24	0.3760
Bartlett	0.8278	1	.	0.3629
F Test 2-sided	1.7253	9	15	0.3367

Welch Anova testing Means Equal, allowing Std Devs Not Equal

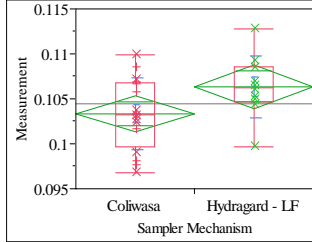
F Ratio	DFNum	DFDen	Prob > F
6.8076	1	15.483	0.0194

t Test

2.6091

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=BaO (wt%), Target Value=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.141251
Adj Rsquare	0.10547
Root Mean Square Error	0.003778
Mean of Response	0.104496
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00303	t Ratio	1.986865
Std Err Dif	0.00152	DF	24
Upper CL Dif	0.00617	Prob > t	0.0585
Lower CL Dif	-0.00012	Prob > t	0.0292
Confidence	0.95	Prob < t	0.9708

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00005634	0.000056	3.9476	0.0585
Error	24	0.00034251	0.000014		
C. Total	25	0.00039885			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103332	0.00094	0.10138	0.10528
Hydragard - LF	10	0.106358	0.00119	0.10389	0.10882

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103332	0.003971	0.00099	0.10122	0.10545
Hydragard - LF	10	0.106358	0.003432	0.00109	0.10390	0.10881

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00303	t Ratio	2.057065
Std Err Dif	0.00147	DF	21.37711
Upper CL Dif	0.00608	Prob > t	0.0521
Lower CL Dif	-0.00003	Prob > t	0.0260
Confidence	0.95	Prob < t	0.9740

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0039705	0.0031262	0.0031262
Hydragard - LF	10	0.0034325	0.0023670	0.0023670

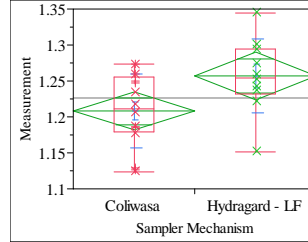
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2970	1	24	0.5908
Brown-Forsythe	0.6524	1	24	0.4272
Levene	0.6543	1	24	0.4265
Bartlett	0.2220	1	.	0.6375
F Test 2-sided	1.3381	15	9	0.6735

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.2315	1	21.377	0.0521

t Test
2.0571

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=CaO (wt%), Target Value=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.186307
Adj Rsquare	0.152403
Root Mean Square Error	0.051621
Mean of Response	1.226883
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.048780	t Ratio	2.344171
Std Err Dif	0.020809	DF	24
Upper CL Dif	0.091727	Prob > t	0.0277
Lower CL Dif	0.005832	Prob > t	0.0138
Confidence	0.95	Prob < t	0.9862

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.01464277	0.014643	5.4951	0.0277
Error	24	0.06395228	0.002665		
C. Total	25	0.07859505			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.20812	0.01291	1.1815	1.2348
Hydragard - LF	10	1.25690	0.01632	1.2232	1.2906

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.20812	0.051478	0.01287	1.1807	1.2356
Hydragard - LF	10	1.25690	0.051857	0.01640	1.2198	1.2940

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.048780	t Ratio	2.340048
Std Err Dif	0.020846	DF	19.14336
Upper CL Dif	0.092388	Prob > t	0.0303
Lower CL Dif	0.005171	Prob > t	0.0151
Confidence	0.95	Prob < t	0.9849

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0514783	0.0429380	0.0429380
Hydragard - LF	10	0.0518567	0.0367990	0.0367990

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0008	1	24	0.9781
Brown-Forsythe	0.2628	1	24	0.6129
Levene	0.2662	1	24	0.6106
Bartlett	0.0006	1	.	0.9808
F Test 2-sided	1.0148	9	15	0.9408

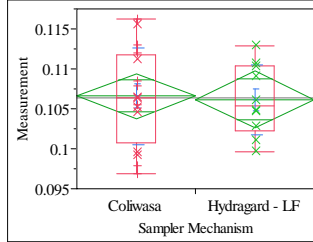
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.4758	1	19.143	0.0303

t Test
2.3400

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Cr2O3 (wt%), Target Value=0.0998



Oneway Anova
Summary of Fit

Rsquare	0.001515
Adj Rsquare	-0.04009
Root Mean Square Error	0.005486
Mean of Response	0.106416
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00042	t Ratio	-0.19083
Std Err Dif	0.00221	DF	24
Upper CL Dif	0.00414	Prob > t	0.8503
Lower CL Dif	-0.00499	Prob > t	0.5749
Confidence	0.95	Prob < t	0.4251

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000110	1.096e-6	0.0364	0.8503
Error	24	0.00072241	0.000030		
C. Total	25	0.00072351			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.106578	0.00137	0.10375	0.10941
Hydragard - LF	10	0.106156	0.00173	0.10258	0.10974

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.106578	0.006048	0.00151	0.10336	0.10980
Hydragard - LF	10	0.106156	0.004393	0.00139	0.10301	0.10930

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00042	t Ratio	-0.20553
Std Err Dif	0.00205	DF	23.31805
Upper CL Dif	0.00382	Prob > t	0.8389
Lower CL Dif	-0.00467	Prob > t	0.5805
Confidence	0.95	Prob < t	0.4195

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0060481	0.0047445	0.0047228
Hydragard - LF	10	0.0043935	0.0036189	0.0035809

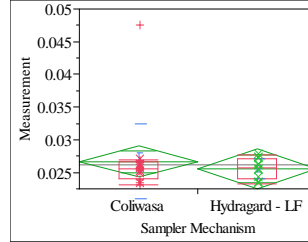
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6750	1	24	0.2079
Brown-Forsythe	0.7883	1	24	0.3834
Levene	0.8090	1	24	0.3773
Bartlett	1.0280	1	.	0.3106
F Test 2-sided	1.8950	15	9	0.3346

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0422	1	23.318	0.8389

t Test
0.2055

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=CuO (wt%), Target Value=0.0504



Oneway Anova
Summary of Fit

Rsquare	0.013531
Adj Rsquare	-0.02757
Root Mean Square Error	0.004624
Mean of Response	0.026232
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00107	t Ratio	-0.57376
Std Err Dif	0.00186	DF	24
Upper CL Dif	0.00278	Prob > t	0.5715
Lower CL Dif	-0.00492	Prob > t	0.7143
Confidence	0.95	Prob < t	0.2857

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000704	7.039e-6	0.3292	0.5715
Error	24	0.00051317	0.000021		
C. Total	25	0.00052021			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.026644	0.00116	0.02426	0.02903
Hydragard - LF	10	0.025574	0.00146	0.02256	0.02859

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.026644	0.005719	0.00143	0.02360	0.02969
Hydragard - LF	10	0.025574	0.001582	0.00050	0.02444	0.02671

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00107	t Ratio	-0.70603
Std Err Dif	0.00151	DF	18.43845
Upper CL Dif	0.00211	Prob > t	0.4890
Lower CL Dif	-0.00425	Prob > t	0.7555
Confidence	0.95	Prob < t	0.2445

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0057192	0.0026777	0.0023276
Hydragard - LF	10	0.0015824	0.0012643	0.0012643

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6231	1	24	0.4376
Brown-Forsythe	0.3899	1	24	0.5382
Levene	0.7714	1	24	0.3885
Bartlett	12.3649	1	.	0.0004
F Test 2-sided	13.0632	15	9	0.0005

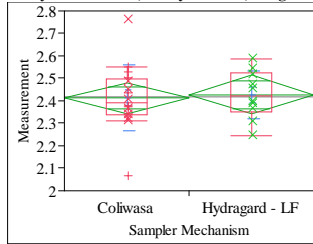
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4985	1	18.438	0.4890

t Test
0.7060

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Fe/Li, Target Value=2.452



Oneway Anova
Summary of Fit

Rsquare	0.002824
Adj Rsquare	-0.03872
Root Mean Square Error	0.13334
Mean of Response	2.418443
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.01401	t Ratio	0.260728
Std Err Dif	0.05375	DF	24
Upper CL Dif	0.12495	Prob > t	0.7965
Lower CL Dif	-0.09692	Prob > t	0.3983
Confidence	0.95	Prob < t	0.6017

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00120865	0.001209	0.0680	0.7965
Error	24	0.42671118	0.017780		
C. Total	25	0.42791983			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.41305	0.03334	2.3443	2.4819
Hydragard - LF	10	2.42707	0.04217	2.3400	2.5141

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.41305	0.146566	0.03664	2.3350	2.4912
Hydragard - LF	10	2.42707	0.107749	0.03407	2.3500	2.5041

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.01401	t Ratio	0.280089
Std Err Dif	0.05004	DF	23.22002
Upper CL Dif	0.11747	Prob > t	0.7819
Lower CL Dif	-0.08944	Prob > t	0.3909
Confidence	0.95	Prob < t	0.6091

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1465658	0.1025282	0.1017131
Hydragard - LF	10	0.1077488	0.0876864	0.0876864

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.4827	1	24	0.4939
Brown-Forsythe	0.1516	1	24	0.7004
Levene	0.1791	1	24	0.6759
Bartlett	0.9554	1	.	0.3284
F Test 2-sided	1.8503	15	9	0.3532

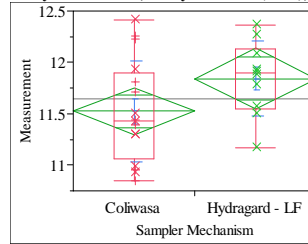
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0784	1	23.22	0.7819

t Test

0.2801

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Fe2O3 (wt%), Target Value=11.462



Oneway Anova
Summary of Fit

Rsquare	0.115326
Adj Rsquare	0.078464
Root Mean Square Error	0.449147
Mean of Response	11.64656
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.32025	t Ratio	1.768795
Std Err Dif	0.18106	DF	24
Upper CL Dif	0.69394	Prob > t	0.0896
Lower CL Dif	-0.05343	Prob > t	0.0448
Confidence	0.95	Prob < t	0.9552

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.6311499	0.631150	3.1286	0.0896
Error	24	4.8415999	0.201733		
C. Total	25	5.4727497			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.5234	0.11229	11.292	11.755
Hydragard - LF	10	11.8436	0.14203	11.550	12.137

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.5234	0.493857	0.12346	11.260	11.787
Hydragard - LF	10	11.8436	0.362579	0.11466	11.584	12.103

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.32025	t Ratio	1.900692
Std Err Dif	0.16849	DF	23.23126
Upper CL Dif	0.66861	Prob > t	0.0698
Lower CL Dif	-0.02811	Prob > t	0.0349
Confidence	0.95	Prob < t	0.9651

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4938574	0.3985289	0.3842319
Hydragard - LF	10	0.3625792	0.2733586	0.2659242

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.3876	1	24	0.2504
Brown-Forsythe	1.0672	1	24	0.3119
Levene	1.4899	1	24	0.2341
Bartlett	0.9634	1	.	0.3263
F Test 2-sided	1.8552	15	9	0.3511

Welch Anova testing Means Equal, allowing Std Devs Not Equal

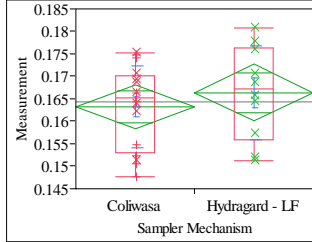
F Ratio	DFNum	DFDen	Prob > F
3.6126	1	23.231	0.0698

t Test

1.9007

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=K2O (wt%), Target Value=0.1591



Oneway Anova
Summary of Fit

Rsquare	0.026139
Adj Rsquare	-0.01444
Root Mean Square Error	0.00968
Mean of Response	0.164428
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00313	t Ratio	0.802602
Std Err Dif	0.00390	DF	24
Upper CL Dif	0.01119	Prob > t	0.4301
Lower CL Dif	-0.00492	Prob > t	0.2150
Confidence	0.95	Prob < t	0.7850

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00006036	0.000060	0.6442	0.4301
Error	24	0.00224900	0.000094		
C. Total	25	0.00230936			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.00242	0.15823	0.16822
Hydragard - LF	10	0.166355	0.00306	0.16004	0.17267

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.009208	0.00230	0.15832	0.16813
Hydragard - LF	10	0.166355	0.010420	0.00330	0.15890	0.17381

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00313	t Ratio	0.779187
Std Err Dif	0.00402	DF	17.43741
Upper CL Dif	0.01160	Prob > t	0.4463
Lower CL Dif	-0.00533	Prob > t	0.2232
Confidence	0.95	Prob < t	0.7768

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0092082	0.0076040	0.0073782
Hydragard - LF	10	0.0104198	0.0083117	0.0083117

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.4037	1	24	0.5312
Brown-Forsythe	0.1684	1	24	0.6852
Levene	0.1169	1	24	0.7354
Bartlett	0.1675	1	.	0.6824
F Test 2-sided	1.2805	9	15	0.6457

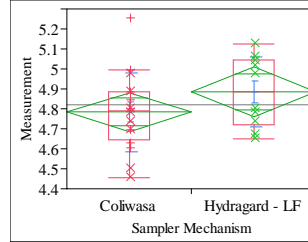
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6071	1	17.437	0.4463

t Test

0.7792

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Li2O (wt%), Target Value=4.674



Oneway Anova
Summary of Fit

Rsquare	0.068263
Adj Rsquare	0.029441
Root Mean Square Error	0.1898
Mean of Response	4.822496
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.10146	t Ratio	1.326025
Std Err Dif	0.07651	DF	24
Upper CL Dif	0.25937	Prob > t	0.1973
Lower CL Dif	-0.05646	Prob > t	0.0987
Confidence	0.95	Prob < t	0.9013

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.06334277	0.063343	1.7583	0.1973
Error	24	0.86457990	0.036024		
C. Total	25	0.92792268			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.78347	0.04745	4.6855	4.8814
Hydragard - LF	10	4.88493	0.06002	4.7611	5.0088

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.78347	0.197976	0.04949	4.6780	4.8890
Hydragard - LF	10	4.88493	0.175329	0.05544	4.7595	5.0104

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.10146	t Ratio	1.365089
Std Err Dif	0.07432	DF	21.04193
Upper CL Dif	0.25600	Prob > t	0.1866
Lower CL Dif	-0.05309	Prob > t	0.0933
Confidence	0.95	Prob < t	0.9067

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1979761	0.1466663	0.1466663
Hydragard - LF	10	0.1753289	0.1571617	0.1571617

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1607	1	24	0.6920
Brown-Forsythe	0.0593	1	24	0.8096
Levene	0.0595	1	24	0.8094
Bartlett	0.1553	1	.	0.6935
F Test 2-sided	1.2750	15	9	0.7307

Welch Anova testing Means Equal, allowing Std Devs Not Equal

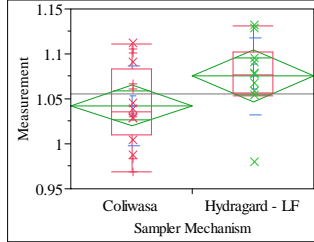
F Ratio	DFNum	DFDen	Prob > F
1.8635	1	21.042	0.1866

t Test

1.3651

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=MgO (wt%), Target Value=1.014



Oneway Anova
Summary of Fit

Rsquare	0.125033
Adj Rsquare	0.088576
Root Mean Square Error	0.043927
Mean of Response	1.055061
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.03279	t Ratio	1.851921
Std Err Dif	0.01771	DF	24
Upper CL Dif	0.06934	Prob > t	0.0764
Lower CL Dif	-0.00375	Prob > t	0.0382
Confidence	0.95	Prob < t	0.9618

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00661768	0.006618	3.4296	0.0764
Error	24	0.04630972	0.001930		
C. Total	25	0.05292740			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.04245	0.01098	1.0198	1.0651
Hydragard - LF	10	1.07524	0.01389	1.0466	1.1039

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.04245	0.044443	0.01111	1.0188	1.0661
Hydragard - LF	10	1.07524	0.043053	0.01361	1.0444	1.1060

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.03279	t Ratio	1.866105
Std Err Dif	0.01757	DF	19.72924
Upper CL Dif	0.06948	Prob > t	0.0770
Lower CL Dif	-0.00390	Prob > t	0.0385
Confidence	0.95	Prob < t	0.9615

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0444427	0.0353684	0.0348243
Hydragard - LF	10	0.0430534	0.0290534	0.0288544

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0124	1	24	0.9122
Brown-Forsythe	0.2719	1	24	0.6069
Levene	0.3299	1	24	0.5711
Bartlett	0.0108	1	.	0.9172
F Test 2-sided	1.0656	15	9	0.9571

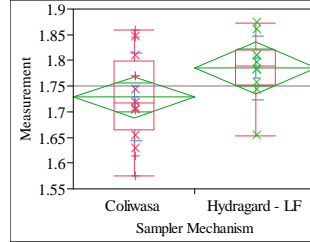
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.4823	1	19.729	0.0770

t Test

1.8661

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=MnO (wt%), Target Value=1.779



Oneway Anova
Summary of Fit

Rsquare	0.122662
Adj Rsquare	0.086106
Root Mean Square Error	0.077376
Mean of Response	1.750569
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.05714	t Ratio	1.831793
Std Err Dif	0.03119	DF	24
Upper CL Dif	0.12151	Prob > t	0.0794
Lower CL Dif	-0.00724	Prob > t	0.0397
Confidence	0.95	Prob < t	0.9603

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.02008909	0.020089	3.3555	0.0794
Error	24	0.14368741	0.005987		
C. Total	25	0.16377650			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.72859	0.01934	1.6887	1.7685
Hydragard - LF	10	1.78573	0.02447	1.7352	1.8362

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.72859	0.085372	0.02134	1.6831	1.7741
Hydragard - LF	10	1.78573	0.061789	0.01954	1.7415	1.8299

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.05714	t Ratio	1.974524
Std Err Dif	0.02894	DF	23.34696
Upper CL Dif	0.11695	Prob > t	0.0603
Lower CL Dif	-0.00267	Prob > t	0.0301
Confidence	0.95	Prob < t	0.9699

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0853723	0.0675863	0.0661740
Hydragard - LF	10	0.0617890	0.0426096	0.0426096

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.2497	1	24	0.2747
Brown-Forsythe	1.4244	1	24	0.2443
Levene	1.7568	1	24	0.1975
Bartlett	1.0508	1	.	0.3053
F Test 2-sided	1.9090	15	9	0.3290

Welch Anova testing Means Equal, allowing Std Devs Not Equal

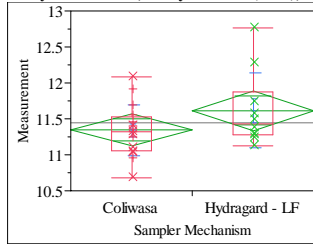
F Ratio	DFNum	DFDen	Prob > F
3.8987	1	23.347	0.0603

t Test

1.9745

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Na2O (wt%), Target Value=11.659



Oneway Anova
Summary of Fit

Rsquare	0.094495
Adj Rsquare	0.056765
Root Mean Square Error	0.426826
Mean of Response	11.44815
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	0.27230	t Ratio	1.582572
Std Err Dif	0.17206	DF	24
Upper CL Dif	0.62741	Prob > t	0.1266
Lower CL Dif	-0.08282	Prob > t	0.0633
Confidence	0.95	Prob < t	0.9367

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.4562776	0.456278	2.5045	0.1266
Error	24	4.3723338	0.182181		
C. Total	25	4.8286114			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	11.3434	0.10671	11.123	11.564
Hydragard - LF	10	11.6157	0.13497	11.337	11.894

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	11.3434	0.357699	0.08942	11.153	11.534
Hydragard - LF	10	11.6157	0.522080	0.16510	11.242	11.989

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	0.27230	t Ratio	1.45024
Std Err Dif	0.18776	DF	14.31627
Upper CL Dif	0.67417	Prob > t	0.1685
Lower CL Dif	-0.12957	Prob > t	0.0843
Confidence	0.95	Prob < t	0.9157

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.3576987	0.2637025	0.2611750
Hydragard - LF	10	0.5220801	0.3879544	0.3518280

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.2155	1	24	0.2812
Brown-Forsythe	0.5077	1	24	0.4830
Levene	1.2995	1	24	0.2656
Bartlett	1.6019	1	.	0.2056
F Test 2-sided	2.1303	9	15	0.1879

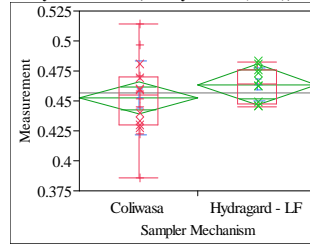
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.1032	1	14.316	0.1685

t Test

1.4502

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=NiO (wt%), Target Value=0.41



Oneway Anova
Summary of Fit

Rsquare	0.047291
Adj Rsquare	0.007595
Root Mean Square Error	0.025921
Mean of Response	0.456681
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	0.01140	t Ratio	1.091477
Std Err Dif	0.01045	DF	24
Upper CL Dif	0.03297	Prob > t	0.2859
Lower CL Dif	-0.01016	Prob > t	0.1429
Confidence	0.95	Prob < t	0.8571

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00080042	0.000800	1.1913	0.2859
Error	24	0.01612510	0.000672		
C. Total	25	0.01692553			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.452294	0.00648	0.43892	0.46567
Hydragard - LF	10	0.463699	0.00820	0.44678	0.48062

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.452294	0.030986	0.00775	0.43578	0.46881
Hydragard - LF	10	0.463699	0.013838	0.00438	0.45380	0.47360

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	0.01140	t Ratio	1.281866
Std Err Dif	0.00890	DF	22.3141
Upper CL Dif	0.02984	Prob > t	0.2130
Lower CL Dif	-0.00703	Prob > t	0.1065
Confidence	0.95	Prob < t	0.8935

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0309855	0.0233027	0.0233027
Hydragard - LF	10	0.0138385	0.0111980	0.0111980

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.5625	1	24	0.1225
Brown-Forsythe	3.4386	1	24	0.0760
Levene	3.5000	1	24	0.0736
Bartlett	5.6842	1	.	0.0171
F Test 2-sided	5.0135	15	9	0.0193

Welch Anova testing Means Equal, allowing Std Devs Not Equal

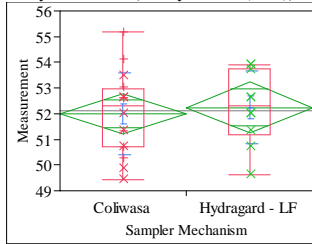
F Ratio	DFNum	DFDen	Prob > F
1.6432	1	22.314	0.2130

t Test

1.2819

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=SiO2 (wt%), Target Value=50.985



Oneway Anova
Summary of Fit

Rsquare	0.00644
Adj Rsquare	-0.03496
Root Mean Square Error	1.530595
Mean of Response	52.09196
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	0.2433	t Ratio	0.394399
Std Err Dif	0.6170	DF	24
Upper CL Dif	1.5168	Prob > t	0.6968
Lower CL Dif	-1.0301	Prob > t	0.3484
Confidence	0.95	Prob < t	0.6516

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.364412	0.36441	0.1556	0.6968
Error	24	56.225302	2.34272		
C. Total	25	56.589715			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	51.9984	0.38265	51.209	52.788
Hydragard - LF	10	52.2417	0.48402	51.243	53.241

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	51.9984	1.59416	0.39854	51.149	52.848
Hydragard - LF	10	52.2417	1.41833	0.44852	51.227	53.256

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	0.2433	t Ratio	0.405575
Std Err Dif	0.6000	DF	20.97662
Upper CL Dif	1.4912	Prob > t	0.6892
Lower CL Dif	-1.0045	Prob > t	0.3446
Confidence	0.95	Prob < t	0.6554

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	1.594161	1.296951	1.296951
Hydragard - LF	10	1.418334	1.112436	1.112436

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.2034	1	24	0.6560
Brown-Forsythe	0.2719	1	24	0.6068
Levene	0.2969	1	24	0.5909
Bartlett	0.1439	1	.	0.7045
F Test 2-sided	1.2633	15	9	0.7419

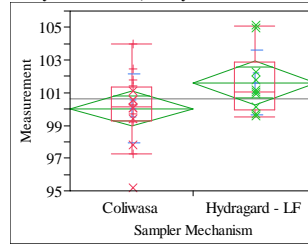
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1645	1	20.977	0.6892

t Test

0.4056

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=Sum of Oxides (wt%), Target Value=99.553



Oneway Anova
Summary of Fit

Rsquare	0.132975
Adj Rsquare	0.096849
Root Mean Square Error	2.051343
Mean of Response	100.6419
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	1.5865	t Ratio	1.91856
Std Err Dif	0.8269	DF	24
Upper CL Dif	3.2932	Prob > t	0.0670
Lower CL Dif	-0.1202	Prob > t	0.0335
Confidence	0.95	Prob < t	0.9665

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	15.48914	15.4891	3.6809	0.0670
Error	24	100.99224	4.2080		
C. Total	25	116.48138			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	100.032	0.51284	98.97	101.09
Hydragard - LF	10	101.618	0.64869	100.28	102.96

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	100.032	2.09866	0.52467	98.91	101.15
Hydragard - LF	10	101.618	1.96996	0.62295	100.21	103.03

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	1.5865	t Ratio	1.947916
Std Err Dif	0.8145	DF	20.19861
Upper CL Dif	3.2844	Prob > t	0.0655
Lower CL Dif	-0.1114	Prob > t	0.0327
Confidence	0.95	Prob < t	0.9673

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	2.098661	1.468017	1.467296
Hydragard - LF	10	1.969956	1.494689	1.393149

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0376	1	24	0.8479
Brown-Forsythe	0.0160	1	24	0.9003
Levene	0.0024	1	24	0.9615
Bartlett	0.0426	1	.	0.8364
F Test 2-sided	1.1349	15	9	0.8757

Welch Anova testing Means Equal, allowing Std Devs Not Equal

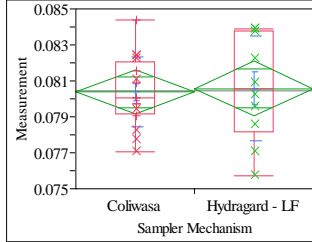
F Ratio	DFNum	DFDen	Prob > F
3.7944	1	20.199	0.0655

t Test

1.9479

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=TiO2 (wt%), Target Value=0.0711



Oneway Anova
Summary of Fit

Rsquare	0.001938
Adj Rsquare	-0.03965
Root Mean Square Error	0.002348
Mean of Response	0.080455
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00020	t Ratio	0.215902
Std Err Dif	0.00095	DF	24
Upper CL Dif	0.00216	Prob > t	0.8309
Lower CL Dif	-0.00175	Prob > t	0.4154
Confidence	0.95	Prob < t	0.5846

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00000026	2.5693e-7	0.0466	0.8309
Error	24	0.00013229	5.5119e-6		
C. Total	25	0.00013254			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.080377	0.00059	0.07917	0.08159
Hydragard - LF	10	0.080581	0.00074	0.07905	0.08211

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.080377	0.001937	0.00048	0.07934	0.08141
Hydragard - LF	10	0.080581	0.002906	0.00092	0.07850	0.08266

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00020	t Ratio	0.196724
Std Err Dif	0.00104	DF	14.04632
Upper CL Dif	0.00243	Prob > t	0.8469
Lower CL Dif	-0.00202	Prob > t	0.4234
Confidence	0.95	Prob < t	0.5766

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0019374	0.0015403	0.0015012
Hydragard - LF	10	0.0029055	0.0023519	0.0023519

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.0375	1	24	0.0942
Brown-Forsythe	2.5159	1	24	0.1258
Levene	2.4936	1	24	0.1274
Bartlett	1.8419	1	.	0.1747
F Test 2-sided	2.2490	9	15	0.1590

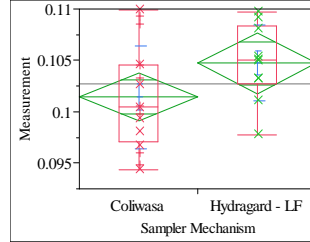
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0387	1	14.046	0.8469

t Test

0.1967

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=ZnO (wt%), Target Value=0.0958



Oneway Anova
Summary of Fit

Rsquare	0.119414
Adj Rsquare	0.082723
Root Mean Square Error	0.004551
Mean of Response	0.102701
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00331	t Ratio	1.804044
Std Err Dif	0.00183	DF	24
Upper CL Dif	0.00710	Prob > t	0.0838
Lower CL Dif	-0.00048	Prob > t	0.0419
Confidence	0.95	Prob < t	0.9581

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00006741	0.000067	3.2546	0.0838
Error	24	0.00049707	0.000021		
C. Total	25	0.00056448			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.101428	0.00114	0.09908	0.10378
Hydragard - LF	10	0.104737	0.00144	0.10177	0.10771

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.101428	0.004995	0.00125	0.09877	0.10409
Hydragard - LF	10	0.104737	0.003694	0.00117	0.10209	0.10738

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00331	t Ratio	1.935461
Std Err Dif	0.00171	DF	23.16858
Upper CL Dif	0.00685	Prob > t	0.0652
Lower CL Dif	-0.00023	Prob > t	0.0326
Confidence	0.95	Prob < t	0.9674

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0049950	0.0040971	0.0039911
Hydragard - LF	10	0.0036942	0.0027535	0.0027137

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3493	1	24	0.2568
Brown-Forsythe	1.3072	1	24	0.2642
Levene	1.7465	1	24	0.1988
Bartlett	0.9199	1	.	0.3375
F Test 2-sided	1.8283	15	9	0.3628

Welch Anova testing Means Equal, allowing Std Devs Not Equal

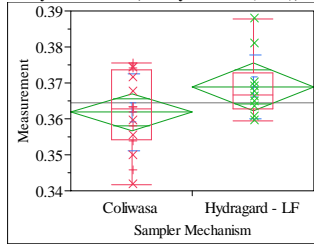
F Ratio	DFNum	DFDen	Prob > F
3.7460	1	23.169	0.0652

t Test

1.9355

Exhibit A2. Statistical Comparisons for Mid-Rheology (Phase 1) Testing

Oneway Analysis of Measurement By Sampler Mechanism Type of Material=SME Simulant, Analytical Block=6, Analyte=ZrO2 (wt%), Target Value=0.3547



**Oneway Anova
Summary of Fit**

Rsquare	0.112403
Adj Rsquare	0.07542
Root Mean Square Error	0.010043
Mean of Response	0.36456
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00706	t Ratio	1.74336
Std Err Dif	0.00405	DF	24
Upper CL Dif	0.01541	Prob > t	0.0941
Lower CL Dif	-0.00130	Prob > t	0.0470
Confidence	0.95	Prob < t	0.9530

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Mechanism	1	0.00030655	0.000307	3.0393	0.0941
Error	24	0.00242069	0.000101		
C. Total	25	0.00272724			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.361846	0.00251	0.35666	0.36703
Hydragard - LF	10	0.368903	0.00318	0.36235	0.37546

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.361846	0.010658	0.00266	0.35617	0.36752
Hydragard - LF	10	0.368903	0.008925	0.00282	0.36252	0.37529

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00706	t Ratio	1.81843
Std Err Dif	0.00388	DF	21.80082
Upper CL Dif	0.01511	Prob > t	0.0828
Lower CL Dif	-0.00100	Prob > t	0.0414
Confidence	0.95	Prob < t	0.9586

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0106576	0.0086325	0.0086114
Hydragard - LF	10	0.0089251	0.0064028	0.0060786

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4467	1	24	0.5103
Brown-Forsythe	1.0267	1	24	0.3211
Levene	0.8971	1	24	0.3530
Bartlett	0.3274	1	.	0.5672
F Test 2-sided	1.4259	15	9	0.6013

Welch Anova testing Means Equal, allowing Std Devs Not Equal

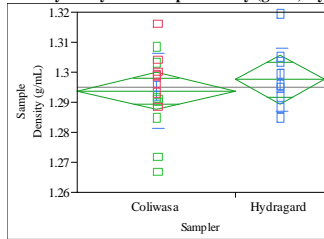
F Ratio	DFNum	DFDen	Prob > F
3.3067	1	21.801	0.0828

t Test

1.8184

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Sample Density (g/mL) By Sampler



Oneway Anova
Summary of Fit

Rsquare	0.025904
Adj Rsquare	-0.01645
Root Mean Square Error	0.01181
Mean of Response	1.295128
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.00385	t Ratio	0.782071
Std Err Dif	0.00492	DF	23
Upper CL Dif	0.01403	Prob > t	0.4422
Lower CL Dif	-0.00633	Prob > t	0.2211
Confidence	0.95	Prob < t	0.7789

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00008530	0.000085	0.6116	0.4422
Error	23	0.00320773	0.000139		
C. Total	24	0.00329304			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.00295	1.2876	1.2998
Hydragard	9	1.29759	0.00394	1.2894	1.3057

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.012479	0.00312	1.2871	1.3004
Hydragard	9	1.29759	0.010439	0.00348	1.2896	1.3056

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.00385	t Ratio	0.823443
Std Err Dif	0.00467	DF	19.35951
Upper CL Dif	0.01362	Prob > t	0.4203
Lower CL Dif	-0.00592	Prob > t	0.2101
Confidence	0.95	Prob < t	0.7899

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0124792	0.0092521	0.0092521
Hydragard	9	0.0104389	0.0078164	0.0076974

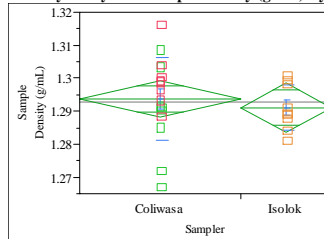
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2524	1	23	0.6202
Brown-Forsythe	0.2360	1	23	0.6317
Levene	0.2120	1	23	0.6496
Bartlett	0.3044	1	.	0.5812
F Test 2-sided	1.4291	15	8	0.6248

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6781	1	19.36	0.4203

t Test
0.8234

Oneway Analysis of Sample Density (g/mL) By Sampler



Oneway Anova
Summary of Fit

Rsquare	0.015378
Adj Rsquare	-0.02743
Root Mean Square Error	0.010871
Mean of Response	1.292765
Observations (or Sum Wgts)	25

t Test

Isolok-Coliwasa
Assuming equal variances

Difference	-0.00271	t Ratio	-0.59935
Std Err Dif	0.00453	DF	23
Upper CL Dif	0.00666	Prob > t	0.5548
Lower CL Dif	-0.01209	Prob > t	0.7226
Confidence	0.95	Prob < t	0.2774

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004245	0.000042	0.3592	0.5548
Error	23	0.00271821	0.000118		
C. Total	24	0.00276067			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.00272	1.2881	1.2994
Isolok	9	1.29103	0.00362	1.2835	1.2985

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.29374	0.012479	0.00312	1.2871	1.3004
Isolok	9	1.29103	0.006912	0.00230	1.2857	1.2963

t Test

Isolok-Coliwasa
Assuming unequal variances

Difference	-0.00271	t Ratio	-0.7
Std Err Dif	0.00388	DF	22.99735
Upper CL Dif	0.00531	Prob > t	0.4910
Lower CL Dif	-0.01074	Prob > t	0.7545
Confidence	0.95	Prob < t	0.2455

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0124792	0.0092521	0.0092521
Isolok	9	0.0069123	0.0055343	0.0053329

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6792	1	23	0.2079
Brown-Forsythe	1.7962	1	23	0.1933
Levene	1.7066	1	23	0.2043
Bartlett	2.9603	1	.	0.0853
F Test 2-sided	3.2593	15	8	0.0966

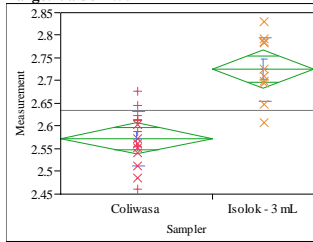
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4900	1	22.997	0.4910

t Test
0.7000

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=Al/B, Target Value=2.552



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.597847
Adj Rsquare	0.580362
Root Mean Square Error	0.064031
Mean of Response	2.633619
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	0.152854	t Ratio	5.847411
Std Err Dif	0.026140	DF	23
Upper CL Dif	0.206930	Prob > t	<.0001
Lower CL Dif	0.098778	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.14018639	0.140186	34.1922	<.0001
Error	23	0.09429887	0.004100		
C. Total	24	0.23448526			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.57248	0.01653	2.5383	2.6067
Isolok - 3 mL	10	2.72533	0.02025	2.6834	2.7672

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	2.57248	0.059738	0.01542	2.5394	2.6056
Isolok - 3 mL	10	2.72533	0.070188	0.02220	2.6751	2.7755

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	0.152854	t Ratio	5.652558
Std Err Dif	0.027029	DF	17.21133
Upper CL Dif	0.209826	Prob > t	<.0001
Lower CL Dif	0.095882	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0597384	0.0473600	0.0477612
Isolok - 3 mL	10	0.0701882	0.0565213	0.0560235

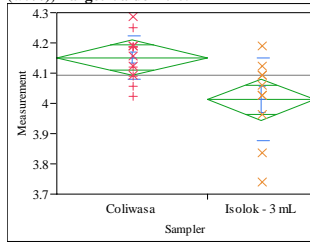
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4478	1	23	0.5100
Brown-Forsythe	0.3142	1	23	0.5805
Levene	0.4035	1	23	0.5316
Bartlett	0.2774	1	.	0.5984
F Test 2-sided	1.3805	9	14	0.5679

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
31.9819	1	17.211	<.0001

t Test
5.6553

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=B2O3 (wt%), Target Value=4.259



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.324683
Adj Rsquare	0.293987
Root Mean Square Error	0.103504
Mean of Response	4.093298
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.13938	t Ratio	-3.25228
Std Err Dif	0.04285	DF	22
Upper CL Dif	-0.05050	Prob > t	0.0037
Lower CL Dif	-0.22825	Prob > t	0.9982
Confidence	0.95	Prob < t	0.0018

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.11331587	0.113316	10.5773	0.0037
Error	22	0.23568872	0.010713		
C. Total	23	0.34900459			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	4.15137	0.02766	4.0940	4.2087
Isolok - 3 mL	10	4.01200	0.03273	3.9441	4.0799

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	4.15137	0.071960	0.01923	4.1098	4.1929
Isolok - 3 mL	10	4.01200	0.136777	0.04325	3.9142	4.1098

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.13938	t Ratio	-2.94441
Std Err Dif	0.04734	DF	12.57034
Upper CL Dif	-0.03676	Prob > t	0.0118
Lower CL Dif	-0.24199	Prob > t	0.9941
Confidence	0.95	Prob < t	0.0059

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0719596	0.0578268	0.0574982
Isolok - 3 mL	10	0.1367773	0.1017488	0.0965970

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.9885	1	22	0.0979
Brown-Forsythe	1.7960	1	22	0.1939
Levene	2.9008	1	22	0.1026
Bartlett	4.2327	1	.	0.0397
F Test 2-sided	3.6129	9	13	0.0361

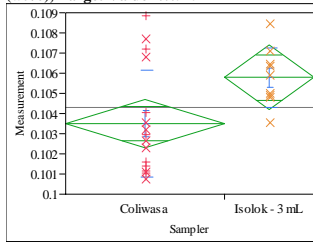
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.6695	1	12.57	0.0118

t Test
2.9444

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=BaO (wt%), Target Value=0.0919



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.196495
Adj Rsquare	0.16156
Root Mean Square Error	0.002317
Mean of Response	0.104317
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwas
Assuming equal variances

Difference	0.002290	t Ratio	2.371621
Std Err Dif	0.000965	DF	23
Upper CL Dif	0.004287	Prob > t	0.0265
Lower CL Dif	0.000292	Prob > t	0.0132
Confidence	0.95	Prob < t	0.9868

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003020	0.000030	5.6246	0.0265
Error	23	0.00012347	5.368e-6		
C. Total	24	0.00015367			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.103493	0.00058	0.10229	0.10469
Isolok - 3 mL	9	0.105782	0.00077	0.10418	0.10738

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.103493	0.002663	0.00067	0.10207	0.10491
Isolok - 3 mL	9	0.105782	0.001463	0.00049	0.10466	0.10691

t Test

Isolok - 3 mL-Coliwas
Assuming unequal variances

Difference	0.002290	t Ratio	2.774453
Std Err Dif	0.000825	DF	22.99976
Upper CL Dif	0.003997	Prob > t	0.0108
Lower CL Dif	0.000582	Prob > t	0.0054
Confidence	0.95	Prob < t	0.9946

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0026626	0.0021266	0.0020167
Isolok - 3 mL	9	0.0014633	0.0011358	0.0011785

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7488	1	23	0.1109
Brown-Forsythe	1.7107	1	23	0.2038
Levene	3.2918	1	23	0.0827
Bartlett	3.0318	1	.	0.0816
F Test 2-sided	3.3108	15	8	0.0925

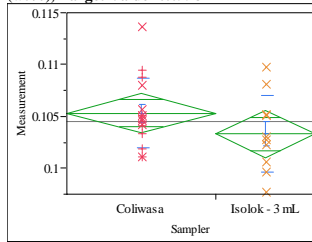
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.6976	1	23	0.0108

t Test

2.7745

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=Cr2O3 (wt%), Target Value=0.0998



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.07923
Adj Rsquare	0.039196
Root Mean Square Error	0.003512
Mean of Response	0.104516
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwas
Assuming equal variances

Difference	-0.00202	t Ratio	-1.4068
Std Err Dif	0.00143	DF	23
Upper CL Dif	0.00095	Prob > t	0.1729
Lower CL Dif	-0.00498	Prob > t	0.9136
Confidence	0.95	Prob < t	0.0864

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002441	0.000024	1.9791	0.1729
Error	23	0.00028368	0.000012		
C. Total	24	0.00030809			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	15	0.105323	0.00091	0.10345	0.10720
Isolok - 3 mL	10	0.103306	0.00111	0.10101	0.10560

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	15	0.105323	0.003380	0.00087	0.10345	0.10719
Isolok - 3 mL	10	0.103306	0.003708	0.00117	0.10065	0.10596

t Test

Isolok - 3 mL-Coliwas
Assuming unequal variances

Difference	-0.00202	t Ratio	-1.37987
Std Err Dif	0.00146	DF	18.14933
Upper CL Dif	0.00105	Prob > t	0.1844
Lower CL Dif	-0.00509	Prob > t	0.9078
Confidence	0.95	Prob < t	0.0922

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	15	0.0033797	0.0024750	0.0023580
Isolok - 3 mL	10	0.0037084	0.0028881	0.0028063

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0960	1	23	0.7595
Brown-Forsythe	0.2110	1	23	0.6503
Levene	0.2173	1	23	0.6455
Bartlett	0.0913	1	.	0.7626
F Test 2-sided	1.2039	9	14	0.7289

Welch Anova testing Means Equal, allowing Std Devs Not Equal

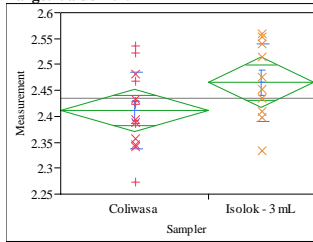
F Ratio	DFNum	DFDen	Prob > F
1.9040	1	18.149	0.1844

t Test

1.3799

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=Fe/Li, Target Value=2.452



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.121425
Adj Rsquare	0.08149
Root Mean Square Error	0.074097
Mean of Response	2.433987
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	0.05350	t Ratio	1.743718
Std Err Dif	0.03068	DF	22
Upper CL Dif	0.11712	Prob > t	0.0952
Lower CL Dif	-0.01013	Prob > t	0.0476
Confidence	0.95	Prob < t	0.9524

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01669385	0.016694	3.0406	0.0952
Error	22	0.12078884	0.005490		
C. Total	23	0.13748269			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	2.41170	0.01980	2.3706	2.4528
Isolok - 3 mL	10	2.46519	0.02343	2.4166	2.5138

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	2.41170	0.073436	0.01963	2.3693	2.4541
Isolok - 3 mL	10	2.46519	0.075042	0.02373	2.4115	2.5189

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	0.05350	t Ratio	1.737155
Std Err Dif	0.03080	DF	19.27869
Upper CL Dif	0.11789	Prob > t	0.0983
Lower CL Dif	-0.01090	Prob > t	0.0492
Confidence	0.95	Prob < t	0.9508

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0734358	0.0580729	0.0580729
Isolok - 3 mL	10	0.0750424	0.0614741	0.0614741

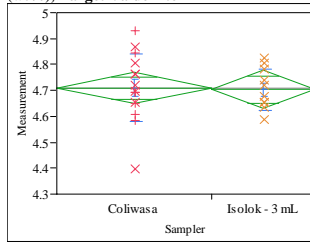
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0074	1	22	0.9320
Brown-Forsythe	0.0412	1	22	0.8411
Levene	0.0415	1	22	0.8405
Bartlett	0.0048	1	.	0.9450
F Test 2-sided	1.0442	9	13	0.9150

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.0177	1	19.279	0.0983

t Test
1.7372

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=Li2O (wt%), Target Value=4.674



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.000512
Adj Rsquare	-0.04294
Root Mean Square Error	0.113338
Mean of Response	4.707101
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.00502	t Ratio	-0.10857
Std Err Dif	0.04627	DF	23
Upper CL Dif	0.09069	Prob > t	0.9145
Lower CL Dif	-0.10074	Prob > t	0.5428
Confidence	0.95	Prob < t	0.4572

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00015141	0.000151	0.0118	0.9145
Error	23	0.29544897	0.012846		
C. Total	24	0.29560038			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	4.70911	0.02926	4.6486	4.7696
Isolok - 3 mL	10	4.70409	0.03584	4.6299	4.7782

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	4.70911	0.130568	0.03371	4.6368	4.7814
Isolok - 3 mL	10	4.70409	0.079427	0.02512	4.6473	4.7609

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.00502	t Ratio	-0.11949
Std Err Dif	0.04204	DF	22.88659
Upper CL Dif	0.08197	Prob > t	0.9059
Lower CL Dif	-0.09201	Prob > t	0.5470
Confidence	0.95	Prob < t	0.4530

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1305676	0.0943449	0.0932923
Isolok - 3 mL	10	0.0794275	0.0667399	0.0667399

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2407	1	23	0.2768
Brown-Forsythe	0.7768	1	23	0.3872
Levene	0.8958	1	23	0.3537
Bartlett	2.3293	1	.	0.1270
F Test 2-sided	2.7023	14	9	0.1378

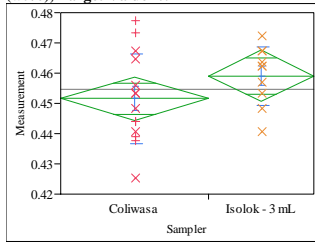
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0143	1	22.887	0.9059

t Test
0.1195

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=NiO (wt%), Target Value=0.41



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.082496
Adj Rsquare	0.040791
Root Mean Square Error	0.012986
Mean of Response	0.454707
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	0.00756	t Ratio	1.406445
Std Err Dif	0.00538	DF	22
Upper CL Dif	0.01871	Prob > t	0.1736
Lower CL Dif	-0.00359	Prob > t	0.0868
Confidence	0.95	Prob < t	0.9132

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00033360	0.000334	1.9781	0.1736
Error	22	0.00371022	0.000169		
C. Total	23	0.00404382			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.451556	0.00347	0.44436	0.45875
Isolok - 3 mL	10	0.459118	0.00411	0.45060	0.46763

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	14	0.451556	0.014839	0.00397	0.44299	0.46012
Isolok - 3 mL	10	0.459118	0.009706	0.00307	0.45217	0.46606

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	0.00756	t Ratio	1.508005
Std Err Dif	0.00501	DF	21.89229
Upper CL Dif	0.01797	Prob > t	0.1458
Lower CL Dif	-0.00284	Prob > t	0.0729
Confidence	0.95	Prob < t	0.9271

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0148386	0.0118161	0.0118161
Isolok - 3 mL	10	0.0097059	0.0076859	0.0071260

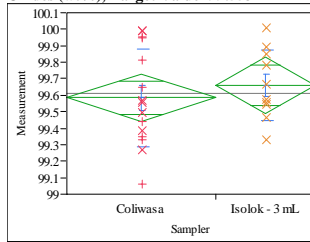
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8888	1	22	0.1832
Brown-Forsythe	2.1023	1	22	0.1612
Levene	1.8794	1	22	0.1842
Bartlett	1.6940	1	.	0.1931
F Test 2-sided	2.3373	13	9	0.2059

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.2741	1	21.892	0.1458

t Test
1.5080

Oneway Analysis of Measurement By Sampler Analytical Block=1, Analyte=Sum of Oxides (wt%), Target Value=99.553



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.020884
Adj Rsquare	-0.02169
Root Mean Square Error	0.265472
Mean of Response	99.61401
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	0.07591	t Ratio	0.700407
Std Err Dif	0.10838	DF	23
Upper CL Dif	0.30011	Prob > t	0.4907
Lower CL Dif	-0.14829	Prob > t	0.2453
Confidence	0.95	Prob < t	0.7547

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0345732	0.034573	0.4906	0.4907
Error	23	1.6209394	0.070476		
C. Total	24	1.6555126			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	99.5836	0.06854	99.442	99.725
Isolok - 3 mL	10	99.6596	0.08395	99.486	99.833

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Mean	Lower 95%	Upper 95%
Coliwasa	15	99.5836	0.294582	0.07606		99.421	99.747
Isolok - 3 mL	10	99.6596	0.212403	0.06717		99.508	99.811

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	0.07591	t Ratio	0.748073
Std Err Dif	0.10147	DF	22.79004
Upper CL Dif	0.28593	Prob > t	0.4621
Lower CL Dif	-0.13411	Prob > t	0.2310
Confidence	0.95	Prob < t	0.7690

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2945825	0.2435547	0.2392251
Isolok - 3 mL	10	0.2124031	0.1738794	0.1738794

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8320	1	23	0.1890
Brown-Forsythe	1.1842	1	23	0.2878
Levene	1.5623	1	23	0.2239
Bartlett	1.0523	1	.	0.3050
F Test 2-sided	1.9235	14	9	0.3259

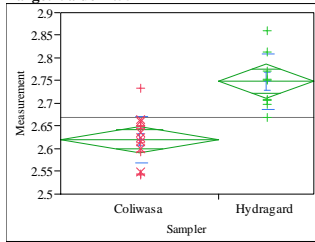
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5596	1	22.79	0.4621

t Test
0.7481

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=Al/B, Target Value=2.552



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.580596
Adj Rsquare	0.561532
Root Mean Square Error	0.054835
Mean of Response	2.668245
Observations (or Sum Wgts)	24

t Test

Hydragard-Coliwasa
 Assuming equal variances

Difference	0.127592	t Ratio	5.518637
Std Err Dif	0.023120	DF	22
Upper CL Dif	0.175541	Prob > t	<.0001
Lower CL Dif	0.079644	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.09157384	0.091574	30.4553	<.0001
Error	22	0.06615010	0.003007		
C. Total	23	0.15772394			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.62040	0.01416	2.5910	2.6498
Hydragard	9	2.74799	0.01828	2.7101	2.7859

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	2.62040	0.051440	0.01328	2.5919	2.6489
Hydragard	9	2.74799	0.060317	0.02011	2.7016	2.7944

t Test

Hydragard-Coliwasa
 Assuming unequal variances

Difference	0.127592	t Ratio	5.295038
Std Err Dif	0.024097	DF	14.88571
Upper CL Dif	0.178987	Prob > t	<.0001
Lower CL Dif	0.076197	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0514398	0.0389884	0.0394414
Hydragard	9	0.0603173	0.0462958	0.0458710

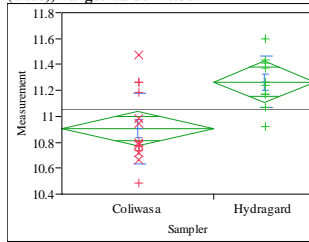
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3033	1	22	0.5874
Brown-Forsythe	0.2115	1	22	0.6501
Levene	0.2747	1	22	0.6055
Bartlett	0.2520	1	.	0.6157
F Test 2-sided	1.3749	8	14	0.5754

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
28.0374	1	14.886	<.0001

t Test
 5.2950

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=Al2O3 (wt%), Target Value=10.869



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.35778
Adj Rsquare	0.329857
Root Mean Square Error	0.245667
Mean of Response	11.0498
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
 Assuming equal variances

Difference	0.359005	t Ratio	3.579563
Std Err Dif	0.100293	DF	23
Upper CL Dif	0.566477	Prob > t	0.0016
Lower CL Dif	0.151533	Prob > t	0.0008
Confidence	0.95	Prob < t	0.9992

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.7733075	0.773308	12.8133	0.0016
Error	23	1.3880977	0.060352		
C. Total	24	2.1614053			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.9062	0.06343	10.775	11.037
Hydragard	10	11.2652	0.07769	11.104	11.426

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.9062	0.272339	0.07032	10.755	11.057
Hydragard	10	11.2652	0.197129	0.06234	11.124	11.406

t Test

Hydragard-Coliwasa
 Assuming unequal variances

Difference	0.359005	t Ratio	3.820381
Std Err Dif	0.093971	DF	22.77272
Upper CL Dif	0.553506	Prob > t	0.0009
Lower CL Dif	0.164504	Prob > t	0.0004
Confidence	0.95	Prob < t	0.9996

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2723391	0.2211975	0.2015467
Hydragard	10	0.1971288	0.1519158	0.1511600

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1140	1	23	0.3022
Brown-Forsythe	0.4621	1	23	0.5034
Levene	1.5645	1	23	0.2236
Bartlett	1.0284	1	.	0.3105
F Test 2-sided	1.9086	14	9	0.3317

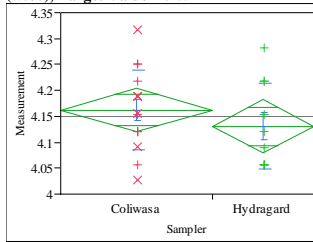
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
14.5953	1	22.773	0.0009

t Test
 3.8204

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=B2O3 (wt%), Target Value=4.259



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.038234
Adj Rsquare	-0.00358
Root Mean Square Error	0.079733
Mean of Response	4.149807
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.03113	t Ratio	-0.95621
Std Err Dif	0.03255	DF	23
Upper CL Dif	0.03621	Prob > t	0.3489
Lower CL Dif	-0.09846	Prob > t	0.8255
Confidence	0.95	Prob < t	0.1745

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00581286	0.005813	0.9143	0.3489
Error	23	0.14621992	0.006357		
C. Total	24	0.15203277			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	4.16226	0.02059	4.1197	4.2048
Hydragard	10	4.13113	0.02521	4.0790	4.1833

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	4.16226	0.077418	0.01999	4.1194	4.2051
Hydragard	10	4.13113	0.083207	0.02631	4.0716	4.1907

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.03113	t Ratio	-0.94195
Std Err Dif	0.03304	DF	18.43809
Upper CL Dif	0.03818	Prob > t	0.3584
Lower CL Dif	-0.10043	Prob > t	0.8208
Confidence	0.95	Prob < t	0.1792

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0774180	0.0606772	0.0601048
Hydragard	10	0.0832067	0.0695498	0.0676179

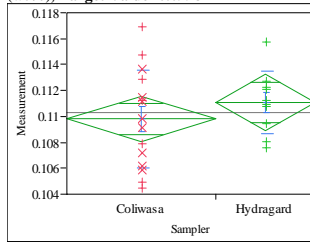
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0847	1	23	0.7736
Brown-Forsythe	0.1441	1	23	0.7077
Levene	0.2549	1	23	0.6185
Bartlett	0.0550	1	.	0.8146
F Test 2-sided	1.1551	9	14	0.7803

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8873	1	18.438	0.3584

t Test
0.9419

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=Cr2O3 (wt%), Target Value=0.0998



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.038403
Adj Rsquare	-0.00341
Root Mean Square Error	0.003287
Mean of Response	0.11031
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.00129	t Ratio	0.958408
Std Err Dif	0.00134	DF	23
Upper CL Dif	0.00406	Prob > t	0.3478
Lower CL Dif	-0.00149	Prob > t	0.1739
Confidence	0.95	Prob < t	0.8261

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000993	0.00001	0.9185	0.3478
Error	23	0.00024854	0.000011		
C. Total	24	0.00025847			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.109795	0.00085	0.10804	0.11155
Hydragard	10	0.111082	0.00104	0.10893	0.11323

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.109795	0.003753	0.00097	0.10772	0.11187
Hydragard	10	0.111082	0.002388	0.00076	0.10937	0.11279

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.00129	t Ratio	1.046932
Std Err Dif	0.00123	DF	22.98227
Upper CL Dif	0.00383	Prob > t	0.3060
Lower CL Dif	-0.00126	Prob > t	0.1530
Confidence	0.95	Prob < t	0.8470

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0037534	0.0030908	0.0031376
Hydragard	10	0.0023878	0.0017247	0.0017247

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4059	1	23	0.1345
Brown-Forsythe	3.8432	1	23	0.0622
Levene	3.4111	1	23	0.0777
Bartlett	1.9514	1	.	0.1624
F Test 2-sided	2.4709	14	9	0.1756

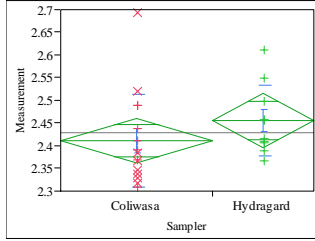
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0961	1	22.982	0.3060

t Test
1.0469

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=Fe/Li, Target Value=2.452



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.055411
Adj Rsquare	0.014342
Root Mean Square Error	0.092764
Mean of Response	2.429069
Observations (or Sum Wgts)	25

t Test
Hydragard-Coliwasa
Assuming equal variances

Difference	0.04399	t Ratio	1.161556
Std Err Dif	0.03787	DF	23
Upper CL Dif	0.12233	Prob > t	0.2573
Lower CL Dif	-0.03435	Prob > t	0.1287
Confidence	0.95	Prob < t	0.8713

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01161019	0.011610	1.3492	0.2573
Error	23	0.19791887	0.008605		
C. Total	24	0.20952906			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.41147	0.02395	2.3619	2.4610
Hydragard	10	2.45546	0.02933	2.3948	2.5161

Std Error uses a pooled estimate of error variance
Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	2.41147	0.101700	0.02626	2.3552	2.4678
Hydragard	10	2.45546	0.076825	0.02429	2.4005	2.5104

t Test
Hydragard-Coliwasa
Assuming unequal variances

Difference	0.04399	t Ratio	1.22966
Std Err Dif	0.03577	DF	22.53782
Upper CL Dif	0.11808	Prob > t	0.2315
Lower CL Dif	-0.03010	Prob > t	0.1158
Confidence	0.95	Prob < t	0.8842

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1017001	0.0756127	0.0713339
Hydragard	10	0.0768246	0.0584781	0.0584781

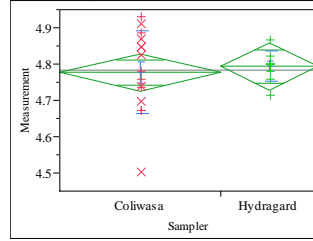
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3812	1	23	0.5430
Brown-Forsythe	0.2186	1	23	0.6445
Levene	0.5197	1	23	0.4782
Bartlett	0.7822	1	.	0.3765
F Test 2-sided	1.7524	14	9	0.4004

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.5121	1	22.538	0.2315

t Test
1.2297

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=Li2O (wt%), Target Value=4.674



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.008464
Adj Rsquare	-0.03661
Root Mean Square Error	0.094261
Mean of Response	4.783026
Observations (or Sum Wgts)	24

t Test
Hydragard-Coliwasa
Assuming equal variances

Difference	0.01722	t Ratio	0.433355
Std Err Dif	0.03974	DF	22
Upper CL Dif	0.09965	Prob > t	0.6690
Lower CL Dif	-0.06520	Prob > t	0.3345
Confidence	0.95	Prob < t	0.6655

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00166859	0.001669	0.1878	0.6690
Error	22	0.19547249	0.008885		
C. Total	23	0.19714108			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	4.77657	0.02434	4.7261	4.8270
Hydragard	9	4.79379	0.03142	4.7286	4.8590

Std Error uses a pooled estimate of error variance
Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	4.77657	0.113882	0.02940	4.7135	4.8396
Hydragard	9	4.79379	0.041691	0.01390	4.7617	4.8258

t Test
Hydragard-Coliwasa
Assuming unequal variances

Difference	0.01722	t Ratio	0.529573
Std Err Dif	0.03252	DF	19.27023
Upper CL Dif	0.08523	Prob > t	0.6025
Lower CL Dif	-0.05078	Prob > t	0.3012
Confidence	0.95	Prob < t	0.6988

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1138820	0.0891779	0.0904218
Hydragard	9	0.0416907	0.0287053	0.0263132

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4451	1	22	0.1322
Brown-Forsythe	7.5181	1	22	0.0119
Levene	6.5809	1	22	0.0176
Bartlett	7.3862	1	.	0.0066
F Test 2-sided	7.4616	14	8	0.0076

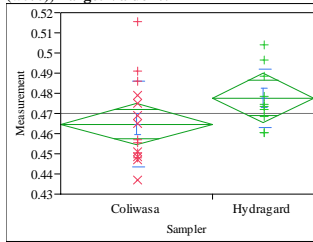
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2804	1	19.27	0.6025

t Test
0.5296

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=NiO (wt%), Target Value=0.41



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.110386
Adj Rsquare	0.071708
Root Mean Square Error	0.01882
Mean of Response	0.469909
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.01298	t Ratio	1.689356
Std Err Dif	0.00768	DF	23
Upper CL Dif	0.02887	Prob > t	0.1047
Lower CL Dif	-0.00291	Prob > t	0.0523
Confidence	0.95	Prob < t	0.9477

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00101080	0.001011	2.8539	0.1047
Error	23	0.00814615	0.000354		
C. Total	24	0.00915696			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.464717	0.00486	0.45466	0.47477
Hydragard	10	0.477697	0.00595	0.46539	0.49001

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.464717	0.021152	0.00546	0.45300	0.47643
Hydragard	10	0.477697	0.014462	0.00457	0.46735	0.48804

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.01298	t Ratio	1.822111
Std Err Dif	0.00712	DF	22.95809
Upper CL Dif	0.02772	Prob > t	0.0815
Lower CL Dif	-0.00176	Prob > t	0.0407
Confidence	0.95	Prob < t	0.9593

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0211524	0.0167631	0.0162880
Hydragard	10	0.0144615	0.0112998	0.0106890

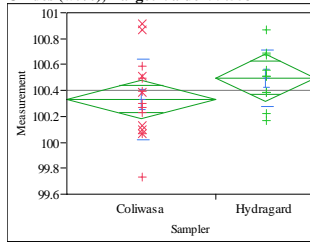
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0228	1	23	0.3224
Brown-Forsythe	1.0563	1	23	0.3148
Levene	1.5518	1	23	0.2254
Bartlett	1.4045	1	.	0.2360
F Test 2-sided	2.1394	14	9	0.2534

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.3201	1	22.958	0.0815

t Test
1.8221

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=Sum of Oxides (wt%), Target Value=99.553



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.08367
Adj Rsquare	0.043829
Root Mean Square Error	0.277911
Mean of Response	100.3973
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.16442	t Ratio	1.449179
Std Err Dif	0.11346	DF	23
Upper CL Dif	0.39912	Prob > t	0.1608
Lower CL Dif	-0.07028	Prob > t	0.0804
Confidence	0.95	Prob < t	0.9196

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1622017	0.162202	2.1001	0.1608
Error	23	1.7763933	0.077234		
C. Total	24	1.9385950			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	100.332	0.07176	100.18	100.48
Hydragard	10	100.496	0.08788	100.31	100.68

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	100.332	0.311160	0.08034	100.16	100.50
Hydragard	10	100.496	0.216257	0.06839	100.34	100.65

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.16442	t Ratio	1.558392
Std Err Dif	0.10551	DF	22.92001
Upper CL Dif	0.38272	Prob > t	0.1328
Lower CL Dif	-0.05388	Prob > t	0.0664
Confidence	0.95	Prob < t	0.9336

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.3111603	0.2388519	0.2384541
Hydragard	10	0.2162567	0.1651795	0.1628642

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1660	1	23	0.2914
Brown-Forsythe	1.1621	1	23	0.2922
Levene	1.1562	1	23	0.2934
Bartlett	1.2910	1	.	0.2559
F Test 2-sided	2.0703	14	9	0.2744

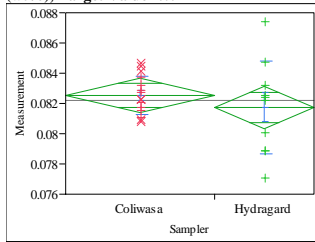
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.4286	1	22.92	0.1328

t Test
1.5584

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=TiO2 (wt%), Target Value=0.0711



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.034039
Adj Rsquare	-0.00796
Root Mean Square Error	0.002163
Mean of Response	0.082226
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.00080	t Ratio	-0.90028
Std Err Dif	0.00088	DF	23
Upper CL Dif	0.00103	Prob > t	0.3773
Lower CL Dif	-0.00262	Prob > t	0.8113
Confidence	0.95	Prob < t	0.1887

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000379	3.7929e-6	0.8105	0.3773
Error	23	0.00010763	4.6797e-6		
C. Total	24	0.00011143			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.082544	0.00056	0.08139	0.08370
Hydragard	10	0.081749	0.00068	0.08033	0.08316

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.082544	0.001258	0.00032	0.08185	0.08324
Hydragard	10	0.081749	0.003082	0.00097	0.07954	0.08395

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.00080	t Ratio	-0.77394
Std Err Dif	0.00103	DF	11.02121
Upper CL Dif	0.00147	Prob > t	0.4552
Lower CL Dif	-0.00306	Prob > t	0.7724
Confidence	0.95	Prob < t	0.2276

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0012575	0.0010438	0.0010230
Hydragard	10	0.0030821	0.0024153	0.0023185

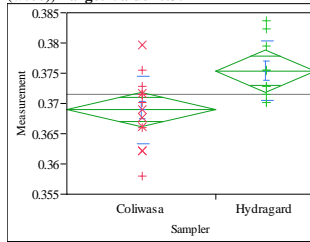
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.0608	1	23	0.0217
Brown-Forsythe	5.4049	1	23	0.0293
Levene	7.8761	1	23	0.0100
Bartlett	8.4269	1	.	0.0037
F Test 2-sided	6.0071	9	14	0.0032

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5990	1	11.021	0.4552

t Test
0.7739

Oneway Analysis of Measurement By Sampler Analytical Block=2, Analyte=ZrO2 (wt%), Target Value=0.3547



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.276547
Adj Rsquare	0.245093
Root Mean Square Error	0.005319
Mean of Response	0.371524
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.006439	t Ratio	2.965127
Std Err Dif	0.002172	DF	23
Upper CL Dif	0.010931	Prob > t	0.0069
Lower CL Dif	0.001947	Prob > t	0.0035
Confidence	0.95	Prob < t	0.9965

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00024875	0.000249	8.7920	0.0069
Error	23	0.00065073	0.000028		
C. Total	24	0.00089948			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.368949	0.00137	0.36611	0.37179
Hydragard	10	0.375387	0.00168	0.37191	0.37887

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.368949	0.005566	0.00144	0.36587	0.37203
Hydragard	10	0.375387	0.004910	0.00155	0.37188	0.37890

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.006439	t Ratio	3.043341
Std Err Dif	0.002116	DF	21.0815
Upper CL Dif	0.010838	Prob > t	0.0062
Lower CL Dif	0.002040	Prob > t	0.0031
Confidence	0.95	Prob < t	0.9969

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0055664	0.0043106	0.0043226
Hydragard	10	0.0049098	0.0039173	0.0039173

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1978	1	23	0.6607
Brown-Forsythe	0.0892	1	23	0.7679
Levene	0.0976	1	23	0.7575
Bartlett	0.1616	1	.	0.6877
F Test 2-sided	1.2854	14	9	0.7204

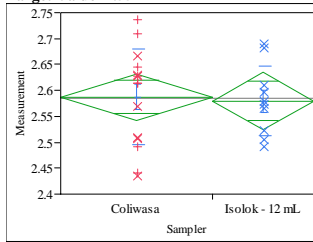
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.2619	1	21.082	0.0062

t Test
3.0433

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=3, Analyte=Al/B, Target Value=2.552



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.002052
Adj Rsquare	-0.04134
Root Mean Square Error	0.083711
Mean of Response	2.584187
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	-0.00743	t Ratio	-0.21749
Std Err Dif	0.03417	DF	23
Upper CL Dif	0.06326	Prob > t	0.8297
Lower CL Dif	-0.07813	Prob > t	0.5851
Confidence	0.95	Prob < t	0.4149

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00033147	0.000331	0.0473	0.8297
Error	23	0.16117424	0.007008		
C. Total	24	0.16150571			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.58716	0.02161	2.5424	2.6319
Isolok - 12 mL	10	2.57973	0.02647	2.5250	2.6345

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	15	2.58716	0.092777	0.02395	2.5358	2.6385
Isolok - 12 mL	10	2.57973	0.067221	0.02126	2.5316	2.6278

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	-0.00743	t Ratio	-0.23208
Std Err Dif	0.03203	DF	22.76826
Upper CL Dif	0.05886	Prob > t	0.8186
Lower CL Dif	-0.07372	Prob > t	0.5907
Confidence	0.95	Prob < t	0.4093

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0927771	0.0771781	0.0717276
Isolok - 12 mL	10	0.0672209	0.0505934	0.0499902

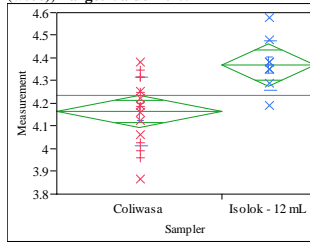
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5354	1	23	0.2278
Brown-Forsythe	0.9241	1	23	0.3464
Levene	2.1097	1	23	0.1599
Bartlett	1.0225	1	.	0.3119
F Test 2-sided	1.9049	14	9	0.3331

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0539	1	22.768	0.8186

t Test
0.2321

Oneway Analysis of Measurement By Sampler Analytical Block=3, Analyte=B2O3 (wt%), Target Value=4.259



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.357788
Adj Rsquare	0.329866
Root Mean Square Error	0.137175
Mean of Response	4.237388
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	0.204598	t Ratio	3.579629
Std Err Dif	0.057156	DF	23
Upper CL Dif	0.322834	Prob > t	0.0016
Lower CL Dif	0.086361	Prob > t	0.0008
Confidence	0.95	Prob < t	0.9992

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.24111513	0.241115	12.8137	0.0016
Error	23	0.43278901	0.018817		
C. Total	24	0.67390414			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.16373	0.03429	4.0928	4.2347
Isolok - 12 mL	9	4.36833	0.04572	4.2737	4.4629

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	16	4.16373	0.149979	0.03749	4.0838	4.2437
Isolok - 12 mL	9	4.36833	0.109192	0.03640	4.2844	4.4523

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.204598	t Ratio	3.915344
Std Err Dif	0.052255	DF	21.23467
Upper CL Dif	0.313196	Prob > t	0.0008
Lower CL Dif	0.096000	Prob > t	0.0004
Confidence	0.95	Prob < t	0.9996

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1499790	0.1215009	0.1187338
Isolok - 12 mL	9	0.1091921	0.0739384	0.0715533

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1160	1	23	0.3018
Brown-Forsythe	1.7033	1	23	0.2048
Levene	2.0334	1	23	0.1673
Bartlett	0.9273	1	.	0.3356
F Test 2-sided	1.8866	15	8	0.3674

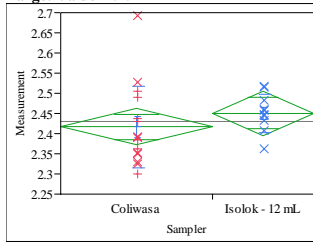
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
15.3299	1	21.235	0.0008

t Test
3.9153

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=3, Analyte=Fe/Li, Target Value=2.452



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.039958
Adj Rsquare	-0.00178
Root Mean Square Error	0.084613
Mean of Response	2.430151
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	0.03380	t Ratio	0.978409
Std Err Dif	0.03454	DF	23
Upper CL Dif	0.10525	Prob > t	0.3381
Lower CL Dif	-0.03766	Prob > t	0.1690
Confidence	0.95	Prob < t	0.8310

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00685348	0.006853	0.9573	0.3381
Error	23	0.16466378	0.007159		
C. Total	24	0.17151726			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.41663	0.02185	2.3714	2.4618
Isolok - 12 mL	10	2.45043	0.02676	2.3951	2.5058

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	15	2.41663	0.101692	0.02626	2.3603	2.4729
Isolok - 12 mL	10	2.45043	0.047006	0.01486	2.4168	2.4841

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.03380	t Ratio	1.120133
Std Err Dif	0.03017	DF	21.04876
Upper CL Dif	0.09654	Prob > t	0.2753
Lower CL Dif	-0.02894	Prob > t	0.1376
Confidence	0.95	Prob < t	0.8624

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1016920	0.0769624	0.0713874
Isolok - 12 mL	10	0.0470062	0.0339728	0.0339728

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5322	1	23	0.2283
Brown-Forsythe	2.1752	1	23	0.1538
Levene	3.9680	1	23	0.0584
Bartlett	5.1916	1	.	0.0227
F Test 2-sided	4.6802	14	9	0.0252

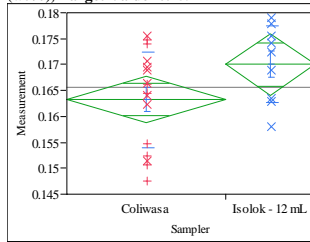
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2547	1	21.049	0.2753

t Test

1.1201

Oneway Analysis of Measurement By Sampler Analytical Block=3, Analyte=K2O (wt%), Target Value=0.1591



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.135655
Adj Rsquare	0.098075
Root Mean Square Error	0.008623
Mean of Response	0.165681
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	0.00683	t Ratio	1.899932
Std Err Dif	0.00359	DF	23
Upper CL Dif	0.01426	Prob > t	0.0701
Lower CL Dif	-0.00061	Prob > t	0.0350
Confidence	0.95	Prob < t	0.9650

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00026839	0.000268	3.6097	0.0701
Error	23	0.00171008	0.000074		
C. Total	24	0.00197846			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.00216	0.15876	0.16768
Isolok - 12 mL	9	0.170049	0.00287	0.16410	0.17600

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	16	0.163223	0.009208	0.00230	0.15832	0.16813
Isolok - 12 mL	9	0.170049	0.007401	0.00247	0.16436	0.17574

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.00683	t Ratio	2.022968
Std Err Dif	0.00337	DF	19.93555
Upper CL Dif	0.01387	Prob > t	0.0567
Lower CL Dif	-0.00021	Prob > t	0.0283
Confidence	0.95	Prob < t	0.9717

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0092082	0.0076040	0.0073782
Isolok - 12 mL	9	0.0074012	0.0062015	0.0061568

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9609	1	23	0.3371
Brown-Forsythe	0.3207	1	23	0.5767
Levene	0.5939	1	23	0.4488
Bartlett	0.4511	1	.	0.5018
F Test 2-sided	1.5479	15	8	0.5423

Welch Anova testing Means Equal, allowing Std Devs Not Equal

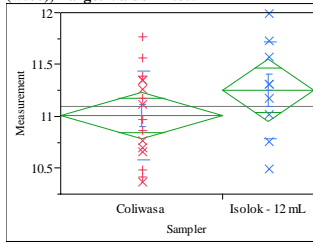
F Ratio	DFNum	DFDen	Prob > F
4.0924	1	19.936	0.0567

t Test

2.0230

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=3, Analyte=Na2O (wt%), Target Value=11.659



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.070802
Adj Rsquare	0.030402
Root Mean Square Error	0.440904
Mean of Response	11.09566
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	0.24320	t Ratio	1.323834
Std Err Dif	0.18371	DF	23
Upper CL Dif	0.62323	Prob > t	0.1986
Lower CL Dif	-0.13683	Prob > t	0.0993
Confidence	0.95	Prob < t	0.9007

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.3406870	0.340687	1.7525	0.1986
Error	23	4.4711207	0.194397		
C. Total	24	4.8118077			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.0081	0.11023	10.780	11.236
Isolok - 12 mL	9	11.2513	0.14697	10.947	11.555

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	16	11.0081	0.425162	0.10629	10.782	11.235
Isolok - 12 mL	9	11.2513	0.468999	0.15633	10.891	11.612

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.24320	t Ratio	1.286481
Std Err Dif	0.18904	DF	15.35563
Upper CL Dif	0.64533	Prob > t	0.2173
Lower CL Dif	-0.15893	Prob > t	0.1087
Confidence	0.95	Prob < t	0.8913

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4251617	0.3589050	0.3589050
Isolok - 12 mL	9	0.4689994	0.3554726	0.3504800

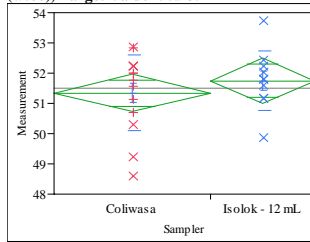
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1819	1	23	0.6737
Brown-Forsythe	0.0070	1	23	0.9339
Levene	0.0012	1	23	0.9724
Bartlett	0.0975	1	.	0.7548
F Test 2-sided	1.2168	8	15	0.7067

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6550	1	15.356	0.2173

t Test
1.2865

Oneway Analysis of Measurement By Sampler Analytical Block=3, Analyte=SiO2 (wt%), Target Value=50.985



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.031007
Adj Rsquare	-0.01112
Root Mean Square Error	1.160566
Mean of Response	51.50579
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	0.4065	t Ratio	0.857889
Std Err Dif	0.4738	DF	23
Upper CL Dif	1.3866	Prob > t	0.3998
Lower CL Dif	-0.5737	Prob > t	0.1999
Confidence	0.95	Prob < t	0.8001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.991293	0.99129	0.7360	0.3998
Error	23	30.979036	1.34691		
C. Total	24	31.970328			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	51.3432	0.29966	50.723	51.963
Isolok - 12 mL	10	51.7497	0.36700	50.990	52.509

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	15	51.3432	1.25525	0.32410	50.648	52.038
Isolok - 12 mL	10	51.7497	0.99553	0.31482	51.038	52.462

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.4065	t Ratio	0.899596
Std Err Dif	0.4518	DF	22.17459
Upper CL Dif	1.3431	Prob > t	0.3780
Lower CL Dif	-0.5301	Prob > t	0.1890
Confidence	0.95	Prob < t	0.8110

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	1.255253	0.9983400	0.9555540
Isolok - 12 mL	10	0.995535	0.6674616	0.6631830

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4501	1	23	0.5090
Brown-Forsythe	0.7523	1	23	0.3947
Levene	1.3054	1	23	0.2650
Bartlett	0.5399	1	.	0.4625
F Test 2-sided	1.5898	14	9	0.4895

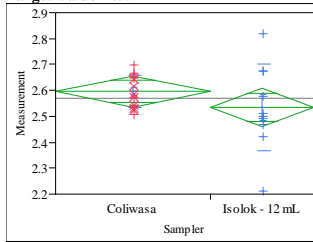
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8093	1	22.175	0.3780

t Test
0.8996

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=Al/B, Target Value=2.552



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.069698
Adj Rsquare	0.02925
Root Mean Square Error	0.114371
Mean of Response	2.571142
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	-0.06129	t Ratio	-1.31269
Std Err Dif	0.04669	DF	23
Upper CL Dif	0.03530	Prob > t	0.2022
Lower CL Dif	-0.15788	Prob > t	0.8989
Confidence	0.95	Prob < t	0.1011

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.02254029	0.022540	1.7232	0.2022
Error	23	0.30085844	0.013081		
C. Total	24	0.32339873			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.59566	0.02953	2.5346	2.6567
Isolok - 12 mL	10	2.53437	0.03617	2.4595	2.6092

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	15	2.59566	0.062120	0.01604	2.5613	2.6301
Isolok - 12 mL	10	2.53437	0.165608	0.05237	2.4159	2.6528

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	-0.06129	t Ratio	-1.11906
Std Err Dif	0.05477	DF	10.70708
Upper CL Dif	0.05966	Prob > t	0.2876
Lower CL Dif	-0.18225	Prob > t	0.8562
Confidence	0.95	Prob < t	0.1438

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0621204	0.0543406	0.0539156
Isolok - 12 mL	10	0.1656077	0.1207008	0.1161805

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.4049	1	23	0.0470
Brown-Forsythe	4.0104	1	23	0.0571
Levene	5.4809	1	23	0.0283
Bartlett	9.9655	1	.	0.0016
F Test 2-sided	7.1071	9	14	0.0013

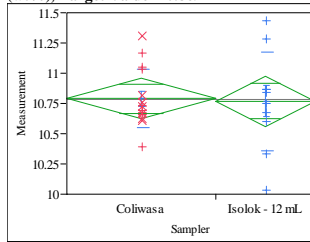
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2523	1	10.707	0.2876

t Test

1.1191

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=Al2O3 (wt%), Target Value=10.869



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.001258
Adj Rsquare	-0.04217
Root Mean Square Error	0.317199
Mean of Response	10.78149
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	-0.02204	t Ratio	-0.17023
Std Err Dif	0.12950	DF	23
Upper CL Dif	0.24584	Prob > t	0.8663
Lower CL Dif	-0.28993	Prob > t	0.5668
Confidence	0.95	Prob < t	0.4332

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0029157	0.002916	0.0290	0.8663
Error	23	2.3141508	0.100615		
C. Total	24	2.3170665			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.7903	0.08190	10.621	10.960
Isolok - 12 mL	10	10.7683	0.10031	10.561	10.976

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	15	10.7903	0.242444	0.06260	10.656	10.925
Isolok - 12 mL	10	10.7683	0.407055	0.12872	10.477	11.059

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	-0.02204	t Ratio	-0.15401
Std Err Dif	0.14314	DF	13.28275
Upper CL Dif	0.28651	Prob > t	0.8799
Lower CL Dif	-0.33060	Prob > t	0.5600
Confidence	0.95	Prob < t	0.4400

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2424443	0.1881102	0.1713147
Isolok - 12 mL	10	0.4070546	0.2890935	0.2890935

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5859	1	23	0.1215
Brown-Forsythe	1.6848	1	23	0.2072
Levene	1.4851	1	23	0.2353
Bartlett	2.9012	1	.	0.0885
F Test 2-sided	2.8189	9	14	0.0804

Welch Anova testing Means Equal, allowing Std Devs Not Equal

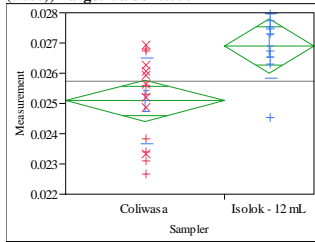
F Ratio	DFNum	DFDen	Prob > F
0.0237	1	13.283	0.8799

t Test

0.1540

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=CuO (wt%), Target Value=0.0504



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.328109
Adj Rsquare	0.298896
Root Mean Square Error	0.001298
Mean of Response	0.02574
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	0.001813	t Ratio	3.351376
Std Err Dif	0.000541	DF	23
Upper CL Dif	0.002932	Prob > t	0.0028
Lower CL Dif	0.000694	Prob > t	0.0014
Confidence	0.95	Prob < t	0.9986

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001893	0.000019	11.2317	0.0028
Error	23	0.00003877	1.686e-6		
C. Total	24	0.00005770			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.00032	0.02442	0.02576
Isolok - 12 mL	9	0.026900	0.00043	0.02600	0.02780

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	16	0.025087	0.001412	0.00035	0.02433	0.02584
Isolok - 12 mL	9	0.026900	0.001053	0.00035	0.02609	0.02771

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.001813	t Ratio	3.642348
Std Err Dif	0.000498	DF	20.94215
Upper CL Dif	0.002848	Prob > t	0.0015
Lower CL Dif	0.000778	Prob > t	0.0008
Confidence	0.95	Prob < t	0.9992

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0014119	0.0011726	0.0011384
Isolok - 12 mL	9	0.0010528	0.0007804	0.0007580

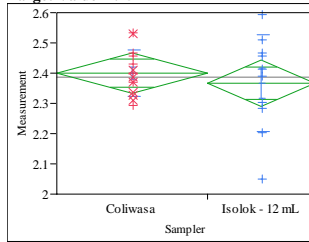
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1347	1	23	0.2978
Brown-Forsythe	1.1763	1	23	0.2893
Levene	1.8050	1	23	0.1922
Bartlett	0.7979	1	.	0.3717
F Test 2-sided	1.7983	15	8	0.4057

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
13.2667	1	20.942	0.0015

t Test
3.6423

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=Fe/Li, Target Value=2.452



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.020429
Adj Rsquare	-0.0241
Root Mean Square Error	0.117736
Mean of Response	2.386205
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	-0.03302	t Ratio	-0.67735
Std Err Dif	0.04875	DF	22
Upper CL Dif	0.06808	Prob > t	0.5052
Lower CL Dif	-0.13411	Prob > t	0.7474
Confidence	0.95	Prob < t	0.2526

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00635990	0.006360	0.4588	0.5052
Error	22	0.30495848	0.013862		
C. Total	23	0.31131837			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	2.39996	0.03147	2.3347	2.4652
Isolok - 12 mL	10	2.36694	0.03723	2.2897	2.4442

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	14	2.39996	0.075964	0.02030	2.3561	2.4438
Isolok - 12 mL	10	2.36694	0.159841	0.05055	2.2526	2.4813

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	-0.03302	t Ratio	-0.60618
Std Err Dif	0.05447	DF	11.92331
Upper CL Dif	0.08575	Prob > t	0.5558
Lower CL Dif	-0.15179	Prob > t	0.7221
Confidence	0.95	Prob < t	0.2779

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0759639	0.0602854	0.0602854
Isolok - 12 mL	10	0.1598408	0.1255358	0.1211468

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.9902	1	22	0.0583
Brown-Forsythe	3.9771	1	22	0.0587
Levene	5.6630	1	22	0.0264
Bartlett	5.6224	1	.	0.0177
F Test 2-sided	4.4275	9	13	0.0159

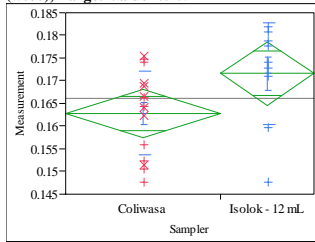
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3675	1	11.923	0.5558

t Test
0.6062

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=K2O (wt%), Target Value=0.1591



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.163836
Adj Rsquare	0.125829
Root Mean Square Error	0.010015
Mean of Response	0.166109
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	0.008767	t Ratio	2.076205
Std Err Dif	0.004223	DF	22
Upper CL Dif	0.017524	Prob > t	0.0498
Lower CL Dif	9.847e-6	Prob > t	0.0249
Confidence	0.95	Prob < t	0.9751

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00043232	0.000432	4.3106	0.0498
Error	22	0.00220642	0.000100		
C. Total	23	0.00263874			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.162822	0.00259	0.15746	0.16818
Isolok - 12 mL	9	0.171589	0.00334	0.16467	0.17851

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	15	0.162822	0.009252	0.00239	0.15770	0.16795
Isolok - 12 mL	9	0.171589	0.011225	0.00374	0.16296	0.18022

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.00877	t Ratio	1.974811
Std Err Dif	0.00444	DF	14.47584
Upper CL Dif	0.01826	Prob > t	0.0677
Lower CL Dif	-0.00073	Prob > t	0.0338
Confidence	0.95	Prob < t	0.9662

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0092518	0.0076291	0.0074284
Isolok - 12 mL	9	0.0112254	0.0081199	0.0076961

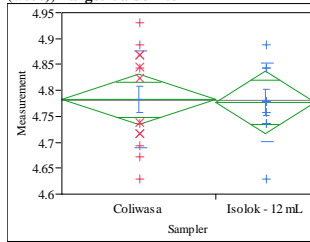
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4239	1	22	0.5217
Brown-Forsythe	0.0094	1	22	0.9236
Levene	0.0403	1	22	0.8428
Bartlett	0.3733	1	.	0.5412
F Test 2-sided	1.4722	8	14	0.5033

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.8999	1	14.476	0.0677

t Test
1.9748

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=Li2O (wt%), Target Value=4.674



Excluded Rows 3
Oneway Anova
Summary of Fit

Rsquare	0.001024
Adj Rsquare	-0.04655
Root Mean Square Error	0.087212
Mean of Response	4.780374
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL-Coliwasa
Assuming equal variances

Difference	-0.00547	t Ratio	-0.14674
Std Err Dif	0.03726	DF	21
Upper CL Dif	0.07202	Prob > t	0.8847
Lower CL Dif	-0.08296	Prob > t	0.5576
Confidence	0.95	Prob < t	0.4424

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00016378	0.000164	0.0215	0.8847
Error	21	0.15972283	0.007606		
C. Total	22	0.15988660			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	4.78251	0.02331	4.7340	4.8310
Isolok - 12 mL	9	4.77705	0.02907	4.7166	4.8375

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err	Lower 95%	Upper 95%
Coliwasa	14	4.78251	0.093216	0.02491	4.7287	4.8363
Isolok - 12 mL	9	4.77705	0.076454	0.02548	4.7183	4.8358

t Test

Isolok - 12 mL-Coliwasa
Assuming unequal variances

Difference	-0.00547	t Ratio	-0.15342
Std Err Dif	0.03564	DF	19.58792
Upper CL Dif	0.06897	Prob > t	0.8796
Lower CL Dif	-0.07991	Prob > t	0.5602
Confidence	0.95	Prob < t	0.4398

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0932165	0.0830404	0.0830404
Isolok - 12 mL	9	0.0764541	0.0552843	0.0550186

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6524	1	21	0.4283
Brown-Forsythe	2.5007	1	21	0.1287
Levene	2.4843	1	21	0.1299
Bartlett	0.3567	1	.	0.5503
F Test 2-sided	1.4866	13	8	0.5846

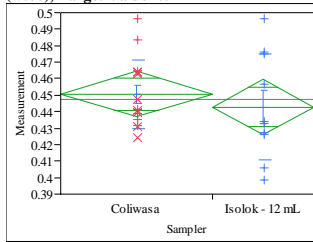
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0235	1	19.588	0.8796

t Test
0.1534

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=NiO (wt%), Target Value=0.41



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.023444
Adj Rsquare	-0.01901
Root Mean Square Error	0.025728
Mean of Response	0.447513
Observations (or Sum Wgts)	25

t Test

Isokol - 12 mL-Coliwasa
Assuming equal variances

Difference	-0.00780	t Ratio	-0.74307
Std Err Dif	0.01050	DF	23
Upper CL Dif	0.01392	Prob > t	0.4650
Lower CL Dif	-0.02953	Prob > t	0.7675
Confidence	0.95	Prob < t	0.2325

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00036548	0.000365	0.5522	0.4650
Error	23	0.01522382	0.000662		
C. Total	24	0.01558929			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.450635	0.00664	0.43689	0.46438
Isokol - 12 mL	10	0.442830	0.00814	0.42600	0.45966

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.450635	0.020753	0.00536	0.43914	0.46213
Isokol - 12 mL	10	0.442830	0.031962	0.01011	0.41997	0.46569

t Test

Isokol - 12 mL-Coliwasa
Assuming unequal variances

Difference	-0.00780	t Ratio	-0.68224
Std Err Dif	0.01144	DF	14.05631
Upper CL Dif	0.01672	Prob > t	0.5062
Lower CL Dif	-0.03233	Prob > t	0.7469
Confidence	0.95	Prob < t	0.2531

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0207531	0.0171703	0.0161183
Isokol - 12 mL	10	0.0319620	0.0264680	0.0246865

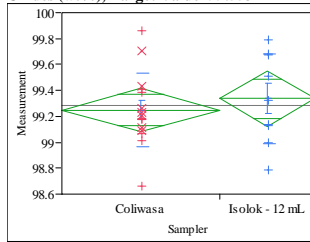
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.9852	1	23	0.0974
Brown-Forsythe	1.3726	1	23	0.2534
Levene	3.1427	1	23	0.0895
Bartlett	2.0170	1	.	0.1556
F Test 2-sided	2.3719	9	14	0.1429

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4654	1	14.056	0.5062

t Test
0.6822

Oneway Analysis of Measurement By Sampler Analytical Block=4, Analyte=Sum of Oxides (wt%), Target Value=99.553



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.019949
Adj Rsquare	-0.0246
Root Mean Square Error	0.31045
Mean of Response	99.28192
Observations (or Sum Wgts)	24

t Test

Isokol - 12 mL-Coliwasa
Assuming equal variances

Difference	0.08760	t Ratio	0.669193
Std Err Dif	0.13090	DF	22
Upper CL Dif	0.35906	Prob > t	0.5103
Lower CL Dif	-0.18387	Prob > t	0.2552
Confidence	0.95	Prob < t	0.7448

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0431605	0.043161	0.4478	0.5103
Error	22	2.1203454	0.096379		
C. Total	23	2.1635060			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	99.2491	0.08016	99.083	99.415
Isokol - 12 mL	9	99.3367	0.10348	99.122	99.551

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	99.2491	0.286708	0.07403	99.090	99.408
Isokol - 12 mL	9	99.3367	0.348125	0.11604	99.069	99.604

t Test

Isokol - 12 mL-Coliwasa
Assuming unequal variances

Difference	0.08760	t Ratio	0.636394
Std Err Dif	0.13764	DF	14.46724
Upper CL Dif	0.38192	Prob > t	0.5345
Lower CL Dif	-0.20673	Prob > t	0.2672
Confidence	0.95	Prob < t	0.7328

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2867075	0.2049800	0.1988269
Isokol - 12 mL	9	0.3481251	0.2910221	0.3101023

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4916	1	22	0.4906
Brown-Forsythe	2.0704	1	22	0.1643
Levene	1.2587	1	22	0.2740
Bartlett	0.3762	1	.	0.5397
F Test 2-sided	1.4743	8	14	0.5018

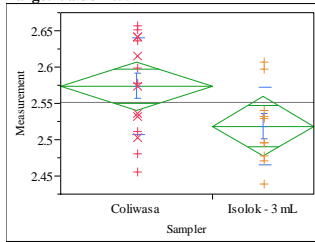
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4050	1	14.467	0.5345

t Test
0.6364

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=Al/B, Target Value=2.552



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.170035
Adj Rsquare	0.13395
Root Mean Square Error	0.062256
Mean of Response	2.551593
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.05517	t Ratio	-2.17072
Std Err Dif	0.02542	DF	23
Upper CL Dif	-0.00259	Prob > t	0.0405
Lower CL Dif	-0.10775	Prob > t	0.9797
Confidence	0.95	Prob < t	0.0203

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01826288	0.018263	4.7120	0.0405
Error	23	0.08914360	0.003876		
C. Total	24	0.10740648			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.57366	0.01607	2.5404	2.6069
Isolok - 3 mL	10	2.51849	0.01969	2.4778	2.5592

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	2.57366	0.067163	0.01734	2.5365	2.6109
Isolok - 3 mL	10	2.51849	0.053739	0.01699	2.4800	2.5569

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.05517	t Ratio	-2.27227
Std Err Dif	0.02428	DF	22.09847
Upper CL Dif	-0.00483	Prob > t	0.0331
Lower CL Dif	-0.10551	Prob > t	0.9834
Confidence	0.95	Prob < t	0.0166

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0671631	0.0570620	0.0571529
Isolok - 3 mL	10	0.0537394	0.0426169	0.0426169

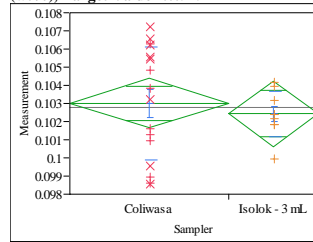
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0343	1	23	0.3197
Brown-Forsythe	1.2845	1	23	0.2687
Levene	1.3006	1	23	0.2658
Bartlett	0.5004	1	.	0.4793
F Test 2-sided	1.5620	14	9	0.5069

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.1632	1	22.098	0.0331

t Test
2.2723

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=BaO (wt%), Target Value=0.0919



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.012559
Adj Rsquare	-0.03037
Root Mean Square Error	0.002622
Mean of Response	0.102798
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.00059	t Ratio	-0.54085
Std Err Dif	0.00109	DF	23
Upper CL Dif	0.00167	Prob > t	0.5938
Lower CL Dif	-0.00285	Prob > t	0.7031
Confidence	0.95	Prob < t	0.2969

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000201	2.0106e-6	0.2925	0.5938
Error	23	0.00015809	6.8734e-6		
C. Total	24	0.00016010			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103011	0.00066	0.10166	0.10437
Isolok - 3 mL	9	0.102420	0.00087	0.10061	0.10423

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103011	0.003111	0.00078	0.10135	0.10467
Isolok - 3 mL	9	0.102420	0.001272	0.00042	0.10144	0.10340

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.00059	t Ratio	-0.66705
Std Err Dif	0.00089	DF	21.65403
Upper CL Dif	0.00125	Prob > t	0.5118
Lower CL Dif	-0.00243	Prob > t	0.7441
Confidence	0.95	Prob < t	0.2559

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0031107	0.0027267	0.0027075
Isolok - 3 mL	9	0.0012718	0.0008932	0.0008808

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	9.3752	1	23	0.0055
Brown-Forsythe	11.7432	1	23	0.0023
Levene	13.9400	1	23	0.0011
Bartlett	6.1405	1	.	0.0132
F Test 2-sided	5.9827	15	8	0.0154

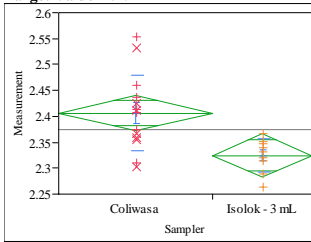
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4450	1	21.654	0.5118

t Test
0.6670

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=Fe/Li, Target Value=2.452



Excluded Rows 3
Oneway Anova
Summary of Fit

Rsquare	0.32155
Adj Rsquare	0.289243
Root Mean Square Error	0.060774
Mean of Response	2.374442
Observations (or Sum Wgts)	23

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.08192	t Ratio	-3.15482
Std Err Dif	0.02597	DF	21
Upper CL Dif	-0.02792	Prob > t	0.0048
Lower CL Dif	-0.13591	Prob > t	0.9976
Confidence	0.95	Prob < t	0.0024

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.03676027	0.036760	9.9529	0.0048
Error	21	0.07756186	0.003693		
C. Total	22	0.11432213			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	2.40650	0.01624	2.3727	2.4403
Isolok - 3 mL	9	2.32458	0.02026	2.2825	2.3667

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	2.40650	0.072936	0.01949	2.3644	2.4486
Isolok - 3 mL	9	2.32458	0.032415	0.01081	2.2997	2.3495

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.08192	t Ratio	-3.67543
Std Err Dif	0.02229	DF	19.26113
Upper CL Dif	-0.03531	Prob > t	0.0016
Lower CL Dif	-0.12852	Prob > t	0.9992
Confidence	0.95	Prob < t	0.0008

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0729361	0.0540963	0.0540341
Isolok - 3 mL	9	0.0324155	0.0249451	0.0249414

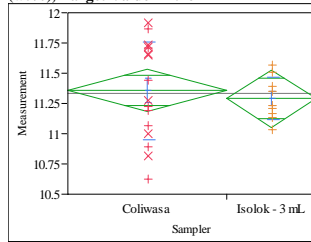
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7626	1	21	0.1113
Brown-Forsythe	3.0793	1	21	0.0939
Levene	3.1545	1	21	0.0902
Bartlett	5.0532	1	.	0.0246
F Test 2-sided	5.0627	13	8	0.0276

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
13.5088	1	19.261	0.0016

t Test
3.6754

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=Fe2O3 (wt%), Target Value=11.462



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.009597
Adj Rsquare	-0.03346
Root Mean Square Error	0.342217
Mean of Response	11.33295
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.06732	t Ratio	-0.47209
Std Err Dif	0.14259	DF	23
Upper CL Dif	0.22766	Prob > t	0.6413
Lower CL Dif	-0.36229	Prob > t	0.6793
Confidence	0.95	Prob < t	0.3207

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0261004	0.026100	0.2229	0.6413
Error	23	2.6935876	0.117113		
C. Total	24	2.7196879			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3572	0.08555	11.180	11.534
Isolok - 3 mL	9	11.2899	0.11407	11.054	11.526

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3572	0.403533	0.10088	11.142	11.572
Isolok - 3 mL	9	11.2899	0.177133	0.05904	11.154	11.426

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.06732	t Ratio	-0.57588
Std Err Dif	0.11689	DF	22.16087
Upper CL Dif	0.17500	Prob > t	0.5705
Lower CL Dif	-0.30963	Prob > t	0.7147
Confidence	0.95	Prob < t	0.2853

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4035327	0.3484894	0.3484894
Isolok - 3 mL	9	0.1771328	0.1472061	0.1445586

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.0419	1	23	0.0219
Brown-Forsythe	9.3635	1	23	0.0055
Levene	9.6633	1	23	0.0049
Bartlett	5.3291	1	.	0.0210
F Test 2-sided	5.1899	15	8	0.0243

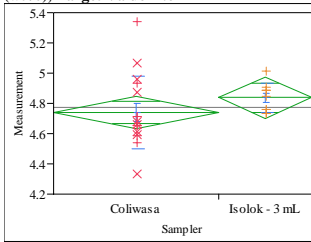
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3316	1	22.161	0.5705

t Test
0.5759

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=Li2O (wt%), Target Value=4.674



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.054052
Adj Rsquare	0.012923
Root Mean Square Error	0.201882
Mean of Response	4.775132
Observations (or Sum Wgts)	25

t Test
Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	0.09643	t Ratio	1.146396
Std Err Dif	0.08412	DF	23
Upper CL Dif	0.27044	Prob > t	0.2634
Lower CL Dif	-0.07758	Prob > t	0.1317
Confidence	0.95	Prob < t	0.8683

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.05356297	0.053563	1.3142	0.2634
Error	23	0.93739541	0.040756		
C. Total	24	0.99095838			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.74042	0.05047	4.6360	4.8448
Isolok - 3 mL	9	4.83685	0.06729	4.6976	4.9761

Std Error uses a pooled estimate of error variance
Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.74042	0.239765	0.05994	4.6127	4.8682
Isolok - 3 mL	9	4.83685	0.096880	0.03229	4.7624	4.9113

t Test
Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	0.09643	t Ratio	1.416308
Std Err Dif	0.06809	DF	21.56487
Upper CL Dif	0.23780	Prob > t	0.1710
Lower CL Dif	-0.04494	Prob > t	0.0855
Confidence	0.95	Prob < t	0.9145

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2397650	0.1804736	0.1655042
Isolok - 3 mL	9	0.0968805	0.0797370	0.0837239

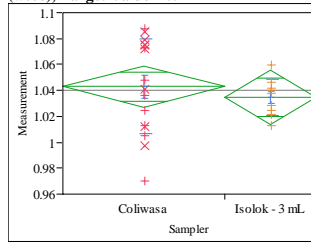
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9447	1	23	0.1765
Brown-Forsythe	1.6432	1	23	0.2127
Levene	3.7444	1	23	0.0654
Bartlett	6.2779	1	.	0.0122
F Test 2-sided	6.1249	15	8	0.0142

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.0059	1	21.565	0.1710

t Test
1.4163

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=MgO (wt%), Target Value=1.014



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.018122
Adj Rsquare	-0.02457
Root Mean Square Error	0.030542
Mean of Response	1.040086
Observations (or Sum Wgts)	25

t Test
Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.00829	t Ratio	-0.65154
Std Err Dif	0.01273	DF	23
Upper CL Dif	0.01803	Prob > t	0.5212
Lower CL Dif	-0.03462	Prob > t	0.7394
Confidence	0.95	Prob < t	0.2606

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00039599	0.000396	0.4245	0.5212
Error	23	0.02145518	0.000933		
C. Total	24	0.02185117			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.04307	0.00764	1.0273	1.0589
Isolok - 3 mL	9	1.03478	0.01018	1.0137	1.0558

Std Error uses a pooled estimate of error variance
Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.04307	0.036367	0.00909	1.0237	1.0624
Isolok - 3 mL	9	1.03478	0.014217	0.00474	1.0239	1.0457

t Test
Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.00829	t Ratio	-0.80872
Std Err Dif	0.01025	DF	21.30878
Upper CL Dif	0.01301	Prob > t	0.4276
Lower CL Dif	-0.02959	Prob > t	0.7862
Confidence	0.95	Prob < t	0.2138

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0363668	0.0308858	0.0308858
Isolok - 3 mL	9	0.0142170	0.0114238	0.0112396

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.5196	1	23	0.0278
Brown-Forsythe	9.8943	1	23	0.0045
Levene	10.0005	1	23	0.0044
Bartlett	6.6691	1	.	0.0098
F Test 2-sided	6.5433	15	8	0.0114

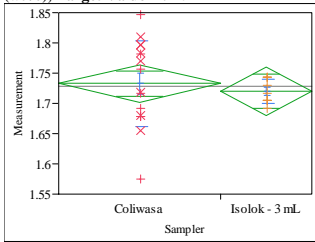
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6540	1	21.309	0.4276

t Test
0.8087

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=MnO (wt%), Target Value=1.779



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.01129
Adj Rsquare	-0.0317
Root Mean Square Error	0.058368
Mean of Response	1.728142
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.01246	t Ratio	-0.51249
Std Err Dif	0.02432	DF	23
Upper CL Dif	0.03785	Prob > t	0.6132
Lower CL Dif	-0.06277	Prob > t	0.6934
Confidence	0.95	Prob < t	0.3066

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00089478	0.000895	0.2626	0.6132
Error	23	0.07835712	0.003407		
C. Total	24	0.07925190			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.73263	0.01459	1.7024	1.7628
Isolok - 3 mL	9	1.72017	0.01946	1.6799	1.7604

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.73263	0.070756	0.01769	1.6949	1.7703
Isolok - 3 mL	9	1.72017	0.020188	0.00673	1.7046	1.7357

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.01246	t Ratio	-0.65855
Std Err Dif	0.01893	DF	18.91294
Upper CL Dif	0.02716	Prob > t	0.5181
Lower CL Dif	-0.05209	Prob > t	0.7409
Confidence	0.95	Prob < t	0.2591

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0707563	0.0589110	0.0589110
Isolok - 3 mL	9	0.0201875	0.0175348	0.0186507

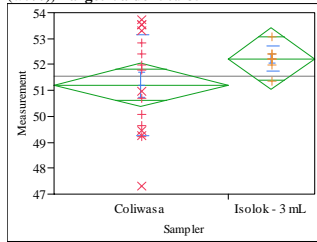
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.0015	1	23	0.0574
Brown-Forsythe	10.6306	1	23	0.0034
Levene	11.3053	1	23	0.0027
Bartlett	10.6853	1	.	0.0011
F Test 2-sided	12.2847	15	8	0.0013

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4337	1	18.913	0.5181

t Test
0.6586

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=SiO2 (wt%), Target Value=50.985



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.086387
Adj Rsquare	0.044859
Root Mean Square Error	1.627086
Mean of Response	51.54822
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	1.0162	t Ratio	1.442295
Std Err Dif	0.7045	DF	22
Upper CL Dif	2.4773	Prob > t	0.1633
Lower CL Dif	-0.4450	Prob > t	0.0817
Confidence	0.95	Prob < t	0.9183

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	5.507181	5.50718	2.0802	0.1633
Error	22	58.243013	2.64741		
C. Total	23	63.750194			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	51.2095	0.40677	50.366	52.053
Isolok - 3 mL	8	52.2257	0.57526	51.033	53.419

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	51.2095	1.94331	0.48583	50.174	52.245
Isolok - 3 mL	8	52.2257	0.47751	0.16882	51.826	52.625

t Test

Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	1.0162	t Ratio	1.975729
Std Err Dif	0.5143	DF	18.27048
Upper CL Dif	2.0956	Prob > t	0.0635
Lower CL Dif	-0.0632	Prob > t	0.0317
Confidence	0.95	Prob < t	0.9683

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.943312	1.657958	1.657958
Isolok - 3 mL	8	0.477507	0.300839	0.294154

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.7884	1	22	0.0250
Brown-Forsythe	15.7441	1	22	0.0007
Levene	15.9628	1	22	0.0006
Bartlett	11.2217	1	.	0.0008
F Test 2-sided	16.5625	15	7	0.0010

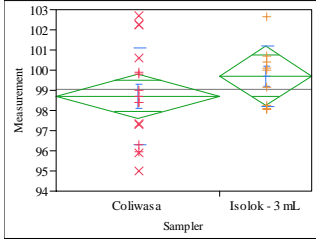
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.9035	1	18.27	0.0635

t Test
1.9757

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=Sum of Oxides (wt%), Target Value=99.553



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.053187
Adj Rsquare	0.012022
Root Mean Square Error	2.122319
Mean of Response	99.07196
Observations (or Sum Wgts)	25

t Test
Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	1.0052	t Ratio	1.136674
Std Err Dif	0.8843	DF	23
Upper CL Dif	2.8345	Prob > t	0.2674
Lower CL Dif	-0.8242	Prob > t	0.1337
Confidence	0.95	Prob < t	0.8663

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	5.81960	5.81960	1.2920	0.2674
Error	23	103.59749	4.50424		
C. Total	24	109.41709			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	98.7101	0.53058	97.613	99.81
Isolok - 3 mL	9	99.7153	0.70744	98.252	101.18

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	98.7101	2.38801	0.59700	97.438	99.98
Isolok - 3 mL	9	99.7153	1.50245	0.50082	98.560	100.87

t Test
Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	1.0052	t Ratio	1.289911
Std Err Dif	0.7792	DF	22.57659
Upper CL Dif	2.6188	Prob > t	0.2101
Lower CL Dif	-0.6085	Prob > t	0.1051
Confidence	0.95	Prob < t	0.8949

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	2.388008	1.907102	1.905940
Isolok - 3 mL	9	1.502445	1.170428	1.148759

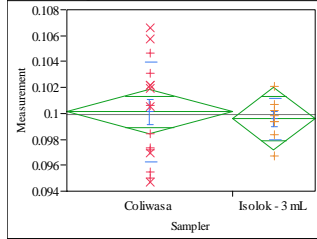
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4552	1	23	0.1308
Brown-Forsythe	2.1871	1	23	0.1527
Levene	2.1737	1	23	0.1539
Bartlett	1.8946	1	.	0.1687
F Test 2-sided	2.5262	15	8	0.1881

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6639	1	22.577	0.2101

t Test
1.2899

Oneway Analysis of Measurement By Sampler Analytical Block=5, Analyte=ZnO (wt%), Target Value=0.0958



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.006775
Adj Rsquare	-0.03837
Root Mean Square Error	0.003293
Mean of Response	0.099937
Observations (or Sum Wgts)	24

t Test
Isolok - 3 mL-Coliwasa
Assuming equal variances

Difference	-0.00055	t Ratio	-0.38738
Std Err Dif	0.00143	DF	22
Upper CL Dif	0.00240	Prob > t	0.7022
Lower CL Dif	-0.00351	Prob > t	0.6489
Confidence	0.95	Prob < t	0.3511

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000163	1.627e-6	0.1501	0.7022
Error	22	0.00023857	0.000011		
C. Total	23	0.00024020			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.100121	0.00082	0.09841	0.10183
Isolok - 3 mL	8	0.099568	0.00116	0.09715	0.10198

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.100121	0.003837	0.00096	0.09808	0.10217
Isolok - 3 mL	8	0.099568	0.001593	0.00056	0.09824	0.10090

t Test
Isolok - 3 mL-Coliwasa
Assuming unequal variances

Difference	-0.00055	t Ratio	-0.49659
Std Err Dif	0.00111	DF	21.62048
Upper CL Dif	0.00176	Prob > t	0.6245
Lower CL Dif	-0.00286	Prob > t	0.6878
Confidence	0.95	Prob < t	0.3122

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0038367	0.0032394	0.0031976
Isolok - 3 mL	8	0.0015933	0.0011359	0.0011359

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.4788	1	22	0.0287
Brown-Forsythe	7.4243	1	22	0.0124
Levene	8.6029	1	22	0.0077
Bartlett	5.2906	1	.	0.0214
F Test 2-sided	5.7981	15	7	0.0256

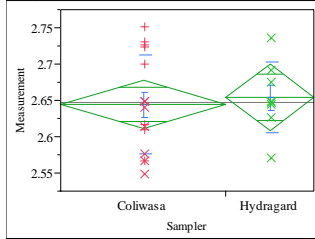
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2466	1	21.62	0.6245

t Test
0.4966

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=6, Analyte=Al/B, Target Value=2.552



Excluded Rows 3
Oneway Anova
Summary of Fit

Rsquare	0.006236
Adj Rsquare	-0.04109
Root Mean Square Error	0.062133
Mean of Response	2.647405
Observations (or Sum Wgts)	23

t Test
Hydragard-Coliwasa
Assuming equal variances

Difference	0.00987	t Ratio	0.363004
Std Err Dif	0.02720	DF	21
Upper CL Dif	0.06644	Prob > t	0.7202
Lower CL Dif	-0.04669	Prob > t	0.3601
Confidence	0.95	Prob < t	0.6399

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00050870	0.000509	0.1318	0.7202
Error	21	0.08106964	0.003860		
C. Total	22	0.08157834			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.64397	0.01604	2.6106	2.6773
Hydragard	8	2.65384	0.02197	2.6082	2.6995

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	2.64397	0.067858	0.01752	2.6064	2.6815
Hydragard	8	2.65384	0.048703	0.01722	2.6131	2.6946

t Test
Hydragard-Coliwasa
Assuming unequal variances

Difference	0.00987	t Ratio	0.401953
Std Err Dif	0.02457	DF	18.87967
Upper CL Dif	0.06131	Prob > t	0.6922
Lower CL Dif	-0.04156	Prob > t	0.3461
Confidence	0.95	Prob < t	0.6539

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0678580	0.0558814	0.0561037
Hydragard	8	0.0487027	0.0347092	0.0331258

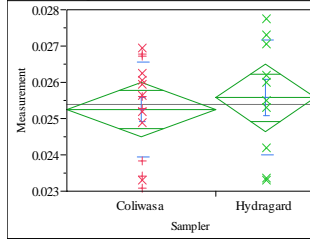
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6144	1	21	0.2178
Brown-Forsythe	2.2172	1	21	0.1513
Levene	1.9972	1	21	0.1722
Bartlett	0.8918	1	.	0.3450
F Test 2-sided	1.9413	14	7	0.3825

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1616	1	18.88	0.6922

t Test
0.4020

Oneway Analysis of Measurement By Sampler Analytical Block=6, Analyte=CuO (wt%), Target Value=0.0504



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.013588
Adj Rsquare	-0.0293
Root Mean Square Error	0.001416
Mean of Response	0.025379
Observations (or Sum Wgts)	25

t Test
Hydragard-Coliwasa
Assuming equal variances

Difference	0.00033	t Ratio	0.562869
Std Err Dif	0.00058	DF	23
Upper CL Dif	0.00152	Prob > t	0.5790
Lower CL Dif	-0.00087	Prob > t	0.2895
Confidence	0.95	Prob < t	0.7105

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000064	6.3558e-7	0.3168	0.5790
Error	23	0.00004614	2.0061e-6		
C. Total	24	0.00004678			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.025249	0.00037	0.02449	0.02601
Hydragard	10	0.025574	0.00045	0.02465	0.02650

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.025249	0.001298	0.00034	0.02453	0.02597
Hydragard	10	0.025574	0.001582	0.00050	0.02444	0.02671

t Test
Hydragard-Coliwasa
Assuming unequal variances

Difference	0.00033	t Ratio	0.540352
Std Err Dif	0.00060	DF	16.72732
Upper CL Dif	0.00160	Prob > t	0.5961
Lower CL Dif	-0.00095	Prob > t	0.2980
Confidence	0.95	Prob < t	0.7020

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0012985	0.0010465	0.0010181
Hydragard	10	0.0015824	0.0012643	0.0012643

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9369	1	23	0.3432
Brown-Forsythe	0.5016	1	23	0.4859
Levene	0.4769	1	23	0.4967
Bartlett	0.4186	1	.	0.5176
F Test 2-sided	1.4850	9	14	0.4892

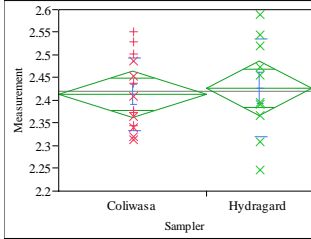
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2920	1	16.727	0.5961

t Test
0.5404

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=6, Analyte=Fe/Li, Target Value=2.452



Excluded Rows 2
Oneway Anova
Summary of Fit

Rsquare	0.005941
Adj Rsquare	-0.03924
Root Mean Square Error	0.092217
Mean of Response	2.418991
Observations (or Sum Wgts)	24

t Test
Hydragard-Coliwasa
Assuming equal variances

Difference	0.01384	t Ratio	0.362604
Std Err Dif	0.03818	DF	22
Upper CL Dif	0.09303	Prob > t	0.7204
Lower CL Dif	-0.06534	Prob > t	0.3602
Confidence	0.95	Prob < t	0.6398

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00111811	0.001118	0.1315	0.7204
Error	22	0.18708623	0.008504		
C. Total	23	0.18820434			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	2.41322	0.02465	2.3621	2.4643
Hydragard	10	2.42707	0.02916	2.3666	2.4875

Std Error uses a pooled estimate of error variance
Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	2.41322	0.079710	0.02130	2.3672	2.4592
Hydragard	10	2.42707	0.107749	0.03407	2.3500	2.5041

t Test
Hydragard-Coliwasa
Assuming unequal variances

Difference	0.01384	t Ratio	0.344526
Std Err Dif	0.04018	DF	15.74583
Upper CL Dif	0.09914	Prob > t	0.7350
Lower CL Dif	-0.07146	Prob > t	0.3675
Confidence	0.95	Prob < t	0.6325

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0797100	0.0677512	0.0667954
Hydragard	10	0.1077488	0.0876864	0.0876864

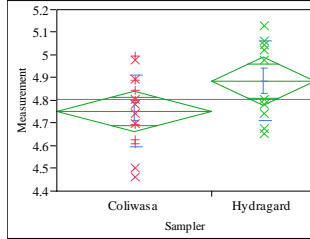
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6796	1	22	0.2084
Brown-Forsythe	1.0321	1	22	0.3207
Levene	1.1103	1	22	0.3034
Bartlett	0.9427	1	.	0.3316
F Test 2-sided	1.8273	9	13	0.3131

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1187	1	15.746	0.7350

t Test
0.3445

Oneway Analysis of Measurement By Sampler Analytical Block=6, Analyte=Li2O (wt%), Target Value=4.674



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.143863
Adj Rsquare	0.10664
Root Mean Square Error	0.165418
Mean of Response	4.805273
Observations (or Sum Wgts)	25

t Test
Hydragard-Coliwasa
Assuming equal variances

Difference	0.13276	t Ratio	1.965924
Std Err Dif	0.06753	DF	23
Upper CL Dif	0.27246	Prob > t	0.0615
Lower CL Dif	-0.00694	Prob > t	0.0307
Confidence	0.95	Prob < t	0.9693

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.10575476	0.105755	3.8649	0.0615
Error	23	0.62935282	0.027363		
C. Total	24	0.73510758			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	4.75217	0.04271	4.6638	4.8405
Hydragard	10	4.88493	0.05231	4.7767	4.9931

Std Error uses a pooled estimate of error variance
Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	4.75217	0.158721	0.04098	4.6643	4.8401
Hydragard	10	4.88493	0.175329	0.05544	4.7595	5.0104

t Test
Hydragard-Coliwasa
Assuming unequal variances

Difference	0.13276	t Ratio	1.925606
Std Err Dif	0.06895	DF	18.05595
Upper CL Dif	0.27758	Prob > t	0.0701
Lower CL Dif	-0.01206	Prob > t	0.0350
Confidence	0.95	Prob < t	0.9650

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1587205	0.1266862	0.1263035
Hydragard	10	0.1753289	0.1571617	0.1571617

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2398	1	23	0.6290
Brown-Forsythe	0.8493	1	23	0.3663
Levene	0.9051	1	23	0.3513
Bartlett	0.1050	1	.	0.7459
F Test 2-sided	1.2202	9	14	0.7125

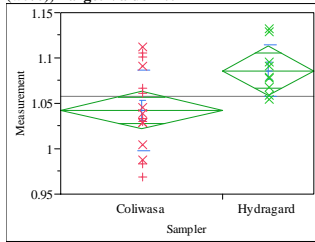
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.7080	1	18.056	0.0701

t Test
1.9256

Exhibit A3. Statistical Comparisons for Mid-Rheology (Phase 1) Testing (screened data)

Oneway Analysis of Measurement By Sampler Analytical Block=6, Analyte=MgO (wt%), Target Value=1.014



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.23339
Adj Rsquare	0.20006
Root Mean Square Error	0.039502
Mean of Response	1.058128
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwas
Assuming equal variances

Difference	0.043553	t Ratio	2.646173
Std Err Dif	0.016459	DF	23
Upper CL Dif	0.077601	Prob > t	0.0144
Lower CL Dif	0.009505	Prob > t	0.0072
Confidence	0.95	Prob < t	0.9928

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01092614	0.010926	7.0022	0.0144
Error	23	0.03588872	0.001560		
C. Total	24	0.04681486			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.04245	0.00988	1.0220	1.0629
Hydragard	9	1.08600	0.01317	1.0588	1.1132

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.04245	0.044443	0.01111	1.0188	1.0661
Hydragard	9	1.08600	0.027976	0.00933	1.0645	1.1075

t Test

Hydragard-Coliwas
Assuming unequal variances

Difference	0.043553	t Ratio	3.002537
Std Err Dif	0.014506	DF	22.57338
Upper CL Dif	0.073592	Prob > t	0.0064
Lower CL Dif	0.013515	Prob > t	0.0032
Confidence	0.95	Prob < t	0.9968

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0444427	0.0353684	0.0348243
Hydragard	9	0.0279762	0.0219059	0.0211894

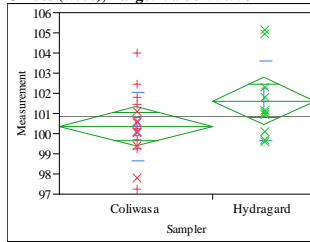
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5385	1	23	0.1248
Brown-Forsythe	1.7864	1	23	0.1944
Levene	2.0779	1	23	0.1629
Bartlett	1.8906	1	.	0.1691
F Test 2-sided	2.5236	15	8	0.1886

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.0152	1	22.573	0.0064

t Test
3.0025

Oneway Analysis of Measurement By Sampler Analytical Block=6, Analyte=Sum of Oxides (wt%), Target Value=99.553



Excluded Rows 1
Oneway Anova
Summary of Fit

Rsquare	0.112117
Adj Rsquare	0.073513
Root Mean Square Error	1.812142
Mean of Response	100.8618
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwas
Assuming equal variances

Difference	1.2608	t Ratio	1.704201
Std Err Dif	0.7398	DF	23
Upper CL Dif	2.7912	Prob > t	0.1018
Lower CL Dif	-0.2696	Prob > t	0.0509
Confidence	0.95	Prob < t	0.9491

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	9.537315	9.53731	2.9043	0.1018
Error	23	75.528775	3.28386		
C. Total	24	85.066090			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	15	100.357	0.46789	99.39	101.33
Hydragard	10	101.618	0.57305	100.43	102.80

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	15	100.357	1.70299	0.43971	99.41	101.30
Hydragard	10	101.618	1.96996	0.62295	100.21	103.03

t Test

Hydragard-Coliwas
Assuming unequal variances

Difference	1.2608	t Ratio	1.65346
Std Err Dif	0.7625	DF	17.42186
Upper CL Dif	2.8666	Prob > t	0.1161
Lower CL Dif	-0.3450	Prob > t	0.0581
Confidence	0.95	Prob < t	0.9419

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	15	1.702985	1.229066	1.237171
Hydragard	10	1.969956	1.494689	1.393149

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2484	1	23	0.6230
Brown-Forsythe	0.0917	1	23	0.7647
Levene	0.3189	1	23	0.5777
Bartlett	0.2260	1	.	0.6345
F Test 2-sided	1.3381	9	14	0.6031

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.7339	1	17.422	0.1161

t Test
1.6535

Appendix B.

Supplemental Tables and Exhibits for High-Rheology (Phase 2) Simulant Testing

Table B1. Density Measurements for Phase 2

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	Sample Density (g/mL)
Coliwasa	LF	Coliwasa Low	DCL01	1.3383
Coliwasa	LF	Coliwasa Low	DCL02	1.3471
Coliwasa	LF	Coliwasa Low	DCL03	1.3291
Coliwasa	LF	Coliwasa Low	DCL04	1.3499
Coliwasa	HF	Coliwasa Low	DCL05	1.3416
Coliwasa	HF	Coliwasa Low	DCL06	1.3406
Coliwasa	HF	Coliwasa Low	DCL07	1.3285
Coliwasa	HF	Coliwasa Low	DCL08	1.3366
Coliwasa	LF	Coliwasa High	DCH01	1.3291
Coliwasa	LF	Coliwasa High	DCH02	1.3437
Coliwasa	LF	Coliwasa High	DCH03	1.3519
Coliwasa	LF	Coliwasa High	DCH04	1.3510
Coliwasa	HF	Coliwasa High	DCH05	1.3306
Coliwasa	HF	Coliwasa High	DCH06	1.3380
Coliwasa	HF	Coliwasa High	DCH07	1.3357
Coliwasa	HF	Coliwasa High	DCH08	1.3121
Hydragard	LF	Hydragard	DLHY01	1.3890
Hydragard	LF	Hydragard	DLHY02	1.3403
Hydragard	LF	Hydragard	DLHY03	1.3422
Hydragard	LF	Hydragard	DLHY04	1.3220
Hydragard	LF	Hydragard	DLHY05	1.3345
Hydragard	LF	Hydragard	DLHY06	1.3315
Hydragard	LF	Hydragard	DLHY07	1.3524
Hydragard	LF	Hydragard	DLHY08	1.3463
Hydragard	LF	Hydragard	DLHY09	1.3653
Hydragard	LF	Hydragard	DLHY10	1.3481
Hydragard	HF	Hydragard	DHHY01	1.3578
Hydragard	HF	Hydragard	DHHY02	1.3462
Hydragard	HF	Hydragard	DHHY03	1.3374
Hydragard	HF	Hydragard	DHHY04	1.3304
Hydragard	HF	Hydragard	DHHY05	1.3216
Hydragard	HF	Hydragard	DHHY06	1.3556
Hydragard	HF	Hydragard	DHHY07	1.3352
Hydragard	HF	Hydragard	DHHY08	1.3244
Hydragard	HF	Hydragard	DHHY09	1.3279
Hydragard	HF	Hydragard	DHHY10	1.3349
Isolok	LF	Isolok	DLIB01	1.3238
Isolok	LF	Isolok	DLIB02	1.3515
Isolok	LF	Isolok	DLIB03	1.3342
Isolok	LF	Isolok	DLIB04	1.3234
Isolok	LF	Isolok	DLIB05	1.3303
Isolok	LF	Isolok	DLIB06	1.3183
Isolok	LF	Isolok	DLIB07	1.3505
Isolok	LF	Isolok	DLIB08	1.3331
Isolok	LF	Isolok	DLIB09	1.3402
Isolok	LF	Isolok	DLIB10	1.3166
Isolok	HF	Isolok	DHIB01	1.3681
Isolok	HF	Isolok	DHIB02	1.3666
Isolok	HF	Isolok	DHIB03	1.3242
Isolok	HF	Isolok	DHIB04	1.3467
Isolok	HF	Isolok	DHIB05	1.3410
Isolok	HF	Isolok	DHIB06	1.3770
Isolok	HF	Isolok	DHIB07	1.3264
Isolok	HF	Isolok	DHIB08	1.3191
Isolok	HF	Isolok	DHIB09	1.3323
Isolok	HF	Isolok	DHIB10	1.3484

Table B2. Solids Measurements for Phase 2

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	wt% dried solids	wt% vitrified solids
Coliwasa	LF	Coliwasa Low	CL01	40.73	33.14
Coliwasa	LF	Coliwasa Low	CL02	40.73	32.94
Coliwasa	LF	Coliwasa Low	CL03	40.42	32.74
Coliwasa	LF	Coliwasa Low	CL04	40.58	32.90
Coliwasa	HF	Coliwasa Low	CL05	40.51	32.73
Coliwasa	HF	Coliwasa Low	CL06	40.34	32.70
Coliwasa	HF	Coliwasa Low	CL07	40.79	33.01
Coliwasa	HF	Coliwasa Low	CL08	41.88	33.88
Coliwasa	LF	Coliwasa High	CH01	39.03	31.57
Coliwasa	LF	Coliwasa High	CH02	40.39	32.57
Coliwasa	LF	Coliwasa High	CH03	40.95	33.19
Coliwasa	LF	Coliwasa High	CH04	40.09	32.45
Coliwasa	HF	Coliwasa High	CH05	40.91	33.15
Coliwasa	HF	Coliwasa High	CH06	40.81	33.09
Coliwasa	HF	Coliwasa High	CH07	41.09	33.30
Coliwasa	HF	Coliwasa High	CH08	40.47	32.71
Hydragard	LF	Hydragard	LHY01	40.37	32.74
Hydragard	LF	Hydragard	LHY02	40.36	32.72
Hydragard	LF	Hydragard	LHY03	40.41	32.77
Hydragard	LF	Hydragard	LHY04	40.54	32.87
Hydragard	LF	Hydragard	LHY05	40.57	32.94
Hydragard	LF	Hydragard	LHY06	39.19	31.84
Hydragard	LF	Hydragard	LHY07	40.48	32.89
Hydragard	LF	Hydragard	LHY08	40.55	32.85
Hydragard	LF	Hydragard	LHY09	40.90	33.19
Hydragard	LF	Hydragard	LHY10	40.79	33.12
Hydragard	HF	Hydragard	HHY01	39.88	32.09
Hydragard	HF	Hydragard	HHY02	40.15	32.40
Hydragard	HF	Hydragard	HHY03	38.67	32.24
Hydragard	HF	Hydragard	HHY04	40.11	32.37
Hydragard	HF	Hydragard	HHY05	40.02	32.33
Hydragard	HF	Hydragard	HHY06	40.15	32.44
Hydragard	HF	Hydragard	HHY07	40.34	32.62
Hydragard	HF	Hydragard	HHY08	40.30	32.52
Hydragard	HF	Hydragard	HHY09	40.13	32.41
Hydragard	HF	Hydragard	HHY10	40.19	32.44
Isolok (3 mL)	LF	Isolok (3 mL)	LIS01	40.60	32.70
Isolok (3 mL)	LF	Isolok (3 mL)	LIS02	40.47	32.58
Isolok (3 mL)	LF	Isolok (3 mL)	LIS03	40.25	32.35
Isolok (3 mL)	LF	Isolok (3 mL)	LIS04	40.50	32.54
Isolok (3 mL)	LF	Isolok (3 mL)	LIS05	40.37	32.49
Isolok (3 mL)	LF	Isolok (3 mL)	LIS06	40.78	32.77
Isolok (3 mL)	LF	Isolok (3 mL)	LIS07	40.58	32.58
Isolok (3 mL)	LF	Isolok (3 mL)	LIS08	40.76	32.60
Isolok (3 mL)	LF	Isolok (3 mL)	LIS09	40.72	32.64
Isolok (3 mL)	LF	Isolok (3 mL)	LIS10	40.95	32.91
Isolok (3 mL)	HF	Isolok (3 mL)	HIS01	41.80	33.63
Isolok (3 mL)	HF	Isolok (3 mL)	HIS02	41.39	33.35
Isolok (3 mL)	HF	Isolok (3 mL)	HIS03	41.71	33.78
Isolok (3 mL)	HF	Isolok (3 mL)	HIS04	41.34	33.23
Isolok (3 mL)	HF	Isolok (3 mL)	HIS05	41.77	33.62
Isolok (3 mL)	HF	Isolok (3 mL)	HIS06	41.42	33.36
Isolok (3 mL)	HF	Isolok (3 mL)	HIS07	41.45	33.41
Isolok (3 mL)	HF	Isolok (3 mL)	HIS08	41.35	33.16
Isolok (3 mL)	HF	Isolok (3 mL)	HIS09	41.75	33.56
Isolok (3 mL)	HF	Isolok (3 mL)	HIS10	41.68	33.58
Isolok (12 mL)	LF	Isolok (12 mL)	LIB01	40.85	32.70
Isolok (12 mL)	LF	Isolok (12 mL)	LIB02	40.85	32.69
Isolok (12 mL)	LF	Isolok (12 mL)	LIB03	40.80	32.63
Isolok (12 mL)	LF	Isolok (12 mL)	LIB04	40.93	32.72
Isolok (12 mL)	LF	Isolok (12 mL)	LIB05	40.87	32.69
Isolok (12 mL)	LF	Isolok (12 mL)	LIB06	40.99	32.81
Isolok (12 mL)	LF	Isolok (12 mL)	LIB07	41.08	32.93

Table B2. Solids Measurements for Phase 2

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	wt% dried solids	wt% vitrified solids
Isolok (12 mL)	LF	Isolok (12 mL)	LIB08	40.96	32.75
Isolok (12 mL)	LF	Isolok (12 mL)	LIB09	41.06	32.82
Isolok (12 mL)	LF	Isolok (12 mL)	LIB10	41.03	32.83
Isolok (12 mL)	HF	Isolok (12 mL)	HIB01	41.52	33.45
Isolok (12 mL)	HF	Isolok (12 mL)	HIB02	41.60	33.56
Isolok (12 mL)	HF	Isolok (12 mL)	HIB03	41.26	33.23
Isolok (12 mL)	HF	Isolok (12 mL)	HIB04	41.42	33.33
Isolok (12 mL)	HF	Isolok (12 mL)	HIB05	41.31	33.28
Isolok (12 mL)	HF	Isolok (12 mL)	HIB06	41.36	33.58
Isolok (12 mL)	HF	Isolok (12 mL)	HIB07	41.53	33.45
Isolok (12 mL)	HF	Isolok (12 mL)	HIB08	41.30	33.26
Isolok (12 mL)	HF	Isolok (12 mL)	HIB09	41.44	33.38
Isolok (12 mL)	HF	Isolok (12 mL)	HIB10	41.35	33.33

Table B3. Phase 2 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	23500	23100	834	9640	< 572	626	< 41.6	93400	21200	< 119	14000
ARG-1	None	0	0	3	1	6	1	ARG-1B31	24500	24900	821	10300	< 557	664	< 40.5	97900	22900	< 116	14600
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	60600	14300	41.2	4330	< 551	122	782	74500	< 2710	< 115	24200
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	60100	14300	98.1	4430	< 528	127	803	73700	< 2590	< 110	24100
SME Simulant	Coliwasa	LF	20	1	2	6	4	CL02	60200	14300	36.1	4410	< 559	125	798	75000	< 2750	< 116	24000
SME Simulant	Coliwasa	LF	38	1	16	6	5	CH03	56600	14100	46.4	4200	< 589	131	780	70300	< 2890	< 122	23800
SME Simulant	Coliwasa	LF	63	1	13	6	6	CH04	58800	13900	47	4200	< 581	125	787	73000	< 2860	< 121	23400
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	58600	12800	105	4260	< 579	154	746	72900	< 2840	< 120	23300
SME Simulant	Coliwasa	HF	23	1	28	6	8	CH06	56000	13200	35.3	4040	< 530	132	760	70500	< 2610	< 110	21800
SME Simulant	Coliwasa	LF	21	1	14	6	9	CH02	55900	14500	39.4	3750	< 558	146	727	70500	< 2740	< 116	24400
SME Simulant	Coliwasa	HF	3	1	20	6	10	CL05	57900	14600	42	4160	< 547	132	737	72000	< 2690	< 114	23300
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	59700	14100	47.6	4250	< 574	105	741	73500	< 2820	< 119	23400
SME Simulant	Coliwasa	LF	40	1	19	6	12	CL03	57900	14500	44.3	4120	< 593	134	836	71200	< 2910	< 123	23300
SME Simulant	Coliwasa	HF	18	1	26	6	13	CL06	58200	14100	43	4280	< 592	128	771	72000	< 2910	< 123	23700
SME Simulant	Coliwasa	HF	1	1	22	6	14	CH05	57400	14400	41.4	4240	< 603	136	764	71000	< 2970	< 126	23700
ARG-1	None	0	0	3	12	6	15	ARG-1B32	24700	24400	873	10300	< 560	668	< 40.7	98500	23100	< 116	14700
SME Simulant	Coliwasa	HF	36	1	21	6	16	CL07	58000	13700	40.3	4230	< 554	132	716	72500	< 2720	< 115	23000
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	59600	14000	42.4	3980	< 567	122	725	76600	< 2790	< 118	22800
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	58100	13200	105	4360	< 541	116	776	72400	< 2660	< 112	24400
SME Simulant	Coliwasa	HF	63	1	5	6	19	CL08	57100	13900	39.8	4220	< 563	141	741	71300	< 2770	< 117	23800
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	57000	13600	113	4170	< 590	129	791	70900	< 2900	< 123	23500
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	57400	13100	114	4320	< 590	165	750	70900	< 2900	< 123	23600
SME Simulant	Coliwasa	HF	65	1	6	6	22	CH08	59100	13800	43.3	4470	< 549	159	784	73500	< 2700	< 114	24000
SME Simulant	Coliwasa	HF	34	1	18	6	23	CH07	58600	14100	42.6	4280	< 602	137	778	72900	< 2960	< 125	24300
SME Simulant	Coliwasa	LF	1	1	12	6	24	CH01	53300	12900	39.5	3850	< 575	113	640	65500	< 2830	< 120	22400
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	57700	13500	119	4200	< 577	127	759	70500	< 2840	< 120	23400
SME Simulant	Coliwasa	LF	4	1	10	6	26	CL01	59200	14500	48	4200	< 553	145	790	74300	< 2720	< 115	23900
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	58600	13100	119	4160	< 585	123	735	72000	< 2870	< 122	23100
SME Simulant	Coliwasa	LF	65	1	23	6	28	CL04	58100	13700	49.4	4220	< 597	125	769	71900	< 2930	< 124	23500
ARG-1	None	0	0	3	23	6	29	ARG-1B33	23400	22700	807	9870	< 577	631	< 41.9	92700	21500	< 120	14000

Table B3. Phase 2 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	4830	13400	81100	7610	716	< 266	< 849	214000	6550	209	931
ARG-1	None	0	0	3	1	6	1	ARG-1B31	5060	14100	84200	7890	720	< 259	< 827	222000	6930	188	983
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	1930	22300	98900	9460	< 204	< 256	1500	234000	105	< 92.5	841
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	1970	22800	99000	9370	< 195	298	1420	233000	97	< 88.5	843
SME Simulant	Coliwasa	LF	20	1	2	6	4	CL02	1980	23500	98200	10600	< 207	378	1640	229000	94.9	< 93.7	831
SME Simulant	Coliwasa	LF	38	1	16	6	5	CH03	1880	22100	96400	9640	< 218	325	1030	233000	115	< 98.7	800
SME Simulant	Coliwasa	LF	63	1	13	6	6	CH04	1830	21200	102000	9130	< 215	587	1110	235000	110	< 97.4	823
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	1890	22000	94700	9560	< 214	441	1550	227000	104	< 97	807
SME Simulant	Coliwasa	HF	23	1	28	6	8	CH06	1820	21800	90800	10000	< 196	< 246	1380	216000	95.5	< 88.9	781
SME Simulant	Coliwasa	LF	21	1	14	6	9	CH02	1660	19400	93600	8890	< 206	< 259	1230	234000	101	< 93.5	823
SME Simulant	Coliwasa	HF	3	1	20	6	10	CL05	1840	21200	99400	8900	< 202	401	1500	235000	98.9	< 91.8	821
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	1850	21300	101000	8720	< 212	763	1480	233000	81.8	< 96.3	802
SME Simulant	Coliwasa	LF	40	1	19	6	12	CL03	1820	20700	99300	8640	< 219	< 275	1400	238000	104	< 99.4	827
SME Simulant	Coliwasa	HF	18	1	26	6	13	CL06	1920	22100	96100	8930	< 219	462	1280	235000	90.2	< 99.2	820
SME Simulant	Coliwasa	HF	1	1	22	6	14	CH05	1890	22000	95800	9150	< 223	295	1400	236000	87.2	< 101	835
ARG-1	None	0	0	3	12	6	15	ARG-1B32	5110	14100	84400	7930	702	284	< 831	224000	6940	213	969
SME Simulant	Coliwasa	HF	36	1	21	6	16	CL07	1890	22100	97100	9570	< 205	270	1150	229000	97.4	< 92.9	807
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	1770	20800	101000	9290	< 210	321	1360	237000	97.7	< 95	835
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	1910	22600	98700	9950	< 200	< 251	1510	233000	101	< 90.6	812
SME Simulant	Coliwasa	HF	63	1	5	6	19	CL08	1830	21400	101000	9340	< 208	267	1410	233000	104	< 94.5	814
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	1820	21000	96900	8850	< 218	354	1440	225000	105	161	793
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	1930	22400	96200	9470	< 218	301	1150	230000	94.5	< 98.9	796
SME Simulant	Coliwasa	HF	65	1	6	6	22	CH08	1980	23400	101000	10100	< 203	361	1500	235000	93.3	< 92.1	817
SME Simulant	Coliwasa	HF	34	1	18	6	23	CH07	1890	22000	100000	9370	< 223	609	1250	239000	110	< 101	794
SME Simulant	Coliwasa	LF	1	1	12	6	24	CH01	1720	19700	89500	7840	< 213	507	< 854	228000	77.3	< 96.4	768
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	1860	21200	98900	8770	< 213	869	1510	238000	78.2	< 96.8	799
SME Simulant	Coliwasa	LF	4	1	10	6	26	CL01	1860	21600	98800	9530	< 204	929	1510	235000	89.4	< 92.7	825
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	1900	22300	92900	9390	< 216	796	1320	227000	91	< 98	800
SME Simulant	Coliwasa	LF	65	1	23	6	28	CL04	1930	22600	96700	9840	< 221	1170	1340	230000	84.5	< 100	763
ARG-1	None	0	0	3	23	6	29	ARG-1B33	4810	13400	79700	7500	570	363	< 856	211000	6530	202	896

Table B4. Phase 2 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al ₂ O ₃ (wt%)	B ₂ O ₃ (wt%)	BaO (wt%)	CaO (wt%)	Cr ₂ O ₃ (wt%)	CuO (wt%)	Fe ₂ O ₃ (wt%)	K ₂ O (wt%)	Li ₂ O (wt%)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	4.762	7.985	0.100	1.469	0.100	0.009	14.297	2.783	3.186
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	11.809	4.508	0.005	0.635	0.022	0.101	10.980	0.167	5.059
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	11.431	4.572	0.005	0.617	0.023	0.097	10.708	0.170	5.059
SME Simulant	Coliwasa - low	LF	20	1	2	1	4	CL02	11.809	4.733	0.006	0.656	0.019	0.105	11.123	0.166	5.404
SME Simulant	Coliwasa - high	LF	38	1	16	1	5	CH03	9.939	4.186	0.005	0.562	0.019	0.089	9.293	0.174	4.779
SME Simulant	Coliwasa - high	LF	63	1	13	1	6	CH04	11.280	4.476	0.006	0.593	0.018	0.100	10.537	0.172	4.909
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	11.602	4.443	0.006	0.625	0.022	0.090	10.823	0.155	5.102
SME Simulant	Coliwasa - high	HF	23	1	28	1	8	CH06	11.356	4.411	0.005	0.620	0.022	0.096	10.780	0.157	5.102
SME Simulant	Coliwasa - high	LF	21	1	14	1	9	CH02	10.732	4.669	0.005	0.530	0.023	0.080	10.222	0.165	4.995
SME Simulant	Coliwasa - low	HF	3	1	20	1	10	CL05	11.129	4.604	0.005	0.593	0.020	0.091	10.451	0.162	4.995
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	11.186	4.476	0.005	0.600	0.020	0.080	10.551	0.164	5.124
SME Simulant	Coliwasa - low	LF	40	1	19	1	12	CL03	11.394	4.830	0.008	0.610	0.019	0.103	10.551	0.175	5.210
SME Simulant	Coliwasa - low	HF	18	1	26	1	13	CL06	10.090	4.315	0.005	0.555	0.018	0.093	9.422	0.160	4.693
SME Simulant	Coliwasa - high	HF	1	1	22	1	14	CH05	10.978	4.798	0.006	0.623	0.019	0.096	10.265	0.179	5.361
ARG-1	None	0	0	1	15	1	15	ARG-1B12	4.780	8.018	0.099	1.483	0.100	0.002	14.583	2.783	3.229
SME Simulant	Coliwasa - low	HF	36	1	21	1	16	CL07	11.054	4.476	0.005	0.600	0.018	0.097	10.437	0.164	4.909
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	11.677	4.218	0.006	0.614	0.017	0.095	10.923	0.174	5.038
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	11.148	4.443	0.005	0.583	0.016	0.091	10.451	0.155	5.167
SME Simulant	Coliwasa - low	HF	63	1	5	1	19	CL08	10.959	4.443	0.005	0.603	0.019	0.094	10.337	0.167	5.124
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	11.620	4.347	0.006	0.750	0.022	0.102	10.823	0.170	5.102
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	11.639	4.572	0.007	0.620	0.025	0.094	10.923	0.170	5.296
SME Simulant	Coliwasa - high	HF	65	1	6	1	22	CH08	11.224	4.443	0.006	0.639	0.021	0.105	10.394	0.163	5.210
SME Simulant	Coliwasa - high	HF	34	1	18	1	23	CH07	11.658	4.830	0.006	0.632	0.025	0.103	10.909	0.178	5.382
SME Simulant	Coliwasa - high	LF	1	1	12	1	24	CH01	10.676	4.637	0.005	0.593	0.018	0.087	9.922	0.170	5.296
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	11.431	4.476	0.006	0.617	0.016	0.089	10.708	0.147	5.124
SME Simulant	Coliwasa - low	LF	4	1	10	1	26	CL01	11.243	4.604	0.005	0.588	0.020	0.102	10.523	0.164	4.952
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	11.639	4.315	0.005	0.624	0.017	0.086	10.923	0.161	5.124
SME Simulant	Coliwasa - low	LF	65	1	23	1	28	CL04	11.148	4.315	0.006	0.606	0.018	0.100	10.394	0.176	5.081
ARG-1	None	0	0	1	29	1	29	ARG-1B13	4.346	7.052	0.090	1.364	0.090	0.006	13.153	2.361	2.906
ARG-1	None	0	0	2	1	2	1	ARG-1B21	4.365	7.631	0.091	1.321	0.092	0.002	13.239	2.674	3.014
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	11.356	4.411	0.006	0.592	0.023	0.093	10.594	0.159	5.210
SME Simulant	Coliwasa - low	HF	36	1	21	2	3	CL07	10.959	4.508	0.005	0.582	0.018	0.101	10.280	0.164	5.102
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	11.469	4.121	0.007	0.572	0.024	0.091	10.909	0.174	4.758
SME Simulant	Coliwasa - high	HF	1	1	22	2	5	CH05	10.751	4.637	0.005	0.576	0.020	0.102	10.036	0.179	5.339
SME Simulant	Coliwasa - low	HF	3	1	20	2	6	CL05	11.091	4.733	0.006	0.572	0.019	0.095	10.380	0.162	5.188
SME Simulant	Coliwasa - high	HF	23	1	28	2	7	CH06	11.205	4.508	0.006	0.579	0.020	0.091	10.666	0.157	5.059
SME Simulant	Coliwasa - high	LF	1	1	12	2	8	CH01	10.543	4.604	0.005	0.560	0.017	0.094	9.822	0.170	5.339
SME Simulant	Coliwasa - low	LF	20	1	2	2	9	CL02	11.243	4.604	0.005	0.593	0.017	0.095	10.651	0.166	5.167
SME Simulant	Coliwasa - low	HF	63	1	5	2	10	CL08	10.732	4.508	0.006	0.555	0.020	0.092	10.122	0.167	5.102
SME Simulant	Coliwasa - high	HF	65	1	6	2	11	CH08	10.978	4.443	0.005	0.592	0.018	0.094	10.194	0.163	5.081
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	10.241	4.154	0.005	0.530	0.022	0.085	9.522	0.171	4.693
SME Simulant	Coliwasa - low	LF	4	1	10	2	13	CL01	11.167	4.733	0.005	0.572	0.020	0.098	10.494	0.164	5.210
SME Simulant	Coliwasa - low	HF	18	1	26	2	14	CL06	10.940	4.701	0.006	0.585	0.020	0.100	10.222	0.175	5.404
ARG-1	None	0	0	2	12	2	15	ARG-1B22	4.573	8.114	0.098	1.427	0.094	0.003	13.940	2.807	3.186
SME Simulant	Coliwasa - low	LF	65	1	23	2	16	CL04	10.959	4.379	0.007	0.567	0.017	0.099	10.265	0.176	5.081
SME Simulant	Coliwasa - low	LF	40	1	19	2	17	CL03	10.732	4.572	0.006	0.543	0.017	0.094	9.951	0.175	4.995
SME Simulant	Coliwasa - high	LF	38	1	16	2	18	CH03	10.732	4.540	0.006	0.588	0.018	0.096	10.051	0.174	5.447
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	11.318	4.347	0.005	0.579	0.021	0.095	10.651	0.148	5.016

Table B4. Phase 2 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al ₂ O ₃ (wt%)	B ₂ O ₃ (wt%)	BaO (wt%)	CaO (wt%)	Cr ₂ O ₃ (wt%)	CuO (wt%)	Fe ₂ O ₃ (wt%)	K ₂ O (wt%)	Li ₂ O (wt%)
SME Simulant	Coliwasa - high	LF	21	1	14	2	20	CH02	10.449	4.669	0.005	0.491	0.022	0.085	9.908	0.165	5.059
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	11.413	4.411	0.006	0.604	0.024	0.096	10.809	0.175	5.059
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	11.375	4.154	0.006	0.585	0.023	0.096	10.894	0.170	5.016
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	11.035	4.540	0.006	0.558	0.022	0.094	10.437	0.173	4.995
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	11.469	4.540	0.006	0.596	0.029	0.098	11.252	0.170	5.016
SME Simulant	Coliwasa - high	HF	34	1	18	2	25	CH07	10.260	4.379	0.006	0.536	0.018	0.091	9.608	0.178	4.930
SME Simulant	Coliwasa - high	LF	63	1	13	2	26	CH04	10.884	4.540	0.006	0.558	0.015	0.090	10.151	0.172	5.145
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	11.224	4.186	0.005	0.596	0.019	0.094	10.723	0.161	5.059
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	11.394	4.315	0.005	0.611	0.020	0.104	10.637	0.347	5.275
ARG-1	None	0	0	2	23	2	29	ARG-1B23	4.610	8.146	0.097	1.441	0.094	0.003	13.954	2.939	3.251
ARG-1	None	0	0	3	1	3	1	ARG-1B31	4.403	7.985	0.085	1.382	0.094	0.007	13.296	2.614	3.057
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	10.884	4.765	0.012	0.576	0.019	0.090	10.122	0.169	5.275
SME Simulant	Coliwasa - low	HF	36	1	21	3	3	CL07	10.940	4.701	0.004	0.590	0.020	0.096	10.265	0.164	5.016
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	10.997	4.765	0.011	0.597	0.017	0.092	10.394	0.167	5.318
SME Simulant	Coliwasa - high	HF	1	1	22	3	5	CH05	10.770	4.862	0.004	0.617	0.022	0.091	10.051	0.179	5.425
SME Simulant	Coliwasa - low	HF	3	1	20	3	6	CL05	11.129	5.023	0.004	0.603	0.021	0.091	10.423	0.162	5.382
SME Simulant	Coliwasa - high	HF	23	1	28	3	7	CH06	11.261	4.637	0.004	0.602	0.023	0.093	10.666	0.157	5.038
SME Simulant	Coliwasa - high	LF	1	1	12	3	8	CH01	10.543	4.733	0.004	0.569	0.019	0.090	9.779	0.170	5.167
SME Simulant	Coliwasa - low	LF	20	1	2	3	9	CL02	11.243	4.765	0.004	0.611	0.023	0.096	10.580	0.166	5.124
SME Simulant	Coliwasa - low	HF	63	1	5	3	10	CL08	10.676	4.798	0.003	0.565	0.021	0.095	10.008	0.167	4.930
SME Simulant	Coliwasa - high	HF	65	1	6	3	11	CH08	10.449	4.411	0.003	0.576	0.019	0.095	9.693	0.163	4.801
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	11.054	4.733	0.012	0.597	0.025	0.101	10.294	0.169	5.296
SME Simulant	Coliwasa - low	LF	4	1	10	3	13	CL01	11.110	4.894	0.003	0.596	0.019	0.098	10.394	0.164	5.296
SME Simulant	Coliwasa - low	HF	18	1	26	3	14	CL06	10.770	4.798	0.003	0.592	0.020	0.099	10.022	0.175	5.188
ARG-1	None	0	0	3	12	3	15	ARG-1B32	4.610	8.243	0.098	1.483	0.096	0.009	13.997	2.903	3.208
SME Simulant	Coliwasa - low	LF	65	1	23	3	16	CL04	10.959	4.830	0.004	0.602	0.018	0.100	10.265	0.176	5.188
SME Simulant	Coliwasa - low	LF	40	1	19	3	17	CL03	10.808	4.798	0.004	0.579	0.021	0.101	10.051	0.175	4.995
SME Simulant	Coliwasa - high	LF	38	1	16	3	18	CH03	10.751	4.733	0.004	0.600	0.020	0.097	10.022	0.174	5.339
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	11.091	4.315	0.012	0.592	0.022	0.092	10.280	0.164	5.102
SME Simulant	Coliwasa - high	LF	21	1	14	3	20	CH02	10.506	4.798	0.004	0.525	0.022	0.086	9.951	0.165	5.275
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	11.129	4.604	0.010	0.613	0.021	0.091	10.365	0.165	5.124
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	11.110	4.443	0.011	0.597	0.017	0.094	10.423	0.169	5.124
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	11.110	4.508	0.013	0.600	0.025	0.092	10.280	0.166	5.124
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	10.373	4.218	0.011	0.590	0.023	0.094	9.593	0.169	4.930
SME Simulant	Coliwasa - high	HF	34	1	18	3	25	CH07	10.865	4.669	0.004	0.593	0.018	0.096	10.079	0.178	5.361
SME Simulant	Coliwasa - high	LF	63	1	13	3	26	CH04	11.035	4.637	0.004	0.575	0.018	0.091	10.280	0.172	4.995
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	11.299	4.765	0.013	0.617	0.017	0.090	10.451	0.171	5.253
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	11.148	4.411	0.012	0.611	0.021	0.094	10.565	0.168	5.404
ARG-1	None	0	0	3	23	3	29	ARG-1B33	4.743	8.275	0.098	1.483	0.099	0.003	14.226	2.915	3.294
ARG-1	None	0	0	4	1	4	1	ARG-1B41	4.421	7.696	0.087	1.391	0.094	0.002	13.382	2.518	3.014
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	10.657	4.508	0.014	0.582	0.031	0.087	10.022	0.167	5.102
SME Simulant	Coliwasa - low	HF	36	1	21	4	3	CL07	10.959	4.572	0.006	0.596	0.020	0.095	10.308	0.164	4.973
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	10.827	4.315	0.016	0.564	0.029	0.084	10.179	0.174	5.145
SME Simulant	Coliwasa - high	HF	1	1	22	4	5	CH05	10.827	4.637	0.006	0.599	0.021	0.090	10.065	0.179	5.210
SME Simulant	Coliwasa - low	HF	3	1	20	4	6	CL05	11.110	4.701	0.005	0.599	0.020	0.086	10.423	0.162	5.145
SME Simulant	Coliwasa - high	HF	23	1	28	4	7	CH06	11.205	4.476	0.006	0.609	0.022	0.093	10.666	0.157	5.102
SME Simulant	Coliwasa - high	LF	1	1	12	4	8	CH01	10.468	4.443	0.005	0.575	0.019	0.089	9.722	0.170	5.188
SME Simulant	Coliwasa - low	LF	20	1	2	4	9	CL02	11.205	4.476	0.005	0.620	0.017	0.098	10.580	0.166	5.145

Table B4. Phase 2 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
SME Simulant	Coliwasa - low	HF	63	1	5	4	10	CL08	10.600	4.379	0.005	0.564	0.020	0.089	9.979	0.167	4.844
SME Simulant	Coliwasa - high	HF	65	1	6	4	11	CH08	10.865	4.315	0.005	0.614	0.022	0.096	10.151	0.163	5.059
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	12	HIB07	10.260	4.121	0.013	0.553	0.025	0.084	9.936	0.170	4.801
SME Simulant	Coliwasa - low	LF	4	1	10	4	13	CL01	11.110	4.604	0.005	0.593	0.019	0.094	10.494	0.164	5.102
SME Simulant	Coliwasa - low	HF	18	1	26	4	14	CL06	10.902	4.476	0.005	0.596	0.020	0.094	10.165	0.175	5.102
ARG-1	None	0	0	4	7	4	15	ARG-1B42	4.535	7.631	0.097	1.455	0.096	0.003	13.839	2.674	3.100
SME Simulant	Coliwasa - low	LF	65	1	23	4	16	CL04	10.902	4.347	0.006	0.599	0.019	0.095	10.237	0.176	5.102
SME Simulant	Coliwasa - low	LF	40	1	19	4	17	CL03	10.695	4.508	0.006	0.574	0.020	0.098	9.979	0.175	4.952
SME Simulant	Coliwasa - high	LF	38	1	16	4	18	CH03	10.713	4.508	0.006	0.583	0.018	0.092	10.036	0.174	4.995
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	19	HIB09	10.751	4.218	0.013	0.593	0.024	0.095	10.165	0.154	5.059
SME Simulant	Coliwasa - high	LF	21	1	14	4	20	CH02	10.430	4.540	0.005	0.541	0.020	0.082	9.965	0.165	5.167
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	21	HIB01	10.770	4.250	0.013	0.581	0.029	0.085	10.094	0.158	5.145
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	22	HIB03	10.751	4.121	0.012	0.588	0.026	0.087	10.094	0.149	5.210
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	23	HIB08	10.865	4.057	0.014	0.603	0.026	0.091	10.351	0.161	5.232
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	24	HIB06	10.921	4.347	0.014	0.603	0.029	0.086	10.451	0.174	5.232
SME Simulant	Coliwasa - high	HF	34	1	18	4	25	CH07	10.147	4.089	0.006	0.557	0.019	0.083	9.536	0.178	4.887
SME Simulant	Coliwasa - high	LF	63	1	13	4	26	CH04	10.940	4.282	0.007	0.576	0.019	0.091	10.308	0.172	4.909
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	27	HIB05	10.676	4.250	0.014	0.565	0.024	0.084	10.022	0.166	5.038
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	28	HIB10	10.732	4.089	0.012	0.567	0.023	0.084	10.065	0.156	4.930
ARG-1	None	0	0	4	13	4	29	ARG-1B43	4.648	7.792	0.091	1.455	0.103	0.003	14.140	2.734	3.165
ARG-1	None	0	0	2	1	5	1	ARG-1B21	4.573	8.082	0.097	1.427	0.096	0.008	13.911	2.674	3.143
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	10.884	4.540	0.004	0.565	0.021	0.089	10.237	0.156	5.102
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	11.091	4.830	0.004	0.569	0.019	0.088	10.380	0.172	5.296
SME Simulant	Coliwasa - low	LF	20	1	2	5	4	CL02	10.902	4.315	0.005	0.582	0.017	0.091	10.208	0.166	4.909
SME Simulant	Coliwasa - high	LF	38	1	16	5	5	CH03	10.619	4.411	0.005	0.569	0.017	0.094	9.836	0.174	5.038
SME Simulant	Coliwasa - high	LF	63	1	13	5	6	CH04	11.110	4.443	0.005	0.565	0.019	0.098	10.394	0.172	4.844
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	10.997	4.669	0.005	0.564	0.024	0.094	10.194	0.169	5.102
SME Simulant	Coliwasa - high	HF	23	1	28	5	8	CH06	11.356	4.572	0.005	0.597	0.022	0.091	10.737	0.157	5.038
SME Simulant	Coliwasa - high	LF	21	1	14	5	9	CH02	10.562	4.669	0.005	0.521	0.021	0.084	9.965	0.165	5.188
SME Simulant	Coliwasa - low	HF	3	1	20	5	10	CL05	10.959	4.733	0.004	0.575	0.019	0.091	10.265	0.162	5.059
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	10.902	4.508	0.005	0.578	0.022	0.092	10.380	0.167	5.232
SME Simulant	Coliwasa - low	LF	40	1	19	5	12	CL03	10.978	4.701	0.005	0.569	0.018	0.104	10.151	0.175	4.973
SME Simulant	Coliwasa - low	HF	18	1	26	5	13	CL06	10.940	4.701	0.005	0.592	0.019	0.095	10.151	0.175	5.188
SME Simulant	Coliwasa - high	HF	1	1	22	5	14	CH05	10.808	4.637	0.005	0.590	0.021	0.097	10.036	0.179	5.188
ARG-1	None	0	0	2	12	5	15	ARG-1B22	4.667	8.114	0.099	1.413	0.096	0.003	14.068	2.722	3.165
SME Simulant	Coliwasa - low	HF	36	1	21	5	16	CL07	10.978	4.508	0.005	0.586	0.019	0.099	10.251	0.164	4.995
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	10.978	4.540	0.005	0.603	0.019	0.096	10.237	0.172	5.296
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	10.770	4.476	0.005	0.558	0.020	0.084	10.108	0.172	5.167
SME Simulant	Coliwasa - low	HF	63	1	5	5	19	CL08	10.827	4.476	0.005	0.572	0.022	0.096	10.122	0.167	5.038
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	10.997	4.508	0.005	0.581	0.022	0.092	10.265	0.169	5.059
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	10.884	4.443	0.005	0.581	0.026	0.090	10.237	0.167	5.145
SME Simulant	Coliwasa - high	HF	65	1	6	5	22	CH08	11.280	4.604	0.004	0.617	0.020	0.102	10.394	0.163	5.145
SME Simulant	Coliwasa - high	HF	34	1	18	5	23	CH07	11.091	4.572	0.005	0.588	0.018	0.094	10.308	0.178	5.210
SME Simulant	Coliwasa - high	LF	1	1	12	5	24	CH01	10.052	4.282	0.004	0.534	0.018	0.085	9.279	0.170	4.909
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	10.978	4.476	0.005	0.572	0.023	0.091	10.208	0.177	5.102
SME Simulant	Coliwasa - low	LF	4	1	10	5	26	CL01	11.224	4.669	0.005	0.579	0.019	0.103	10.480	0.164	5.038
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	10.940	4.315	0.005	0.564	0.023	0.088	10.265	0.152	5.016
SME Simulant	Coliwasa - low	LF	65	1	23	5	28	CL04	10.997	4.476	0.005	0.592	0.017	0.098	10.265	0.176	5.124

Table B4. Phase 2 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	4.440	7.438	0.093	1.349	0.091	0.003	13.353	2.554	3.014
ARG-1	None	0	0	3	1	6	1	ARG-1B31	4.629	8.018	0.092	1.441	0.097	0.003	13.997	2.759	3.143
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	11.450	4.604	0.005	0.606	0.018	0.098	10.651	0.163	5.210
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	11.356	4.604	0.011	0.620	0.019	0.101	10.537	0.156	5.188
SME Simulant	Coliwasa - low	LF	20	1	2	6	4	CL02	11.375	4.604	0.004	0.617	0.018	0.100	10.723	0.166	5.167
SME Simulant	Coliwasa - high	LF	38	1	16	6	5	CH03	10.695	4.540	0.005	0.588	0.019	0.098	10.051	0.174	5.124
SME Simulant	Coliwasa - high	LF	63	1	13	6	6	CH04	11.110	4.476	0.005	0.588	0.018	0.099	10.437	0.172	5.038
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	11.072	4.121	0.012	0.596	0.023	0.093	10.423	0.171	5.016
SME Simulant	Coliwasa - high	HF	23	1	28	6	8	CH06	10.581	4.250	0.004	0.565	0.019	0.095	10.079	0.157	4.693
SME Simulant	Coliwasa - high	LF	21	1	14	6	9	CH02	10.562	4.669	0.004	0.525	0.021	0.091	10.079	0.165	5.253
SME Simulant	Coliwasa - low	HF	3	1	20	6	10	CL05	10.940	4.701	0.005	0.582	0.019	0.092	10.294	0.162	5.016
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	11.280	4.540	0.005	0.595	0.015	0.093	10.508	0.170	5.038
SME Simulant	Coliwasa - low	LF	40	1	19	6	12	CL03	10.940	4.669	0.005	0.576	0.020	0.105	10.179	0.175	5.016
SME Simulant	Coliwasa - low	HF	18	1	26	6	13	CL06	10.997	4.540	0.005	0.599	0.019	0.097	10.294	0.175	5.102
SME Simulant	Coliwasa - high	HF	1	1	22	6	14	CH05	10.846	4.637	0.005	0.593	0.020	0.096	10.151	0.179	5.102
ARG-1	None	0	0	3	12	6	15	ARG-1B32	4.667	7.857	0.097	1.441	0.098	0.003	14.083	2.783	3.165
SME Simulant	Coliwasa - low	HF	36	1	21	6	16	CL07	10.959	4.411	0.004	0.592	0.019	0.090	10.365	0.164	4.952
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	11.261	4.508	0.005	0.557	0.018	0.091	10.952	0.168	4.909
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	10.978	4.250	0.012	0.610	0.017	0.097	10.351	0.160	5.253
SME Simulant	Coliwasa - low	HF	63	1	5	6	19	CL08	10.789	4.476	0.004	0.590	0.021	0.093	10.194	0.167	5.124
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	10.770	4.379	0.013	0.583	0.019	0.099	10.137	0.175	5.059
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	10.846	4.218	0.013	0.604	0.024	0.094	10.137	0.175	5.081
SME Simulant	Coliwasa - high	HF	65	1	6	6	22	CH08	11.167	4.443	0.005	0.625	0.023	0.098	10.508	0.163	5.167
SME Simulant	Coliwasa - high	HF	34	1	18	6	23	CH07	11.072	4.540	0.005	0.599	0.020	0.097	10.423	0.178	5.232
SME Simulant	Coliwasa - high	LF	1	1	12	6	24	CH01	10.071	4.154	0.004	0.539	0.017	0.080	9.365	0.170	4.822
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	10.902	4.347	0.013	0.588	0.019	0.095	10.079	0.171	5.038
SME Simulant	Coliwasa - low	LF	4	1	10	6	26	CL01	11.186	4.669	0.005	0.588	0.021	0.099	10.623	0.164	5.145
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	11.072	4.218	0.013	0.582	0.018	0.092	10.294	0.173	4.973
SME Simulant	Coliwasa - low	LF	65	1	23	6	28	CL04	10.978	4.411	0.006	0.590	0.018	0.096	10.280	0.176	5.059
ARG-1	None	0	0	3	23	6	29	ARG-1B33	4.421	7.309	0.090	1.381	0.092	0.003	13.253	2.590	3.014

Table B4. Phase 2 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum of Oxides (wt%)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	0.856	1.846	11.822	1.029	49.418	1.158	0.026	0.130	100.977
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	0.335	3.021	13.750	1.285	51.557	0.018	0.006	0.112	103.371
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	0.317	2.866	13.440	1.205	51.771	0.016	0.006	0.113	102.418
SME Simulant	Coliwasa - low	LF	20	1	2	1	4	CL02	0.340	3.125	14.424	1.412	51.343	0.017	0.006	0.111	104.799
SME Simulant	Coliwasa - high	LF	38	1	16	1	5	CH03	0.287	2.621	12.617	1.153	46.851	0.021	0.006	0.093	92.695
SME Simulant	Coliwasa - high	LF	63	1	13	1	6	CH04	0.303	2.737	13.884	1.177	51.343	0.018	0.006	0.108	101.668
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	0.328	2.983	13.884	1.271	51.343	0.016	0.005	0.110	102.809
SME Simulant	Coliwasa - high	HF	23	1	28	1	8	CH06	0.322	2.983	13.750	1.362	49.632	0.014	0.006	0.107	100.724
SME Simulant	Coliwasa - high	LF	21	1	14	1	9	CH02	0.279	2.531	12.617	1.145	51.343	0.016	0.006	0.105	99.464
SME Simulant	Coliwasa - low	HF	3	1	20	1	10	CL05	0.307	2.763	13.884	1.143	51.343	0.016	0.006	0.107	101.619
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	0.313	2.879	13.615	1.239	49.632	0.014	0.006	0.104	100.009
SME Simulant	Coliwasa - low	LF	40	1	19	1	12	CL03	0.312	2.750	14.558	1.149	53.269	0.014	0.006	0.105	105.062
SME Simulant	Coliwasa - low	HF	18	1	26	1	13	CL06	0.290	2.595	12.429	1.074	46.423	0.015	0.006	0.098	92.281
SME Simulant	Coliwasa - high	HF	1	1	22	1	14	CH05	0.315	2.854	14.154	1.205	51.343	0.017	0.006	0.106	102.324
ARG-1	None	0	0	1	15	1	15	ARG-1B12	0.872	1.885	12.038	1.037	50.487	1.174	0.026	0.131	102.729
SME Simulant	Coliwasa - low	HF	36	1	21	1	16	CL07	0.315	2.866	13.372	1.211	50.274	0.015	0.006	0.105	99.924
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	0.325	2.957	13.750	1.248	51.129	0.016	0.006	0.106	102.299
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	0.307	2.789	13.413	1.154	51.343	0.015	0.005	0.108	101.194
SME Simulant	Coliwasa - low	HF	63	1	5	1	19	CL08	0.307	2.776	14.019	1.185	50.915	0.016	0.006	0.100	101.075
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	0.325	2.918	14.019	1.225	51.129	0.015	0.006	0.105	102.686
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	0.327	2.983	14.019	1.285	51.985	0.016	0.006	0.109	104.075
SME Simulant	Coliwasa - high	HF	65	1	6	1	22	CH08	0.325	2.996	14.289	1.285	50.274	0.015	0.006	0.105	101.498
SME Simulant	Coliwasa - high	HF	34	1	18	1	23	CH07	0.328	2.970	14.558	1.269	54.552	0.018	0.006	0.109	107.533
SME Simulant	Coliwasa - high	LF	1	1	12	1	24	CH01	0.302	2.673	13.884	1.098	51.985	0.014	0.006	0.104	101.471
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	0.322	2.957	13.750	1.271	51.129	0.014	0.005	0.109	102.171
SME Simulant	Coliwasa - low	LF	4	1	10	1	26	CL01	0.307	2.763	13.305	1.195	50.487	0.016	0.006	0.105	100.384
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	0.328	3.008	14.019	1.285	51.129	0.013	0.006	0.109	102.792
SME Simulant	Coliwasa - low	LF	65	1	23	1	28	CL04	0.322	2.918	13.615	1.285	50.274	0.014	0.006	0.100	100.376
ARG-1	None	0	0	1	29	1	29	ARG-1B13	0.784	1.691	10.878	0.944	45.139	1.058	0.023	0.117	92.003
ARG-1	None	0	0	2	1	2	1	ARG-1B21	0.799	1.743	10.744	0.965	44.925	1.096	0.025	0.130	92.856
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	0.320	2.944	13.008	1.217	48.776	0.018	0.006	0.122	98.855
SME Simulant	Coliwasa - low	HF	36	1	21	2	3	CL07	0.313	2.879	13.386	1.222	49.418	0.017	0.006	0.117	99.075
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	0.312	2.892	13.264	1.273	48.776	0.018	0.006	0.116	98.782
SME Simulant	Coliwasa - high	HF	1	1	22	2	5	CH05	0.312	2.841	13.480	1.168	49.846	0.016	0.006	0.118	99.433
SME Simulant	Coliwasa - low	HF	3	1	20	2	6	CL05	0.308	2.802	13.884	1.169	50.915	0.017	0.006	0.119	101.468
SME Simulant	Coliwasa - high	HF	23	1	28	2	7	CH06	0.320	3.021	13.076	1.362	48.990	0.018	0.006	0.115	99.198
SME Simulant	Coliwasa - high	LF	1	1	12	2	8	CH01	0.300	2.686	13.305	1.056	51.343	0.018	0.006	0.114	99.983
SME Simulant	Coliwasa - low	LF	20	1	2	2	9	CL02	0.328	3.047	13.318	1.362	48.776	0.019	0.006	0.119	99.516
SME Simulant	Coliwasa - low	HF	63	1	5	2	10	CL08	0.302	2.763	13.480	1.196	49.846	0.018	0.006	0.113	99.029
SME Simulant	Coliwasa - high	HF	65	1	6	2	11	CH08	0.320	2.970	13.345	1.271	49.204	0.017	0.006	0.116	98.817
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	0.285	2.557	12.361	1.032	44.711	0.017	0.006	0.108	90.501
SME Simulant	Coliwasa - low	LF	4	1	10	2	13	CL01	0.308	2.828	13.480	1.206	50.487	0.018	0.006	0.115	100.912
SME Simulant	Coliwasa - low	HF	18	1	26	2	14	CL06	0.317	2.866	13.615	1.164	50.274	0.016	0.006	0.114	100.525
ARG-1	None	0	0	2	12	2	15	ARG-1B22	0.841	1.834	11.458	1.021	47.492	1.156	0.027	0.136	98.206
SME Simulant	Coliwasa - low	LF	65	1	23	2	16	CL04	0.320	2.944	13.022	1.273	48.990	0.016	0.006	0.113	98.233
SME Simulant	Coliwasa - low	LF	40	1	19	2	17	CL03	0.297	2.647	13.413	1.084	49.846	0.019	0.006	0.113	98.509
SME Simulant	Coliwasa - high	LF	38	1	16	2	18	CH03	0.310	2.879	14.019	1.243	50.060	0.022	0.006	0.111	100.303

Table B4. Phase 2 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum of Oxides (wt%)
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	0.317	2.944	13.224	1.245	48.348	0.018	0.005	0.118	98.399
SME Simulant	Coliwasa - high	LF	21	1	14	2	20	CH02	0.272	2.518	12.159	1.126	49.632	0.019	0.006	0.116	96.700
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	0.328	3.060	13.305	1.323	47.920	0.020	0.006	0.123	98.683
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	0.323	3.060	13.372	1.400	47.920	0.019	0.006	0.121	98.541
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	0.295	2.634	14.154	1.122	50.060	0.020	0.006	0.119	100.270
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	0.327	3.125	13.453	1.476	48.990	0.020	0.006	0.121	100.693
SME Simulant	Coliwasa - high	HF	34	1	18	2	25	CH07	0.292	2.673	12.739	1.122	48.134	0.022	0.006	0.112	95.105
SME Simulant	Coliwasa - high	LF	63	1	13	2	26	CH04	0.297	2.699	14.019	1.162	49.418	0.022	0.006	0.118	99.301
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	0.323	3.073	13.480	1.323	48.134	0.022	0.006	0.120	98.550
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	0.332	3.047	13.426	1.273	48.562	0.021	0.006	0.123	99.496
ARG-1	None	0	0	2	23	2	29	ARG-1B23	0.842	1.846	11.647	1.014	47.706	1.173	0.025	0.143	98.933
ARG-1	None	0	0	3	1	3	1	ARG-1B31	0.808	1.769	10.851	0.965	45.353	1.101	0.022	0.124	93.916
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	0.300	2.712	13.480	1.073	47.920	0.018	0.006	0.110	97.530
SME Simulant	Coliwasa - low	HF	36	1	21	3	3	CL07	0.315	2.905	13.170	1.204	49.418	0.019	0.006	0.111	98.944
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	0.312	2.866	13.750	1.243	49.846	0.018	0.006	0.113	100.512
SME Simulant	Coliwasa - high	HF	1	1	22	3	5	CH05	0.315	2.866	13.750	1.157	50.060	0.017	0.006	0.116	100.307
SME Simulant	Coliwasa - low	HF	3	1	20	3	6	CL05	0.312	2.828	14.289	1.172	51.557	0.018	0.006	0.115	103.134
SME Simulant	Coliwasa - high	HF	23	1	28	3	7	CH06	0.322	3.034	13.035	1.362	49.418	0.018	0.006	0.117	99.791
SME Simulant	Coliwasa - high	LF	1	1	12	3	8	CH01	0.302	2.712	12.941	1.055	51.557	0.018	0.006	0.111	99.778
SME Simulant	Coliwasa - low	LF	20	1	2	3	9	CL02	0.328	3.047	13.143	1.336	48.776	0.019	0.006	0.113	99.380
SME Simulant	Coliwasa - low	HF	63	1	5	3	10	CL08	0.302	2.763	13.089	1.181	49.418	0.019	0.006	0.110	98.150
SME Simulant	Coliwasa - high	HF	65	1	6	3	11	CH08	0.307	2.854	12.604	1.196	47.065	0.017	0.006	0.111	94.370
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	0.315	2.854	13.615	1.178	50.274	0.021	0.006	0.117	100.660
SME Simulant	Coliwasa - low	LF	4	1	10	3	13	CL01	0.307	2.815	13.615	1.187	50.274	0.019	0.006	0.117	100.914
SME Simulant	Coliwasa - low	HF	18	1	26	3	14	CL06	0.313	2.841	13.170	1.133	49.632	0.019	0.006	0.114	98.895
ARG-1	None	0	0	3	12	3	15	ARG-1B32	0.852	1.859	11.606	1.003	48.348	1.164	0.025	0.139	99.644
SME Simulant	Coliwasa - low	LF	65	1	23	3	16	CL04	0.322	2.970	13.359	1.273	49.418	0.018	0.006	0.108	99.615
SME Simulant	Coliwasa - low	LF	40	1	19	3	17	CL03	0.300	2.686	13.426	1.077	50.701	0.020	0.006	0.111	99.858
SME Simulant	Coliwasa - high	LF	38	1	16	3	18	CH03	0.313	2.905	13.615	1.233	50.274	0.024	0.035	0.111	100.251
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	0.310	2.763	13.615	1.093	50.274	0.020	0.006	0.118	99.868
SME Simulant	Coliwasa - high	LF	21	1	14	3	20	CH02	0.275	2.531	12.658	1.115	50.060	0.019	0.006	0.111	98.103
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	0.327	2.957	13.210	1.233	48.562	0.019	0.006	0.116	98.553
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	0.320	2.931	13.332	1.213	48.562	0.019	0.006	0.111	98.482
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	0.320	2.931	13.130	1.157	50.060	0.018	0.006	0.115	99.653
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	0.312	2.854	12.766	1.134	47.065	0.016	0.006	0.105	94.259
SME Simulant	Coliwasa - high	HF	34	1	18	3	25	CH07	0.308	2.815	13.884	1.166	50.701	0.021	0.006	0.111	100.876
SME Simulant	Coliwasa - high	LF	63	1	13	3	26	CH04	0.302	2.750	13.480	1.159	50.274	0.020	0.006	0.113	99.910
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	0.323	2.944	14.019	1.215	49.418	0.017	0.006	0.116	100.735
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	0.320	2.983	14.019	1.336	49.204	0.016	0.006	0.113	100.432
ARG-1	None	0	0	3	23	3	29	ARG-1B33	0.867	1.898	11.795	1.026	48.990	1.181	0.026	0.133	101.051
ARG-1	None	0	0	4	1	4	1	ARG-1B41	0.798	1.730	10.851	0.981	45.995	1.108	0.024	0.126	94.217
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	0.305	2.789	13.008	1.223	49.632	0.017	0.006	0.107	98.256
SME Simulant	Coliwasa - low	HF	36	1	21	4	3	CL07	0.312	2.841	13.345	1.236	49.632	0.017	0.006	0.110	99.191
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	0.294	2.673	13.035	1.169	50.915	0.017	0.006	0.107	99.550
SME Simulant	Coliwasa - high	HF	1	1	22	4	5	CH05	0.308	2.802	13.399	1.173	50.487	0.016	0.006	0.110	99.936
SME Simulant	Coliwasa - low	HF	3	1	20	4	6	CL05	0.307	2.763	13.884	1.185	51.557	0.017	0.006	0.114	102.084
SME Simulant	Coliwasa - high	HF	23	1	28	4	7	CH06	0.315	2.957	13.156	1.362	49.204	0.020	0.006	0.113	99.466

Table B4. Phase 2 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum of Oxides (wt%)
SME Simulant	Coliwasa - high	LF	1	1	12	4	8	CH01	0.295	2.634	13.224	1.050	51.129	0.020	0.006	0.112	99.151
SME Simulant	Coliwasa - low	LF	20	1	2	4	9	CL02	0.322	2.983	13.426	1.349	48.990	0.020	0.006	0.115	99.521
SME Simulant	Coliwasa - low	HF	63	1	5	4	10	CL08	0.295	2.699	13.049	1.161	49.418	0.019	0.006	0.108	97.402
SME Simulant	Coliwasa - high	HF	65	1	6	4	11	CH08	0.315	2.905	13.237	1.261	49.204	0.019	0.006	0.113	98.351
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	12	HIB07	0.294	2.699	12.226	1.194	47.492	0.019	0.006	0.106	93.999
SME Simulant	Coliwasa - low	LF	4	1	10	4	13	CL01	0.303	2.763	13.399	1.200	50.487	0.021	0.006	0.113	100.479
SME Simulant	Coliwasa - low	HF	18	1	26	4	14	CL06	0.312	2.802	13.143	1.152	50.274	0.017	0.006	0.111	99.352
ARG-1	None	0	0	4	7	4	15	ARG-1B42	0.826	1.795	11.337	1.008	47.492	1.149	0.027	0.130	97.194
SME Simulant	Coliwasa - low	LF	65	1	23	4	16	CL04	0.315	2.892	13.480	1.256	49.204	0.021	0.006	0.107	98.765
SME Simulant	Coliwasa - low	LF	40	1	19	4	17	CL03	0.295	2.608	13.480	1.094	50.487	0.019	0.006	0.107	99.105
SME Simulant	Coliwasa - high	LF	38	1	16	4	18	CH03	0.308	2.841	12.954	1.234	50.487	0.026	0.006	0.110	99.093
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	19	HIB09	0.303	2.763	12.941	1.180	50.487	0.021	0.005	0.112	98.886
SME Simulant	Coliwasa - high	LF	21	1	14	4	20	CH02	0.270	2.479	12.685	1.113	50.060	0.020	0.006	0.111	97.660
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	21	HIB01	0.297	2.634	13.224	1.089	50.274	0.021	0.006	0.114	98.784
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	22	HIB03	0.300	2.724	13.399	1.177	50.274	0.019	0.005	0.115	99.052
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	23	HIB08	0.310	2.828	13.615	1.203	50.701	0.019	0.006	0.114	100.193
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	24	HIB06	0.300	2.712	13.480	1.185	51.129	0.020	0.006	0.114	100.802
SME Simulant	Coliwasa - high	HF	34	1	18	4	25	CH07	0.285	2.608	12.819	1.101	47.706	0.021	0.006	0.105	94.155
SME Simulant	Coliwasa - high	LF	63	1	13	4	26	CH04	0.297	2.686	13.615	1.153	50.274	0.019	0.006	0.111	99.465
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	27	HIB05	0.289	2.621	13.278	1.149	50.701	0.019	0.006	0.108	99.011
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	28	HIB10	0.295	2.660	12.981	1.136	50.487	0.017	0.006	0.109	98.349
ARG-1	None	0	0	4	13	4	29	ARG-1B43	0.842	1.834	11.593	1.017	48.776	1.166	0.022	0.139	99.520
ARG-1	None	0	0	2	1	5	1	ARG-1B21	0.837	1.821	11.377	1.014	47.706	1.153	0.026	0.133	98.078
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	0.305	2.776	12.900	1.192	51.343	0.016	0.005	0.112	100.249
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	0.307	2.789	13.291	1.217	52.199	0.016	0.006	0.111	102.385
SME Simulant	Coliwasa - low	LF	20	1	2	5	4	CL02	0.312	2.879	12.536	1.273	47.065	0.016	0.006	0.108	95.389
SME Simulant	Coliwasa - high	LF	38	1	16	5	5	CH03	0.305	2.789	12.941	1.210	49.204	0.022	0.006	0.106	97.347
SME Simulant	Coliwasa - high	LF	63	1	13	5	6	CH04	0.302	2.724	13.305	1.164	50.487	0.018	0.006	0.115	99.772
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	0.307	2.815	13.089	1.205	48.562	0.017	0.006	0.106	97.924
SME Simulant	Coliwasa - high	HF	23	1	28	5	8	CH06	0.320	2.996	13.183	1.362	49.418	0.017	0.006	0.115	99.991
SME Simulant	Coliwasa - high	LF	21	1	14	5	9	CH02	0.274	2.492	12.712	1.117	50.060	0.016	0.006	0.111	97.967
SME Simulant	Coliwasa - low	HF	3	1	20	5	10	CL05	0.305	2.737	13.750	1.154	50.487	0.017	0.006	0.110	100.435
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	0.305	2.789	13.372	1.203	50.915	0.016	0.006	0.110	100.602
SME Simulant	Coliwasa - low	LF	40	1	19	5	12	CL03	0.303	2.660	13.480	1.112	51.129	0.017	0.006	0.110	100.494
SME Simulant	Coliwasa - low	HF	18	1	26	5	13	CL06	0.313	2.828	13.372	1.157	50.274	0.015	0.006	0.112	99.943
SME Simulant	Coliwasa - high	HF	1	1	22	5	14	CH05	0.310	2.815	13.359	1.159	50.274	0.016	0.006	0.112	99.613
ARG-1	None	0	0	2	12	5	15	ARG-1B22	0.844	1.821	11.458	1.023	48.348	1.156	0.025	0.136	99.158
SME Simulant	Coliwasa - low	HF	36	1	21	5	16	CL07	0.312	2.841	13.332	1.220	49.204	0.015	0.006	0.108	98.643
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	0.317	2.892	13.480	1.245	51.129	0.016	0.006	0.110	101.140
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	0.295	2.686	13.035	1.158	51.771	0.017	0.006	0.111	100.438
SME Simulant	Coliwasa - low	HF	63	1	5	5	19	CL08	0.302	2.750	13.453	1.199	50.060	0.014	0.006	0.110	99.218
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	0.310	2.828	13.089	1.205	50.915	0.017	0.006	0.111	100.178
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	0.308	2.828	13.251	1.233	50.060	0.017	0.006	0.109	99.389
SME Simulant	Coliwasa - high	HF	65	1	6	5	22	CH08	0.327	3.008	13.750	1.298	50.487	0.016	0.006	0.114	101.337
SME Simulant	Coliwasa - high	HF	34	1	18	5	23	CH07	0.312	2.828	13.615	1.194	51.771	0.017	0.006	0.111	101.917
SME Simulant	Coliwasa - high	LF	1	1	12	5	24	CH01	0.284	2.518	12.509	1.008	48.776	0.016	0.006	0.103	94.554
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	0.312	2.841	13.062	1.199	50.701	0.016	0.006	0.107	99.876

Table B4. Phase 2 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum of Oxides (wt%)
SME Simulant	Coliwasa - low	LF	4	1	10	5	26	CL01	0.305	2.776	13.210	1.208	50.274	0.015	0.006	0.113	100.186
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	0.307	2.815	12.900	1.228	49.846	0.014	0.005	0.107	98.590
SME Simulant	Coliwasa - low	LF	65	1	23	5	28	CL04	0.318	2.918	13.386	1.273	49.418	0.015	0.006	0.108	99.192
ARG-1	None	0	0	2	23	5	29	ARG-1B23	0.801	1.730	10.932	0.968	45.781	1.093	0.026	0.126	93.793
ARG-1	None	0	0	3	1	6	1	ARG-1B31	0.839	1.821	11.350	1.004	47.492	1.156	0.023	0.133	97.996
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	0.320	2.879	13.332	1.204	50.060	0.018	0.006	0.114	100.737
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	0.327	2.944	13.345	1.192	49.846	0.016	0.006	0.114	100.381
SME Simulant	Coliwasa - low	LF	20	1	2	6	4	CL02	0.328	3.034	13.237	1.349	48.990	0.016	0.006	0.112	99.847
SME Simulant	Coliwasa - high	LF	38	1	16	6	5	CH03	0.312	2.854	12.995	1.227	49.846	0.019	0.006	0.108	98.659
SME Simulant	Coliwasa - high	LF	63	1	13	6	6	CH04	0.303	2.737	13.750	1.162	50.274	0.018	0.006	0.111	100.304
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	0.313	2.841	12.766	1.217	48.562	0.017	0.006	0.109	97.358
SME Simulant	Coliwasa - high	HF	23	1	28	6	8	CH06	0.302	2.815	12.240	1.273	46.209	0.016	0.006	0.105	93.410
SME Simulant	Coliwasa - high	LF	21	1	14	6	9	CH02	0.275	2.505	12.617	1.131	50.060	0.017	0.006	0.111	98.092
SME Simulant	Coliwasa - low	HF	3	1	20	6	10	CL05	0.305	2.737	13.399	1.133	50.274	0.016	0.006	0.111	99.792
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	0.307	2.750	13.615	1.110	49.846	0.014	0.006	0.108	100.000
SME Simulant	Coliwasa - low	LF	40	1	19	6	12	CL03	0.302	2.673	13.386	1.099	50.915	0.017	0.006	0.112	100.196
SME Simulant	Coliwasa - low	HF	18	1	26	6	13	CL06	0.318	2.854	12.954	1.136	50.274	0.015	0.006	0.111	99.495
SME Simulant	Coliwasa - high	HF	1	1	22	6	14	CH05	0.313	2.841	12.914	1.164	50.487	0.015	0.006	0.113	99.481
ARG-1	None	0	0	3	12	6	15	ARG-1B32	0.847	1.821	11.377	1.009	47.920	1.158	0.027	0.131	98.482
SME Simulant	Coliwasa - low	HF	36	1	21	6	16	CL07	0.313	2.854	13.089	1.218	48.990	0.016	0.006	0.109	98.151
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	0.294	2.686	13.615	1.182	50.701	0.016	0.006	0.113	101.080
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	0.317	2.918	13.305	1.266	49.846	0.017	0.006	0.110	99.512
SME Simulant	Coliwasa - low	HF	63	1	5	6	19	CL08	0.303	2.763	13.615	1.189	49.846	0.017	0.006	0.110	99.306
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	0.302	2.712	13.062	1.126	48.134	0.018	0.020	0.107	96.714
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	0.320	2.892	12.968	1.205	49.204	0.016	0.006	0.108	97.910
SME Simulant	Coliwasa - high	HF	65	1	6	6	22	CH08	0.328	3.021	13.615	1.285	50.274	0.016	0.006	0.110	100.855
SME Simulant	Coliwasa - high	HF	34	1	18	6	23	CH07	0.313	2.841	13.480	1.192	51.129	0.018	0.006	0.107	101.253
SME Simulant	Coliwasa - high	LF	1	1	12	6	24	CH01	0.285	2.544	12.065	0.998	48.776	0.013	0.006	0.104	94.012
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	0.308	2.737	13.332	1.116	50.915	0.013	0.006	0.108	99.788
SME Simulant	Coliwasa - low	LF	4	1	10	6	26	CL01	0.308	2.789	13.318	1.213	50.274	0.015	0.006	0.111	100.534
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	0.315	2.879	12.523	1.195	48.562	0.015	0.006	0.108	97.039
SME Simulant	Coliwasa - low	LF	65	1	23	6	28	CL04	0.320	2.918	13.035	1.252	49.204	0.014	0.006	0.103	98.468
ARG-1	None	0	0	3	23	6	29	ARG-1B33	0.798	1.730	10.744	0.954	45.139	1.089	0.025	0.121	92.754

**Table B5. Reference Calcine Oxide Concentrations for High-Rheology SME Simulant
(Phase 2 Testing)**

Oxide	Targeted wt%
Al ₂ O ₃ (wt%)	10.934
B ₂ O ₃ (wt%)	5.281
BaO (wt%)	0
CaO (wt%)	0.543
Cr ₂ O ₃ (wt%)	0.015
CuO (wt%)	0.103
Fe ₂ O ₃ (wt%)	9.931
K ₂ O (wt%)	0.076
Li ₂ O (wt%)	4.988
MgO (wt%)	0.286
MnO (wt%)	2.918
Na ₂ O (wt%)	13.318
NiO (wt%)	1.033
SiO ₂ (wt%)	50.183
TiO ₂ (wt%)	0.013
ZnO (wt%)	0
ZrO ₂ (wt%)	0.111
Sum of Oxides (wt%)	99.73

Shaded rows indicate oxides that are at reportable concentrations and that are considered critical in the comparisons conducted as part of this study.

Table B6. Comparisons for Density and Solids from the High-Rheology (Phase 2) Testing

Density

	Sampler Mean	BL Mean	Difference	Difference	Statistically			Statistically	g/mL	% of BL		
	(g/mL)	(g/mL)	(g/mL)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Different	Bound on	Bound on	n sampler	n BL
								Variations	Bias (95%)	Bias (95%)		
Coliwasa High Location vs Coliwasa Low Location (BL)	1.33651	1.33896	-0.002	-0.2%	no	0.013022	0.007637	no	0.0139	1.0%	8	8
Hydragard (LF) vs Coliwasa	1.34716	1.33774	0.009	0.7%	no	0.018912	0.01039	no	0.02124	1.6%	10	16
Hydragard (LF) vs Coliwasa ---- scrnd	1.34251	1.33774	0.005	0.4%	no	0.012619	0.01039	no	0.01444	1.1%	9	16
Hydragard (HF) vs Coliwasa	1.33714	1.33774	-0.001	0.0%	no	0.012442	0.01039	no	0.00992	0.7%	10	16
Isolok (LF) vs Coliwasa	1.33219	1.33774	-0.006	-0.4%	no	0.012312	0.01039	no	0.01482	1.1%	10	16
Isolok (HF) vs Coliwasa	1.34498	1.33774	0.007	0.5%	no	0.020176	0.01039	yes	0.02225	1.7%	10	16

Dried wt% Solids

	Sampler Mean	BL Mean	Difference	Difference	Statistically			Statistically	(wt%)	% of BL		
	(wt%)	(wt%)	(wt%)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Different	Bound on	Bound on	n sampler	n BL
								Variations	Bias (95%)	Bias (95%)		
Coliwasa High Location vs Coliwasa Low Location (BL)	40.4675	40.7475	-0.280	-0.7%	no	0.670645	0.484436	no	0.90735	2.2%	8	8
Coliwasa High Location vs Coliwasa Low Location (BL) - scrnd	40.4675	40.5857	-0.118	-0.3%	no	0.670645	0.171742	no	0.6837	1.7%	8	7
Hydragard (LF) vs Coliwasa	40.4160	40.6075	-0.192	-0.5%	no	0.464715	0.583364	no	0.64237	1.6%	10	16
Hydragard (LF) vs Coliwasa ---- scrnd	40.5522	40.6293	-0.077	-0.2%	no	0.184917	0.276001	no	0.29503	0.7%	9	14
Hydragard (HF) vs Coliwasa	39.9940	40.6075	-0.614	-1.5%	yes	0.482935	0.583364	no	1.0693	2.6%	10	16
Hydragard (HF) vs Coliwasa ---- scrnd	40.1411	40.6293	-0.488	-1.2%	yes	0.137518	0.276001	yes	0.66927	1.6%	9	14
Isolok (12; LF) vs Coliwasa	40.9420	40.6075	0.334	0.8%	no	0.097616	0.583364	yes	0.650016	1.6%	10	16
Isolok (12; LF) vs Coliwasa ---- scrnd	40.9420	40.6293	0.313	0.8%	yes	0.097616	0.276001	yes	0.481279	1.2%	10	14
Isolok (12; HF) vs Coliwasa	41.4090	40.6075	0.801	2.0%	yes	0.112689	0.583364	no	1.18947	2.9%	10	16
Isolok (12; HF) vs Coliwasa ---- scrnd	41.4090	40.6293	0.780	1.9%	yes	0.112689	0.276001	yes	0.9516	2.3%	10	14
Isolok (3; LF) vs Coliwasa	40.5980	40.6075	-0.010	0.0%	no	0.210175	0.583364	no	0.40786	1.0%	10	16
Isolok (3; LF) vs Coliwasa ---- scrnd	40.5980	40.6293	-0.031	-0.1%	no	0.210175	0.276001	no	0.24695	0.6%	10	14
Isolok (3; HF) vs Coliwasa	41.5660	40.6075	0.959	2.4%	yes	0.190741	0.583364	no	1.35432	3.3%	10	16
Isolok (3; HF) vs Coliwasa ---- scrnd	41.5660	40.6293	0.937	2.3%	yes	0.190741	0.276001	no	1.14686	2.8%	10	14

Vitrified wt% Solids

	Sampler Mean	BL Mean	Difference	Difference	Statistically			Statistically	(wt%)	% of BL		
	(wt%)	(wt%)	(wt%)	(%)	Significant Bias	Sampler Std Dev	BL Std Dev	Different	Bound on	Bound on	n sampler	n BL
								Variations	Bias (95%)	Bias (95%)		
Coliwasa High Location vs Coliwasa Low Location (BL)	32.7538	33.0050	-0.251	-0.8%	no	0.571713	0.385079	no	0.77395	2.3%	8	8
Coliwasa High Location vs Coliwasa Low Location (BL) - scrnd	32.7538	32.8800	-0.126	-0.4%	no	0.571713	0.164823	yes	0.61089	1.9%	8	7
Hydragard (LF) vs Coliwasa	32.7930	32.8794	-0.086	-0.3%	no	0.368422	0.488432	no	0.45845	1.4%	10	16
Hydragard (LF) vs Coliwasa ---- scrnd	32.8989	32.9014	-0.003	0.0%	no	0.162976	0.256601	no	0.20295	0.6%	9	14
Hydragard (HF) vs Coliwasa	32.3860	32.8794	-0.493	-1.5%	yes	0.145922	0.488432	yes	0.76664	2.3%	10	16
Hydragard (HF) vs Coliwasa ---- scrnd	32.3860	32.9014	-0.515	-1.6%	yes	0.145922	0.256601	yes	0.68724	2.1%	10	14
Isolok (12; LF) vs Coliwasa	32.7570	32.8794	-0.122	-0.4%	no	0.089325	0.488432	yes	0.38733	1.2%	10	16
Isolok (12; LF) vs Coliwasa ---- scrnd	32.7570	32.9014	-0.144	-0.4%	no	0.089325	0.256601	yes	0.30086	0.9%	10	14
Isolok (12; HF) vs Coliwasa	33.3850	32.8794	0.506	1.5%	yes	0.121952	0.488432	yes	0.774822	2.4%	10	16
Isolok (12; HF) vs Coliwasa ---- scrnd	33.3850	32.9014	0.484	1.5%	yes	0.121952	0.256601	yes	0.647864	2.0%	10	14
Isolok (3; LF) vs Coliwasa	32.6160	32.8794	-0.263	-0.8%	no	0.153854	0.488432	no	0.59406	1.8%	10	16
Isolok (3; LF) vs Coliwasa ---- scrnd	32.6160	32.9014	-0.285	-0.9%	yes	0.153854	0.256601	yes	0.46004	1.4%	10	14
Isolok (3; HF) vs Coliwasa	33.4680	32.8794	0.589	1.8%	yes	0.196684	0.488432	no	0.925153	2.8%	10	16
Isolok (3; HF) vs Coliwasa ---- scrnd	33.4680	32.9014	0.567	1.7%	yes	0.196684	0.256601	no	0.767457	2.3%	10	14

Table B7. Oxide Comparisons between the Low and High Colowasa Samples for the High-Rheology (Phase 2) Testing

All Data														
Type of Material	Test Phase	Analytical Block	Oxide	Mean(Measured wt%) Coliwasa - low location	Mean(Measured wt%) Coliwasa - high location	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa - low location	Std Dev(Measured wt%) Coliwasa - high location	Sig. Diff	n low	n high
SME Simulant	2nd phase	avg	Al/B	2.393	2.386	-0.3%	No	0.0853	3.57	0.0552	0.0886	No	8	8
SME Simulant	2nd phase	avg	Al ₂ O ₃ (wt%)	10.995	10.800	-1.8%	No	0.4439	4.04	0.1831	0.2733	No	8	8
SME Simulant	2nd phase	avg	B ₂ O ₃ (wt%)	4.600	4.530	-1.5%	No	0.1761	3.83	0.1003	0.0979	No	8	8
SME Simulant	2nd phase	avg	BaO (wt%)	0.005	0.005	0.3%	No	0.0004	8.58	0.0004	0.0003	No	8	8
SME Simulant	2nd phase	avg	CaO (wt%)	0.588	0.579	-1.6%	No	0.0322	5.47	0.0120	0.0275	No	8	8
SME Simulant	2nd phase	avg	Cr ₂ O ₃ (wt%)	0.019	0.020	2.2%	No	0.0018	9.13	0.0008	0.0015	Yes	8	8
SME Simulant	2nd phase	avg	CuO (wt%)	0.096	0.093	-3.8%	No	0.0077	7.96	0.0031	0.0043	No	8	8
SME Simulant	2nd phase	avg	Fe/Li	2.028	1.982	-2.3%	No	0.1167	5.76	0.0334	0.0824	Yes	8	8
SME Simulant	2nd phase	avg	Fe ₂ O ₃ (wt%)	10.305	10.120	-1.8%	No	0.4514	4.38	0.2012	0.2890	No	8	8
SME Simulant	2nd phase	avg	K ₂ O (wt%)	0.168	0.170	0.9%	No	0.0088	5.20	0.0057	0.0077	No	8	8
SME Simulant	2nd phase	avg	Li ₂ O (wt%)	5.084	5.111	0.5%	No	0.1126	2.22	0.0602	0.0943	No	8	8
SME Simulant	2nd phase	avg	MgO (wt%)	0.311	0.304	-2.2%	No	0.0199	6.39	0.0086	0.0146	No	8	8
SME Simulant	2nd phase	avg	MnO (wt%)	2.824	2.778	-1.6%	No	0.1905	6.75	0.1093	0.1565	No	8	8
SME Simulant	2nd phase	avg	Na ₂ O (wt%)	13.421	13.250	-1.3%	No	0.4961	3.70	0.2255	0.3642	No	8	8
SME Simulant	2nd phase	avg	NiO (wt%)	1.202	1.188	-1.2%	No	0.1046	8.70	0.0775	0.0910	No	8	8
SME Simulant	2nd phase	avg	SiO ₂ (wt%)	49.975	49.988	0.0%	No	0.7896	1.58	0.7706	0.6738	No	8	8
SME Simulant	2nd phase	avg	Sum of Oxides (wt%)	99.726	99.072	-0.7%	No	1.7222	1.73	1.0263	0.9636	No	8	8
SME Simulant	2nd phase	avg	TiO ₂ (wt%)	0.017	0.018	6.6%	No	0.0029	17.13	0.0006	0.0021	Yes	8	8
SME Simulant	2nd phase	avg	ZnO (wt%)	0.006	0.007	10.9%	No	0.0020	33.87	0.0002	0.0018	No	8	8
SME Simulant	2nd phase	avg	ZrO ₂ (wt%)	0.110	0.110	0.1%	No	0.0025	2.27	0.0023	0.0022	No	8	8
Screened Data														
Type of Material	Test Phase	Analytical Block	Oxide	Mean(Measured wt%) Coliwasa - low location	Mean(Measured wt%) Coliwasa - high location	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa - low location	Std Dev(Measured wt%) Coliwasa - high location	Sig. Diff	n low	n high
SME Simulant	2nd phase	avg	Al/B	2.393	2.386	-0.3%	No	0.0853	3.57	0.0552	0.0886	No	8	8
SME Simulant	2nd phase	avg	Al ₂ O ₃ (wt%)	10.995	10.800	-1.8%	No	0.4439	4.04	0.1831	0.2733	No	8	8
SME Simulant	2nd phase	avg	B ₂ O ₃ (wt%)	4.600	4.530	-1.5%	No	0.1761	3.83	0.1003	0.0979	No	8	8
SME Simulant	2nd phase	avg	BaO (wt%)	0.005	0.005	0.3%	No	0.0004	8.58	0.0004	0.0003	No	8	8
SME Simulant	2nd phase	avg	CaO (wt%)	0.588	0.579	-1.6%	No	0.0322	5.47	0.0120	0.0275	No	8	8
SME Simulant	2nd phase	avg	Cr ₂ O ₃ (wt%)	0.019	0.020	2.2%	No	0.0018	9.13	0.0008	0.0015	Yes	8	8
SME Simulant	2nd phase	avg	CuO (wt%)	0.096	0.093	-3.8%	No	0.0077	7.96	0.0031	0.0043	No	8	8
SME Simulant	2nd phase	avg	Fe/Li	2.028	1.982	-2.3%	No	0.1167	5.76	0.0334	0.0824	Yes	8	8
SME Simulant	2nd phase	avg	Fe ₂ O ₃ (wt%)	10.305	10.120	-1.8%	No	0.4514	4.38	0.2012	0.2890	No	8	8
SME Simulant	2nd phase	avg	K ₂ O (wt%)	0.168	0.170	0.9%	No	0.0088	5.20	0.0057	0.0077	No	8	8
SME Simulant	2nd phase	avg	Li ₂ O (wt%)	5.084	5.111	0.5%	No	0.1126	2.22	0.0602	0.0943	No	8	8
SME Simulant	2nd phase	avg	MgO (wt%)	0.311	0.304	-2.2%	No	0.0199	6.39	0.0086	0.0146	No	8	8
SME Simulant	2nd phase	avg	MnO (wt%)	2.824	2.778	-1.6%	No	0.1905	6.75	0.1093	0.1565	No	8	8
SME Simulant	2nd phase	avg	Na ₂ O (wt%)	13.421	13.250	-1.3%	No	0.4961	3.70	0.2255	0.3642	No	8	8
SME Simulant	2nd phase	avg	NiO (wt%)	1.202	1.188	-1.2%	No	0.1046	8.70	0.0775	0.0910	No	8	8
SME Simulant	2nd phase	avg	SiO ₂ (wt%)	49.975	49.988	0.0%	No	0.7896	1.58	0.7706	0.6738	No	8	8
SME Simulant	2nd phase	avg	Sum of Oxides (wt%)	99.726	99.072	-0.7%	No	1.7222	1.73	1.0263	0.9636	No	8	8
SME Simulant	2nd phase	avg	TiO ₂ (wt%)	0.017	0.018	6.6%	No	0.0029	17.13	0.0006	0.0021	Yes	8	8
SME Simulant	2nd phase	avg	ZnO (wt%)	0.006	0.006	0.4%	No	0.0003	5.06	0.0002	0.0003	No	8	7
SME Simulant	2nd phase	avg	ZrO ₂ (wt%)	0.110	0.110	0.1%	No	0.0025	2.27	0.0023	0.0022	No	8	8

Table B8. Oxide Comparisons Between Samplers for the High-Rheology (Phase 2) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Al/B	2.429	2.598	6.9%	Yes	0.248	10.19	0.096	0.093	No	16	10
1	Isolok-LFR-3mL	Al ₂ O ₃ (wt%)	11.042	11.518	4.3%	Yes	0.821	7.44	0.497	0.216	No	16	10
1	Isolok-LFR-3mL	B ₂ O ₃ (wt%)	4.548	4.437	-2.4%	No	0.236	5.20	0.196	0.113	Yes	16	10
1	Isolok-LFR-3mL	BaO (wt%)	0.006	0.006	0.0%	No	0.001	10.28	0.001	0.001	No	16	10
1	Isolok-LFR-3mL	CaO (wt%)	0.600	0.629	4.7%	No	0.059	9.90	0.032	0.045	No	16	10
1	Isolok-LFR-3mL	Cr ₂ O ₃ (wt%)	0.020	0.020	1.4%	No	0.003	14.40	0.002	0.003	Yes	16	10
1	Isolok-LFR-3mL	CuO (wt%)	0.096	0.092	-3.9%	No	0.009	9.80	0.007	0.007	No	16	10
1	Isolok-LFR-3mL	Fe/Li	2.035	2.106	3.5%	Yes	0.128	6.29	0.078	0.048	No	16	10
1	Isolok-LFR-3mL	Fe ₂ O ₃ (wt%)	10.347	10.781	4.2%	Yes	0.760	7.34	0.477	0.175	No	16	10
1	Isolok-LFR-3mL	K ₂ O (wt%)	0.168	0.163	-3.0%	No	0.011	6.75	0.007	0.009	No	16	10
1	Isolok-LFR-3mL	Li ₂ O (wt%)	5.088	5.120	0.6%	No	0.154	3.02	0.214	0.073	Yes	16	10
1	Isolok-LFR-3mL	MgO (wt%)	0.310	0.323	4.1%	Yes	0.024	7.76	0.016	0.008	No	16	10
1	Isolok-LFR-3mL	MnO (wt%)	2.808	2.936	4.6%	Yes	0.226	8.04	0.163	0.073	Yes	16	10
1	Isolok-LFR-3mL	Na ₂ O (wt%)	13.710	13.766	0.4%	No	0.442	3.22	0.682	0.226	Yes	16	10
1	Isolok-LFR-3mL	NiO (wt%)	1.209	1.247	3.1%	No	0.102	8.45	0.092	0.043	No	16	10
1	Isolok-LFR-3mL	SiO ₂ (wt%)	26.732	27.845	4.2%	No	1.613	6.03	1.220	0.525	Yes	16	10
1	Isolok-LFR-3mL	Sum (wt%)	100.806	102.382	1.6%	No	4.190	4.16	3.877	1.125	No	16	10
1	Isolok-LFR-3mL	TiO ₂ (wt%)	0.016	0.015	-3.7%	No	0.002	12.44	0.002	0.001	No	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.006	0.006	-3.0%	No	0.000	6.74	0.000	0.000	No	16	10
1	Isolok-LFR-3mL	ZrO ₂ (wt%)	0.104	0.108	4.0%	Yes	0.007	7.10	0.005	0.003	No	16	10
2	Hydragard - HFR	Al/B	2.378	2.603	9.5%	Yes	0.300	12.64	0.073	0.112	No	16	10
2	Hydragard - HFR	Al ₂ O ₃ (wt%)	10.852	11.229	3.5%	Yes	0.640	5.89	0.276	0.370	No	16	10
2	Hydragard - HFR	B ₂ O ₃ (wt%)	4.566	4.318	-5.4%	Yes	0.358	7.84	0.112	0.159	No	16	10
2	Hydragard - HFR	BaO (wt%)	0.006	0.006	2.3%	No	0.001	10.86	0.001	0.001	No	16	10
2	Hydragard - HFR	CaO (wt%)	0.566	0.582	3.0%	No	0.038	6.70	0.026	0.024	No	16	10
2	Hydragard - HFR	Cr ₂ O ₃ (wt%)	0.018	0.023	22.7%	Yes	0.006	32.36	0.002	0.003	No	16	10
2	Hydragard - HFR	CuO (wt%)	0.095	0.095	-0.2%	No	0.004	4.19	0.004	0.005	No	16	10
2	Hydragard - HFR	Fe/Li	1.971	2.126	7.8%	Yes	0.222	11.27	0.075	0.091	No	16	10
2	Hydragard - HFR	Fe ₂ O ₃ (wt%)	10.175	10.643	4.6%	Yes	0.766	7.53	0.287	0.452	No	16	10
2	Hydragard - HFR	K ₂ O (wt%)	0.169	0.185	9.2%	No	0.057	33.57	0.007	0.058	Yes	16	10
2	Hydragard - HFR	Li ₂ O (wt%)	5.166	5.010	-3.0%	Yes	0.288	5.58	0.148	0.176	No	16	10
2	Hydragard - HFR	MgO (wt%)	0.307	0.316	2.9%	No	0.021	6.78	0.014	0.015	No	16	10
2	Hydragard - HFR	MnO (wt%)	2.816	2.934	4.2%	No	0.254	9.03	0.146	0.193	No	16	10
2	Hydragard - HFR	Na ₂ O (wt%)	13.359	13.305	-0.4%	No	0.436	3.26	0.468	0.445	No	16	10
2	Hydragard - HFR	NiO (wt%)	1.199	1.268	5.8%	No	0.156	13.02	0.088	0.128	No	16	10
2	Hydragard - HFR	SiO ₂ (wt%)	49.699	48.220	-3.0%	Yes	2.366	4.76	0.818	1.383	No	16	10
2	Hydragard - HFR	Sum (wt%)	99.132	98.277	-0.9%	No	2.628	2.65	1.557	2.842	No	16	10
2	Hydragard - HFR	TiO ₂ (wt%)	0.018	0.019	4.7%	No	0.002	12.84	0.002	0.001	No	16	10
2	Hydragard - HFR	ZnO (wt%)	0.006	0.006	-1.8%	No	0.000	5.53	0.000	0.000	No	16	10
2	Hydragard - HFR	ZrO ₂ (wt%)	0.115	0.119	3.5%	Yes	0.007	5.96	0.002	0.005	No	16	10

Table B8. Oxide Comparisons Between Samplers for the High-Rheology (Phase 2) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
3	Isolok-LFR-12mL	Al/B	2.286	2.424	6.0%	Yes	0.206	9.00	0.071	0.097	No	16	10
3	Isolok-LFR-12mL	Al ₂ O ₃ (wt%)	10.863	11.020	1.4%	No	0.365	3.36	0.251	0.251	No	16	10
3	Isolok-LFR-12mL	B ₂ O ₃ (wt%)	4.755	4.553	-4.3%	Yes	0.358	7.54	0.135	0.204	Yes	16	10
3	Isolok-LFR-12mL	BaO (wt%)	0.004	0.012	201.3%	Yes	0.008	216.95	0.000	0.001	Yes	16	10
3	Isolok-LFR-12mL	CaO (wt%)	0.587	0.599	2.0%	No	0.028	4.75	0.022	0.012	No	16	10
3	Isolok-LFR-12mL	Cr ₂ O ₃ (wt%)	0.020	0.021	1.9%	No	0.003	13.54	0.002	0.003	Yes	16	10
3	Isolok-LFR-12mL	CuO (wt%)	0.095	0.093	-1.6%	No	0.005	4.90	0.004	0.003	No	16	10
3	Isolok-LFR-12mL	Fe/Li	1.972	1.979	0.4%	No	0.056	2.85	0.081	0.040	Yes	16	10
3	Isolok-LFR-12mL	Fe ₂ O ₃ (wt%)	10.158	10.277	1.2%	No	0.353	3.47	0.270	0.268	No	16	10
3	Isolok-LFR-12mL	K ₂ O (wt%)	0.169	0.168	-0.9%	No	0.005	3.08	0.007	0.002	Yes	16	10
3	Isolok-LFR-12mL	Li ₂ O (wt%)	5.158	5.195	0.7%	No	0.177	3.42	0.182	0.138	No	16	10
3	Isolok-LFR-12mL	MgO (wt%)	0.309	0.316	2.2%	No	0.016	5.12	0.012	0.008	No	16	10
3	Isolok-LFR-12mL	MnO (wt%)	2.833	2.879	1.7%	No	0.144	5.08	0.131	0.088	No	16	10
3	Isolok-LFR-12mL	Na ₂ O (wt%)	13.327	13.493	1.3%	No	0.522	3.92	0.444	0.397	No	16	10
3	Isolok-LFR-12mL	NiO (wt%)	1.188	1.187	0.0%	No	0.068	5.69	0.083	0.078	No	16	10
3	Isolok-LFR-12mL	SiO ₂ (wt%)	49.913	49.118	-1.6%	No	1.693	3.39	1.082	1.078	No	16	10
3	Isolok-LFR-12mL	Sum (wt%)	99.517	99.068	-0.5%	No	2.023	2.03	1.818	2.009	No	16	10
3	Isolok-LFR-12mL	TiO ₂ (wt%)	0.019	0.018	-3.2%	No	0.002	10.50	0.002	0.002	No	16	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.008	0.006	-23.8%	No	0.007	85.37	0.007	0.000	No	16	10
3	Isolok-LFR-12mL	ZrO ₂ (wt%)	0.113	0.113	0.6%	No	0.003	2.84	0.003	0.004	No	16	10
4	Isolok-HFR-12mL	Al/B	2.427	2.538	4.6%	Yes	0.177	7.31	0.076	0.086	No	16	10
4	Isolok-HFR-12mL	Al ₂ O ₃ (wt%)	10.817	10.721	-0.9%	No	0.312	2.89	0.297	0.181	No	16	10
4	Isolok-HFR-12mL	B ₂ O ₃ (wt%)	4.460	4.228	-5.2%	Yes	0.354	7.94	0.151	0.138	No	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.006	0.013	137.3%	Yes	0.009	152.96	0.000	0.001	Yes	16	10
4	Isolok-HFR-12mL	CaO (wt%)	0.587	0.580	-1.3%	No	0.024	4.09	0.021	0.017	No	16	10
4	Isolok-HFR-12mL	Cr ₂ O ₃ (wt%)	0.020	0.026	33.2%	Yes	0.009	42.83	0.001	0.003	Yes	16	10
4	Isolok-HFR-12mL	CuO (wt%)	0.091	0.087	-5.3%	Yes	0.009	9.32	0.005	0.004	No	16	10
4	Isolok-HFR-12mL	Fe/Li	2.011	1.993	-0.9%	No	0.065	3.21	0.064	0.039	No	16	10
4	Isolok-HFR-12mL	Fe ₂ O ₃ (wt%)	10.163	10.138	-0.2%	No	0.240	2.36	0.302	0.157	No	16	10
4	Isolok-HFR-12mL	K ₂ O (wt%)	0.169	0.163	-3.7%	Yes	0.012	7.38	0.007	0.009	No	16	10
4	Isolok-HFR-12mL	Li ₂ O (wt%)	5.055	5.089	0.7%	No	0.137	2.72	0.114	0.139	No	16	10
4	Isolok-HFR-12mL	MgO (wt%)	0.303	0.299	-1.6%	No	0.014	4.64	0.013	0.006	No	16	10
4	Isolok-HFR-12mL	MnO (wt%)	2.766	2.710	-2.0%	No	0.141	5.09	0.140	0.067	Yes	16	10
4	Isolok-HFR-12mL	Na ₂ O (wt%)	13.269	13.119	-1.1%	No	0.431	3.24	0.303	0.388	No	16	10
4	Isolok-HFR-12mL	NiO (wt%)	1.192	1.170	-1.8%	No	0.074	6.18	0.087	0.038	Yes	16	10
4	Isolok-HFR-12mL	SiO ₂ (wt%)	49.913	50.209	0.6%	No	1.112	2.23	0.943	1.039	No	16	10
4	Isolok-HFR-12mL	Sum (wt%)	98.949	98.688	-0.3%	No	1.699	1.72	1.668	1.827	No	16	10
4	Isolok-HFR-12mL	TiO ₂ (wt%)	0.020	0.019	-3.7%	No	0.002	12.76	0.002	0.002	No	16	10
4	Isolok-HFR-12mL	ZnO (wt%)	0.006	0.006	-3.6%	No	0.000	7.21	0.000	0.000	No	16	10
4	Isolok-HFR-12mL	ZrO ₂ (wt%)	0.111	0.111	0.1%	No	0.003	2.36	0.003	0.004	No	16	10

Table B8. Oxide Comparisons Between Samplers for the High-Rheology (Phase 2) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
5	Isolok-HFR-3mL	Al/B	2.402	2.417	0.6%	No	0.074	3.08	0.075	0.063	No	16	10
5	Isolok-HFR-3mL	Al ₂ O ₃ (wt%)	10.918	10.942	0.2%	No	0.199	1.82	0.315	0.087	Yes	16	10
5	Isolok-HFR-3mL	B ₂ O ₃ (wt%)	4.548	4.530	-0.4%	No	0.133	2.92	0.139	0.137	No	16	10
5	Isolok-HFR-3mL	BaO (wt%)	0.005	0.005	1.8%	No	0.000	6.14	0.000	0.000	No	16	10
5	Isolok-HFR-3mL	CaO (wt%)	0.577	0.574	-0.6%	No	0.021	3.58	0.023	0.013	No	16	10
5	Isolok-HFR-3mL	Cr ₂ O ₃ (wt%)	0.019	0.022	14.4%	Yes	0.004	22.83	0.002	0.002	No	16	10
5	Isolok-HFR-3mL	CuO (wt%)	0.095	0.090	-5.2%	Yes	0.009	9.58	0.006	0.003	No	16	10
5	Isolok-HFR-3mL	Fe/Li	2.014	1.990	-1.2%	No	0.068	3.37	0.074	0.034	Yes	16	10
5	Isolok-HFR-3mL	Fe ₂ O ₃ (wt%)	10.178	10.251	0.7%	No	0.250	2.45	0.319	0.081	Yes	16	10
5	Isolok-HFR-3mL	K ₂ O (wt%)	0.169	0.167	-1.1%	No	0.008	4.56	0.007	0.008	No	16	10
5	Isolok-HFR-3mL	Li ₂ O (wt%)	5.055	5.152	1.9%	Yes	0.185	3.66	0.112	0.096	No	16	10
5	Isolok-HFR-3mL	MgO (wt%)	0.306	0.307	0.3%	No	0.010	3.20	0.013	0.006	No	16	10
5	Isolok-HFR-3mL	MnO (wt%)	2.785	2.806	0.7%	No	0.119	4.27	0.143	0.053	Yes	16	10
5	Isolok-HFR-3mL	Na ₂ O (wt%)	13.243	13.147	-0.7%	No	0.369	2.78	0.386	0.195	No	16	10
5	Isolok-HFR-3mL	NiO (wt%)	1.194	1.208	1.2%	No	0.032	2.71	0.084	0.024	Yes	16	10
5	Isolok-HFR-3mL	SiO ₂ (wt%)	49.899	50.744	1.7%	No	1.728	3.46	1.072	1.042	No	16	10
5	Isolok-HFR-3mL	Sum (wt%)	99.125	100.077	1.0%	No	2.407	2.43	1.985	1.259	No	16	10
5	Isolok-HFR-3mL	TiO ₂ (wt%)	0.016	0.016	-2.2%	No	0.002	9.55	0.002	0.001	No	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.006	0.006	-1.1%	No	0.000	4.53	0.000	0.000	No	16	10
5	Isolok-HFR-3mL	ZrO ₂ (wt%)	0.111	0.109	-1.1%	No	0.004	3.18	0.003	0.002	No	16	10
6	Hydragard-LFR	Al/B	2.415	2.537	5.0%	Yes	0.183	7.58	0.073	0.076	No	16	10
6	Hydragard-LFR	Al ₂ O ₃ (wt%)	10.892	11.099	1.9%	No	0.442	4.06	0.309	0.230	No	16	10
6	Hydragard-LFR	B ₂ O ₃ (wt%)	4.512	4.379	-2.9%	No	0.269	5.96	0.155	0.176	No	16	10
6	Hydragard-LFR	BaO (wt%)	0.005	0.010	113.5%	Yes	0.008	169.14	0.000	0.004	Yes	16	10
6	Hydragard-LFR	CaO (wt%)	0.585	0.594	1.6%	No	0.028	4.82	0.025	0.018	No	16	10
6	Hydragard-LFR	Cr ₂ O ₃ (wt%)	0.020	0.019	-3.6%	No	0.002	12.12	0.002	0.003	No	16	10
6	Hydragard-LFR	CuO (wt%)	0.095	0.095	0.0%	No	0.004	4.20	0.005	0.003	No	16	10
6	Hydragard-LFR	Fe/Li	2.026	2.051	1.3%	No	0.080	3.93	0.059	0.074	No	16	10
6	Hydragard-LFR	Fe ₂ O ₃ (wt%)	10.253	10.407	1.5%	No	0.398	3.88	0.307	0.269	No	16	10
6	Hydragard-LFR	K ₂ O (wt%)	0.169	0.168	-0.6%	No	0.007	3.86	0.007	0.006	No	16	10
6	Hydragard-LFR	Li ₂ O (wt%)	5.063	5.077	0.3%	No	0.124	2.44	0.145	0.109	No	16	10
6	Hydragard-LFR	MgO (wt%)	0.308	0.312	1.3%	No	0.014	4.68	0.014	0.010	No	16	10
6	Hydragard-LFR	MnO (wt%)	2.799	2.824	0.9%	No	0.131	4.68	0.143	0.094	No	16	10
6	Hydragard-LFR	Na ₂ O (wt%)	13.107	13.186	0.6%	No	0.443	3.38	0.480	0.354	No	16	10
6	Hydragard-LFR	NiO (wt%)	1.189	1.181	-0.6%	No	0.068	5.70	0.083	0.050	No	16	10
6	Hydragard-LFR	SiO ₂ (wt%)	49.739	49.568	-0.3%	No	1.070	2.15	1.161	0.930	No	16	10
6	Hydragard-LFR	Sum (wt%)	98.866	99.052	0.2%	No	1.865	1.89	2.217	1.635	No	16	10
6	Hydragard-LFR	TiO ₂ (wt%)	0.016	0.016	-1.6%	No	0.002	10.01	0.002	0.002	No	16	10
6	Hydragard-LFR	ZnO (wt%)	0.006	0.007	22.7%	No	0.005	76.46	0.000	0.004	Yes	16	10
6	Hydragard-LFR	ZrO ₂ (wt%)	0.109	0.110	0.4%	No	0.003	2.61	0.003	0.003	No	16	10

Table B9. Oxide Comparisons Between Samplers for the High-Rheology (Phase 2) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Al/B	2.429	2.598	6.9%	Yes	0.24756	10.19	0.096	0.093	No	16	10
1	Isolok-LFR-3mL	Al ₂ O ₃ (wt%)	11.115	11.518	3.6%	Yes	0.69912	6.29	0.415	0.216	No	15	10
1	Isolok-LFR-3mL	B ₂ O ₃ (wt%)	4.548	4.437	-2.4%	No	0.23636	5.20	0.196	0.113	Yes	16	10
1	Isolok-LFR-3mL	BaO (wt%)	0.006	0.006	0.0%	No	0.00058	10.28	0.001	0.001	No	16	10
1	Isolok-LFR-3mL	CaO (wt%)	0.605	0.619	2.3%	No	0.03043	5.03	0.027	0.010	Yes	15	8
1	Isolok-LFR-3mL	Cr ₂ O ₃ (wt%)	0.019	0.020	3.2%	No	0.00311	16.10	0.001	0.003	Yes	15	10
1	Isolok-LFR-3mL	CuO (wt%)	0.096	0.092	-3.9%	No	0.00943	9.80	0.007	0.007	No	16	10
1	Isolok-LFR-3mL	Fe/Li	2.035	2.106	3.5%	Yes	0.12805	6.29	0.078	0.048	No	16	10
1	Isolok-LFR-3mL	Fe ₂ O ₃ (wt%)	10.440	10.781	3.3%	Yes	0.5322	5.10	0.246	0.175	No	13	10
1	Isolok-LFR-3mL	K ₂ O (wt%)	0.168	0.163	-3.0%	No	0.01136	6.75	0.007	0.009	No	16	10
1	Isolok-LFR-3mL	Li ₂ O (wt%)	5.088	5.100	0.2%	No	0.12893	2.53	0.214	0.041	Yes	16	9
1	Isolok-LFR-3mL	MgO (wt%)	0.310	0.323	4.1%	Yes	0.02405	7.76	0.016	0.008	No	16	10
1	Isolok-LFR-3mL	MnO (wt%)	2.808	2.936	4.6%	Yes	0.22562	8.04	0.163	0.073	Yes	16	10
1	Isolok-LFR-3mL	Na ₂ O (wt%)	13.710	13.766	0.4%	No	0.4421	3.22	0.682	0.226	Yes	16	10
1	Isolok-LFR-3mL	NiO (wt%)	1.209	1.247	3.1%	No	0.10219	8.45	0.092	0.043	No	16	10
1	Isolok-LFR-3mL	SiO ₂ (wt%)	50.880	51.391	1.0%	No	0.98359	1.93	0.682	0.317	Yes	12	9
1	Isolok-LFR-3mL	Sum (wt%)	101.568	102.646	1.1%	No	2.3453	2.31	1.687	0.800	No	13	9
1	Isolok-LFR-3mL	TiO ₂ (wt%)	0.016	0.015	-3.7%	No	0.00198	12.44	0.002	0.001	No	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.006	0.006	-3.0%	No	0.0004	6.74	0.000	0.000	No	16	10
1	Isolok-LFR-3mL	ZrO ₂ (wt%)	0.104	0.108	4.0%	Yes	0.0074	7.10	0.005	0.003	No	16	10
2	Hydragard - HFR	Al/B	2.3775	2.6031	9.5%	Yes	0.30041	12.64	0.073	0.112	No	16	10
2	Hydragard - HFR	Al ₂ O ₃ (wt%)	10.8516	11.3391	4.5%	Yes	0.65871	6.07	0.276	0.137	Yes	16	9
2	Hydragard - HFR	B ₂ O ₃ (wt%)	4.5662	4.3179	-5.4%	Yes	0.35788	7.84	0.112	0.159	No	16	10
2	Hydragard - HFR	BaO (wt%)	0.0055	0.0057	2.3%	No	0.0006	10.86	0.001	0.001	No	16	10
2	Hydragard - HFR	CaO (wt%)	0.5706	0.5825	2.1%	No	0.02897	5.08	0.017	0.024	No	15	10
2	Hydragard - HFR	Cr ₂ O ₃ (wt%)	0.0185	0.0220	19.3%	Yes	0.00508	27.49	0.002	0.002	No	16	9
2	Hydragard - HFR	CuO (wt%)	0.0947	0.0946	-0.1%	No	0.00355	3.75	0.004	0.002	No	16	8
2	Hydragard - HFR	Fe/Li	1.9711	2.1255	7.8%	Yes	0.22218	11.27	0.075	0.091	No	16	10
2	Hydragard - HFR	Fe ₂ O ₃ (wt%)	10.1750	10.7672	5.8%	Yes	0.8254	8.11	0.287	0.236	No	16	9
2	Hydragard - HFR	K ₂ O (wt%)	0.1692	0.1668	-1.5%	No	0.00902	5.33	0.007	0.009	No	16	9
2	Hydragard - HFR	Li ₂ O (wt%)	5.1656	5.0450	-2.3%	No	0.24728	4.79	0.148	0.145	No	16	9
2	Hydragard - HFR	MgO (wt%)	0.3073	0.3162	2.9%	No	0.02083	6.78	0.014	0.015	No	16	10
2	Hydragard - HFR	MnO (wt%)	2.8164	2.9336	4.2%	No	0.25446	9.03	0.146	0.193	No	16	10
2	Hydragard - HFR	Na ₂ O (wt%)	13.4387	13.3166	-0.9%	No	0.39713	2.96	0.353	0.154	No	15	8
2	Hydragard - HFR	NiO (wt%)	1.1992	1.2683	5.8%	No	0.15608	13.02	0.088	0.128	No	16	10
2	Hydragard - HFR	SiO ₂ (wt%)	49.6986	48.6097	-2.2%	Yes	1.7516	3.52	0.818	0.666	No	16	9
2	Hydragard - HFR	Sum (wt%)	99.4002	99.1409	-0.3%	No	1.1834	1.19	1.167	0.828	No	15	9
2	Hydragard - HFR	TiO ₂ (wt%)	0.0175	0.0192	9.7%	Yes	0.00274	15.61	0.001	0.001	No	13	10
2	Hydragard - HFR	ZnO (wt%)	0.0060	0.0059	-1.8%	No	0.00033	5.53	0.000	0.000	No	16	10
2	Hydragard - HFR	ZrO ₂ (wt%)	0.1152	0.1205	4.6%	Yes	0.0074	6.42	0.002	0.003	No	16	9

Table B9. Oxide Comparisons Between Samplers for the High-Rheology (Phase 2) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
3	Isolok-LFR-12mL	Al/B	2.286	2.424	6.0%	Yes	0.20575	9.00	0.071	0.097	No	16	10
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.863	11.091	2.1%	Yes	0.37978	3.50	0.251	0.113	Yes	16	9
3	Isolok-LFR-12mL	B2O3 (wt%)	4.778	4.553	-4.7%	Yes	0.37705	7.89	0.102	0.204	Yes	15	10
3	Isolok-LFR-12mL	BaO (wt%)	0.004	0.012	201.3%	Yes	0.00834	216.95	0.000	0.001	Yes	16	10
3	Isolok-LFR-12mL	CaO (wt%)	0.591	0.599	1.3%	No	0.01976	3.34	0.015	0.012	No	15	10
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.020	0.021	1.9%	Yes	0.00233	11.52	0.002	0.003	No	16	10
3	Isolok-LFR-12mL	CuO (wt%)	0.095	0.092	-2.5%	No	0.00479	5.07	0.004	0.002	Yes	16	9
3	Isolok-LFR-12mL	Fe/Li	1.972	1.979	0.4%	No	0.05619	2.85	0.081	0.040	Yes	16	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	10.158	10.353	1.9%	No	0.35938	3.54	0.270	0.127	Yes	16	9
3	Isolok-LFR-12mL	K2O (wt%)	0.169	0.168	-0.9%	No	0.00521	3.08	0.007	0.002	Yes	16	10
3	Isolok-LFR-12mL	Li2O (wt%)	5.158	5.195	0.7%	No	0.17654	3.42	0.182	0.138	No	16	10
3	Isolok-LFR-12mL	MgO (wt%)	0.311	0.316	1.5%	No	0.01158	3.72	0.008	0.008	No	15	10
3	Isolok-LFR-12mL	MnO (wt%)	2.833	2.879	1.7%	No	0.14388	5.08	0.131	0.088	No	16	10
3	Isolok-LFR-12mL	Na2O (wt%)	13.327	13.493	1.3%	No	0.52207	3.92	0.444	0.397	No	16	10
3	Isolok-LFR-12mL	NiO (wt%)	1.176	1.187	1.0%	No	0.07368	6.26	0.071	0.078	No	15	10
3	Isolok-LFR-12mL	SiO2 (wt%)	50.102	49.118	-2.0%	Yes	1.7587	3.51	0.797	1.078	No	15	10
3	Isolok-LFR-12mL	Sum (wt%)	99.627	99.603	0.0%	No	0.90081	0.90	0.869	1.153	No	14	9
3	Isolok-LFR-12mL	TiO2 (wt%)	0.019	0.018	-1.4%	No	0.00133	7.18	0.001	0.002	No	15	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.006	0.006	-0.6%	No	0.00018	3.02	0.000	0.000	Yes	15	10
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.113	0.113	0.6%	No	0.0032	2.84	0.003	0.004	No	16	10
4	Isolok-HFR-12mL	Al/B	2.427	2.538	4.6%	Yes	0.17747	7.31	0.076	0.086	No	16	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.817	10.772	-0.4%	No	0.21143	1.95	0.297	0.086	Yes	16	9
4	Isolok-HFR-12mL	B2O3 (wt%)	4.460	4.228	-5.2%	Yes	0.35388	7.94	0.151	0.138	No	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.006	0.013	132.1%	Yes	0.00802	141.63	0.000	0.001	No	16	9
4	Isolok-HFR-12mL	CaO (wt%)	0.587	0.580	-1.3%	No	0.02401	4.09	0.021	0.017	No	16	10
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.020	0.026	32.0%	No	0.00797	39.69	0.001	0.003	No	15	10
4	Isolok-HFR-12mL	CuO (wt%)	0.091	0.086	-6.3%	Yes	0.00873	9.54	0.005	0.002	Yes	16	9
4	Isolok-HFR-12mL	Fe/Li	2.011	1.993	-0.9%	No	0.06463	3.21	0.064	0.039	No	16	10
4	Isolok-HFR-12mL	Fe2O3 (wt%)	10.163	10.138	-0.2%	No	0.23974	2.36	0.302	0.157	No	16	10
4	Isolok-HFR-12mL	K2O (wt%)	0.169	0.163	-3.7%	Yes	0.01249	7.38	0.007	0.009	No	16	10
4	Isolok-HFR-12mL	Li2O (wt%)	5.055	5.089	0.7%	No	0.13726	2.72	0.114	0.139	No	16	10
4	Isolok-HFR-12mL	MgO (wt%)	0.303	0.299	-1.6%	No	0.01409	4.64	0.013	0.006	No	16	10
4	Isolok-HFR-12mL	MnO (wt%)	2.766	2.710	-2.0%	No	0.14082	5.09	0.140	0.067	Yes	16	10
4	Isolok-HFR-12mL	Na2O (wt%)	13.269	13.218	-0.4%	No	0.29491	2.22	0.303	0.243	No	16	9
4	Isolok-HFR-12mL	NiO (wt%)	1.192	1.170	-1.8%	No	0.07365	6.18	0.087	0.038	Yes	16	10
4	Isolok-HFR-12mL	SiO2 (wt%)	49.913	50.511	1.2%	No	1.17157	2.35	0.943	0.434	Yes	16	9
4	Isolok-HFR-12mL	Sum (wt%)	99.067	99.209	0.1%	No	0.87682	0.89	0.820	0.838	No	14	9
4	Isolok-HFR-12mL	TiO2 (wt%)	0.019	0.019	-1.4%	No	0.00166	8.71	0.002	0.002	No	15	10
4	Isolok-HFR-12mL	ZnO (wt%)	0.006	0.006	-3.6%	No	0.00043	7.21	0.000	0.000	No	16	10
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.111	0.111	0.1%	No	0.00261	2.36	0.003	0.004	No	16	10

Table B9. Oxide Comparisons Between Samplers for the High-Rheology (Phase 2) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
5	Isolok-HFR-3mL	Al/B	2.402	2.417	0.6%	No	0.07407	3.08	0.075	0.063	No	16	10
5	Isolok-HFR-3mL	Al ₂ O ₃ (wt%)	10.975	10.942	-0.3%	No	0.18639	1.70	0.221	0.087	No	15	10
5	Isolok-HFR-3mL	B ₂ O ₃ (wt%)	4.548	4.497	-1.1%	No	0.15878	3.49	0.139	0.094	No	16	9
5	Isolok-HFR-3mL	BaO (wt%)	0.005	0.005	1.8%	No	0.00029	6.14	0.000	0.000	No	16	10
5	Isolok-HFR-3mL	CaO (wt%)	0.584	0.574	-1.8%	No	0.02197	3.76	0.014	0.013	No	14	10
5	Isolok-HFR-3mL	Cr ₂ O ₃ (wt%)	0.019	0.022	14.4%	Yes	0.00437	22.83	0.002	0.002	No	16	10
5	Isolok-HFR-3mL	CuO (wt%)	0.095	0.090	-5.2%	Yes	0.00911	9.58	0.006	0.003	No	16	10
5	Isolok-HFR-3mL	Fe/Li	2.014	1.990	-1.2%	No	0.06793	3.37	0.074	0.034	Yes	16	10
5	Isolok-HFR-3mL	Fe ₂ O ₃ (wt%)	10.238	10.251	0.1%	No	0.14309	1.40	0.219	0.081	Yes	15	10
5	Isolok-HFR-3mL	K ₂ O (wt%)	0.169	0.169	-0.1%	No	0.00569	3.36	0.007	0.006	No	16	9
5	Isolok-HFR-3mL	Li ₂ O (wt%)	5.055	5.152	1.9%	Yes	0.18516	3.66	0.112	0.096	No	16	10
5	Isolok-HFR-3mL	MgO (wt%)	0.310	0.309	-0.6%	No	0.00741	2.39	0.007	0.004	No	14	9
5	Isolok-HFR-3mL	MnO (wt%)	2.804	2.819	0.5%	No	0.08663	3.09	0.125	0.035	Yes	15	9
5	Isolok-HFR-3mL	Na ₂ O (wt%)	13.243	13.147	-0.7%	No	0.36851	2.78	0.386	0.195	No	16	10
5	Isolok-HFR-3mL	NiO (wt%)	1.194	1.208	1.2%	No	0.06082	5.09	0.084	0.024	Yes	16	10
5	Isolok-HFR-3mL	SiO ₂ (wt%)	50.088	50.744	1.3%	No	1.4126	2.82	0.788	1.042	No	15	10
5	Isolok-HFR-3mL	Sum (wt%)	99.430	100.077	0.7%	No	1.9057	1.92	1.621	1.259	No	15	10
5	Isolok-HFR-3mL	TiO ₂ (wt%)	0.016	0.016	1.5%	No	0.00085	5.28	0.001	0.000	Yes	15	9
5	Isolok-HFR-3mL	ZnO (wt%)	0.006	0.006	-1.1%	No	0.00027	4.53	0.000	0.000	No	16	10
5	Isolok-HFR-3mL	ZrO ₂ (wt%)	0.111	0.109	-1.1%	No	0.00351	3.18	0.003	0.002	No	16	10
6	Hydragard-LFR	Al/B	2.415	2.537	5.0%	Yes	0.18303	7.58	0.0728	0.0760	No	16	10
6	Hydragard-LFR	Al ₂ O ₃ (wt%)	10.947	11.099	1.4%	No	0.34459	3.15	0.2260	0.2299	No	15	10
6	Hydragard-LFR	B ₂ O ₃ (wt%)	4.512	4.379	-2.9%	No	0.26873	5.96	0.1550	0.1764	No	16	10
6	Hydragard-LFR	BaO (wt%)	0.005	0.010	113.5%	Yes	0.008	169.14	0.0004	0.0037	Yes	16	10
6	Hydragard-LFR	CaO (wt%)	0.592	0.594	0.3%	No	0.01569	2.65	0.0151	0.0178	No	14	10
6	Hydragard-LFR	Cr ₂ O ₃ (wt%)	0.020	0.018	-6.6%	No	0.00274	14.01	0.0016	0.0019	No	16	9
6	Hydragard-LFR	CuO (wt%)	0.096	0.095	-1.1%	No	0.0041	4.26	0.0038	0.0032	No	15	10
6	Hydragard-LFR	Fe/Li	2.026	2.031	0.3%	No	0.05157	2.55	0.0593	0.0411	No	16	9
6	Hydragard-LFR	Fe ₂ O ₃ (wt%)	10.312	10.407	0.9%	No	0.28959	2.81	0.2018	0.2694	No	15	10
6	Hydragard-LFR	K ₂ O (wt%)	0.169	0.168	-0.6%	No	0.00654	3.86	0.0067	0.0063	No	16	10
6	Hydragard-LFR	Li ₂ O (wt%)	5.088	5.077	-0.2%	No	0.10411	2.05	0.1100	0.1092	No	15	10
6	Hydragard-LFR	MgO (wt%)	0.310	0.312	0.6%	No	0.01081	3.48	0.0111	0.0098	No	15	10
6	Hydragard-LFR	MnO (wt%)	2.823	2.824	0.0%	No	0.08047	2.85	0.0884	0.0937	No	13	10
6	Hydragard-LFR	Na ₂ O (wt%)	13.176	13.186	0.1%	No	0.33555	2.55	0.4045	0.3542	No	15	10
6	Hydragard-LFR	NiO (wt%)	1.189	1.181	-0.6%	No	0.06781	5.70	0.0832	0.0497	No	16	10
6	Hydragard-LFR	SiO ₂ (wt%)	49.974	49.568	-0.8%	No	1.0822	2.17	0.7040	0.9300	No	15	10
6	Hydragard-LFR	Sum (wt%)	99.602	99.052	-0.6%	No	1.7993	1.81	0.9915	1.6350	Yes	14	10
6	Hydragard-LFR	TiO ₂ (wt%)	0.016	0.016	-1.6%	No	0.00162	10.01	0.0017	0.0016	No	16	10
6	Hydragard-LFR	ZnO (wt%)	0.006	0.006	-1.0%	No	0.00026	4.36	0.0002	0.0002	No	16	9
6	Hydragard-LFR	ZrO ₂ (wt%)	0.109	0.110	0.4%	No	0.00285	2.61	0.0030	0.0026	No	16	10

Table B10. Phase 2 (High-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwas (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwas (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
2	Hydragard - HFR	Al/B	2.378	2.603	0.226	9.5%	Yes	0.300	12.64	0.073	0.112	No	16	10
1	Isolok-LFR-3mL	Al/B	2.429	2.598	0.168	6.9%	Yes	0.248	10.19	0.096	0.093	No	16	10
3	Isolok-LFR-12mL	Al/B	2.286	2.424	0.138	6.0%	Yes	0.206	9.00	0.071	0.097	No	16	10
6	Hydragard-LFR	Al/B	2.415	2.537	0.121	5.0%	Yes	0.183	7.58	0.073	0.076	No	16	10
4	Isolok-HFR-12mL	Al/B	2.427	2.538	0.111	4.6%	Yes	0.177	7.31	0.076	0.086	No	16	10
5	Isolok-HFR-3mL	Al/B	2.402	2.417	0.015	0.6%	No	0.074	3.08	0.075	0.063	No	16	10
1	Isolok-LFR-3mL	Al2O3 (wt%)	11.115	11.518	0.403	3.6%	Yes	0.699	6.29	0.415	0.216	No	15	10
2	Hydragard - HFR	Al2O3 (wt%)	10.852	11.339	0.487	4.5%	Yes	0.659	6.07	0.276	0.137	Yes	16	9
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.863	11.091	0.228	2.1%	Yes	0.380	3.50	0.251	0.113	Yes	16	9
6	Hydragard-LFR	Al2O3 (wt%)	10.947	11.099	0.152	1.4%	No	0.345	3.15	0.226	0.230	No	15	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.817	10.772	-0.045	-0.4%	No	0.211	1.95	0.297	0.086	Yes	16	9
5	Isolok-HFR-3mL	Al2O3 (wt%)	10.975	10.942	-0.033	-0.3%	No	0.186	1.70	0.221	0.087	No	15	10
4	Isolok-HFR-12mL	B2O3 (wt%)	4.460	4.228	-0.232	-5.2%	Yes	0.354	7.94	0.151	0.138	No	16	10
3	Isolok-LFR-12mL	B2O3 (wt%)	4.778	4.553	-0.225	-4.7%	Yes	0.377	7.89	0.102	0.204	Yes	15	10
2	Hydragard - HFR	B2O3 (wt%)	4.566	4.318	-0.248	-5.4%	Yes	0.358	7.84	0.112	0.159	No	16	10
6	Hydragard-LFR	B2O3 (wt%)	4.512	4.379	-0.133	-2.9%	No	0.269	5.96	0.155	0.176	No	16	10
1	Isolok-LFR-3mL	B2O3 (wt%)	4.548	4.437	-0.111	-2.4%	No	0.236	5.20	0.196	0.113	Yes	16	10
5	Isolok-HFR-3mL	B2O3 (wt%)	4.548	4.497	-0.051	-1.1%	No	0.159	3.49	0.139	0.094	No	16	9
3	Isolok-LFR-12mL	BaO (wt%)	0.004	0.012	0.008	201.3%	Yes	0.008	216.95	0.000	0.001	Yes	16	10
6	Hydragard-LFR	BaO (wt%)	0.005	0.010	0.005	113.5%	Yes	0.008	169.14	0.000	0.004	Yes	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.006	0.013	0.007	132.1%	Yes	0.008	141.63	0.000	0.001	No	16	9
2	Hydragard - HFR	BaO (wt%)	0.006	0.006	0.000	2.3%	No	0.001	10.86	0.001	0.001	No	16	10
1	Isolok-LFR-3mL	BaO (wt%)	0.006	0.006	0.000	0.0%	No	0.001	10.28	0.001	0.001	No	16	10
5	Isolok-HFR-3mL	BaO (wt%)	0.005	0.005	0.000	1.8%	No	0.000	6.14	0.000	0.000	No	16	10
2	Hydragard - HFR	CaO (wt%)	0.571	0.582	0.012	2.1%	No	0.029	5.08	0.017	0.024	No	15	10
1	Isolok-LFR-3mL	CaO (wt%)	0.605	0.619	0.014	2.3%	No	0.030	5.03	0.027	0.010	Yes	15	8
4	Isolok-HFR-12mL	CaO (wt%)	0.587	0.580	-0.007	-1.3%	No	0.024	4.09	0.021	0.017	No	16	10
5	Isolok-HFR-3mL	CaO (wt%)	0.584	0.574	-0.010	-1.8%	No	0.022	3.76	0.014	0.013	No	14	10
3	Isolok-LFR-12mL	CaO (wt%)	0.591	0.599	0.008	1.3%	No	0.020	3.34	0.015	0.012	No	15	10
6	Hydragard-LFR	CaO (wt%)	0.592	0.594	0.002	0.3%	No	0.016	2.65	0.015	0.018	No	14	10
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.020	0.026	0.006	32.0%	No	0.008	39.69	0.001	0.003	No	15	10
2	Hydragard - HFR	Cr2O3 (wt%)	0.018	0.022	0.004	19.3%	Yes	0.005	27.49	0.002	0.002	No	16	9
5	Isolok-HFR-3mL	Cr2O3 (wt%)	0.019	0.022	0.003	14.4%	Yes	0.004	22.83	0.002	0.002	No	16	10
1	Isolok-LFR-3mL	Cr2O3 (wt%)	0.019	0.020	0.001	3.2%	No	0.003	16.10	0.001	0.003	Yes	15	10
6	Hydragard-LFR	Cr2O3 (wt%)	0.020	0.018	-0.001	-6.6%	No	0.003	14.01	0.002	0.002	No	16	9
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.020	0.021	0.000	1.9%	Yes	0.002	11.52	0.002	0.003	No	16	10
1	Isolok-LFR-3mL	CuO (wt%)	0.096	0.092	-0.004	-3.9%	No	0.009	9.80	0.007	0.007	No	16	10
5	Isolok-HFR-3mL	CuO (wt%)	0.095	0.090	-0.005	-5.2%	Yes	0.009	9.58	0.006	0.003	No	16	10
4	Isolok-HFR-12mL	CuO (wt%)	0.091	0.086	-0.006	-6.3%	Yes	0.009	9.54	0.005	0.002	Yes	16	9
3	Isolok-LFR-12mL	CuO (wt%)	0.095	0.092	-0.002	-2.5%	No	0.005	5.07	0.004	0.002	Yes	16	9
6	Hydragard-LFR	CuO (wt%)	0.096	0.095	-0.001	-1.1%	No	0.004	4.26	0.004	0.003	No	15	10

Table B10. Phase 2 (High-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

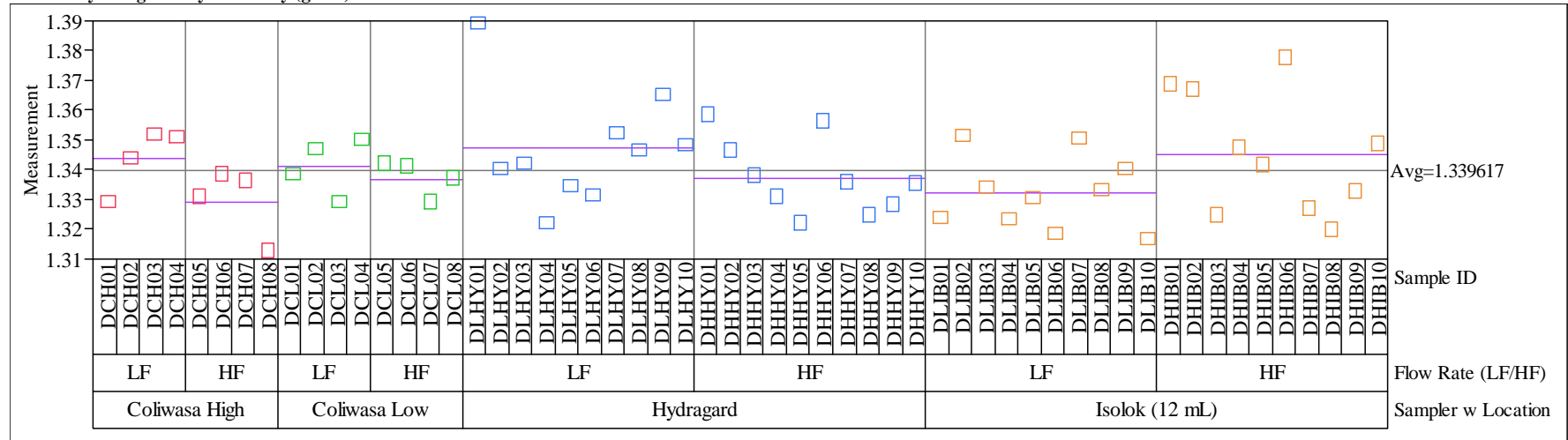
Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwas (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwas (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
2	Hydragard - HFR	CuO (wt%)	0.095	0.095	0.000	-0.1%	No	0.004	3.75	0.004	0.002	No	16	8
2	Hydragard - HFR	Fe/Li	1.971	2.126	0.154	7.8%	Yes	0.222	11.27	0.075	0.091	No	16	10
1	Isolok-LFR-3mL	Fe/Li	2.035	2.106	0.071	3.5%	Yes	0.128	6.29	0.078	0.048	No	16	10
5	Isolok-HFR-3mL	Fe/Li	2.014	1.990	-0.024	-1.2%	No	0.068	3.37	0.074	0.034	Yes	16	10
4	Isolok-HFR-12mL	Fe/Li	2.011	1.993	-0.018	-0.9%	No	0.065	3.21	0.064	0.039	No	16	10
3	Isolok-LFR-12mL	Fe/Li	1.972	1.979	0.007	0.4%	No	0.056	2.85	0.081	0.040	Yes	16	10
6	Hydragard-LFR	Fe/Li	2.026	2.031	0.005	0.3%	No	0.052	2.55	0.059	0.041	No	16	9
2	Hydragard - HFR	Fe2O3 (wt%)	10.175	10.767	0.592	5.8%	Yes	0.825	8.11	0.287	0.236	No	16	9
1	Isolok-LFR-3mL	Fe2O3 (wt%)	10.440	10.781	0.341	3.3%	Yes	0.532	5.10	0.246	0.175	No	13	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	10.158	10.353	0.195	1.9%	No	0.359	3.54	0.270	0.127	Yes	16	9
6	Hydragard-LFR	Fe2O3 (wt%)	10.312	10.407	0.095	0.9%	No	0.290	2.81	0.202	0.269	No	15	10
4	Isolok-HFR-12mL	Fe2O3 (wt%)	10.163	10.138	-0.025	-0.2%	No	0.240	2.36	0.302	0.157	No	16	10
5	Isolok-HFR-3mL	Fe2O3 (wt%)	10.238	10.251	0.013	0.1%	No	0.143	1.40	0.219	0.081	Yes	15	10
4	Isolok-HFR-12mL	K2O (wt%)	0.169	0.163	-0.006	-3.7%	Yes	0.012	7.38	0.007	0.009	No	16	10
1	Isolok-LFR-3mL	K2O (wt%)	0.168	0.163	-0.005	-3.0%	No	0.011	6.75	0.007	0.009	No	16	10
2	Hydragard - HFR	K2O (wt%)	0.169	0.167	-0.002	-1.5%	No	0.009	5.33	0.007	0.009	No	16	9
6	Hydragard-LFR	K2O (wt%)	0.169	0.168	-0.001	-0.6%	No	0.007	3.86	0.007	0.006	No	16	10
5	Isolok-HFR-3mL	K2O (wt%)	0.169	0.169	0.000	-0.1%	No	0.006	3.36	0.007	0.006	No	16	9
3	Isolok-LFR-12mL	K2O (wt%)	0.169	0.168	-0.001	-0.9%	No	0.005	3.08	0.007	0.002	Yes	16	10
2	Hydragard - HFR	Li2O (wt%)	5.166	5.045	-0.121	-2.3%	No	0.247	4.79	0.148	0.145	No	16	9
5	Isolok-HFR-3mL	Li2O (wt%)	5.055	5.152	0.097	1.9%	Yes	0.185	3.66	0.112	0.096	No	16	10
3	Isolok-LFR-12mL	Li2O (wt%)	5.158	5.195	0.037	0.7%	No	0.177	3.42	0.182	0.138	No	16	10
4	Isolok-HFR-12mL	Li2O (wt%)	5.055	5.089	0.034	0.7%	No	0.137	2.72	0.114	0.139	No	16	10
1	Isolok-LFR-3mL	Li2O (wt%)	5.088	5.100	0.012	0.2%	No	0.129	2.53	0.214	0.041	Yes	16	9
6	Hydragard-LFR	Li2O (wt%)	5.088	5.077	-0.011	-0.2%	No	0.104	2.05	0.110	0.109	No	15	10
1	Isolok-LFR-3mL	MgO (wt%)	0.310	0.323	0.013	4.1%	Yes	0.024	7.76	0.016	0.008	No	16	10
2	Hydragard - HFR	MgO (wt%)	0.307	0.316	0.009	2.9%	No	0.021	6.78	0.014	0.015	No	16	10
4	Isolok-HFR-12mL	MgO (wt%)	0.303	0.299	-0.005	-1.6%	No	0.014	4.64	0.013	0.006	No	16	10
3	Isolok-LFR-12mL	MgO (wt%)	0.311	0.316	0.005	1.5%	No	0.012	3.72	0.008	0.008	No	15	10
6	Hydragard-LFR	MgO (wt%)	0.310	0.312	0.002	0.6%	No	0.011	3.48	0.011	0.010	No	15	10
5	Isolok-HFR-3mL	MgO (wt%)	0.310	0.309	-0.002	-0.6%	No	0.007	2.39	0.007	0.004	No	14	9
2	Hydragard - HFR	MnO (wt%)	2.816	2.934	0.117	4.2%	No	0.254	9.03	0.146	0.193	No	16	10
1	Isolok-LFR-3mL	MnO (wt%)	2.808	2.936	0.129	4.6%	Yes	0.226	8.04	0.163	0.073	Yes	16	10
4	Isolok-HFR-12mL	MnO (wt%)	2.766	2.710	-0.056	-2.0%	No	0.141	5.09	0.140	0.067	Yes	16	10
3	Isolok-LFR-12mL	MnO (wt%)	2.833	2.879	0.047	1.7%	No	0.144	5.08	0.131	0.088	No	16	10
5	Isolok-HFR-3mL	MnO (wt%)	2.804	2.819	0.015	0.5%	No	0.087	3.09	0.125	0.035	Yes	15	9
6	Hydragard-LFR	MnO (wt%)	2.823	2.824	0.001	0.0%	No	0.080	2.85	0.088	0.094	No	13	10
3	Isolok-LFR-12mL	Na2O (wt%)	13.327	13.493	0.167	1.3%	No	0.522	3.92	0.444	0.397	No	16	10
1	Isolok-LFR-3mL	Na2O (wt%)	13.710	13.766	0.056	0.4%	No	0.442	3.22	0.682	0.226	Yes	16	10
2	Hydragard - HFR	Na2O (wt%)	13.439	13.317	-0.122	-0.9%	No	0.397	2.96	0.353	0.154	No	15	8
5	Isolok-HFR-3mL	Na2O (wt%)	13.243	13.147	-0.096	-0.7%	No	0.369	2.78	0.386	0.195	No	16	10

Table B10. Phase 2 (High-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwas (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwas (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
6	Hydragard-LFR	Na2O (wt%)	13.176	13.186	0.010	0.1%	No	0.336	2.55	0.405	0.354	No	15	10
4	Isolok-HFR-12mL	Na2O (wt%)	13.269	13.218	-0.051	-0.4%	No	0.295	2.22	0.303	0.243	No	16	9
2	Hydragard - HFR	NiO (wt%)	1.199	1.268	0.069	5.8%	No	0.156	13.02	0.088	0.128	No	16	10
1	Isolok-LFR-3mL	NiO (wt%)	1.209	1.247	0.038	3.1%	No	0.102	8.45	0.092	0.043	No	16	10
3	Isolok-LFR-12mL	NiO (wt%)	1.176	1.187	0.011	1.0%	No	0.074	6.26	0.071	0.078	No	15	10
4	Isolok-HFR-12mL	NiO (wt%)	1.192	1.170	-0.022	-1.8%	No	0.074	6.18	0.087	0.038	Yes	16	10
6	Hydragard-LFR	NiO (wt%)	1.189	1.181	-0.007	-0.6%	No	0.068	5.70	0.083	0.050	No	16	10
5	Isolok-HFR-3mL	NiO (wt%)	1.194	1.208	0.014	1.2%	No	0.061	5.09	0.084	0.024	Yes	16	10
2	Hydragard - HFR	SiO2 (wt%)	49.699	48.610	-1.089	-2.2%	Yes	1.752	3.52	0.818	0.666	No	16	9
3	Isolok-LFR-12mL	SiO2 (wt%)	50.102	49.118	-0.984	-2.0%	Yes	1.759	3.51	0.797	1.078	No	15	10
5	Isolok-HFR-3mL	SiO2 (wt%)	50.088	50.744	0.656	1.3%	No	1.413	2.82	0.788	1.042	No	15	10
4	Isolok-HFR-12mL	SiO2 (wt%)	49.913	50.511	0.599	1.2%	No	1.172	2.35	0.943	0.434	Yes	16	9
6	Hydragard-LFR	SiO2 (wt%)	49.974	49.568	-0.406	-0.8%	No	1.082	2.17	0.704	0.930	No	15	10
1	Isolok-LFR-3mL	SiO2 (wt%)	50.880	51.391	0.511	1.0%	No	0.984	1.93	0.682	0.317	Yes	12	9
1	Isolok-LFR-3mL	Sum (wt%)	101.568	102.646	1.078	1.1%	No	2.345	2.31	1.687	0.800	No	13	9
5	Isolok-HFR-3mL	Sum (wt%)	99.430	100.077	0.647	0.7%	No	1.906	1.92	1.621	1.259	No	15	10
6	Hydragard-LFR	Sum (wt%)	99.602	99.052	-0.551	-0.6%	No	1.799	1.81	0.991	1.635	Yes	14	10
2	Hydragard - HFR	Sum (wt%)	99.400	99.141	-0.259	-0.3%	No	1.183	1.19	1.167	0.828	No	15	9
3	Isolok-LFR-12mL	Sum (wt%)	99.627	99.603	-0.024	0.0%	No	0.901	0.90	0.869	1.153	No	14	9
4	Isolok-HFR-12mL	Sum (wt%)	99.067	99.209	0.142	0.1%	No	0.877	0.89	0.820	0.838	No	14	9
2	Hydragard - HFR	TiO2 (wt%)	0.018	0.019	0.002	9.7%	Yes	0.003	15.61	0.001	0.001	No	13	10
1	Isolok-LFR-3mL	TiO2 (wt%)	0.016	0.015	-0.001	-3.7%	No	0.002	12.44	0.002	0.001	No	16	10
6	Hydragard-LFR	TiO2 (wt%)	0.016	0.016	0.000	-1.6%	No	0.002	10.01	0.002	0.002	No	16	10
4	Isolok-HFR-12mL	TiO2 (wt%)	0.019	0.019	0.000	-1.4%	No	0.002	8.71	0.002	0.002	No	15	10
3	Isolok-LFR-12mL	TiO2 (wt%)	0.019	0.018	0.000	-1.4%	No	0.001	7.18	0.001	0.002	No	15	10
5	Isolok-HFR-3mL	TiO2 (wt%)	0.016	0.016	0.000	1.5%	No	0.001	5.28	0.001	0.000	Yes	15	9
4	Isolok-HFR-12mL	ZnO (wt%)	0.006	0.006	0.000	-3.6%	No	0.000	7.21	0.000	0.000	No	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.006	0.006	0.000	-3.0%	No	0.000	6.74	0.000	0.000	No	16	10
2	Hydragard - HFR	ZnO (wt%)	0.006	0.006	0.000	-1.8%	No	0.000	5.53	0.000	0.000	No	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.006	0.006	0.000	-1.1%	No	0.000	4.53	0.000	0.000	No	16	10
6	Hydragard-LFR	ZnO (wt%)	0.006	0.006	0.000	-1.0%	No	0.000	4.36	0.000	0.000	No	16	9
3	Isolok-LFR-12mL	ZnO (wt%)	0.006	0.006	0.000	-0.6%	No	0.000	3.02	0.000	0.000	Yes	15	10
1	Isolok-LFR-3mL	ZrO2 (wt%)	0.104	0.108	0.004	4.0%	Yes	0.007	7.10	0.005	0.003	No	16	10
2	Hydragard - HFR	ZrO2 (wt%)	0.115	0.120	0.005	4.6%	Yes	0.007	6.42	0.002	0.003	No	16	9
5	Isolok-HFR-3mL	ZrO2 (wt%)	0.111	0.109	-0.001	-1.1%	No	0.004	3.18	0.003	0.002	No	16	10
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.113	0.113	0.001	0.6%	No	0.003	2.84	0.003	0.004	No	16	10
6	Hydragard-LFR	ZrO2 (wt%)	0.109	0.110	0.000	0.4%	No	0.003	2.61	0.003	0.003	No	16	10
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.111	0.111	0.000	0.1%	No	0.003	2.36	0.003	0.004	No	16	10

Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Analyte=density (g/mL)



Variability Gauge Analyte=wt% dried solids

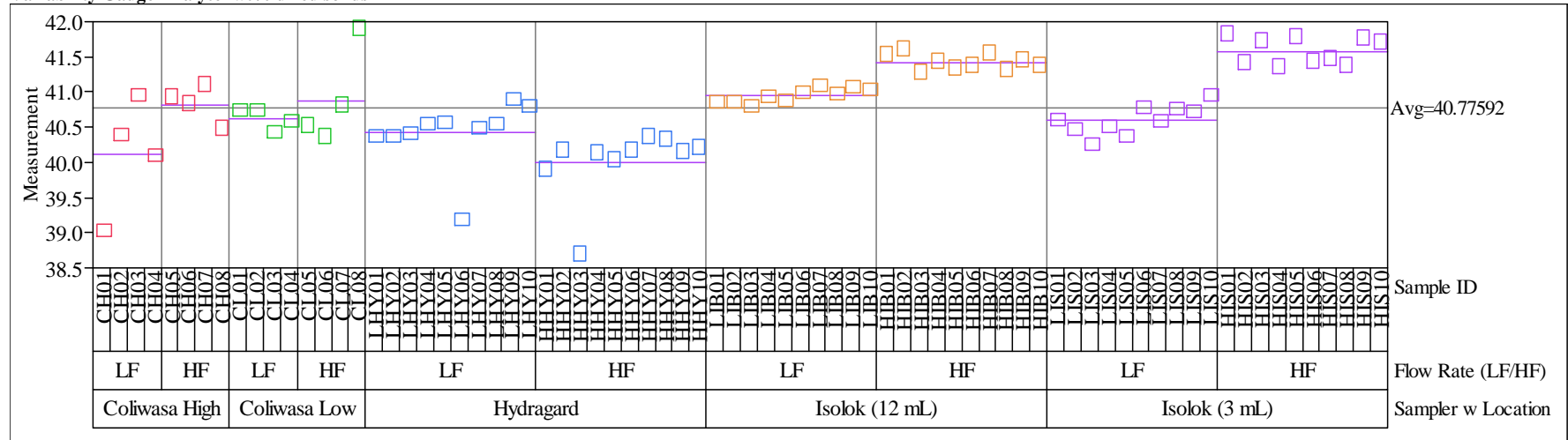
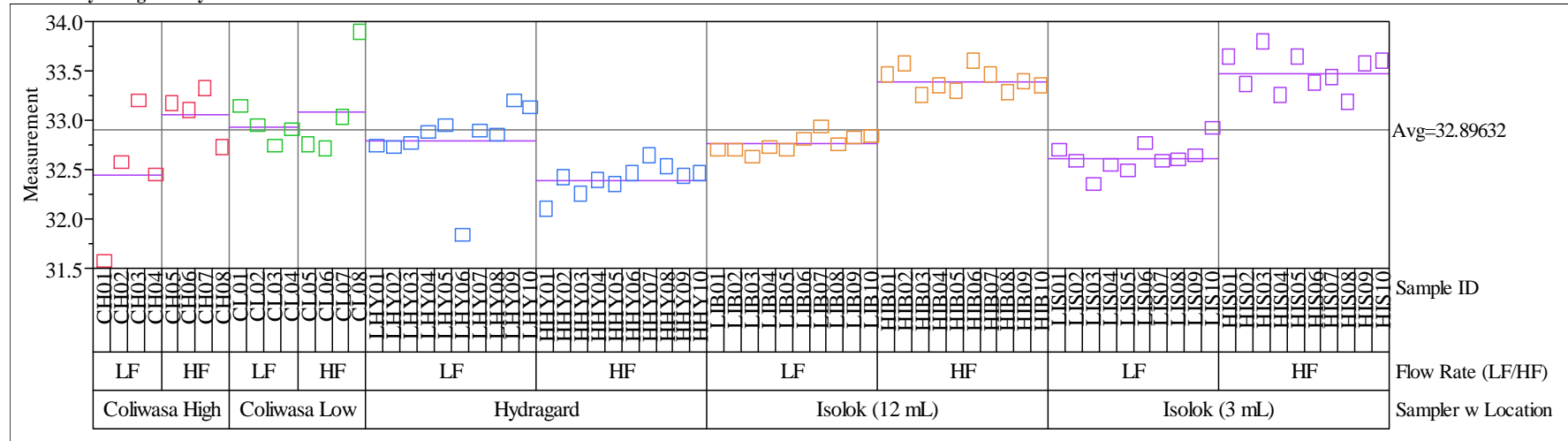


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Analyte=wt% vitrified solids



Variability Gauge Type of Material=SME Simulant, Analyte=A1/B

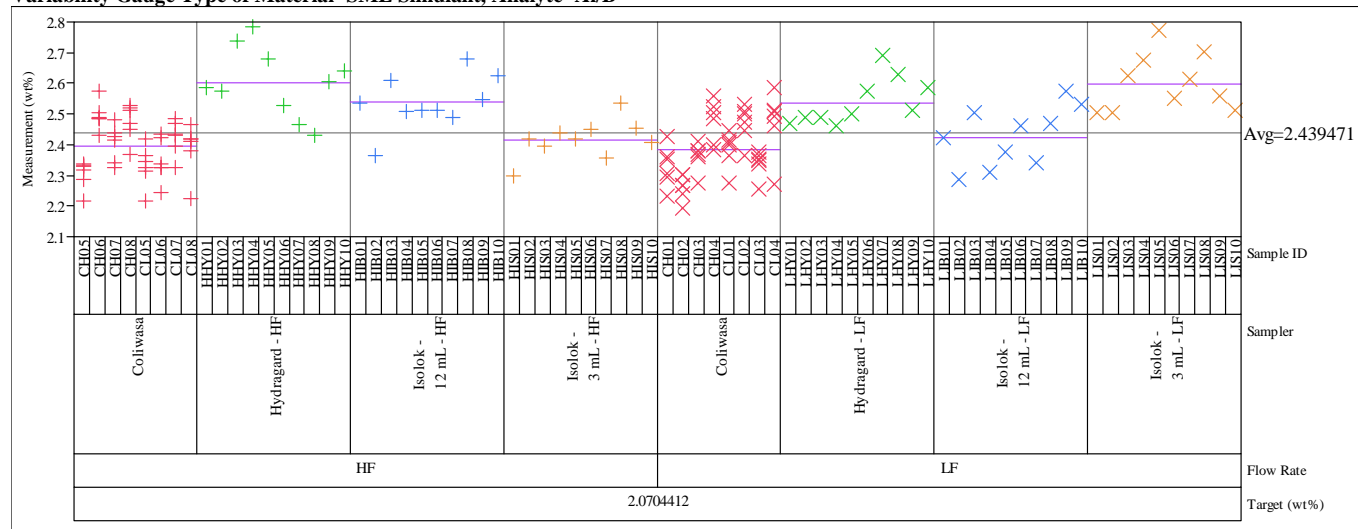
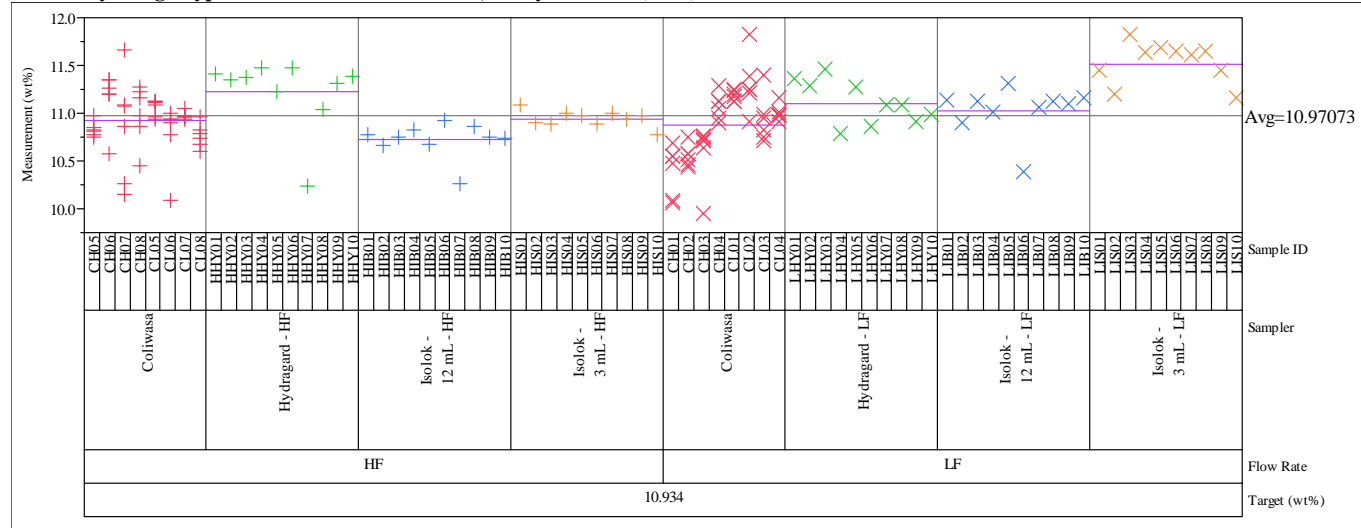


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=Al₂O₃ (wt%)



Variability Gauge Type of Material=SME Simulant, Analyte=B₂O₃ (wt%)

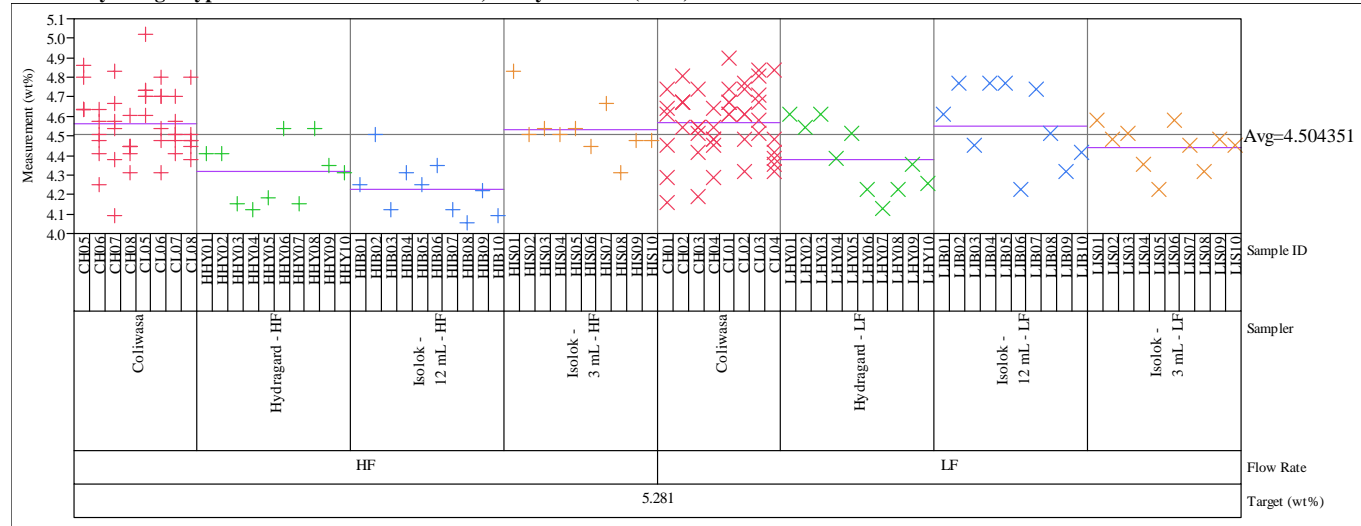
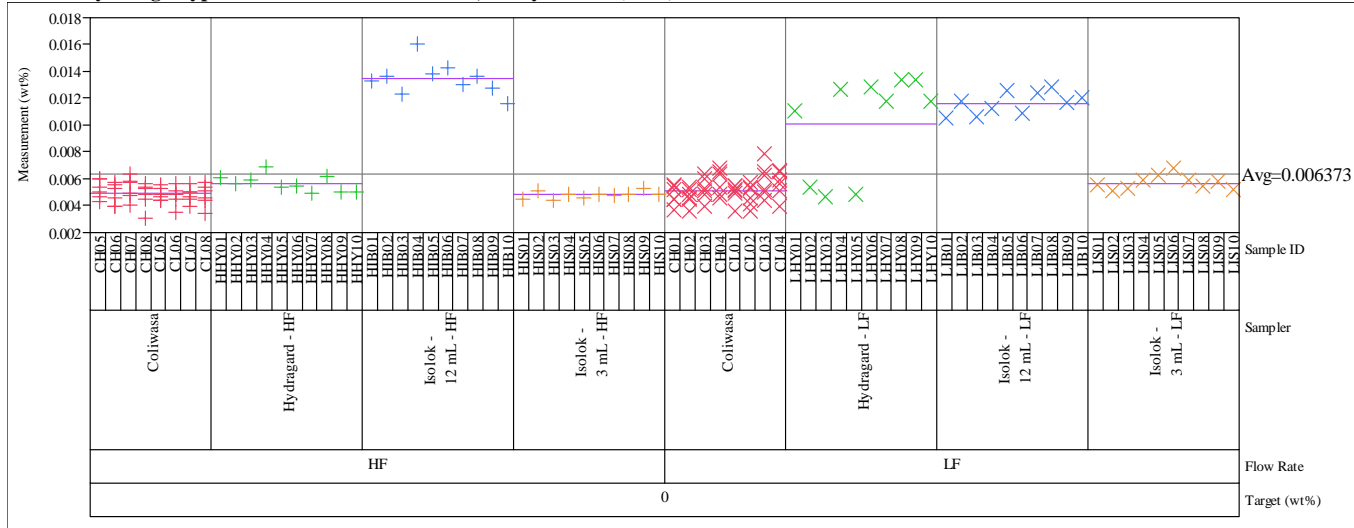


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=BaO (wt%)



Variability Gauge Type of Material=SME Simulant, Analyte=CaO (wt%)

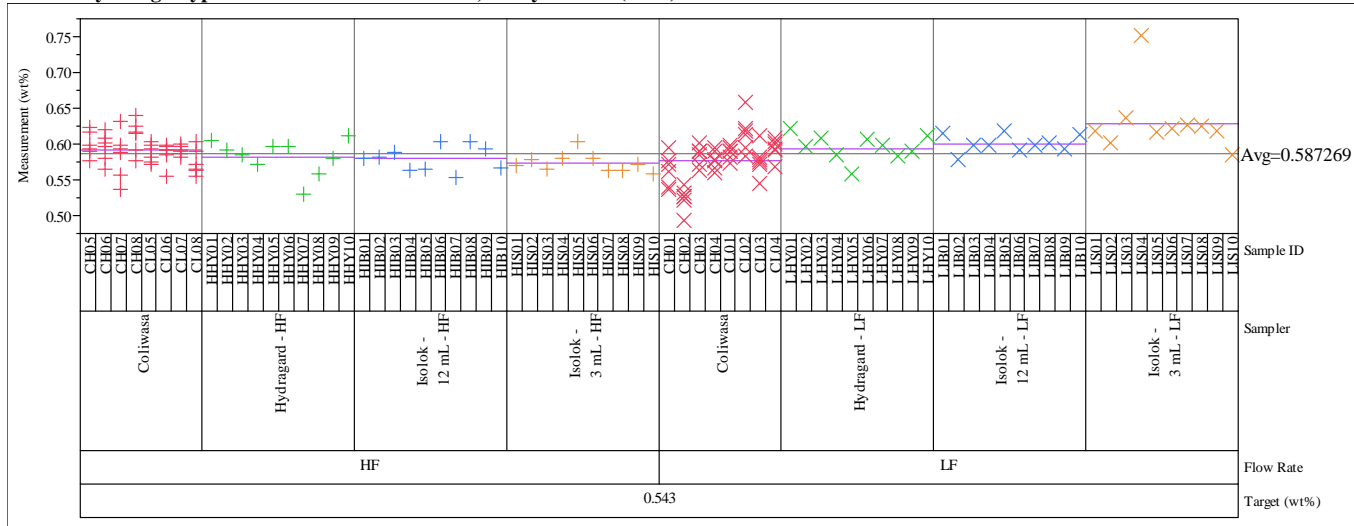
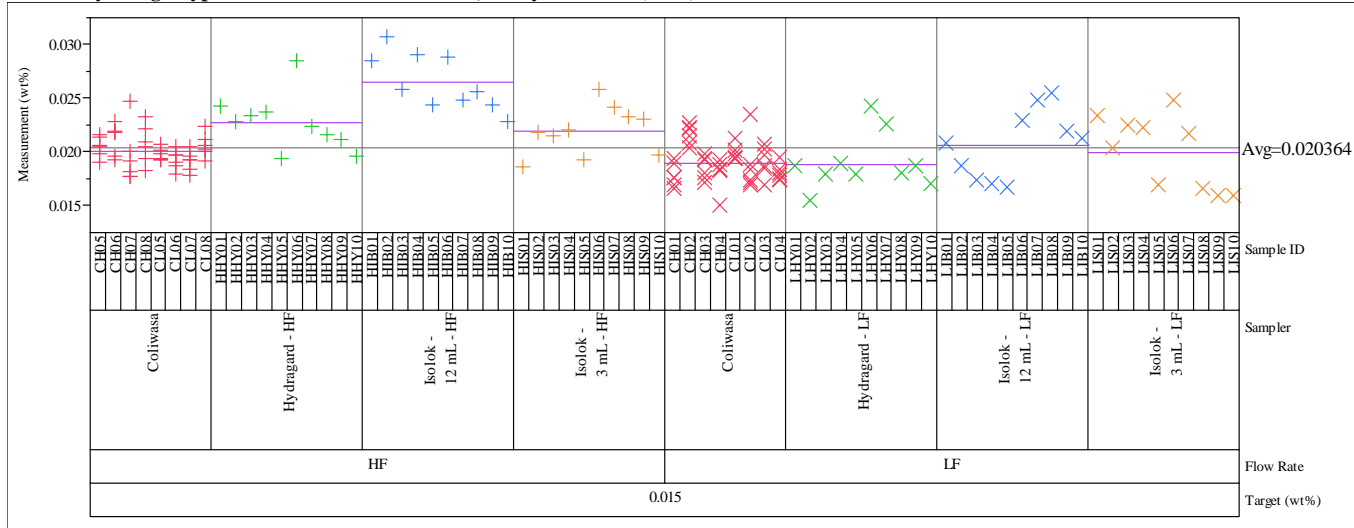


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=Cr2O3 (wt%)



Variability Gauge Type of Material=SME Simulant, Analyte=CuO (wt%)

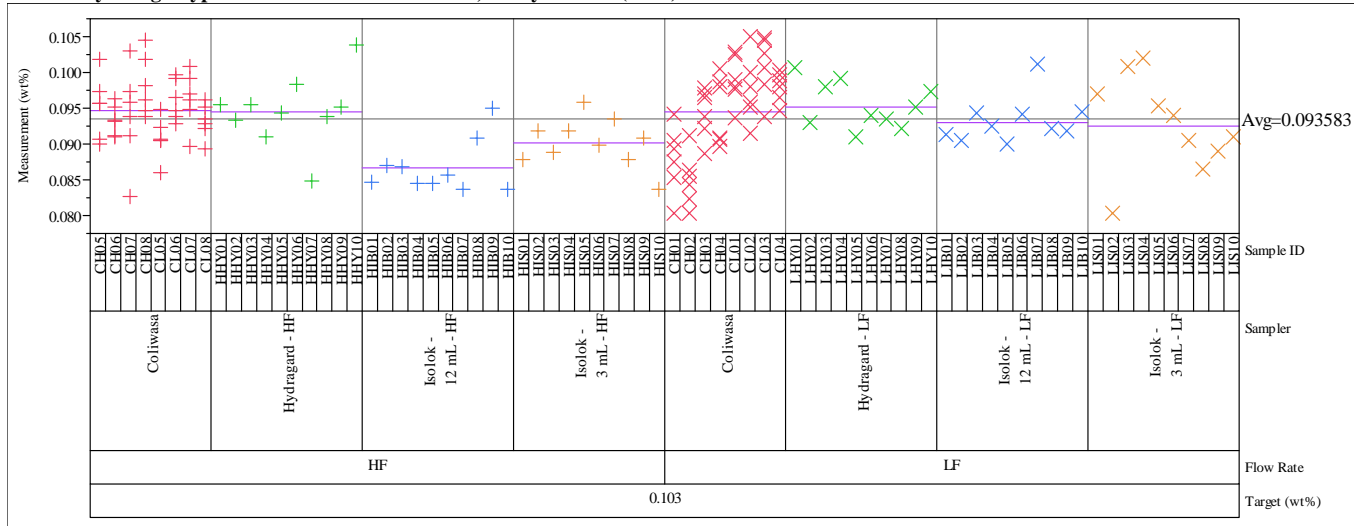
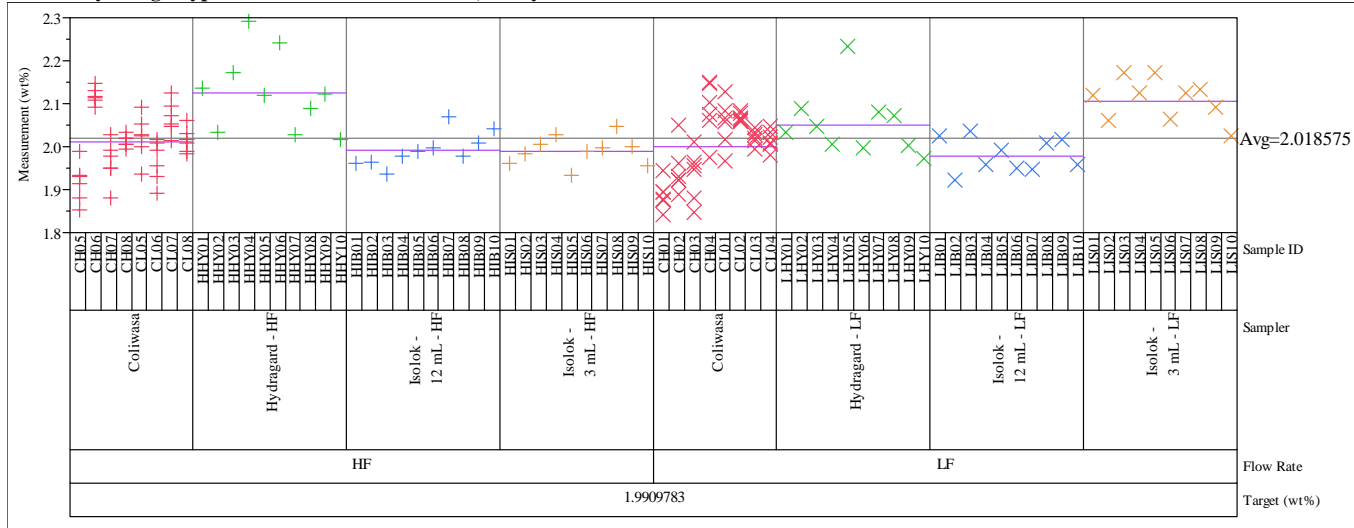


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=Fe/Li



Variability Gauge Type of Material=SME Simulant, Analyte=Fe2O3 (wt%)

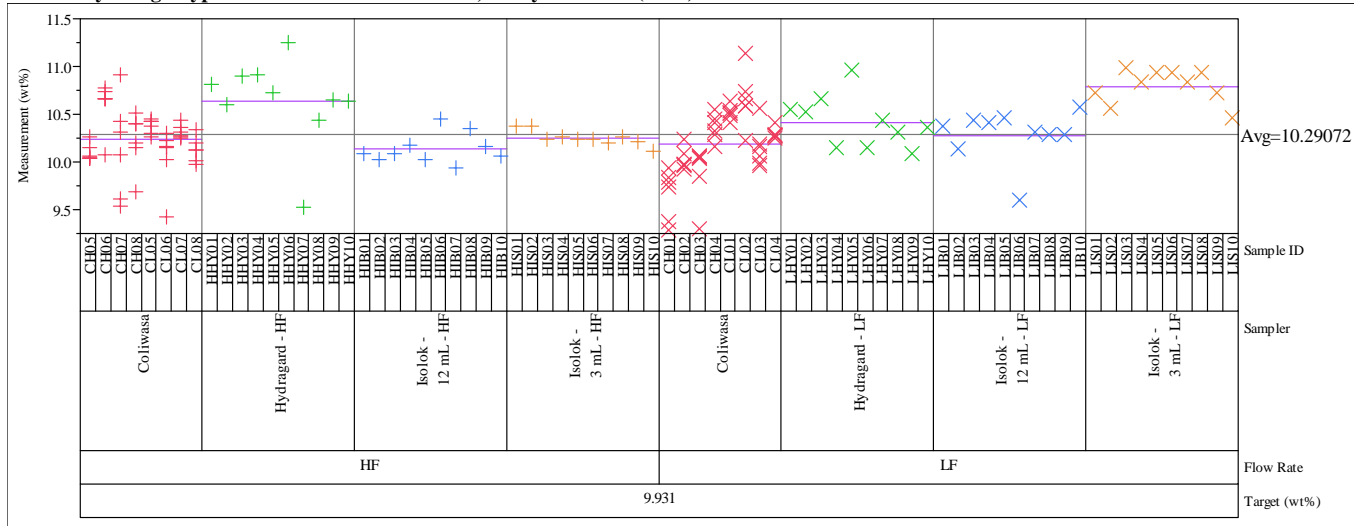
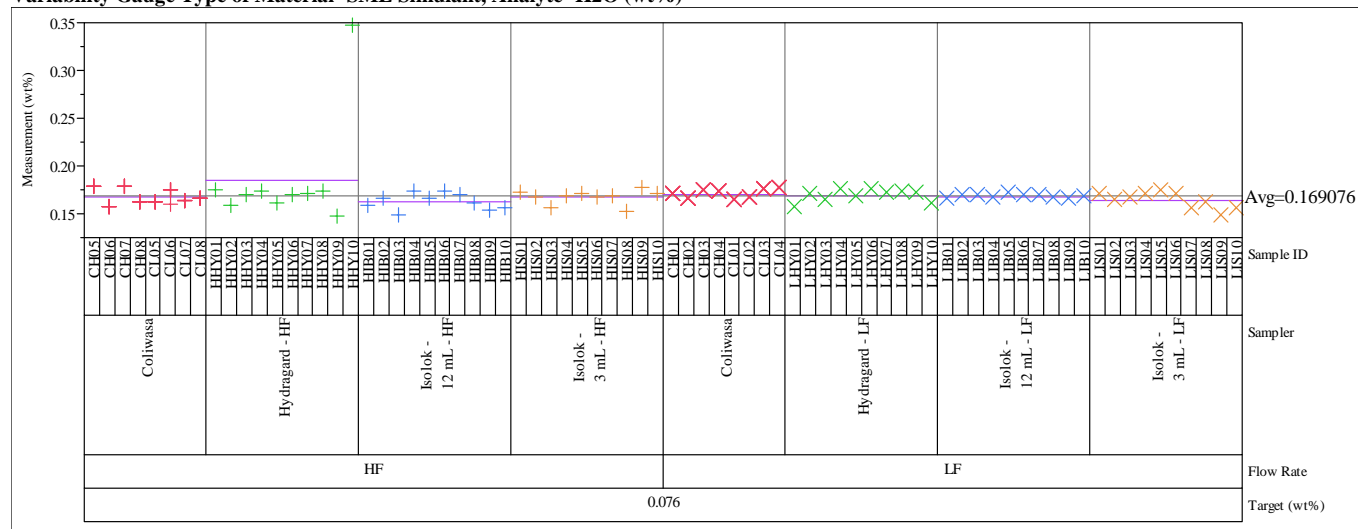


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=K₂O (wt%)



Variability Gauge Type of Material=SME Simulant, Analyte=Li₂O (wt%)

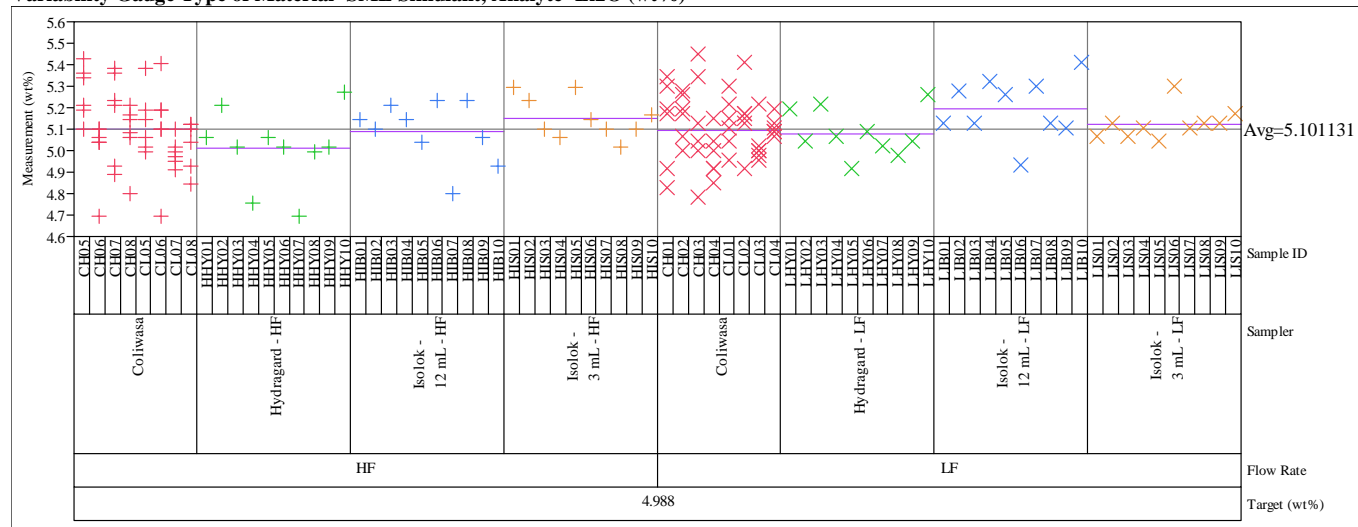


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

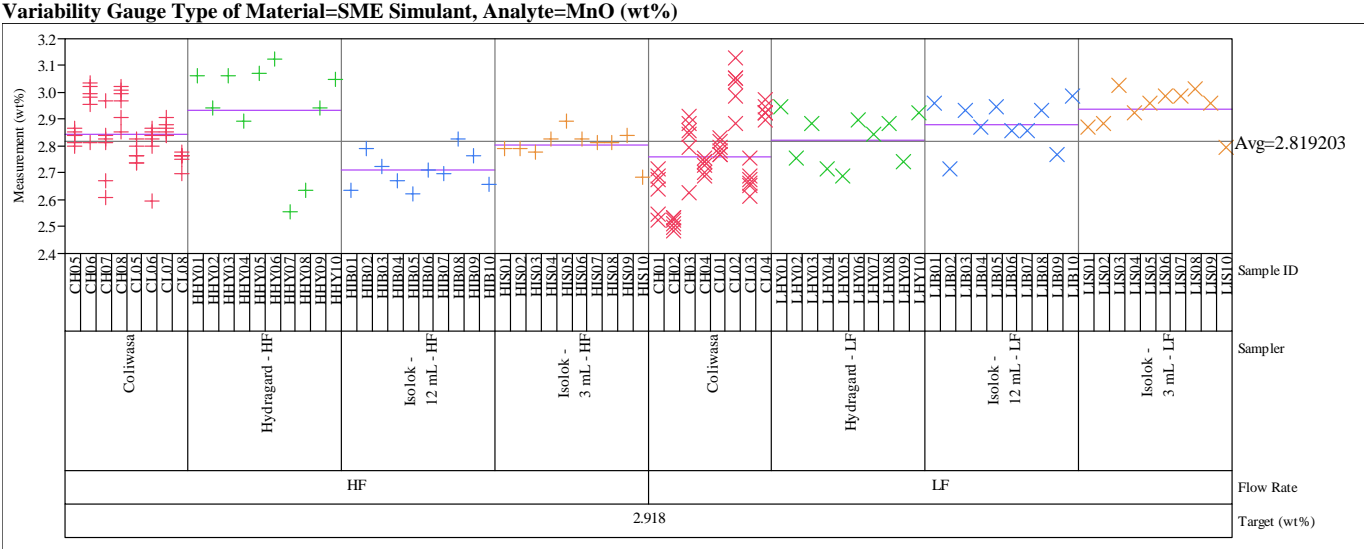
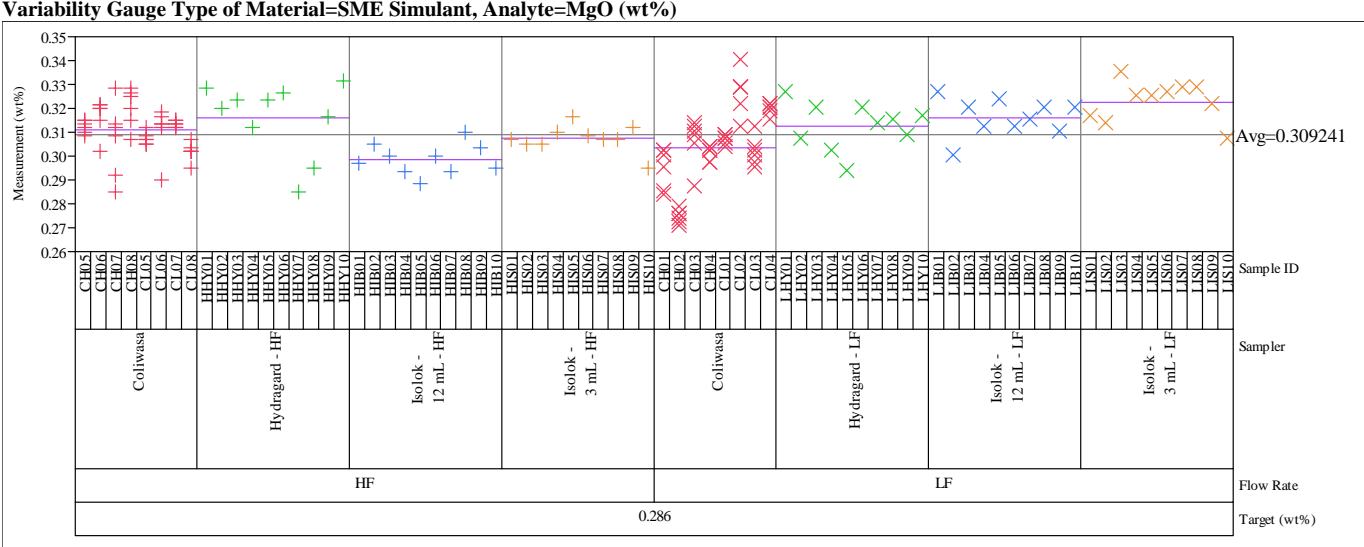
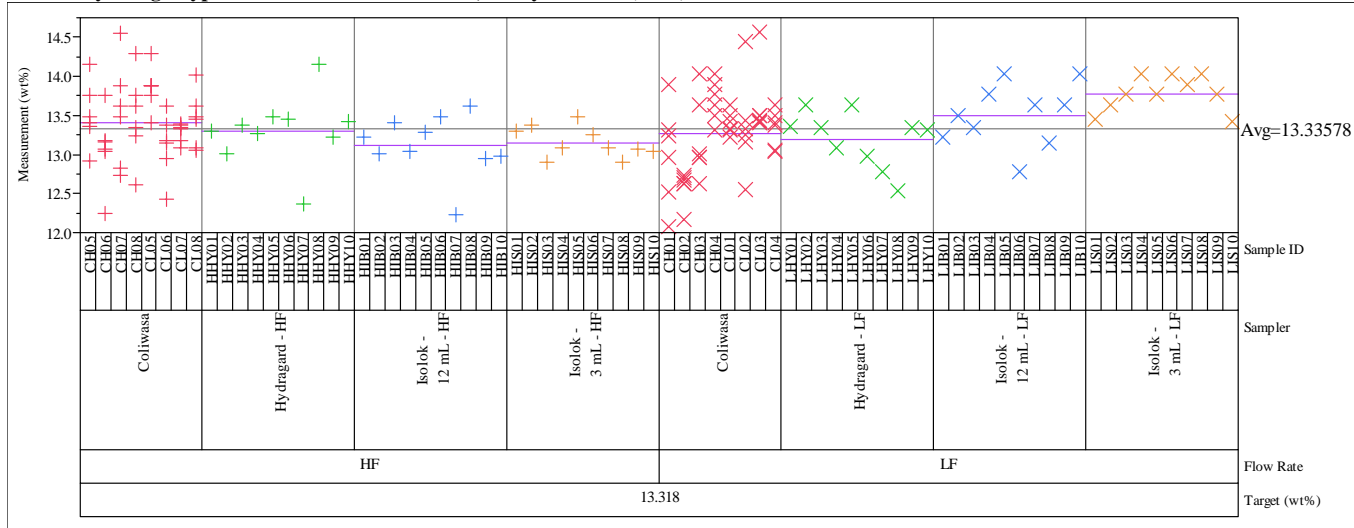


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=Na₂O (wt%)



Variability Gauge Type of Material=SME Simulant, Analyte=NiO (wt%)

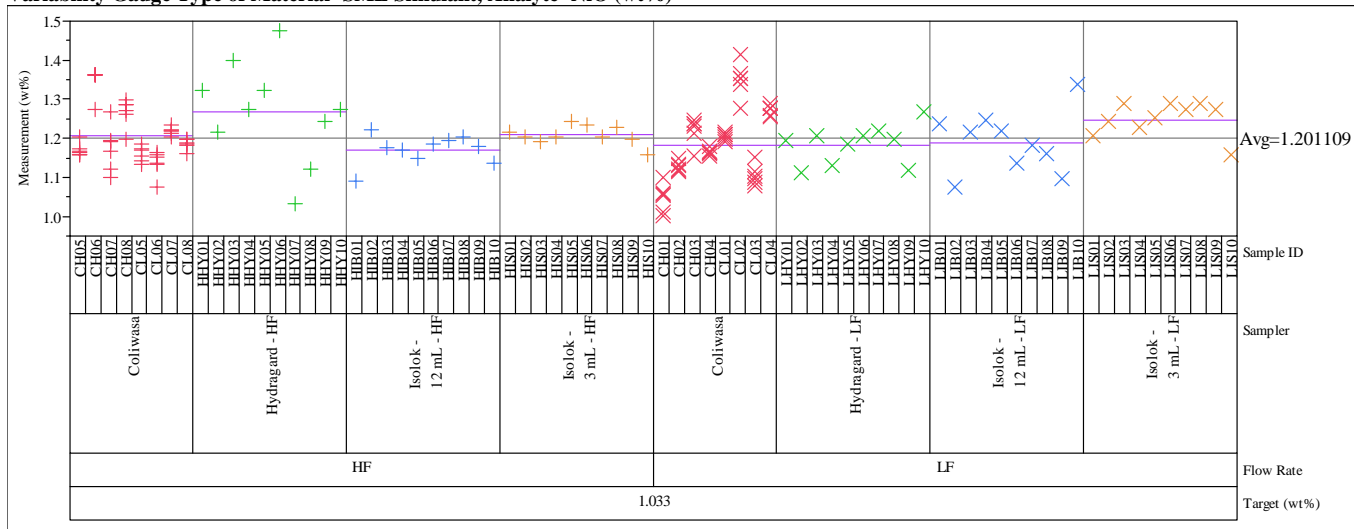
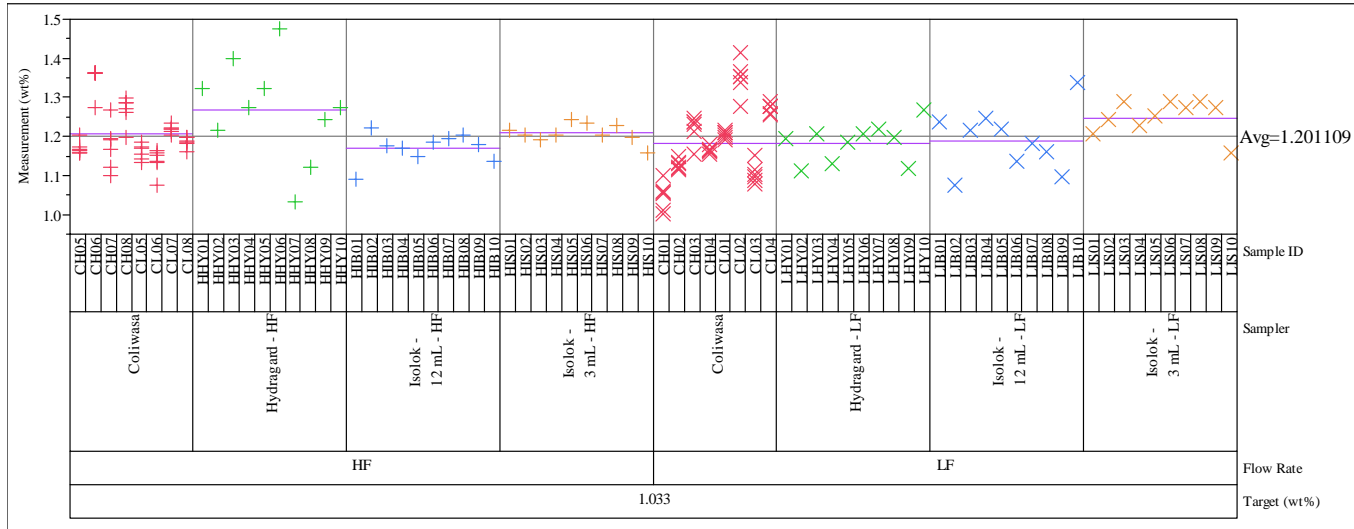


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing



Variability Gauge Type of Material=SME Simulant, Analyte=SiO2 (wt%)

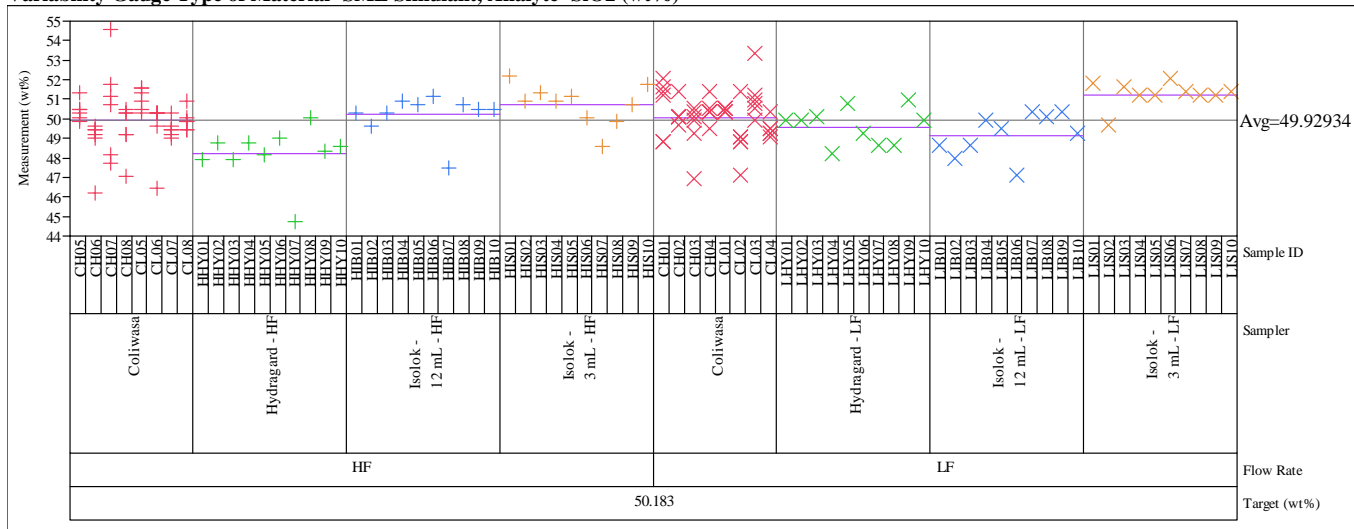
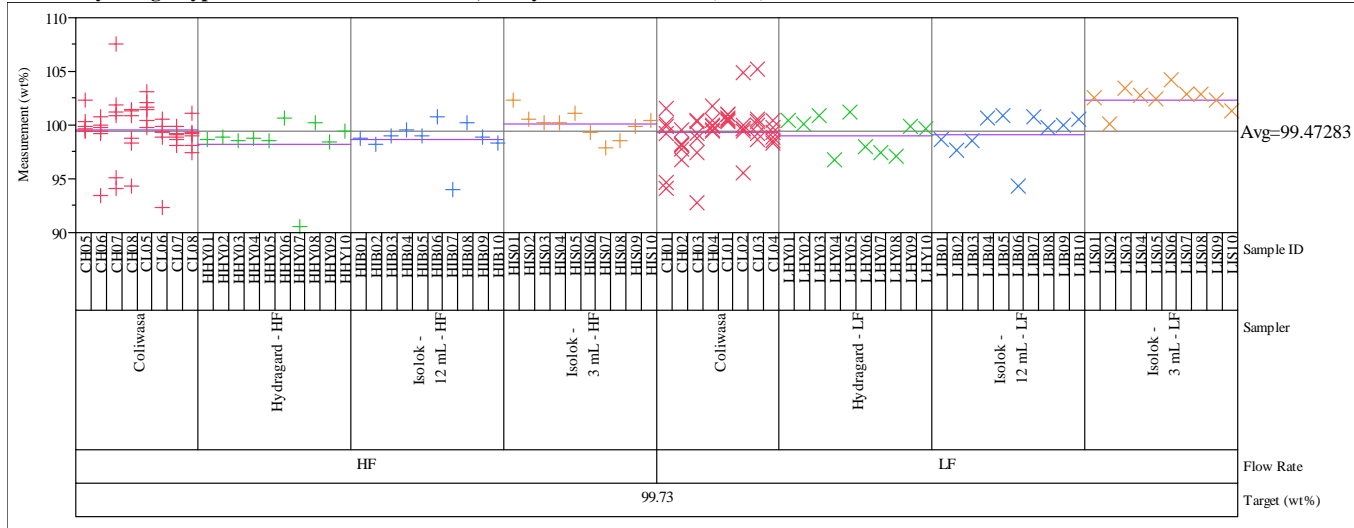


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=Sum of Oxides (wt%)



Variability Gauge Type of Material=SME Simulant, Analyte=TiO2 (wt%)

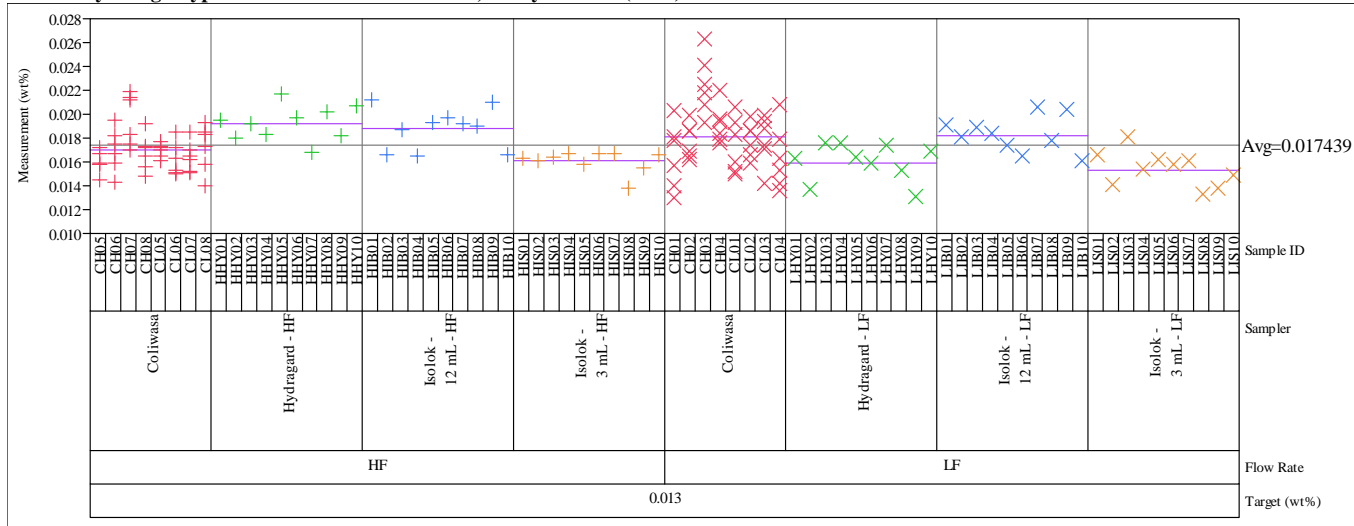
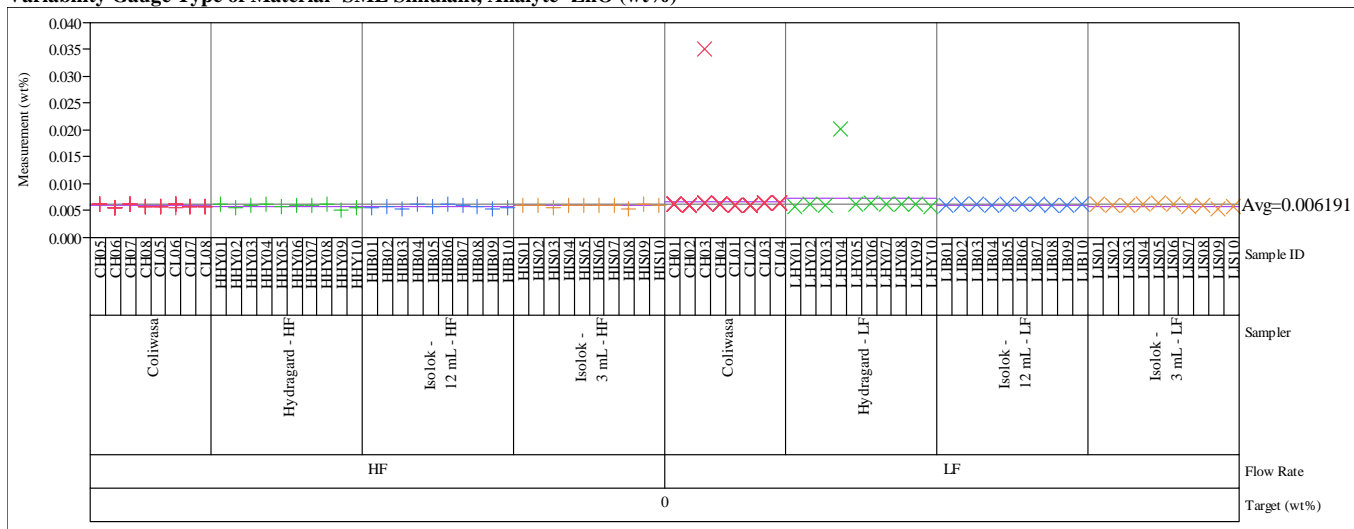


Exhibit B1. Density, Weight Percent Solids, and Oxide Measurements from the High-Rheology (Phase 2) Testing

Variability Gauge Type of Material=SME Simulant, Analyte=ZnO (wt%)



Variability Gauge Type of Material=SME Simulant, Analyte=ZrO2 (wt%)

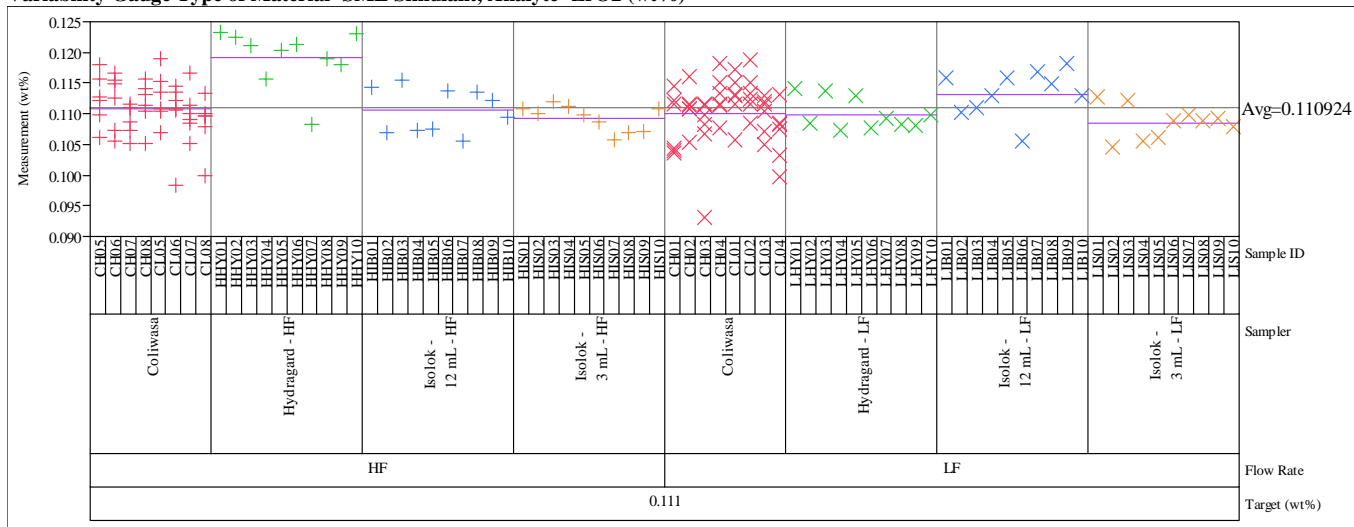
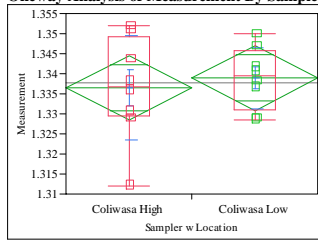


Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement By Sampler w Location Analyte=density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.014827
Adj Rsquare	-0.05554
Root Mean Square Error	0.010675
Mean of Response	1.337738
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	0.00245	t Ratio	0.459027
Std Err Dif	0.00534	DF	14
Upper CL Dif	0.01390	Prob > t	0.6533
Lower CL Dif	-0.00900	Prob > t	0.3266
Confidence	0.95	Prob < t	0.6734

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.00002401	0.000024	0.2107	0.6533
Error	14	0.00159531	0.000114		
C. Total	15	0.00161932			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	1.33651	0.00377	1.3284	1.3446
Coliwasa Low	8	1.33896	0.00377	1.3309	1.3471

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	1.33651	0.013022	0.00460	1.3256	1.3474
Coliwasa Low	8	1.33896	0.007637	0.00270	1.3326	1.3453

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	0.00245	t Ratio	0.459027
Std Err Dif	0.00534	DF	11.30546
Upper CL Dif	0.01416	Prob > t	0.6549
Lower CL Dif	-0.00926	Prob > t	0.3275
Confidence	0.95	Prob < t	0.6725

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.0130223	0.0096375	0.0096375
Coliwasa Low	8	0.0076367	0.0058375	0.0058375

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.4805	1	14	0.2438
Brown-Forsythe	1.3883	1	14	0.2583
Levene	1.3951	1	14	0.2572
Bartlett	1.7787	1	.	0.1823
F Test 2-sided	2.9078	7	7	0.1824

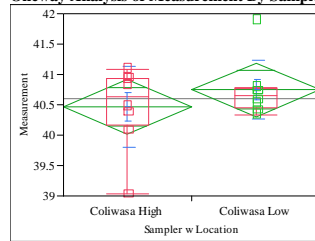
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2107	1	11.305	0.6549

t Test

0.4590

Oneway Analysis of Measurement By Sampler w Location Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.061434
Adj Rsquare	-0.00561
Root Mean Square Error	0.584997
Mean of Response	40.6075
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	0.28000	t Ratio	0.95727
Std Err Dif	0.29250	DF	14
Upper CL Dif	0.90735	Prob > t	0.3547
Lower CL Dif	-0.34735	Prob > t	0.1773
Confidence	0.95	Prob < t	0.8227

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.3136000	0.313600	0.9164	0.3547
Error	14	4.7911000	0.342221		
C. Total	15	5.1047000			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	40.4675	0.20683	40.024	40.911
Coliwasa Low	8	40.7475	0.20683	40.304	41.191

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	40.4675	0.670645	0.23711	39.907	41.028
Coliwasa Low	8	40.7475	0.484436	0.17127	40.343	41.152

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	0.28000	t Ratio	0.95727
Std Err Dif	0.29250	DF	12.74172
Upper CL Dif	0.91321	Prob > t	0.3562
Lower CL Dif	-0.35321	Prob > t	0.1781
Confidence	0.95	Prob < t	0.8219

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.6706447	0.4731250	0.4725000
Coliwasa Low	8	0.4844363	0.2937500	0.2850000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3628	1	14	0.5566
Brown-Forsythe	0.7396	1	14	0.4043
Levene	0.7800	1	14	0.3921
Bartlett	0.6793	1	.	0.4098
F Test 2-sided	1.9165	7	7	0.4102

Welch Anova testing Means Equal, allowing Std Devs Not Equal

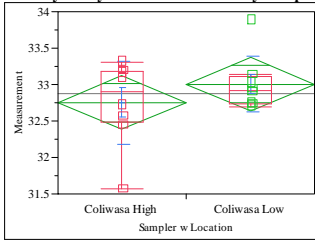
F Ratio	DFNum	DFDen	Prob > F
0.9164	1	12.742	0.3562

t Test

0.9573

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement By Sampler w Location Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.070562
Adj Rsquare	0.004174
Root Mean Square Error	0.487412
Mean of Response	32.87938
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	0.25125	t Ratio	1.030955
Std Err Dif	0.24371	DF	14
Upper CL Dif	0.77395	Prob > t	0.3200
Lower CL Dif	-0.27145	Prob > t	0.1600
Confidence	0.95	Prob < t	0.8400

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.2525062	0.252506	1.0629	0.3200
Error	14	3.3259875	0.237571		
C. Total	15	3.5784937			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	32.7538	0.17233	32.384	33.123
Coliwasa Low	8	33.0050	0.17233	32.635	33.375

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	32.7538	0.571713	0.20213	32.276	33.232
Coliwasa Low	8	33.0050	0.385079	0.13615	32.683	33.327

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	0.25125	t Ratio	1.030955
Std Err Dif	0.24371	DF	12.26731
Upper CL Dif	0.78096	Prob > t	0.3225
Lower CL Dif	-0.27846	Prob > t	0.1612
Confidence	0.95	Prob < t	0.8388

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.5717127	0.4287500	0.4287500
Coliwasa Low	8	0.3850788	0.2537500	0.2375000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5965	1	14	0.4527
Brown-Forsythe	1.2543	1	14	0.2816
Levene	1.2796	1	14	0.2770
Bartlett	0.9948	1	.	0.3186
F Test 2-sided	2.2042	7	7	0.3189

Welch Anova testing Means Equal, allowing Std Devs Not Equal

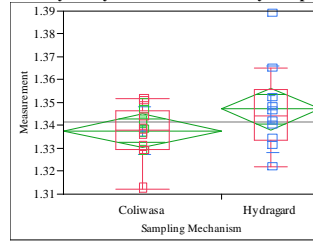
F Ratio	DFNum	DFDen	Prob > F
1.0629	1	12.267	0.3225

t Test

1.0310

Hydragard at Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



**Oneway Anova
Summary of Fit**

Rsquare	0.101467
Adj Rsquare	0.064028
Root Mean Square Error	0.014198
Mean of Response	1.341362
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.00942	t Ratio	1.646271
Std Err Dif	0.00572	DF	24
Upper CL Dif	0.02124	Prob > t	0.1127
Lower CL Dif	-0.00239	Prob > t	0.0564
Confidence	0.95	Prob < t	0.9436

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00054636	0.000546	2.7102	0.1127
Error	24	0.00483824	0.000202		
C. Total	25	0.00538460			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.33774	0.00355	1.3304	1.3451
Hydragard	10	1.34716	0.00449	1.3379	1.3564

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.33774	0.010390	0.00260	1.3322	1.3433
Hydragard	10	1.34716	0.018912	0.00598	1.3336	1.3607

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.00942	t Ratio	1.445125
Std Err Dif	0.00652	DF	12.45011
Upper CL Dif	0.02357	Prob > t	0.1731
Lower CL Dif	-0.00473	Prob > t	0.0866
Confidence	0.95	Prob < t	0.9134

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0103901	0.0078078	0.0077750
Hydragard	10	0.0189119	0.0132320	0.0130600

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.2250	1	24	0.1488
Brown-Forsythe	1.8312	1	24	0.1886
Levene	2.0575	1	24	0.1644
Bartlett	4.0256	1	.	0.0448
F Test 2-sided	3.3130	9	15	0.0395

Welch Anova testing Means Equal, allowing Std Devs Not Equal

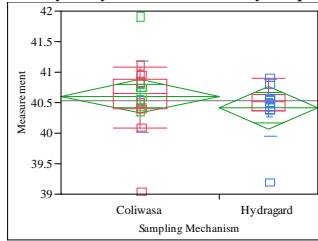
F Ratio	DFNum	DFDen	Prob > F
2.0884	1	12.45	0.1731

t Test

1.4451

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Hydragard at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.031025
Adj Rsquare	-0.00935
Root Mean Square Error	0.541923
Mean of Response	40.53385
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwas
Assuming equal variances

Difference	-0.19150	t Ratio	-0.87661
Std Err Dif	0.21846	DF	24
Upper CL Dif	0.25937	Prob > t	0.3894
Lower CL Dif	-0.64237	Prob > t	0.8053
Confidence	0.95	Prob < t	0.1947

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.2256754	0.225675	0.7684	0.3894
Error	24	7.0483400	0.293681		
C. Total	25	7.2740154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	40.6075	0.13548	40.328	40.887
Hydragard	10	40.4160	0.17137	40.062	40.770

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	40.6075	0.583364	0.14584	40.297	40.918
Hydragard	10	40.4160	0.464715	0.14696	40.084	40.748

t Test

Hydragard-Coliwas
Assuming unequal variances

Difference	-0.19150	t Ratio	-0.92494
Std Err Dif	0.20704	DF	22.41336
Upper CL Dif	0.23742	Prob > t	0.3648
Lower CL Dif	-0.62042	Prob > t	0.8176
Confidence	0.95	Prob < t	0.1824

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.5833638	0.3787500	0.3787500
Hydragard	10	0.4647150	0.2668000	0.2540000

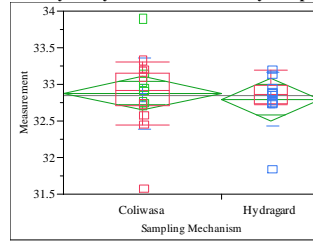
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1953	1	24	0.6625
Brown-Forsythe	0.5431	1	24	0.4683
Levene	0.4580	1	24	0.5050
Bartlett	0.5319	1		0.4658
F Test 2-sided	1.5758	15	9	0.4966

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8555	1	22.413	0.3648

t Test
0.9249

Hydragard at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.009474
Adj Rsquare	-0.0318
Root Mean Square Error	0.447218
Mean of Response	32.84615
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwas
Assuming equal variances

Difference	-0.08637	t Ratio	-0.47912
Std Err Dif	0.18028	DF	24
Upper CL Dif	0.28570	Prob > t	0.6362
Lower CL Dif	-0.45845	Prob > t	0.6819
Confidence	0.95	Prob < t	0.3181

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.0459116	0.045912	0.2296	0.6362
Error	24	4.8001038	0.200004		
C. Total	25	4.8460154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	32.8794	0.11180	32.649	33.110
Hydragard	10	32.7930	0.14142	32.501	33.085

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	32.8794	0.488432	0.12211	32.619	33.140
Hydragard	10	32.7930	0.368422	0.11651	32.529	33.057

t Test

Hydragard-Coliwas
Assuming unequal variances

Difference	-0.08637	t Ratio	-0.51179
Std Err Dif	0.16877	DF	22.98887
Upper CL Dif	0.26276	Prob > t	0.6137
Lower CL Dif	-0.43551	Prob > t	0.6932
Confidence	0.95	Prob < t	0.3068

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.4884324	0.3357031	0.3331250
Hydragard	10	0.3684216	0.2204000	0.2090000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3156	1	24	0.5794
Brown-Forsythe	0.8558	1	24	0.3641
Levene	0.7819	1	24	0.3853
Bartlett	0.8075	1		0.3689
F Test 2-sided	1.7576	15	9	0.3957

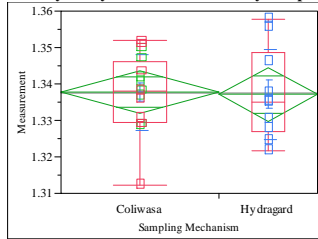
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2619	1	22.989	0.6137

t Test
0.5118

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Hydragard at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.000729
Adj Rsquare	-0.04091
Root Mean Square Error	0.011204
Mean of Response	1.337508
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.00060	t Ratio	-0.1323
Std Err Dif	0.00452	DF	24
Upper CL Dif	0.00872	Prob > t	0.8959
Lower CL Dif	-0.00992	Prob > t	0.5521
Confidence	0.95	Prob < t	0.4479

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00000220	2.197e-6	0.0175	0.8959
Error	24	0.00301246	0.000126		
C. Total	25	0.00301466			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.33774	0.00280	1.3320	1.3435
Hydragard	10	1.33714	0.00354	1.3298	1.3445

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.33774	0.010390	0.00260	1.3322	1.3433
Hydragard	10	1.33714	0.012442	0.00393	1.3282	1.3460

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.00060	t Ratio	-0.12674
Std Err Dif	0.00471	DF	16.65696
Upper CL Dif	0.00936	Prob > t	0.9007
Lower CL Dif	-0.01056	Prob > t	0.5497
Confidence	0.95	Prob < t	0.4503

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0103901	0.0078078	0.0077750
Hydragard	10	0.0124416	0.0096880	0.0093000

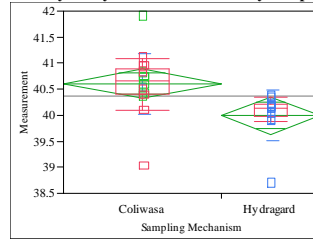
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4244	1	24	0.5209
Brown-Forsythe	0.2800	1	24	0.6016
Levene	0.4753	1	24	0.4972
Bartlett	0.3583	1	.	0.5495
F Test 2-sided	1.4339	9	15	0.5162

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0161	1	16.657	0.9007

t Test
0.1267

Hydragard at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.2433
Adj Rsquare	0.211771
Root Mean Square Error	0.547865
Mean of Response	40.37154
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.6135	t Ratio	-2.77789
Std Err Dif	0.2209	DF	24
Upper CL Dif	-0.1577	Prob > t	0.0105
Lower CL Dif	-1.0693	Prob > t	0.9948
Confidence	0.95	Prob < t	0.0052

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	2.3161985	2.31620	7.7167	0.0105
Error	24	7.2037400	0.30016		
C. Total	25	9.5199385			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.13697	40.325	40.890
Hydragard	10	39.9940	0.17325	39.636	40.352

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.583364	0.14584	40.297	40.918
Hydragard	10	39.9940	0.482935	0.15272	39.649	40.339

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.6135	t Ratio	-2.90526
Std Err Dif	0.2112	DF	21.94821
Upper CL Dif	-0.1755	Prob > t	0.0082
Lower CL Dif	-1.0515	Prob > t	0.9959
Confidence	0.95	Prob < t	0.0041

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.5833638	0.3787500	0.3787500
Hydragard	10	0.4829355	0.2876000	0.2320000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1337	1	24	0.7179
Brown-Forsythe	0.6885	1	24	0.4148
Levene	0.3007	1	24	0.5885
Bartlett	0.3703	1	.	0.5428
F Test 2-sided	1.4592	15	9	0.5762

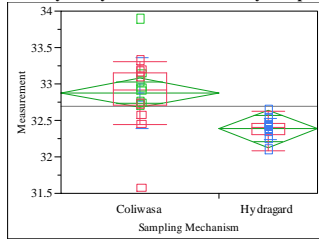
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.4405	1	21.948	0.0082

t Test
2.9053

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Hydragard at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.284346
Adj Rsquare	0.254527
Root Mean Square Error	0.396344
Mean of Response	32.68962
Observations (or Sum Wgts)	26

t Test

Hydragard-Coliwas
Assuming equal variances

Difference	-0.49338	t Ratio	-3.088
Std Err Dif	0.15977	DF	24
Upper CL Dif	-0.16362	Prob > t	0.0050
Lower CL Dif	-0.82313	Prob > t	0.9975
Confidence	0.95	Prob < t	0.0025

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.4979624	1.49796	9.5358	0.0050
Error	24	3.7701337	0.15709		
C. Total	25	5.2680962			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	32.8794	0.09909	32.675	33.084
Hydragard	10	32.3860	0.12534	32.127	32.645

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	32.8794	0.488432	0.12211	32.619	33.140
Hydragard	10	32.3860	0.145922	0.04614	32.282	32.490

t Test

Hydragard-Coliwas
Assuming unequal variances

Difference	-0.49338	t Ratio	-3.7796
Std Err Dif	0.13054	DF	18.94618
Upper CL Dif	-0.22011	Prob > t	0.0013
Lower CL Dif	-0.76664	Prob > t	0.9994
Confidence	0.95	Prob < t	0.0006

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.4884324	0.3357031	0.3331250
Hydragard	10	0.1459224	0.1028000	0.1000000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7581	1	24	0.1973
Brown-Forsythe	4.1706	1	24	0.0523
Levene	4.3042	1	24	0.0489
Bartlett	11.2096	1	.	0.0008
F Test 2-sided	11.2038	15	9	0.0009

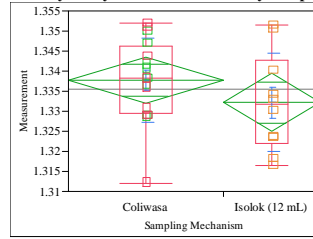
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
14.2854	1	18.946	0.0013

t Test

3.7796

Isolok at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.059685
Adj Rsquare	0.020505
Root Mean Square Error	0.01115
Mean of Response	1.335604
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwas
Assuming equal variances

Difference	-0.00555	t Ratio	-1.23424
Std Err Dif	0.00449	DF	24
Upper CL Dif	0.00373	Prob > t	0.2291
Lower CL Dif	-0.01482	Prob > t	0.8855
Confidence	0.95	Prob < t	0.1145

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00018938	0.000189	1.5233	0.2291
Error	24	0.00298369	0.000124		
C. Total	25	0.00317307			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.33774	0.00279	1.3320	1.3435
Isolok (12 mL)	10	1.33219	0.00353	1.3249	1.3395

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.33774	0.010390	0.00260	1.3322	1.3433
Isolok (12 mL)	10	1.33219	0.012312	0.00389	1.3234	1.3410

t Test

Isolok (12 mL)-Coliwas
Assuming unequal variances

Difference	-0.00555	t Ratio	-1.18524
Std Err Dif	0.00468	DF	16.79766
Upper CL Dif	0.00434	Prob > t	0.2524
Lower CL Dif	-0.01543	Prob > t	0.8738
Confidence	0.95	Prob < t	0.1262

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0103901	0.0078078	0.0077750
Isolok (12 mL)	10	0.0123125	0.0097100	0.0097100

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3886	1	24	0.5389
Brown-Forsythe	0.5126	1	24	0.4809
Levene	0.5016	1	24	0.4856
Bartlett	0.3176	1	.	0.5731
F Test 2-sided	1.4043	9	15	0.5391

Welch Anova testing Means Equal, allowing Std Devs Not Equal

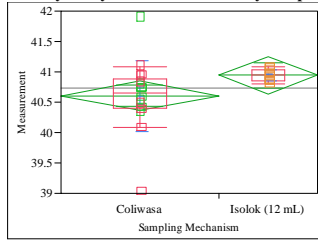
F Ratio	DFNum	DFDen	Prob > F
1.4048	1	16.798	0.2524

t Test

1.1852

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Isolok at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.117121
Adj Rsquare	0.080334
Root Mean Square Error	0.465047
Mean of Response	40.73615
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	0.33450	t Ratio	1.784318
Std Err Dif	0.18747	DF	24
Upper CL Dif	0.72141	Prob > t	0.0870
Lower CL Dif	-0.05241	Prob > t	0.0435
Confidence	0.95	Prob < t	0.9565

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.6885554	0.688555	3.1838	0.0870
Error	24	5.1904600	0.216269		
C. Total	25	5.8790154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.11626	40.368	40.847
Isolok (12 mL)	10	40.9420	0.14706	40.638	41.246

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.583364	0.14584	40.297	40.918
Isolok (12 mL)	10	40.9420	0.097616	0.03087	40.872	41.012

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	0.334500	t Ratio	2.243882
Std Err Dif	0.149072	DF	16.31953
Upper CL Dif	0.650016	Prob > t	0.0390
Lower CL Dif	0.018984	Prob > t	0.0195
Confidence	0.95	Prob < t	0.9805

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.5833638	0.3787500	0.3787500
Isolok (12 mL)	10	0.0976160	0.0820000	0.0820000

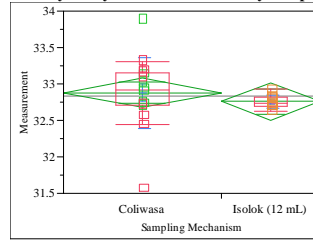
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8022	1	24	0.1920
Brown-Forsythe	4.5409	1	24	0.0435
Levene	4.5990	1	24	0.0423
Bartlett	20.3752	1	.	<.0001
F Test 2-sided	35.7139	15	9	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	5.0350	DFNum	1	DFDen	16.32	Prob > F	0.0390
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t Test
2.2439

Isolok at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.024625
Adj Rsquare	-0.01602
Root Mean Square Error	0.389995
Mean of Response	32.83231
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	-0.12237	t Ratio	-0.77841
Std Err Dif	0.15721	DF	24
Upper CL Dif	0.20209	Prob > t	0.4439
Lower CL Dif	-0.44684	Prob > t	0.7780
Confidence	0.95	Prob < t	0.2220

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.0921578	0.092158	0.6059	0.4439
Error	24	3.6503038	0.152096		
C. Total	25	3.7424615			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.09750	32.678	33.081
Isolok (12 mL)	10	32.7570	0.12333	32.502	33.012

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.488432	0.12211	32.619	33.140
Isolok (12 mL)	10	32.7570	0.089325	0.02825	32.693	32.821

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	-0.12237	t Ratio	-0.9764
Std Err Dif	0.12533	DF	16.56924
Upper CL Dif	0.14258	Prob > t	0.3429
Lower CL Dif	-0.38733	Prob > t	0.8285
Confidence	0.95	Prob < t	0.1715

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4884324	0.3357031	0.3331250
Isolok (12 mL)	10	0.0893246	0.0724000	0.0710000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9852	1	24	0.1717
Brown-Forsythe	5.4688	1	24	0.0280
Levene	5.7052	1	24	0.0251
Bartlett	18.9190	1	.	<.0001
F Test 2-sided	29.8997	15	9	<.0001

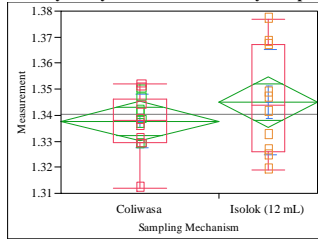
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.9534	DFNum	1	DFDen	16.569	Prob > F	0.3429
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t Test
0.9764

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Isolok at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.057635
Adj Rsquare	0.01837
Root Mean Square Error	0.014836
Mean of Response	1.340524
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwas
Assuming equal variances

Difference	0.00725	t Ratio	1.211541
Std Err Dif	0.00598	DF	24
Upper CL Dif	0.01959	Prob > t	0.2375
Lower CL Dif	-0.00510	Prob > t	0.1187
Confidence	0.95	Prob < t	0.8813

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00032310	0.000323	1.4678	0.2375
Error	24	0.00528286	0.000220		
C. Total	25	0.00560596			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.33774	0.00371	1.3301	1.3454
Isolok (12 mL)	10	1.34498	0.00469	1.3353	1.3547

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.33774	0.010390	0.00260	1.3322	1.3433
Isolok (12 mL)	10	1.34498	0.020176	0.00638	1.3306	1.3594

t Test

Isolok (12 mL)-Coliwas
Assuming unequal variances

Difference	0.00725	t Ratio	1.051868
Std Err Dif	0.00689	DF	12.03248
Upper CL Dif	0.02225	Prob > t	0.3135
Lower CL Dif	-0.00776	Prob > t	0.1568
Confidence	0.95	Prob < t	0.8432

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0103901	0.0078078	0.0077750
Isolok (12 mL)	10	0.0201757	0.0163766	0.0163766

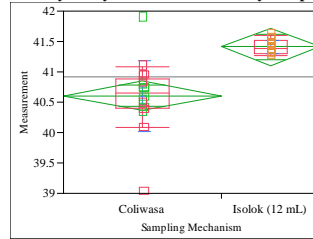
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	7.1075	1	24	0.0135
Brown-Forsythe	6.6254	1	24	0.0167
Levene	6.6710	1	24	0.0163
Bartlett	4.9301	1	.	0.0264
F Test 2-sided	3.7707	9	15	0.0230

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.1064	1	12.032	0.3135

t Test
1.0519

Isolok at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.431001
Adj Rsquare	0.407293
Root Mean Square Error	0.466324
Mean of Response	40.91577
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwas
Assuming equal variances

Difference	0.80150	t Ratio	4.263725
Std Err Dif	0.18798	DF	24
Upper CL Dif	1.18947	Prob > t	0.0003
Lower CL Dif	0.41353	Prob > t	0.0001
Confidence	0.95	Prob < t	0.9999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	3.9532446	3.95324	18.1794	0.0003
Error	24	5.2189900	0.21746		
C. Total	25	9.1722346			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	40.6075	0.11658	40.367	40.848
Isolok (12 mL)	10	41.4090	0.14746	41.105	41.713

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	40.6075	0.583364	0.14584	40.297	40.918
Isolok (12 mL)	10	41.4090	0.112689	0.03564	41.328	41.490

t Test

Isolok (12 mL)-Coliwas
Assuming unequal variances

Difference	0.80150	t Ratio	5.338653
Std Err Dif	0.15013	DF	16.74512
Upper CL Dif	1.11862	Prob > t	<.0001
Lower CL Dif	0.48438	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.5833638	0.3787500	0.3787500
Isolok (12 mL)	10	0.1126893	0.0930000	0.0930000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7677	1	24	0.1962
Brown-Forsythe	4.1917	1	24	0.0517
Levene	4.2504	1	24	0.0502
Bartlett	18.0285	1	.	<.0001
F Test 2-sided	26.7987	15	9	<.0001

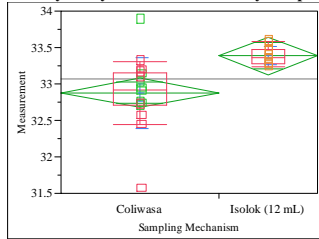
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
28.5012	1	16.745	<.0001

t Test
5.3387

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Isolok at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.297652
Adj Rsquare	0.268387
Root Mean Square Error	0.393295
Mean of Response	33.07385
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	0.505625	t Ratio	3.189212
Std Err Dif	0.158542	DF	24
Upper CL Dif	0.832840	Prob > t	0.0039
Lower CL Dif	0.178410	Prob > t	0.0020
Confidence	0.95	Prob < t	0.9980

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.5732716	1.57327	10.1711	0.0039
Error	24	3.7123437	0.15468		
C. Total	25	5.2856154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.09832	32.676	33.082
Isolok (12 mL)	10	33.3850	0.12437	33.128	33.642

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.488432	0.12211	32.619	33.140
Isolok (12 mL)	10	33.3850	0.121952	0.03856	33.298	33.472

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	0.505625	t Ratio	3.948555
Std Err Dif	0.128053	DF	17.84565
Upper CL Dif	0.774822	Prob > t	0.0010
Lower CL Dif	0.236428	Prob > t	0.0005
Confidence	0.95	Prob < t	0.9995

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4884324	0.3357031	0.3331250
Isolok (12 mL)	10	0.1219517	0.1000000	0.0990000

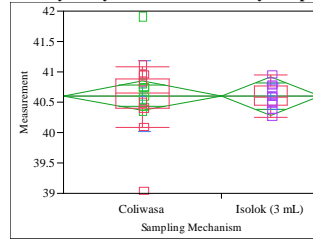
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8677	1	24	0.1844
Brown-Forsythe	4.3196	1	24	0.0485
Levene	4.5353	1	24	0.0437
Bartlett	13.9449	1	.	0.0002
F Test 2-sided	16.0411	15	9	0.0002

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
15.5911	1	17.846	0.0010

t Test
3.9486

Isolok at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.000101
Adj Rsquare	-0.04156
Root Mean Square Error	0.478812
Mean of Response	40.60385
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	-0.00950	t Ratio	-0.04922
Std Err Dif	0.19302	DF	24
Upper CL Dif	0.38886	Prob > t	0.9612
Lower CL Dif	-0.40786	Prob > t	0.5194
Confidence	0.95	Prob < t	0.4806

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.0005554	0.000555	0.0024	0.9612
Error	24	5.5022600	0.229261		
C. Total	25	5.5028154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.11970	40.360	40.855
Isolok (3 mL)	10	40.5980	0.15141	40.285	40.911

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.583364	0.14584	40.297	40.918
Isolok (3 mL)	10	40.5980	0.210175	0.06646	40.448	40.748

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	-0.00950	t Ratio	-0.05927
Std Err Dif	0.16027	DF	20.41024
Upper CL Dif	0.32439	Prob > t	0.9533
Lower CL Dif	-0.34339	Prob > t	0.5233
Confidence	0.95	Prob < t	0.4767

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.5833638	0.3787500	0.3787500
Isolok (3 mL)	10	0.2101745	0.1640000	0.1640000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.4403	1	24	0.2418
Brown-Forsythe	2.2896	1	24	0.1433
Levene	2.3183	1	24	0.1409
Bartlett	8.5095	1	.	0.0035
F Test 2-sided	7.7040	15	9	0.0040

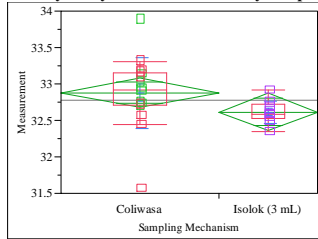
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0035	1	20.41	0.9533

t Test
0.0593

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Isolok at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.101192
Adj Rsquare	0.063742
Root Mean Square Error	0.397468
Mean of Response	32.77808
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	-0.26337	t Ratio	-1.64379
Std Err Dif	0.16022	DF	24
Upper CL Dif	0.06731	Prob > t	0.1133
Lower CL Dif	-0.59406	Prob > t	0.9434
Confidence	0.95	Prob < t	0.0566

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.4268701	0.426870	2.7020	0.1133
Error	24	3.7915338	0.157981		
C. Total	25	4.2184038			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.09937	32.674	33.084
Isolok (3 mL)	10	32.6160	0.12569	32.357	32.875

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.488432	0.12211	32.619	33.140
Isolok (3 mL)	10	32.6160	0.153854	0.04865	32.506	32.726

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	-0.26337	t Ratio	-2.00371
Std Err Dif	0.13144	DF	19.32881
Upper CL Dif	0.01142	Prob > t	0.0593
Lower CL Dif	-0.53817	Prob > t	0.9703
Confidence	0.95	Prob < t	0.0297

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4884324	0.3357031	0.3331250
Isolok (3 mL)	10	0.1538542	0.1112000	0.1080000

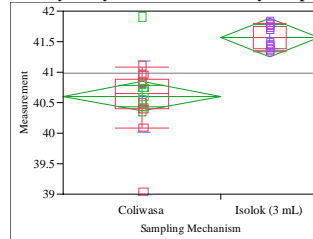
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7193	1	24	0.2022
Brown-Forsythe	3.8733	1	24	0.0607
Levene	3.9920	1	24	0.0572
Bartlett	10.4282	1	.	0.0012
F Test 2-sided	10.0784	15	9	0.0014

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	4.0148	DFNum	1	DFDen	19.329	Prob > F	0.0593
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t Test
2.0037

Isolok at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.509992
Adj Rsquare	0.489575
Root Mean Square Error	0.475751
Mean of Response	40.97615
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	0.95850	t Ratio	4.997877
Std Err Dif	0.19178	DF	24
Upper CL Dif	1.35432	Prob > t	<.0001
Lower CL Dif	0.56268	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	5.653675	5.65368	24.9788	<.0001
Error	24	5.432140	0.22634		
C. Total	25	11.085815			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.11894	40.362	40.853
Isolok (3 mL)	10	41.5660	0.15045	41.255	41.877

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	40.6075	0.583364	0.14584	40.297	40.918
Isolok (3 mL)	10	41.5660	0.190741	0.06032	41.430	41.702

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	0.95850	t Ratio	6.073295
Std Err Dif	0.15782	DF	19.61399
Upper CL Dif	1.28813	Prob > t	<.0001
Lower CL Dif	0.62887	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.5833638	0.3787500	0.3787500
Isolok (3 mL)	10	0.1907412	0.1760000	0.1760000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5211	1	24	0.2294
Brown-Forsythe	2.1204	1	24	0.1583
Levene	2.1475	1	24	0.1558
Bartlett	9.8856	1	.	0.0017
F Test 2-sided	9.3538	15	9	0.0019

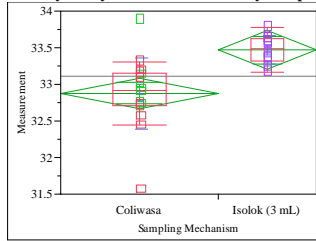
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	36.8849	DFNum	1	DFDen	19.614	Prob > F	<.0001
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t Test
6.0733

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Isolok at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.351913
Adj Rsquare	0.324909
Root Mean Square Error	0.404488
Mean of Response	33.10577
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	0.588625	t Ratio	3.609993
Std Err Dif	0.163054	DF	24
Upper CL Dif	0.925153	Prob > t	0.0014
Lower CL Dif	0.252097	Prob > t	0.0007
Confidence	0.95	Prob < t	0.9993

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	2.1321809	2.13218	13.0320	0.0014
Error	24	3.9266537	0.16361		
C. Total	25	6.0588346			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.10112	32.671	33.088
Isolok (3 mL)	10	33.4680	0.12791	33.204	33.732

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	32.8794	0.488432	0.12211	32.619	33.140
Isolok (3 mL)	10	33.4680	0.196684	0.06220	33.327	33.609

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	0.588625	t Ratio	4.295408
Std Err Dif	0.137036	DF	21.39305
Upper CL Dif	0.873288	Prob > t	0.0003
Lower CL Dif	0.303962	Prob > t	0.0002
Confidence	0.95	Prob < t	0.9998

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4884324	0.3357031	0.3331250
Isolok (3 mL)	10	0.1966836	0.1660000	0.1660000

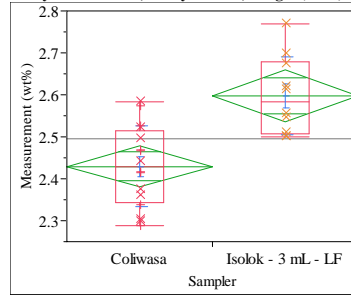
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.4861	1	24	0.2347
Brown-Forsythe	2.1656	1	24	0.1541
Levene	2.3017	1	24	0.1423
Bartlett	7.0033	1	.	0.0081
F Test 2-sided	6.1670	15	9	0.0092

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
18.4505	1	21.393	0.0003

t Test
4.2954

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant,
Analytical Block=1, Analyte=Al/B, Target (wt%)=2.0704412



Oneway Anova
Summary of Fit

Rsquare	0.446219
Adj Rsquare	0.423144
Root Mean Square Error	0.095043
Mean of Response	2.494118
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.168483	t Ratio	4.397545
Std Err Dif	0.038313	DF	24
Upper CL Dif	0.247557	Prob > t	0.0002
Lower CL Dif	0.089409	Prob > t	<.0001
Confidence	0.95	Prob < t	0.9999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.17468607	0.174686	19.3384	0.0002
Error	24	0.21679481	0.009033		
C. Total	25	0.39148088			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.42932	0.02376	2.3803	2.4784
Isolok - 3 mL - LF	10	2.59780	0.03006	2.5358	2.6598

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.42932	0.096476	0.02412	2.3779	2.4807
Isolok - 3 mL - LF	10	2.59780	0.092604	0.02928	2.5316	2.6640

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.168483	t Ratio	4.441023
Std Err Dif	0.037938	DF	19.86678
Upper CL Dif	0.247654	Prob > t	0.0003
Lower CL Dif	0.089312	Prob > t	0.0001
Confidence	0.95	Prob < t	0.9999

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0964763	0.0803064	0.0803064
Isolok - 3 mL - LF	10	0.0926040	0.0761823	0.0761823

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0370	1	24	0.8490
Brown-Forsythe	0.0434	1	24	0.8368
Levene	0.0452	1	24	0.8334
Bartlett	0.0179	1	.	0.8935
F Test 2-sided	1.0854	15	9	0.9332

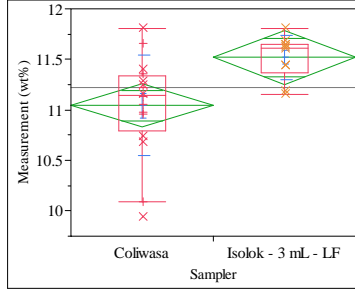
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
19.7227	1	19.867	0.0003

t Test
4.4410

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Al2O3 (wt%), Target (wt%)=10.934



**Oneway Anova
Summary of Fit**

Rsquare	0.253183
Adj Rsquare	0.222066
Root Mean Square Error	0.41451
Mean of Response	11.22508
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.476626	t Ratio	2.852439
Std Err Dif	0.167094	DF	24
Upper CL Dif	0.821492	Prob > t	0.0088
Lower CL Dif	0.131761	Prob > t	0.0044
Confidence	0.95	Prob < t	0.9956

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.3979859	1.39799	8.1364	0.0088
Error	24	4.1236464	0.17182		
C. Total	25	5.5216322			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.0418	0.10363	10.828	11.256
Isolok - 3 mL - LF	10	11.5184	0.13108	11.248	11.789

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.0418	0.496948	0.12424	10.777	11.307
Isolok - 3 mL - LF	10	11.5184	0.215841	0.06825	11.364	11.673

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.476626	t Ratio	3.362402
Std Err Dif	0.141752	DF	22.07038
Upper CL Dif	0.770547	Prob > t	0.0028
Lower CL Dif	0.182706	Prob > t	0.0014
Confidence	0.95	Prob < t	0.9986

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4969481	0.3595955	0.3471956
Isolok - 3 mL - LF	10	0.2158409	0.1753456	0.1587180

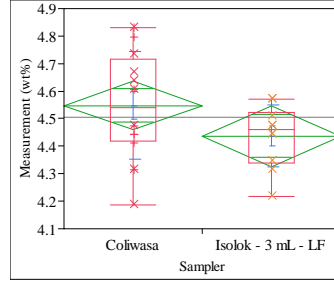
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4071	1	24	0.1339
Brown-Forsythe	2.4080	1	24	0.1338
Levene	2.8696	1	24	0.1032
Bartlett	6.0307	1	.	0.0141
F Test 2-sided	5.3010	15	9	0.0159

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
11.3057	1	22.07	0.0028

t Test
3.3624

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=B2O3 (wt%), Target (wt%)=5.281



**Oneway Anova
Summary of Fit**

Rsquare	0.099002
Adj Rsquare	0.06146
Root Mean Square Error	0.169695
Mean of Response	4.505383
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.11109	t Ratio	-1.62392
Std Err Dif	0.06841	DF	24
Upper CL Dif	0.03010	Prob > t	0.1175
Lower CL Dif	-0.25227	Prob > t	0.9413
Confidence	0.95	Prob < t	0.0587

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.07593983	0.075940	2.6371	0.1175
Error	24	0.6911462	0.028796		
C. Total	25	0.76705444			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.54811	0.04242	4.4606	4.6357
Isolok - 3 mL - LF	10	4.43702	0.05366	4.3263	4.5478

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.54811	0.195859	0.04896	4.4437	4.6525
Isolok - 3 mL - LF	10	4.43702	0.113384	0.03586	4.3559	4.5181

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.11109	t Ratio	-1.83043
Std Err Dif	0.06069	DF	23.93124
Upper CL Dif	0.01419	Prob > t	0.0797
Lower CL Dif	-0.23636	Prob > t	0.9602
Confidence	0.95	Prob < t	0.0398

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1958589	0.1650199	0.1650199
Isolok - 3 mL - LF	10	0.1133844	0.0862933	0.0837174

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.3808	1	24	0.0784
Brown-Forsythe	5.0995	1	24	0.0333
Levene	5.0589	1	24	0.0339
Bartlett	2.8279	1	.	0.0926
F Test 2-sided	2.9839	15	9	0.1022

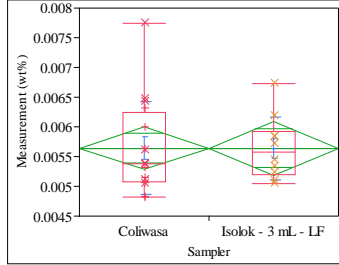
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.3505	1	23.931	0.0797

t Test
1.8304

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=BaO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	9.269e-8
Adj Rsquare	-0.04167
Root Mean Square Error	0.000696
Mean of Response	0.005643
Observations (or Sum Wgts)	26

t Test

Isok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-4.19e-7	t Ratio	-0.00149
Std Err Dif	0.00028	DF	24
Upper CL Dif	0.00058	Prob > t	0.9988
Lower CL Dif	-0.00058	Prob > t	0.5006
Confidence	0.95	Prob < t	0.4994

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.0788e-12	1.079e-12	0.0000	0.9988
Error	24	0.00001164	4.8495e-7		
C. Total	25	0.00001164			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005643	0.00017	0.00528	0.00600
Isok - 3 mL - LF	10	0.005643	0.00022	0.00519	0.00610

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005643	0.000780	0.00019	0.00523	0.00606
Isok - 3 mL - LF	10	0.005643	0.000529	0.00017	0.00526	0.00602

t Test

Isok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-4.19e-7	t Ratio	-0.00163
Std Err Dif	0.00026	DF	23.75286
Upper CL Dif	0.00053	Prob > t	0.9987
Lower CL Dif	-0.00053	Prob > t	0.5006
Confidence	0.95	Prob < t	0.4994

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0007797	0.0005929	0.0005548
Isok - 3 mL - LF	10	0.0005292	0.0004153	0.0004153

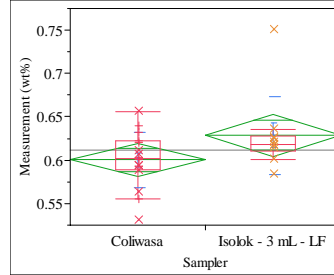
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7190	1	24	0.4048
Brown-Forsythe	0.4643	1	24	0.5021
Levene	1.0853	1	24	0.3079
Bartlett	1.4843	1	.	0.2231
F Test 2-sided	2.1702	15	9	0.2421

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0000	1	23.753	0.9987

t Test
0.0016

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=CaO (wt%), Target (wt%)=0.543



**Oneway Anova
Summary of Fit**

Rsquare	0.128214
Adj Rsquare	0.091889
Root Mean Square Error	0.037389
Mean of Response	0.611235
Observations (or Sum Wgts)	26

t Test

Isok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.02832	t Ratio	1.878745
Std Err Dif	0.01507	DF	24
Upper CL Dif	0.05942	Prob > t	0.0725
Lower CL Dif	-0.00279	Prob > t	0.0362
Confidence	0.95	Prob < t	0.9638

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00493424	0.004934	3.5297	0.0725
Error	24	0.03355022	0.001398		
C. Total	25	0.03848445			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.600344	0.00935	0.58105	0.61964
Isok - 3 mL - LF	10	0.628661	0.01182	0.60426	0.65306

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.600344	0.031994	0.00800	0.58330	0.61739
Isok - 3 mL - LF	10	0.628661	0.044964	0.01422	0.59650	0.66083

t Test

Isok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.02832	t Ratio	1.735692
Std Err Dif	0.01631	DF	14.71329
Upper CL Dif	0.06315	Prob > t	0.1035
Lower CL Dif	-0.00652	Prob > t	0.0518
Confidence	0.95	Prob < t	0.9482

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0319944	0.0233491	0.0233491
Isok - 3 mL - LF	10	0.0449637	0.0255774	0.0222473

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4938	1	24	0.4890
Brown-Forsythe	0.0086	1	24	0.9271
Levene	0.0401	1	24	0.8430
Bartlett	1.2949	1	.	0.2551
F Test 2-sided	1.9750	9	15	0.2344

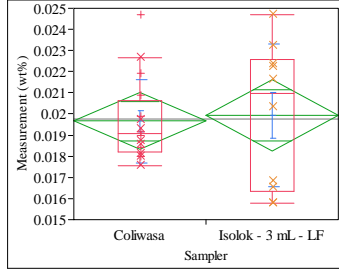
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.0126	1	14.713	0.1035

t Test
1.7357

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Cr2O3 (wt%), Target (wt%)=0.015



**Oneway Anova
Summary of Fit**

Rsquare	0.002925
Adj Rsquare	-0.03862
Root Mean Square Error	0.002596
Mean of Response	0.019765
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming equal variances

Difference	0.00028	t Ratio	0.265348
Std Err Dif	0.00105	DF	24
Upper CL Dif	0.00244	Prob > t	0.7930
Lower CL Dif	-0.00188	Prob > t	0.3965
Confidence	0.95	Prob < t	0.6035

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000047	4.7458e-7	0.0704	0.7930
Error	24	0.00016177	6.7403e-6		
C. Total	25	0.00016224			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	16	0.019659	0.00065	0.01832	0.02100
Isolok - 3 mL - LF	10	0.019936	0.00082	0.01824	0.02163

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	16	0.019659	0.001968	0.00049	0.01861	0.02071
Isolok - 3 mL - LF	10	0.019936	0.003394	0.00107	0.01751	0.02236

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming unequal variances

Difference	0.00028	t Ratio	0.235216
Std Err Dif	0.00118	DF	12.84094
Upper CL Dif	0.00283	Prob > t	0.8178
Lower CL Dif	-0.00228	Prob > t	0.4089
Confidence	0.95	Prob < t	0.5911

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	16	0.0019682	0.0014799	0.0013703
Isolok - 3 mL - LF	10	0.0033938	0.0029700	0.0028940

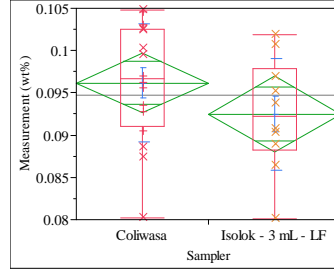
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.3563	1	24	0.0187
Brown-Forsythe	5.3400	1	24	0.0297
Levene	8.5135	1	24	0.0075
Bartlett	3.3347	1	.	0.0678
F Test 2-sided	2.9733	9	15	0.0604

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0553	1	12.841	0.8178

t Test
0.2352

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=CuO (wt%), Target (wt%)=0.103



**Oneway Anova
Summary of Fit**

Rsquare	0.069381
Adj Rsquare	0.030605
Root Mean Square Error	0.006875
Mean of Response	0.094752
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming equal variances

Difference	-0.00371	t Ratio	-1.33764
Std Err Dif	0.00277	DF	24
Upper CL Dif	0.00201	Prob > t	0.1936
Lower CL Dif	-0.00943	Prob > t	0.9032
Confidence	0.95	Prob < t	0.0968

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00008456	0.000085	1.7893	0.1936
Error	24	0.00113422	0.000047		
C. Total	25	0.00121878			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	16	0.096177	0.00172	0.09263	0.09972
Isolok - 3 mL - LF	10	0.092470	0.00217	0.08798	0.09696

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	16	0.096177	0.007022	0.00176	0.09244	0.09992
Isolok - 3 mL - LF	10	0.092470	0.006621	0.00209	0.08773	0.09721

t Test

Isolok - 3 mL - LF-Coliwasas
Assuming unequal variances

Difference	-0.00371	t Ratio	-1.35666
Std Err Dif	0.00273	DF	20.13263
Upper CL Dif	0.00199	Prob > t	0.1899
Lower CL Dif	-0.00940	Prob > t	0.9050
Confidence	0.95	Prob < t	0.0950

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	16	0.0070222	0.0055891	0.0055783
Isolok - 3 mL - LF	10	0.0066210	0.0051950	0.0051950

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0441	1	24	0.8355
Brown-Forsythe	0.0586	1	24	0.8108
Levene	0.0629	1	24	0.8041
Bartlett	0.0369	1	.	0.8477
F Test 2-sided	1.1249	15	9	0.8871

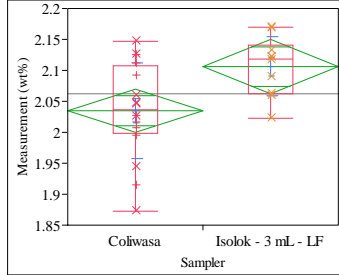
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.8405	1	20.133	0.1899

t Test
1.3567

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Fe/Li, Target (wt%)=1.99097835



**Oneway Anova
Summary of Fit**

Rsquare	0.22036
Adj Rsquare	0.187875
Root Mean Square Error	0.068041
Mean of Response	2.062369
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.071437	t Ratio	2.6045
Std Err Dif	0.027428	DF	24
Upper CL Dif	0.128047	Prob > t	0.0155
Lower CL Dif	0.014828	Prob > t	0.0078
Confidence	0.95	Prob < t	0.9922

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.03140473	0.031405	6.7834	0.0155
Error	24	0.11111113	0.004630		
C. Total	25	0.14251586			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.03489	0.01701	1.9998	2.0700
Isolok - 3 mL - LF	10	2.10633	0.02152	2.0619	2.1507

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.03489	0.077713	0.01943	1.9935	2.0763
Isolok - 3 mL - LF	10	2.10633	0.047750	0.01510	2.0722	2.1405

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.071437	t Ratio	2.903208
Std Err Dif	0.024606	DF	23.99974
Upper CL Dif	0.122222	Prob > t	0.0078
Lower CL Dif	0.020652	Prob > t	0.0039
Confidence	0.95	Prob < t	0.9961

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0777132	0.0593291	0.0593291
Isolok - 3 mL - LF	10	0.0477504	0.0382198	0.0361695

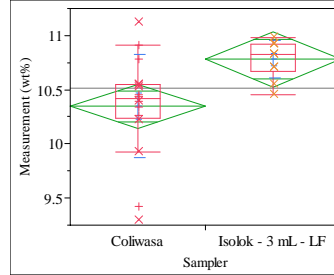
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.0420	1	24	0.1659
Brown-Forsythe	1.8292	1	24	0.1888
Levene	1.6378	1	24	0.2129
Bartlett	2.2834	1	.	0.1308
F Test 2-sided	2.6487	15	9	0.1434

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.4286	1	24	0.0078

t Test
2.9032

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Fe2O3 (wt%), Target (wt%)=9.931



**Oneway Anova
Summary of Fit**

Rsquare	0.239333
Adj Rsquare	0.207639
Root Mean Square Error	0.391712
Mean of Response	10.51434
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.433914	t Ratio	2.747955
Std Err Dif	0.157904	DF	24
Upper CL Dif	0.759812	Prob > t	0.0112
Lower CL Dif	0.108015	Prob > t	0.0056
Confidence	0.95	Prob < t	0.9944

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.1586543	1.15865	7.5513	0.0112
Error	24	3.6825258	0.15344		
C. Total	25	4.8411800			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.3475	0.09793	10.145	10.550
Isolok - 3 mL - LF	10	10.7814	0.12387	10.526	11.037

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.3475	0.476571	0.11914	10.094	10.601
Isolok - 3 mL - LF	10	10.7814	0.175030	0.05535	10.656	10.907

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.433914	t Ratio	3.302943
Std Err Dif	0.131372	DF	20.57595
Upper CL Dif	0.707460	Prob > t	0.0035
Lower CL Dif	0.160368	Prob > t	0.0017
Confidence	0.95	Prob < t	0.9983

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4765714	0.3279374	0.3163211
Isolok - 3 mL - LF	10	0.1750304	0.1412544	0.1329621

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.6105	1	24	0.1192
Brown-Forsythe	2.4880	1	24	0.1278
Levene	2.9207	1	24	0.1004
Bartlett	8.2435	1	.	0.0041
F Test 2-sided	7.4136	15	9	0.0047

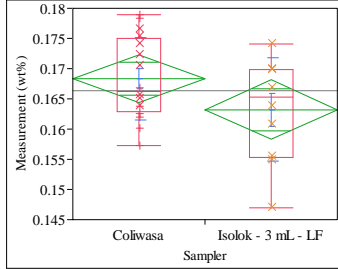
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.9094	1	20.576	0.0035

t Test
3.3029

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=K2O (wt%), Target (wt%)=0.076



**Oneway Anova
Summary of Fit**

Rsquare	0.10421
Adj Rsquare	0.066885
Root Mean Square Error	0.007545
Mean of Response	0.166351
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwas
Assuming equal variances

Difference	-0.00508	t Ratio	-1.67092
Std Err Dif	0.00304	DF	24
Upper CL Dif	0.00120	Prob > t	0.1077
Lower CL Dif	-0.01136	Prob > t	0.9461
Confidence	0.95	Prob < t	0.0539

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00015893	0.000159	2.7920	0.1077
Error	24	0.00136615	0.000057		
C. Total	25	0.00152508			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.168305	0.00189	0.16441	0.17220
Isolok - 3 mL - LF	10	0.163223	0.00239	0.15830	0.16815

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.168305	0.006835	0.00171	0.16466	0.17195
Isolok - 3 mL - LF	10	0.163223	0.008598	0.00272	0.15707	0.16937

t Test

Isolok - 3 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.00508	t Ratio	-1.5825
Std Err Dif	0.00321	DF	16.01539
Upper CL Dif	0.00173	Prob > t	0.1331
Lower CL Dif	-0.01189	Prob > t	0.9335
Confidence	0.95	Prob < t	0.0665

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0068354	0.0059430	0.0057595
Isolok - 3 mL - LF	10	0.0085979	0.0069867	0.0068662

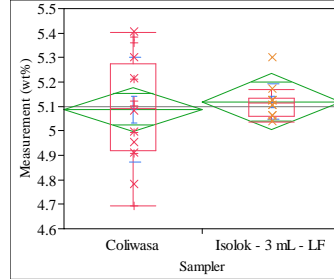
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0538	1	24	0.3149
Brown-Forsythe	0.3793	1	24	0.5438
Levene	0.5141	1	24	0.4803
Bartlett	0.5836	1	.	0.4449
F Test 2-sided	1.5822	9	15	0.4152

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.5043	1	16.015	0.1331

t Test
1.5825

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Li2O (wt%), Target (wt%)=4.988



**Oneway Anova
Summary of Fit**

Rsquare	0.008517
Adj Rsquare	-0.03279
Root Mean Square Error	0.17496
Mean of Response	5.099889
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwas
Assuming equal variances

Difference	0.03202	t Ratio	0.454063
Std Err Dif	0.07053	DF	24
Upper CL Dif	0.17759	Prob > t	0.6539
Lower CL Dif	-0.11354	Prob > t	0.3269
Confidence	0.95	Prob < t	0.6731

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00631115	0.006311	0.2062	0.6539
Error	24	0.73466146	0.030611		
C. Total	25	0.74097261			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	5.08757	0.04374	4.9973	5.1778
Isolok - 3 mL - LF	10	5.11960	0.05533	5.0054	5.2338

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	5.08757	0.213954	0.05349	4.9736	5.2016
Isolok - 3 mL - LF	10	5.11960	0.073044	0.02310	5.0673	5.1718

t Test

Isolok - 3 mL - LF-Coliwas
Assuming unequal variances

Difference	0.03202	t Ratio	0.549654
Std Err Dif	0.05826	DF	19.95935
Upper CL Dif	0.15357	Prob > t	0.5887
Lower CL Dif	-0.08953	Prob > t	0.2943
Confidence	0.95	Prob < t	0.7057

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.2139537	0.1735776	0.1735776
Isolok - 3 mL - LF	10	0.0730437	0.0473638	0.0473638

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.0654	1	24	0.0213
Brown-Forsythe	10.1920	1	24	0.0039
Levene	10.2221	1	24	0.0039
Bartlett	9.2664	1	.	0.0023
F Test 2-sided	8.5798	15	9	0.0027

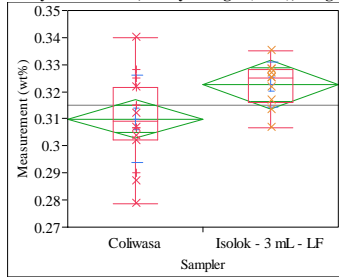
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3021	1	19.959	0.5887

t Test
0.5497

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=MgO (wt%), Target (wt%)=0.286



**Oneway Anova
Summary of Fit**

Rsquare	0.182239
Adj Rsquare	0.148165
Root Mean Square Error	0.01363
Mean of Response	0.314886
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.012707	t Ratio	2.312665
Std Err Dif	0.005494	DF	24
Upper CL Dif	0.024047	Prob > t	0.0296
Lower CL Dif	0.001367	Prob > t	0.0148
Confidence	0.95	Prob < t	0.9852

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00099361	0.000994	5.3484	0.0296
Error	24	0.00445861	0.000186		
C. Total	25	0.00545222			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.309998	0.00341	0.30297	0.31703
Isolok - 3 mL - LF	10	0.322705	0.00431	0.31381	0.33160

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.309998	0.016003	0.00400	0.30147	0.31853
Isolok - 3 mL - LF	10	0.322705	0.008280	0.00262	0.31678	0.32863

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.012707	t Ratio	2.657467
Std Err Dif	0.004782	DF	23.43602
Upper CL Dif	0.022588	Prob > t	0.0139
Lower CL Dif	0.002826	Prob > t	0.0070
Confidence	0.95	Prob < t	0.9930

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0160032	0.0123336	0.0123336
Isolok - 3 mL - LF	10	0.0082804	0.0064342	0.0059699

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.7066	1	24	0.1130
Brown-Forsythe	3.4560	1	24	0.0753
Levene	3.1912	1	24	0.0867
Bartlett	3.9749	1	.	0.0462
F Test 2-sided	3.7351	15	9	0.0515

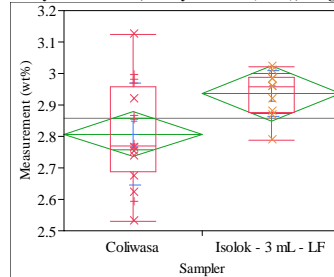
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.0621	1	23.436	0.0139

t Test

2.6575

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=MnO (wt%), Target (wt%)=2.918



**Oneway Anova
Summary of Fit**

Rsquare	0.18581
Adj Rsquare	0.151885
Root Mean Square Error	0.136351
Mean of Response	2.857028
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.128636	t Ratio	2.340329
Std Err Dif	0.054965	DF	24
Upper CL Dif	0.242078	Prob > t	0.0279
Lower CL Dif	0.015194	Prob > t	0.0140
Confidence	0.95	Prob < t	0.9860

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.10182873	0.101829	5.4771	0.0279
Error	24	0.44619830	0.018592		
C. Total	25	0.54802704			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.80755	0.03409	2.7372	2.8779
Isolok - 3 mL - LF	10	2.93619	0.04312	2.8472	3.0252

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.80755	0.162983	0.04075	2.7207	2.8944
Isolok - 3 mL - LF	10	2.93619	0.072838	0.02303	2.8841	2.9883

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.128636	t Ratio	2.74831
Std Err Dif	0.046805	DF	22.31983
Upper CL Dif	0.225624	Prob > t	0.0116
Lower CL Dif	0.031648	Prob > t	0.0058
Confidence	0.95	Prob < t	0.9942

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1629826	0.1322471	0.1283130
Isolok - 3 mL - LF	10	0.0728381	0.0583622	0.0542304

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	4.1612	1	24	0.0525
Brown-Forsythe	4.4870	1	24	0.0447
Levene	6.0937	1	24	0.0211
Bartlett	5.6760	1	.	0.0172
F Test 2-sided	5.0069	15	9	0.0194

Welch Anova testing Means Equal, allowing Std Devs Not Equal

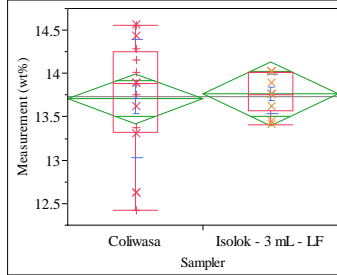
F Ratio	DFNum	DFDen	Prob > F
7.5532	1	22.32	0.0116

t Test

2.7483

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Na2O (wt%), Target (wt%)=13.318



**Oneway Anova
Summary of Fit**

Rsquare	0.002563
Adj Rsquare	-0.039
Root Mean Square Error	0.557091
Mean of Response	13.73145
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.05577	t Ratio	0.248356
Std Err Dif	0.22457	DF	24
Upper CL Dif	0.51926	Prob > t	0.8060
Lower CL Dif	-0.40772	Prob > t	0.4030
Confidence	0.95	Prob < t	0.5970

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0191427	0.019143	0.0617	0.8060
Error	24	7.4484070	0.310350		
C. Total	25	7.4675496			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	13.7100	0.13927	13.423	13.997
Isolok - 3 mL - LF	10	13.7658	0.17617	13.402	14.129

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	13.7100	0.682492	0.17062	13.346	14.074
Isolok - 3 mL - LF	10	13.7658	0.226439	0.07161	13.604	13.928

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.05577	t Ratio	0.301414
Std Err Dif	0.18504	DF	19.72911
Upper CL Dif	0.44210	Prob > t	0.7663
Lower CL Dif	-0.33055	Prob > t	0.3831
Confidence	0.95	Prob < t	0.6169

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.6824923	0.5381469	0.5113975
Isolok - 3 mL - LF	10	0.2264390	0.1757792	0.1725440

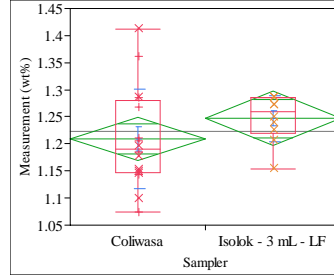
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	5.1765	1	24	0.0321
Brown-Forsythe	4.9076	1	24	0.0365
Levene	7.7395	1	24	0.0104
Bartlett	9.6749	1	.	0.0019
F Test 2-sided	9.0843	15	9	0.0021

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0909	1	19.729	0.7663

t Test
0.3014

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=NiO (wt%), Target (wt%)=1.033



**Oneway Anova
Summary of Fit**

Rsquare	0.057533
Adj Rsquare	0.018263
Root Mean Square Error	0.077424
Mean of Response	1.223802
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.03778	t Ratio	1.210403
Std Err Dif	0.03121	DF	24
Upper CL Dif	0.10219	Prob > t	0.2379
Lower CL Dif	-0.02664	Prob > t	0.1190
Confidence	0.95	Prob < t	0.8810

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00878232	0.008782	1.4651	0.2379
Error	24	0.14386677	0.005994		
C. Total	25	0.15264909			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.20927	0.01936	1.1693	1.2492
Isolok - 3 mL - LF	10	1.24705	0.02448	1.1965	1.2976

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.20927	0.092161	0.02304	1.1602	1.2584
Isolok - 3 mL - LF	10	1.24705	0.042767	0.01352	1.2165	1.2776

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.03778	t Ratio	1.414019
Std Err Dif	0.02672	DF	22.63804
Upper CL Dif	0.09309	Prob > t	0.1710
Lower CL Dif	-0.01754	Prob > t	0.0855
Confidence	0.95	Prob < t	0.9145

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0921612	0.0711208	0.0687945
Isolok - 3 mL - LF	10	0.0427673	0.0328305	0.0325760

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.7966	1	24	0.1075
Brown-Forsythe	2.9703	1	24	0.0977
Levene	4.1516	1	24	0.0528
Bartlett	5.2192	1	.	0.0223
F Test 2-sided	4.6438	15	9	0.0251

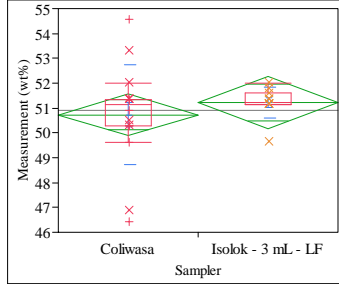
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.9995	1	22.638	0.1710

t Test
1.4140

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=SiO2 (wt%), Target (wt%)=50.183



**Oneway Anova
Summary of Fit**

Rsquare	0.022398
Adj Rsquare	-0.01834
Root Mean Square Error	1.628159
Mean of Response	50.91534
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.4867	t Ratio	0.741531
Std Err Dif	0.6563	DF	24
Upper CL Dif	1.8413	Prob > t	0.4656
Lower CL Dif	-0.8679	Prob > t	0.2328
Confidence	0.95	Prob < t	0.7672

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.457649	1.45765	0.5499	0.4656
Error	24	63.621667	2.65090		
C. Total	25	65.079316			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	50.7282	0.40704	49.888	51.568
Isolok - 3 mL - LF	10	51.2148	0.51487	50.152	52.277

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	50.7282	2.00056	0.50014	49.662	51.794
Isolok - 3 mL - LF	10	51.2148	0.63141	0.19967	50.763	51.667

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.4867	t Ratio	0.903751
Std Err Dif	0.5385	DF	19.34349
Upper CL Dif	1.6125	Prob > t	0.3772
Lower CL Dif	-0.6391	Prob > t	0.1886
Confidence	0.95	Prob < t	0.8114

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	2.000560	1.360461	1.337063
Isolok - 3 mL - LF	10	0.631406	0.385074	0.385074

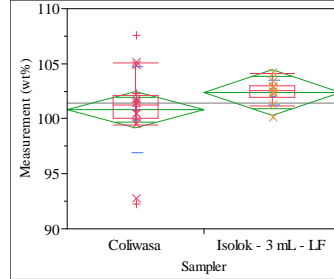
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5724	1	24	0.1218
Brown-Forsythe	3.7063	1	24	0.0661
Levene	4.3201	1	24	0.0485
Bartlett	10.3995	1	.	0.0013
F Test 2-sided	10.0389	15	9	0.0014

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8168	1	19.343	0.3772

t Test
0.9038

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Sum of Oxides (wt%), Target (wt%)=99.73



**Oneway Anova
Summary of Fit**

Rsquare	0.060647
Adj Rsquare	0.021507
Root Mean Square Error	3.141203
Mean of Response	101.4124
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	1.5762	t Ratio	1.244787
Std Err Dif	1.2663	DF	24
Upper CL Dif	4.1897	Prob > t	0.2252
Lower CL Dif	-1.0372	Prob > t	0.1126
Confidence	0.95	Prob < t	0.8874

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	15.28910	15.2891	1.5495	0.2252
Error	24	236.81169	9.8672		
C. Total	25	252.10079			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	100.806	0.78530	99.19	102.43
Isolok - 3 mL - LF	10	102.382	0.99334	100.33	104.43

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	100.806	3.87668	0.96917	98.74	102.87
Isolok - 3 mL - LF	10	102.382	1.12455	0.35561	101.58	103.19

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	1.5762	t Ratio	1.526824
Std Err Dif	1.0324	DF	18.74466
Upper CL Dif	3.7390	Prob > t	0.1435
Lower CL Dif	-0.5865	Prob > t	0.0718
Confidence	0.95	Prob < t	0.9282

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	3.876684	2.474234	2.440686
Isolok - 3 mL - LF	10	1.124552	0.771314	0.764222

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5166	1	24	0.1257
Brown-Forsythe	2.9771	1	24	0.0973
Levene	3.2224	1	24	0.0852
Bartlett	11.6502	1	.	0.0006
F Test 2-sided	11.8840	15	9	0.0007

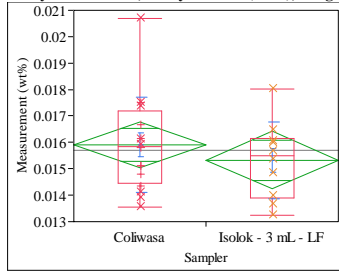
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3312	1	18.745	0.1435

t Test
1.5268

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=TiO2 (wt%), Target (wt%)=0.013



**Oneway Anova
Summary of Fit**

Rsquare	0.03051
Adj Rsquare	-0.00989
Root Mean Square Error	0.001676
Mean of Response	0.015687
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00059	t Ratio	-0.86907
Std Err Dif	0.00068	DF	24
Upper CL Dif	0.00081	Prob > t	0.3934
Lower CL Dif	-0.00198	Prob > t	0.8033
Confidence	0.95	Prob < t	0.1967

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000212	2.1214e-6	0.7553	0.3934
Error	24	0.00006741	2.8087e-6		
C. Total	25	0.00006953			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.015913	0.00042	0.01505	0.01678
Isolok - 3 mL - LF	10	0.015326	0.00053	0.01423	0.01642

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.015913	0.001801	0.00045	0.01495	0.01687
Isolok - 3 mL - LF	10	0.015326	0.001444	0.00046	0.01429	0.01636

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00059	t Ratio	-0.91566
Std Err Dif	0.00064	DF	22.33961
Upper CL Dif	0.00074	Prob > t	0.3696
Lower CL Dif	-0.00192	Prob > t	0.8152
Confidence	0.95	Prob < t	0.1848

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0018009	0.0013281	0.0013261
Isolok - 3 mL - LF	10	0.0014438	0.0011149	0.0011109

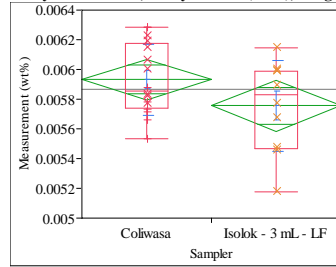
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3179	1	24	0.5781
Brown-Forsythe	0.2504	1	24	0.6213
Levene	0.2510	1	24	0.6209
Bartlett	0.5033	1	.	0.4781
F Test 2-sided	1.5559	15	9	0.5093

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8384	1	22.34	0.3696

t Test
0.9157

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=ZnO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.101376
Adj Rsquare	0.063933
Root Mean Square Error	0.000267
Mean of Response	0.005864
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00018	t Ratio	-1.64545
Std Err Dif	0.00011	DF	24
Upper CL Dif	0.000045	Prob > t	0.1129
Lower CL Dif	-0.00040	Prob > t	0.9435
Confidence	0.95	Prob < t	0.0565

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.93122e-7	1.9312e-7	2.7075	0.1129
Error	24	1.71189e-6	7.1329e-8		
C. Total	25	1.90501e-6			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005932	6.68e-5	0.00579	0.00607
Isolok - 3 mL - LF	10	0.005755	8.45e-5	0.00558	0.00593

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005932	0.000240	0.00006	0.00580	0.00606
Isolok - 3 mL - LF	10	0.005755	0.000307	0.0001	0.00554	0.00597

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00018	t Ratio	-1.55213
Std Err Dif	0.00011	DF	15.79592
Upper CL Dif	0.000065	Prob > t	0.1404
Lower CL Dif	-0.00042	Prob > t	0.9298
Confidence	0.95	Prob < t	0.0702

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0002399	0.0002082	0.0002019
Isolok - 3 mL - LF	10	0.0003071	0.0002495	0.0002465

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2293	1	24	0.2785
Brown-Forsythe	0.4914	1	24	0.4900
Levene	0.6355	1	24	0.4332
Bartlett	0.6773	1	.	0.4105
F Test 2-sided	1.6387	9	15	0.3822

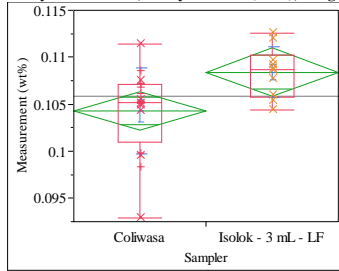
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.4091	1	15.796	0.1404

t Test
1.5521

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=ZrO2 (wt%), Target (wt%)=0.111



**Oneway Anova
Summary of Fit**

Rsquare	0.218421
Adj Rsquare	0.185855
Root Mean Square Error	0.003946
Mean of Response	0.105866
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.004120	t Ratio	2.589799
Std Err Dif	0.001591	DF	24
Upper CL Dif	0.007403	Prob > t	0.0161
Lower CL Dif	0.000837	Prob > t	0.0080
Confidence	0.95	Prob < t	0.9920

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00010445	0.000104	6.7071	0.0161
Error	24	0.00037377	0.000016		
C. Total	25	0.00047823			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.104282	0.00099	0.10225	0.10632
Isolok - 3 mL - LF	10	0.108402	0.00125	0.10583	0.11098

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.104282	0.004544	0.00114	0.10186	0.10670
Isolok - 3 mL - LF	10	0.108402	0.002668	0.00084	0.10649	0.11031

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.004120	t Ratio	2.911629
Std Err Dif	0.001415	DF	23.96099
Upper CL Dif	0.007041	Prob > t	0.0077
Lower CL Dif	0.001199	Prob > t	0.0038
Confidence	0.95	Prob < t	0.9962

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0045440	0.0033095	0.0030393
Isolok - 3 mL - LF	10	0.0026678	0.0020532	0.0020127

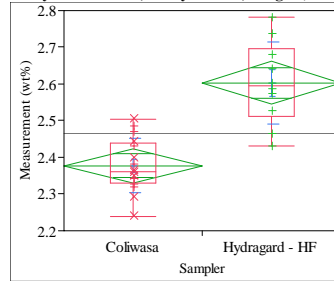
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3485	1	24	0.2570
Brown-Forsythe	0.7840	1	24	0.3847
Levene	1.4905	1	24	0.2340
Bartlett	2.6952	1	.	0.1007
F Test 2-sided	2.9011	15	9	0.1109

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.4776	1	23.961	0.0077

t Test
2.9116

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Al/B, Target (wt%)=2.0704412



**Oneway Anova
Summary of Fit**

Rsquare	0.617245
Adj Rsquare	0.601297
Root Mean Square Error	0.089947
Mean of Response	2.464264
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.225573	t Ratio	6.221199
Std Err Dif	0.036259	DF	24
Upper CL Dif	0.300408	Prob > t	<.0001
Lower CL Dif	0.150739	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.31312805	0.313128	38.7033	<.0001
Error	24	0.19417129	0.008090		
C. Total	25	0.50729934			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.37751	0.02249	2.3311	2.4239
Hydragard - HF	10	2.60308	0.02844	2.5444	2.6618

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.37751	0.073175	0.01829	2.3385	2.4165
Hydragard - HF	10	2.60308	0.112474	0.03557	2.5226	2.6835

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.225573	t Ratio	5.639866
Std Err Dif	0.039996	DF	13.81166
Upper CL Dif	0.311467	Prob > t	<.0001
Lower CL Dif	0.139680	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0731745	0.0583840	0.0566865
Hydragard - HF	10	0.1124740	0.0863295	0.0863295

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.0090	1	24	0.0956
Brown-Forsythe	1.7811	1	24	0.1945
Levene	1.7716	1	24	0.1957
Bartlett	2.0741	1	.	0.1498
F Test 2-sided	2.3626	9	15	0.1358

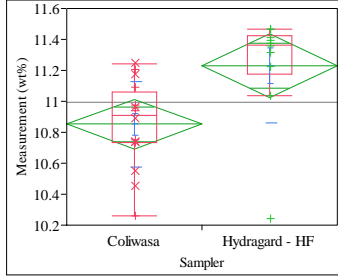
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
31.8081	1	13.812	<.0001

t Test
5.6399

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Al2O3 (wt%), Target (wt%)=10.934



**Oneway Anova
Summary of Fit**

Rsquare	0.269627
Adj Rsquare	0.239195
Root Mean Square Error	0.314748
Mean of Response	10.99689
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.377664	t Ratio	2.976565
Std Err Dif	0.126879	DF	24
Upper CL Dif	0.639529	Prob > t	0.0066
Lower CL Dif	0.115798	Prob > t	0.0033
Confidence	0.95	Prob < t	0.9967

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.8777228	0.877723	8.8599	0.0066
Error	24	2.3775949	0.099066		
C. Total	25	3.2553177			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	10.8516	0.07869	10.689	11.014
Hydragard - HF	10	11.2293	0.09953	11.024	11.435

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	10.8516	0.275955	0.06899	10.705	10.999
Hydragard - HF	10	11.2293	0.370484	0.11716	10.964	11.494

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.377664	t Ratio	2.777742
Std Err Dif	0.135961	DF	15.22525
Upper CL Dif	0.667084	Prob > t	0.0139
Lower CL Dif	0.088243	Prob > t	0.0070
Confidence	0.95	Prob < t	0.9930

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.2759549	0.2200972	0.2161116
Hydragard - HF	10	0.3704844	0.2376991	0.1946185

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4276	1	24	0.5194
Brown-Forsythe	0.0456	1	24	0.8326
Levene	0.0441	1	24	0.8354
Bartlett	0.9675	1	.	0.3253
F Test 2-sided	1.8025	9	15	0.3009

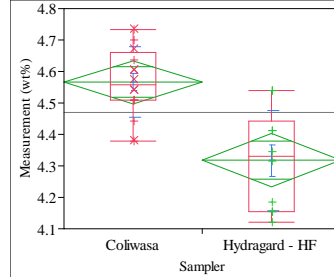
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.7159	1	15.225	0.0139

t Test

2.7777

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=B2O3 (wt%), Target (wt%)=5.281



**Oneway Anova
Summary of Fit**

Rsquare	0.477006
Adj Rsquare	0.455215
Root Mean Square Error	0.131671
Mean of Response	4.470707
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	-0.24833	t Ratio	-4.67864
Std Err Dif	0.05308	DF	24
Upper CL Dif	-0.13879	Prob > t	<.0001
Lower CL Dif	-0.35788	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.37950872	0.379509	21.8896	<.0001
Error	24	0.41609693	0.017337		
C. Total	25	0.79560565			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	4.56622	0.03292	4.4983	4.6342
Hydragard - HF	10	4.31789	0.04164	4.2319	4.4038

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	4.56622	0.112293	0.02807	4.5064	4.6261
Hydragard - HF	10	4.31789	0.158798	0.05022	4.2043	4.4315

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	-0.24833	t Ratio	-4.31656
Std Err Dif	0.05753	DF	14.64637
Upper CL Dif	-0.12545	Prob > t	0.0006
Lower CL Dif	-0.37122	Prob > t	0.9997
Confidence	0.95	Prob < t	0.0003

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1122933	0.0905597	0.0905597
Hydragard - HF	10	0.1587976	0.1320159	0.1320159

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.1672	1	24	0.0878
Brown-Forsythe	2.2290	1	24	0.1485
Levene	2.2950	1	24	0.1428
Bartlett	1.3432	1	.	0.2465
F Test 2-sided	1.9998	9	15	0.2263

Welch Anova testing Means Equal, allowing Std Devs Not Equal

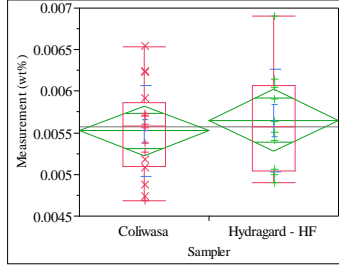
F Ratio	DFNum	DFDen	Prob > F
18.6327	1	14.646	0.0006

t Test

4.3166

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=BaO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.01236
Adj Rsquare	-0.02879
Root Mean Square Error	0.000574
Mean of Response	0.005573
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00013	t Ratio	0.548044
Std Err Dif	0.00023	DF	24
Upper CL Dif	0.00060	Prob > t	0.5887
Lower CL Dif	-0.00035	Prob > t	0.2944
Confidence	0.95	Prob < t	0.7056

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	9.88225e-8	9.8822e-8	0.3004	0.5887
Error	24	7.89652e-6	3.2902e-7		
C. Total	25	7.99535e-6			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005524	0.00014	0.00523	0.00582
Hydragard - HF	10	0.005651	0.00018	0.00528	0.00602

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005524	0.000545	0.00014	0.00523	0.00581
Hydragard - HF	10	0.005651	0.000619	0.00020	0.00521	0.00609

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00013	t Ratio	0.531656
Std Err Dif	0.00024	DF	17.39274
Upper CL Dif	0.00063	Prob > t	0.6017
Lower CL Dif	-0.00038	Prob > t	0.3008
Confidence	0.95	Prob < t	0.6992

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0005449	0.0004372	0.0004326
Hydragard - HF	10	0.0006185	0.0004792	0.0004767

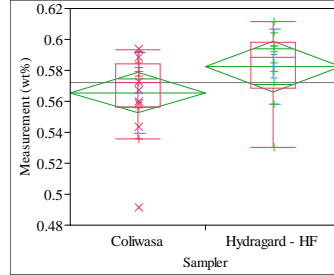
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2413	1	24	0.6277
Brown-Forsythe	0.1046	1	24	0.7492
Levene	0.1026	1	24	0.7515
Bartlett	0.1762	1	.	0.6746
F Test 2-sided	1.2886	9	15	0.6381

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2827	1	17.393	0.6017

t Test
0.5317

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=CaO (wt%), Target (wt%)=0.543



**Oneway Anova
Summary of Fit**

Rsquare	0.102464
Adj Rsquare	0.065067
Root Mean Square Error	0.025268
Mean of Response	0.572111
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.01686	t Ratio	1.655257
Std Err Dif	0.01019	DF	24
Upper CL Dif	0.03788	Prob > t	0.1109
Lower CL Dif	-0.00416	Prob > t	0.0554
Confidence	0.95	Prob < t	0.9446

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00174936	0.001749	2.7399	0.1109
Error	24	0.01532359	0.000638		
C. Total	25	0.01707295			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.565627	0.00632	0.55259	0.57866
Hydragard - HF	10	0.582487	0.00799	0.56600	0.59898

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.565627	0.025969	0.00649	0.55179	0.57946
Hydragard - HF	10	0.582487	0.024055	0.00761	0.56528	0.59969

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.01686	t Ratio	1.685919
Std Err Dif	0.01000	DF	20.39409
Upper CL Dif	0.03770	Prob > t	0.1071
Lower CL Dif	-0.00397	Prob > t	0.0535
Confidence	0.95	Prob < t	0.9465

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0259689	0.0188018	0.0178398
Hydragard - HF	10	0.0240551	0.0179657	0.0174900

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0326	1	24	0.8581
Brown-Forsythe	0.0022	1	24	0.9630
Levene	0.0160	1	24	0.9003
Bartlett	0.0622	1	.	0.8030
F Test 2-sided	1.1654	15	9	0.8420

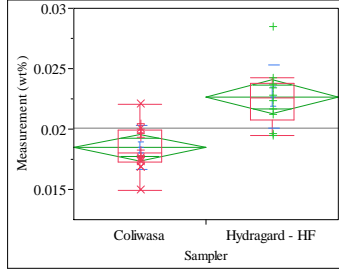
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.8423	1	20.394	0.1071

t Test
1.6859

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Cr2O3 (wt%), Target (wt%)=0.015



**Oneway Anova
Summary of Fit**

Rsquare	0.498405
Adj Rsquare	0.477506
Root Mean Square Error	0.002136
Mean of Response	0.020097
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.004204	t Ratio	4.883381
Std Err Dif	0.000861	DF	24
Upper CL Dif	0.005981	Prob > t	<.0001
Lower CL Dif	0.002427	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00010876	0.000109	23.8474	<.0001
Error	24	0.00010945	4.561e-6		
C. Total	25	0.00021821			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.018480	0.00053	0.01738	0.01958
Hydragard - HF	10	0.022684	0.00068	0.02129	0.02408

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.018480	0.001790	0.00045	0.01753	0.01943
Hydragard - HF	10	0.022684	0.002612	0.00083	0.02082	0.02455

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.004204	t Ratio	4.475407
Std Err Dif	0.000939	DF	14.3202
Upper CL Dif	0.006214	Prob > t	0.0005
Lower CL Dif	0.002193	Prob > t	0.0002
Confidence	0.95	Prob < t	0.9998

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0017901	0.0014787	0.0014525
Hydragard - HF	10	0.0026117	0.0018416	0.0018416

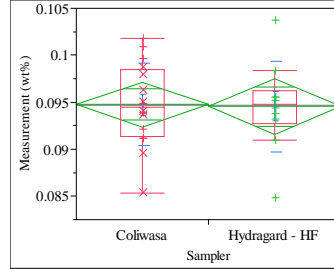
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1629	1	24	0.2916
Brown-Forsythe	0.4988	1	24	0.4868
Levene	0.4796	1	24	0.4952
Bartlett	1.5986	1	.	0.2061
F Test 2-sided	2.1287	9	15	0.1883

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
20.0293	1	14.32	0.0005

t Test
4.4754

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=CuO (wt%), Target (wt%)=0.103



**Oneway Anova
Summary of Fit**

Rsquare	0.000385
Adj Rsquare	-0.04127
Root Mean Square Error	0.004564
Mean of Response	0.09467
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	-0.00018	t Ratio	-0.0961
Std Err Dif	0.00184	DF	24
Upper CL Dif	0.00362	Prob > t	0.9242
Lower CL Dif	-0.00397	Prob > t	0.5379
Confidence	0.95	Prob < t	0.4621

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000019	1.924e-7	0.0092	0.9242
Error	24	0.00050001	0.000021		
C. Total	25	0.00050020			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.094738	0.00114	0.09238	0.09709
Hydragard - HF	10	0.094561	0.00144	0.09158	0.09754

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.094738	0.004393	0.00110	0.09240	0.09708
Hydragard - HF	10	0.094561	0.004837	0.00153	0.09110	0.09802

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	-0.00018	t Ratio	-0.0939
Std Err Dif	0.00188	DF	17.82695
Upper CL Dif	0.00378	Prob > t	0.9262
Lower CL Dif	-0.00414	Prob > t	0.5369
Confidence	0.95	Prob < t	0.4631

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0043927	0.0033877	0.0033877
Hydragard - HF	10	0.0048371	0.0031045	0.0031045

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0923	1	24	0.7638
Brown-Forsythe	0.0534	1	24	0.8192
Levene	0.0538	1	24	0.8185
Bartlett	0.1015	1	.	0.7501
F Test 2-sided	1.2126	9	15	0.7121

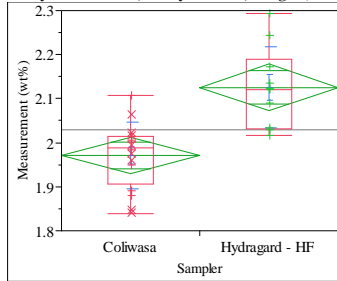
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0088	1	17.827	0.9262

t Test
0.0939

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Fe/Li, Target (wt%)=1.99097835



**Oneway Anova
Summary of Fit**

Rsquare	0.47936
Adj Rsquare	0.457666
Root Mean Square Error	0.081477
Mean of Response	2.0305
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.154394	t Ratio	4.700752
Std Err Dif	0.032845	DF	24
Upper CL Dif	0.222182	Prob > t	<.0001
Lower CL Dif	0.086606	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.14669233	0.146692	22.0971	<.0001
Error	24	0.15932503	0.006639		
C. Total	25	0.30601736			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.97112	0.02037	1.9291	2.0132
Hydragard - HF	10	2.12551	0.02577	2.0723	2.1787

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.97112	0.074949	0.01874	1.9312	2.0111
Hydragard - HF	10	2.12551	0.091326	0.02888	2.0602	2.1908

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.154394	t Ratio	4.484836
Std Err Dif	0.034426	DF	16.42542
Upper CL Dif	0.227220	Prob > t	0.0004
Lower CL Dif	0.081568	Prob > t	0.0002
Confidence	0.95	Prob < t	0.9998

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0749492	0.0579101	0.0561107
Hydragard - HF	10	0.0913262	0.0683811	0.0679487

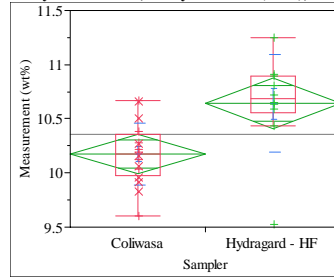
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6116	1	24	0.4418
Brown-Forsythe	0.3065	1	24	0.5850
Levene	0.2749	1	24	0.6049
Bartlett	0.4318	1	.	0.5111
F Test 2-sided	1.4848	9	15	0.4791

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
20.1138	1	16.425	0.0004

t Test
4.4848

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Fe2O3 (wt%), Target (wt%)=9.931



**Oneway Anova
Summary of Fit**

Rsquare	0.304182
Adj Rsquare	0.27519
Root Mean Square Error	0.358185
Mean of Response	10.35488
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.467691	t Ratio	3.239104
Std Err Dif	0.144389	DF	24
Upper CL Dif	0.765695	Prob > t	0.0035
Lower CL Dif	0.169687	Prob > t	0.0017
Confidence	0.95	Prob < t	0.9983

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.3460585	1.34606	10.4918	0.0035
Error	24	3.0791118	0.12830		
C. Total	25	4.4251703			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	10.1750	0.08955	9.990	10.360
Hydragard - HF	10	10.6427	0.11327	10.409	10.876

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	10.1750	0.287400	0.07185	10.022	10.328
Hydragard - HF	10	10.6427	0.452171	0.14299	10.319	10.966

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.467691	t Ratio	2.922592
Std Err Dif	0.160026	DF	13.59848
Upper CL Dif	0.811865	Prob > t	0.0114
Lower CL Dif	0.123516	Prob > t	0.0057
Confidence	0.95	Prob < t	0.9943

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.2874002	0.2189228	0.2189228
Hydragard - HF	10	0.4521711	0.2762180	0.2745024

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0331	1	24	0.3196
Brown-Forsythe	0.2890	1	24	0.5958
Levene	0.3129	1	24	0.5811
Bartlett	2.3063	1	.	0.1288
F Test 2-sided	2.4753	9	15	0.1164

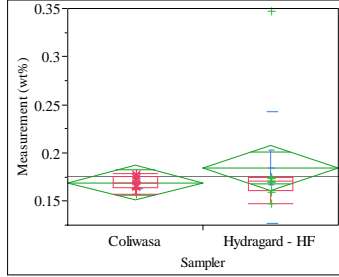
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.5415	1	13.598	0.0114

t Test
2.9226

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=K2O (wt%), Target (wt%)=0.076



**Oneway Anova
Summary of Fit**

Rsquare	0.046406
Adj Rsquare	0.006673
Root Mean Square Error	0.035669
Mean of Response	0.175223
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.01554	t Ratio	1.080714
Std Err Dif	0.01438	DF	24
Upper CL Dif	0.04522	Prob > t	0.2906
Lower CL Dif	-0.01414	Prob > t	0.1453
Confidence	0.95	Prob < t	0.8547

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00148598	0.001486	1.1679	0.2906
Error	24	0.03053526	0.001272		
C. Total	25	0.03202124			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.169246	0.00892	0.15084	0.18765
Hydragard - HF	10	0.184786	0.01128	0.16151	0.20807

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.169246	0.006682	0.00167	0.16569	0.17281
Hydragard - HF	10	0.184786	0.057606	0.01822	0.14358	0.22599

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.01554	t Ratio	0.849474
Std Err Dif	0.01829	DF	9.151601
Upper CL Dif	0.05682	Prob > t	0.4173
Lower CL Dif	-0.02574	Prob > t	0.2086
Confidence	0.95	Prob < t	0.7914

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0066816	0.0058724	0.0058724
Hydragard - HF	10	0.0576056	0.0324278	0.0232488

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8779	1	24	0.1833
Brown-Forsythe	1.6740	1	24	0.2080
Levene	5.3499	1	24	0.0296
Bartlett	39.8136	1	.	<.0001
F Test 2-sided	74.3297	9	15	<.0001

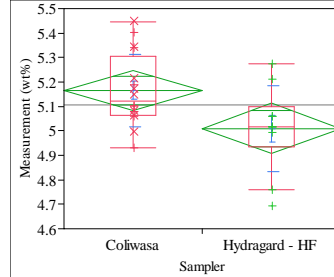
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7216	1	9.1516	0.4173

t Test

0.8495

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Li2O (wt%), Target (wt%)=4.988



**Oneway Anova
Summary of Fit**

Rsquare	0.197349
Adj Rsquare	0.163905
Root Mean Square Error	0.15912
Mean of Response	5.105685
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.15582	t Ratio	-2.42918
Std Err Dif	0.06414	DF	24
Upper CL Dif	-0.02343	Prob > t	0.0230
Lower CL Dif	-0.28820	Prob > t	0.9885
Confidence	0.95	Prob < t	0.0115

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.14940719	0.149407	5.9009	0.0230
Error	24	0.60766305	0.025319		
C. Total	25	0.75707024			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	5.16561	0.03978	5.0835	5.2477
Hydragard - HF	10	5.00980	0.05032	4.9059	5.1137

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	5.16561	0.148007	0.03700	5.0867	5.2445
Hydragard - HF	10	5.00980	0.176091	0.05568	4.8838	5.1358

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.15582	t Ratio	-2.33057
Std Err Dif	0.06686	DF	16.74375
Upper CL Dif	-0.01459	Prob > t	0.0326
Lower CL Dif	-0.29704	Prob > t	0.9837
Confidence	0.95	Prob < t	0.0163

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1480070	0.1168957	0.1143728
Hydragard - HF	10	0.1760909	0.1166872	0.1141037

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4269	1	24	0.5197
Brown-Forsythe	0.0000	1	24	0.9953
Levene	0.0000	1	24	0.9960
Bartlett	0.3328	1	.	0.5640
F Test 2-sided	1.4155	9	15	0.5303

Welch Anova testing Means Equal, allowing Std Devs Not Equal

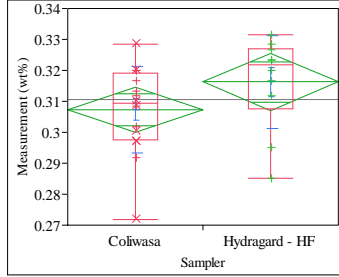
F Ratio	DFNum	DFDen	Prob > F
5.4316	1	16.744	0.0326

t Test

2.3306

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=MgO (wt%), Target (wt%)=0.286



**Oneway Anova
Summary of Fit**

Rsquare	0.090938
Adj Rsquare	0.05306
Root Mean Square Error	0.014303
Mean of Response	0.31074
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.00893	t Ratio	1.549465
Std Err Dif	0.00577	DF	24
Upper CL Dif	0.02083	Prob > t	0.1344
Lower CL Dif	-0.00297	Prob > t	0.0672
Confidence	0.95	Prob < t	0.9328

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00049119	0.000491	2.4008	0.1344
Error	24	0.00491015	0.000205		
C. Total	25	0.00540134			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.307304	0.00358	0.29992	0.31468
Hydragard - HF	10	0.316238	0.00452	0.30690	0.32557

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.307304	0.013844	0.00346	0.29993	0.31468
Hydragard - HF	10	0.316238	0.015038	0.00476	0.30548	0.32700

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.00893	t Ratio	1.519003
Std Err Dif	0.00588	DF	18.02544
Upper CL Dif	0.02129	Prob > t	0.1461
Lower CL Dif	-0.00342	Prob > t	0.0731
Confidence	0.95	Prob < t	0.9269

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0138442	0.0105458	0.0102607
Hydragard - HF	10	0.0150379	0.0113096	0.0104473

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0617	1	24	0.8059
Brown-Forsythe	0.0021	1	24	0.9642
Levene	0.0465	1	24	0.8310
Bartlett	0.0746	1	.	0.7848
F Test 2-sided	1.1799	9	15	0.7463

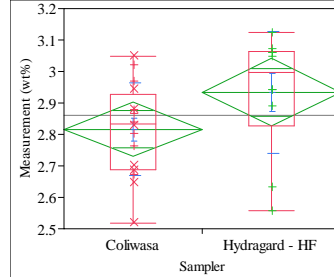
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3074	1	18.025	0.1461

t Test

1.5190

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=MnO (wt%), Target (wt%)=2.918



**Oneway Anova
Summary of Fit**

Rsquare	0.114502
Adj Rsquare	0.077606
Root Mean Square Error	0.165004
Mean of Response	2.861498
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.11718	t Ratio	1.761646
Std Err Dif	0.06652	DF	24
Upper CL Dif	0.25446	Prob > t	0.0909
Lower CL Dif	-0.02010	Prob > t	0.0454
Confidence	0.95	Prob < t	0.9546

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.08449421	0.084494	3.1034	0.0909
Error	24	0.65343303	0.027226		
C. Total	25	0.73792724			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	2.81643	0.04125	2.7313	2.9016
Hydragard - HF	10	2.93361	0.05218	2.8259	3.0413

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	2.81643	0.145768	0.03644	2.7388	2.8941
Hydragard - HF	10	2.93361	0.192846	0.06098	2.7957	3.0716

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.11718	t Ratio	1.649392
Std Err Dif	0.07104	DF	15.39733
Upper CL Dif	0.26826	Prob > t	0.1193
Lower CL Dif	-0.03391	Prob > t	0.0597
Confidence	0.95	Prob < t	0.9403

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1457684	0.1160063	0.1145940
Hydragard - HF	10	0.1928461	0.1435814	0.1394496

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9916	1	24	0.3293
Brown-Forsythe	0.3121	1	24	0.5815
Levene	0.4842	1	24	0.4932
Bartlett	0.8724	1	.	0.3503
F Test 2-sided	1.7502	9	15	0.3247

Welch Anova testing Means Equal, allowing Std Devs Not Equal

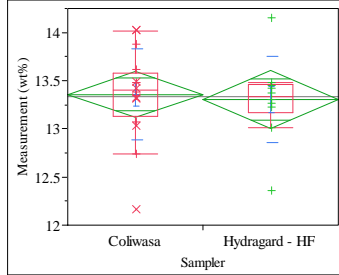
F Ratio	DFNum	DFDen	Prob > F
2.7205	1	15.397	0.1193

t Test

1.6494

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Na2O (wt%), Target (wt%)=13.318



**Oneway Anova
Summary of Fit**

Rsquare	0.00352
Adj Rsquare	-0.038
Root Mean Square Error	0.45936
Mean of Response	13.33794
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.05392	t Ratio	-0.29119
Std Err Dif	0.18517	DF	24
Upper CL Dif	0.32826	Prob > t	0.7734
Lower CL Dif	-0.43610	Prob > t	0.6133
Confidence	0.95	Prob < t	0.3867

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0178915	0.017891	0.0848	0.7734
Error	24	5.0642688	0.211011		
C. Total	25	5.0821603			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	13.3587	0.11484	13.122	13.596
Hydragard - HF	10	13.3048	0.14526	13.005	13.605

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	13.3587	0.467946	0.11699	13.109	13.608
Hydragard - HF	10	13.3048	0.444681	0.14062	12.987	13.623

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.05392	t Ratio	-0.29477
Std Err Dif	0.18292	DF	20.01623
Upper CL Dif	0.32763	Prob > t	0.7712
Lower CL Dif	-0.43547	Prob > t	0.6144
Confidence	0.95	Prob < t	0.3856

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.4679457	0.3184650	0.3150950
Hydragard - HF	10	0.4446811	0.2722960	0.2722960

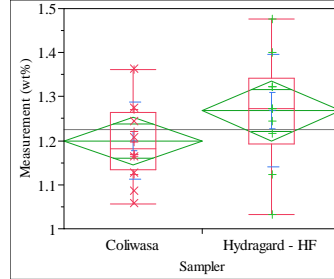
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0172	1	24	0.8968
Brown-Forsythe	0.0976	1	24	0.7574
Levene	0.1166	1	24	0.7357
Bartlett	0.0277	1	.	0.8677
F Test 2-sided	1.1074	15	9	0.9073

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0869	1	20.016	0.7712

t Test
0.2948

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=NiO (wt%), Target (wt%)=1.033



**Oneway Anova
Summary of Fit**

Rsquare	0.100866
Adj Rsquare	0.063402
Root Mean Square Error	0.104512
Mean of Response	1.22576
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.06913	t Ratio	1.64084
Std Err Dif	0.04213	DF	24
Upper CL Dif	0.15608	Prob > t	0.1139
Lower CL Dif	-0.01782	Prob > t	0.0569
Confidence	0.95	Prob < t	0.9431

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.02940774	0.029408	2.6924	0.1139
Error	24	0.26214439	0.010923		
C. Total	25	0.29155213			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.19917	0.02613	1.1452	1.2531
Hydragard - HF	10	1.26830	0.03305	1.2001	1.3365

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.19917	0.087631	0.02191	1.1525	1.2459
Hydragard - HF	10	1.26830	0.127783	0.04041	1.1769	1.3597

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.06913	t Ratio	1.50393
Std Err Dif	0.04597	DF	14.32569
Upper CL Dif	0.16750	Prob > t	0.1543
Lower CL Dif	-0.02925	Prob > t	0.0772
Confidence	0.95	Prob < t	0.9228

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0876307	0.0679793	0.0676016
Hydragard - HF	10	0.1277834	0.0915691	0.0907293

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6779	1	24	0.2075
Brown-Forsythe	0.7106	1	24	0.4076
Levene	0.7876	1	24	0.3836
Bartlett	1.5940	1	.	0.2068
F Test 2-sided	2.1264	9	15	0.1889

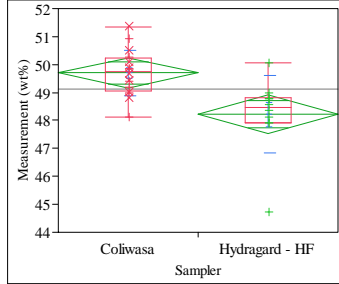
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.2618	1	14.326	0.1543

t Test
1.5039

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=SiO2 (wt%), Target (wt%)=50.183



**Oneway Anova
Summary of Fit**

Rsquare	0.330433
Adj Rsquare	0.302534
Root Mean Square Error	1.065933
Mean of Response	49.12985
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-1.4788	t Ratio	-3.44152
Std Err Dif	0.4297	DF	24
Upper CL Dif	-0.5920	Prob > t	0.0021
Lower CL Dif	-2.3656	Prob > t	0.9989
Confidence	0.95	Prob < t	0.0011

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	13.457373	13.4574	11.8441	0.0021
Error	24	27.269126	1.1362		
C. Total	25	40.726499			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	49.6986	0.26648	49.149	50.249
Hydragard - HF	10	48.2198	0.33708	47.524	48.916

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	49.6986	0.81824	0.20456	49.263	50.135
Hydragard - HF	10	48.2198	1.38349	0.43750	47.230	49.210

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-1.4788	t Ratio	-3.06194
Std Err Dif	0.4830	DF	12.99275
Upper CL Dif	-0.4354	Prob > t	0.0091
Lower CL Dif	-2.5222	Prob > t	0.9955
Confidence	0.95	Prob < t	0.0045

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.818241	0.6284194	0.6284194
Hydragard - HF	10	1.383488	0.8386056	0.8129340

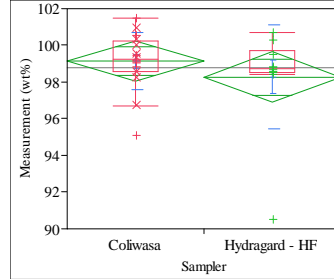
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1437	1	24	0.2955
Brown-Forsythe	0.3370	1	24	0.5670
Levene	0.4688	1	24	0.5001
Bartlett	3.0992	1	.	0.0783
F Test 2-sided	2.8588	9	15	0.0699

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.3755	1	12.993	0.0091

t Test
3.0619

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Sum of Oxides (wt%), Target (wt%)=99.73



**Oneway Anova
Summary of Fit**

Rsquare	0.03961
Adj Rsquare	-0.00041
Root Mean Square Error	2.131604
Mean of Response	98.80298
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.8549	t Ratio	-0.99491
Std Err Dif	0.8593	DF	24
Upper CL Dif	0.9186	Prob > t	0.3297
Lower CL Dif	-2.6284	Prob > t	0.8351
Confidence	0.95	Prob < t	0.1649

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	4.49763	4.49763	0.9899	0.3297
Error	24	109.04964	4.54374		
C. Total	25	113.54727			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.1318	0.53290	98.032	100.23
Hydragard - HF	10	98.2769	0.67407	96.886	99.67

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.1318	1.55720	0.38930	98.302	99.96
Hydragard - HF	10	98.2769	2.84169	0.89862	96.244	100.31

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.8549	t Ratio	-0.87296
Std Err Dif	0.9793	DF	12.43247
Upper CL Dif	1.2707	Prob > t	0.3992
Lower CL Dif	-2.9805	Prob > t	0.8004
Confidence	0.95	Prob < t	0.1996

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.557197	1.056679	1.048377
Hydragard - HF	10	2.841688	1.555220	1.342245

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9922	1	24	0.3292
Brown-Forsythe	0.1684	1	24	0.6852
Levene	0.5479	1	24	0.4664
Bartlett	4.0600	1	.	0.0439
F Test 2-sided	3.3302	9	15	0.0387

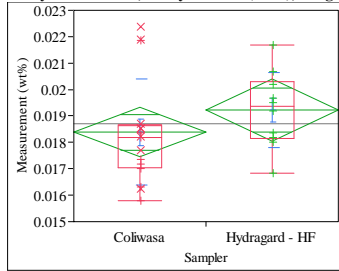
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7621	1	12.432	0.3992

t Test
0.8730

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=TiO2 (wt%), Target (wt%)=0.013



**Oneway Anova
Summary of Fit**

Rsquare	0.05394
Adj Rsquare	0.01452
Root Mean Square Error	0.001813
Mean of Response	0.018706
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00085	t Ratio	1.169769
Std Err Dif	0.00073	DF	24
Upper CL Dif	0.00236	Prob > t	0.2536
Lower CL Dif	-0.00065	Prob > t	0.1268
Confidence	0.95	Prob < t	0.8732

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000450	4.497e-6	1.3684	0.2536
Error	24	0.00007887	3.2864e-6		
C. Total	25	0.00008337			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.018377	0.00045	0.01744	0.01931
Hydragard - HF	10	0.019232	0.00057	0.01805	0.02042

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.018377	0.002008	0.00050	0.01731	0.01945
Hydragard - HF	10	0.019232	0.001428	0.00045	0.01821	0.02025

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00085	t Ratio	1.265671
Std Err Dif	0.00068	DF	23.47608
Upper CL Dif	0.00225	Prob > t	0.2180
Lower CL Dif	-0.00054	Prob > t	0.1090
Confidence	0.95	Prob < t	0.8910

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0020085	0.0014376	0.0014095
Hydragard - HF	10	0.0014285	0.0011176	0.0011176

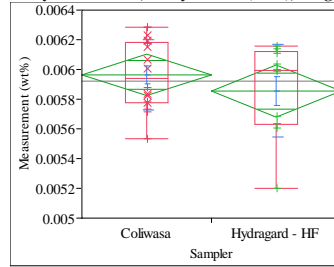
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0616	1	24	0.3131
Brown-Forsythe	0.3560	1	24	0.5563
Levene	0.4541	1	24	0.5069
Bartlett	1.1622	1	.	0.2810
F Test 2-sided	1.9768	15	9	0.3034

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6019	1	23.476	0.2180

t Test
1.2657

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=ZnO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.040766
Adj Rsquare	0.000798
Root Mean Square Error	0.000267
Mean of Response	0.005922
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00011	t Ratio	-1.00993
Std Err Dif	0.00011	DF	24
Upper CL Dif	0.00011	Prob > t	0.3226
Lower CL Dif	-0.00033	Prob > t	0.8387
Confidence	0.95	Prob < t	0.1613

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	7.259e-8	7.259e-8	1.0200	0.3226
Error	24	1.70807e-6	7.1169e-8		
C. Total	25	1.78066e-6			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005964	6.67e-5	0.00583	0.00610
Hydragard - HF	10	0.005856	8.44e-5	0.00568	0.00603

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005964	0.000235	5.88e-5	0.00584	0.00609
Hydragard - HF	10	0.005856	0.000312	0.0001	0.00563	0.00608

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00011	t Ratio	-0.94481
Std Err Dif	0.00011	DF	15.35441
Upper CL Dif	0.00014	Prob > t	0.3594
Lower CL Dif	-0.00035	Prob > t	0.8203
Confidence	0.95	Prob < t	0.1797

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0002352	0.0002062	0.0002062
Hydragard - HF	10	0.0003123	0.0002592	0.0002328

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1286	1	24	0.2986
Brown-Forsythe	0.1525	1	24	0.6996
Levene	1.1643	1	24	0.2913
Bartlett	0.8955	1	.	0.3440
F Test 2-sided	1.7630	9	15	0.3187

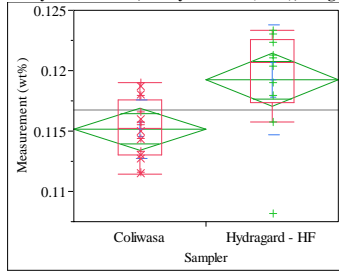
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8927	1	15.354	0.3594

t Test
0.9448

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=ZrO2 (wt%), Target (wt%)=0.111



Oneway Anova Summary of Fit

Rsquare	0.270992
Adj Rsquare	0.240617
Root Mean Square Error	0.003374
Mean of Response	0.116735
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.004063	t Ratio	2.98688
Std Err Dif	0.001360	DF	24
Upper CL Dif	0.006870	Prob > t	0.0064
Lower CL Dif	0.001255	Prob > t	0.0032
Confidence	0.95	Prob < t	0.9968

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00010156	0.000102	8.9215	0.0064
Error	24	0.00027322	0.000011		
C. Total	25	0.00037479			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.115173	0.000084	0.11343	0.11691
Hydragard - HF	10	0.119235	0.00107	0.11703	0.12144

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.115173	0.002416	0.00060	0.11389	0.11646
Hydragard - HF	10	0.119235	0.004542	0.00144	0.11599	0.12248

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.004063	t Ratio	2.607397
Std Err Dif	0.001558	DF	12.23629
Upper CL Dif	0.007450	Prob > t	0.0226
Lower CL Dif	0.000675	Prob > t	0.0113
Confidence	0.95	Prob < t	0.9887

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0024163	0.0019755	0.0019755
Hydragard - HF	10	0.0045417	0.0032095	0.0029853

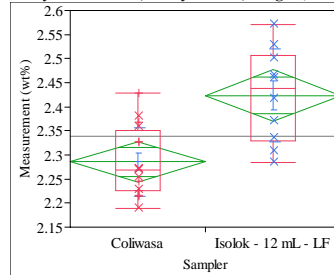
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8485	1	24	0.1866
Brown-Forsythe	1.0531	1	24	0.3150
Levene	2.0867	1	24	0.1615
Bartlett	4.4642	1	.	0.0346
F Test 2-sided	3.5329	9	15	0.0304

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.7985	1	12.236	0.0226

t Test
2.6074

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Al/B, Target (wt%)=2.0704412



Oneway Anova Summary of Fit

Rsquare	0.423396
Adj Rsquare	0.39937
Root Mean Square Error	0.08151
Mean of Response	2.338811
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.137936	t Ratio	4.197975
Std Err Dif	0.032858	DF	24
Upper CL Dif	0.205751	Prob > t	0.0003
Lower CL Dif	0.070121	Prob > t	0.0002
Confidence	0.95	Prob < t	0.9998

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.11708511	0.117085	17.6230	0.0003
Error	24	0.15945320	0.006644		
C. Total	25	0.27653831			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	2.28576	0.02038	2.2437	2.3278
Isolok - 12 mL - LF	10	2.42369	0.02578	2.3705	2.4769

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	2.28576	0.070559	0.01764	2.2482	2.3234
Isolok - 12 mL - LF	10	2.42369	0.097053	0.03069	2.3543	2.4931

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.137936	t Ratio	3.896593
Std Err Dif	0.035399	DF	14.94949
Upper CL Dif	0.213410	Prob > t	0.0014
Lower CL Dif	0.062462	Prob > t	0.0007
Confidence	0.95	Prob < t	0.9993

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0705592	0.0595251	0.0557725
Isolok - 12 mL - LF	10	0.0970534	0.0807192	0.0807192

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.3786	1	24	0.1361
Brown-Forsythe	1.8086	1	24	0.1913
Levene	1.7642	1	24	0.1966
Bartlett	1.1351	1	.	0.2867
F Test 2-sided	1.8920	9	15	0.2642

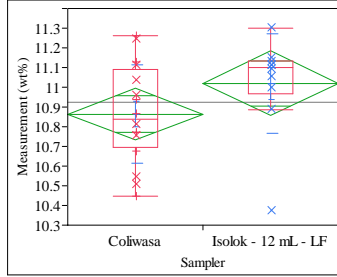
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
15.1834	1	14.949	0.0014

t Test
3.8966

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Al2O3 (wt%), Target (wt%)=10.934



**Oneway Anova
Summary of Fit**

Rsquare	0.090102
Adj Rsquare	0.05219
Root Mean Square Error	0.25122
Mean of Response	10.92349
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.15612	t Ratio	1.541621
Std Err Dif	0.10127	DF	24
Upper CL Dif	0.36513	Prob > t	0.1362
Lower CL Dif	-0.05289	Prob > t	0.0681
Confidence	0.95	Prob < t	0.9319

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1499904	0.149990	2.3766	0.1362
Error	24	1.5146751	0.063111		
C. Total	25	1.6646655			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	10.8634	0.06280	10.734	10.993
Isolok - 12 mL - LF	10	11.0196	0.07944	10.856	11.184

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	10.8634	0.251473	0.06287	10.729	10.997
Isolok - 12 mL - LF	10	11.0196	0.250797	0.07931	10.840	11.199

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.15612	t Ratio	1.542619
Std Err Dif	0.10120	DF	19.29355
Upper CL Dif	0.36773	Prob > t	0.1392
Lower CL Dif	-0.05549	Prob > t	0.0696
Confidence	0.95	Prob < t	0.9304

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.2514733	0.2043022	0.2043022
Isolok - 12 mL - LF	10	0.2507971	0.1609854	0.1398230

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0001	1	24	0.9938
Brown-Forsythe	0.8421	1	24	0.3679
Levene	0.4716	1	24	0.4989
Bartlett	0.0001	1	.	0.9930
F Test 2-sided	1.0054	15	9	1.0000

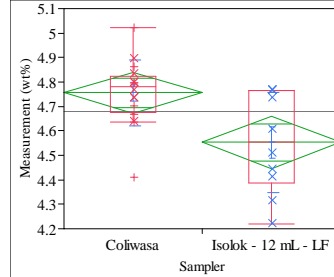
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3797	1	19.294	0.1392

t Test

1.5426

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=B2O3 (wt%), Target (wt%)=5.281



**Oneway Anova
Summary of Fit**

Rsquare	0.28056
Adj Rsquare	0.250583
Root Mean Square Error	0.164162
Mean of Response	4.677524
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	-0.20245	t Ratio	-3.05929
Std Err Dif	0.06618	DF	24
Upper CL Dif	-0.06587	Prob > t	0.0054
Lower CL Dif	-0.33903	Prob > t	0.9973
Confidence	0.95	Prob < t	0.0027

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.25222458	0.252225	9.3593	0.0054
Error	24	0.64677950	0.026949		
C. Total	25	0.89900407			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	4.75539	0.04104	4.6707	4.8401
Isolok - 12 mL - LF	10	4.55294	0.05191	4.4458	4.6601

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	4.75539	0.134938	0.03373	4.6835	4.8273
Isolok - 12 mL - LF	10	4.55294	0.203757	0.06443	4.4072	4.6987

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.20245	t Ratio	-2.78358
Std Err Dif	0.07273	DF	13.97996
Upper CL Dif	-0.04644	Prob > t	0.0147
Lower CL Dif	-0.35846	Prob > t	0.9927
Confidence	0.95	Prob < t	0.0073

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1349384	0.0958423	0.0945846
Isolok - 12 mL - LF	10	0.2037575	0.1738746	0.1738746

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.4875	1	24	0.1278
Brown-Forsythe	4.3722	1	24	0.0473
Levene	4.5538	1	24	0.0433
Bartlett	1.9052	1	.	0.1675
F Test 2-sided	2.2801	9	15	0.1523

Welch Anova testing Means Equal, allowing Std Devs Not Equal

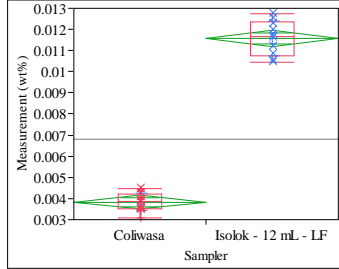
F Ratio	DFNum	DFDen	Prob > F
7.7483	1	13.98	0.0147

t Test

2.7836

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=BaO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.977732
Adj Rsquare	0.976804
Root Mean Square Error	0.000591
Mean of Response	0.006818
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.007736	t Ratio	32.4617
Std Err Dif	0.000238	DF	24
Upper CL Dif	0.008228	Prob > t	<.0001
Lower CL Dif	0.007244	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00036832	0.000368	1053.762	<.0001
Error	24	0.00000839	3.495e-7		
C. Total	25	0.00037670			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.003843	0.00015	0.00354	0.00415
Isolok - 12 mL - LF	10	0.011579	0.00019	0.01119	0.01197

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.003843	0.000408	0.00010	0.00363	0.00406
Isolok - 12 mL - LF	10	0.011579	0.000809	0.00026	0.01100	0.01216

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.007736	t Ratio	28.08834
Std Err Dif	0.000275	DF	11.90882
Upper CL Dif	0.008337	Prob > t	<.0001
Lower CL Dif	0.007136	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0004081	0.0003396	0.0003384
Isolok - 12 mL - LF	10	0.0008090	0.0006641	0.0006576

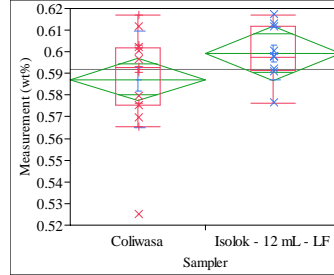
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	9.4222	1	24	0.0053
Brown-Forsythe	6.4548	1	24	0.0179
Levene	7.2906	1	24	0.0125
Bartlett	5.2386	1	.	0.0221
F Test 2-sided	3.9309	9	15	0.0192

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
788.9547	1	11.909	<.0001

t Test
28.0883

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=CaO (wt%), Target (wt%)=0.543



**Oneway Anova
Summary of Fit**

Rsquare	0.090937
Adj Rsquare	0.053059
Root Mean Square Error	0.019153
Mean of Response	0.591915
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.01196	t Ratio	1.549454
Std Err Dif	0.00772	DF	24
Upper CL Dif	0.02790	Prob > t	0.1344
Lower CL Dif	-0.00397	Prob > t	0.0672
Confidence	0.95	Prob < t	0.9328

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00088072	0.000881	2.4008	0.1344
Error	24	0.00880425	0.000367		
C. Total	25	0.00968497			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.587314	0.00479	0.57743	0.59720
Isolok - 12 mL - LF	10	0.599277	0.00606	0.58678	0.61178

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.587314	0.022349	0.00559	0.57541	0.59922
Isolok - 12 mL - LF	10	0.599277	0.012073	0.00382	0.59064	0.60791

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.01196	t Ratio	1.76782
Std Err Dif	0.00677	DF	23.67529
Upper CL Dif	0.02594	Prob > t	0.0900
Lower CL Dif	-0.00201	Prob > t	0.0450
Confidence	0.95	Prob < t	0.9550

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0223493	0.0167030	0.0157410
Isolok - 12 mL - LF	10	0.0120734	0.0088989	0.0085351

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0938	1	24	0.3061
Brown-Forsythe	1.6726	1	24	0.2082
Levene	2.5348	1	24	0.1244
Bartlett	3.5170	1	.	0.0607
F Test 2-sided	3.4267	15	9	0.0674

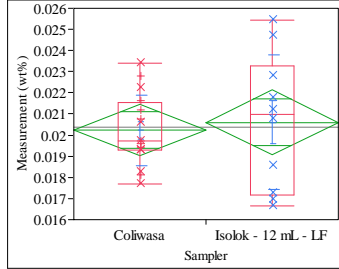
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.1252	1	23.675	0.0900

t Test
1.7678

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Cr2O3 (wt%), Target (wt%)=0.015



**Oneway Anova
Summary of Fit**

Rsquare	0.006457
Adj Rsquare	-0.03494
Root Mean Square Error	0.002353
Mean of Response	0.020378
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00037	t Ratio	0.39493
Std Err Dif	0.00095	DF	24
Upper CL Dif	0.00233	Prob > t	0.6964
Lower CL Dif	-0.00158	Prob > t	0.3482
Confidence	0.95	Prob < t	0.6518

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000086	8.6324e-7	0.1560	0.6964
Error	24	0.00013283	5.5347e-6		
C. Total	25	0.00013370			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.020234	0.00059	0.01902	0.02145
Isolok - 12 mL - LF	10	0.020609	0.00074	0.01907	0.02214

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.020234	0.001671	0.00042	0.01934	0.02112
Isolok - 12 mL - LF	10	0.020609	0.003179	0.00101	0.01833	0.02288

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00037	t Ratio	0.344037
Std Err Dif	0.00109	DF	12.1578
Upper CL Dif	0.00274	Prob > t	0.7367
Lower CL Dif	-0.00199	Prob > t	0.3683
Confidence	0.95	Prob < t	0.6317

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0016707	0.0013691	0.0013063
Isolok - 12 mL - LF	10	0.0031791	0.0026016	0.0025724

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	8.0914	1	24	0.0090
Brown-Forsythe	5.2930	1	24	0.0304
Levene	6.3822	1	24	0.0185
Bartlett	4.6377	1	.	0.0313
F Test 2-sided	3.6209	9	15	0.0274

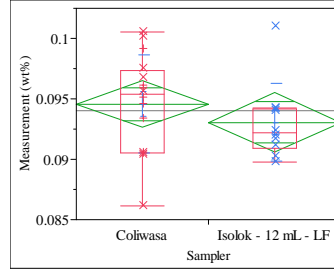
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1184	1	12.158	0.7367

t Test

0.3440

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=CuO (wt%), Target (wt%)=0.103



**Oneway Anova
Summary of Fit**

Rsquare	0.039656
Adj Rsquare	-0.00036
Root Mean Square Error	0.003755
Mean of Response	0.093986
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00151	t Ratio	-0.99551
Std Err Dif	0.00151	DF	24
Upper CL Dif	0.00162	Prob > t	0.3294
Lower CL Dif	-0.00463	Prob > t	0.8353
Confidence	0.95	Prob < t	0.1647

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001397	0.000014	0.9910	0.3294
Error	24	0.00033838	0.000014		
C. Total	25	0.00035236			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.094566	0.00094	0.09263	0.09650
Isolok - 12 mL - LF	10	0.093059	0.00119	0.09061	0.09551

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.094566	0.004045	0.00101	0.09241	0.09672
Isolok - 12 mL - LF	10	0.093059	0.003214	0.00102	0.09076	0.09536

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00151	t Ratio	-1.05097
Std Err Dif	0.00143	DF	22.44054
Upper CL Dif	0.00146	Prob > t	0.3045
Lower CL Dif	-0.00448	Prob > t	0.8478
Confidence	0.95	Prob < t	0.1522

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0040447	0.002332	0.0031530
Isolok - 12 mL - LF	10	0.0032144	0.0022382	0.0021030

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4876	1	24	0.4917
Brown-Forsythe	1.0617	1	24	0.3131
Levene	1.2080	1	24	0.2826
Bartlett	0.5427	1	.	0.4613
F Test 2-sided	1.5833	15	9	0.4919

Welch Anova testing Means Equal, allowing Std Devs Not Equal

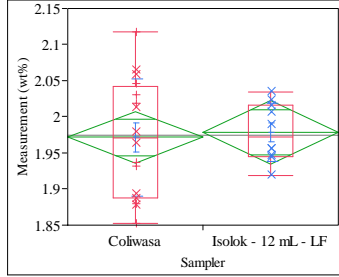
F Ratio	DFNum	DFDen	Prob > F
1.1045	1	22.441	0.3045

t Test

1.0510

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Fe/Li, Target (wt%)=1.99097835



**Oneway Anova
Summary of Fit**

Rsquare	0.00265
Adj Rsquare	-0.03891
Root Mean Square Error	0.068408
Mean of Response	1.974291
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00696	t Ratio	0.252534
Std Err Dif	0.02758	DF	24
Upper CL Dif	0.06388	Prob > t	0.8028
Lower CL Dif	-0.04995	Prob > t	0.4014
Confidence	0.95	Prob < t	0.5986

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00029844	0.000298	0.0638	0.8028
Error	24	0.11231081	0.004680		
C. Total	25	0.11260924			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.97161	0.01710	1.9363	2.0069
Isolok - 12 mL - LF	10	1.97858	0.02163	1.9339	2.0232

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.97161	0.080879	0.02022	1.9285	2.0147
Isolok - 12 mL - LF	10	1.97858	0.039706	0.01256	1.9502	2.0070

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00696	t Ratio	0.292585
Std Err Dif	0.02380	DF	23.0793
Upper CL Dif	0.05619	Prob > t	0.7725
Lower CL Dif	-0.04226	Prob > t	0.3862
Confidence	0.95	Prob < t	0.6138

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0808791	0.0691507	0.0691507
Isolok - 12 mL - LF	10	0.0397064	0.0349048	0.0349048

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	6.1244	1	24	0.0208
Brown-Forsythe	7.2099	1	24	0.0129
Levene	7.3338	1	24	0.0123
Bartlett	4.5605	1	.	0.0327
F Test 2-sided	4.1491	15	9	0.0366

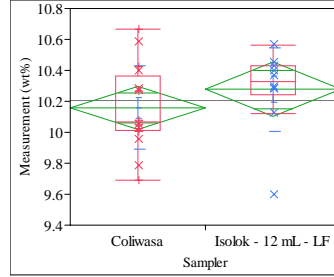
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0856	1	23.079	0.7725

t Test

0.2926

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Fe2O3 (wt%), Target (wt%)=9.931



**Oneway Anova
Summary of Fit**

Rsquare	0.047497
Adj Rsquare	0.00781
Root Mean Square Error	0.269085
Mean of Response	10.20366
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.11867	t Ratio	1.093973
Std Err Dif	0.10847	DF	24
Upper CL Dif	0.34254	Prob > t	0.2848
Lower CL Dif	-0.10521	Prob > t	0.1424
Confidence	0.95	Prob < t	0.8576

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0866548	0.086655	1.1968	0.2848
Error	24	1.7377628	0.072407		
C. Total	25	1.8244176			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.1580	0.06727	10.019	10.297
Isolok - 12 mL - LF	10	10.2767	0.08509	10.101	10.452

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.1580	0.269553	0.06739	10.014	10.302
Isolok - 12 mL - LF	10	10.2767	0.268303	0.08484	10.085	10.469

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.11867	t Ratio	1.095196
Std Err Dif	0.10835	DF	19.32287
Upper CL Dif	0.34519	Prob > t	0.2869
Lower CL Dif	-0.10786	Prob > t	0.1434
Confidence	0.95	Prob < t	0.8566

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2695531	0.2207099	0.2108807
Isolok - 12 mL - LF	10	0.2683032	0.1675608	0.1629858

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0002	1	24	0.9896
Brown-Forsythe	0.3656	1	24	0.5511
Levene	0.6157	1	24	0.4403
Bartlett	0.0002	1	.	0.9878
F Test 2-sided	1.0093	15	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

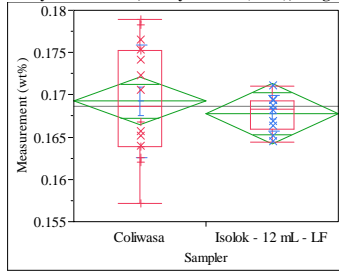
F Ratio	DFNum	DFDen	Prob > F
1.1995	1	19.323	0.2869

t Test

1.0952

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=K2O (wt%), Target (wt%)=0.076



**Oneway Anova
Summary of Fit**

Rsquare	0.017796
Adj Rsquare	-0.02313
Root Mean Square Error	0.005438
Mean of Response	0.16869
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	-0.00145	t Ratio	-0.65942
Std Err Dif	0.00219	DF	24
Upper CL Dif	0.00308	Prob > t	0.5159
Lower CL Dif	-0.00597	Prob > t	0.7420
Confidence	0.95	Prob < t	0.2580

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001286	0.000013	0.4348	0.5159
Error	24	0.00070971	0.000030		
C. Total	25	0.00072257			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.169246	0.00136	0.16644	0.17205
Isolok - 12 mL - LF	10	0.167801	0.00172	0.16425	0.17135

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.169246	0.006682	0.00167	0.16569	0.17281
Isolok - 12 mL - LF	10	0.167801	0.002109	0.00067	0.16629	0.16931

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.00145	t Ratio	-0.80365
Std Err Dif	0.00180	DF	19.34584
Upper CL Dif	0.00231	Prob > t	0.4314
Lower CL Dif	-0.00521	Prob > t	0.7843
Confidence	0.95	Prob < t	0.2157

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0066816	0.0058724	0.0058724
Isolok - 12 mL - LF	10	0.0021095	0.0017346	0.0016864

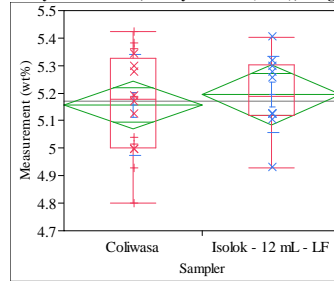
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	9.1424	1	24	0.0059
Brown-Forsythe	18.7193	1	24	0.0002
Levene	19.7773	1	24	0.0002
Bartlett	10.3949	1	.	0.0013
F Test 2-sided	10.0326	15	9	0.0014

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6459	1	19.346	0.4314

t Test
0.8037

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Li2O (wt%), Target (wt%)=4.988



**Oneway Anova
Summary of Fit**

Rsquare	0.012667
Adj Rsquare	-0.02847
Root Mean Square Error	0.167228
Mean of Response	5.171928
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.03741	t Ratio	0.554899
Std Err Dif	0.06741	DF	24
Upper CL Dif	0.17654	Prob > t	0.5841
Lower CL Dif	-0.10172	Prob > t	0.2920
Confidence	0.95	Prob < t	0.7080

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00861081	0.008611	0.3079	0.5841
Error	24	0.67116225	0.027965		
C. Total	25	0.67977306			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	5.15754	0.04181	5.0713	5.2438
Isolok - 12 mL - LF	10	5.19495	0.05288	5.0858	5.3041

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	5.15754	0.182336	0.04558	5.0604	5.2547
Isolok - 12 mL - LF	10	5.19495	0.138431	0.04378	5.0959	5.2940

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.03741	t Ratio	0.59188
Std Err Dif	0.06320	DF	22.92623
Upper CL Dif	0.16817	Prob > t	0.5597
Lower CL Dif	-0.09336	Prob > t	0.2799
Confidence	0.95	Prob < t	0.7201

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1823357	0.1505348	0.1493574
Isolok - 12 mL - LF	10	0.1384307	0.1141037	0.1141037

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1243	1	24	0.2996
Brown-Forsythe	0.9611	1	24	0.3367
Levene	1.0988	1	24	0.3050
Bartlett	0.7719	1	.	0.3796
F Test 2-sided	1.7349	15	9	0.4069

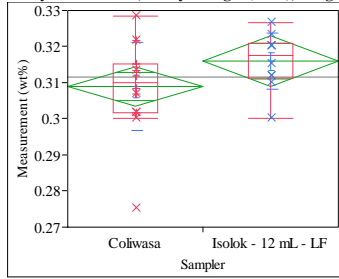
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3503	1	22.926	0.5597

t Test
0.5919

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=MgO (wt%), Target (wt%)=0.286



**Oneway Anova
Summary of Fit**

Rsquare	0.097757
Adj Rsquare	0.060164
Root Mean Square Error	0.010683
Mean of Response	0.311633
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.00694	t Ratio	1.612567
Std Err Dif	0.00431	DF	24
Upper CL Dif	0.01583	Prob > t	0.1199
Lower CL Dif	-0.00194	Prob > t	0.0600
Confidence	0.95	Prob < t	0.9400

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00029674	0.000297	2.6004	0.1199
Error	24	0.00273879	0.000114		
C. Total	25	0.00303553			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.308962	0.00267	0.30345	0.31447
Isolok - 12 mL - LF	10	0.315906	0.00338	0.30893	0.32288

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.308962	0.012106	0.00303	0.30251	0.31541
Isolok - 12 mL - LF	10	0.315906	0.007749	0.00245	0.31036	0.32145

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.00694	t Ratio	1.783236
Std Err Dif	0.00389	DF	23.95519
Upper CL Dif	0.01498	Prob > t	0.0872
Lower CL Dif	-0.00109	Prob > t	0.0436
Confidence	0.95	Prob < t	0.9564

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0121063	0.0086024	0.0086024
Isolok - 12 mL - LF	10	0.0077486	0.0061357	0.0061357

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.7214	1	24	0.4041
Brown-Forsythe	0.7327	1	24	0.4005
Levene	0.7627	1	24	0.3911
Bartlett	1.9384	1	.	0.1638
F Test 2-sided	2.4410	15	9	0.1789

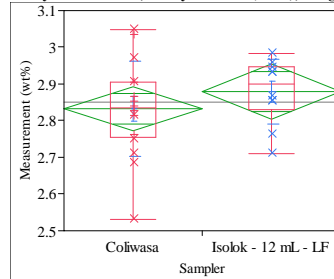
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.1799	1	23.955	0.0872

t Test

1.7832

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=MnO (wt%), Target (wt%)=2.918



**Oneway Anova
Summary of Fit**

Rsquare	0.039628
Adj Rsquare	-0.00039
Root Mean Square Error	0.116678
Mean of Response	2.850572
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.04681	t Ratio	0.995146
Std Err Dif	0.04703	DF	24
Upper CL Dif	0.14388	Prob > t	0.3296
Lower CL Dif	-0.05027	Prob > t	0.1648
Confidence	0.95	Prob < t	0.8352

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01348186	0.013482	0.9903	0.3296
Error	24	0.32672902	0.013614		
C. Total	25	0.34021087			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	2.83257	0.02917	2.7724	2.8928
Isolok - 12 mL - LF	10	2.87938	0.03690	2.8032	2.9555

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	2.83257	0.130989	0.03275	2.7628	2.9024
Isolok - 12 mL - LF	10	2.87938	0.087785	0.02776	2.8166	2.9422

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.04681	t Ratio	1.09028
Std Err Dif	0.04293	DF	23.81102
Upper CL Dif	0.13545	Prob > t	0.2865
Lower CL Dif	-0.04183	Prob > t	0.1433
Confidence	0.95	Prob < t	0.8567

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1309895	0.0952260	0.0952260
Isolok - 12 mL - LF	10	0.0877847	0.0697248	0.0697248

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0951	1	24	0.3058
Brown-Forsythe	0.7020	1	24	0.4104
Levene	0.7220	1	24	0.4039
Bartlett	1.5789	1	.	0.2089
F Test 2-sided	2.2266	15	9	0.2270

Welch Anova testing Means Equal, allowing Std Devs Not Equal

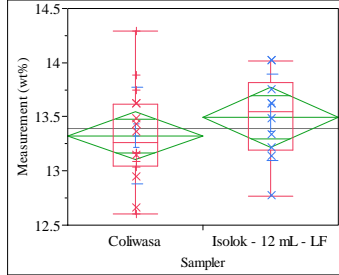
F Ratio	DFNum	DFDen	Prob > F
1.1887	1	23.811	0.2865

t Test

1.0903

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Na2O (wt%), Target (wt%)=13.318



Oneway Anova Summary of Fit

Rsquare	0.03766
Adj Rsquare	-0.00244
Root Mean Square Error	0.427
Mean of Response	13.39082
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.16682	t Ratio	0.969126
Std Err Dif	0.17213	DF	24
Upper CL Dif	0.52207	Prob > t	0.3421
Lower CL Dif	-0.18844	Prob > t	0.1711
Confidence	0.95	Prob < t	0.8289

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1712446	0.171245	0.9392	0.3421
Error	24	4.3759044	0.182329		
C. Total	25	4.5471490			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	13.3267	0.10675	13.106	13.547
Isolok - 12 mL - LF	10	13.4935	0.13503	13.215	13.772

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	13.3267	0.444169	0.11104	13.090	13.563
Isolok - 12 mL - LF	10	13.4935	0.396739	0.12546	13.210	13.777

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.16682	t Ratio	0.995657
Std Err Dif	0.16754	DF	20.92067
Upper CL Dif	0.51532	Prob > t	0.3308
Lower CL Dif	-0.18169	Prob > t	0.1654
Confidence	0.95	Prob < t	0.8346

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4441689	0.3504800	0.3504800
Isolok - 12 mL - LF	10	0.3967387	0.3100400	0.3100400

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1527	1	24	0.6994
Brown-Forsythe	0.1568	1	24	0.6956
Levene	0.1667	1	24	0.6867
Bartlett	0.1344	1	.	0.7139
F Test 2-sided	1.2534	15	9	0.7515

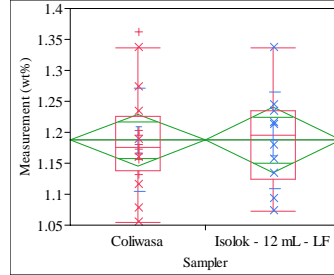
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9913	1	20.921	0.3308

t Test

0.9957

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=NiO (wt%), Target (wt%)=1.033



Oneway Anova Summary of Fit

Rsquare	1.938e-6
Adj Rsquare	-0.04166
Root Mean Square Error	0.080994
Mean of Response	1.187634
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00022	t Ratio	-0.00682
Std Err Dif	0.03265	DF	24
Upper CL Dif	0.06716	Prob > t	0.9946
Lower CL Dif	-0.06761	Prob > t	0.5027
Confidence	0.95	Prob < t	0.4973

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000031	3.052e-7	0.0000	0.9946
Error	24	0.15743923	0.006560		
C. Total	25	0.15743954			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.18772	0.02025	1.1459	1.2295
Isolok - 12 mL - LF	10	1.18750	0.02561	1.1346	1.2404

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.18772	0.082768	0.02069	1.1436	1.2318
Isolok - 12 mL - LF	10	1.18750	0.077947	0.02465	1.1317	1.2433

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00022	t Ratio	-0.00692
Std Err Dif	0.03218	DF	20.15007
Upper CL Dif	0.06688	Prob > t	0.9945
Lower CL Dif	-0.06732	Prob > t	0.5027
Confidence	0.95	Prob < t	0.4973

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0827678	0.0596087	0.0586941
Isolok - 12 mL - LF	10	0.0779470	0.0605710	0.0605710

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0397	1	24	0.8438
Brown-Forsythe	0.0076	1	24	0.9312
Levene	0.0021	1	24	0.9635
Bartlett	0.0383	1	.	0.8447
F Test 2-sided	1.1275	15	9	0.8841

Welch Anova testing Means Equal, allowing Std Devs Not Equal

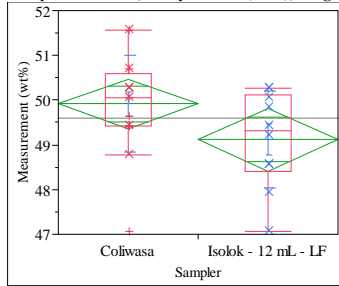
F Ratio	DFNum	DFDen	Prob > F
0.0000	1	20.15	0.9945

t Test

0.0069

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=SiO2 (wt%), Target (wt%)=50.183



**Oneway Anova
Summary of Fit**

Rsquare	0.121748
Adj Rsquare	0.085154
Root Mean Square Error	1.08015
Mean of Response	49.60708
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.7942	t Ratio	-1.82401
Std Err Dif	0.4354	DF	24
Upper CL Dif	0.1045	Prob > t	0.0806
Lower CL Dif	-1.6929	Prob > t	0.9597
Confidence	0.95	Prob < t	0.0403

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	3.881709	3.88171	3.3270	0.0806
Error	24	28.001382	1.16672		
C. Total	25	31.883091			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	49.9125	0.27004	49.355	50.470
Isolok - 12 mL - LF	10	49.1183	0.34157	48.413	49.823

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	49.9125	1.08162	0.27040	49.336	50.489
Isolok - 12 mL - LF	10	49.1183	1.07770	0.34080	48.347	49.889

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.7942	t Ratio	-1.8256
Std Err Dif	0.4350	DF	19.30755
Upper CL Dif	0.1154	Prob > t	0.0834
Lower CL Dif	-1.7038	Prob > t	0.9583
Confidence	0.95	Prob < t	0.0417

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.081617	0.7805102	0.7621256
Isolok - 12 mL - LF	10	1.077701	0.8728344	0.8557200

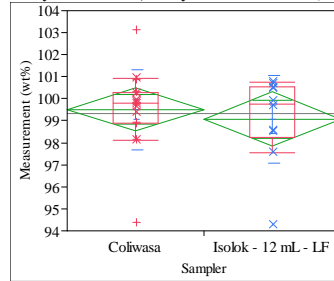
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0001	1	24	0.9918
Brown-Forsythe	0.1069	1	24	0.7465
Levene	0.1184	1	24	0.7338
Bartlett	0.0001	1	.	0.9905
F Test 2-sided	1.0073	15	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.3328	1	19.308	0.0834

t Test
1.8256

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Sum of Oxides (wt%), Target (wt%)=99.73



**Oneway Anova
Summary of Fit**

Rsquare	0.014225
Adj Rsquare	-0.02685
Root Mean Square Error	1.891876
Mean of Response	99.34463
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.4488	t Ratio	-0.5885
Std Err Dif	0.7626	DF	24
Upper CL Dif	1.1252	Prob > t	0.5617
Lower CL Dif	-2.0228	Prob > t	0.7192
Confidence	0.95	Prob < t	0.2808

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.239579	1.23958	0.3463	0.5617
Error	24	85.900653	3.57919		
C. Total	25	87.140232			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.5172	0.47297	98.541	100.49
Isolok - 12 mL - LF	10	99.0684	0.59826	97.834	100.30

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.5172	1.81770	0.45442	98.549	100.49
Isolok - 12 mL - LF	10	99.0684	2.00943	0.63544	97.631	100.51

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.4488	t Ratio	-0.57451
Std Err Dif	0.7812	DF	17.77079
Upper CL Dif	1.1940	Prob > t	0.5728
Lower CL Dif	-2.0916	Prob > t	0.7136
Confidence	0.95	Prob < t	0.2864

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.817700	1.157718	1.112898
Isolok - 12 mL - LF	10	2.009427	1.489968	1.372980

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0531	1	24	0.8197
Brown-Forsythe	0.1879	1	24	0.6685
Levene	0.3858	1	24	0.5404
Bartlett	0.1099	1	.	0.7403
F Test 2-sided	1.2221	9	15	0.7025

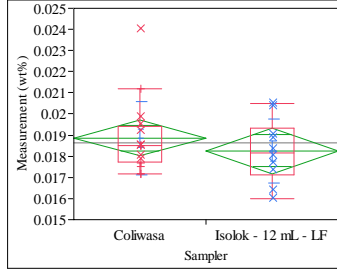
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3301	1	17.771	0.5728

t Test
0.5745

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=TiO2 (wt%), Target (wt%)=0.013



**Oneway Anova
Summary of Fit**

Rsquare	0.033951
Adj Rsquare	-0.0063
Root Mean Square Error	0.001646
Mean of Response	0.018625
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	-0.00061	t Ratio	-0.9184
Std Err Dif	0.00066	DF	24
Upper CL Dif	0.00076	Prob > t	0.3675
Lower CL Dif	-0.00198	Prob > t	0.8162
Confidence	0.95	Prob < t	0.1838

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000228	2.2841e-6	0.8435	0.3675
Error	24	0.00006499	2.708e-6		
C. Total	25	0.00006728			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.018859	0.00041	0.01801	0.01971
Isolok - 12 mL - LF	10	0.018250	0.00052	0.01718	0.01932

Std Error uses a pooled estimation of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.018859	0.001726	0.00043	0.01794	0.01978
Isolok - 12 mL - LF	10	0.018250	0.001501	0.00047	0.01718	0.01932

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.00061	t Ratio	-0.94955
Std Err Dif	0.00064	DF	21.29685
Upper CL Dif	0.00072	Prob > t	0.3530
Lower CL Dif	-0.00194	Prob > t	0.8235
Confidence	0.95	Prob < t	0.1765

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0017264	0.0011819	0.0010529
Isolok - 12 mL - LF	10	0.0015013	0.0011659	0.0011659

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0929	1	24	0.7631
Brown-Forsythe	0.0530	1	24	0.8199
Levene	0.0013	1	24	0.9715
Bartlett	0.2048	1	.	0.6509
F Test 2-sided	1.3225	15	9	0.6872

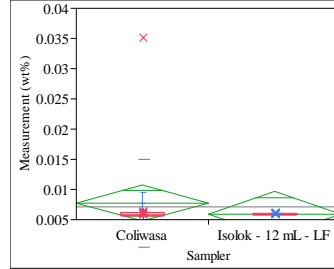
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9016	1	21.297	0.3530

t Test

0.9495

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=ZnO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.025991
Adj Rsquare	-0.01459
Root Mean Square Error	0.00574
Mean of Response	0.007054
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	-0.00185	t Ratio	-0.80028
Std Err Dif	0.00231	DF	24
Upper CL Dif	0.00292	Prob > t	0.4314
Lower CL Dif	-0.00663	Prob > t	0.7843
Confidence	0.95	Prob < t	0.2157

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002110	0.000021	0.6404	0.4314
Error	24	0.00079073	0.000033		
C. Total	25	0.00081183			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.007766	0.00143	0.00480	0.01073
Isolok - 12 mL - LF	10	0.005915	0.00182	0.00217	0.00966

Std Error uses a pooled estimation of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.007766	0.007260	0.00182	0.00390	0.01164
Isolok - 12 mL - LF	10	0.005915	0.000073	2.3e-5	0.00586	0.00597

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.00185	t Ratio	-1.0201
Std Err Dif	0.00182	DF	15.00481
Upper CL Dif	0.00202	Prob > t	0.3238
Lower CL Dif	-0.00572	Prob > t	0.8381
Confidence	0.95	Prob < t	0.1619

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0072603	0.0034016	0.0020084
Isolok - 12 mL - LF	10	0.0000726	0.0000575	0.0000566

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6598	1	24	0.4246
Brown-Forsythe	0.7218	1	24	0.4040
Levene	2.7274	1	24	0.1117
Bartlett	68.4961	1	.	<.0001
F Test 2-sided	9988.2410	15	9	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

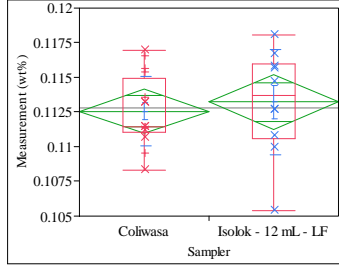
F Ratio	DFNum	DFDen	Prob > F
1.0406	1	15.005	0.3238

t Test

1.0201

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=ZrO2 (wt%), Target (wt%)=0.111



**Oneway Anova
Summary of Fit**

Rsquare	0.011845
Adj Rsquare	-0.02933
Root Mean Square Error	0.003053
Mean of Response	0.112818
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00066	t Ratio	0.536373
Std Err Dif	0.00123	DF	24
Upper CL Dif	0.00320	Prob > t	0.5966
Lower CL Dif	-0.00188	Prob > t	0.2983
Confidence	0.95	Prob < t	0.7017

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000268	2.6823e-6	0.2877	0.5966
Error	24	0.00022376	9.3233e-6		
C. Total	25	0.00022644			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.112564	0.00076	0.11099	0.11414
Isolok - 12 mL - LF	10	0.113224	0.00097	0.11123	0.11522

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.112564	0.002512	0.00063	0.11123	0.11390
Isolok - 12 mL - LF	10	0.113224	0.003787	0.00120	0.11052	0.11593

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00066	t Ratio	0.488218
Std Err Dif	0.00135	DF	13.99756
Upper CL Dif	0.00356	Prob > t	0.6330
Lower CL Dif	-0.00224	Prob > t	0.3165
Confidence	0.95	Prob < t	0.6835

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0025125	0.0020737	0.0019333
Isolok - 12 mL - LF	10	0.0037870	0.0029447	0.0029447

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8673	1	24	0.1845
Brown-Forsythe	1.5200	1	24	0.2296
Levene	1.6421	1	24	0.2123
Bartlett	1.8883	1	.	0.1694
F Test 2-sided	2.2718	9	15	0.1540

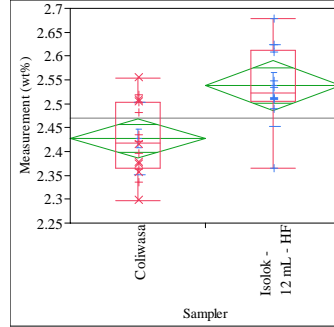
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2384	1	13.998	0.6330

t Test

0.4882

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Al/B, Target (wt%)=2.0704412



**Oneway Anova
Summary of Fit**

Rsquare	0.329387
Adj Rsquare	0.301445
Root Mean Square Error	0.080083
Mean of Response	2.46988
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.110838	t Ratio	3.433389
Std Err Dif	0.032282	DF	24
Upper CL Dif	0.177465	Prob > t	0.0022
Lower CL Dif	0.044210	Prob > t	0.0011
Confidence	0.95	Prob < t	0.9989

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.07559991	0.075600	11.7882	0.0022
Error	24	0.15391698	0.006413		
C. Total	25	0.22951689			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.42725	0.02002	2.3859	2.4686
Isolok - 12 mL - HF	10	2.53809	0.02532	2.4858	2.5904

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.42725	0.076133	0.01903	2.3867	2.4678
Isolok - 12 mL - HF	10	2.53809	0.086264	0.02728	2.4764	2.5998

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.110838	t Ratio	3.332174
Std Err Dif	0.033263	DF	17.41866
Upper CL Dif	0.180888	Prob > t	0.0038
Lower CL Dif	0.040787	Prob > t	0.0019
Confidence	0.95	Prob < t	0.9981

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0761328	0.0642810	0.0634535
Isolok - 12 mL - HF	10	0.0862645	0.0615123	0.0606933

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2233	1	24	0.6408
Brown-Forsythe	0.0199	1	24	0.8891
Levene	0.0227	1	24	0.8816
Bartlett	0.1711	1	.	0.6791
F Test 2-sided	1.2839	9	15	0.6425

Welch Anova testing Means Equal, allowing Std Devs Not Equal

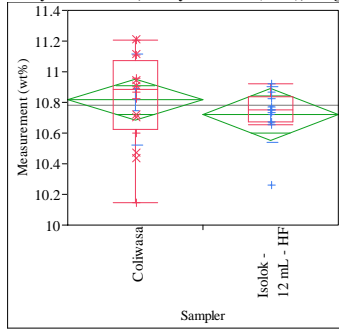
F Ratio	DFNum	DFDen	Prob > F
11.1034	1	17.419	0.0038

t Test

3.3322

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Al2O3 (wt%), Target (wt%)=10.934



Oneway Anova Summary of Fit

Rsquare	0.034198
Adj Rsquare	-0.00604
Root Mean Square Error	0.259316
Mean of Response	10.78032
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.09636	t Ratio	-0.92185
Std Err Dif	0.10453	DF	24
Upper CL Dif	0.11938	Prob > t	0.3658
Lower CL Dif	-0.31211	Prob > t	0.8171
Confidence	0.95	Prob < t	0.1829

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0571453	0.057145	0.8498	0.3658
Error	24	1.6138778	0.067245		
C. Total	25	1.6710232			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.8174	0.06483	10.684	10.951
Isolok - 12 mL - HF	10	10.7210	0.08200	10.552	10.890

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.8174	0.296517	0.07413	10.659	10.975
Isolok - 12 mL - HF	10	10.7210	0.181059	0.05726	10.592	10.851

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.09636	t Ratio	-1.02881
Std Err Dif	0.09367	DF	23.99982
Upper CL Dif	0.09695	Prob > t	0.3138
Lower CL Dif	-0.28968	Prob > t	0.8431
Confidence	0.95	Prob < t	0.1569

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2965171	0.2314638	0.2243781
Isolok - 12 mL - HF	10	0.1810593	0.1141258	0.1058120

Test

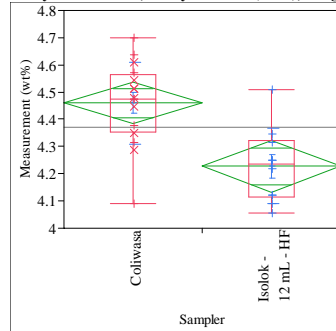
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5434	1	24	0.2261
Brown-Forsythe	2.6773	1	24	0.1148
Levene	3.2461	1	24	0.0842
Bartlett	2.3382	1	.	0.1262
F Test 2-sided	2.6820	15	9	0.1385

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0584	1	24	0.3138

t Test
1.0288

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=B2O3 (wt%), Target (wt%)=5.281



Oneway Anova Summary of Fit

Rsquare	0.390417
Adj Rsquare	0.365017
Root Mean Square Error	0.146688
Mean of Response	4.370395
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.23183	t Ratio	-3.92061
Std Err Dif	0.05913	DF	24
Upper CL Dif	-0.10979	Prob > t	0.0006
Lower CL Dif	-0.35388	Prob > t	0.9997
Confidence	0.95	Prob < t	0.0003

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.33074737	0.330747	15.3711	0.0006
Error	24	0.51641793	0.021517		
C. Total	25	0.84716529			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.45956	0.03667	4.3839	4.5352
Isolok - 12 mL - HF	10	4.22773	0.04639	4.1320	4.3235

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.45956	0.151484	0.03787	4.3788	4.5403
Isolok - 12 mL - HF	10	4.22773	0.138327	0.04374	4.1288	4.3267

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.23183	t Ratio	-4.00688
Std Err Dif	0.05786	DF	20.6031
Upper CL Dif	-0.11137	Prob > t	0.0007
Lower CL Dif	-0.35230	Prob > t	0.9997
Confidence	0.95	Prob < t	0.0003

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1514837	0.1126965	0.1086716
Isolok - 12 mL - HF	10	0.1383267	0.1062567	0.1062567

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0743	1	24	0.7875
Brown-Forsythe	0.0039	1	24	0.9505
Levene	0.0306	1	24	0.8627
Bartlett	0.0874	1	.	0.7675
F Test 2-sided	1.1993	15	9	0.8060

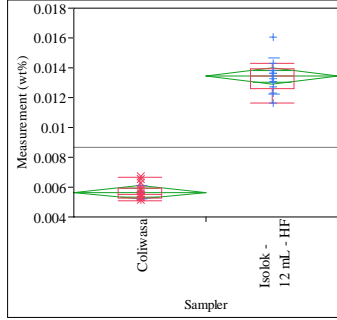
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
16.0551	1	20.603	0.0007

t Test
4.0069

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=BaO (wt%), Target (wt%)=0



Oneway Anova Summary of Fit

Rsquare	0.957101
Adj Rsquare	0.955314
Root Mean Square Error	0.000834
Mean of Response	0.008656
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.007778	t Ratio	23.13997
Std Err Dif	0.000336	DF	24
Upper CL Dif	0.008472	Prob > t	<.0001
Lower CL Dif	0.007084	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00037227	0.000372	535.4580	<.0001
Error	24	0.00001669	6.952e-7		
C. Total	25	0.00038896			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005665	0.00021	0.00523	0.00610
Isolok - 12 mL - HF	10	0.013443	0.00026	0.01290	0.01399

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005665	0.000477	0.00012	0.00541	0.00592
Isolok - 12 mL - HF	10	0.013443	0.001214	0.00038	0.01257	0.01431

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.007778	t Ratio	19.34405
Std Err Dif	0.000402	DF	10.76219
Upper CL Dif	0.008665	Prob > t	<.0001
Lower CL Dif	0.006890	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0004773	0.0003843	0.0003712
Isolok - 12 mL - HF	10	0.0012142	0.0008485	0.0008485

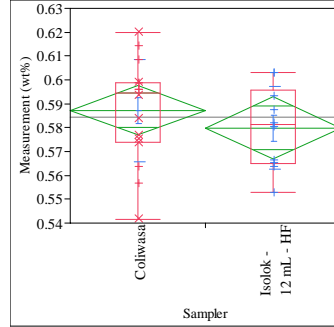
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.6168	1	24	0.0693
Brown-Forsythe	4.3732	1	24	0.0473
Levene	4.4687	1	24	0.0451
Bartlett	9.5378	1	.	0.0020
F Test 2-sided	6.4712	9	15	0.0017

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
374.1922	1	10.762	<.0001

t Test
19.3440

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=CaO (wt%), Target (wt%)=0.543



Oneway Anova Summary of Fit

Rsquare	0.033989
Adj Rsquare	-0.00626
Root Mean Square Error	0.019972
Mean of Response	0.584381
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00740	t Ratio	-0.91893
Std Err Dif	0.00805	DF	24
Upper CL Dif	0.00922	Prob > t	0.3673
Lower CL Dif	-0.02401	Prob > t	0.8164
Confidence	0.95	Prob < t	0.1836

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00033683	0.000337	0.8444	0.3673
Error	24	0.00957313	0.000399		
C. Total	25	0.00990996			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.587227	0.00499	0.57692	0.59753
Isolok - 12 mL - HF	10	0.579828	0.00632	0.56679	0.59286

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.587227	0.021402	0.00535	0.57582	0.59863
Isolok - 12 mL - HF	10	0.579828	0.017329	0.00548	0.56743	0.59222

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00740	t Ratio	-0.966
Std Err Dif	0.00766	DF	22.22213
Upper CL Dif	0.00848	Prob > t	0.3444
Lower CL Dif	-0.02327	Prob > t	0.8278
Confidence	0.95	Prob < t	0.1722

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0214019	0.0174572	0.0167030
Isolok - 12 mL - HF	10	0.0173285	0.0141599	0.0139920

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5753	1	24	0.4555
Brown-Forsythe	0.2674	1	24	0.6098
Levene	0.5965	1	24	0.4475
Bartlett	0.4602	1	.	0.4975
F Test 2-sided	1.5254	15	9	0.5294

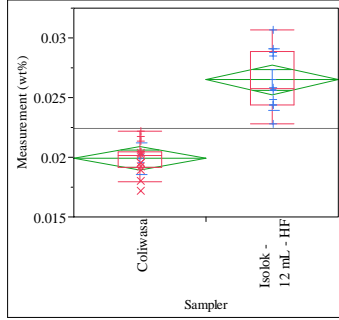
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9332	1	22.222	0.3444

t Test
0.9660

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Cr2O3 (wt%), Target (wt%)=0.015



Oneway Anova Summary of Fit

Rsquare	0.756796
Adj Rsquare	0.746662
Root Mean Square Error	0.001895
Mean of Response	0.022436
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.006603	t Ratio	8.641907
Std Err Dif	0.000764	DF	24
Upper CL Dif	0.008180	Prob > t	<.0001
Lower CL Dif	0.005026	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00026829	0.000268	74.6826	<.0001
Error	24	0.00008622	3.592e-6		
C. Total	25	0.00035450			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.019896	0.00047	0.01892	0.02087
Isolok - 12 mL - HF	10	0.026499	0.00060	0.02526	0.02774

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.019896	0.001323	0.00033	0.01919	0.02060
Isolok - 12 mL - HF	10	0.026499	0.002581	0.00082	0.02465	0.02835

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.006603	t Ratio	7.497696
Std Err Dif	0.000881	DF	12.00664
Upper CL Dif	0.008521	Prob > t	<.0001
Lower CL Dif	0.004684	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0013234	0.0010208	0.0009866
Isolok - 12 mL - HF	10	0.0025808	0.0022158	0.0020901

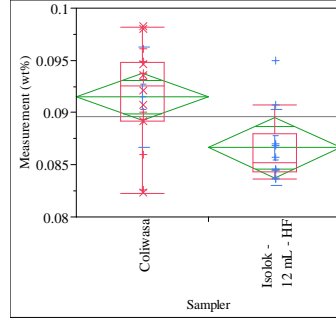
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	7.4688	1	24	0.0116
Brown-Forsythe	5.2647	1	24	0.0308
Levene	10.3145	1	24	0.0037
Bartlett	4.9928	1	.	0.0255
F Test 2-sided	3.8031	9	15	0.0222

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
56.2154	1	12.007	<.0001

t Test
7.4977

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=CuO (wt%), Target (wt%)=0.103



Oneway Anova Summary of Fit

Rsquare	0.237968
Adj Rsquare	0.206216
Root Mean Square Error	0.004405
Mean of Response	0.089629
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00486	t Ratio	-2.73765
Std Err Dif	0.00178	DF	24
Upper CL Dif	-0.00120	Prob > t	0.0115
Lower CL Dif	-0.00853	Prob > t	0.9943
Confidence	0.95	Prob < t	0.0057

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00014545	0.000145	7.4947	0.0115
Error	24	0.00046577	0.000019		
C. Total	25	0.00061123			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.091499	0.00110	0.08923	0.09377
Isolok - 12 mL - HF	10	0.086637	0.00139	0.08376	0.08951

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.091499	0.004810	0.00120	0.08894	0.09406
Isolok - 12 mL - HF	10	0.086637	0.003633	0.00115	0.08404	0.08924

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00486	t Ratio	-2.9235
Std Err Dif	0.00166	DF	22.97679
Upper CL Dif	-0.00142	Prob > t	0.0076
Lower CL Dif	-0.00830	Prob > t	0.9962
Confidence	0.95	Prob < t	0.0038

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0048098	0.0038111	0.0037476
Isolok - 12 mL - HF	10	0.0036326	0.0026188	0.0024410

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7507	1	24	0.3948
Brown-Forsythe	1.1411	1	24	0.2960
Levene	1.2742	1	24	0.2701
Bartlett	0.8005	1	.	0.3709
F Test 2-sided	1.7532	15	9	0.3978

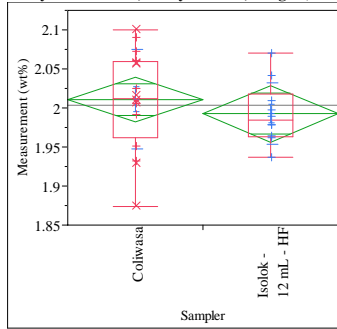
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.5468	1	22.977	0.0076

t Test
2.9235

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Fe/Li, Target (wt%)=1.99097835



**Oneway Anova
Summary of Fit**

Rsquare	0.026847
Adj Rsquare	-0.0137
Root Mean Square Error	0.055717
Mean of Response	2.004018
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.01828	t Ratio	-0.8137
Std Err Dif	0.02246	DF	24
Upper CL Dif	0.02808	Prob > t	0.4238
Lower CL Dif	-0.06463	Prob > t	0.7881
Confidence	0.95	Prob < t	0.2119

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00205547	0.002055	0.6621	0.4238
Error	24	0.07450595	0.003104		
C. Total	25	0.07656142			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.01105	0.01393	1.9823	2.0398
Isolok - 12 mL - HF	10	1.99277	0.01762	1.9564	2.0291

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.01105	0.063586	0.01590	1.9772	2.0449
Isolok - 12 mL - HF	10	1.99277	0.039241	0.01241	1.9647	2.0208

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.01828	t Ratio	-0.90626
Std Err Dif	0.02017	DF	23.99864
Upper CL Dif	0.02335	Prob > t	0.3738
Lower CL Dif	-0.05990	Prob > t	0.8131
Confidence	0.95	Prob < t	0.1869

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0635856	0.0485722	0.0485722
Isolok - 12 mL - HF	10	0.0392414	0.0294065	0.0287333

Test

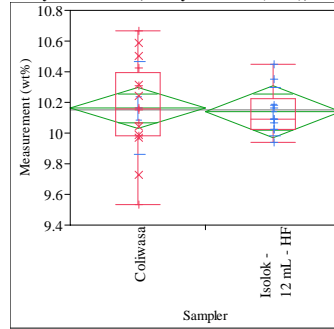
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9347	1	24	0.1770
Brown-Forsythe	1.9839	1	24	0.1718
Levene	1.9299	1	24	0.1775
Bartlett	2.2453	1	.	0.1340
F Test 2-sided	2.6256	15	9	0.1469

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8213	1	23.999	0.3738

t Test
0.9063

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Fe2O3 (wt%), Target (wt%)=9.931



**Oneway Anova
Summary of Fit**

Rsquare	0.002481
Adj Rsquare	-0.03908
Root Mean Square Error	0.257654
Mean of Response	10.15362
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02538	t Ratio	-0.24433
Std Err Dif	0.10386	DF	24
Upper CL Dif	0.18899	Prob > t	0.8091
Lower CL Dif	-0.23974	Prob > t	0.5955
Confidence	0.95	Prob < t	0.4045

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0039631	0.003963	0.0597	0.8091
Error	24	1.5932593	0.066386		
C. Total	25	1.5972224			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.1634	0.06441	10.030	10.296
Isolok - 12 mL - HF	10	10.1380	0.08148	9.970	10.306

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.1634	0.302289	0.07557	10.002	10.324
Isolok - 12 mL - HF	10	10.1380	0.157260	0.04973	10.026	10.250

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02538	t Ratio	-0.28051
Std Err Dif	0.09047	DF	23.46892
Upper CL Dif	0.16156	Prob > t	0.7815
Lower CL Dif	-0.21232	Prob > t	0.6092
Confidence	0.95	Prob < t	0.3908

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3022894	0.2341134	0.2341134
Isolok - 12 mL - HF	10	0.1572598	0.1189510	0.1100869

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.6795	1	24	0.1147
Brown-Forsythe	3.6928	1	24	0.0666
Levene	3.4076	1	24	0.0773
Bartlett	3.9163	1	.	0.0478
F Test 2-sided	3.6950	15	9	0.0533

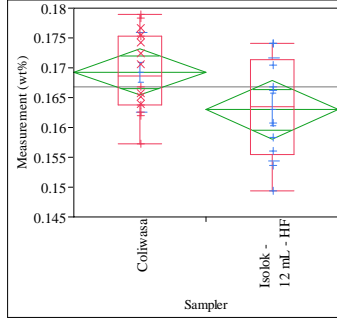
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0787	1	23.469	0.7815

t Test
0.2805

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=K2O (wt%), Target (wt%)=0.076



**Oneway Anova
Summary of Fit**

Rsquare	0.152242
Adj Rsquare	0.116918
Root Mean Square Error	0.007485
Mean of Response	0.166837
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00626	t Ratio	-2.07604
Std Err Dif	0.00302	DF	24
Upper CL Dif	-3.66e-5	Prob > t	0.0488
Lower CL Dif	-0.01249	Prob > t	0.9756
Confidence	0.95	Prob < t	0.0244

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00024146	0.000241	4.3100	0.0488
Error	24	0.00134455	0.000056		
C. Total	25	0.00158601			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.00187	0.16538	0.17311
Isolok - 12 mL - HF	10	0.162982	0.00237	0.15810	0.16787

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.006682	0.00167	0.16569	0.17281
Isolok - 12 mL - HF	10	0.162982	0.008660	0.00274	0.15679	0.16918

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00626	t Ratio	-1.95281
Std Err Dif	0.00321	DF	15.64423
Upper CL Dif	0.00055	Prob > t	0.0690
Lower CL Dif	-0.01308	Prob > t	0.9655
Confidence	0.95	Prob < t	0.0345

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0066816	0.0058724	0.0058724
Isolok - 12 mL - HF	10	0.0086595	0.0073481	0.0073481

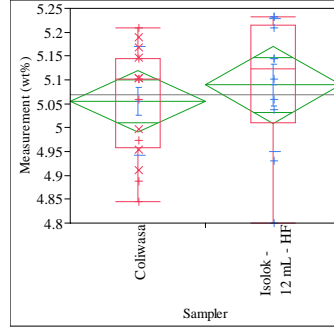
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8909	1	24	0.1818
Brown-Forsythe	1.2294	1	24	0.2785
Levene	1.2719	1	24	0.2706
Bartlett	0.7476	1	.	0.3872
F Test 2-sided	1.6797	9	15	0.3599

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.8134	1	15.644	0.0690

t Test	1.9528
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Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Li2O (wt%), Target (wt%)=4.988



**Oneway Anova
Summary of Fit**

Rsquare	0.019138
Adj Rsquare	-0.02173
Root Mean Square Error	0.123896
Mean of Response	5.068423
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.03418	t Ratio	0.684311
Std Err Dif	0.04994	DF	24
Upper CL Dif	0.13726	Prob > t	0.5003
Lower CL Dif	-0.06890	Prob > t	0.2502
Confidence	0.95	Prob < t	0.7498

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00718823	0.007188	0.4683	0.5003
Error	24	0.36840547	0.015350		
C. Total	25	0.37559369			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	5.05528	0.03097	4.9914	5.1192
Isolok - 12 mL - HF	10	5.08946	0.03918	5.0086	5.1703

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	5.05528	0.113980	0.02850	4.9945	5.1160
Isolok - 12 mL - HF	10	5.08946	0.138858	0.04391	4.9901	5.1888

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.03418	t Ratio	0.65291
Std Err Dif	0.05235	DF	16.42806
Upper CL Dif	0.14491	Prob > t	0.5228
Lower CL Dif	-0.07656	Prob > t	0.2614
Confidence	0.95	Prob < t	0.7386

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1139801	0.0965441	0.0901527
Isolok - 12 mL - HF	10	0.1388579	0.1059227	0.1033392

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5528	1	24	0.4644
Brown-Forsythe	0.1435	1	24	0.7081
Levene	0.1213	1	24	0.7306
Bartlett	0.4309	1	.	0.5116
F Test 2-sided	1.4842	9	15	0.4795

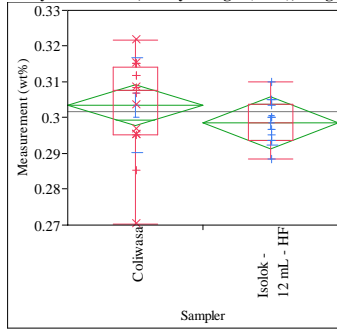
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4263	1	16.428	0.5228

t Test	0.6529
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Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=MgO (wt%), Target (wt%)=0.286



Oneway Anova Summary of Fit

Rsquare	0.045452
Adj Rsquare	0.005679
Root Mean Square Error	0.01116
Mean of Response	0.301619
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00481	t Ratio	-1.06901
Std Err Dif	0.00450	DF	24
Upper CL Dif	0.00448	Prob > t	0.2957
Lower CL Dif	-0.01409	Prob > t	0.8522
Confidence	0.95	Prob < t	0.1478

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00014232	0.000142	1.1428	0.2957
Error	24	0.00298893	0.000125		
C. Total	25	0.00313125			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.303469	0.00279	0.29771	0.30923
Isolok - 12 mL - HF	10	0.298660	0.00353	0.29138	0.30594

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.303469	0.013211	0.00330	0.29643	0.31051
Isolok - 12 mL - HF	10	0.298660	0.006420	0.00203	0.29407	0.30325

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00481	t Ratio	-1.24045
Std Err Dif	0.00388	DF	23.00359
Upper CL Dif	0.00321	Prob > t	0.2273
Lower CL Dif	-0.01283	Prob > t	0.8863
Confidence	0.95	Prob < t	0.1137

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0132110	0.0103644	0.0099498
Isolok - 12 mL - HF	10	0.0064202	0.0051407	0.0051407

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9469	1	24	0.1757
Brown-Forsythe	2.4123	1	24	0.1335
Levene	4.0062	1	24	0.0568
Bartlett	4.6770	1	.	0.0306
F Test 2-sided	4.2342	15	9	0.0342

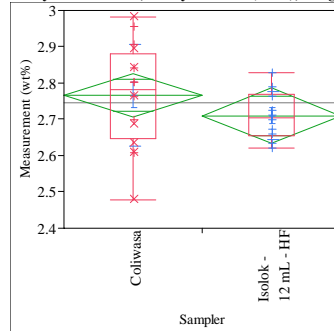
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.5387	1	23.004	0.2273

t Test

1.2405

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=MnO (wt%), Target (wt%)=2.918



Oneway Anova Summary of Fit

Rsquare	0.05497
Adj Rsquare	0.015594
Root Mean Square Error	0.117926
Mean of Response	2.744793
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.05617	t Ratio	-1.18154
Std Err Dif	0.04754	DF	24
Upper CL Dif	0.04195	Prob > t	0.2490
Lower CL Dif	-0.15428	Prob > t	0.8755
Confidence	0.95	Prob < t	0.1245

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01941387	0.019414	1.3960	0.2490
Error	24	0.33375626	0.013907		
C. Total	25	0.35317013			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.76640	0.02948	2.7055	2.8272
Isolok - 12 mL - HF	10	2.71023	0.03729	2.6333	2.7872

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.76640	0.139744	0.03494	2.6919	2.8409
Isolok - 12 mL - HF	10	2.71023	0.067355	0.02130	2.6620	2.7584

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.05617	t Ratio	-1.37271
Std Err Dif	0.04092	DF	22.9408
Upper CL Dif	0.02849	Prob > t	0.1831
Lower CL Dif	-0.14082	Prob > t	0.9084
Confidence	0.95	Prob < t	0.0916

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1397442	0.1113660	0.1113660
Isolok - 12 mL - HF	10	0.0673545	0.0529392	0.0529392

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.6449	1	24	0.0683
Brown-Forsythe	4.5126	1	24	0.0441
Levene	4.6991	1	24	0.0403
Bartlett	4.7723	1	.	0.0289
F Test 2-sided	4.3046	15	9	0.0324

Welch Anova testing Means Equal, allowing Std Devs Not Equal

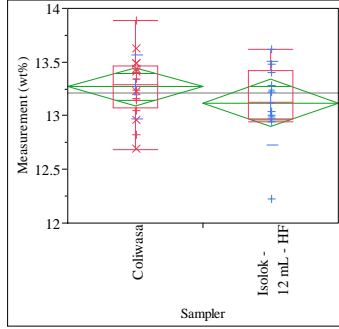
F Ratio	DFNum	DFDen	Prob > F
1.8843	1	22.941	0.1831

t Test

1.3727

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Na2O (wt%), Target (wt%)=13.318



Oneway Anova Summary of Fit

Rsquare	0.048112
Adj Rsquare	0.00845
Root Mean Square Error	0.337393
Mean of Response	13.21092
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.14980	t Ratio	-1.10138
Std Err Dif	0.13601	DF	24
Upper CL Dif	0.13091	Prob > t	0.2817
Lower CL Dif	-0.43050	Prob > t	0.8592
Confidence	0.95	Prob < t	0.1408

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1380861	0.138086	1.2130	0.2817
Error	24	2.7320227	0.113834		
C. Total	25	2.8701088			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	13.2685	0.08435	13.094	13.443
Isolok - 12 mL - HF	10	13.1187	0.10669	12.899	13.339

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	13.2685	0.302694	0.07567	13.107	13.430
Isolok - 12 mL - HF	10	13.1187	0.388397	0.12282	12.841	13.397

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.14980	t Ratio	-1.03836
Std Err Dif	0.14426	DF	15.76668
Upper CL Dif	0.15639	Prob > t	0.3148
Lower CL Dif	-0.45599	Prob > t	0.8426
Confidence	0.95	Prob < t	0.1574

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3026940	0.2350575	0.2350575
Isolok - 12 mL - HF	10	0.3883966	0.2803840	0.2803840

Test

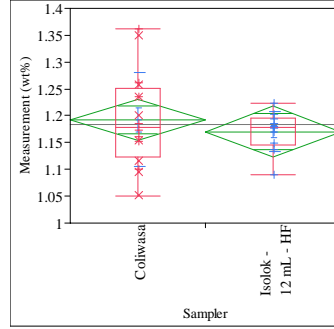
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5135	1	24	0.4806
Brown-Forsythe	0.2832	1	24	0.5995
Levene	0.2858	1	24	0.5979
Bartlett	0.6905	1	.	0.4060
F Test 2-sided	1.6464	9	15	0.3779

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0782	1	15.767	0.3148

t Test
1.0384

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=NiO (wt%), Target (wt%)=1.033



Oneway Anova Summary of Fit

Rsquare	0.022735
Adj Rsquare	-0.01798
Root Mean Square Error	0.072927
Mean of Response	1.183963
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02197	t Ratio	-0.74722
Std Err Dif	0.02940	DF	24
Upper CL Dif	0.03871	Prob > t	0.4622
Lower CL Dif	-0.08264	Prob > t	0.7689
Confidence	0.95	Prob < t	0.2311

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00296941	0.002969	0.5583	0.4622
Error	24	0.12764036	0.005318		
C. Total	25	0.13060977			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.19241	0.01823	1.1548	1.2300
Isolok - 12 mL - HF	10	1.17045	0.02306	1.1228	1.2180

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.19241	0.087477	0.02187	1.1458	1.2390
Isolok - 12 mL - HF	10	1.17045	0.037795	0.01195	1.1434	1.1975

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02197	t Ratio	-0.88141
Std Err Dif	0.02492	DF	22.02391
Upper CL Dif	0.02972	Prob > t	0.3876
Lower CL Dif	-0.07365	Prob > t	0.8062
Confidence	0.95	Prob < t	0.1938

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0874773	0.0688045	0.0678402
Isolok - 12 mL - HF	10	0.0377951	0.0275369	0.0262135

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.5944	1	24	0.0701
Brown-Forsythe	5.0532	1	24	0.0340
Levene	5.6761	1	24	0.0255
Bartlett	6.0968	1	.	0.0135
F Test 2-sided	5.3570	15	9	0.0153

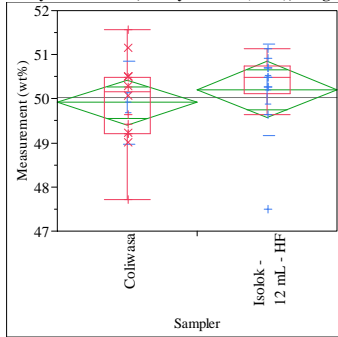
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7769	1	22.024	0.3876

t Test
0.8814

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=SiO2 (wt%), Target (wt%)=50.183



**Oneway Anova
Summary of Fit**

Rsquare	0.022987
Adj Rsquare	-0.01772
Root Mean Square Error	0.979901
Mean of Response	50.02671
Observations (or Sum Wgts)	26

t Test
Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.2968	t Ratio	0.751443
Std Err Dif	0.3950	DF	24
Upper CL Dif	1.1121	Prob > t	0.4597
Lower CL Dif	-0.5184	Prob > t	0.2298
Confidence	0.95	Prob < t	0.7702

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.542196	0.542196	0.5647	0.4597
Error	24	23.044920	0.960205		
C. Total	25	23.587115			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	49.9125	0.24498	49.407	50.418
Isolok - 12 mL - HF	10	50.2094	0.30987	49.570	50.849

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	49.9125	0.94297	0.23574	49.410	50.415
Isolok - 12 mL - HF	10	50.2094	1.03853	0.32841	49.466	50.952

t Test
Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.2968	t Ratio	0.734241
Std Err Dif	0.4043	DF	17.82487
Upper CL Dif	1.1468	Prob > t	0.4724
Lower CL Dif	-0.5531	Prob > t	0.2362
Confidence	0.95	Prob < t	0.7638

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.942972	0.7537690	0.7353844
Isolok - 12 mL - HF	10	1.038534	0.6589044	0.5776110

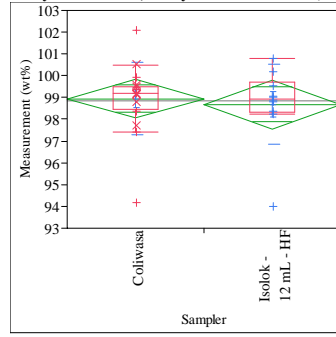
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0564	1	24	0.8143
Brown-Forsythe	0.2858	1	24	0.5978
Levene	0.1383	1	24	0.7133
Bartlett	0.1018	1	.	0.7497
F Test 2-sided	1.2130	9	15	0.7118

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5391	1	17.825	0.4724

t Test
0.7342

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Sum of Oxides (wt%), Target (wt%)=99.73



**Oneway Anova
Summary of Fit**

Rsquare	0.005775
Adj Rsquare	-0.03565
Root Mean Square Error	1.72958
Mean of Response	98.84839
Observations (or Sum Wgts)	26

t Test
Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.2603	t Ratio	-0.37338
Std Err Dif	0.6972	DF	24
Upper CL Dif	1.1787	Prob > t	0.7121
Lower CL Dif	-1.6993	Prob > t	0.6439
Confidence	0.95	Prob < t	0.3561

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.417040	0.41704	0.1394	0.7121
Error	24	71.794700	2.99145		
C. Total	25	72.211740			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	98.9485	0.43239	98.056	99.841
Isolok - 12 mL - HF	10	98.6882	0.54694	97.559	99.817

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	98.9485	1.66822	0.41705	98.060	99.837
Isolok - 12 mL - HF	10	98.6882	1.82728	0.57784	97.381	99.995

t Test
Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.2603	t Ratio	-0.36531
Std Err Dif	0.7126	DF	17.90389
Upper CL Dif	1.2374	Prob > t	0.7192
Lower CL Dif	-1.7581	Prob > t	0.6404
Confidence	0.95	Prob < t	0.3596

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.668218	1.051274	0.988287
Isolok - 12 mL - HF	10	1.827276	1.092085	1.033456

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0371	1	24	0.8490
Brown-Forsythe	0.0064	1	24	0.9368
Levene	0.0058	1	24	0.9398
Bartlett	0.0905	1	.	0.7635
F Test 2-sided	1.1998	9	15	0.7253

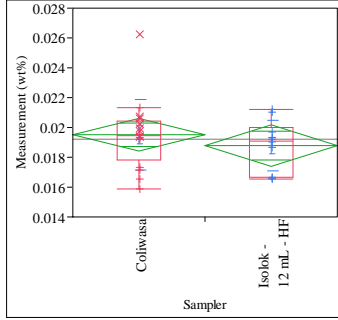
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1334	1	17.904	0.7192

t Test
0.3653

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=TiO2 (wt%), Target (wt%)=0.013



Oneway Anova
Summary of Fit

Rsquare	0.027785
Adj Rsquare	-0.01272
Root Mean Square Error	0.002138
Mean of Response	0.019233
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00071	t Ratio	-0.82819
Std Err Dif	0.00086	DF	24
Upper CL Dif	0.00107	Prob > t	0.4157
Lower CL Dif	-0.00249	Prob > t	0.7921
Confidence	0.95	Prob < t	0.2079

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000314	3.1364e-6	0.6859	0.4157
Error	24	0.00010974	4.5727e-6		
C. Total	25	0.00011288			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.019507	0.00053	0.01840	0.02061
Isolok - 12 mL - HF	10	0.018793	0.00068	0.01740	0.02019

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.019507	0.002359	0.00059	0.01825	0.02076
Isolok - 12 mL - HF	10	0.018793	0.001710	0.00054	0.01757	0.02002

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00071	t Ratio	-0.89242
Std Err Dif	0.00080	DF	23.33491
Upper CL Dif	0.00094	Prob > t	0.3813
Lower CL Dif	-0.00237	Prob > t	0.8094
Confidence	0.95	Prob < t	0.1906

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0023585	0.0014887	0.0014887
Isolok - 12 mL - HF	10	0.0017096	0.0013337	0.0012894

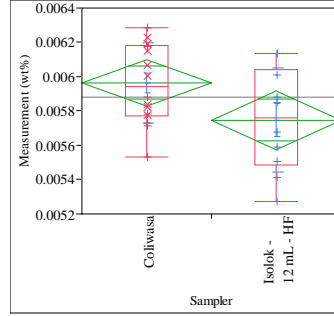
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4341	1	24	0.5163
Brown-Forsythe	0.1000	1	24	0.7546
Levene	0.0628	1	24	0.8043
Bartlett	1.0412	1	.	0.3075
F Test 2-sided	1.9031	15	9	0.3313

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.7964	DFNum	1	DFDen	23.335	Prob > F	0.3813
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t Test	0.8924
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Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=ZnO (wt%), Target (wt%)=0



Oneway Anova
Summary of Fit

Rsquare	0.148059
Adj Rsquare	0.112561
Root Mean Square Error	0.000263
Mean of Response	0.005881
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00022	t Ratio	-2.04229
Std Err Dif	0.00011	DF	24
Upper CL Dif	2.288e-6	Prob > t	0.0523
Lower CL Dif	-0.00043	Prob > t	0.9739
Confidence	0.95	Prob < t	0.0261

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.87869e-7	2.8787e-7	4.1709	0.0523
Error	24	1.65643e-6	6.9018e-8		
C. Total	25	1.94429e-6			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005964	6.57e-5	0.00583	0.00610
Isolok - 12 mL - HF	10	0.005748	8.31e-5	0.00558	0.00592

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005964	0.000235	5.88e-5	0.00584	0.00609
Isolok - 12 mL - HF	10	0.005748	0.000303	0.0001	0.00553	0.00596

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00022	t Ratio	-1.92372
Std Err Dif	0.00011	DF	15.71872
Upper CL Dif	2.24e-5	Prob > t	0.0727
Lower CL Dif	-0.00045	Prob > t	0.9637
Confidence	0.95	Prob < t	0.0363

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0002352	0.0002062	0.0002062
Isolok - 12 mL - HF	10	0.0003030	0.0002558	0.0002558

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7731	1	24	0.1955
Brown-Forsythe	1.0924	1	24	0.3063
Levene	1.1302	1	24	0.2983
Bartlett	0.7125	1	.	0.3986
F Test 2-sided	1.6593	9	15	0.3708

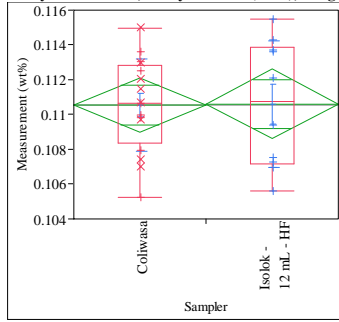
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	3.7007	DFNum	1	DFDen	15.719	Prob > F	0.0727
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t Test	1.9237
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Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=ZrO2 (wt%), Target (wt%)=0.111



Oneway Anova Summary of Fit

Rsquare	0.00009
Adj Rsquare	-0.04157
Root Mean Square Error	0.003065
Mean of Response	0.110568
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	5.741e-5	t Ratio	0.04647
Std Err Dif	0.00124	DF	24
Upper CL Dif	0.00261	Prob > t	0.9633
Lower CL Dif	-0.00249	Prob > t	0.4817
Confidence	0.95	Prob < t	0.5183

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.02818e-8	2.0282e-8	0.0022	0.9633
Error	24	0.00022541	9.3919e-6		
C. Total	25	0.00022543			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.110546	0.00077	0.10896	0.11213
Isolok - 12 mL - HF	10	0.110604	0.00097	0.10860	0.11260

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.110546	0.002670	0.00067	0.10912	0.11197
Isolok - 12 mL - HF	10	0.110604	0.003628	0.00115	0.10801	0.11320

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	5.741e-5	t Ratio	0.043252
Std Err Dif	0.00133	DF	15.08896
Upper CL Dif	0.00289	Prob > t	0.9661
Lower CL Dif	-0.00277	Prob > t	0.4830
Confidence	0.95	Prob < t	0.5170

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0026703	0.0021043	0.0020937
Isolok - 12 mL - HF	10	0.0036278	0.0032419	0.0032419

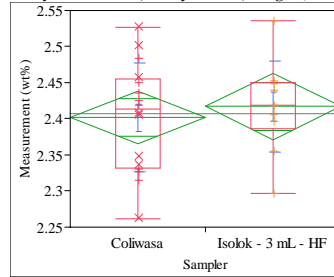
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.8212	1	24	0.1060
Brown-Forsythe	3.8523	1	24	0.0614
Levene	3.8648	1	24	0.0610
Bartlett	1.0479	1	.	0.3060
F Test 2-sided	1.8458	9	15	0.2825

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0019	1	15.089	0.9661

t Test
0.0433

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Al/B, Target (wt%)=2.0704412



Oneway Anova Summary of Fit

Rsquare	0.011712
Adj Rsquare	-0.02947
Root Mean Square Error	0.070742
Mean of Response	2.40756
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.01521	t Ratio	0.533319
Std Err Dif	0.02852	DF	24
Upper CL Dif	0.07407	Prob > t	0.5987
Lower CL Dif	-0.04365	Prob > t	0.2994
Confidence	0.95	Prob < t	0.7006

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00142341	0.001423	0.2844	0.5987
Error	24	0.12010695	0.005004		
C. Total	25	0.12153037			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.40171	0.01769	2.3652	2.4382
Isolok - 3 mL - HF	10	2.41692	0.02237	2.3707	2.4631

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.40171	0.074996	0.01875	2.3617	2.4417
Isolok - 3 mL - HF	10	2.41692	0.063018	0.01993	2.3718	2.4620

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01521	t Ratio	0.555842
Std Err Dif	0.02736	DF	21.7565
Upper CL Dif	0.07199	Prob > t	0.5840
Lower CL Dif	-0.04157	Prob > t	0.2920
Confidence	0.95	Prob < t	0.7080

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0749956	0.0614966	0.0605266
Isolok - 3 mL - HF	10	0.0630184	0.0424564	0.0422344

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4055	1	24	0.5303
Brown-Forsythe	1.0798	1	24	0.3091
Levene	1.2880	1	24	0.2676
Bartlett	0.3152	1	.	0.5745
F Test 2-sided	1.4162	15	9	0.6089

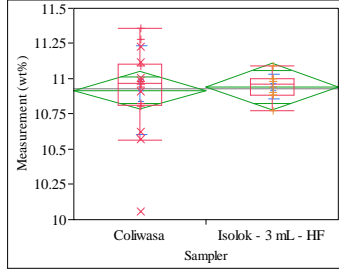
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3090	1	21.756	0.5840

t Test
0.5558

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Al2O3 (wt%), Target (wt%)=10.934



**Oneway Anova
Summary of Fit**

Rsquare 0.002338
Adj Rsquare -0.03923
Root Mean Square Error 0.254479
Mean of Response 10.92712
Observations (or Sum Wgts) 26

t Test

Isolok - 3 mL - HF-Coliwas
Assuming equal variances

Difference 0.02433 t Ratio 0.237146
Std Err Dif 0.10258 DF 24
Upper CL Dif 0.23605 Prob > |t| 0.8146
Lower CL Dif -0.18740 Prob > t 0.4073
Confidence 0.95 Prob < t 0.5927

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0036420	0.003642	0.0562	0.8146
Error	24	1.5542330	0.064760		
C. Total	25	1.5578750			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	10.9178	0.06362	10.786	11.049
Isolok - 3 mL - HF	10	10.9421	0.08047	10.776	11.108

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	10.9178	0.314681	0.07867	10.750	11.085
Isolok - 3 mL - HF	10	10.9421	0.087477	0.02766	10.880	11.005

t Test

Isolok - 3 mL - HF-Coliwas
Assuming unequal variances

Difference 0.02433 t Ratio 0.291722
Std Err Dif 0.08339 DF 18.468
Upper CL Dif 0.19921 Prob > |t| 0.7738
Lower CL Dif -0.15056 Prob > t 0.3869
Confidence 0.95 Prob < t 0.6131

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.3146812	0.2169973	0.2090259
Isolok - 3 mL - HF	10	0.0874766	0.0661325	0.0661325

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9655	1	24	0.1737
Brown-Forsythe	3.5247	1	24	0.0727
Levene	4.4400	1	24	0.0457
Bartlett	12.2933	1	.	0.0005
F Test 2-sided	12.9407	15	9	0.0005

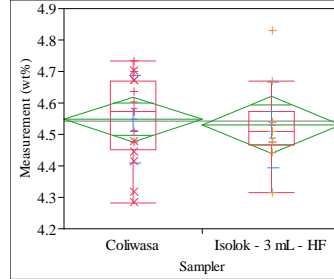
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0851	1	18.468	0.7738

t Test

0.2917

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=B2O3 (wt%), Target (wt%)=5.281



**Oneway Anova
Summary of Fit**

Rsquare 0.004184
Adj Rsquare -0.03731
Root Mean Square Error 0.138353
Mean of Response 4.541297
Observations (or Sum Wgts) 26

t Test

Isolok - 3 mL - HF-Coliwas
Assuming equal variances

Difference -0.01771 t Ratio -0.31753
Std Err Dif 0.05577 DF 24
Upper CL Dif 0.09740 Prob > |t| 0.7536
Lower CL Dif -0.13282 Prob > t 0.6232
Confidence 0.95 Prob < t 0.3768

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00193000	0.001930	0.1008	0.7536
Error	24	0.45939527	0.019141		
C. Total	25	0.46132527			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	4.54811	0.03459	4.4767	4.6195
Isolok - 3 mL - HF	10	4.53040	0.04375	4.4401	4.6207

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	4.54811	0.138867	0.03472	4.4741	4.6221
Isolok - 3 mL - HF	10	4.53040	0.137491	0.04348	4.4320	4.6288

t Test

Isolok - 3 mL - HF-Coliwas
Assuming unequal variances

Difference -0.01771 t Ratio -0.3183
Std Err Dif 0.05564 DF 19.40248
Upper CL Dif 0.09858 Prob > |t| 0.7537
Lower CL Dif -0.13400 Prob > t 0.6232
Confidence 0.95 Prob < t 0.3768

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1388669	0.1157152	0.1126965
Isolok - 3 mL - HF	10	0.1374914	0.0914452	0.0869373

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0012	1	24	0.9729
Brown-Forsythe	0.5025	1	24	0.4852
Levene	0.5386	1	24	0.4701
Bartlett	0.0011	1	.	0.9740
F Test 2-sided	1.0201	15	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

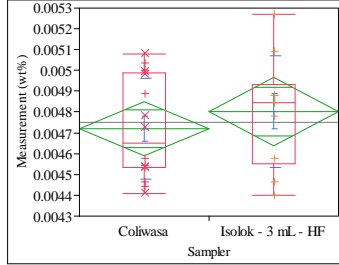
F Ratio	DFNum	DFDen	Prob > F
0.1013	1	19.402	0.7537

t Test

0.3183

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=BaO (wt%), Target (wt%)=0



Oneway Anova Summary of Fit

Rsquare	0.027263
Adj Rsquare	-0.01327
Root Mean Square Error	0.000252
Mean of Response	0.004752
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	8.318e-5	t Ratio	0.820151
Std Err Dif	0.00010	DF	24
Upper CL Dif	0.00029	Prob > t	0.4202
Lower CL Dif	-0.00013	Prob > t	0.2101
Confidence	0.95	Prob < t	0.7899

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	4.25772e-8	4.2577e-8	0.6726	0.4202
Error	24	1.51915e-6	6.3298e-8		
C. Total	25	1.56172e-6			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.004720	6.29e-5	0.00459	0.00485
Isolok - 3 mL - HF	10	0.004803	0.00008	0.00464	0.00497

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.004720	0.000241	0.00006	0.00459	0.00485
Isolok - 3 mL - HF	10	0.004803	0.000268	8.46e-5	0.00461	0.00499

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	8.318e-5	t Ratio	0.800208
Std Err Dif	0.00010	DF	17.73673
Upper CL Dif	0.00030	Prob > t	0.4342
Lower CL Dif	-0.00014	Prob > t	0.2171
Confidence	0.95	Prob < t	0.7829

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0002415	0.0002149	0.0002149
Isolok - 3 mL - HF	10	0.0002676	0.0001983	0.0001898

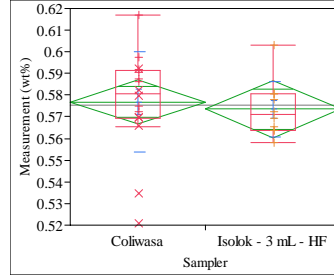
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2572	1	24	0.6167
Brown-Forsythe	0.1807	1	24	0.6745
Levene	0.1057	1	24	0.7480
Bartlett	0.1152	1	.	0.7344
F Test 2-sided	1.2279	9	15	0.6966

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6403	1	17.737	0.4342

t Test
0.8002

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=CaO (wt%), Target (wt%)=0.543



Oneway Anova Summary of Fit

Rsquare	0.007215
Adj Rsquare	-0.03415
Root Mean Square Error	0.02005
Mean of Response	0.575609
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00338	t Ratio	-0.41763
Std Err Dif	0.00808	DF	24
Upper CL Dif	0.01331	Prob > t	0.6799
Lower CL Dif	-0.02006	Prob > t	0.6600
Confidence	0.95	Prob < t	0.3400

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00007012	0.000070	0.1744	0.6799
Error	24	0.00964851	0.000402		
C. Total	25	0.00971863			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.576908	0.00501	0.56656	0.58725
Isolok - 3 mL - HF	10	0.573532	0.00634	0.56045	0.58662

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.576908	0.023311	0.00583	0.56449	0.58933
Isolok - 3 mL - HF	10	0.573532	0.012899	0.00408	0.56430	0.58276

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00338	t Ratio	-0.47453
Std Err Dif	0.00711	DF	23.7836
Upper CL Dif	0.01131	Prob > t	0.6394
Lower CL Dif	-0.01806	Prob > t	0.6803
Confidence	0.95	Prob < t	0.3197

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0233110	0.0164734	0.0161783
Isolok - 3 mL - HF	10	0.0128991	0.0096265	0.0093746

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3369	1	24	0.2590
Brown-Forsythe	1.4013	1	24	0.2481
Levene	1.5808	1	24	0.2207
Bartlett	3.2711	1	.	0.0705
F Test 2-sided	3.2659	15	9	0.0781

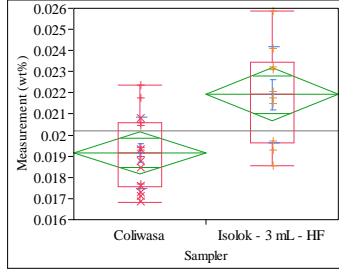
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2252	1	23.784	0.6394

t Test
0.4745

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Cr2O3 (wt%), Target (wt%)=0.015



**Oneway Anova
Summary of Fit**

Rsquare	0.34549
Adj Rsquare	0.318218
Root Mean Square Error	0.001929
Mean of Response	0.020221
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwas
Assuming equal variances

Difference	0.002768	t Ratio	3.559301
Std Err Dif	0.000778	DF	24
Upper CL Dif	0.004373	Prob > t	0.0016
Lower CL Dif	0.001163	Prob > t	0.0008
Confidence	0.95	Prob < t	0.9992

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004715	0.000047	12.6686	0.0016
Error	24	0.00008932	3.722e-6		
C. Total	25	0.00013646			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.019156	0.00048	0.01816	0.02015
Isolok - 3 mL - HF	10	0.021924	0.00061	0.02066	0.02318

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.019156	0.001685	0.00042	0.01826	0.02005
Isolok - 3 mL - HF	10	0.021924	0.002279	0.00072	0.02029	0.02355

t Test

Isolok - 3 mL - HF-Coliwas
Assuming unequal variances

Difference	0.002768	t Ratio	3.315995
Std Err Dif	0.000835	DF	15.13853
Upper CL Dif	0.004546	Prob > t	0.0047
Lower CL Dif	0.000990	Prob > t	0.0023
Confidence	0.95	Prob < t	0.9977

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0016847	0.0013428	0.0013428
Isolok - 3 mL - HF	10	0.0022789	0.0017539	0.0017539

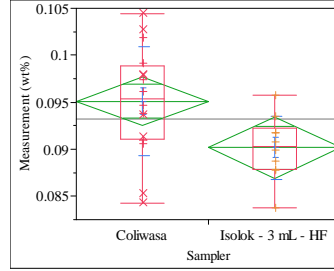
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6241	1	24	0.2147
Brown-Forsythe	0.8402	1	24	0.3685
Levene	0.8403	1	24	0.3684
Bartlett	1.0181	1	.	0.3130
F Test 2-sided	1.8298	9	15	0.2891

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.9958	1	15.139	0.0047

t Test
3.3160

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=CuO (wt%), Target (wt%)=0.103



**Oneway Anova
Summary of Fit**

Rsquare	0.20088
Adj Rsquare	0.167583
Root Mean Square Error	0.005
Mean of Response	0.093201
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwas
Assuming equal variances

Difference	-0.00495	t Ratio	-2.45622
Std Err Dif	0.00202	DF	24
Upper CL Dif	-0.00079	Prob > t	0.0217
Lower CL Dif	-0.00911	Prob > t	0.9892
Confidence	0.95	Prob < t	0.0108

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00015084	0.000151	6.0330	0.0217
Error	24	0.00060005	0.000025		
C. Total	25	0.00075088			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.095106	0.00125	0.09253	0.09769
Isolok - 3 mL - HF	10	0.090155	0.00158	0.08689	0.09342

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.095106	0.005761	0.00144	0.09204	0.09818
Isolok - 3 mL - HF	10	0.090155	0.003371	0.00107	0.08774	0.09257

t Test

Isolok - 3 mL - HF-Coliwas
Assuming unequal variances

Difference	-0.00495	t Ratio	-2.76308
Std Err Dif	0.00179	DF	23.95493
Upper CL Dif	-0.00125	Prob > t	0.0108
Lower CL Dif	-0.00865	Prob > t	0.9946
Confidence	0.95	Prob < t	0.0054

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0057605	0.0045534	0.0045534
Isolok - 3 mL - HF	10	0.0033712	0.0025537	0.0025537

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.3902	1	24	0.1352
Brown-Forsythe	2.8863	1	24	0.1023
Levene	2.9081	1	24	0.1010
Bartlett	2.7252	1	.	0.0988
F Test 2-sided	2.9198	15	9	0.1089

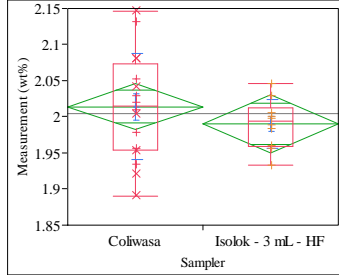
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.6346	1	23.955	0.0108

t Test
2.7631

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Fe/Li, Target (wt%)=1.99097835



**Oneway Anova
Summary of Fit**

Rsquare	0.036614
Adj Rsquare	-0.00353
Root Mean Square Error	0.061782
Mean of Response	2.004898
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02379	t Ratio	-0.95506
Std Err Dif	0.02491	DF	24
Upper CL Dif	0.02762	Prob > t	0.3491
Lower CL Dif	-0.07519	Prob > t	0.8255
Confidence	0.95	Prob < t	0.1745

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00348168	0.003482	0.9121	0.3491
Error	24	0.09160904	0.003817		
C. Total	25	0.09509072			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.01405	0.01545	1.9822	2.0459
Isolok - 3 mL - HF	10	1.99026	0.01954	1.9499	2.0306

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.01405	0.073540	0.01839	1.9749	2.0532
Isolok - 3 mL - HF	10	1.99026	0.034134	0.01079	1.9658	2.0147

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02379	t Ratio	-1.11568
Std Err Dif	0.02132	DF	22.64003
Upper CL Dif	0.02036	Prob > t	0.2763
Lower CL Dif	-0.06793	Prob > t	0.8619
Confidence	0.95	Prob < t	0.1381

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0735403	0.0583708	0.0583708
Isolok - 3 mL - HF	10	0.0341345	0.0257641	0.0257641

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.2460	1	24	0.0503
Brown-Forsythe	5.1353	1	24	0.0327
Levene	5.1557	1	24	0.0324
Bartlett	5.2164	1	.	0.0224
F Test 2-sided	4.6416	15	9	0.0252

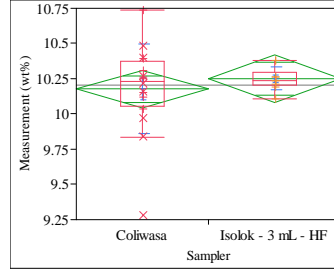
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2448	1	22.64	0.2763

t Test

1.1157

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Fe2O3 (wt%), Target (wt%)=9.931



**Oneway Anova
Summary of Fit**

Rsquare	0.020353
Adj Rsquare	-0.02047
Root Mean Square Error	0.257408
Mean of Response	10.20586
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.07327	t Ratio	0.706139
Std Err Dif	0.10376	DF	24
Upper CL Dif	0.28743	Prob > t	0.4869
Lower CL Dif	-0.14089	Prob > t	0.2435
Confidence	0.95	Prob < t	0.7565

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0330388	0.033039	0.4986	0.4869
Error	24	1.5902136	0.066259		
C. Total	25	1.6232524			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.1777	0.06435	10.045	10.310
Isolok - 3 mL - HF	10	10.2509	0.08140	10.083	10.419

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.1777	0.319429	0.07986	10.007	10.348
Isolok - 3 mL - HF	10	10.2509	0.081436	0.02575	10.193	10.309

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.07327	t Ratio	0.873255
Std Err Dif	0.08391	DF	17.9583
Upper CL Dif	0.24958	Prob > t	0.3941
Lower CL Dif	-0.10304	Prob > t	0.1970
Confidence	0.95	Prob < t	0.8030

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3194295	0.2128913	0.2090936
Isolok - 3 mL - HF	10	0.0814357	0.0571880	0.0543286

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7363	1	24	0.2000
Brown-Forsythe	3.9037	1	24	0.0598
Levene	4.3018	1	24	0.0490
Bartlett	13.6211	1	.	0.0002
F Test 2-sided	15.3858	15	9	0.0003

Welch Anova testing Means Equal, allowing Std Devs Not Equal

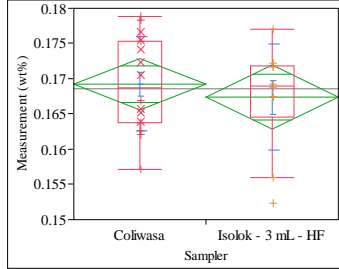
F Ratio	DFNum	DFDen	Prob > F
0.7626	1	17.958	0.3941

t Test

0.8733

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=K2O (wt%), Target (wt%)=0.076



**Oneway Anova
Summary of Fit**

Rsquare	0.017802
Adj Rsquare	-0.02312
Root Mean Square Error	0.007023
Mean of Response	0.168528
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00187	t Ratio	-0.65954
Std Err Dif	0.00283	DF	24
Upper CL Dif	0.00398	Prob > t	0.5158
Lower CL Dif	-0.00771	Prob > t	0.7421
Confidence	0.95	Prob < t	0.2579

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002145	0.000021	0.4350	0.5158
Error	24	0.00118367	0.000049		
C. Total	25	0.00120512			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.00176	0.16562	0.17281
Isolok - 3 mL - HF	10	0.167379	0.00222	0.16280	0.17196

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.006682	0.00167	0.16569	0.17281
Isolok - 3 mL - HF	10	0.167379	0.007557	0.00239	0.16197	0.17279

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00187	t Ratio	-0.64037
Std Err Dif	0.00292	DF	17.44415
Upper CL Dif	0.00427	Prob > t	0.5303
Lower CL Dif	-0.00801	Prob > t	0.7349
Confidence	0.95	Prob < t	0.2651

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0066816	0.0058724	0.0058724
Isolok - 3 mL - HF	10	0.0075572	0.0052761	0.0049991

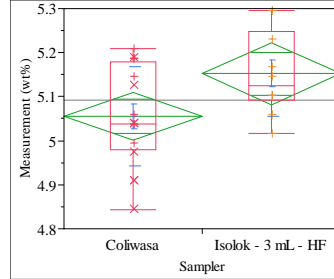
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2366	1	24	0.6311
Brown-Forsythe	0.2732	1	24	0.6060
Levene	0.1485	1	24	0.7033
Bartlett	0.1662	1	.	0.6835
F Test 2-sided	1.2793	9	15	0.6468

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4101	1	17.444	0.5303

t Test
0.6404

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Li2O (wt%), Target (wt%)=4.988



**Oneway Anova
Summary of Fit**

Rsquare	0.174428
Adj Rsquare	0.140029
Root Mean Square Error	0.106431
Mean of Response	5.092437
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.096611	t Ratio	2.25183
Std Err Dif	0.042904	DF	24
Upper CL Dif	0.185160	Prob > t	0.0338
Lower CL Dif	0.008063	Prob > t	0.0169
Confidence	0.95	Prob < t	0.9831

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.05743852	0.057439	5.0707	0.0338
Error	24	0.27185886	0.011327		
C. Total	25	0.32929739			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	5.05528	0.02661	5.0004	5.1102
Isolok - 3 mL - HF	10	5.15189	0.03366	5.0824	5.2214

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	5.05528	0.112342	0.02809	4.9954	5.1151
Isolok - 3 mL - HF	10	5.15189	0.095771	0.03029	5.0834	5.2204

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.096611	t Ratio	2.339045
Std Err Dif	0.041304	DF	21.5661
Upper CL Dif	0.182370	Prob > t	0.0290
Lower CL Dif	0.010853	Prob > t	0.0145
Confidence	0.95	Prob < t	0.9855

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1123417	0.0896481	0.0874616
Isolok - 3 mL - HF	10	0.0957711	0.0766432	0.0753515

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4657	1	24	0.5015
Brown-Forsythe	0.2055	1	24	0.6544
Levene	0.2955	1	24	0.5917
Bartlett	0.2659	1	.	0.6061
F Test 2-sided	1.3760	15	9	0.6413

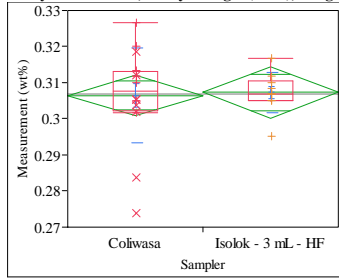
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.4711	1	21.566	0.0290

t Test
2.3390

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=MgO (wt%), Target (wt%)=0.286



**Oneway Anova
Summary of Fit**

Rsquare	0.001425
Adj Rsquare	-0.04018
Root Mean Square Error	0.010835
Mean of Response	0.306786
Observations (or Sum Wgts)	26

t Test

Isok - 3 mL - HF-Coliwas
Assuming equal variances

Difference	0.00081	t Ratio	0.185093
Std Err Dif	0.00437	DF	24
Upper CL Dif	0.00982	Prob > t	0.8547
Lower CL Dif	-0.00821	Prob > t	0.4274
Confidence	0.95	Prob < t	0.5726

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000402	4.022e-6	0.0343	0.8547
Error	24	0.00281744	0.000117		
C. Total	25	0.00282146			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.306475	0.00271	0.30088	0.31207
Isok - 3 mL - HF	10	0.307283	0.00343	0.30021	0.31435

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.306475	0.013018	0.00325	0.29954	0.31341
Isok - 3 mL - HF	10	0.307283	0.005530	0.00175	0.30333	0.31124

t Test

Isok - 3 mL - HF-Coliwas
Assuming unequal variances

Difference	0.00081	t Ratio	0.218805
Std Err Dif	0.00369	DF	21.87361
Upper CL Dif	0.00847	Prob > t	0.8288
Lower CL Dif	-0.00686	Prob > t	0.4144
Confidence	0.95	Prob < t	0.5856

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0130184	0.0090170	0.0090170
Isok - 3 mL - HF	10	0.0055304	0.0035819	0.0034824

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.8110	1	24	0.1910
Brown-Forsythe	3.1892	1	24	0.0868
Levene	3.1427	1	24	0.0890
Bartlett	6.3108	1	.	0.0120
F Test 2-sided	5.5411	15	9	0.0136

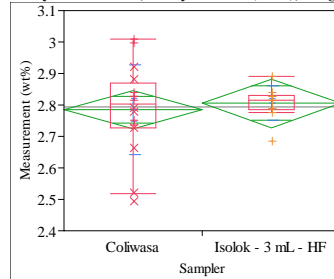
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0479	1	21.874	0.8288

t Test

0.2188

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=MnO (wt%), Target (wt%)=2.918



**Oneway Anova
Summary of Fit**

Rsquare	0.007915
Adj Rsquare	-0.03342
Root Mean Square Error	0.118033
Mean of Response	2.792965
Observations (or Sum Wgts)	26

t Test

Isok - 3 mL - HF-Coliwas
Assuming equal variances

Difference	0.02082	t Ratio	0.437586
Std Err Dif	0.04758	DF	24
Upper CL Dif	0.11902	Prob > t	0.6656
Lower CL Dif	-0.07738	Prob > t	0.3328
Confidence	0.95	Prob < t	0.6672

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00266768	0.002668	0.1915	0.6656
Error	24	0.33436270	0.013932		
C. Total	25	0.33703037			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	2.78496	0.02951	2.7241	2.8459
Isok - 3 mL - HF	10	2.80578	0.03733	2.7287	2.8828

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	2.78496	0.143451	0.03586	2.7085	2.8614
Isok - 3 mL - HF	10	2.80578	0.053429	0.01690	2.7676	2.8440

t Test

Isok - 3 mL - HF-Coliwas
Assuming unequal variances

Difference	0.02082	t Ratio	0.525198
Std Err Dif	0.03964	DF	20.69813
Upper CL Dif	0.10334	Prob > t	0.6050
Lower CL Dif	-0.06170	Prob > t	0.3025
Confidence	0.95	Prob < t	0.6975

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1434506	0.1046074	0.1041030
Isok - 3 mL - HF	10	0.0534286	0.0366701	0.0348624

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.2022	1	24	0.0862
Brown-Forsythe	4.5913	1	24	0.0425
Levene	4.6743	1	24	0.0408
Bartlett	8.0510	1	.	0.0045
F Test 2-sided	7.2087	15	9	0.0052

Welch Anova testing Means Equal, allowing Std Devs Not Equal

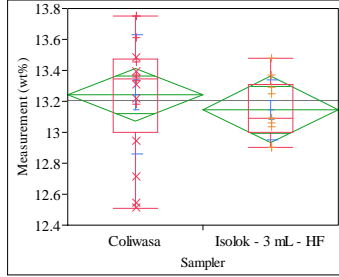
F Ratio	DFNum	DFDen	Prob > F
0.2758	1	20.698	0.6050

t Test

0.5252

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Na2O (wt%), Target (wt%)=13.318



Oneway Anova Summary of Fit

Rsquare	0.021678
Adj Rsquare	-0.01909
Root Mean Square Error	0.32729
Mean of Response	13.20625
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.09621	t Ratio	-0.72925
Std Err Dif	0.13193	DF	24
Upper CL Dif	0.17609	Prob > t	0.4729
Lower CL Dif	-0.36851	Prob > t	0.7635
Confidence	0.95	Prob < t	0.2365

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0569664	0.056966	0.5318	0.4729
Error	24	2.5708456	0.107119		
C. Total	25	2.6278119			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	13.2433	0.08182	13.074	13.412
Isolok - 3 mL - HF	10	13.1470	0.10350	12.933	13.361

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	13.2433	0.385536	0.09638	13.038	13.449
Isolok - 3 mL - HF	10	13.1470	0.194728	0.06158	13.008	13.286

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.09621	t Ratio	-0.84121
Std Err Dif	0.11438	DF	23.28
Upper CL Dif	0.14023	Prob > t	0.4088
Lower CL Dif	-0.33266	Prob > t	0.7956
Confidence	0.95	Prob < t	0.2044

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3855364	0.2959281	0.2771825
Isolok - 3 mL - HF	10	0.1947278	0.1612208	0.1496280

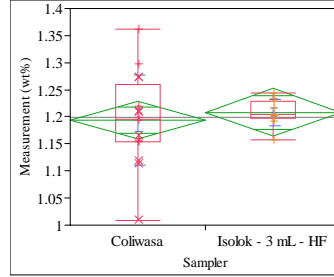
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.0477	1	24	0.0936
Brown-Forsythe	1.8238	1	24	0.1895
Levene	2.9459	1	24	0.0990
Bartlett	4.2403	1	.	0.0395
F Test 2-sided	3.9199	15	9	0.0441

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7076	1	23.28	0.4088

t Test
0.8412

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=NiO (wt%), Target (wt%)=1.033



Oneway Anova Summary of Fit

Rsquare	0.011161
Adj Rsquare	-0.03004
Root Mean Square Error	0.0677
Mean of Response	1.199625
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.01420	t Ratio	0.520478
Std Err Dif	0.02729	DF	24
Upper CL Dif	0.07053	Prob > t	0.6075
Lower CL Dif	-0.04212	Prob > t	0.3037
Confidence	0.95	Prob < t	0.6963

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00124161	0.001242	0.2709	0.6075
Error	24	0.10999986	0.004583		
C. Total	25	0.11124147			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.19416	0.01693	1.1592	1.2291
Isolok - 3 mL - HF	10	1.20837	0.02141	1.1642	1.2526

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.19416	0.083542	0.02089	1.1496	1.2387
Isolok - 3 mL - HF	10	1.20837	0.024294	0.00768	1.1910	1.2257

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01420	t Ratio	0.638293
Std Err Dif	0.02225	DF	18.76131
Upper CL Dif	0.06082	Prob > t	0.5310
Lower CL Dif	-0.03241	Prob > t	0.2655
Confidence	0.95	Prob < t	0.7345

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0835416	0.0610005	0.0610005
Isolok - 3 mL - HF	10	0.0242941	0.0177132	0.0170515

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.1028	1	24	0.0909
Brown-Forsythe	5.9770	1	24	0.0222
Levene	5.8477	1	24	0.0236
Bartlett	11.6129	1	.	0.0007
F Test 2-sided	11.8251	15	9	0.0008

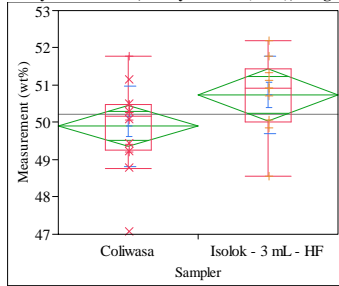
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4074	1	18.761	0.5310

t Test
0.6383

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=SiO2 (wt%), Target (wt%)=50.183



Oneway Anova Summary of Fit

Rsquare	0.139839
Adj Rsquare	0.103999
Root Mean Square Error	1.061238
Mean of Response	50.22418
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.8450	t Ratio	1.975283
Std Err Dif	0.4278	DF	24
Upper CL Dif	1.7280	Prob > t	0.0598
Lower CL Dif	-0.0379	Prob > t	0.0299
Confidence	0.95	Prob < t	0.9701

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	4.394244	4.39424	3.9017	0.0598
Error	24	27.029426	1.12623		
C. Total	25	31.423671			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	49.8992	0.26531	49.352	50.447
Isolok - 3 mL - HF	10	50.7442	0.33559	50.052	51.437

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	49.8992	1.07250	0.26812	49.328	50.471
Isolok - 3 mL - HF	10	50.7442	1.04220	0.32957	49.999	51.490

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.8450	t Ratio	1.98893
Std Err Dif	0.4249	DF	19.68279
Upper CL Dif	1.7322	Prob > t	0.0608
Lower CL Dif	-0.0421	Prob > t	0.0304
Confidence	0.95	Prob < t	0.9696

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.072499	0.7888669	0.7487550
Isolok - 3 mL - HF	10	1.042200	0.7615908	0.7273620

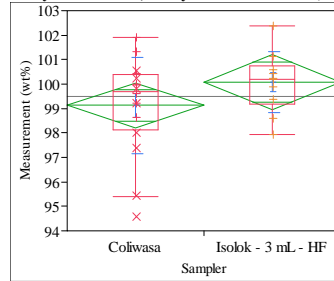
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0058	1	24	0.9399
Brown-Forsythe	0.0048	1	24	0.9456
Levene	0.0097	1	24	0.9222
Bartlett	0.0088	1	.	0.9253
F Test 2-sided	1.0590	15	9	0.9652

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.9558	1	19.683	0.0608

t Test
1.9889

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Sum of Oxides (wt%), Target (wt%)=99.73



Oneway Anova Summary of Fit

Rsquare	0.070688
Adj Rsquare	0.031967
Root Mean Square Error	1.748167
Mean of Response	99.49112
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.9522	t Ratio	1.351135
Std Err Dif	0.7047	DF	24
Upper CL Dif	2.4066	Prob > t	0.1893
Lower CL Dif	-0.5023	Prob > t	0.0946
Confidence	0.95	Prob < t	0.9054

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	5.579088	5.57909	1.8256	0.1893
Error	24	73.346090	3.05609		
C. Total	25	78.925177			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.125	0.43704	98.223	100.03
Isolok - 3 mL - HF	10	100.077	0.55282	98.936	101.22

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.125	1.98464	0.49616	98.067	100.18
Isolok - 3 mL - HF	10	100.077	1.25893	0.39811	99.176	100.98

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.9522	t Ratio	1.496788
Std Err Dif	0.6361	DF	23.97162
Upper CL Dif	2.2652	Prob > t	0.1475
Lower CL Dif	-0.3608	Prob > t	0.0738
Confidence	0.95	Prob < t	0.9262

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.984640	1.465547	1.384609
Isolok - 3 mL - HF	10	1.258930	0.905929	0.885656

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1977	1	24	0.2847
Brown-Forsythe	0.9154	1	24	0.3482
Levene	1.5030	1	24	0.2321
Bartlett	2.0121	1	.	0.1560
F Test 2-sided	2.4852	15	9	0.1706

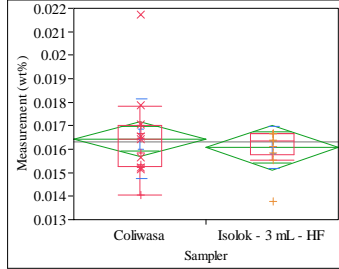
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.2404	1	23.972	0.1475

t Test
1.4968

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=TiO2 (wt%), Target (wt%)=0.013



**Oneway Anova
Summary of Fit**

Rsquare	0.016011
Adj Rsquare	-0.02499
Root Mean Square Error	0.001451
Mean of Response	0.016294
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00037	t Ratio	-0.6249
Std Err Dif	0.00058	DF	24
Upper CL Dif	0.00084	Prob > t	0.5379
Lower CL Dif	-0.00157	Prob > t	0.7310
Confidence	0.95	Prob < t	0.2690

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0000082	8.221e-7	0.3905	0.5379
Error	24	0.00005053	2.1052e-6		
C. Total	25	0.00005135			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.016435	0.00036	0.01569	0.01718
Isolok - 3 mL - HF	10	0.016070	0.00046	0.01512	0.01702

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.016435	0.001700	0.00043	0.01553	0.01734
Isolok - 3 mL - HF	10	0.016070	0.000892	0.00028	0.01543	0.01671

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00037	t Ratio	-0.71653
Std Err Dif	0.00051	DF	23.51511
Upper CL Dif	0.00069	Prob > t	0.4807
Lower CL Dif	-0.00142	Prob > t	0.7596
Confidence	0.95	Prob < t	0.2404

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0017004	0.0010936	0.0010936
Isolok - 3 mL - HF	10	0.0008916	0.0006112	0.0005438

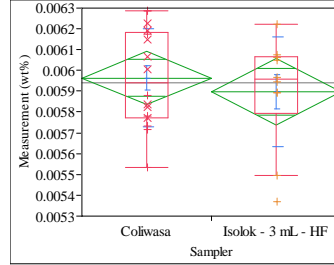
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7452	1	24	0.3965
Brown-Forsythe	1.5240	1	24	0.2290
Levene	1.2429	1	24	0.2759
Bartlett	3.8322	1	.	0.0503
F Test 2-sided	3.6376	15	9	0.0560

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5134	1	23.515	0.4807

t Test
0.7165

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=ZnO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.018136
Adj Rsquare	-0.02277
Root Mean Square Error	0.000247
Mean of Response	0.005939
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-6.63e-5	t Ratio	-0.66582
Std Err Dif	0.0001	DF	24
Upper CL Dif	0.00014	Prob > t	0.5119
Lower CL Dif	-0.00027	Prob > t	0.7441
Confidence	0.95	Prob < t	0.2559

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.70387e-8	2.7039e-8	0.4433	0.5119
Error	24	1.46381e-6	6.0992e-8		
C. Total	25	1.49085e-6			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005964	6.17e-5	0.00584	0.00609
Isolok - 3 mL - HF	10	0.005898	7.81e-5	0.00574	0.00606

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005964	0.000235	5.88e-5	0.00584	0.00609
Isolok - 3 mL - HF	10	0.005898	0.000265	8.39e-5	0.00571	0.00609

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-6.63e-5	t Ratio	-0.64687
Std Err Dif	0.00010	DF	17.48128
Upper CL Dif	0.00015	Prob > t	0.5261
Lower CL Dif	-0.00028	Prob > t	0.7369
Confidence	0.95	Prob < t	0.2631

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0002352	0.0002062	0.0002062
Isolok - 3 mL - HF	10	0.0002654	0.0001872	0.0001780

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2285	1	24	0.6369
Brown-Forsythe	0.2298	1	24	0.6360
Levene	0.1225	1	24	0.7294
Bartlett	0.1591	1	.	0.6900
F Test 2-sided	1.2726	9	15	0.6531

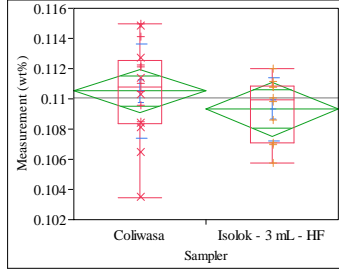
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4184	1	17.481	0.5261

t Test
0.6469

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=ZrO2 (wt%), Target (wt%)=0.111



**Oneway Anova
Summary of Fit**

Rsquare	0.047085
Adj Rsquare	0.00738
Root Mean Square Error	0.002766
Mean of Response	0.1110054
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwas
Assuming equal variances

Difference	-0.00121	t Ratio	-1.08898
Std Err Dif	0.00111	DF	24
Upper CL Dif	0.00109	Prob > t	0.2870
Lower CL Dif	-0.00351	Prob > t	0.8565
Confidence	0.95	Prob < t	0.1435

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000907	9.07e-6	1.1859	0.2870
Error	24	0.00018356	7.6484e-6		
C. Total	25	0.00019263			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.110521	0.00069	0.10909	0.11195
Isolok - 3 mL - HF	10	0.109307	0.00087	0.10750	0.11111

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.110521	0.003105	0.00078	0.10887	0.11218
Isolok - 3 mL - HF	10	0.109307	0.002081	0.00066	0.10782	0.11080

t Test

Isolok - 3 mL - HF-Coliwas
Assuming unequal variances

Difference	-0.00121	t Ratio	-1.19307
Std Err Dif	0.00102	DF	23.81085
Upper CL Dif	0.00089	Prob > t	0.2446
Lower CL Dif	-0.00332	Prob > t	0.8777
Confidence	0.95	Prob < t	0.1223

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0031048	0.0023892	0.0023892
Isolok - 3 mL - HF	10	0.0020808	0.0017506	0.0016480

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3115	1	24	0.2634
Brown-Forsythe	1.1555	1	24	0.2931
Levene	0.9781	1	24	0.3325
Bartlett	1.5786	1	.	0.2090
F Test 2-sided	2.2264	15	9	0.2271

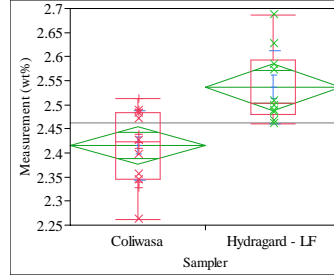
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.4234	1	23.811	0.2446

t Test

1.1931

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Al/B, Target (wt%)=2.0704412



**Oneway Anova
Summary of Fit**

Rsquare	0.4081
Adj Rsquare	0.383437
Root Mean Square Error	0.074046
Mean of Response	2.462194
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	0.121420	t Ratio	4.067844
Std Err Dif	0.029849	DF	24
Upper CL Dif	0.183025	Prob > t	0.0004
Lower CL Dif	0.059815	Prob > t	0.0002
Confidence	0.95	Prob < t	0.9998

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.09072524	0.090725	16.5474	0.0004
Error	24	0.13158633	0.005483		
C. Total	25	0.22231157			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	2.41549	0.01851	2.3773	2.4537
Hydragard - LF	10	2.53691	0.02342	2.4886	2.5852

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	2.41549	0.072839	0.01821	2.3767	2.4543
Hydragard - LF	10	2.53691	0.076015	0.02404	2.4825	2.5913

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	0.121420	t Ratio	4.026335
Std Err Dif	0.030156	DF	18.61529
Upper CL Dif	0.184627	Prob > t	0.0007
Lower CL Dif	0.058213	Prob > t	0.0004
Confidence	0.95	Prob < t	0.9996

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0728389	0.0593227	0.0584856
Hydragard - LF	10	0.0760145	0.0636069	0.0578460

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0294	1	24	0.8652
Brown-Forsythe	0.0011	1	24	0.9740
Levene	0.0778	1	24	0.7826
Bartlett	0.0197	1	.	0.8883
F Test 2-sided	1.0891	9	15	0.8486

Welch Anova testing Means Equal, allowing Std Devs Not Equal

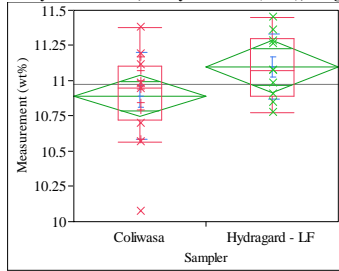
F Ratio	DFNum	DFDen	Prob > F
16.2114	1	18.615	0.0007

t Test

4.0263

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Al2O3 (wt%), Target (wt%)=10.934



Oneway Anova Summary of Fit

Rsquare	0.121479
Adj Rsquare	0.084873
Root Mean Square Error	0.282066
Mean of Response	10.97145
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.20714	t Ratio	1.82171
Std Err Dif	0.11370	DF	24
Upper CL Dif	0.44181	Prob > t	0.0810
Lower CL Dif	-0.02754	Prob > t	0.0405
Confidence	0.95	Prob < t	0.9595

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.2640339	0.264034	3.3186	0.0810
Error	24	1.9094689	0.079561		
C. Total	25	2.1735028			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	10.8918	0.07052	10.746	11.037
Hydragard - LF	10	11.0989	0.08920	10.915	11.283

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	10.8918	0.309168	0.07729	10.727	11.057
Hydragard - LF	10	11.0989	0.229902	0.07270	10.934	11.263

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.20714	t Ratio	1.952072
Std Err Dif	0.10611	DF	23.12048
Upper CL Dif	0.42658	Prob > t	0.0631
Lower CL Dif	-0.01231	Prob > t	0.0316
Confidence	0.95	Prob < t	0.9684

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.3091681	0.2258543	0.2137497
Hydragard - LF	10	0.2299021	0.1904616	0.1851710

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5047	1	24	0.4843
Brown-Forsythe	0.1346	1	24	0.7169
Levene	0.2532	1	24	0.6194
Bartlett	0.8881	1	.	0.3460
F Test 2-sided	1.8084	15	9	0.3717

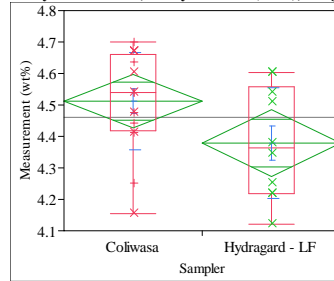
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.8106	1	23.12	0.0631

t Test

1.9521

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=B2O3 (wt%), Target (wt%)=5.281



Oneway Anova Summary of Fit

Rsquare	0.144937
Adj Rsquare	0.10931
Root Mean Square Error	0.163359
Mean of Response	4.4608
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.13282	t Ratio	-2.01696
Std Err Dif	0.06585	DF	24
Upper CL Dif	0.00309	Prob > t	0.0550
Lower CL Dif	-0.26873	Prob > t	0.9725
Confidence	0.95	Prob < t	0.0275

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.10856237	0.108562	4.0681	0.0550
Error	24	0.64046813	0.026686		
C. Total	25	0.74903050			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	4.51188	0.04084	4.4276	4.5962
Hydragard - LF	10	4.37906	0.05166	4.2724	4.4857

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	4.51188	0.155035	0.03876	4.4293	4.5945
Hydragard - LF	10	4.37906	0.176361	0.05577	4.2529	4.5052

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.13282	t Ratio	-1.95567
Std Err Dif	0.06792	DF	17.36301
Upper CL Dif	0.01024	Prob > t	0.0668
Lower CL Dif	-0.27588	Prob > t	0.9666
Confidence	0.95	Prob < t	0.0334

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1550352	0.1202431	0.1167214
Hydragard - LF	10	0.1763612	0.1481154	0.1481154

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2801	1	24	0.6015
Brown-Forsythe	0.6665	1	24	0.4223
Levene	0.6047	1	24	0.4444
Bartlett	0.1822	1	.	0.6695
F Test 2-sided	1.2940	9	15	0.6331

Welch Anova testing Means Equal, allowing Std Devs Not Equal

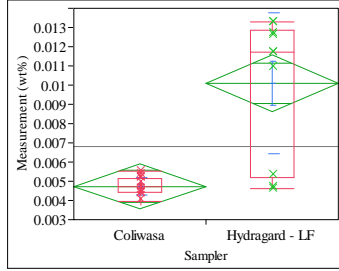
F Ratio	DFNum	DFDen	Prob > F
3.8246	1	17.363	0.0668

t Test

1.9557

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=BaO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.587384
Adj Rsquare	0.570192
Root Mean Square Error	0.002278
Mean of Response	0.006794
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.005367	t Ratio	5.845126
Std Err Dif	0.000918	DF	24
Upper CL Dif	0.007262	Prob > t	<.0001
Lower CL Dif	0.003472	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00017724	0.000177	34.1655	<.0001
Error	24	0.00012451	5.188e-6		
C. Total	25	0.00030175			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.004730	0.00057	0.00355	0.00590
Hydragard - LF	10	0.010097	0.00072	0.00861	0.01158

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.004730	0.000449	0.00011	0.00449	0.00497
Hydragard - LF	10	0.010097	0.003674	0.00116	0.00747	0.01272

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.005367	t Ratio	4.597819
Std Err Dif	0.001167	DF	9.168025
Upper CL Dif	0.008000	Prob > t	0.0012
Lower CL Dif	0.002734	Prob > t	0.0006
Confidence	0.95	Prob < t	0.9994

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0004486	0.0003503	0.0003503
Hydragard - LF	10	0.0036740	0.0031282	0.0026316

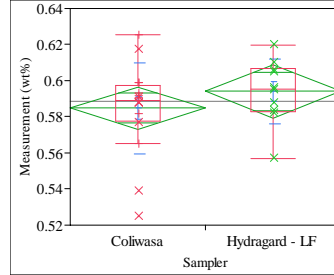
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	17.0770	1	24	0.0004
Brown-Forsythe	9.6376	1	24	0.0048
Levene	46.1686	1	24	<.0001
Bartlett	38.3945	1	.	<.0001
F Test 2-sided	67.0756	9	15	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
21.1399	1	9.168	0.0012

t Test
4.5978

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=CaO (wt%), Target (wt%)=0.543



**Oneway Anova
Summary of Fit**

Rsquare	0.041524
Adj Rsquare	0.001587
Root Mean Square Error	0.022679
Mean of Response	0.588364
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00932	t Ratio	1.019676
Std Err Dif	0.00914	DF	24
Upper CL Dif	0.02819	Prob > t	0.3181
Lower CL Dif	-0.00955	Prob > t	0.1590
Confidence	0.95	Prob < t	0.8410

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00053479	0.000535	1.0397	0.3181
Error	24	0.01234434	0.000514		
C. Total	25	0.01287913			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.584778	0.00567	0.57308	0.59648
Hydragard - LF	10	0.594100	0.00717	0.57930	0.60890

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.584778	0.025157	0.00629	0.57137	0.59818
Hydragard - LF	10	0.594100	0.017799	0.00563	0.58137	0.60683

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00932	t Ratio	1.104509
Std Err Dif	0.00844	DF	23.51214
Upper CL Dif	0.02676	Prob > t	0.2805
Lower CL Dif	-0.00812	Prob > t	0.1403
Confidence	0.95	Prob < t	0.8597

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0251569	0.0170855	0.0160033
Hydragard - LF	10	0.0177991	0.0132644	0.0131525

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6762	1	24	0.4190
Brown-Forsythe	0.1758	1	24	0.6787
Levene	0.3646	1	24	0.5516
Bartlett	1.1966	1	.	0.2740
F Test 2-sided	1.9976	15	9	0.2960

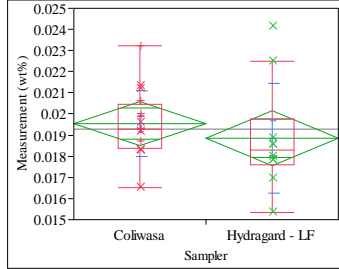
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2199	1	23.512	0.2805

t Test
1.1045

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Cr2O3 (wt%), Target (wt%)=0.015



**Oneway Anova
Summary of Fit**

Rsquare	0.030697
Adj Rsquare	-0.00969
Root Mean Square Error	0.002001
Mean of Response	0.019287
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00070	t Ratio	-0.87181
Std Err Dif	0.00081	DF	24
Upper CL Dif	0.00096	Prob > t	0.3919
Lower CL Dif	-0.00237	Prob > t	0.8040
Confidence	0.95	Prob < t	0.1960

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000304	3.0447e-6	0.7601	0.3919
Error	24	0.00009614	4.0059e-6		
C. Total	25	0.00009919			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.019558	0.00050	0.01853	0.02059
Hydragard - LF	10	0.018855	0.00063	0.01755	0.02016

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.019558	0.001553	0.00039	0.01873	0.02039
Hydragard - LF	10	0.018855	0.002582	0.00082	0.01701	0.02070

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00070	t Ratio	-0.77812
Std Err Dif	0.00090	DF	13.12581
Upper CL Dif	0.00125	Prob > t	0.4503
Lower CL Dif	-0.00265	Prob > t	0.7749
Confidence	0.95	Prob < t	0.2251

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0015525	0.0011202	0.0010871
Hydragard - LF	10	0.0025817	0.0017832	0.0016662

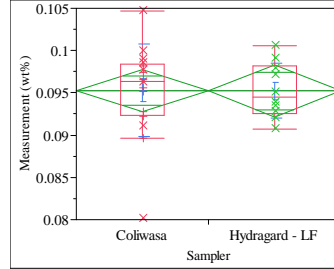
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.0400	1	24	0.1661
Brown-Forsythe	0.9172	1	24	0.3478
Levene	1.4664	1	24	0.2377
Bartlett	2.9060	1	.	0.0882
F Test 2-sided	2.7652	9	15	0.0790

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6055	1	13.126	0.4503

t Test
0.7781

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=CuO (wt%), Target (wt%)=0.103



**Oneway Anova
Summary of Fit**

Rsquare	1.872e-5
Adj Rsquare	-0.04165
Root Mean Square Error	0.004761
Mean of Response	0.095262
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00004	t Ratio	-0.0212
Std Err Dif	0.00192	DF	24
Upper CL Dif	0.00392	Prob > t	0.9833
Lower CL Dif	-0.00400	Prob > t	0.5084
Confidence	0.95	Prob < t	0.4916

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.01855e-8	1.019e-8	0.0004	0.9833
Error	24	0.00054396	0.000023		
C. Total	25	0.00054397			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.095278	0.00119	0.09282	0.09773
Hydragard - LF	10	0.095237	0.00151	0.09213	0.09834

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.095278	0.005472	0.00137	0.09236	0.09819
Hydragard - LF	10	0.095237	0.003246	0.00103	0.09291	0.09756

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00004	t Ratio	-0.02379
Std Err Dif	0.00171	DF	23.97765
Upper CL Dif	0.00349	Prob > t	0.9812
Lower CL Dif	-0.00357	Prob > t	0.5094
Confidence	0.95	Prob < t	0.4906

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0054719	0.0038454	0.0036772
Hydragard - LF	10	0.0032460	0.0027239	0.0026789

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8916	1	24	0.3544
Brown-Forsythe	0.5223	1	24	0.4768
Levene	0.7966	1	24	0.3810
Bartlett	2.5992	1	.	0.1069
F Test 2-sided	2.8417	15	9	0.1177

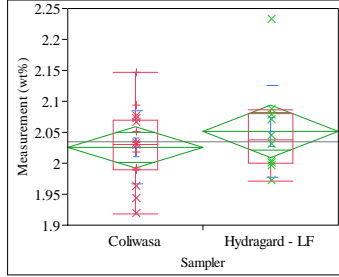
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0006	1	23.978	0.9812

t Test
0.0238

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Fe/Li, Target (wt%)=1.99097835



**Oneway Anova
Summary of Fit**

Rsquare	0.037182
Adj Rsquare	-0.00294
Root Mean Square Error	0.06528
Mean of Response	2.035371
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	0.02533	t Ratio	0.962716
Std Err Dif	0.02632	DF	24
Upper CL Dif	0.07965	Prob > t	0.3453
Lower CL Dif	-0.02898	Prob > t	0.1726
Confidence	0.95	Prob < t	0.8274

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00394966	0.003950	0.9268	0.3453
Error	24	0.10227624	0.004262		
C. Total	25	0.10622590			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	2.02563	0.01632	1.9919	2.0593
Hydragard - LF	10	2.05096	0.02064	2.0084	2.0936

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	2.02563	0.059283	0.01482	1.9940	2.0572
Hydragard - LF	10	2.05096	0.074206	0.02347	1.9979	2.1040

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	0.02533	t Ratio	0.912794
Std Err Dif	0.02775	DF	16.07722
Upper CL Dif	0.08415	Prob > t	0.3748
Lower CL Dif	-0.03348	Prob > t	0.1874
Confidence	0.95	Prob < t	0.8126

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0592829	0.0460802	0.0456218
Hydragard - LF	10	0.0742064	0.0521476	0.0508316

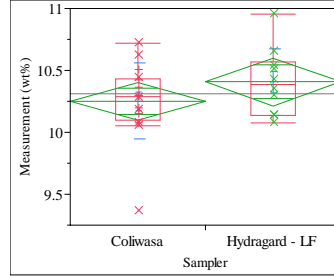
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3754	1	24	0.5459
Brown-Forsythe	0.0885	1	24	0.7687
Levene	0.1323	1	24	0.7193
Bartlett	0.5588	1	.	0.4547
F Test 2-sided	1.5668	9	15	0.4247

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8332	1	16.077	0.3748

t Test
0.9128

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Fe2O3 (wt%), Target (wt%)=9.931



**Oneway Anova
Summary of Fit**

Rsquare	0.066062
Adj Rsquare	0.027148
Root Mean Square Error	0.293301
Mean of Response	10.31199
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	0.15405	t Ratio	1.302931
Std Err Dif	0.11823	DF	24
Upper CL Dif	0.39807	Prob > t	0.2050
Lower CL Dif	-0.08997	Prob > t	0.1025
Confidence	0.95	Prob < t	0.8975

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1460397	0.146040	1.6976	0.2050
Error	24	2.0646154	0.086026		
C. Total	25	2.2106551			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	10.2527	0.07333	10.101	10.404
Hydragard - LF	10	10.4068	0.09275	10.215	10.598

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	10.2527	0.306764	0.07669	10.089	10.416
Hydragard - LF	10	10.4068	0.269372	0.08518	10.214	10.599

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	0.15405	t Ratio	1.344013
Std Err Dif	0.11462	DF	21.16127
Upper CL Dif	0.39230	Prob > t	0.1932
Lower CL Dif	-0.08420	Prob > t	0.0966
Confidence	0.95	Prob < t	0.9034

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.3067642	0.2088702	0.2055194
Hydragard - LF	10	0.2693719	0.2073065	0.2073065

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0854	1	24	0.7726
Brown-Forsythe	0.0005	1	24	0.9827
Levene	0.0004	1	24	0.9845
Bartlett	0.1775	1	.	0.6735
F Test 2-sided	1.2969	15	9	0.7103

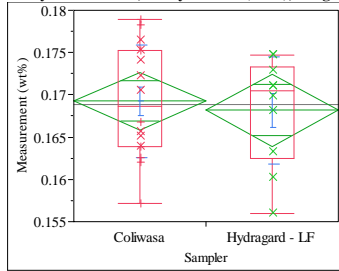
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.8064	1	21.161	0.1932

t Test
1.3440

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=K2O (wt%), Target (wt%)=0.076



**Oneway Anova
Summary of Fit**

Rsquare	0.006963
Adj Rsquare	-0.03441
Root Mean Square Error	0.006556
Mean of Response	0.168829
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00108	t Ratio	-0.41022
Std Err Dif	0.00264	DF	24
Upper CL Dif	0.00437	Prob > t	0.6853
Lower CL Dif	-0.00654	Prob > t	0.6574
Confidence	0.95	Prob < t	0.3426

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000723	7.233e-6	0.1683	0.6853
Error	24	0.00103156	0.000043		
C. Total	25	0.00103879			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.169246	0.00164	0.16586	0.17263
Hydragard - LF	10	0.168162	0.00207	0.16388	0.17244

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.169246	0.006682	0.00167	0.16569	0.17281
Hydragard - LF	10	0.168162	0.006341	0.00201	0.16363	0.17270

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00108	t Ratio	-0.4154
Std Err Dif	0.00261	DF	20.03563
Upper CL Dif	0.00436	Prob > t	0.6823
Lower CL Dif	-0.00653	Prob > t	0.6589
Confidence	0.95	Prob < t	0.3411

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0066816	0.0058724	0.0058724
Hydragard - LF	10	0.0063412	0.0050352	0.0046979

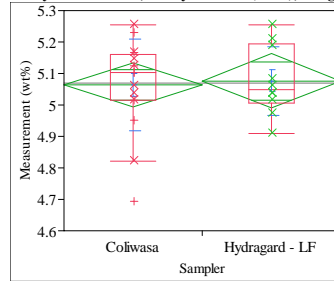
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0576	1	24	0.8124
Brown-Forsythe	0.6421	1	24	0.4308
Levene	0.4575	1	24	0.5053
Bartlett	0.0292	1	.	0.8644
F Test 2-sided	1.1103	15	9	0.9040

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1726	1	20.036	0.6823

t Test
0.4154

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Li2O (wt%), Target (wt%)=4.988



**Oneway Anova
Summary of Fit**

Rsquare	0.002525
Adj Rsquare	-0.03904
Root Mean Square Error	0.132716
Mean of Response	5.068423
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.01319	t Ratio	0.246478
Std Err Dif	0.05350	DF	24
Upper CL Dif	0.12360	Prob > t	0.8074
Lower CL Dif	-0.09723	Prob > t	0.4037
Confidence	0.95	Prob < t	0.5963

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00107006	0.001070	0.0608	0.8074
Error	24	0.42272741	0.017614		
C. Total	25	0.42379747			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	5.06335	0.03318	4.9949	5.1318
Hydragard - LF	10	5.07654	0.04197	4.9899	5.1632

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	5.06335	0.145001	0.03625	4.9861	5.1406
Hydragard - LF	10	5.07654	0.109212	0.03454	4.9984	5.1547

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.01319	t Ratio	0.263371
Std Err Dif	0.05007	DF	23.00287
Upper CL Dif	0.11676	Prob > t	0.7946
Lower CL Dif	-0.09039	Prob > t	0.3973
Confidence	0.95	Prob < t	0.6027

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1450015	0.1057949	0.1009172
Hydragard - LF	10	0.1092124	0.0852548	0.0818102

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5044	1	24	0.4844
Brown-Forsythe	0.2396	1	24	0.6289
Levene	0.3645	1	24	0.5517
Bartlett	0.8157	1	.	0.3664
F Test 2-sided	1.7628	15	9	0.3931

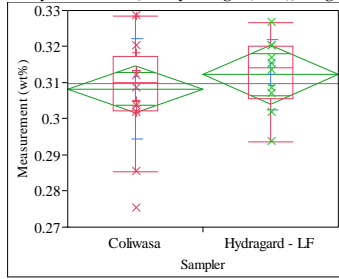
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0694	1	23.003	0.7946

t Test
0.2634

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=MgO (wt%), Target (wt%)=0.286



**Oneway Anova
Summary of Fit**

Rsquare	0.025775
Adj Rsquare	-0.01482
Root Mean Square Error	0.012519
Mean of Response	0.309783
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00402	t Ratio	0.796841
Std Err Dif	0.00505	DF	24
Upper CL Dif	0.01444	Prob > t	0.4334
Lower CL Dif	-0.00639	Prob > t	0.2167
Confidence	0.95	Prob < t	0.7833

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00009952	0.000100	0.6350	0.4334
Error	24	0.00376153	0.000157		
C. Total	25	0.00386105			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.308237	0.00313	0.30178	0.31470
Hydragard - LF	10	0.312258	0.00396	0.30409	0.32043

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.308237	0.013899	0.00347	0.30083	0.31564
Hydragard - LF	10	0.312258	0.009797	0.00310	0.30525	0.31927

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00402	t Ratio	0.863836
Std Err Dif	0.00466	DF	23.53756
Upper CL Dif	0.01364	Prob > t	0.3964
Lower CL Dif	-0.00560	Prob > t	0.1982
Confidence	0.95	Prob < t	0.8018

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0138991	0.0101830	0.0101571
Hydragard - LF	10	0.0097966	0.0076945	0.0074623

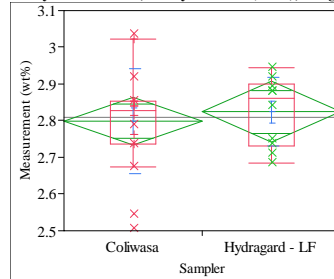
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8007	1	24	0.3798
Brown-Forsythe	0.6503	1	24	0.4279
Levene	0.6055	1	24	0.4441
Bartlett	1.2219	1	.	0.2690
F Test 2-sided	2.0129	15	9	0.2907

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7462	1	23.538	0.3964

t Test
0.8638

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=MnO (wt%), Target (wt%)=2.918



**Oneway Anova
Summary of Fit**

Rsquare	0.009972
Adj Rsquare	-0.03128
Root Mean Square Error	0.127035
Mean of Response	2.80836
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.02518	t Ratio	0.491677
Std Err Dif	0.05121	DF	24
Upper CL Dif	0.13087	Prob > t	0.6274
Lower CL Dif	-0.08051	Prob > t	0.3137
Confidence	0.95	Prob < t	0.6863

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00390124	0.003901	0.2417	0.6274
Error	24	0.38730664	0.016138		
C. Total	25	0.39120788			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.79868	0.03176	2.7331	2.8642
Hydragard - LF	10	2.82385	0.04017	2.7409	2.9068

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.79868	0.143356	0.03584	2.7223	2.8751
Hydragard - LF	10	2.82385	0.093715	0.02964	2.7568	2.8909

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.02518	t Ratio	0.541417
Std Err Dif	0.04650	DF	23.90143
Upper CL Dif	0.12118	Prob > t	0.5932
Lower CL Dif	-0.07082	Prob > t	0.2966
Confidence	0.95	Prob < t	0.7034

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1433562	0.1053135	0.1032960
Hydragard - LF	10	0.0937146	0.0821203	0.0787632

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3789	1	24	0.2518
Brown-Forsythe	0.4908	1	24	0.4903
Levene	0.5579	1	24	0.4624
Bartlett	1.7692	1	.	0.1835
F Test 2-sided	2.3400	15	9	0.1999

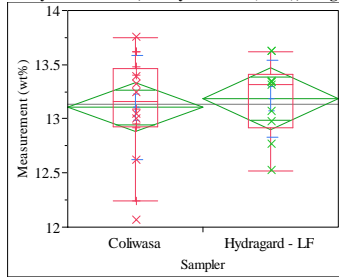
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2931	1	23.901	0.5932

t Test
0.5414

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Na2O (wt%), Target (wt%)=13.318



**Oneway Anova
Summary of Fit**

Rsquare	0.008395
Adj Rsquare	-0.03292
Root Mean Square Error	0.436776
Mean of Response	13.1373
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.07936	t Ratio	0.450749
Std Err Dif	0.17607	DF	24
Upper CL Dif	0.44275	Prob > t	0.6562
Lower CL Dif	-0.28403	Prob > t	0.3281
Confidence	0.95	Prob < t	0.6719

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0387604	0.038760	0.2032	0.6562
Error	24	4.5785638	0.190773		
C. Total	25	4.6173242			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	13.1068	0.10919	12.881	13.332
Hydragard - LF	10	13.1861	0.13812	12.901	13.471

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	13.1068	0.479548	0.11989	12.851	13.362
Hydragard - LF	10	13.1861	0.354193	0.11201	12.933	13.440

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.07936	t Ratio	0.483725
Std Err Dif	0.16407	DF	23.18004
Upper CL Dif	0.41862	Prob > t	0.6331
Lower CL Dif	-0.25989	Prob > t	0.3166
Confidence	0.95	Prob < t	0.6834

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4795476	0.3681725	0.3681725
Hydragard - LF	10	0.3541933	0.2852368	0.2615120

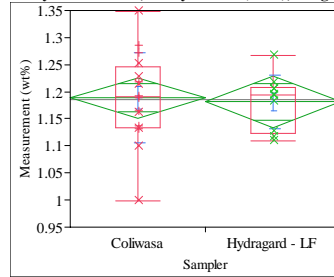
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8300	1	24	0.3713
Brown-Forsythe	0.8610	1	24	0.3627
Levene	0.6365	1	24	0.4328
Bartlett	0.9277	1	.	0.3355
F Test 2-sided	1.8331	15	9	0.3607

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2340	1	23.18	0.6331

t Test
0.4837

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=NiO (wt%), Target (wt%)=1.033



**Oneway Anova
Summary of Fit**

Rsquare	0.002731
Adj Rsquare	-0.03882
Root Mean Square Error	0.072496
Mean of Response	1.185872
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00749	t Ratio	-0.25636
Std Err Dif	0.02922	DF	24
Upper CL Dif	0.05282	Prob > t	0.7999
Lower CL Dif	-0.06781	Prob > t	0.6001
Confidence	0.95	Prob < t	0.3999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00034540	0.000345	0.0657	0.7999
Error	24	0.12613446	0.005256		
C. Total	25	0.12647986			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.18875	0.01812	1.1513	1.2262
Hydragard - LF	10	1.18126	0.02293	1.1339	1.2286

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.18875	0.083217	0.02080	1.1444	1.2331
Hydragard - LF	10	1.18126	0.049731	0.01573	1.1457	1.2168

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00749	t Ratio	-0.28727
Std Err Dif	0.02608	DF	23.98677
Upper CL Dif	0.04633	Prob > t	0.7764
Lower CL Dif	-0.06132	Prob > t	0.6118
Confidence	0.95	Prob < t	0.3882

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0832170	0.0622730	0.0622730
Hydragard - LF	10	0.0497309	0.0384041	0.0360118

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.4704	1	24	0.2371
Brown-Forsythe	1.9332	1	24	0.1772
Levene	1.7054	1	24	0.2040
Bartlett	2.5315	1	.	0.1116
F Test 2-sided	2.8001	15	9	0.1227

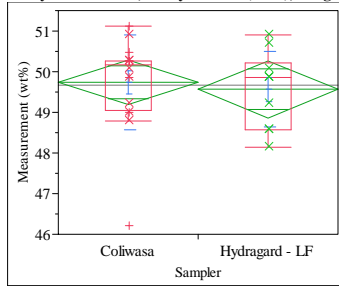
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0825	1	23.987	0.7764

t Test
0.2873

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=SiO2 (wt%), Target (wt%)=50.183



**Oneway Anova
Summary of Fit**

Rsquare	0.006393
Adj Rsquare	-0.03501
Root Mean Square Error	1.080382
Mean of Response	49.6729
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.1711	t Ratio	-0.39297
Std Err Dif	0.4355	DF	24
Upper CL Dif	0.7277	Prob > t	0.6978
Lower CL Dif	-1.0700	Prob > t	0.6511
Confidence	0.95	Prob < t	0.3489

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.180248	0.18025	0.1544	0.6978
Error	24	28.013396	1.16722		
C. Total	25	28.193644			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	49.7387	0.27010	49.181	50.296
Hydragard - LF	10	49.5676	0.34165	48.862	50.273

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	49.7387	1.16128	0.29032	49.120	50.358
Hydragard - LF	10	49.5676	0.93004	0.29411	48.902	50.233

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.1711	t Ratio	-0.41413
Std Err Dif	0.4133	DF	22.3515
Upper CL Dif	0.6851	Prob > t	0.6827
Lower CL Dif	-1.0274	Prob > t	0.6586
Confidence	0.95	Prob < t	0.3414

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.161281	0.8156081	0.7487550
Hydragard - LF	10	0.930042	0.7615908	0.7059690

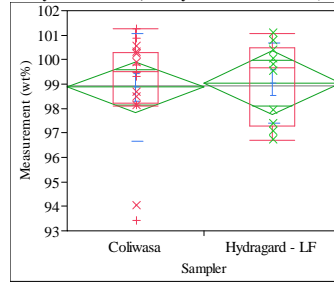
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1970	1	24	0.6611
Brown-Forsythe	0.0152	1	24	0.9028
Levene	0.0372	1	24	0.8486
Bartlett	0.5078	1	.	0.4761
F Test 2-sided	1.5591	15	9	0.5073

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1715	1	22.351	0.6827

t Test
0.4141

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Sum of Oxides (wt%), Target (wt%)=99.73



**Oneway Anova
Summary of Fit**

Rsquare	0.002171
Adj Rsquare	-0.03941
Root Mean Square Error	2.018312
Mean of Response	98.93749
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.1859	t Ratio	0.228502
Std Err Dif	0.8136	DF	24
Upper CL Dif	1.8651	Prob > t	0.8212
Lower CL Dif	-1.4933	Prob > t	0.4106
Confidence	0.95	Prob < t	0.5894

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.212695	0.21270	0.0522	0.8212
Error	24	97.765968	4.07358		
C. Total	25	97.978663			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	98.8660	0.50458	97.825	99.91
Hydragard - LF	10	99.0519	0.63825	97.735	100.37

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	98.8660	2.21670	0.55417	97.685	100.05
Hydragard - LF	10	99.0519	1.63502	0.51704	97.882	100.22

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.1859	t Ratio	0.245292
Std Err Dif	0.7579	DF	23.1918
Upper CL Dif	1.7531	Prob > t	0.8084
Lower CL Dif	-1.3812	Prob > t	0.4042
Confidence	0.95	Prob < t	0.5958

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	2.216699	1.550510	1.418562
Hydragard - LF	10	1.635021	1.437241	1.345209

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5065	1	24	0.4835
Brown-Forsythe	0.0139	1	24	0.9072
Levene	0.0490	1	24	0.8266
Bartlett	0.9357	1	.	0.3334
F Test 2-sided	1.8381	15	9	0.3585

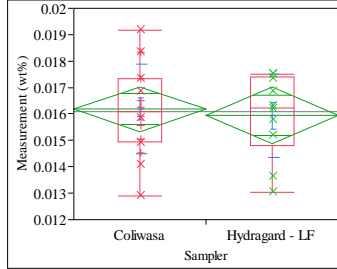
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0602	1	23.192	0.8084

t Test
0.2453

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=TiO2 (wt%), Target (wt%)=0.013



**Oneway Anova
Summary of Fit**

Rsquare	0.006012
Adj Rsquare	-0.0354
Root Mean Square Error	0.001648
Mean of Response	0.016089
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	-0.00025	t Ratio	-0.38101
Std Err Dif	0.00066	DF	24
Upper CL Dif	0.00112	Prob > t	0.7065
Lower CL Dif	-0.00162	Prob > t	0.6467
Confidence	0.95	Prob < t	0.3533

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000039	3.9427e-7	0.1452	0.7065
Error	24	0.00006518	2.7159e-6		
C. Total	25	0.00006558			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.016186	0.00041	0.01534	0.01704
Hydragard - LF	10	0.015933	0.00052	0.01486	0.01701

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.016186	0.001693	0.00042	0.01528	0.01709
Hydragard - LF	10	0.015933	0.001571	0.00050	0.01481	0.01706

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	-0.00025	t Ratio	-0.38789
Std Err Dif	0.00065	DF	20.36477
Upper CL Dif	0.00111	Prob > t	0.7021
Lower CL Dif	-0.00161	Prob > t	0.6489
Confidence	0.95	Prob < t	0.3511

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0016925	0.0013344	0.0013344
Hydragard - LF	10	0.0015709	0.0012203	0.0011709

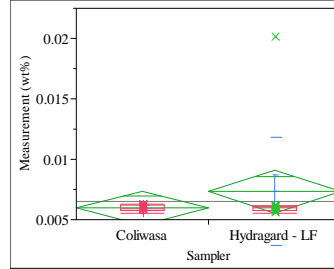
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0809	1	24	0.7786
Brown-Forsythe	0.1640	1	24	0.6891
Levene	0.0882	1	24	0.7691
Bartlett	0.0590	1	.	0.8080
F Test 2-sided	1.1608	15	9	0.8470

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1505	1	20.365	0.7021

t Test
0.3879

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=ZnO (wt%), Target (wt%)=0



**Oneway Anova
Summary of Fit**

Rsquare	0.058539
Adj Rsquare	0.019311
Root Mean Square Error	0.002747
Mean of Response	0.006484
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwas
Assuming equal variances

Difference	0.00135	t Ratio	1.221591
Std Err Dif	0.00111	DF	24
Upper CL Dif	0.00364	Prob > t	0.2337
Lower CL Dif	-0.00093	Prob > t	0.1169
Confidence	0.95	Prob < t	0.8831

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001126	0.000011	1.4923	0.2337
Error	24	0.00018112	7.547e-6		
C. Total	25	0.00019238			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.005964	0.00069	0.00455	0.00738
Hydragard - LF	10	0.007317	0.00087	0.00552	0.00911

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.005964	0.000235	5.88e-5	0.00584	0.00609
Hydragard - LF	10	0.007317	0.004476	0.00142	0.00412	0.01052

t Test

Hydragard - LF-Coliwas
Assuming unequal variances

Difference	0.00135	t Ratio	0.954973
Std Err Dif	0.00142	DF	9.031087
Upper CL Dif	0.00456	Prob > t	0.3645
Lower CL Dif	-0.00185	Prob > t	0.1822
Confidence	0.95	Prob < t	0.8178

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0002352	0.0002062	0.0002062
Hydragard - LF	10	0.0044757	0.0025449	0.0015548

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8383	1	24	0.1878
Brown-Forsythe	1.5493	1	24	0.2253
Levene	6.9834	1	24	0.0143
Bartlett	62.1266	1	.	<.0001
F Test 2-sided	362.0079	9	15	<.0001

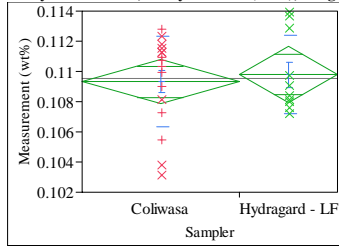
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9120	1	9.0311	0.3645

t Test
0.9550

Exhibit B2. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=ZrO2 (wt%), Target (wt%)=0.111



**Oneway Anova
Summary of Fit**

Rsquare	0.006911
Adj Rsquare	-0.03447
Root Mean Square Error	0.00286
Mean of Response	0.109503
Observations (or Sum Wgts)	26

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00047	t Ratio	0.408684
Std Err Dif	0.00115	DF	24
Upper CL Dif	0.00285	Prob > t	0.6864
Lower CL Dif	-0.00191	Prob > t	0.3432
Confidence	0.95	Prob < t	0.6568

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000137	1.3657e-6	0.1670	0.6864
Error	24	0.00019624	8.1768e-6		
C. Total	25	0.00019761			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.109322	0.00071	0.10785	0.11080
Hydragard - LF	10	0.109793	0.00090	0.10793	0.11166

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.109322	0.002995	0.00075	0.10773	0.11092
Hydragard - LF	10	0.109793	0.002618	0.00083	0.10792	0.11167

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00047	t Ratio	0.422047
Std Err Dif	0.00112	DF	21.22808
Upper CL Dif	0.00279	Prob > t	0.6772
Lower CL Dif	-0.00185	Prob > t	0.3386
Confidence	0.95	Prob < t	0.6614

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0029953	0.0024124	0.0022035
Hydragard - LF	10	0.0026176	0.0021775	0.0019992

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2424	1	24	0.6270
Brown-Forsythe	0.0532	1	24	0.8195
Levene	0.1463	1	24	0.7054
Bartlett	0.1907	1	.	0.6624
F Test 2-sided	1.3094	15	9	0.6989

Welch Anova testing Means Equal, allowing Std Devs Not Equal

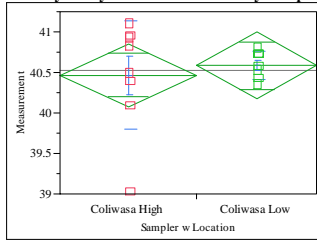
F Ratio	DFNum	DFDen	Prob > F
0.1781	1	21.228	0.6772

t Test

0.4220

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler w Location Analyte=wt% dried solids



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.015447
Adj Rsquare	-0.06029
Root Mean Square Error	0.505761
Mean of Response	40.52267
Observations (or Sum Wgts)	15

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	0.11821	t Ratio	0.45162
Std Err Dif	0.26176	DF	13
Upper CL Dif	0.68370	Prob > t	0.6590
Lower CL Dif	-0.44728	Prob > t	0.3295
Confidence	0.95	Prob < t	0.6705

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.0521719	0.052172	0.2040	0.6590
Error	13	3.3253214	0.255794		
C. Total	14	3.3774933			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	40.4675	0.17881	40.081	40.854
Coliwasa Low	7	40.5857	0.19116	40.173	40.999

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	40.4675	0.670645	0.23711	39.907	41.028
Coliwasa Low	7	40.5857	0.171742	0.06491	40.427	40.745

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	0.11821	t Ratio	0.480871
Std Err Dif	0.24583	DF	8.035927
Upper CL Dif	0.68467	Prob > t	0.6434
Lower CL Dif	-0.44824	Prob > t	0.3217
Confidence	0.95	Prob < t	0.6783

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.6706447	0.4731250	0.4725000
Coliwasa Low	7	0.1717418	0.1408163	0.1500000

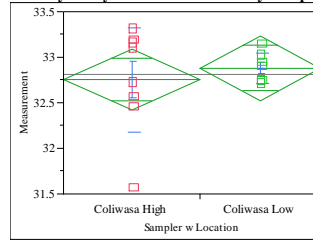
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6892	1	13	0.2163
Brown-Forsythe	3.1064	1	13	0.1015
Levene	3.8399	1	13	0.0718
Bartlett	8.3621	1	.	0.0038
F Test 2-sided	15.2487	7	6	0.0039

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2312	1	8.0359	0.6434

t Test
0.4809

Oneway Analysis of Measurement By Sampler w Location Analyte=wt% vitrified solids



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.023703
Adj Rsquare	-0.0514
Root Mean Square Error	0.434209
Mean of Response	32.81267
Observations (or Sum Wgts)	15

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	0.12625	t Ratio	0.561799
Std Err Dif	0.22472	DF	13
Upper CL Dif	0.61174	Prob > t	0.5838
Lower CL Dif	-0.35924	Prob > t	0.2919
Confidence	0.95	Prob < t	0.7081

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.0595058	0.059506	0.3156	0.5838
Error	13	2.4509875	0.188537		
C. Total	14	2.5104933			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	32.7538	0.15352	32.422	33.085
Coliwasa Low	7	32.8800	0.16412	32.525	33.235

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	32.7538	0.571713	0.20213	32.276	33.232
Coliwasa Low	7	32.8800	0.164823	0.06230	32.728	33.032

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	0.12625	t Ratio	0.596889
Std Err Dif	0.21151	DF	8.305574
Upper CL Dif	0.61089	Prob > t	0.5665
Lower CL Dif	-0.35839	Prob > t	0.2832
Confidence	0.95	Prob < t	0.7168

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.5717127	0.4287500	0.4287500
Coliwasa Low	7	0.1648231	0.1342857	0.1371429

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9152	1	13	0.1897
Brown-Forsythe	4.0294	1	13	0.0660
Levene	4.9269	1	13	0.0448
Bartlett	7.2130	1	.	0.0072
F Test 2-sided	12.0315	7	6	0.0075

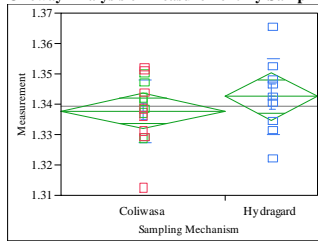
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3563	1	8.3056	0.5665

t Test
0.5969

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Hydragard at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=density (g/mL)



Oneway Anova
Summary of Fit

Rsquare	0.043399
Adj Rsquare	0.001807
Root Mean Square Error	0.011216
Mean of Response	1.339456
Observations (or Sum Wgts)	25

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	0.00477	t Ratio	1.021497
Std Err Dif	0.00467	DF	23
Upper CL Dif	0.01444	Prob > t	0.3176
Lower CL Dif	-0.00489	Prob > t	0.1588
Confidence	0.95	Prob < t	0.8412

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.00013126	0.000131	1.0435	0.3176
Error	23	0.00289315	0.000126		
C. Total	24	0.00302440			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.33774	0.00280	1.3319	1.3435
Hydragard	9	1.34251	0.00374	1.3348	1.3502

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.33774	0.010390	0.00260	1.3322	1.3433
Hydragard	9	1.34251	0.012619	0.00421	1.3328	1.3522

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	0.00477	t Ratio	0.965613
Std Err Dif	0.00494	DF	14.16651
Upper CL Dif	0.01536	Prob > t	0.3504
Lower CL Dif	-0.00582	Prob > t	0.1752
Confidence	0.95	Prob < t	0.8248

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0103901	0.0078078	0.0077750
Hydragard	9	0.0126186	0.0093457	0.0095222

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3837	1	23	0.5417
Brown-Forsythe	0.3620	1	23	0.5533
Levene	0.2769	1	23	0.6038
Bartlett	0.3884	1	.	0.5332
F Test 2-sided	1.4750	8	15	0.4917

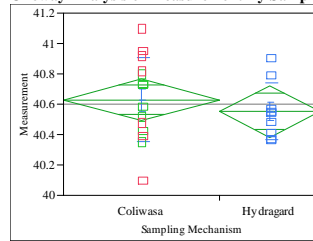
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9324	1	14.167	0.3504

t Test

0.9656

Hydragard at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.025096
Adj Rsquare	-0.02133
Root Mean Square Error	0.245323
Mean of Response	40.59913
Observations (or Sum Wgts)	23

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.07706	t Ratio	-0.73525
Std Err Dif	0.10481	DF	21
Upper CL Dif	0.14091	Prob > t	0.4703
Lower CL Dif	-0.29503	Prob > t	0.7648
Confidence	0.95	Prob < t	0.2352

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.0325342	0.032534	0.5406	0.4703
Error	21	1.2638484	0.060183		
C. Total	22	1.2963826			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.06557	40.493	40.766
Hydragard	9	40.5522	0.08177	40.382	40.722

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.276001	0.07376	40.470	40.789
Hydragard	9	40.5522	0.184917	0.06164	40.410	40.694

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.07706	t Ratio	-0.80168
Std Err Dif	0.09613	DF	20.91904
Upper CL Dif	0.12289	Prob > t	0.4318
Lower CL Dif	-0.27702	Prob > t	0.7841
Confidence	0.95	Prob < t	0.2159

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2760007	0.2292857	0.2292857
Hydragard	9	0.1849174	0.1340741	0.1333333

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5243	1	21	0.2306
Brown-Forsythe	2.7981	1	21	0.1092
Levene	2.8490	1	21	0.1062
Bartlett	1.3877	1	.	0.2388
F Test 2-sided	2.2277	13	8	0.2591

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6427	1	20.919	0.4318

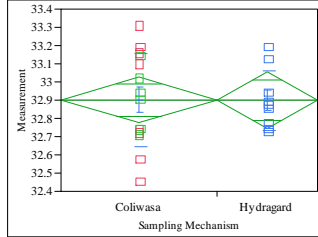
t Test

0.8017

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Hydragard at Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.000033
Adj Rsquare	-0.04758
Root Mean Square Error	0.225564
Mean of Response	32.90043
Observations (or Sum Wgts)	23

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.00254	t Ratio	-0.02635
Std Err Dif	0.09637	DF	21
Upper CL Dif	0.19788	Prob > t	0.9792
Lower CL Dif	-0.20295	Prob > t	0.5104
Confidence	0.95	Prob < t	0.4896

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.0000353	0.000035	0.0007	0.9792
Error	21	1.0684603	0.050879		
C. Total	22	1.0684957			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.06028	32.776	33.027
Hydragard	9	32.8989	0.07519	32.743	33.055

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.256601	0.06858	32.753	33.050
Hydragard	9	32.8989	0.162976	0.05433	32.774	33.024

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.00254	t Ratio	-0.02903
Std Err Dif	0.08749	DF	20.99811
Upper CL Dif	0.17941	Prob > t	0.9771
Lower CL Dif	-0.18448	Prob > t	0.5114
Confidence	0.95	Prob < t	0.4886

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2566008	0.2157143	0.2157143
Hydragard	9	0.1629758	0.1229630	0.1200000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.6157	1	21	0.1207
Brown-Forsythe	3.5115	1	21	0.0749
Levene	3.5230	1	21	0.0745
Bartlett	1.7577	1	.	0.1849
F Test 2-sided	2.4790	13	8	0.2017

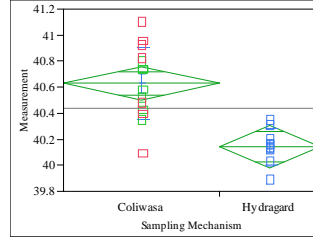
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0008	1	20.998	0.9771

t Test
0.0290

Hydragard at High Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.533502
Adj Rsquare	0.511288
Root Mean Square Error	0.233155
Mean of Response	40.43826
Observations (or Sum Wgts)	23

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.48817	t Ratio	-4.90064
Std Err Dif	0.09961	DF	21
Upper CL Dif	-0.28101	Prob > t	<.0001
Lower CL Dif	-0.69533	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.3055487	1.30555	24.0163	<.0001
Error	21	1.1415817	0.05436		
C. Total	22	2.4471304			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.06231	40.500	40.759
Hydragard	9	40.1411	0.07772	39.979	40.303

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.276001	0.07376	40.470	40.789
Hydragard	9	40.1411	0.137518	0.04584	40.035	40.247

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.48817	t Ratio	-5.62109
Std Err Dif	0.08685	DF	20.10663
Upper CL Dif	-0.30708	Prob > t	<.0001
Lower CL Dif	-0.66927	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2760007	0.2292857	0.2292857
Hydragard	9	0.1375177	0.0943210	0.0933333

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.1035	1	21	0.0927
Brown-Forsythe	6.3070	1	21	0.0203
Levene	6.4379	1	21	0.0192
Bartlett	3.8623	1	.	0.0494
F Test 2-sided	4.0281	13	8	0.0550

Welch Anova testing Means Equal, allowing Std Devs Not Equal

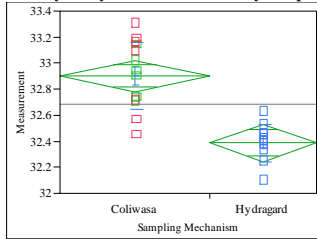
F Ratio	DFNum	DFDen	Prob > F
31.5966	1	20.107	<.0001

t Test
5.6211

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Hydragard at High Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.596659
Adj Rsquare	0.578325
Root Mean Square Error	0.218217
Mean of Response	32.68667
Observations (or Sum Wgts)	24

t Test

Hydragard-Coliwasa
Assuming equal variances

Difference	-0.51543	t Ratio	-5.70477
Std Err Dif	0.09035	DF	22
Upper CL Dif	-0.32805	Prob > t	<.0001
Lower CL Dif	-0.70280	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.5497219	1.54972	32.5444	<.0001
Error	22	1.0476114	0.04762		
C. Total	23	2.5973333			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.05832	32.780	33.022
Hydragard	10	32.3860	0.06901	32.243	32.529

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.256601	0.06858	32.753	33.050
Hydragard	10	32.3860	0.145922	0.04614	32.282	32.490

t Test

Hydragard-Coliwasa
Assuming unequal variances

Difference	-0.51543	t Ratio	-6.23562
Std Err Dif	0.08266	DF	21.16854
Upper CL Dif	-0.34361	Prob > t	<.0001
Lower CL Dif	-0.68724	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2566008	0.2157143	0.2157143
Hydragard	10	0.1459224	0.1028000	0.1000000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.6753	1	22	0.0683
Brown-Forsythe	5.6415	1	22	0.0267
Levene	5.6328	1	22	0.0268
Bartlett	2.8932	1	.	0.0890
F Test 2-sided	3.0922	13	9	0.0959

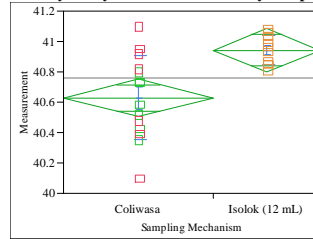
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
38.8829	1	21.169	<.0001

t Test
6.2356

Isolok at Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.346459
Adj Rsquare	0.316752
Root Mean Square Error	0.221159
Mean of Response	40.75958
Observations (or Sum Wgts)	24

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	0.312714	t Ratio	3.415078
Std Err Dif	0.091569	DF	22
Upper CL Dif	0.502616	Prob > t	0.0025
Lower CL Dif	0.122812	Prob > t	0.0012
Confidence	0.95	Prob < t	0.9988

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.5704430	0.570443	11.6628	0.0025
Error	22	1.0760529	0.048911		
C. Total	23	1.6464958			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.05911	40.507	40.752
Isolok (12 mL)	10	40.9420	0.06994	40.797	41.087

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.276001	0.07376	40.470	40.789
Isolok (12 mL)	10	40.9420	0.097616	0.03087	40.872	41.012

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	0.312714	t Ratio	3.910744
Std Err Dif	0.079963	DF	17.19044
Upper CL Dif	0.481279	Prob > t	0.0011
Lower CL Dif	0.144150	Prob > t	0.0006
Confidence	0.95	Prob < t	0.9994

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2760007	0.2292857	0.2292857
Isolok (12 mL)	10	0.0976160	0.0820000	0.0820000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.9301	1	22	0.0370
Brown-Forsythe	9.8668	1	22	0.0047
Levene	10.2049	1	22	0.0042
Bartlett	8.5551	1	.	0.0034
F Test 2-sided	7.9943	13	9	0.0038

Welch Anova testing Means Equal, allowing Std Devs Not Equal

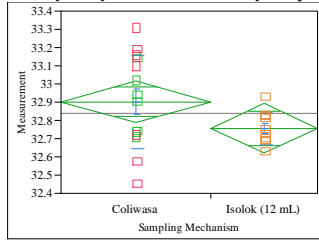
F Ratio	DFNum	DFDen	Prob > F
15.2939	1	17.19	0.0011

t Test
3.9107

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Isolok at Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.115946
Adj Rsquare	0.075762
Root Mean Square Error	0.205358
Mean of Response	32.84125
Observations (or Sum Wgts)	24

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	-0.14443	t Ratio	-1.69863
Std Err Dif	0.08503	DF	22
Upper CL Dif	0.03191	Prob > t	0.1035
Lower CL Dif	-0.32076	Prob > t	0.9483
Confidence	0.95	Prob < t	0.0517

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.1216811	0.121681	2.8854	0.1035
Error	22	0.9277814	0.042172		
C. Total	23	1.0494625			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.05488	32.788	33.015
Isolok (12 mL)	10	32.7570	0.06494	32.622	32.892

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.256601	0.06858	32.753	33.050
Isolok (12 mL)	10	32.7570	0.089325	0.02825	32.693	32.821

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	-0.14443	t Ratio	-1.94729
Std Err Dif	0.07417	DF	17.0752
Upper CL Dif	0.01200	Prob > t	0.0681
Lower CL Dif	-0.30086	Prob > t	0.9659
Confidence	0.95	Prob < t	0.0341

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2566008	0.2157143	0.2157143
Isolok (12 mL)	10	0.0893246	0.0724000	0.0710000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	7.2266	1	22	0.0134
Brown-Forsythe	11.4082	1	22	0.0027
Levene	11.7720	1	22	0.0024
Bartlett	8.7756	1	.	0.0031
F Test 2-sided	8.2523	13	9	0.0034

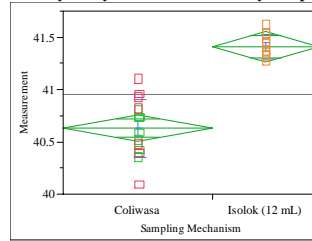
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.7919	1	17.075	0.0681

t Test
1.9473

Isolok at High Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.762506
Adj Rsquare	0.75171
Root Mean Square Error	0.224072
Mean of Response	40.95417
Observations (or Sum Wgts)	24

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	0.779714	t Ratio	8.404388
Std Err Dif	0.092775	DF	22
Upper CL Dif	0.972117	Prob > t	<.0001
Lower CL Dif	0.587311	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	3.5464005	3.54640	70.6337	<.0001
Error	22	1.1045829	0.05021		
C. Total	23	4.6509833			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.05989	40.505	40.753
Isolok (12 mL)	10	41.4090	0.07086	41.262	41.556

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.276001	0.07376	40.470	40.789
Isolok (12 mL)	10	41.4090	0.112689	0.03564	41.328	41.490

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	0.779714	t Ratio	9.517875
Std Err Dif	0.081921	DF	18.33367
Upper CL Dif	0.951600	Prob > t	<.0001
Lower CL Dif	0.607829	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2760007	0.2292857	0.2292857
Isolok (12 mL)	10	0.1126893	0.0930000	0.0930000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.4361	1	22	0.0468
Brown-Forsythe	8.0814	1	22	0.0095
Levene	8.4500	1	22	0.0082
Bartlett	6.6372	1	.	0.0100
F Test 2-sided	5.9987	13	9	0.0110

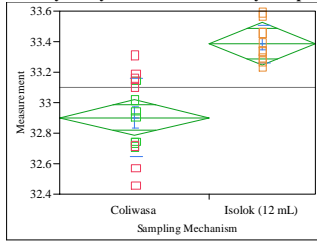
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
90.5899	1	18.334	<.0001

t Test
9.5179

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Isolok at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.579497
Adj Rsquare	0.560383
Root Mean Square Error	0.212113
Mean of Response	33.10292
Observations (or Sum Wgts)	24

t Test

Isolok (12 mL)-Coliwasa
Assuming equal variances

Difference	0.483571	t Ratio	5.5062
Std Err Dif	0.087823	DF	22
Upper CL Dif	0.665705	Prob > t	<.0001
Lower CL Dif	0.301437	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.3640744	1.36407	30.3182	<.0001
Error	22	0.9898214	0.04499		
C. Total	23	2.3538958			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.05669	32.784	33.019
Isolok (12 mL)	10	33.3850	0.06708	33.246	33.524

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.256601	0.06858	32.753	33.050
Isolok (12 mL)	10	33.3850	0.121952	0.03856	33.298	33.472

t Test

Isolok (12 mL)-Coliwasa
Assuming unequal variances

Difference	0.483571	t Ratio	6.146142
Std Err Dif	0.078679	DF	19.67923
Upper CL Dif	0.647864	Prob > t	<.0001
Lower CL Dif	0.319279	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2566008	0.2157143	0.2157143
Isolok (12 mL)	10	0.1219517	0.1000000	0.0990000

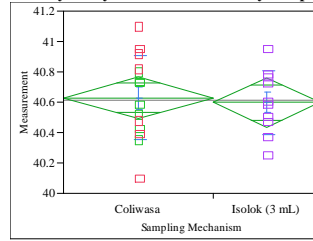
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.4986	1	22	0.0285
Brown-Forsythe	6.8777	1	22	0.0155
Levene	7.2090	1	22	0.0135
Bartlett	4.7850	1	.	0.0287
F Test 2-sided	4.4273	13	9	0.0313

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
37.7751	1	19.679	<.0001

t Test
6.1461

Isolok at Low Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



Oneway Anova
Summary of Fit

Rsquare	0.004097
Adj Rsquare	-0.04117
Root Mean Square Error	0.251166
Mean of Response	40.61625
Observations (or Sum Wgts)	24

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	-0.03129	t Ratio	-0.30085
Std Err Dif	0.10399	DF	22
Upper CL Dif	0.18438	Prob > t	0.7664
Lower CL Dif	-0.24695	Prob > t	0.6168
Confidence	0.95	Prob < t	0.3832

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.0057096	0.005710	0.0905	0.7664
Error	22	1.3878529	0.063084		
C. Total	23	1.3935625			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.06713	40.490	40.768
Isolok (3 mL)	10	40.5980	0.07943	40.433	40.763

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.276001	0.07376	40.470	40.789
Isolok (3 mL)	10	40.5980	0.210175	0.06646	40.448	40.748

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	-0.03129	t Ratio	-0.31509
Std Err Dif	0.09929	DF	21.86256
Upper CL Dif	0.17470	Prob > t	0.7557
Lower CL Dif	-0.23728	Prob > t	0.6222
Confidence	0.95	Prob < t	0.3778

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2760007	0.2292857	0.2292857
Isolok (3 mL)	10	0.2101745	0.1640000	0.1640000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9266	1	22	0.3462
Brown-Forsythe	1.3926	1	22	0.2506
Levene	1.4286	1	22	0.2447
Bartlett	0.7213	1	.	0.3957
F Test 2-sided	1.7245	13	9	0.4167

Welch Anova testing Means Equal, allowing Std Devs Not Equal

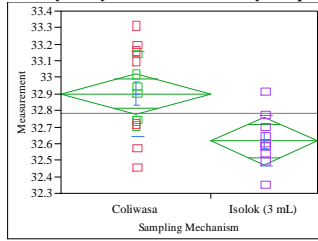
F Ratio	DFNum	DFDen	Prob > F
0.0993	1	21.863	0.7557

t Test
0.3151

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Isolok at Low Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.307747
Adj Rsquare	0.276281
Root Mean Square Error	0.220435
Mean of Response	32.7825
Observations (or Sum Wgts)	24

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	-0.28543	t Ratio	-3.12735
Std Err Dif	0.09127	DF	22
Upper CL Dif	-0.09615	Prob > t	0.0049
Lower CL Dif	-0.47471	Prob > t	0.9975
Confidence	0.95	Prob < t	0.0025

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	0.4752386	0.475239	9.7803	0.0049
Error	22	1.0690114	0.048591		
C. Total	23	1.5442500			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.05891	32.779	33.024
Isolok (3 mL)	10	32.6160	0.06971	32.471	32.761

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.256601	0.06858	32.753	33.050
Isolok (3 mL)	10	32.6160	0.153854	0.04865	32.506	32.726

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	-0.28543	t Ratio	-3.39453
Std Err Dif	0.08408	DF	21.50891
Upper CL Dif	-0.11082	Prob > t	0.0027
Lower CL Dif	-0.46004	Prob > t	0.9987
Confidence	0.95	Prob < t	0.0013

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2566008	0.2157143	0.2157143
Isolok (3 mL)	10	0.1538542	0.1112000	0.1080000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.2264	1	22	0.0862
Brown-Forsythe	4.7647	1	22	0.0400
Levene	4.7697	1	22	0.0399
Bartlett	2.4083	1	.	0.1207
F Test 2-sided	2.7816	13	9	0.1296

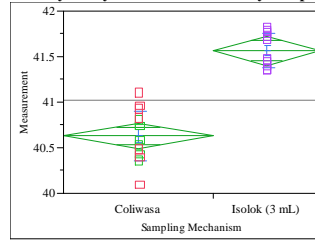
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	11.5229	DFNum	1	DFDen	21.509	Prob > F	0.0027
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t Test
3.3945

Isolok at High Flow Rate

Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.795259
Adj Rsquare	0.785953
Root Mean Square Error	0.244739
Mean of Response	41.01958
Observations (or Sum Wgts)	24

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	0.93671	t Ratio	9.244069
Std Err Dif	0.10133	DF	22
Upper CL Dif	1.14686	Prob > t	<.0001
Lower CL Dif	0.72657	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	5.1183630	5.11836	85.4528	<.0001
Error	22	1.3177329	0.05990		
C. Total	23	6.4360958			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.06541	40.494	40.765
Isolok (3 mL)	10	41.5660	0.07739	41.405	41.727

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	40.6293	0.276001	0.07376	40.470	40.789
Isolok (3 mL)	10	41.5660	0.190741	0.06032	41.430	41.702

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	0.93671	t Ratio	9.830571
Std Err Dif	0.09529	DF	21.99361
Upper CL Dif	1.13433	Prob > t	<.0001
Lower CL Dif	0.73910	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2760007	0.2292857	0.2292857
Isolok (3 mL)	10	0.1907412	0.1760000	0.1760000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7229	1	22	0.2028
Brown-Forsythe	1.2957	1	22	0.2672
Levene	1.3398	1	22	0.2595
Bartlett	1.2996	1	.	0.2543
F Test 2-sided	2.0938	13	9	0.2700

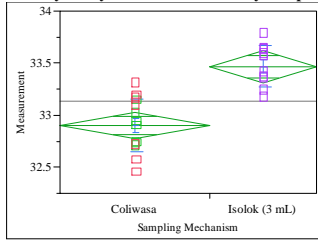
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	96.6401	DFNum	1	DFDen	21.994	Prob > F	<.0001
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t Test
9.8306

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Isolok at High Flow Rate
Oneway Analysis of Measurement By Sampling Mechanism Analyte=wt% vitrified solids



Oneway Anova
Summary of Fit

Rsquare	0.608623
Adj Rsquare	0.590833
Root Mean Square Error	0.233951
Mean of Response	33.1375
Observations (or Sum Wgts)	24

t Test

Isolok (3 mL)-Coliwasa
Assuming equal variances

Difference	0.566571	t Ratio	5.849079
Std Err Dif	0.096865	DF	22
Upper CL Dif	0.767457	Prob > t	<.0001
Lower CL Dif	0.365686	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Mechanism	1	1.8725186	1.87252	34.2117	<.0001
Error	22	1.2041314	0.05473		
C. Total	23	3.0766500			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.06253	32.772	33.031
Isolok (3 mL)	10	33.4680	0.07398	33.315	33.621

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	32.9014	0.256601	0.06858	32.753	33.050
Isolok (3 mL)	10	33.4680	0.196684	0.06220	33.327	33.609

t Test

Isolok (3 mL)-Coliwasa
Assuming unequal variances

Difference	0.566571	t Ratio	6.119615
Std Err Dif	0.092583	DF	21.83897
Upper CL Dif	0.758659	Prob > t	<.0001
Lower CL Dif	0.374484	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2566008	0.2157143	0.2157143
Isolok (3 mL)	10	0.1966836	0.1660000	0.1660000

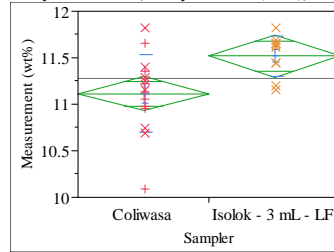
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2750	1	22	0.2710
Brown-Forsythe	1.1136	1	22	0.3028
Levene	1.1446	1	22	0.2963
Bartlett	0.6880	1	.	0.4068
F Test 2-sided	1.7021	13	9	0.4282

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
37.4497	1	21.839	<.0001

t Test	6.1196
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Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Al2O3 (wt%), Target (wt%)=10.869



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.256497
Adj Rsquare	0.224171
Root Mean Square Error	0.350524
Mean of Response	11.27654
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.403093	t Ratio	2.81685
Std Err Dif	0.143101	DF	23
Upper CL Dif	0.699120	Prob > t	0.0098
Lower CL Dif	0.107067	Prob > t	0.0049
Confidence	0.95	Prob < t	0.9951

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.9749054	0.974905	7.9346	0.0098
Error	23	2.8259404	0.122867		
C. Total	24	3.8008458			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	11.1153	0.09050	10.928	11.303
Isolok - 3 mL - LF	10	11.5184	0.11085	11.289	11.748

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	11.1153	0.414613	0.10705	10.886	11.345
Isolok - 3 mL - LF	10	11.5184	0.215841	0.06825	11.364	11.673

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.403093	t Ratio	3.174949
Std Err Dif	0.126961	DF	22.03227
Upper CL Dif	0.666371	Prob > t	0.0044
Lower CL Dif	0.139816	Prob > t	0.0022
Confidence	0.95	Prob < t	0.9978

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.4146130	0.2937543	0.2909830
Isolok - 3 mL - LF	10	0.2158409	0.1753456	0.1587180

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5447	1	23	0.2264
Brown-Forsythe	1.7169	1	23	0.2030
Levene	1.5806	1	23	0.2213
Bartlett	3.8479	1	.	0.0498
F Test 2-sided	3.6899	14	9	0.0548

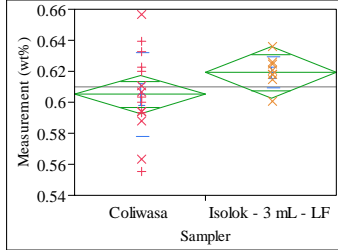
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.0803	1	22.032	0.0044

t Test	3.1749
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Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=CaO (wt%), Target (wt%)=1.1462



Excluded Rows

3

**Oneway Anova
Summary of Fit**

Rsquare	0.087742
Adj Rsquare	0.044301
Root Mean Square Error	0.022713
Mean of Response	0.60993
Observations (or Sum Wgts)	23

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.01413	t Ratio	1.421196
Std Err Dif	0.00994	DF	21
Upper CL Dif	0.03481	Prob > t	0.1699
Lower CL Dif	-0.00655	Prob > t	0.0850
Confidence	0.95	Prob < t	0.9150

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00104197	0.001042	2.0198	0.1699
Error	21	0.01083346	0.000516		
C. Total	22	0.01187544			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.605014	0.00586	0.59282	0.61721
Isolok - 3 mL - LF	8	0.619146	0.00803	0.60245	0.63585

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.605014	0.026887	0.00694	0.59012	0.61990
Isolok - 3 mL - LF	8	0.619146	0.010090	0.00357	0.61071	0.62758

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.01413	t Ratio	1.810596
Std Err Dif	0.00781	DF	19.63186
Upper CL Dif	0.03043	Prob > t	0.0855
Lower CL Dif	-0.00217	Prob > t	0.0428
Confidence	0.95	Prob < t	0.9572

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0268871	0.0201858	0.0202418
Isolok - 3 mL - LF	8	0.0100898	0.0069960	0.0069960

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.9008	1	21	0.1033
Brown-Forsythe	4.4037	1	21	0.0481
Levene	4.4022	1	21	0.0482
Bartlett	6.2866	1	.	0.0122
F Test 2-sided	7.1011	14	7	0.0145

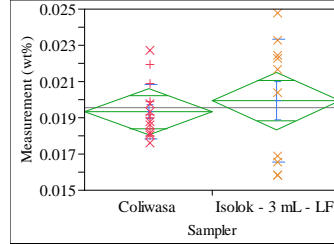
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.2783	1	19.632	0.0855

t Test

1.8106

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Cr2O3 (wt%), Target (wt%)=0.0998



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.016515
Adj Rsquare	-0.02625
Root Mean Square Error	0.00242
Mean of Response	0.019568
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00061	t Ratio	0.621473
Std Err Dif	0.00099	DF	23
Upper CL Dif	0.00266	Prob > t	0.5404
Lower CL Dif	-0.00143	Prob > t	0.2702
Confidence	0.95	Prob < t	0.7298

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000226	2.261e-6	0.3862	0.5404
Error	23	0.00013465	5.8541e-6		
C. Total	24	0.00013691			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.019322	0.00062	0.01803	0.02061
Isolok - 3 mL - LF	10	0.019936	0.00077	0.01835	0.02152

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.019322	0.001488	0.00038	0.01850	0.02015
Isolok - 3 mL - LF	10	0.019936	0.003394	0.00107	0.01751	0.02236

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00061	t Ratio	0.53854
Std Err Dif	0.00114	DF	11.33395
Upper CL Dif	0.00311	Prob > t	0.6006
Lower CL Dif	-0.00189	Prob > t	0.3003
Confidence	0.95	Prob < t	0.6997

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0014877	0.0011303	0.0010913
Isolok - 3 mL - LF	10	0.0033938	0.0029700	0.0028940

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	14.9636	1	23	0.0008
Brown-Forsythe	9.8837	1	23	0.0045
Levene	17.1241	1	23	0.0004
Bartlett	7.1938	1	.	0.0073
F Test 2-sided	5.2042	9	14	0.0063

Welch Anova testing Means Equal, allowing Std Devs Not Equal

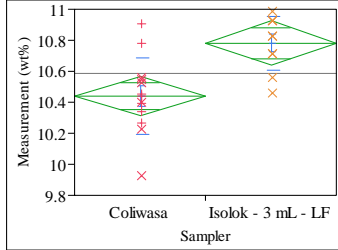
F Ratio	DFNum	DFDen	Prob > F
0.2900	1	11.334	0.6006

t Test

0.5385

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Fe2O3 (wt%), Target (wt%)=11.462



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.396806
Adj Rsquare	0.368082
Root Mean Square Error	0.218283
Mean of Response	10.58848
Observations (or Sum Wgts)	23

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.341258	t Ratio	3.716809
Std Err Dif	0.091815	DF	21
Upper CL Dif	0.532198	Prob > t	0.0013
Lower CL Dif	0.150319	Prob > t	0.0006
Confidence	0.95	Prob < t	0.9994

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.6582369	0.658237	13.8147	0.0013
Error	21	1.0006011	0.047648		
C. Total	22	1.6588379			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	13	10.4401	0.06054	10.314	10.566
Isolok - 3 mL - LF	10	10.7814	0.06903	10.638	10.925

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	13	10.4401	0.245778	0.06817	10.292	10.589
Isolok - 3 mL - LF	10	10.7814	0.175030	0.05535	10.656	10.907

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.341258	t Ratio	3.886419
Std Err Dif	0.087808	DF	20.91668
Upper CL Dif	0.523909	Prob > t	0.0009
Lower CL Dif	0.158607	Prob > t	0.0004
Confidence	0.95	Prob < t	0.9996

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	13	0.2457777	0.1707180	0.1715640
Isolok - 3 mL - LF	10	0.1750304	0.1412544	0.1329621

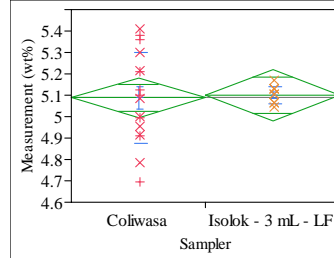
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7632	1	21	0.3922
Brown-Forsythe	0.3856	1	21	0.5413
Levene	0.2441	1	21	0.6264
Bartlett	1.0752	1	.	0.2998
F Test 2-sided	1.9718	12	9	0.3138

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
15.1043	1	20.917	0.0009

t Test
3.8864

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Li2O (wt%), Target (wt%)=4.674



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.001265
Adj Rsquare	-0.04216
Root Mean Square Error	0.17446
Mean of Response	5.092039
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.01241	t Ratio	0.170709
Std Err Dif	0.07269	DF	23
Upper CL Dif	0.16278	Prob > t	0.8659
Lower CL Dif	-0.13796	Prob > t	0.4330
Confidence	0.95	Prob < t	0.5670

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00088695	0.000887	0.0291	0.8659
Error	23	0.70003302	0.030436		
C. Total	24	0.70091998			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	5.08757	0.04361	4.9973	5.1778
Isolok - 3 mL - LF	9	5.09998	0.05815	4.9797	5.2203

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	5.08757	0.213954	0.05349	4.9736	5.2016
Isolok - 3 mL - LF	9	5.09998	0.040911	0.01364	5.0685	5.1314

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.01241	t Ratio	0.224804
Std Err Dif	0.05520	DF	16.87971
Upper CL Dif	0.12893	Prob > t	0.8248
Lower CL Dif	-0.10411	Prob > t	0.4124
Confidence	0.95	Prob < t	0.5876

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2139537	0.1735776	0.1735776
Isolok - 3 mL - LF	9	0.0409114	0.0318948	0.0310974

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.6555	1	23	0.0167
Brown-Forsythe	12.8327	1	23	0.0016
Levene	12.7359	1	23	0.0016
Bartlett	16.2785	1	.	<.0001
F Test 2-sided	27.3496	15	8	<.0001

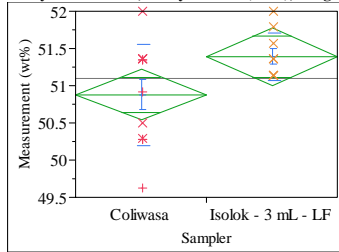
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0505	1	16.88	0.8248

t Test
0.2248

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=SiO2 (wt%), Target (wt%)=50.985



Excluded Rows
5

**Oneway Anova
Summary of Fit**

Rsquare	0.185085
Adj Rsquare	0.142195
Root Mean Square Error	0.557909
Mean of Response	51.09871
Observations (or Sum Wgts)	21

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.5111	t Ratio	2.077334
Std Err Dif	0.2460	DF	19
Upper CL Dif	1.0260	Prob > t	0.0516
Lower CL Dif	-0.0039	Prob > t	0.0258
Confidence	0.95	Prob < t	0.9742

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.3431971	1.34320	4.3153	0.0516
Error	19	5.9139900	0.31126		
C. Total	20	7.2571871			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	12	50.8797	0.16105	50.543	51.217
Isolok - 3 mL - LF	9	51.3907	0.18597	51.002	51.780

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	12	50.8797	0.681612	0.19676	50.447	51.313
Isolok - 3 mL - LF	9	51.3907	0.316909	0.10564	51.147	51.634

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.511055	t Ratio	2.288364
Std Err Dif	0.223328	DF	16.38336
Upper CL Dif	0.983590	Prob > t	0.0357
Lower CL Dif	0.038520	Prob > t	0.0179
Confidence	0.95	Prob < t	0.9821

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	12	0.6816118	0.5764225	0.5704800
Isolok - 3 mL - LF	9	0.3169086	0.2535467	0.2377000

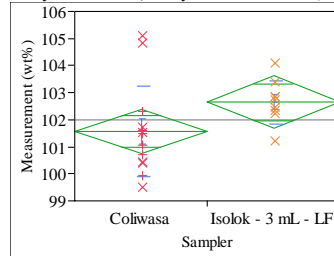
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.9440	1	19	0.0617
Brown-Forsythe	4.7713	1	19	0.0417
Levene	7.5554	1	19	0.0128
Bartlett	4.4038	1	.	0.0359
F Test 2-sided	4.6260	11	8	0.0387

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.2366	1	16.383	0.0357

t Test
2.2884

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=1, Analyte=Sum of Oxides (wt%), Target (wt%)=99.553



Excluded Rows
4

**Oneway Anova
Summary of Fit**

Rsquare	0.135893
Adj Rsquare	0.092688
Root Mean Square Error	1.40135
Mean of Response	102.0092
Observations (or Sum Wgts)	22

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	1.0777	t Ratio	1.773493
Std Err Dif	0.6077	DF	20
Upper CL Dif	2.3453	Prob > t	0.0914
Lower CL Dif	-0.1899	Prob > t	0.0457
Confidence	0.95	Prob < t	0.9543

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	6.176637	6.17664	3.1453	0.0914
Error	20	39.275611	1.96378		
C. Total	21	45.452248			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	13	101.568	0.38866	100.76	102.38
Isolok - 3 mL - LF	9	102.646	0.46712	101.67	103.62

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	13	101.568	1.68702	0.46789	100.55	102.59
Isolok - 3 mL - LF	9	102.646	0.80026	0.26675	102.03	103.26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	1.0777	t Ratio	2.00094
Std Err Dif	0.5386	DF	18.18649
Upper CL Dif	2.2084	Prob > t	0.0606
Lower CL Dif	-0.0530	Prob > t	0.0303
Confidence	0.95	Prob < t	0.9697

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	13	1.687017	1.173894	1.157677
Isolok - 3 mL - LF	9	0.800258	0.556139	0.563487

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9502	1	20	0.1779
Brown-Forsythe	1.9615	1	20	0.1767
Levene	2.1849	1	20	0.1549
Bartlett	4.2853	1	.	0.0384
F Test 2-sided	4.4440	12	8	0.0423

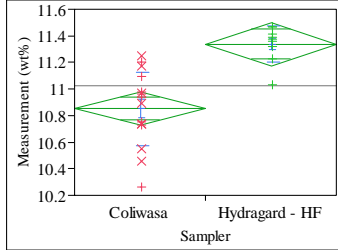
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.0038	1	18.186	0.0606

t Test
2.0009

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Al2O3 (wt%), Target (wt%)=10.869



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.514311
Adj Rsquare	0.493194
Root Mean Square Error	0.237059
Mean of Response	11.02712
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.487465	t Ratio	4.935119
Std Err Dif	0.098775	DF	23
Upper CL Dif	0.691796	Prob > t	<.0001
Lower CL Dif	0.283134	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.3687021	1.36870	24.3554	<.0001
Error	23	1.2925326	0.05620		
C. Total	24	2.6612347			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.8516	0.05926	10.729	10.974
Hydragard - HF	9	11.3391	0.07902	11.176	11.503

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.8516	0.275955	0.06899	10.705	10.999
Hydragard - HF	9	11.3391	0.137052	0.04568	11.234	11.444

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.487465	t Ratio	5.891281
Std Err Dif	0.082743	DF	22.8141
Upper CL Dif	0.658710	Prob > t	<.0001
Lower CL Dif	0.316220	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2759549	0.2200972	0.2161116
Hydragard - HF	9	0.1370521	0.0979741	0.0923756

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5912	1	23	0.1211
Brown-Forsythe	3.7679	1	23	0.0646
Levene	4.5836	1	23	0.0431
Bartlett	4.0112	1	.	0.0452
F Test 2-sided	4.0542	15	8	0.0517

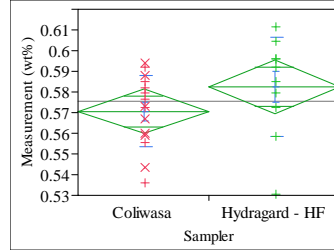
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
34.7072	1	22.814	<.0001

t Test

5.8913

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=CaO (wt%), Target (wt%)=1.1462



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.082792
Adj Rsquare	0.042914
Root Mean Square Error	0.020219
Mean of Response	0.575351
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.01189	t Ratio	1.44087
Std Err Dif	0.00825	DF	23
Upper CL Dif	0.02897	Prob > t	0.1631
Lower CL Dif	-0.00518	Prob > t	0.0815
Confidence	0.95	Prob < t	0.9185

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00084869	0.000849	2.0761	0.1631
Error	23	0.00940215	0.000409		
C. Total	24	0.01025083			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.570594	0.00522	0.55979	0.58139
Hydragard - HF	10	0.582487	0.00639	0.56926	0.59571

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.570594	0.017309	0.00447	0.56101	0.58018
Hydragard - HF	10	0.582487	0.024055	0.00761	0.56528	0.59969

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.01189	t Ratio	1.348042
Std Err Dif	0.00882	DF	15.12667
Upper CL Dif	0.03068	Prob > t	0.1975
Lower CL Dif	-0.00690	Prob > t	0.0987
Confidence	0.95	Prob < t	0.9013

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0173088	0.0139547	0.0136189
Hydragard - HF	10	0.0240551	0.0179657	0.0174900

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0319	1	23	0.3203
Brown-Forsythe	0.5237	1	23	0.4766
Levene	0.6824	1	23	0.4172
Bartlett	1.1692	1	.	0.2796
F Test 2-sided	1.9314	9	14	0.2601

Welch Anova testing Means Equal, allowing Std Devs Not Equal

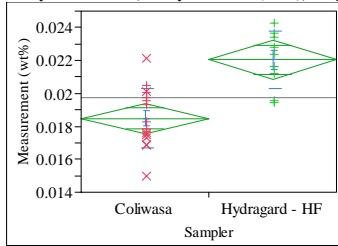
F Ratio	DFNum	DFDen	Prob > F
1.8172	1	15.127	0.1975

t Test

1.3480

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Cr2O3 (wt%), Target (wt%)=0.0998



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.503617
Adj Rsquare	0.482035
Root Mean Square Error	0.001768
Mean of Response	0.019761
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.003558	t Ratio	4.830648
Std Err Dif	0.000736	DF	23
Upper CL Dif	0.005081	Prob > t	<.0001
Lower CL Dif	0.002034	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00007290	0.000073	23.3352	<.0001
Error	23	0.00007185	3.124e-6		
C. Total	24	0.00014475			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.018480	0.00044	0.01757	0.01939
Hydragard - HF	9	0.022038	0.00059	0.02082	0.02326

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.018480	0.001790	0.00045	0.01753	0.01943
Hydragard - HF	9	0.022038	0.001724	0.00057	0.02071	0.02336

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.003558	t Ratio	4.883631
Std Err Dif	0.000728	DF	17.25627
Upper CL Dif	0.005093	Prob > t	0.0001
Lower CL Dif	0.002022	Prob > t	<.0001
Confidence	0.95	Prob < t	0.9999

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0017901	0.0014787	0.0014525
Hydragard - HF	9	0.0017244	0.0014002	0.0014129

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0192	1	23	0.8911
Brown-Forsythe	0.0086	1	23	0.9270
Levene	0.0425	1	23	0.8386
Bartlett	0.0138	1	.	0.9066
F Test 2-sided	1.0776	15	8	0.9569

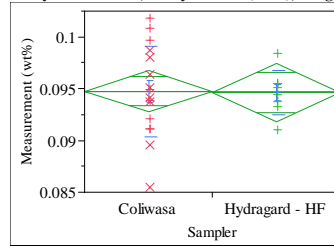
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
23.8499	1	17.256	0.0001

t Test

4.8836

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=CuO (wt%), Target (wt%)=0.0504



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.000229
Adj Rsquare	-0.04522
Root Mean Square Error	0.003821
Mean of Response	0.094699
Observations (or Sum Wgts)	24

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00012	t Ratio	-0.07093
Std Err Dif	0.00165	DF	22
Upper CL Dif	0.00331	Prob > t	0.9441
Lower CL Dif	-0.00355	Prob > t	0.5280
Confidence	0.95	Prob < t	0.4720

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	7.34533e-8	7.345e-8	0.0050	0.9441
Error	22	0.00032122	0.000015		
C. Total	23	0.00032130			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.094738	0.00096	0.09276	0.09672
Hydragard - HF	8	0.094620	0.00135	0.09182	0.09742

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.094738	0.004393	0.00110	0.09240	0.09708
Hydragard - HF	8	0.094620	0.002131	0.00075	0.09284	0.09640

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00012	t Ratio	-0.08812
Std Err Dif	0.00133	DF	21.99963
Upper CL Dif	0.00264	Prob > t	0.9306
Lower CL Dif	-0.00288	Prob > t	0.5347
Confidence	0.95	Prob < t	0.4653

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0043927	0.0033877	0.0033877
Hydragard - HF	8	0.0021311	0.0015178	0.0015178

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4024	1	22	0.1354
Brown-Forsythe	3.3997	1	22	0.0787
Levene	3.4425	1	22	0.0770
Bartlett	3.7858	1	.	0.0517
F Test 2-sided	4.2484	15	7	0.0608

Welch Anova testing Means Equal, allowing Std Devs Not Equal

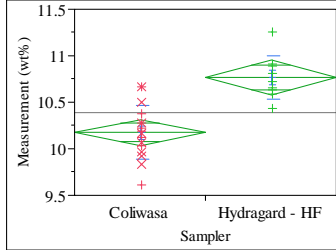
F Ratio	DFNum	DFDen	Prob > F
0.0078	1	22	0.9306

t Test

0.0881

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Fe2O3 (wt%), Target (wt%)=11.462



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.545517
Adj Rsquare	0.525757
Root Mean Square Error	0.270517
Mean of Response	10.3882
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.592233	t Ratio	5.25423
Std Err Dif	0.112716	DF	23
Upper CL Dif	0.825403	Prob > t	<.0001
Lower CL Dif	0.359064	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.0202645	2.02026	27.6069	<.0001
Error	23	1.6831310	0.07318		
C. Total	24	3.7033955			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.1750	0.06763	10.035	10.315
Hydragard - HF	9	10.7672	0.09017	10.581	10.954

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.1750	0.287400	0.07185	10.022	10.328
Hydragard - HF	9	10.7672	0.235624	0.07854	10.586	10.948

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.592233	t Ratio	5.5636
Std Err Dif	0.106448	DF	19.65224
Upper CL Dif	0.814532	Prob > t	<.0001
Lower CL Dif	0.369935	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2874002	0.2189228	0.2189228
Hydragard - HF	9	0.2356235	0.1765062	0.1795068

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3804	1	23	0.5434
Brown-Forsythe	0.3170	1	23	0.5789
Levene	0.3748	1	23	0.5464
Bartlett	0.3749	1	.	0.5403
F Test 2-sided	1.4878	15	8	0.5825

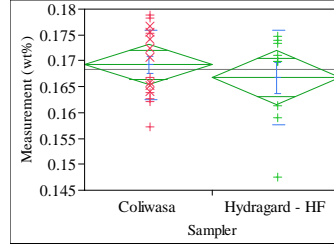
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
30.9536	1	19.652	<.0001

t Test

5.5636

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=K2O (wt%), Target (wt%)=0.1591



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.025959
Adj Rsquare	-0.01639
Root Mean Square Error	0.00759
Mean of Response	0.168355
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00248	t Ratio	-0.78292
Std Err Dif	0.00316	DF	23
Upper CL Dif	0.00407	Prob > t	0.4417
Lower CL Dif	-0.00902	Prob > t	0.7792
Confidence	0.95	Prob < t	0.2208

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003532	0.000035	0.6130	0.4417
Error	23	0.00132514	0.000058		
C. Total	24	0.00136046			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.00190	0.16532	0.17317
Hydragard - HF	9	0.166770	0.00253	0.16154	0.17200

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.006682	0.00167	0.16569	0.17281
Hydragard - HF	9	0.166770	0.009052	0.00302	0.15981	0.17373

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00248	t Ratio	-0.71797
Std Err Dif	0.00345	DF	13.0039
Upper CL Dif	0.00497	Prob > t	0.4855
Lower CL Dif	-0.00993	Prob > t	0.7573
Confidence	0.95	Prob < t	0.2427

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0066816	0.0058724	0.0058724
Hydragard - HF	9	0.0090518	0.0071830	0.0061568

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0580	1	23	0.3144
Brown-Forsythe	0.0205	1	23	0.8875
Levene	0.7363	1	23	0.3997
Bartlett	0.9612	1	.	0.3269
F Test 2-sided	1.8353	8	15	0.2959

Welch Anova testing Means Equal, allowing Std Devs Not Equal

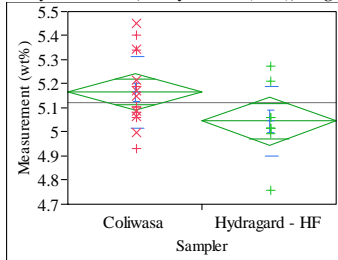
F Ratio	DFNum	DFDen	Prob > F
0.5155	1	13.004	0.4855

t Test

0.7180

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Li2O (wt%), Target (wt%)=4.674



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.144509
Adj Rsquare	0.107314
Root Mean Square Error	0.146907
Mean of Response	5.12218
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.12065	t Ratio	-1.97108
Std Err Dif	0.06121	DF	23
Upper CL Dif	0.00597	Prob > t	0.0609
Lower CL Dif	-0.24728	Prob > t	0.9696
Confidence	0.95	Prob < t	0.0304

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.08384792	0.083848	3.8852	0.0609
Error	23	0.49637722	0.021582		
C. Total	24	0.58022514			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	5.16561	0.03673	5.0896	5.2416
Hydragard - HF	9	5.04496	0.04897	4.9437	5.1463

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	5.16561	0.148007	0.03700	5.0867	5.2445
Hydragard - HF	9	5.04496	0.144822	0.04827	4.9336	5.1563

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.12065	t Ratio	-1.98364
Std Err Dif	0.06082	DF	17.0271
Upper CL Dif	0.00766	Prob > t	0.0637
Lower CL Dif	-0.24896	Prob > t	0.9682
Confidence	0.95	Prob < t	0.0318

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1480070	0.1168957	0.1143728
Hydragard - HF	9	0.1448215	0.0940897	0.0909002

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0054	1	23	0.9419
Brown-Forsythe	0.2944	1	23	0.5927
Levene	0.3479	1	23	0.5611
Bartlett	0.0047	1	.	0.9454
F Test 2-sided	1.0445	15	8	0.9960

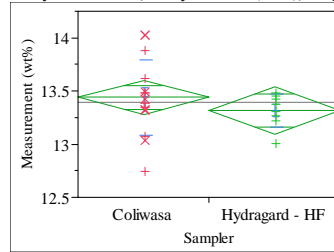
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.9348	1	17.027	0.0637

t Test

1.9836

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Na2O (wt%), Target (wt%)=11.659



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.039011
Adj Rsquare	-0.00675
Root Mean Square Error	0.302079
Mean of Response	13.39619
Observations (or Sum Wgts)	23

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.12211	t Ratio	-0.9233
Std Err Dif	0.13225	DF	21
Upper CL Dif	0.15292	Prob > t	0.3663
Lower CL Dif	-0.39713	Prob > t	0.8168
Confidence	0.95	Prob < t	0.1832

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0777911	0.077791	0.8525	0.3663
Error	21	1.9162831	0.091252		
C. Total	22	1.9940741			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	13.4387	0.07800	13.276	13.601
Hydragard - HF	8	13.3166	0.10680	13.094	13.539

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	13.4387	0.353484	0.09127	13.243	13.634
Hydragard - HF	8	13.3166	0.154443	0.05460	13.187	13.446

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.12211	t Ratio	-1.14809
Std Err Dif	0.10636	DF	20.55013
Upper CL Dif	0.09937	Prob > t	0.2641
Lower CL Dif	-0.34358	Prob > t	0.8679
Confidence	0.95	Prob < t	0.1321

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.3534841	0.2542628	0.2543227
Hydragard - HF	8	0.1544433	0.1162650	0.1162650

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5093	1	21	0.1281
Brown-Forsythe	2.4491	1	21	0.1325
Levene	2.4887	1	21	0.1296
Bartlett	4.7291	1	.	0.0297
F Test 2-sided	5.2384	14	7	0.0348

Welch Anova testing Means Equal, allowing Std Devs Not Equal

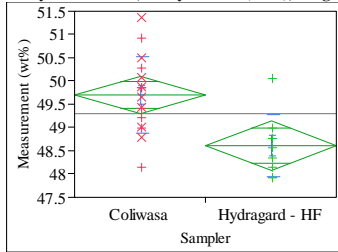
F Ratio	DFNum	DFDen	Prob > F
1.3181	1	20.55	0.2641

t Test

1.1481

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=SiO2 (wt%), Target (wt%)=50.985



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.334454
Adj Rsquare	0.305518
Root Mean Square Error	0.768743
Mean of Response	49.30659
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-1.0890	t Ratio	-3.39972
Std Err Dif	0.3203	DF	23
Upper CL Dif	-0.4264	Prob > t	0.0025
Lower CL Dif	-1.7516	Prob > t	0.9988
Confidence	0.95	Prob < t	0.0012

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	6.830442	6.83044	11.5581	0.0025
Error	23	13.592198	0.59097		
C. Total	24	20.422640			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	49.6986	0.19219	49.301	50.096
Hydragard - HF	9	48.6097	0.25625	48.080	49.140

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	49.6986	0.818241	0.20456	49.263	50.135
Hydragard - HF	9	48.6097	0.666090	0.22203	48.098	49.122

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-1.0890	t Ratio	-3.60706
Std Err Dif	0.3019	DF	19.7543
Upper CL Dif	-0.4587	Prob > t	0.0018
Lower CL Dif	-1.7192	Prob > t	0.9991
Confidence	0.95	Prob < t	0.0009

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.8182415	0.6284194	0.6284194
Hydragard - HF	9	0.6660904	0.4806822	0.4991700

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3634	1	23	0.5525
Brown-Forsythe	0.4320	1	23	0.5175
Levene	0.5567	1	23	0.4632
Bartlett	0.4014	1	.	0.5264
F Test 2-sided	1.5090	15	8	0.5679

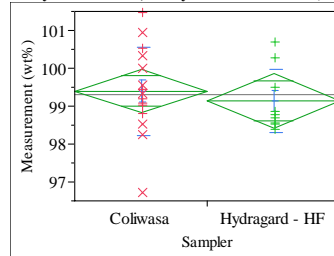
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
13.0109	1	19.754	0.0018

t Test

3.6071

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=Sum of Oxides (wt%), Target (wt%)=99.553



Excluded Rows

2

**Oneway Anova
Summary of Fit**

Rsquare	0.015167
Adj Rsquare	-0.0296
Root Mean Square Error	1.056739
Mean of Response	99.30299
Observations (or Sum Wgts)	24

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.2593	t Ratio	-0.58207
Std Err Dif	0.4456	DF	22
Upper CL Dif	0.6647	Prob > t	0.5664
Lower CL Dif	-1.1834	Prob > t	0.7168
Confidence	0.95	Prob < t	0.2832

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.378340	0.37834	0.3388	0.5664
Error	22	24.567364	1.11670		
C. Total	23	24.945704			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	99.4002	0.27285	98.834	99.966
Hydragard - HF	9	99.1409	0.35225	98.410	99.871

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	99.4002	1.16733	0.30140	98.754	100.05
Hydragard - HF	9	99.1409	0.82842	0.27614	98.504	99.78

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.2593	t Ratio	-0.63445
Std Err Dif	0.4088	DF	21.21213
Upper CL Dif	0.5902	Prob > t	0.5326
Lower CL Dif	-1.1089	Prob > t	0.7337
Confidence	0.95	Prob < t	0.2663

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	1.167325	0.8451312	0.8453896
Hydragard - HF	9	0.828424	0.6746812	0.5792359

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7264	1	22	0.4032
Brown-Forsythe	0.7216	1	22	0.4048
Levene	0.3685	1	22	0.5500
Bartlett	1.0549	1	.	0.3044
F Test 2-sided	1.9855	14	8	0.3315

Welch Anova testing Means Equal, allowing Std Devs Not Equal

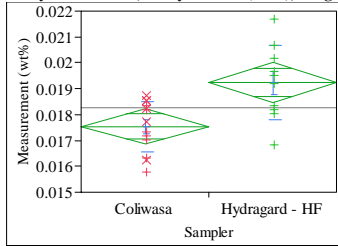
F Ratio	DFNum	DFDen	Prob > F
0.4025	1	21.212	0.5326

t Test

0.6344

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=TiO2 (wt%), Target (wt%)=0.0711



Excluded Rows

3

**Oneway Anova
Summary of Fit**

Rsquare	0.352896
Adj Rsquare	0.322082
Root Mean Square Error	0.001191
Mean of Response	0.018274
Observations (or Sum Wgts)	23

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.001695	t Ratio	3.384124
Std Err Dif	0.000501	DF	21
Upper CL Dif	0.002737	Prob > t	0.0028
Lower CL Dif	0.000653	Prob > t	0.0014
Confidence	0.95	Prob < t	0.9986

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001624	0.000016	11.4523	0.0028
Error	21	0.00002978	1.418e-6		
C. Total	22	0.00004601			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	13	0.017537	0.00033	0.01685	0.01822
Hydragard - HF	10	0.019232	0.00038	0.01845	0.02002

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	13	0.017537	0.000975	0.00027	0.01695	0.01813
Hydragard - HF	10	0.019232	0.001428	0.00045	0.01821	0.02025

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.001695	t Ratio	3.219284
Std Err Dif	0.000526	DF	15.14818
Upper CL Dif	0.002816	Prob > t	0.0057
Lower CL Dif	0.000574	Prob > t	0.0028
Confidence	0.95	Prob < t	0.9972

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	13	0.0009751	0.0008220	0.0008366
Hydragard - HF	10	0.0014285	0.0011176	0.0011176

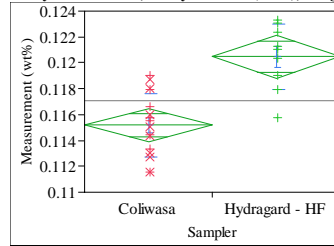
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9376	1	21	0.1785
Brown-Forsythe	1.0768	1	21	0.3112
Levene	1.2198	1	21	0.2819
Bartlett	1.4475	1	.	0.2289
F Test 2-sided	2.1462	9	12	0.2175

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.3638	1	15.148	0.0057

t Test
3.2193

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=2, Analyte=ZrO2 (wt%), Target (wt%)=0.3547



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.538824
Adj Rsquare	0.518773
Root Mean Square Error	0.002449
Mean of Response	0.117077
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.005289	t Ratio	5.183872
Std Err Dif	0.001020	DF	23
Upper CL Dif	0.007399	Prob > t	<.0001
Lower CL Dif	0.003178	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00016111	0.000161	26.8725	<.0001
Error	23	0.00013790	0.000006		
C. Total	24	0.00029901			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.115173	0.00061	0.11391	0.11644
Hydragard - HF	9	0.120461	0.00082	0.11877	0.12215

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.115173	0.002416	0.00060	0.11389	0.11646
Hydragard - HF	9	0.120461	0.002508	0.00084	0.11853	0.12239

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.005289	t Ratio	5.12784
Std Err Dif	0.001031	DF	16.18279
Upper CL Dif	0.007473	Prob > t	<.0001
Lower CL Dif	0.003104	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0024163	0.0019755	0.0019755
Hydragard - HF	9	0.0025079	0.0019545	0.0019211

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0250	1	23	0.8758
Brown-Forsythe	0.0087	1	23	0.9267
Levene	0.0014	1	23	0.9702
Bartlett	0.0139	1	.	0.9063
F Test 2-sided	1.0772	8	15	0.8560

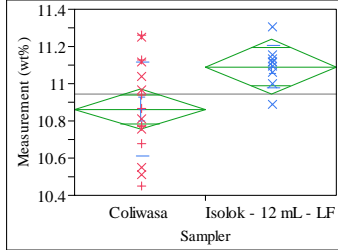
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
26.2947	1	16.183	<.0001

t Test
5.1278

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Al2O3 (wt%), Target (wt%)=10.869



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.221659
Adj Rsquare	0.187818
Root Mean Square Error	0.213734
Mean of Response	10.9455
Observations (or Sum Wgts)	25

t Test

Islok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	0.227921	t Ratio	2.559305
Std Err Dif	0.089056	DF	23
Upper CL Dif	0.412147	Prob > t	0.0175
Lower CL Dif	0.043695	Prob > t	0.0088
Confidence	0.95	Prob < t	0.9912

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.2992202	0.299220	6.5500	0.0175
Error	23	1.0506906	0.045682		
C. Total	24	1.3499108			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	10.8634	0.05343	10.753	10.974
Islok - 12 mL - LF	9	11.0914	0.07124	10.944	11.239

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	10.8634	0.251473	0.06287	10.729	10.997
Islok - 12 mL - LF	9	11.0914	0.112976	0.03766	11.005	11.178

t Test

Islok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	0.227921	t Ratio	3.110091
Std Err Dif	0.073284	DF	22.30993
Upper CL Dif	0.379781	Prob > t	0.0050
Lower CL Dif	0.076061	Prob > t	0.0025
Confidence	0.95	Prob < t	0.9975

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.2514733	0.2043022	0.2043022
Islok - 12 mL - LF	9	0.1129757	0.0755800	0.0734806

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.5850	1	23	0.0431
Brown-Forsythe	6.4913	1	23	0.0180
Levene	6.6228	1	23	0.0170
Bartlett	5.0723	1	.	0.0243
F Test 2-sided	4.9547	15	8	0.0281

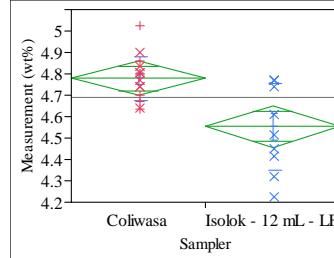
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.6727	1	22.31	0.0050

t Test

3.1101

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=B2O3 (wt%), Target (wt%)=4.259



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.369347
Adj Rsquare	0.341927
Root Mean Square Error	0.150429
Mean of Response	4.688174
Observations (or Sum Wgts)	25

t Test

Islok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	-0.22539	t Ratio	-3.67017
Std Err Dif	0.06141	DF	23
Upper CL Dif	-0.09835	Prob > t	0.0013
Lower CL Dif	-0.35243	Prob > t	0.9994
Confidence	0.95	Prob < t	0.0006

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.30481203	0.304812	13.4701	0.0013
Error	23	0.52046135	0.022629		
C. Total	24	0.82527338			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	15	4.77833	0.03884	4.6980	4.8587
Islok - 12 mL - LF	10	4.55294	0.04757	4.4545	4.6513

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	15	4.77833	0.102402	0.02644	4.7216	4.8350
Islok - 12 mL - LF	10	4.55294	0.203757	0.06443	4.4072	4.6987

t Test

Islok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.22539	t Ratio	-3.23619
Std Err Dif	0.06965	DF	12.06617
Upper CL Dif	-0.07374	Prob > t	0.0071
Lower CL Dif	-0.37705	Prob > t	0.9965
Confidence	0.95	Prob < t	0.0035

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	15	0.1024024	0.0764190	0.0751310
Islok - 12 mL - LF	10	0.2037575	0.1738746	0.1738746

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	7.5837	1	23	0.0113
Brown-Forsythe	9.6683	1	23	0.0049
Levene	10.0404	1	23	0.0043
Bartlett	5.0712	1	.	0.0243
F Test 2-sided	3.9592	9	14	0.0216

Welch Anova testing Means Equal, allowing Std Devs Not Equal

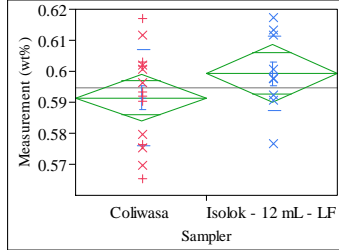
F Ratio	DFNum	DFDen	Prob > F
10.4729	1	12.066	0.0071

t Test

3.2362

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=CaO (wt%), Target (wt%)=1.1462



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.072999
Adj Rsquare	0.032695
Root Mean Square Error	0.014176
Mean of Response	0.594604
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00779	t Ratio	1.34581
Std Err Dif	0.00579	DF	23
Upper CL Dif	0.01976	Prob > t	0.1915
Lower CL Dif	-0.00418	Prob > t	0.0957
Confidence	0.95	Prob < t	0.9043

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00036400	0.000364	1.8112	0.1915
Error	23	0.00462234	0.000201		
C. Total	24	0.00498634			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.591488	0.00366	0.58392	0.59906
Isolok - 12 mL - LF	10	0.599277	0.00448	0.59000	0.60855

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.591488	0.015377	0.00397	0.58297	0.60000
Isolok - 12 mL - LF	10	0.599277	0.012073	0.00382	0.59064	0.60791

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00779	t Ratio	1.414043
Std Err Dif	0.00551	DF	22.25768
Upper CL Dif	0.01920	Prob > t	0.1712
Lower CL Dif	-0.00363	Prob > t	0.0856
Confidence	0.95	Prob < t	0.9144

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0153773	0.0123876	0.0123130
Isolok - 12 mL - LF	10	0.0120734	0.0088989	0.0085351

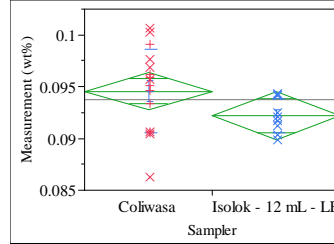
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8737	1	23	0.3597
Brown-Forsythe	1.1573	1	23	0.2932
Levene	1.0987	1	23	0.3054
Bartlett	0.5866	1	.	0.4437
F Test 2-sided	1.6222	14	9	0.4702

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.9995	1	22.258	0.1712

t Test
1.4140

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=CuO (wt%), Target (wt%)=0.0504



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.109478
Adj Rsquare	0.07076
Root Mean Square Error	0.003413
Mean of Response	0.093705
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00239	t Ratio	-1.68154
Std Err Dif	0.00142	DF	23
Upper CL Dif	0.00055	Prob > t	0.1062
Lower CL Dif	-0.00533	Prob > t	0.9469
Confidence	0.95	Prob < t	0.0531

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003294	0.000033	2.8276	0.1062
Error	23	0.00026796	0.000012		
C. Total	24	0.00030090			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.094566	0.00085	0.09280	0.09633
Isolok - 12 mL - LF	9	0.092174	0.00114	0.08982	0.09453

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.094566	0.004045	0.00101	0.09241	0.09672
Isolok - 12 mL - LF	9	0.092174	0.001679	0.00056	0.09088	0.09347

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00239	t Ratio	-2.0691
Std Err Dif	0.00116	DF	21.76978
Upper CL Dif	6.987e-6	Prob > t	0.0506
Lower CL Dif	-0.00479	Prob > t	0.9747
Confidence	0.95	Prob < t	0.0253

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0040447	0.0032332	0.0031530
Isolok - 12 mL - LF	9	0.0016795	0.0013538	0.0013770

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.8074	1	23	0.0633
Brown-Forsythe	4.0561	1	23	0.0559
Levene	5.5567	1	23	0.0273
Bartlett	5.9605	1	.	0.0146
F Test 2-sided	5.8000	15	8	0.0170

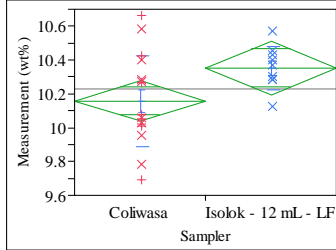
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.2812	1	21.77	0.0506

t Test
2.0691

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Fe2O3 (wt%), Target (wt%)=11.462



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.151794
Adj Rsquare	0.114915
Root Mean Square Error	0.230202
Mean of Response	10.22807
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.19460	t Ratio	2.028805
Std Err Dif	0.09592	DF	23
Upper CL Dif	0.39302	Prob > t	0.0542
Lower CL Dif	-0.00382	Prob > t	0.0271
Confidence	0.95	Prob < t	0.9729

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.2181220	0.218122	4.1161	0.0542
Error	23	1.2188396	0.052993		
C. Total	24	1.4369616			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.1580	0.05755	10.039	10.277
Isolok - 12 mL - LF	9	10.3526	0.07673	10.194	10.511

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.1580	0.269553	0.06739	10.014	10.302
Isolok - 12 mL - LF	9	10.3526	0.126963	0.04232	10.255	10.450

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.194598	t Ratio	2.445456
Std Err Dif	0.079575	DF	22.57973
Upper CL Dif	0.359382	Prob > t	0.0227
Lower CL Dif	0.029814	Prob > t	0.0113
Confidence	0.95	Prob < t	0.9887

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2695531	0.2207099	0.2108807
Isolok - 12 mL - LF	9	0.1269628	0.0967254	0.0984904

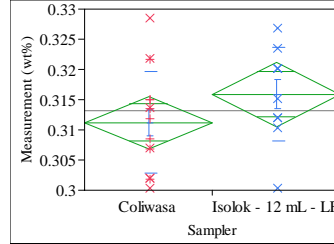
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.2547	1	23	0.0843
Brown-Forsythe	2.9859	1	23	0.0974
Levene	5.7329	1	23	0.0252
Bartlett	4.5615	1	.	0.0327
F Test 2-sided	4.5075	15	8	0.0376

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.9803	1	22.58	0.0227

t Test
2.4455

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=MgO (wt%), Target (wt%)=1.014



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.079746
Adj Rsquare	0.039735
Root Mean Square Error	0.008152
Mean of Response	0.313087
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00470	t Ratio	1.411773
Std Err Dif	0.00333	DF	23
Upper CL Dif	0.01158	Prob > t	0.1714
Lower CL Dif	-0.00219	Prob > t	0.0857
Confidence	0.95	Prob < t	0.9143

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00013246	0.000132	1.9931	0.1714
Error	23	0.00152852	0.000066		
C. Total	24	0.00166098			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.311208	0.00210	0.30685	0.31556
Isolok - 12 mL - LF	10	0.315906	0.00258	0.31057	0.32124

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.311208	0.008401	0.00217	0.30656	0.31586
Isolok - 12 mL - LF	10	0.315906	0.007749	0.00245	0.31036	0.32145

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00470	t Ratio	1.435737
Std Err Dif	0.00327	DF	20.52893
Upper CL Dif	0.01151	Prob > t	0.1661
Lower CL Dif	-0.00212	Prob > t	0.0831
Confidence	0.95	Prob < t	0.9169

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0084013	0.0067806	0.0068543
Isolok - 12 mL - LF	10	0.0077486	0.0061357	0.0061357

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0865	1	23	0.7713
Brown-Forsythe	0.1478	1	23	0.7042
Levene	0.1241	1	23	0.7278
Bartlett	0.0676	1	.	0.7948
F Test 2-sided	1.1756	14	9	0.8291

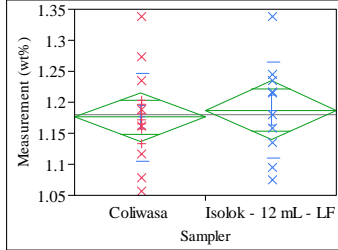
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.0613	1	20.529	0.1661

t Test
1.4357

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=NiO (wt%), Target (wt%)=0.41



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.006155
Adj Rsquare	-0.03706
Root Mean Square Error	0.073779
Mean of Response	1.180676
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasas
Assuming equal variances

Difference	0.01137	t Ratio	0.377408
Std Err Dif	0.03012	DF	23
Upper CL Dif	0.07368	Prob > t	0.7093
Lower CL Dif	-0.05094	Prob > t	0.3547
Confidence	0.95	Prob < t	0.6453

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00077534	0.000775	0.1424	0.7093
Error	23	0.12519852	0.005443		
C. Total	24	0.12597386			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	15	1.17613	0.01905	1.1367	1.2155
Isolok - 12 mL - LF	10	1.18750	0.02333	1.1392	1.2358

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	15	1.17613	0.070971	0.01832	1.1368	1.2154
Isolok - 12 mL - LF	10	1.18750	0.077947	0.02465	1.1317	1.2433

t Test

Isolok - 12 mL - LF-Coliwasas
Assuming unequal variances

Difference	0.01137	t Ratio	0.37011
Std Err Dif	0.03071	DF	18.13608
Upper CL Dif	0.07586	Prob > t	0.7156
Lower CL Dif	-0.05313	Prob > t	0.3578
Confidence	0.95	Prob < t	0.6422

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	15	0.0709713	0.0502440	0.0503910
Isolok - 12 mL - LF	10	0.0779470	0.0605710	0.0605710

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0941	1	23	0.7618
Brown-Forsythe	0.2784	1	23	0.6028
Levene	0.2906	1	23	0.5950
Bartlett	0.0932	1	.	0.7602
F Test 2-sided	1.2062	9	14	0.7266

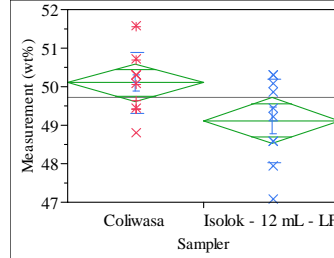
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1370	1	18.136	0.7156

t Test

0.3701

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=SiO2 (wt%), Target (wt%)=50.985



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.230937
Adj Rsquare	0.1975
Root Mean Square Error	0.917224
Mean of Response	49.70877
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasas
Assuming equal variances

Difference	-0.9841	t Ratio	-2.62803
Std Err Dif	0.3745	DF	23
Upper CL Dif	-0.2095	Prob > t	0.0150
Lower CL Dif	-1.7587	Prob > t	0.9925
Confidence	0.95	Prob < t	0.0075

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	5.810457	5.81046	6.9065	0.0150
Error	23	19.349884	0.84130		
C. Total	24	25.160341			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	15	50.1024	0.23683	49.612	50.592
Isolok - 12 mL - LF	10	49.1183	0.29005	48.518	49.718

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	15	50.1024	0.79718	0.20583	49.661	50.544
Isolok - 12 mL - LF	10	49.1183	1.07770	0.34080	48.347	49.889

t Test

Isolok - 12 mL - LF-Coliwasas
Assuming unequal variances

Difference	-0.9841	t Ratio	-2.47173
Std Err Dif	0.3981	DF	15.44253
Upper CL Dif	-0.1376	Prob > t	0.0255
Lower CL Dif	-1.8306	Prob > t	0.9872
Confidence	0.95	Prob < t	0.0128

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	15	0.797179	0.6161184	0.6132660
Isolok - 12 mL - LF	10	1.077701	0.8728344	0.8557200

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3154	1	23	0.2632
Brown-Forsythe	1.1958	1	23	0.2855
Levene	1.5064	1	23	0.2321
Bartlett	0.9800	1	.	0.3222
F Test 2-sided	1.8276	9	14	0.3008

Welch Anova testing Means Equal, allowing Std Devs Not Equal

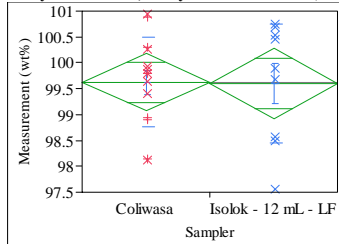
F Ratio	DFNum	DFDen	Prob > F
6.1094	1	15.443	0.0255

t Test

2.4717

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=Sum of Oxides (wt%), Target (wt%)=99.553



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.000151
Adj Rsquare	-0.04746
Root Mean Square Error	0.987082
Mean of Response	99.61727
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.02378	t Ratio	-0.05638
Std Err Dif	0.42173	DF	21
Upper CL Dif	0.85325	Prob > t	0.9556
Lower CL Dif	-0.90081	Prob > t	0.5222
Confidence	0.95	Prob < t	0.4778

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.003097	0.003097	0.0032	0.9556
Error	21	20.460963	0.974332		
C. Total	22	20.464060			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	99.6266	0.26381	99.078	100.18
Isolok - 12 mL - LF	9	99.6028	0.32903	98.919	100.29

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	99.6266	0.86910	0.23228	99.125	100.13
Isolok - 12 mL - LF	9	99.6028	1.15334	0.38445	98.716	100.49

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.02378	t Ratio	-0.05294
Std Err Dif	0.44917	DF	13.77693
Upper CL Dif	0.94106	Prob > t	0.9585
Lower CL Dif	-0.98861	Prob > t	0.5207
Confidence	0.95	Prob < t	0.4793

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.869102	0.6674727	0.6458948
Isolok - 12 mL - LF	9	1.153341	0.9430413	0.9261808

Test

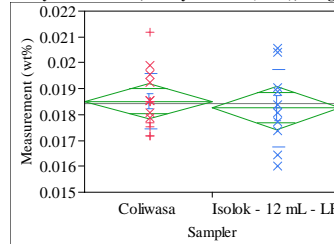
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2584	1	21	0.2746
Brown-Forsythe	1.1401	1	21	0.2978
Levene	1.4046	1	21	0.2492
Bartlett	0.7789	1	.	0.3775
F Test 2-sided	1.7611	8	13	0.3502

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0028	1	13.777	0.9585

t Test
0.0529

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=TiO2 (wt%), Target (wt%)=0.0711



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.011403
Adj Rsquare	-0.03158
Root Mean Square Error	0.001261
Mean of Response	0.018409
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00027	t Ratio	-0.51507
Std Err Dif	0.00051	DF	23
Upper CL Dif	0.00080	Prob > t	0.6114
Lower CL Dif	-0.00133	Prob > t	0.6943
Confidence	0.95	Prob < t	0.3057

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0000042	4.2202e-7	0.2653	0.6114
Error	23	0.00003659	1.5908e-6		
C. Total	24	0.00003701			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.018515	0.00033	0.01784	0.01919
Isolok - 12 mL - LF	10	0.018250	0.00040	0.01742	0.01907

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.018515	0.001079	0.00028	0.01792	0.01911
Isolok - 12 mL - LF	10	0.018250	0.001501	0.00047	0.01718	0.01932

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00027	t Ratio	-0.4818
Std Err Dif	0.00055	DF	15.11554
Upper CL Dif	0.00091	Prob > t	0.6369
Lower CL Dif	-0.00144	Prob > t	0.6816
Confidence	0.95	Prob < t	0.3184

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0010791	0.0007562	0.0007562
Isolok - 12 mL - LF	10	0.0015013	0.0011659	0.0011659

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3870	1	23	0.2510
Brown-Forsythe	1.6021	1	23	0.2183
Levene	1.6073	1	23	0.2176
Bartlett	1.1763	1	.	0.2781
F Test 2-sided	1.9353	9	14	0.2587

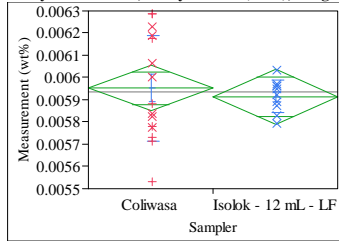
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2321	1	15.116	0.6369

t Test
0.4818

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=3, Analyte=ZnO (wt%), Target (wt%)=0.0958



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.009932
Adj Rsquare	-0.03311
Root Mean Square Error	0.000191
Mean of Response	0.005937
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-3.76e-5	t Ratio	-0.48035
Std Err Dif	7.818e-5	DF	23
Upper CL Dif	0.00012	Prob > t	0.6355
Lower CL Dif	-0.00020	Prob > t	0.6822
Confidence	0.95	Prob < t	0.3178

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	8.46068e-9	8.4607e-9	0.2307	0.6355
Error	23	8.43386e-7	3.6669e-8		
C. Total	24	8.51846e-7			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.005952	0.00005	0.00585	0.00605
Isolok - 12 mL - LF	10	0.005915	0.00006	0.00579	0.00604

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.005952	0.000238	6.16e-5	0.00582	0.00608
Isolok - 12 mL - LF	10	0.005915	0.000073	2.3e-5	0.00586	0.00597

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-3.76e-5	t Ratio	-0.57148
Std Err Dif	6.571e-5	DF	17.63839
Upper CL Dif	0.00010	Prob > t	0.5749
Lower CL Dif	-0.00018	Prob > t	0.7126
Confidence	0.95	Prob < t	0.2874

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0002384	0.0002072	0.0002058
Isolok - 12 mL - LF	10	0.0000726	0.0000575	0.0000566

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	8.9910	1	23	0.0064
Brown-Forsythe	11.9996	1	23	0.0021
Levene	18.5808	1	23	0.0003
Bartlett	10.8069	1	.	0.0010
F Test 2-sided	10.7721	14	.	0.0011

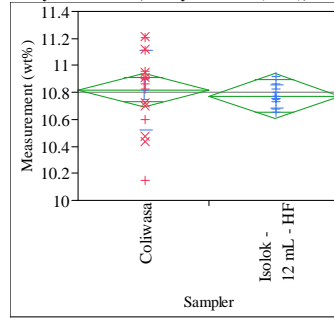
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3266	1	17.638	0.5749

t Test

0.5715

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Al2O3 (wt%), Target (wt%)=10.869



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.008446
Adj Rsquare	-0.03466
Root Mean Square Error	0.244745
Mean of Response	10.80114
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.04514	t Ratio	-0.44263
Std Err Dif	0.10198	DF	23
Upper CL Dif	0.16582	Prob > t	0.6622
Lower CL Dif	-0.25609	Prob > t	0.6689
Confidence	0.95	Prob < t	0.3311

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0117357	0.011736	0.1959	0.6622
Error	23	1.3777045	0.059900		
C. Total	24	1.3894401			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.8174	0.06119	10.691	10.944
Isolok - 12 mL - HF	9	10.7722	0.08158	10.603	10.941

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.8174	0.296517	0.07413	10.659	10.975
Isolok - 12 mL - HF	9	10.7722	0.085782	0.02859	10.706	10.838

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.04514	t Ratio	-0.56811
Std Err Dif	0.07945	DF	19.00681
Upper CL Dif	0.12115	Prob > t	0.5766
Lower CL Dif	-0.21143	Prob > t	0.7117
Confidence	0.95	Prob < t	0.2883

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2965171	0.2314638	0.2243781
Isolok - 12 mL - HF	9	0.0857823	0.0657826	0.0629833

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.6171	1	23	0.0698
Brown-Forsythe	5.6533	1	23	0.0261
Levene	7.5519	1	23	0.0115
Bartlett	10.4992	1	.	0.0012
F Test 2-sided	11.9482	15	8	0.0014

Welch Anova testing Means Equal, allowing Std Devs Not Equal

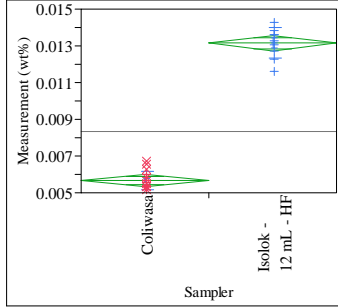
F Ratio	DFNum	DFDen	Prob > F
0.3227	1	19.007	0.5766

t Test

0.5681

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=BaO (wt%), Target (wt%)=0.0919



Excluded Rows
1

Oneway Anova Summary of Fit

Rsquare	0.972951
Adj Rsquare	0.971775
Root Mean Square Error	0.000625
Mean of Response	0.008359
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.007485	t Ratio	28.76321
Std Err Dif	0.000260	DF	23
Upper CL Dif	0.008023	Prob > t	<.0001
Lower CL Dif	0.006947	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00032271	0.000323	827.3221	<.0001
Error	23	0.00000897	3.901e-7		
C. Total	24	0.00033168			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005665	0.00016	0.00534	0.00599
Isolok - 12 mL - HF	9	0.013150	0.00021	0.01272	0.01358

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005665	0.000477	0.00012	0.00541	0.00592
Isolok - 12 mL - HF	9	0.013150	0.000833	0.00028	0.01251	0.01379

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.007485	t Ratio	24.76103
Std Err Dif	0.000302	DF	11.02552
Upper CL Dif	0.008150	Prob > t	<.0001
Lower CL Dif	0.006820	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0004773	0.0003843	0.0003712
Isolok - 12 mL - HF	9	0.0008332	0.0006478	0.0006575

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.4242	1	23	0.0771
Brown-Forsythe	3.0970	1	23	0.0917
Levene	3.2499	1	23	0.0845
Bartlett	3.2913	1	.	0.0696
F Test 2-sided	3.0474	8	15	0.0600

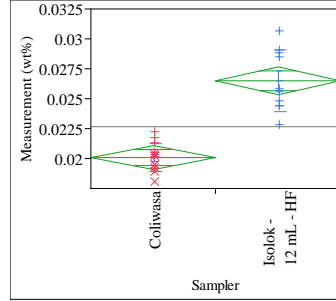
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
613.1085	1	11.026	<.0001

t Test

24.7610

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Cr2O3 (wt%), Target (wt%)=0.0998



Excluded Rows
1

Oneway Anova Summary of Fit

Rsquare	0.760293
Adj Rsquare	0.749871
Root Mean Square Error	0.00184
Mean of Response	0.022649
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.006416	t Ratio	8.541096
Std Err Dif	0.000751	DF	23
Upper CL Dif	0.007970	Prob > t	<.0001
Lower CL Dif	0.004862	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00024702	0.000247	72.9503	<.0001
Error	23	0.00007788	3.386e-6		
C. Total	24	0.00032491			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.020082	0.00048	0.01910	0.02107
Isolok - 12 mL - HF	10	0.026499	0.00058	0.02530	0.02770

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.020082	0.001132	0.00029	0.01946	0.02071
Isolok - 12 mL - HF	10	0.026499	0.002581	0.00082	0.02465	0.02835

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.006416	t Ratio	7.401764
Std Err Dif	0.000867	DF	11.33631
Upper CL Dif	0.008318	Prob > t	<.0001
Lower CL Dif	0.004515	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0011319	0.0008653	0.0008477
Isolok - 12 mL - HF	10	0.0025808	0.0022158	0.0020901

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	9.4751	1	23	0.0053
Brown-Forsythe	7.2119	1	23	0.0132
Levene	14.3379	1	23	0.0010
Bartlett	7.1855	1	.	0.0073
F Test 2-sided	5.1990	9	14	0.0064

Welch Anova testing Means Equal, allowing Std Devs Not Equal

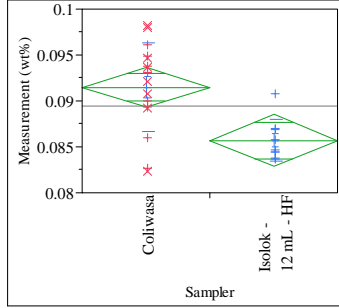
F Ratio	DFNum	DFDen	Prob > F
54.7861	1	11.336	<.0001

t Test

7.4018

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=CuO (wt%), Target (wt%)=0.0504



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.332554
Adj Rsquare	0.303534
Root Mean Square Error	0.004106
Mean of Response	0.089414
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00579	t Ratio	-3.38522
Std Err Dif	0.00171	DF	23
Upper CL Dif	-0.00225	Prob > t	0.0025
Lower CL Dif	-0.00933	Prob > t	0.9987
Confidence	0.95	Prob < t	0.0013

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00019324	0.000193	11.4597	0.0025
Error	23	0.00038785	0.000017		
C. Total	24	0.00058109			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.091499	0.00103	0.08938	0.09362
Isolok - 12 mL - HF	9	0.085707	0.00137	0.08287	0.08854

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.091499	0.004810	0.00120	0.08894	0.09406
Isolok - 12 mL - HF	9	0.085707	0.002259	0.00075	0.08397	0.08744

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00579	t Ratio	-4.08239
Std Err Dif	0.00142	DF	22.56562
Upper CL Dif	-0.00285	Prob > t	0.0005
Lower CL Dif	-0.00873	Prob > t	0.9998
Confidence	0.95	Prob < t	0.0002

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0048098	0.0038111	0.0037476
Isolok - 12 mL - HF	9	0.0022593	0.0016783	0.0015717

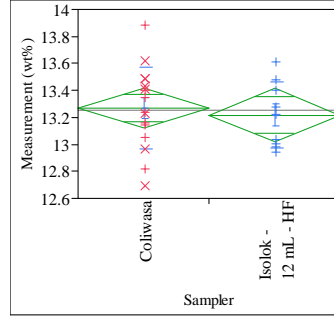
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.9524	1	23	0.0992
Brown-Forsythe	3.6917	1	23	0.0672
Levene	4.6321	1	23	0.0421
Bartlett	4.5904	1	.	0.0322
F Test 2-sided	4.5321	15	8	0.0370

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
16.6659	1	22.566	0.0005

t Test
4.0824

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Na2O (wt%), Target (wt%)=11.659



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.007934
Adj Rsquare	-0.0352
Root Mean Square Error	0.283396
Mean of Response	13.2503
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.05064	t Ratio	-0.42889
Std Err Dif	0.11808	DF	23
Upper CL Dif	0.19363	Prob > t	0.6720
Lower CL Dif	-0.29491	Prob > t	0.6640
Confidence	0.95	Prob < t	0.3360

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0147731	0.014773	0.1839	0.6720
Error	23	1.8472061	0.080313		
C. Total	24	1.8619792			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	13.2685	0.07085	13.122	13.415
Isolok - 12 mL - HF	9	13.2179	0.09447	13.022	13.413

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	13.2685	0.302694	0.07567	13.107	13.430
Isolok - 12 mL - HF	9	13.2179	0.243118	0.08104	13.031	13.405

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.05064	t Ratio	-0.45675
Std Err Dif	0.11088	DF	19.94582
Upper CL Dif	0.18068	Prob > t	0.6528
Lower CL Dif	-0.28197	Prob > t	0.6736
Confidence	0.95	Prob < t	0.3264

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3026940	0.2350575	0.2350575
Isolok - 12 mL - HF	9	0.2431180	0.2013679	0.2066933

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4862	1	23	0.4926
Brown-Forsythe	0.1806	1	23	0.6748
Levene	0.2513	1	23	0.6209
Bartlett	0.4540	1	.	0.5004
F Test 2-sided	1.5501	15	8	0.5409

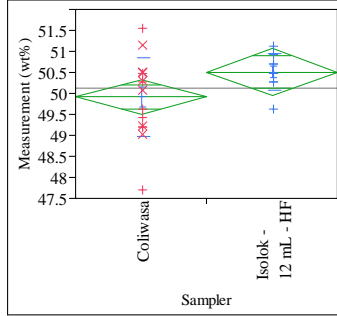
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2086	1	19.946	0.6528

t Test
0.4568

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=SiO2 (wt%), Target (wt%)=50.985



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.122113
Adj Rsquare	0.083945
Root Mean Square Error	0.803339
Mean of Response	50.12808
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.5987	t Ratio	1.788655
Std Err Dif	0.3347	DF	23
Upper CL Dif	1.2911	Prob > t	0.0869
Lower CL Dif	-0.0937	Prob > t	0.0434
Confidence	0.95	Prob < t	0.9566

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.064672	2.06467	3.1993	0.0869
Error	23	14.843136	0.64535		
C. Total	24	16.907808			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	49.9125	0.20083	49.497	50.328
Isolok - 12 mL - HF	9	50.5113	0.26778	49.957	51.065

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	49.9125	0.942972	0.23574	49.410	50.415
Isolok - 12 mL - HF	9	50.5113	0.433762	0.14459	50.178	50.845

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.59871	t Ratio	2.164909
Std Err Dif	0.27655	DF	22.45096
Upper CL Dif	1.17157	Prob > t	0.0413
Lower CL Dif	0.02584	Prob > t	0.0206
Confidence	0.95	Prob < t	0.9794

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.9429720	0.7537690	0.7353844
Isolok - 12 mL - HF	9	0.4337618	0.3116511	0.3090100

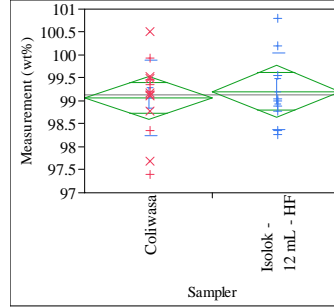
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.1577	1	23	0.1554
Brown-Forsythe	3.7816	1	23	0.0641
Levene	5.3083	1	23	0.0306
Bartlett	4.8149	1	.	0.0282
F Test 2-sided	4.7260	15	8	0.0325

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.6868	1	22.451	0.0413

t Test
2.1649

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=Sum of Oxides (wt%), Target (wt%)=99.553



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.007668
Adj Rsquare	-0.03959
Root Mean Square Error	0.826709
Mean of Response	99.1226
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.14228	t Ratio	0.402819
Std Err Dif	0.35321	DF	21
Upper CL Dif	0.87682	Prob > t	0.6912
Lower CL Dif	-0.59226	Prob > t	0.3456
Confidence	0.95	Prob < t	0.6544

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.110898	0.110898	0.1623	0.6912
Error	21	14.352390	0.683447		
C. Total	22	14.463288			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	99.0669	0.22095	98.607	99.526
Isolok - 12 mL - HF	9	99.2092	0.27557	98.636	99.782

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	99.0669	0.819638	0.21906	98.594	99.540
Isolok - 12 mL - HF	9	99.2092	0.838071	0.27936	98.565	99.853

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.14228	t Ratio	0.400784
Std Err Dif	0.35500	DF	16.925
Upper CL Dif	0.89152	Prob > t	0.6936
Lower CL Dif	-0.60696	Prob > t	0.3468
Confidence	0.95	Prob < t	0.6532

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.8196380	0.5842977	0.5630615
Isolok - 12 mL - HF	9	0.8380712	0.6483275	0.5960098

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0050	1	21	0.9445
Brown-Forsythe	0.0173	1	21	0.8966
Levene	0.0815	1	21	0.7781
Bartlett	0.0047	1	.	0.9455
F Test 2-sided	1.0455	8	13	0.9049

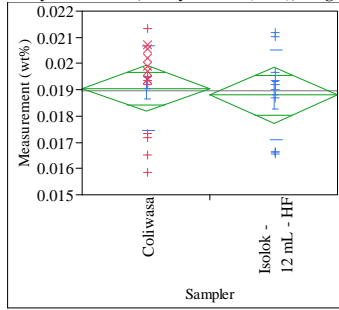
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1606	1	16.925	0.6936

t Test
0.4008

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=4, Analyte=TiO2 (wt%), Target (wt%)=0.0711



Excluded Rows

1

Oneway Anova

Summary of Fit

Rsquare	0.006915
Adj Rsquare	-0.03626
Root Mean Square Error	0.001644
Mean of Response	0.018954
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa

Assuming equal variances

Difference	-0.00027	t Ratio	-0.40019
Std Err Dif	0.00067	DF	23
Upper CL Dif	0.00112	Prob > t	0.6927
Lower CL Dif	-0.00166	Prob > t	0.6536
Confidence	0.95	Prob < t	0.3464

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000043	4.3271e-7	0.1602	0.6927
Error	23	0.00006214	2.7018e-6		
C. Total	24	0.00006257			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.019062	0.00042	0.01818	0.01994
Isolok - 12 mL - HF	10	0.018793	0.00052	0.01772	0.01987

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.019062	0.001600	0.00041	0.01818	0.01995
Isolok - 12 mL - HF	10	0.018793	0.001710	0.00054	0.01757	0.02002

t Test

Isolok - 12 mL - HF-Coliwasa

Assuming unequal variances

Difference	-0.00027	t Ratio	-0.3947
Std Err Dif	0.00068	DF	18.51901
Upper CL Dif	0.00116	Prob > t	0.6976
Lower CL Dif	-0.00170	Prob > t	0.6512
Confidence	0.95	Prob < t	0.3488

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0015999	0.0012437	0.0011320
Isolok - 12 mL - HF	10	0.0017096	0.0013337	0.0012894

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0786	1	23	0.7816
Brown-Forsythe	0.1200	1	23	0.7321
Levene	0.0529	1	23	0.8201
Bartlett	0.0465	1	.	0.8293
F Test 2-sided	1.1418	9	14	0.7949

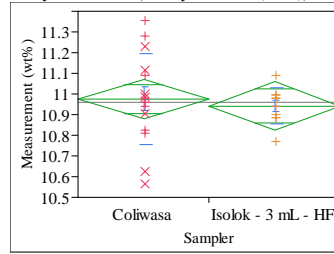
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1558	1	18.519	0.6976

t Test

0.3947

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Al2O3 (wt%), Target (wt%)=10.869



Excluded Rows

1

Oneway Anova

Summary of Fit

Rsquare	0.008778
Adj Rsquare	-0.03432
Root Mean Square Error	0.181176
Mean of Response	10.96212
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa

Assuming equal variances

Difference	-0.03338	t Ratio	-0.45131
Std Err Dif	0.07396	DF	23
Upper CL Dif	0.11963	Prob > t	0.6560
Lower CL Dif	-0.18639	Prob > t	0.6720
Confidence	0.95	Prob < t	0.3280

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00668581	0.006686	0.2037	0.6560
Error	23	0.75496856	0.032825		
C. Total	24	0.76165437			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.9755	0.04678	10.879	11.072
Isolok - 3 mL - HF	10	10.9421	0.05729	10.824	11.061

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.9755	0.221375	0.05716	10.853	11.098
Isolok - 3 mL - HF	10	10.9421	0.087477	0.02766	10.880	11.005

t Test

Isolok - 3 mL - HF-Coliwasa

Assuming unequal variances

Difference	-0.03338	t Ratio	-0.52568
Std Err Dif	0.06350	DF	19.6493
Upper CL Dif	0.09923	Prob > t	0.6050
Lower CL Dif	-0.16599	Prob > t	0.6975
Confidence	0.95	Prob < t	0.3025

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2213754	0.1614053	0.1612373
Isolok - 3 mL - HF	10	0.0874766	0.0661325	0.0661325

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.8008	1	23	0.0635
Brown-Forsythe	3.8494	1	23	0.0620
Levene	3.9088	1	23	0.0601
Bartlett	7.1628	1	.	0.0074
F Test 2-sided	6.4044	14	9	0.0083

Welch Anova testing Means Equal, allowing Std Devs Not Equal

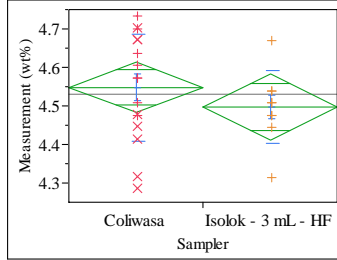
F Ratio	DFNum	DFDen	Prob > F
0.2763	1	19.649	0.6050

t Test

0.5257

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=B2O3 (wt%), Target (wt%)=4.259



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.039951
Adj Rsquare	-0.00179
Root Mean Square Error	0.125067
Mean of Response	4.529755
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.05098	t Ratio	-0.97832
Std Err Dif	0.05211	DF	23
Upper CL Dif	0.05682	Prob > t	0.3381
Lower CL Dif	-0.15878	Prob > t	0.8310
Confidence	0.95	Prob < t	0.1690

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01497104	0.014971	0.9571	0.3381
Error	23	0.35976113	0.015642		
C. Total	24	0.37473217			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.54811	0.03127	4.4834	4.6128
Isolok - 3 mL - HF	9	4.49713	0.04169	4.4109	4.5834

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.54811	0.138867	0.03472	4.4741	4.6221
Isolok - 3 mL - HF	9	4.49713	0.093875	0.03129	4.4250	4.5693

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.05098	t Ratio	-1.0908
Std Err Dif	0.04674	DF	22.02093
Upper CL Dif	0.04594	Prob > t	0.2872
Lower CL Dif	-0.14790	Prob > t	0.8564
Confidence	0.95	Prob < t	0.1436

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1388669	0.1157152	0.1126965
Isolok - 3 mL - HF	9	0.0938754	0.0620129	0.0608203

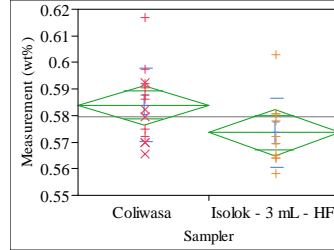
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.5396	1	23	0.2272
Brown-Forsythe	2.6680	1	23	0.1160
Levene	3.4448	1	23	0.0763
Bartlett	1.3819	1	.	0.2398
F Test 2-sided	2.1882	15	8	0.2651

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.1898	1	22.021	0.2872

t Test
1.0908

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=CaO (wt%), Target (wt%)=1.1462



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.13789
Adj Rsquare	0.098703
Root Mean Square Error	0.013434
Mean of Response	0.579619
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.01043	t Ratio	-1.87584
Std Err Dif	0.00556	DF	22
Upper CL Dif	0.00110	Prob > t	0.0740
Lower CL Dif	-0.02197	Prob > t	0.9630
Confidence	0.95	Prob < t	0.0370

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00063507	0.000635	3.5188	0.0740
Error	22	0.00397056	0.000180		
C. Total	23	0.00460563			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.583966	0.00359	0.57652	0.59141
Isolok - 3 mL - HF	10	0.573532	0.00425	0.56472	0.58234

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	0.583966	0.013793	0.00369	0.57600	0.59193
Isolok - 3 mL - HF	10	0.573532	0.012899	0.00408	0.56430	0.58276

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.01043	t Ratio	-1.89782
Std Err Dif	0.00550	DF	20.32007
Upper CL Dif	0.00102	Prob > t	0.0720
Lower CL Dif	-0.02189	Prob > t	0.9640
Confidence	0.95	Prob < t	0.0360

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0137926	0.0106939	0.0106939
Isolok - 3 mL - HF	10	0.0128991	0.0096265	0.0093746

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0337	1	22	0.8561
Brown-Forsythe	0.1430	1	22	0.7089
Levene	0.1013	1	22	0.7532
Bartlett	0.0451	1	.	0.8317
F Test 2-sided	1.1433	13	9	0.8612

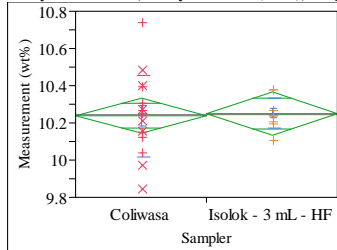
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.6017	1	20.32	0.0720

t Test
1.8978

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Fe2O3 (wt%), Target (wt%)=11.462



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.001465
Adj Rsquare	-0.04195
Root Mean Square Error	0.177945
Mean of Response	10.24294
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.01334	t Ratio	0.183684
Std Err Dif	0.07265	DF	23
Upper CL Dif	0.16362	Prob > t	0.8559
Lower CL Dif	-0.13693	Prob > t	0.4279
Confidence	0.95	Prob < t	0.5721

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00106835	0.001068	0.0337	0.8559
Error	23	0.72827857	0.031664		
C. Total	24	0.72934692			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.2376	0.04595	10.143	10.333
Isolok - 3 mL - HF	10	10.2509	0.05627	10.135	10.367

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.2376	0.218533	0.05642	10.117	10.359
Isolok - 3 mL - HF	10	10.2509	0.081436	0.02575	10.193	10.309

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01334	t Ratio	0.215141
Std Err Dif	0.06202	DF	19.14749
Upper CL Dif	0.14309	Prob > t	0.8319
Lower CL Dif	-0.11641	Prob > t	0.4160
Confidence	0.95	Prob < t	0.5840

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2185329	0.1591097	0.1591733
Isolok - 3 mL - HF	10	0.0814357	0.0571880	0.0543286

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.6496	1	23	0.1172
Brown-Forsythe	4.6872	1	23	0.0410
Levene	4.5389	1	23	0.0440
Bartlett	7.9484	1	.	0.0048
F Test 2-sided	7.2012	14	9	0.0054

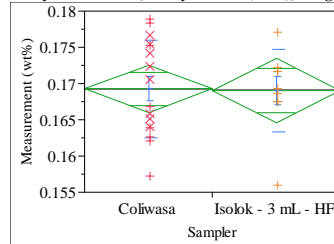
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0463	1	19.147	0.8319

t Test

0.2151

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=K2O (wt%), Target (wt%)=0.1591



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.000249
Adj Rsquare	-0.04322
Root Mean Square Error	0.006372
Mean of Response	0.169174
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00020	t Ratio	-0.07562
Std Err Dif	0.00265	DF	23
Upper CL Dif	0.00529	Prob > t	0.9404
Lower CL Dif	-0.00569	Prob > t	0.5298
Confidence	0.95	Prob < t	0.4702

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000023	2.322e-7	0.0057	0.9404
Error	23	0.00093376	0.000041		
C. Total	24	0.00093399			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.00159	0.16595	0.17254
Isolok - 3 mL - HF	9	0.169046	0.00212	0.16465	0.17344

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.169246	0.006682	0.00167	0.16569	0.17281
Isolok - 3 mL - HF	9	0.169046	0.005746	0.00192	0.16463	0.17346

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00020	t Ratio	-0.079
Std Err Dif	0.00254	DF	18.95178
Upper CL Dif	0.00512	Prob > t	0.9379
Lower CL Dif	-0.00552	Prob > t	0.5311
Confidence	0.95	Prob < t	0.4689

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0066816	0.0058724	0.0058724
Isolok - 3 mL - HF	9	0.0057456	0.0037030	0.0037476

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2841	1	23	0.5991
Brown-Forsythe	2.2818	1	23	0.1445
Levene	2.4112	1	23	0.1341
Bartlett	0.2190	1	.	0.6398
F Test 2-sided	1.3524	15	8	0.6853

Welch Anova testing Means Equal, allowing Std Devs Not Equal

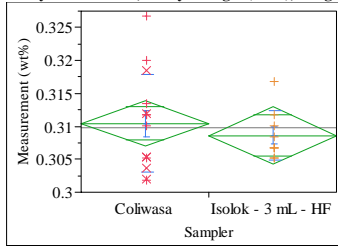
F Ratio	DFNum	DFDen	Prob > F
0.0062	1	18.952	0.9379

t Test

0.0790

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=MgO (wt%), Target (wt%)=1.014



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.021652
Adj Rsquare	-0.02494
Root Mean Square Error	0.006281
Mean of Response	0.309742
Observations (or Sum Wgts)	23

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00183	t Ratio	-0.68173
Std Err Dif	0.00268	DF	21
Upper CL Dif	0.00375	Prob > t	0.5029
Lower CL Dif	-0.00741	Prob > t	0.7486
Confidence	0.95	Prob < t	0.2514

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001833	0.000018	0.4648	0.5029
Error	21	0.00082841	0.000039		
C. Total	22	0.00084675			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.310457	0.00168	0.30697	0.31395
Isolok - 3 mL - HF	9	0.308628	0.00209	0.30427	0.31298

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	0.310457	0.007421	0.00198	0.30617	0.31474
Isolok - 3 mL - HF	9	0.308628	0.003749	0.00125	0.30575	0.31151

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00183	t Ratio	-0.78037
Std Err Dif	0.00234	DF	20.19781
Upper CL Dif	0.00306	Prob > t	0.4442
Lower CL Dif	-0.00672	Prob > t	0.7779
Confidence	0.95	Prob < t	0.2221

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0074212	0.0058040	0.0058040
Isolok - 3 mL - HF	9	0.0037490	0.0028253	0.0025796

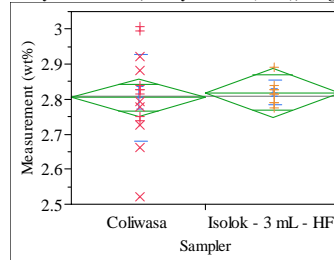
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.3623	1	21	0.1392
Brown-Forsythe	3.6180	1	21	0.0710
Levene	3.5823	1	21	0.0723
Bartlett	3.7262	1	.	0.0536
F Test 2-sided	3.9184	13	8	0.0596

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6090	1	20.198	0.4442

t Test
0.7804

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=MnO (wt%), Target (wt%)=1.779



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.005283
Adj Rsquare	-0.03993
Root Mean Square Error	0.101535
Mean of Response	2.809974
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.01463	t Ratio	0.34182
Std Err Dif	0.04281	DF	22
Upper CL Dif	0.10342	Prob > t	0.7357
Lower CL Dif	-0.07415	Prob > t	0.3679
Confidence	0.95	Prob < t	0.6321

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00120455	0.001205	0.1168	0.7357
Error	22	0.22680554	0.010309		
C. Total	23	0.22801009			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	2.80449	0.02622	2.7501	2.8589
Isolok - 3 mL - HF	9	2.81912	0.03384	2.7489	2.8893

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	2.80449	0.124538	0.03216	2.7355	2.8735
Isolok - 3 mL - HF	9	2.81912	0.034767	0.01159	2.7924	2.8458

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01463	t Ratio	0.428132
Std Err Dif	0.03418	DF	17.36051
Upper CL Dif	0.08663	Prob > t	0.6738
Lower CL Dif	-0.05737	Prob > t	0.3369
Confidence	0.95	Prob < t	0.6631

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1245379	0.0902118	0.0903840
Isolok - 3 mL - HF	9	0.0347666	0.0248676	0.0243893

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7590	1	22	0.1109
Brown-Forsythe	5.3444	1	22	0.0305
Levene	5.3283	1	22	0.0308
Bartlett	10.8825	1	.	0.0010
F Test 2-sided	12.8315	14	8	0.0011

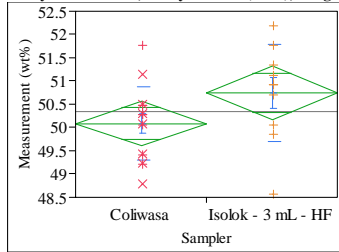
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1833	1	17.361	0.6738

t Test
0.4281

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=SiO2 (wt%), Target (wt%)=50.985



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.122731
Adj Rsquare	0.084589
Root Mean Square Error	0.895859
Mean of Response	50.35056
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.6561	t Ratio	1.7938
Std Err Dif	0.3657	DF	23
Upper CL Dif	1.4126	Prob > t	0.0860
Lower CL Dif	-0.1005	Prob > t	0.0430
Confidence	0.95	Prob < t	0.9570

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.582425	2.58243	3.2177	0.0860
Error	23	18.458971	0.80256		
C. Total	24	21.041397			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	50.0881	0.23131	49.610	50.567
Isolok - 3 mL - HF	10	50.7442	0.28330	50.158	51.330

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	50.0881	0.78755	0.20335	49.652	50.524
Isolok - 3 mL - HF	10	50.7442	1.04220	0.32957	49.999	51.490

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.6561	t Ratio	1.694103
Std Err Dif	0.3873	DF	15.69447
Upper CL Dif	1.4783	Prob > t	0.1100
Lower CL Dif	-0.1662	Prob > t	0.0550
Confidence	0.95	Prob < t	0.9450

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.787552	0.5971024	0.5847420
Isolok - 3 mL - HF	10	1.042200	0.7615908	0.7273620

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7794	1	23	0.3865
Brown-Forsythe	0.3172	1	23	0.5787
Levene	0.5107	1	23	0.4820
Bartlett	0.8452	1	.	0.3579
F Test 2-sided	1.7512	9	14	0.3350

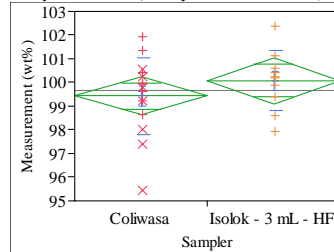
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.8700	1	15.694	0.1100

t Test

1.6941

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=Sum of Oxides (wt%), Target (wt%)=99.553



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.046943
Adj Rsquare	0.005506
Root Mean Square Error	1.489953
Mean of Response	99.68861
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.6474	t Ratio	1.064366
Std Err Dif	0.6083	DF	23
Upper CL Dif	1.9057	Prob > t	0.2982
Lower CL Dif	-0.6109	Prob > t	0.1491
Confidence	0.95	Prob < t	0.8509

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.514938	2.51494	1.1329	0.2982
Error	23	51.059087	2.21996		
C. Total	24	53.574025			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	99.430	0.38470	98.634	100.23
Isolok - 3 mL - HF	10	100.077	0.47116	99.102	101.05

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	99.430	1.62118	0.41859	98.532	100.33
Isolok - 3 mL - HF	10	100.077	1.25893	0.39811	99.176	100.98

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.6474	t Ratio	1.120745
Std Err Dif	0.5777	DF	22.34377
Upper CL Dif	1.8444	Prob > t	0.2743
Lower CL Dif	-0.5495	Prob > t	0.1371
Confidence	0.95	Prob < t	0.8629

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	1.621175	1.176262	1.139670
Isolok - 3 mL - HF	10	1.258930	0.905929	0.885656

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4114	1	23	0.5276
Brown-Forsythe	0.3464	1	23	0.5619
Levene	0.4564	1	23	0.5061
Bartlett	0.6396	1	.	0.4238
F Test 2-sided	1.6583	14	9	0.4496

Welch Anova testing Means Equal, allowing Std Devs Not Equal

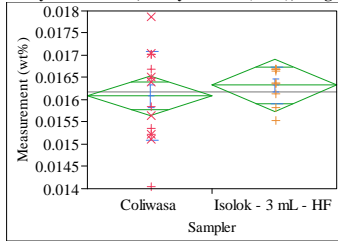
F Ratio	DFNum	DFDen	Prob > F
1.2561	1	22.344	0.2743

t Test

1.1207

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=5, Analyte=TiO2 (wt%), Target (wt%)=0.0711



Excluded Rows

2

Oneway Anova Summary of Fit

Rsquare	0.020161
Adj Rsquare	-0.02438
Root Mean Square Error	0.000836
Mean of Response	0.016174
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00024	t Ratio	0.672802
Std Err Dif	0.00035	DF	22
Upper CL Dif	0.00097	Prob > t	0.5081
Lower CL Dif	-0.00049	Prob > t	0.2540
Confidence	0.95	Prob < t	0.7460

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000032	3.1656e-7	0.4527	0.5081
Error	22	0.00001539	6.9932e-7		
C. Total	23	0.00001570			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.016085	0.00022	0.01564	0.01653
Isolok - 3 mL - HF	9	0.016322	0.00028	0.01574	0.01690

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.016085	0.000999	0.00026	0.01553	0.01664
Isolok - 3 mL - HF	9	0.016322	0.000419	0.00014	0.01600	0.01664

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00024	t Ratio	0.80865
Std Err Dif	0.00029	DF	20.3422
Upper CL Dif	0.00085	Prob > t	0.4281
Lower CL Dif	-0.00037	Prob > t	0.2140
Confidence	0.95	Prob < t	0.7860

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0009994	0.0008325	0.0008195
Isolok - 3 mL - HF	9	0.0004187	0.0003287	0.0003206

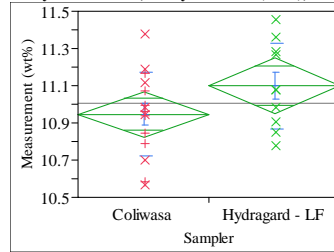
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.5239	1	22	0.0738
Brown-Forsythe	5.3774	1	22	0.0301
Levene	7.8218	1	22	0.0105
Bartlett	5.7883	1	.	0.0161
F Test 2-sided	5.6979	14	8	0.0185

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6539	1	20.342	0.4281

t Test
0.8087

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Al2O3 (wt%), Target (wt%)=10.869



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.10478
Adj Rsquare	0.065857
Root Mean Square Error	0.227551
Mean of Response	11.00747
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.15242	t Ratio	1.640733
Std Err Dif	0.09290	DF	23
Upper CL Dif	0.34459	Prob > t	0.1145
Lower CL Dif	-0.03975	Prob > t	0.0572
Confidence	0.95	Prob < t	0.9428

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1393905	0.139391	2.6920	0.1145
Error	23	1.1909269	0.051779		
C. Total	24	1.3303175			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.9465	0.05875	10.825	11.068
Hydragard - LF	10	11.0989	0.07196	10.950	11.248

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.9465	0.226027	0.05836	10.821	11.072
Hydragard - LF	10	11.0989	0.229902	0.07270	10.934	11.263

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.15242	t Ratio	1.634922
Std Err Dif	0.09323	DF	19.20852
Upper CL Dif	0.34740	Prob > t	0.1183
Lower CL Dif	-0.04256	Prob > t	0.0592
Confidence	0.95	Prob < t	0.9408

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2260266	0.1696351	0.1700550
Hydragard - LF	10	0.2299021	0.1904616	0.1851710

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0051	1	23	0.9439
Brown-Forsythe	0.0744	1	23	0.7875
Levene	0.1510	1	23	0.7012
Bartlett	0.0030	1	.	0.9561
F Test 2-sided	1.0346	9	14	0.9208

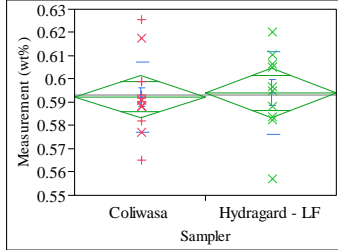
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.6730	1	19.209	0.1183

t Test
1.6349

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=CaO (wt%), Target (wt%)=1.1462



Excluded Rows

2

**Oneway Anova
Summary of Fit**

Rsquare	0.003029
Adj Rsquare	-0.04229
Root Mean Square Error	0.016245
Mean of Response	0.593086
Observations (or Sum Wgts)	24

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00174	t Ratio	0.258543
Std Err Dif	0.00673	DF	22
Upper CL Dif	0.01569	Prob > t	0.7984
Lower CL Dif	-0.01221	Prob > t	0.3992
Confidence	0.95	Prob < t	0.6008

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001764	0.000018	0.0668	0.7984
Error	22	0.00580596	0.000264		
C. Total	23	0.00582360			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.592361	0.00434	0.58336	0.60137
Hydragard - LF	10	0.594100	0.00514	0.58345	0.60475

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	0.592361	0.015076	0.00403	0.58366	0.60107
Hydragard - LF	10	0.594100	0.017799	0.00563	0.58137	0.60683

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00174	t Ratio	0.251225
Std Err Dif	0.00692	DF	17.4203
Upper CL Dif	0.01632	Prob > t	0.8046
Lower CL Dif	-0.01284	Prob > t	0.4023
Confidence	0.95	Prob < t	0.5977

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0150759	0.0102370	0.0098943
Hydragard - LF	10	0.0177991	0.0132644	0.0131525

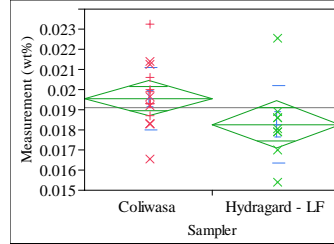
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2390	1	22	0.6298
Brown-Forsythe	0.4915	1	22	0.4906
Levene	0.4560	1	22	0.5065
Bartlett	0.2844	1	.	0.5938
F Test 2-sided	1.3939	9	13	0.5680

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0631	1	17.42	0.8046

t Test
0.2512

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Cr2O3 (wt%), Target (wt%)=0.0998



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.127524
Adj Rsquare	0.08959
Root Mean Square Error	0.001686
Mean of Response	0.019094
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00129	t Ratio	-1.83351
Std Err Dif	0.00070	DF	23
Upper CL Dif	0.00017	Prob > t	0.0797
Lower CL Dif	-0.00274	Prob > t	0.9601
Confidence	0.95	Prob < t	0.0399

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000956	9.556e-6	3.3617	0.0797
Error	23	0.00006538	2.8426e-6		
C. Total	24	0.00007494			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.019558	0.00042	0.01869	0.02043
Hydragard - LF	9	0.018270	0.00056	0.01711	0.01943

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.019558	0.001553	0.00039	0.01873	0.02039
Hydragard - LF	9	0.018270	0.001911	0.00064	0.01680	0.01974

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00129	t Ratio	-1.72655
Std Err Dif	0.00075	DF	14.01103
Upper CL Dif	0.00031	Prob > t	0.1062
Lower CL Dif	-0.00289	Prob > t	0.9469
Confidence	0.95	Prob < t	0.0531

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0015525	0.0011202	0.0010871
Hydragard - LF	9	0.0019113	0.0012018	0.0011855

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2905	1	23	0.5951
Brown-Forsythe	0.0359	1	23	0.8513
Levene	0.0273	1	23	0.8702
Bartlett	0.4454	1	.	0.5045
F Test 2-sided	1.5156	8	15	0.4643

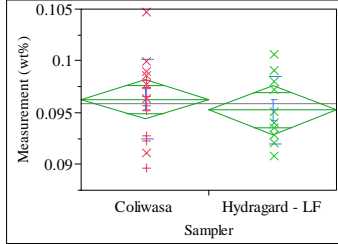
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.9810	1	14.011	0.1062

t Test
1.7266

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=CuO (wt%), Target (wt%)=0.0504



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.021725
Adj Rsquare	-0.02081
Root Mean Square Error	0.003604
Mean of Response	0.095868
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00105	t Ratio	-0.71468
Std Err Dif	0.00147	DF	23
Upper CL Dif	0.00199	Prob > t	0.4820
Lower CL Dif	-0.00410	Prob > t	0.7590
Confidence	0.95	Prob < t	0.2410

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000663	6.634e-6	0.5108	0.4820
Error	23	0.00029873	0.000013		
C. Total	24	0.00030537			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.096288	0.00093	0.09436	0.09821
Hydragard - LF	10	0.095237	0.00114	0.09288	0.09759

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.096288	0.003816	0.00099	0.09418	0.09840
Hydragard - LF	10	0.095237	0.003246	0.00103	0.09291	0.09756

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00105	t Ratio	-0.739
Std Err Dif	0.00142	DF	21.49555
Upper CL Dif	0.00190	Prob > t	0.4679
Lower CL Dif	-0.00401	Prob > t	0.7660
Confidence	0.95	Prob < t	0.2340

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0038164	0.0028441	0.0028458
Hydragard - LF	10	0.0032460	0.0027239	0.0026789

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2852	1	23	0.5984
Brown-Forsythe	0.0342	1	23	0.8550
Levene	0.0193	1	23	0.8907
Bartlett	0.2670	1	.	0.6054
F Test 2-sided	1.3823	14	9	0.6364

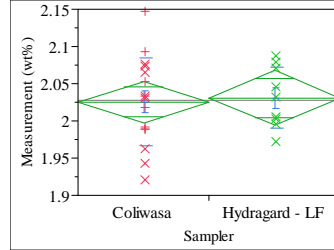
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5461	1	21.496	0.4679

t Test

0.7390

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Fe/Li, Target (wt%)=2.452



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.002456
Adj Rsquare	-0.04092
Root Mean Square Error	0.053661
Mean of Response	2.027543
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00532	t Ratio	0.237986
Std Err Dif	0.02236	DF	23
Upper CL Dif	0.05157	Prob > t	0.8140
Lower CL Dif	-0.04093	Prob > t	0.4070
Confidence	0.95	Prob < t	0.5930

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00016309	0.000163	0.0566	0.8140
Error	23	0.06622922	0.002880		
C. Total	24	0.06639231			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.02563	0.01342	1.9979	2.0534
Hydragard - LF	9	2.03095	0.01789	1.9939	2.0680

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.02563	0.059283	0.01482	1.9940	2.0572
Hydragard - LF	9	2.03095	0.041098	0.01370	1.9994	2.0625

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00532	t Ratio	0.263652
Std Err Dif	0.02018	DF	21.77607
Upper CL Dif	0.04720	Prob > t	0.7945
Lower CL Dif	-0.03656	Prob > t	0.3973
Confidence	0.95	Prob < t	0.6027

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0592829	0.0460802	0.0456218
Hydragard - LF	9	0.0410980	0.0342428	0.0357353

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2139	1	23	0.2820
Brown-Forsythe	0.5884	1	23	0.4508
Levene	0.8554	1	23	0.3646
Bartlett	1.2187	1	.	0.2696
F Test 2-sided	2.0807	15	8	0.2971

Welch Anova testing Means Equal, allowing Std Devs Not Equal

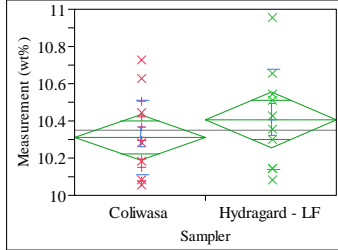
F Ratio	DFNum	DFDen	Prob > F
0.0695	1	21.776	0.7945

t Test

0.2637

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Fe2O3 (wt%), Target (wt%)=11.462



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.042256
Adj Rsquare	0.000615
Root Mean Square Error	0.230606
Mean of Response	10.34988
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.09484	t Ratio	1.007353
Std Err Dif	0.09414	DF	23
Upper CL Dif	0.28959	Prob > t	0.3242
Lower CL Dif	-0.09992	Prob > t	0.1621
Confidence	0.95	Prob < t	0.8379

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0539641	0.053964	1.0148	0.3242
Error	23	1.2231207	0.053179		
C. Total	24	1.2770848			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.3119	0.05954	10.189	10.435
Hydragard - LF	10	10.4068	0.07292	10.256	10.558

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.3119	0.201790	0.05210	10.200	10.424
Hydragard - LF	10	10.4068	0.269372	0.08518	10.214	10.599

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.09484	t Ratio	0.949758
Std Err Dif	0.09985	DF	15.59091
Upper CL Dif	0.30697	Prob > t	0.3567
Lower CL Dif	-0.11730	Prob > t	0.1784
Confidence	0.95	Prob < t	0.8216

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.2017902	0.1608889	0.1572670
Hydragard - LF	10	0.2693719	0.2073065	0.2073065

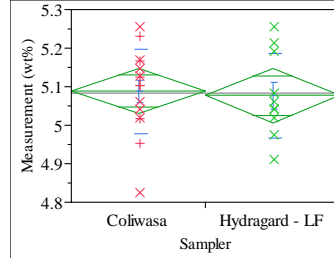
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0237	1	23	0.3222
Brown-Forsythe	0.8012	1	23	0.3800
Levene	0.7340	1	23	0.4004
Bartlett	0.8990	1	.	0.3431
F Test 2-sided	1.7820	9	14	0.3208

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9020	1	15.591	0.3567

t Test
0.9498

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Li2O (wt%), Target (wt%)=4.674



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.002851
Adj Rsquare	-0.0405
Root Mean Square Error	0.109679
Mean of Response	5.083427
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.01148	t Ratio	-0.25643
Std Err Dif	0.04478	DF	23
Upper CL Dif	0.08114	Prob > t	0.7999
Lower CL Dif	-0.10411	Prob > t	0.6001
Confidence	0.95	Prob < t	0.3999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00079104	0.000791	0.0658	0.7999
Error	23	0.27667731	0.012029		
C. Total	24	0.27746835			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	5.08802	0.02832	5.0294	5.1466
Hydragard - LF	10	5.07654	0.03468	5.0048	5.1483

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	5.08802	0.109978	0.02840	5.0271	5.1489
Hydragard - LF	10	5.07654	0.109212	0.03454	4.9984	5.1547

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.01148	t Ratio	-0.25681
Std Err Dif	0.04471	DF	19.54083
Upper CL Dif	0.08192	Prob > t	0.8000
Lower CL Dif	-0.10489	Prob > t	0.6000
Confidence	0.95	Prob < t	0.4000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1099777	0.0832455	0.0803749
Hydragard - LF	10	0.1092124	0.0852548	0.0818102

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0005	1	23	0.9821
Brown-Forsythe	0.0023	1	23	0.9622
Levene	0.0056	1	23	0.9412
Bartlett	0.0005	1	.	0.9820
F Test 2-sided	1.0141	14	9	1.0000

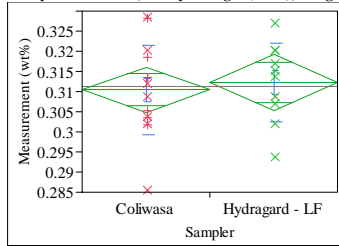
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0660	1	19.541	0.8000

t Test
0.2568

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=MgO (wt%), Target (wt%)=1.014



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.007612
Adj Rsquare	-0.03554
Root Mean Square Error	0.010638
Mean of Response	0.311163
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00182	t Ratio	0.420022
Std Err Dif	0.00434	DF	23
Upper CL Dif	0.01081	Prob > t	0.6784
Lower CL Dif	-0.00716	Prob > t	0.3392
Confidence	0.95	Prob < t	0.6608

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001996	0.000020	0.1764	0.6784
Error	23	0.00260284	0.000113		
C. Total	24	0.00262280			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.310434	0.00275	0.30475	0.31612
Hydragard - LF	10	0.312258	0.00336	0.30530	0.31922

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.310434	0.011145	0.00288	0.30426	0.31661
Hydragard - LF	10	0.312258	0.009797	0.00310	0.30525	0.31927

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00182	t Ratio	0.431408
Std Err Dif	0.00423	DF	21.12258
Upper CL Dif	0.01061	Prob > t	0.6705
Lower CL Dif	-0.00697	Prob > t	0.3353
Confidence	0.95	Prob < t	0.6647

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0111454	0.0084905	0.0085126
Hydragard - LF	10	0.0097966	0.0076945	0.0074623

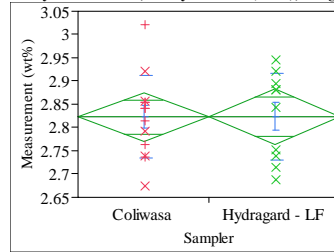
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1576	1	23	0.6950
Brown-Forsythe	0.1481	1	23	0.7039
Levene	0.0941	1	23	0.7618
Bartlett	0.1706	1	.	0.6796
F Test 2-sided	1.2943	14	9	0.7122

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1861	1	21.123	0.6705

t Test
0.4314

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=MnO (wt%), Target (wt%)=1.779



Excluded Rows

3

**Oneway Anova
Summary of Fit**

Rsquare	0.000039
Adj Rsquare	-0.04758
Root Mean Square Error	0.090742
Mean of Response	2.823237
Observations (or Sum Wgts)	23

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00109	t Ratio	0.028625
Std Err Dif	0.03817	DF	21
Upper CL Dif	0.08047	Prob > t	0.9774
Lower CL Dif	-0.07828	Prob > t	0.4887
Confidence	0.95	Prob < t	0.5113

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000675	6.747e-6	0.0008	0.9774
Error	21	0.17291787	0.008234		
C. Total	22	0.17292462			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	13	2.82276	0.02517	2.7704	2.8751
Hydragard - LF	10	2.82385	0.02870	2.7642	2.8835

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	13	2.82276	0.088448	0.02453	2.7693	2.8762
Hydragard - LF	10	2.82385	0.093715	0.02964	2.7568	2.8909

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00109	t Ratio	0.028399
Std Err Dif	0.03847	DF	18.90289
Upper CL Dif	0.08164	Prob > t	0.9776
Lower CL Dif	-0.07946	Prob > t	0.4888
Confidence	0.95	Prob < t	0.5112

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	13	0.0884477	0.0649420	0.0635668
Hydragard - LF	10	0.0937146	0.0821203	0.0787632

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0441	1	21	0.8356
Brown-Forsythe	0.3627	1	21	0.5535
Levene	0.6915	1	21	0.4150
Bartlett	0.0330	1	.	0.8559
F Test 2-sided	1.1226	9	12	0.8324

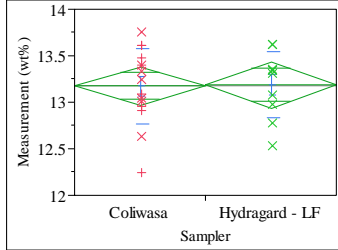
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0008	1	18.903	0.9776

t Test
0.0284

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Na2O (wt%), Target (wt%)=11.659



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.000171
Adj Rsquare	-0.0433
Root Mean Square Error	0.385613
Mean of Response	13.1802
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00989	t Ratio	0.062794
Std Err Dif	0.15743	DF	23
Upper CL Dif	0.33555	Prob > t	0.9505
Lower CL Dif	-0.31577	Prob > t	0.4752
Confidence	0.95	Prob < t	0.5248

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0005863	0.000586	0.0039	0.9505
Error	23	3.4200320	0.148697		
C. Total	24	3.4206183			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	13.1763	0.09956	12.970	13.382
Hydragard - LF	10	13.1861	0.12194	12.934	13.438

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	13.1763	0.404524	0.10445	12.952	13.400
Hydragard - LF	10	13.1861	0.354193	0.11201	12.933	13.440

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00989	t Ratio	0.064547
Std Err Dif	0.15315	DF	21.16811
Upper CL Dif	0.32822	Prob > t	0.9491
Lower CL Dif	-0.30845	Prob > t	0.4746
Confidence	0.95	Prob < t	0.5254

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.4045241	0.3186073	0.3199253
Hydragard - LF	10	0.3541933	0.2852368	0.2615120

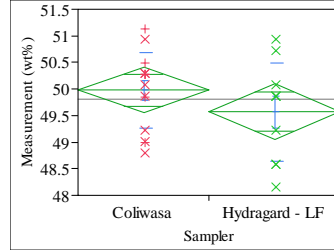
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1784	1	23	0.6766
Brown-Forsythe	0.3275	1	23	0.5727
Levene	0.1418	1	23	0.7100
Bartlett	0.1809	1	.	0.6706
F Test 2-sided	1.3044	14	9	0.7030

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0042	1	21.168	0.9491

t Test
0.0645

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=SiO2 (wt%), Target (wt%)=50.985



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.063082
Adj Rsquare	0.022347
Root Mean Square Error	0.80008
Mean of Response	49.81146
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.4065	t Ratio	-1.24442
Std Err Dif	0.3266	DF	23
Upper CL Dif	0.2692	Prob > t	0.2259
Lower CL Dif	-1.0822	Prob > t	0.8871
Confidence	0.95	Prob < t	0.1129

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.991293	0.991293	1.5486	0.2259
Error	23	14.722937	0.640128		
C. Total	24	15.714229			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	49.9740	0.20658	49.547	50.401
Hydragard - LF	10	49.5676	0.25301	49.044	50.091

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	49.9740	0.703975	0.18177	49.584	50.364
Hydragard - LF	10	49.5676	0.930042	0.29411	48.902	50.233

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.4065	t Ratio	-1.17564
Std Err Dif	0.3457	DF	15.71448
Upper CL Dif	0.3276	Prob > t	0.2572
Lower CL Dif	-1.1405	Prob > t	0.8714
Confidence	0.95	Prob < t	0.1286

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.7039751	0.5590704	0.5276940
Hydragard - LF	10	0.9300421	0.7615908	0.7059690

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5737	1	23	0.2223
Brown-Forsythe	0.5710	1	23	0.4575
Levene	1.3367	1	23	0.2595
Bartlett	0.8351	1	.	0.3608
F Test 2-sided	1.7454	9	14	0.3378

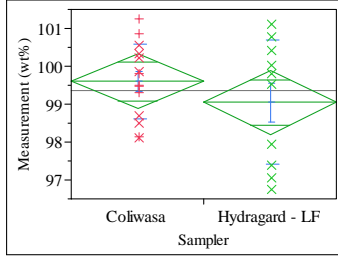
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.3821	1	15.714	0.2572

t Test
1.1756

Exhibit B3. Statistical Comparisons for High-Rheology (Phase 2) Simulant Testing (screened data)

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=Sum of Oxides (wt%), Target (wt%)=99.553



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.045797
Adj Rsquare	0.002424
Root Mean Square Error	1.294031
Mean of Response	99.37305
Observations (or Sum Wgts)	24

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.5505	t Ratio	-1.02756
Std Err Dif	0.5358	DF	22
Upper CL Dif	0.5606	Prob > t	0.3153
Lower CL Dif	-1.6617	Prob > t	0.8423
Confidence	0.95	Prob < t	0.1577

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.768094	1.76809	1.0559	0.3153
Error	22	36.839350	1.67452		
C. Total	23	38.607444			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	99.6024	0.34584	98.885	100.32
Hydragard - LF	10	99.0519	0.40921	98.203	99.90

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	99.6024	0.99149	0.26499	99.030	100.17
Hydragard - LF	10	99.0519	1.63502	0.51704	97.882	100.22

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.5505	t Ratio	-0.9476
Std Err Dif	0.5810	DF	13.69479
Upper CL Dif	0.6982	Prob > t	0.3598
Lower CL Dif	-1.7993	Prob > t	0.8201
Confidence	0.95	Prob < t	0.1799

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.991491	0.794837	0.794837
Hydragard - LF	10	1.635021	1.437241	1.345209

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	6.9422	1	22	0.0151
Brown-Forsythe	2.8796	1	22	0.1038
Levene	7.2173	1	22	0.0135
Bartlett	2.5908	1	.	0.1075
F Test 2-sided	2.7194	9	13	0.0994

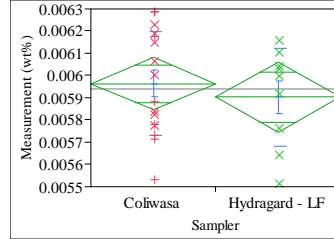
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8980	1	13.695	0.3598

t Test

0.9476

Oneway Analysis of Measurement (wt%) By Sampler Type of Material=SME Simulant, Analytical Block=6, Analyte=ZnO (wt%), Target (wt%)=0.0958



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.017275
Adj Rsquare	-0.02545
Root Mean Square Error	0.00023
Mean of Response	0.005942
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-6.1e-5	t Ratio	-0.63585
Std Err Dif	0.000096	DF	23
Upper CL Dif	0.00014	Prob > t	0.5311
Lower CL Dif	-0.00026	Prob > t	0.7344
Confidence	0.95	Prob < t	0.2656

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.14539e-8	2.1454e-8	4.4043	0.5311
Error	23	1.22045e-6	5.3063e-8		
C. Total	24	1.24191e-6			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.005964	5.76e-5	0.00585	0.00608
Hydragard - LF	9	0.005903	7.68e-5	0.00574	0.00606

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.005964	0.000235	5.88e-5	0.00584	0.00609
Hydragard - LF	9	0.005903	0.000221	7.36e-5	0.00573	0.00607

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-6.1e-5	t Ratio	-0.64761
Std Err Dif	9.424e-5	DF	17.6337
Upper CL Dif	0.00014	Prob > t	0.5256
Lower CL Dif	-0.00026	Prob > t	0.7372
Confidence	0.95	Prob < t	0.2628

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0002352	0.0002062	0.0002062
Hydragard - LF	9	0.0002209	0.0001789	0.0001701

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0833	1	23	0.7755
Brown-Forsythe	0.4737	1	23	0.4982
Levene	0.3909	1	23	0.5380
Bartlett	0.0387	1	.	0.8440
F Test 2-sided	1.1339	15	8	0.8938

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4194	1	17.634	0.5256

t Test

0.6476

Appendix C.

Supplemental Tables and Exhibits for Low-Rheology (Phase 3) Simulant Testing

Table C1. Density Measurements for Phase 3

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	Sample Density (g/mL)
Coliwasa	LF	Coliwasa Low	DCL01	1.2453
Coliwasa	LF	Coliwasa Low	DCL02	1.2620
Coliwasa	LF	Coliwasa Low	DCL03	1.2604
Coliwasa	LF	Coliwasa Low	DCL04	1.2621
Coliwasa	HF	Coliwasa Low	DCL05	1.2453
Coliwasa	HF	Coliwasa Low	DCL06	1.2643
Coliwasa	HF	Coliwasa Low	DCL07	1.2655
Coliwasa	HF	Coliwasa Low	DCL08	1.2683
Coliwasa	LF	Coliwasa High	DCH01	1.2608
Coliwasa	LF	Coliwasa High	DCH02	1.2610
Coliwasa	LF	Coliwasa High	DCH03	1.2666
Coliwasa	LF	Coliwasa High	DCH04	1.2445
Coliwasa	HF	Coliwasa High	DCH05	1.2366
Coliwasa	HF	Coliwasa High	DCH06	1.2429
Coliwasa	HF	Coliwasa High	DCH07	1.2428
Coliwasa	HF	Coliwasa High	DCH08	1.2486
Hydragard	LF	Hydragard	DLHY01	1.2456
Hydragard	LF	Hydragard	DLHY02	1.2582
Hydragard	LF	Hydragard	DLHY03	1.2394
Hydragard	LF	Hydragard	DLHY04	1.2510
Hydragard	LF	Hydragard	DLHY05	1.2466
Hydragard	LF	Hydragard	DLHY06	1.2399
Hydragard	LF	Hydragard	DLHY07	1.2456
Hydragard	LF	Hydragard	DLHY08	1.2453
Hydragard	LF	Hydragard	DLHY09	1.2576
Hydragard	LF	Hydragard	DLHY10	1.2720
Hydragard	HF	Hydragard	DHHY01	1.2659
Hydragard	HF	Hydragard	DHHY02	1.2552
Hydragard	HF	Hydragard	DHHY03	1.2629
Hydragard	HF	Hydragard	DHHY04	1.2505
Hydragard	HF	Hydragard	DHHY05	1.2400
Hydragard	HF	Hydragard	DHHY06	1.2476
Hydragard	HF	Hydragard	DHHY07	1.2550
Hydragard	HF	Hydragard	DHHY08	1.2545
Hydragard	HF	Hydragard	DHHY09	1.2544
Hydragard	HF	Hydragard	DHHY10	1.2586
Isolok	LF	Isolok	DLIB01	1.2596
Isolok	LF	Isolok	DLIB02	1.2585
Isolok	LF	Isolok	DLIB03	1.2512
Isolok	LF	Isolok	DLIB04	1.2754
Isolok	LF	Isolok	DLIB05	1.2616
Isolok	LF	Isolok	DLIB06	1.2680
Isolok	LF	Isolok	DLIB07	1.2446
Isolok	LF	Isolok	DLIB08	1.2439
Isolok	LF	Isolok	DLIB09	1.2521
Isolok	LF	Isolok	DLIB10	1.2566
Isolok	HF	Isolok	DHIB01	1.2510
Isolok	HF	Isolok	DHIB02	1.2578
Isolok	HF	Isolok	DHIB03	1.2478
Isolok	HF	Isolok	DHIB04	1.2524
Isolok	HF	Isolok	DHIB05	1.2441
Isolok	HF	Isolok	DHIB06	1.2555
Isolok	HF	Isolok	DHIB07	1.2510
Isolok	HF	Isolok	DHIB08	1.2351
Isolok	HF	Isolok	DHIB09	1.2496
Isolok	HF	Isolok	DHIB10	1.2588

Table C2. Solids Measurements for Phase 3

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	wt% dried solids	wt% vitrified solids
Coliwasa	LF	Coliwasa Low	CL01	31.45	26.65
Coliwasa	LF	Coliwasa Low	CL02	31.55	26.75
Coliwasa	LF	Coliwasa Low	CL03	31.57	26.78
Coliwasa	LF	Coliwasa Low	CL04	31.48	26.67
Coliwasa	HF	Coliwasa Low	CL05	31.77	27.00
Coliwasa	HF	Coliwasa Low	CL06	31.51	26.71
Coliwasa	HF	Coliwasa Low	CL07	31.71	26.92
Coliwasa	HF	Coliwasa Low	CL08	31.70	26.90
Coliwasa	LF	Coliwasa High	CH01	31.52	26.72
Coliwasa	LF	Coliwasa High	CH02	31.54	26.74
Coliwasa	LF	Coliwasa High	CH03	31.59	26.82
Coliwasa	LF	Coliwasa High	CH04	31.40	26.60
Coliwasa	HF	Coliwasa High	CH05	31.41	26.62
Coliwasa	HF	Coliwasa High	CH06	31.62	26.82
Coliwasa	HF	Coliwasa High	CH07	31.61	26.82
Coliwasa	HF	Coliwasa High	CH08	31.67	26.86
Hydragard	LF	Hydragard	LHY01	30.83	25.98
Hydragard	LF	Hydragard	LHY02	31.02	26.16
Hydragard	LF	Hydragard	LHY03	30.91	26.01
Hydragard	LF	Hydragard	LHY04	30.74	25.85
Hydragard	LF	Hydragard	LHY05	30.85	25.99
Hydragard	LF	Hydragard	LHY06	30.83	25.98
Hydragard	LF	Hydragard	LHY07	31.03	26.14
Hydragard	LF	Hydragard	LHY08	30.87	25.92
Hydragard	LF	Hydragard	LHY09	30.68	25.77
Hydragard	LF	Hydragard	LHY10	30.90	26.00
Hydragard	HF	Hydragard	HHY01	30.94	26.17
Hydragard	HF	Hydragard	HHY02	30.67	25.81
Hydragard	HF	Hydragard	HHY03	30.76	25.91
Hydragard	HF	Hydragard	HHY04	30.85	26.04
Hydragard	HF	Hydragard	HHY05	30.70	25.88
Hydragard	HF	Hydragard	HHY06	30.78	25.91
Hydragard	HF	Hydragard	HHY07	30.75	25.88
Hydragard	HF	Hydragard	HHY08	30.87	26.03
Hydragard	HF	Hydragard	HHY09	30.60	25.72
Hydragard	HF	Hydragard	HHY10	30.59	25.73
Isolok (3 mL)	LF	Isolok (3 mL)	LIS01	31.73	26.83
Isolok (3 mL)	LF	Isolok (3 mL)	LIS02	31.43	26.73
Isolok (3 mL)	LF	Isolok (3 mL)	LIS03	31.56	26.88
Isolok (3 mL)	LF	Isolok (3 mL)	LIS04	31.51	26.74
Isolok (3 mL)	LF	Isolok (3 mL)	LIS05	31.58	27.00
Isolok (3 mL)	LF	Isolok (3 mL)	LIS06	31.61	26.83
Isolok (3 mL)	LF	Isolok (3 mL)	LIS07	31.92	27.05
Isolok (3 mL)	LF	Isolok (3 mL)	LIS08	31.50	26.61
Isolok (3 mL)	LF	Isolok (3 mL)	LIS09	31.64	26.80
Isolok (3 mL)	LF	Isolok (3 mL)	LIS10	31.69	26.88
Isolok (3 mL)	HF	Isolok (3 mL)	HIS01	31.62	27.23
Isolok (3 mL)	HF	Isolok (3 mL)	HIS02	31.35	26.65
Isolok (3 mL)	HF	Isolok (3 mL)	HIS03	31.37	26.76
Isolok (3 mL)	HF	Isolok (3 mL)	HIS04	31.70	27.09
Isolok (3 mL)	HF	Isolok (3 mL)	HIS05	31.37	26.74
Isolok (3 mL)	HF	Isolok (3 mL)	HIS06	31.66	26.97
Isolok (3 mL)	HF	Isolok (3 mL)	HIS07	31.47	26.85
Isolok (3 mL)	HF	Isolok (3 mL)	HIS08	31.58	26.87
Isolok (3 mL)	HF	Isolok (3 mL)	HIS09	32.00	27.26
Isolok (3 mL)	HF	Isolok (3 mL)	HIS10	31.70	26.97
Isolok (12 mL)	LF	Isolok (12 mL)	LIB01	31.50	26.75
Isolok (12 mL)	LF	Isolok (12 mL)	LIB02	31.70	26.92
Isolok (12 mL)	LF	Isolok (12 mL)	LIB03	31.45	26.71
Isolok (12 mL)	LF	Isolok (12 mL)	LIB04	31.34	26.55
Isolok (12 mL)	LF	Isolok (12 mL)	LIB05	31.57	26.77
Isolok (12 mL)	LF	Isolok (12 mL)	LIB06	31.56	26.73
Isolok (12 mL)	LF	Isolok (12 mL)	LIB07	31.62	26.77

Table C2. Solids Measurements for Phase 3

Sampling Mechanism	Flow Rate (LF/HF)	Sampler w Location	Sample ID	wt% dried solids	wt% vitrified solids
Isolok (12 mL)	LF	Isolok (12 mL)	LIB08	31.68	26.80
Isolok (12 mL)	LF	Isolok (12 mL)	LIB09	31.70	26.74
Isolok (12 mL)	LF	Isolok (12 mL)	LIB10	31.73	26.83
Isolok (12 mL)	HF	Isolok (12 mL)	HIB01	31.40	26.69
Isolok (12 mL)	HF	Isolok (12 mL)	HIB02	31.51	26.69
Isolok (12 mL)	HF	Isolok (12 mL)	HIB03	31.47	26.68
Isolok (12 mL)	HF	Isolok (12 mL)	HIB04	31.57	26.83
Isolok (12 mL)	HF	Isolok (12 mL)	HIB05	31.54	26.80
Isolok (12 mL)	HF	Isolok (12 mL)	HIB06	31.57	26.77
Isolok (12 mL)	HF	Isolok (12 mL)	HIB07	31.57	26.78
Isolok (12 mL)	HF	Isolok (12 mL)	HIB08	31.68	26.89
Isolok (12 mL)	HF	Isolok (12 mL)	HIB09	31.46	26.65
Isolok (12 mL)	HF	Isolok (12 mL)	HIB10	31.70	26.88

Table C3. Phase 3 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	23600	24100	792	10000	< 712	652	77.7	94600	23700	< 148	14200
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	54400	13000	907	8260	< 559	621	270	76700	< 2750	< 116	22200
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	54500	12600	920	8170	< 611	724	273	76600	< 3000	< 127	21300
SME Simulant	Coliwasa	LF	20	1	2	1	4	CL02	53800	12800	921	8440	< 649	771	303	76800	< 3190	< 135	20900
SME Simulant	Coliwasa	LF	38	1	16	1	5	CH03	55300	12800	939	8350	< 548	747	252	77800	< 2690	< 114	21300
SME Simulant	Coliwasa	LF	63	1	13	1	6	CH04	55700	12700	952	8480	< 581	757	292	78500	< 2860	< 121	21100
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	53000	12600	883	7820	< 609	601	245	74100	< 2990	< 127	21400
SME Simulant	Coliwasa	HF	23	1	28	1	8	CH06	53700	12700	878	7960	< 607	698	202	75700	< 2980	< 126	20800
SME Simulant	Coliwasa	LF	21	1	14	1	9	CH02	54900	13000	918	8170	< 615	727	289	77700	< 3020	< 128	21200
SME Simulant	Coliwasa	HF	3	1	20	1	10	CL05	54400	12900	924	8400	< 610	812	301	77400	< 3000	< 127	21800
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	53200	11500	899	8040	< 617	619	272	76000	< 3030	< 128	20600
SME Simulant	Coliwasa	LF	40	1	19	1	12	CL03	55200	12000	922	8220	< 576	759	240	77600	< 2830	< 120	20700
SME Simulant	Coliwasa	HF	18	1	26	1	13	CL06	54400	12900	959	8500	< 644	854	233	77500	< 3160	< 134	20500
SME Simulant	Coliwasa	HF	1	1	22	1	14	CH05	54800	12000	914	8230	< 614	869	301	78000	< 3020	< 128	21200
ARG-1	None	0	0	1	15	1	15	ARG-1B12	23600	24700	810	10100	< 573	665	< 41.6	97200	21500	< 119	14200
SME Simulant	Coliwasa	HF	36	1	21	1	16	CL07	51100	12000	867	7640	< 582	739	208	72500	< 2860	< 121	20000
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	52300	12500	853	7540	< 545	746	301	74500	< 2680	< 113	20100
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	54500	12600	907	8110	< 639	656	318	76600	< 3140	< 133	20800
SME Simulant	Coliwasa	HF	63	1	5	1	19	CL08	55000	12500	930	8270	< 624	837	281	78000	< 3070	< 130	20500
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	54500	13000	911	8200	< 581	649	302	77700	< 2860	< 121	20800
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	55200	12200	892	8050	< 605	603	325	77600	< 2970	< 126	20900
SME Simulant	Coliwasa	HF	65	1	6	1	22	CH08	54500	12800	907	8120	< 580	716	261	77500	< 2850	< 121	21000
SME Simulant	Coliwasa	HF	34	1	18	1	23	CH07	54500	12900	917	8230	< 595	711	302	77400	< 2930	< 124	20800
SME Simulant	Coliwasa	LF	1	1	12	1	24	CH01	53700	13100	902	8460	< 629	714	257	76600	< 3090	< 131	21600
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	54200	13200	898	7980	< 622	646	247	76400	< 3060	< 129	20900
SME Simulant	Coliwasa	LF	4	1	10	1	26	CL01	54800	13100	937	8100	< 537	698	250	77300	< 2640	< 112	20800
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	54200	12800	887	7960	< 680	638	228	75900	< 3340	< 141	20500
SME Simulant	Coliwasa	LF	65	1	23	1	28	CL04	55200	12700	913	8350	< 569	735	253	77800	< 2800	< 118	21500
ARG-1	None	0	0	1	29	1	29	ARG-1B13	24000	24800	800	10200	< 650	659	< 47.3	96900	22600	< 135	14300
ARG-1	None	0	0	2	1	2	1	ARG-1B21	24900	25800	842	10400	< 598	689	62.8	99100	23100	< 124	14500
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	60200	13700	1030	9600	< 601	888	286	85500	< 2960	< 125	21000
SME Simulant	Coliwasa	HF	36	1	21	2	3	CL07	55400	13000	927	8330	< 582	762	293	77600	< 2860	< 121	21900
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	58400	12400	954	8680	< 553	872	287	82100	< 2720	< 115	21000
SME Simulant	Coliwasa	HF	1	1	22	2	5	CH05	56600	12400	937	8360	< 614	867	261	79800	< 3020	< 128	21400
SME Simulant	Coliwasa	HF	3	1	20	2	6	CL05	56100	13400	934	8400	< 610	805	298	79400	< 3000	< 127	21700
SME Simulant	Coliwasa	HF	23	1	28	2	7	CH06	55200	13200	897	8370	< 607	686	276	78200	< 2980	< 126	21800
SME Simulant	Coliwasa	LF	1	1	12	2	8	CH01	55100	13100	914	8670	< 629	718	331	78400	< 3090	< 131	21600
SME Simulant	Coliwasa	LF	20	1	2	2	9	CL02	55000	12800	933	8670	< 649	752	355	79800	< 3190	< 135	21000
SME Simulant	Coliwasa	HF	63	1	5	2	10	CL08	55900	12400	924	8140	< 624	812	285	79300	< 3070	< 130	20400
SME Simulant	Coliwasa	HF	65	1	6	2	11	CH08	56000	12900	924	8670	< 580	711	289	79800	< 2850	< 121	21000
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	58100	12300	960	8900	< 624	752	373	83500	< 3070	< 130	20100
SME Simulant	Coliwasa	LF	4	1	10	2	13	CL01	56300	13000	955	8600	< 537	713	244	80100	< 2640	< 112	20700
SME Simulant	Coliwasa	HF	18	1	26	2	14	CL06	56200	12600	938	8590	< 644	816	285	80300	< 3160	< 134	21000
ARG-1	None	0	0	2	12	2	15	ARG-1B22	23900	25000	812	10500	< 657	665	< 47.8	98400	21700	< 137	14200
SME Simulant	Coliwasa	LF	65	1	23	2	16	CL04	55800	12200	910	8390	< 569	699	304	79200	< 2800	< 118	20600
SME Simulant	Coliwasa	LF	40	1	19	2	17	CL03	56300	12500	923	8490	< 576	758	325	79800	< 2830	< 120	21000
SME Simulant	Coliwasa	LF	38	1	16	2	18	CH03	55300	12600	933	8260	< 548	737	293	79100	< 2690	< 114	20600
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	58700	12300	1000	8930	< 588	864	348	84500	< 2890	< 122	20700

Table C3. Phase 3 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
SME Simulant	Coliwasa	LF	21	1	14	2	20	CH02	54900	12900	923	8560	< 615	718	263	78400	< 3020	< 128	20800
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	56800	12500	951	9090	< 582	866	242	81800	< 2860	< 121	20800
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	58500	12000	975	8560	< 576	847	299	83200	< 2830	< 120	19500
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	57600	11900	925	8460	< 592	716	299	81100	< 2910	< 123	20900
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	57300	12400	962	8950	< 618	750	279	82900	< 3040	< 129	21200
SME Simulant	Coliwasa	HF	34	1	18	2	25	CH07	56300	13500	945	8860	< 595	733	314	80100	< 2930	< 124	21300
SME Simulant	Coliwasa	LF	63	1	13	2	26	CH04	55400	11700	916	8490	< 581	706	325	78700	< 2860	< 121	20900
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	58200	10200	913	10400	< 584	788	328	82400	< 2870	< 121	20800
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	59700	11100	994	9130	< 590	773	279	85700	< 2900	< 123	20400
ARG-1	None	0	0	2	23	2	29	ARG-1B23	24500	23900	799	10500	< 647	726	< 47.1	98100	24100	< 135	14400
ARG-1	None	0	0	3	1	3	1	ARG-1B31	24900	24700	808	10200	< 625	659	< 45.4	98500	22500	< 130	14700
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	53400	13400	871	7980	< 600	712	372	74000	< 2950	< 125	23600
SME Simulant	Coliwasa	HF	36	1	21	3	3	CL07	55600	13200	912	8240	< 582	771	322	77500	< 2860	< 121	21800
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	57200	12100	924	8610	< 604	704	418	79500	< 2970	< 126	21300
SME Simulant	Coliwasa	HF	1	1	22	3	5	CH05	57200	12100	932	8520	< 614	865	412	80300	< 3020	< 128	22100
SME Simulant	Coliwasa	HF	3	1	20	3	6	CL05	56500	12400	919	8490	< 610	791	359	80000	< 3000	< 127	22300
SME Simulant	Coliwasa	HF	23	1	28	3	7	CH06	55000	13000	898	8320	< 607	701	266	77300	< 2980	< 126	21500
SME Simulant	Coliwasa	LF	1	1	12	3	8	CH01	56200	12200	900	8900	< 629	699	352	79300	< 3090	< 131	22900
SME Simulant	Coliwasa	LF	20	1	2	3	9	CL02	56200	13100	947	8760	< 649	807	325	80400	< 3190	< 135	21900
SME Simulant	Coliwasa	HF	63	1	5	3	10	CL08	57400	11900	930	8420	< 624	819	286	81000	< 3070	< 130	21500
SME Simulant	Coliwasa	HF	65	1	6	3	11	CH08	56500	12500	914	8440	< 580	715	303	79700	< 2850	< 121	21900
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	55400	11800	908	8360	< 628	719	296	77900	< 3090	< 131	22200
SME Simulant	Coliwasa	LF	4	1	10	3	13	CL01	57100	12800	959	8450	< 537	714	291	79700	< 2640	< 112	21300
SME Simulant	Coliwasa	HF	18	1	26	3	14	CL06	57300	12800	957	8880	< 644	863	376	80600	< 3160	< 134	21700
ARG-1	None	0	0	3	12	3	15	ARG-1B32	24800	24300	826	10400	< 637	707	< 46.3	99500	23800	< 133	14600
SME Simulant	Coliwasa	LF	65	1	23	3	16	CL04	56300	12000	916	8500	< 569	727	347	78400	< 2800	< 118	21100
SME Simulant	Coliwasa	LF	40	1	19	3	17	CL03	56000	12300	934	8400	< 576	769	329	78800	< 2830	< 120	21600
SME Simulant	Coliwasa	LF	38	1	16	3	18	CH03	55900	11700	901	8380	< 548	707	291	78100	< 2690	< 114	22000
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	56800	11500	937	8420	< 605	877	328	79100	< 2970	< 126	23500
SME Simulant	Coliwasa	LF	21	1	14	3	20	CH02	56800	12700	924	8320	< 615	722	289	78900	< 3020	< 128	22000
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	56300	12800	920	8420	< 583	702	341	78900	< 2870	< 121	22400
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	57200	12300	880	9750	< 606	841	317	79000	< 2980	< 126	22100
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	53000	12100	843	7670	< 559	678	343	71800	< 2750	< 116	22300
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	50700	12700	801	6810	< 607	658	323	69000	< 2980	< 126	24500
SME Simulant	Coliwasa	HF	34	1	18	3	25	CH07	53600	11600	875	8180	< 595	653	301	74700	< 2930	< 124	20600
SME Simulant	Coliwasa	LF	63	1	13	3	26	CH04	57600	12300	954	8730	< 581	774	332	80800	< 2860	< 121	22400
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	56500	12300	912	8350	< 621	732	404	78500	< 3050	< 129	22300
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	52100	12100	865	8040	< 596	650	289	71200	< 2930	< 124	23500
ARG-1	None	0	0	3	23	3	29	ARG-1B33	24200	23600	811	10300	< 674	652	< 49	97000	22400	< 140	14800
ARG-1	None	0	0	4	1	4	1	ARG-1B41	24100	24600	854	10500	< 679	671	< 49.4	98500	23000	< 141	14800
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	55000	13600	944	8400	< 588	732	254	77300	< 2890	< 122	22200
SME Simulant	Coliwasa	HF	36	1	21	4	3	CL07	52200	12000	886	7950	< 582	717	269	74200	< 2860	< 121	21200
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	55500	12400	924	8270	< 615	812	354	77500	< 3020	< 128	21800
SME Simulant	Coliwasa	HF	1	1	22	4	5	CH05	56700	12200	949	8500	< 614	892	319	79600	< 3020	< 128	22500
SME Simulant	Coliwasa	HF	3	1	20	4	6	CL05	55500	13100	944	8550	< 610	797	329	78800	< 3000	< 127	23200
SME Simulant	Coliwasa	HF	23	1	28	4	7	CH06	56300	13400	960	8350	< 607	716	211	79400	< 2980	< 126	22000
SME Simulant	Coliwasa	LF	1	1	12	4	8	CH01	57000	13300	967	9000	< 629	745	217	80600	< 3090	< 131	22800
SME Simulant	Coliwasa	LF	20	1	2	4	9	CL02	54800	12600	956	8530	< 649	757	261	78900	< 3190	< 135	21500

Table C3. Phase 3 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
SME Simulant	Coliwasa	HF	63	1	5	4	10	CL08	57200	11900	964	8490	< 624	798	265	79900	< 3070	< 130	21400
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	11	HIB07	56100	12700	943	8320	< 610	852	276	79100	< 3000	< 127	21400
SME Simulant	Coliwasa	LF	4	1	10	4	12	CL01	57200	13000	998	8520	< 537	705	302	80800	< 2640	< 112	21700
SME Simulant	Coliwasa	HF	18	1	26	4	13	CL06	56400	12600	966	8590	< 644	826	267	80300	< 3160	< 134	21600
ARG-1	None	0	0	4	7	4	14	ARG-1B42	24300	24400	847	10200	< 691	670	< 50.2	98000	22200	< 144	14600
SME Simulant	Coliwasa	LF	65	1	23	4	15	CL04	56300	12200	943	8490	< 569	714	293	79200	< 2800	< 118	21400
SME Simulant	Coliwasa	LF	40	1	19	4	16	CL03	56600	12500	965	8400	< 576	758	252	80200	< 2830	< 120	21900
SME Simulant	Coliwasa	LF	21	1	14	4	17	CH02	55700	13200	965	8310	< 615	732	210	78900	< 3020	< 128	21700
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	18	HIB01	56800	12900	957	8490	< 582	760	224	80100	< 2860	< 121	22100
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	19	HIB03	57300	12200	960	8490	< 537	780	261	81200	< 2640	< 112	22100
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	20	HIB08	53700	11300	944	8360	< 595	1060	250	76400	< 2920	< 124	19800
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	21	HIB06	54600	12400	911	8090	< 573	865	301	76800	< 2820	< 119	22200
SME Simulant	Coliwasa	HF	34	1	18	4	22	CH07	57200	12800	963	8730	< 595	718	237	81300	< 2930	< 124	22000
SME Simulant	Coliwasa	LF	63	1	13	4	23	CH04	56300	12200	971	8590	< 581	734	342	80200	< 2860	< 121	21800
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	24	HIB05	54800	12100	921	7950	< 600	729	331	76500	< 2950	< 125	22200
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	25	HIB10	52700	12800	903	7780	< 601	739	191	73900	< 2950	< 125	22600
ARG-1	None	0	0	4	13	4	26	ARG-1B43	24000	23400	834	10200	< 645	652	< 46.9	97700	23600	< 134	14500
SME Simulant	Coliwasa	HF	65	1	6	4	27	CH08	57200	12600	962	8560	< 580	723	286	80500	< 2850	< 121	21800
SME Simulant	Coliwasa	LF	38	1	16	4	28	CH03	56600	12500	965	8450	< 548	731	247	80000	< 2690	< 114	21700
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	29	HIB09	60800	12200	1080	9230	< 623	988	357	87700	< 3060	< 130	20900
ARG-1	None	0	0	2	1	5	1	ARG-1B21	25100	25000	832	10500	< 598	706	87	98000	21200	< 124	15000
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	57100	12100	926	8600	< 608	780	448	79000	< 2990	< 127	22500
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	57700	13300	1020	8920	< 617	744	365	79600	< 3030	< 128	23400
SME Simulant	Coliwasa	LF	20	1	2	5	4	CL02	56100	13400	942	8690	< 649	797	409	79400	3210	< 135	22200
SME Simulant	Coliwasa	LF	38	1	16	5	5	CH03	56600	12600	927	8350	< 548	745	326	78700	< 2690	< 114	22200
SME Simulant	Coliwasa	LF	63	1	13	5	6	CH04	57100	12700	935	8700	< 581	742	409	79900	< 2860	< 121	22300
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	57800	13200	961	8650	< 623	743	329	79200	< 3060	< 130	22200
SME Simulant	Coliwasa	HF	23	1	28	5	8	CH06	57300	13300	939	8520	< 607	721	312	78900	< 2980	< 126	22400
SME Simulant	Coliwasa	LF	21	1	14	5	9	CH02	57400	12700	962	8710	< 615	720	371	79500	< 3020	< 128	23100
SME Simulant	Coliwasa	HF	3	1	20	5	10	CL05	56500	12900	902	8250	< 610	788	380	78400	< 3000	< 127	21400
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	56000	12000	929	8360	< 620	702	384	77100	< 3050	< 129	21800
SME Simulant	Coliwasa	LF	40	1	19	5	12	CL03	57800	12700	953	8540	< 576	782	344	80200	< 2830	< 120	21900
SME Simulant	Coliwasa	HF	18	1	26	5	13	CL06	57200	13000	979	8780	< 644	864	368	79400	< 3160	< 134	22200
SME Simulant	Coliwasa	HF	1	1	22	5	14	CH05	57200	12800	980	8780	< 614	908	380	79700	< 3020	< 128	23100
ARG-1	None	0	0	2	12	5	15	ARG-1B22	25200	26200	879	10800	< 657	691	47.8	98500	22900	< 137	15500
SME Simulant	Coliwasa	HF	36	1	21	5	16	CL07	56000	12800	920	8640	< 582	775	381	78000	< 2860	< 121	22400
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	56700	12800	950	8770	< 624	766	382	79300	< 3070	< 130	22500
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	55800	12900	952	8480	< 629	733	432	77600	< 3090	< 131	23000
SME Simulant	Coliwasa	HF	63	1	5	5	19	CL08	56700	12900	942	8730	< 624	839	374	79400	3290	< 130	21800
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	55200	13100	910	8420	< 552	676	425	76200	< 2710	< 115	22900
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	56500	13900	920	8660	< 616	730	367	78500	< 3030	< 128	22400
SME Simulant	Coliwasa	HF	65	1	6	5	22	CH08	56600	13800	926	8290	< 580	751	377	78800	< 2850	< 121	22300
SME Simulant	Coliwasa	HF	34	1	18	5	23	CH07	56700	14300	946	8930	< 595	765	432	79500	< 2930	< 124	22200
SME Simulant	Coliwasa	LF	1	1	12	5	24	CH01	55700	14200	923	9040	< 629	757	371	79000	< 3090	< 131	22900
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	54900	13300	887	8350	< 549	737	391	75500	< 2700	< 114	23500
SME Simulant	Coliwasa	LF	4	1	10	5	26	CL01	57100	14100	963	8430	< 537	734	323	79400	< 2640	< 112	21900
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	56400	12600	907	8400	< 593	662	339	78100	< 2910	< 123	22400
SME Simulant	Coliwasa	LF	65	1	23	5	28	CL04	57000	13000	917	8660	< 569	727	383	79100	< 2800	< 118	22000

Table C3. Phase 3 Elemental Concentration Measurements (part 1)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al (ug/g)	B (ug/g)	Ba (ug/g)	Ca (ug/g)	Ce (ug/g)	Cr (ug/g)	Cu (ug/g)	Fe (ug/g)	K (ug/g)	La (ug/g)	Li (ug/g)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	25200	27200	832	11000	< 647	793	136	98300	23500	< 135	15000
ARG-1	None	0	0	3	1	6	1	ARG-1B31	25100	25300	823	10500	< 625	697	< 45.4	98700	21600	< 130	14400
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	55700	12900	906	8350	< 604	732	320	78200	< 2970	< 126	20800
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	57900	12600	901	8380	< 608	726	311	80800	< 2990	< 127	21100
SME Simulant	Coliwasa	LF	20	1	2	6	4	CL02	56100	13300	931	8900	< 649	803	311	79500	< 3190	< 135	21400
SME Simulant	Coliwasa	LF	38	1	16	6	5	CH03	56500	12600	909	8290	< 548	744	254	79100	< 2690	< 114	21100
SME Simulant	Coliwasa	LF	63	1	13	6	6	CH04	56500	12200	907	8400	< 581	748	343	79700	< 2860	< 121	21500
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	57000	12300	932	8440	< 584	836	348	80300	< 2870	< 122	21500
SME Simulant	Coliwasa	HF	23	1	28	6	8	CH06	56400	13200	909	8720	< 607	725	289	78900	< 2980	< 126	21400
SME Simulant	Coliwasa	LF	21	1	14	6	9	CH02	56500	13000	904	8280	< 615	721	278	79200	< 3020	< 128	21400
SME Simulant	Coliwasa	HF	3	1	20	6	10	CL05	55800	12100	886	8600	< 610	774	346	78300	< 3000	< 127	21800
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	59700	12300	969	9390	< 610	778	323	83800	< 3000	< 127	20500
SME Simulant	Coliwasa	LF	40	1	19	6	12	CL03	57200	11600	876	8480	< 576	714	316	79700	< 2830	< 120	21300
SME Simulant	Coliwasa	HF	18	1	26	6	13	CL06	56400	12400	920	8560	< 644	824	276	79400	< 3160	< 134	21100
SME Simulant	Coliwasa	HF	1	1	22	6	14	CH05	57000	12400	932	8660	< 614	912	319	80100	< 3020	< 128	21500
ARG-1	None	0	0	3	12	6	15	ARG-1B32	24500	26100	830	10700	< 637	757	< 46.3	99000	22500	< 133	14300
SME Simulant	Coliwasa	HF	36	1	21	6	16	CL07	55900	12500	898	8590	< 582	778	318	78000	< 2860	< 121	21600
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	55700	12800	870	8100	< 583	707	225	76700	< 2870	< 121	21700
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	79100	15700	1270	13000	< 599	1060	479	111000	< 2940	< 125	30100
SME Simulant	Coliwasa	HF	63	1	5	6	19	CL08	57200	12400	914	8650	< 624	831	345	79700	< 3070	< 130	21100
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	59100	12100	930	8790	< 620	740	307	82400	< 3050	< 129	21200
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	58600	12300	961	8870	< 569	897	277	82000	< 2800	< 118	20700
SME Simulant	Coliwasa	HF	65	1	6	6	22	CH08	56700	12500	885	8410	< 580	717	310	79100	< 2850	< 121	21600
SME Simulant	Coliwasa	HF	34	1	18	6	23	CH07	56700	12900	918	8690	< 595	742	277	79800	< 2930	< 124	21400
SME Simulant	Coliwasa	LF	1	1	12	6	24	CH01	55800	13200	914	8690	< 629	754	310	78900	< 3090	< 131	22100
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	57300	11600	913	8540	< 580	766	255	78600	< 2850	< 121	20400
SME Simulant	Coliwasa	LF	4	1	10	6	26	CL01	57300	12900	947	8330	< 537	724	302	79700	< 2640	< 112	21200
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	58200	12600	930	9870	< 590	753	266	81400	< 2900	< 123	20100
SME Simulant	Coliwasa	LF	65	1	23	6	28	CL04	57000	12600	925	8740	< 569	760	297	79600	< 2800	< 118	21200
ARG-1	None	0	0	3	23	6	29	ARG-1B33	25200	25400	831	10500	< 674	726	< 49	97900	20700	< 140	14400

Table C3. Phase 3 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	4890	13600	80300	7860	753	< 331	< 1060	225000	6890	222	980
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	5960	12800	79300	3560	< 207	775	< 830	245000	487	835	2780
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	5960	12700	76000	3680	< 226	788	< 907	245000	502	827	2740
SME Simulant	Coliwasa	LF	20	1	2	1	4	CL02	6120	13100	75800	3540	< 240	830	< 964	245000	496	850	2720
SME Simulant	Coliwasa	LF	38	1	16	1	5	CH03	6110	13100	77400	3650	< 202	864	1120	249000	492	844	2780
SME Simulant	Coliwasa	LF	63	1	13	1	6	CH04	6130	13100	78600	3740	< 215	981	1190	244000	497	850	2740
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	5770	12300	74200	3340	< 225	849	< 904	251000	508	774	2720
SME Simulant	Coliwasa	HF	23	1	28	1	8	CH06	5900	12600	75700	3460	< 224	602	1240	243000	483	792	2750
SME Simulant	Coliwasa	LF	21	1	14	1	9	CH02	6020	12900	79600	3570	< 227	653	1010	245000	482	826	2770
SME Simulant	Coliwasa	HF	3	1	20	1	10	CL05	6040	12900	75300	3570	< 226	635	1100	249000	495	829	2770
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	5880	12600	79900	3420	< 228	1710	< 916	242000	460	806	2680
SME Simulant	Coliwasa	LF	40	1	19	1	12	CL03	6020	12900	77800	3560	< 213	1540	1510	241000	473	835	2750
SME Simulant	Coliwasa	HF	18	1	26	1	13	CL06	6070	13000	70500	3720	< 238	2130	1440	247000	493	875	2750
SME Simulant	Coliwasa	HF	1	1	22	1	14	CH05	6030	12900	77800	3950	< 227	473	1220	243000	478	820	2740
ARG-1	None	0	0	1	15	1	15	ARG-1B12	4990	13900	81500	8190	688	341	< 850	230000	7010	199	1000
SME Simulant	Coliwasa	HF	36	1	21	1	16	CL07	5650	12100	72800	3350	< 215	402	< 864	234000	468	779	2620
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	5710	12200	74400	3420	< 202	< 253	< 809	243000	489	757	2690
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	5890	12600	73500	3580	< 236	337	1090	247000	508	812	2760
SME Simulant	Coliwasa	HF	63	1	5	1	19	CL08	5970	12800	75800	3710	< 231	500	1330	243000	461	834	2760
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	5980	12800	80800	3610	< 215	< 270	< 863	243000	498	819	2770
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	6000	12800	74800	3420	< 224	< 281	< 898	252000	511	789	2770
SME Simulant	Coliwasa	HF	65	1	6	1	22	CH08	6020	12800	76200	3530	< 214	< 269	1070	242000	498	795	2770
SME Simulant	Coliwasa	HF	34	1	18	1	23	CH07	6080	13000	73400	3490	< 220	< 277	1050	244000	487	812	2790
SME Simulant	Coliwasa	LF	1	1	12	1	24	CH01	6090	13100	75600	3520	< 232	< 292	1250	242000	493	817	2730
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	5880	12600	74400	3570	< 230	< 289	< 923	246000	511	805	2770
SME Simulant	Coliwasa	LF	4	1	10	1	26	CL01	5940	12700	81300	3520	< 199	< 250	919	238000	486	792	2750
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	5860	12600	76500	3450	< 251	< 316	< 1010	239000	487	775	2730
SME Simulant	Coliwasa	LF	65	1	23	1	28	CL04	6020	12900	78200	3570	< 210	< 265	1080	244000	503	813	2790
ARG-1	None	0	0	1	29	1	29	ARG-1B13	4970	13900	81500	7920	786	< 302	< 966	229000	7050	189	1020
ARG-1	None	0	0	2	1	2	1	ARG-1B21	5010	14000	86800	8260	779	< 278	< 888	230000	7100	198	1020
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	6620	14200	76200	4040	< 222	670	1670	239000	500	938	2830
SME Simulant	Coliwasa	HF	36	1	21	2	3	CL07	5970	12700	81100	3520	< 215	774	1450	248000	489	806	2770
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	6200	13300	80900	3680	< 204	701	1500	245000	499	811	2870
SME Simulant	Coliwasa	HF	1	1	22	2	5	CH05	6080	13000	83400	3970	< 227	738	1410	245000	502	797	2800
SME Simulant	Coliwasa	HF	3	1	20	2	6	CL05	6120	13100	79800	3570	< 226	< 284	1330	250000	519	815	2820
SME Simulant	Coliwasa	HF	23	1	28	2	7	CH06	5970	12800	80900	3450	< 224	< 282	1120	244000	498	805	2810
SME Simulant	Coliwasa	LF	1	1	12	2	8	CH01	6120	13100	81500	3500	< 232	< 292	1190	243000	500	813	2750
SME Simulant	Coliwasa	LF	20	1	2	2	9	CL02	6240	13300	80800	3570	< 240	1100	1410	247000	503	828	2750
SME Simulant	Coliwasa	HF	63	1	5	2	10	CL08	5950	12800	80300	3670	< 231	727	1760	240000	483	820	2760
SME Simulant	Coliwasa	HF	65	1	6	2	11	CH08	6070	13000	82000	3540	< 214	1320	1490	243000	476	819	2720
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	6320	13500	81100	3770	< 231	1450	1250	239000	476	865	2790
SME Simulant	Coliwasa	LF	4	1	10	2	13	CL01	6060	12900	87800	3610	< 199	1200	1900	240000	476	816	2780
SME Simulant	Coliwasa	HF	18	1	26	2	14	CL06	6160	13200	75900	3520	< 238	607	1500	249000	512	824	2830
ARG-1	None	0	0	2	12	2	15	ARG-1B22	4960	13900	86400	8090	774	< 305	< 976	227000	7000	190	1030
SME Simulant	Coliwasa	LF	65	1	23	2	16	CL04	6030	12800	82500	3480	< 210	363	1230	241000	494	789	2780
SME Simulant	Coliwasa	LF	40	1	19	2	17	CL03	6060	12900	83500	3570	< 213	426	1620	241000	488	811	2790
SME Simulant	Coliwasa	LF	38	1	16	2	18	CH03	6070	12900	80900	3560	< 202	794	1600	246000	493	821	2770
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	6500	13800	83300	3900	< 217	872	1380	235000	490	892	2800

Table C3. Phase 3 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
SME Simulant	Coliwasa	LF	21	1	14	2	20	CH02	5960	12700	83200	3590	< 227	1240	1310	242000	466	822	2720
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	6340	13500	81000	3640	< 215	1120	1500	242000	490	847	2750
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	6410	13500	79400	3660	< 213	575	1420	246000	504	851	2880
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	6120	13300	81000	3600	< 219	< 275	1460	241000	498	782	2770
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	6420	13800	82400	3780	< 229	1740	2300	237000	462	867	2730
SME Simulant	Coliwasa	HF	34	1	18	2	25	CH07	6180	13200	79800	3590	< 220	< 277	1480	247000	508	829	2810
SME Simulant	Coliwasa	LF	63	1	13	2	26	CH04	6020	12900	82400	3470	< 215	1010	1690	241000	473	794	2700
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	6480	13300	90800	3380	< 216	1530	2070	238000	466	775	2590
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	6580	14100	83500	3790	< 218	2150	1670	234000	456	897	2820
ARG-1	None	0	0	2	23	2	29	ARG-1B23	4960	13800	87400	7740	721	< 301	< 961	228000	7030	171	1000
ARG-1	None	0	0	3	1	3	1	ARG-1B31	5110	14200	85500	7940	800	< 290	< 927	230000	7010	199	987
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	5740	12300	82100	3470	< 222	< 279	1300	249000	499	785	2620
SME Simulant	Coliwasa	HF	36	1	21	3	3	CL07	6110	12900	80600	3500	< 215	< 270	1160	247000	510	804	2790
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	6210	13200	87400	3450	< 223	< 280	1020	238000	499	796	2740
SME Simulant	Coliwasa	HF	1	1	22	3	5	CH05	6280	13400	82200	3990	< 227	419	1380	246000	500	815	2770
SME Simulant	Coliwasa	HF	3	1	20	3	6	CL05	6330	13400	79200	3500	< 226	973	1690	254000	512	822	2770
SME Simulant	Coliwasa	HF	23	1	28	3	7	CH06	6070	12800	78700	3550	< 224	450	1480	242000	486	809	2720
SME Simulant	Coliwasa	LF	1	1	12	3	8	CH01	6360	13500	80700	3400	< 232	423	1250	245000	493	809	2710
SME Simulant	Coliwasa	LF	20	1	2	3	9	CL02	6450	13700	80200	3680	< 240	890	< 964	250000	487	881	2750
SME Simulant	Coliwasa	HF	63	1	5	3	10	CL08	6260	13400	81100	3630	< 231	1450	1700	246000	481	847	2750
SME Simulant	Coliwasa	HF	65	1	6	3	11	CH08	6230	13200	80800	3560	< 214	1240	1480	244000	478	855	2700
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	6010	12800	79300	3600	< 232	1250	1460	249000	478	796	2650
SME Simulant	Coliwasa	LF	4	1	10	3	13	CL01	6190	13200	86200	3580	< 199	1200	1600	242000	473	817	2750
SME Simulant	Coliwasa	HF	18	1	26	3	14	CL06	6370	13600	75400	3660	< 238	1490	1930	252000	494	873	2790
ARG-1	None	0	0	3	12	3	15	ARG-1B32	5170	14400	86000	8120	752	929	< 946	230000	7000	210	974
SME Simulant	Coliwasa	LF	65	1	23	3	16	CL04	6160	13100	81500	3570	< 210	1570	1570	241000	481	827	2680
SME Simulant	Coliwasa	LF	40	1	19	3	17	CL03	6180	13100	81800	3650	< 213	941	1650	239000	482	842	2730
SME Simulant	Coliwasa	LF	38	1	16	3	18	CH03	6180	13100	80000	3400	< 202	843	1300	245000	485	802	2710
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	6100	13100	79900	3750	< 224	1240	1550	244000	491	834	2710
SME Simulant	Coliwasa	LF	21	1	14	3	20	CH02	6180	13200	83500	3570	< 227	1040	1580	245000	477	830	2740
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	6210	13200	82500	3580	< 216	944	1250	249000	502	836	2730
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	6140	13100	84700	3600	< 224	1900	1820	248000	499	883	2640
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	5390	11500	81700	3250	< 207	1550	1790	250000	486	720	2590
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	5030	10700	80800	3170	< 224	1520	1550	257000	497	697	2530
SME Simulant	Coliwasa	HF	34	1	18	3	25	CH07	5960	12600	74600	3250	< 220	2020	1260	231000	436	799	2530
SME Simulant	Coliwasa	LF	63	1	13	3	26	CH04	6400	13600	84400	3680	< 215	1330	1670	249000	514	854	2770
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	6150	13100	83200	3580	< 229	1120	1410	249000	492	846	2670
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	5530	11700	81100	3220	< 220	859	1430	247000	484	732	2580
ARG-1	None	0	0	3	23	3	29	ARG-1B33	5060	14100	86000	7910	668	569	< 1000	227000	6930	192	984
ARG-1	None	0	0	4	1	4	1	ARG-1B41	5170	14500	86000	8090	661	453	< 1010	227000	6960	191	946
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	6200	13200	76700	3580	< 217	637	1190	252000	512	830	2680
SME Simulant	Coliwasa	HF	36	1	21	4	3	CL07	5880	12500	77300	3260	< 215	< 270	< 864	234000	472	757	2620
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	5910	12700	76000	3560	< 227	648	969	246000	487	783	2670
SME Simulant	Coliwasa	HF	1	1	22	4	5	CH05	6270	13400	82500	3960	< 227	486	1140	243000	480	825	2720
SME Simulant	Coliwasa	HF	3	1	20	4	6	CL05	6250	13300	79300	3510	< 226	485	1300	247000	500	813	2730
SME Simulant	Coliwasa	HF	23	1	28	4	7	CH06	6260	13400	81200	3630	< 224	2170	1660	246000	469	849	2720
SME Simulant	Coliwasa	LF	1	1	12	4	8	CH01	6520	13900	82800	3660	< 232	1400	1370	248000	498	852	2700
SME Simulant	Coliwasa	LF	20	1	2	4	9	CL02	6390	13600	79900	3520	< 240	2250	1120	243000	467	843	2630

Table C3. Phase 3 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
SME Simulant	Coliwasa	HF	63	1	5	4	10	CL08	6240	13400	81700	3620	< 231	3170	1720	243000	444	839	2690
SME Simulant	Isolok - 12 mL	HF	46	4	2	4	11	HIB07	6220	13200	86300	3650	< 226	1960	1520	241000	481	822	2640
SME Simulant	Coliwasa	LF	4	1	10	4	12	CL01	6310	13500	88300	3570	< 199	1550	1230	243000	477	820	2730
SME Simulant	Coliwasa	HF	18	1	26	4	13	CL06	6360	13600	75400	3580	< 238	2210	1560	248000	463	835	2750
ARG-1	None	0	0	4	7	4	14	ARG-1B42	5110	14300	85900	8170	512	1550	< 1030	226000	6860	205	937
SME Simulant	Coliwasa	LF	65	1	23	4	15	CL04	6260	13300	82700	3550	< 210	1440	1160	242000	482	813	2700
SME Simulant	Coliwasa	LF	40	1	19	4	16	CL03	6310	13500	83500	3670	< 213	1240	1300	242000	472	844	2720
SME Simulant	Coliwasa	LF	21	1	14	4	17	CH02	6210	13200	83400	3660	< 227	2650	1780	242000	482	850	2690
SME Simulant	Isolok - 12 mL	HF	7	4	12	4	18	HIB01	6300	13400	81000	3710	< 215	2370	1650	248000	471	831	2640
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	19	HIB03	6430	13800	83900	3790	< 198	2110	1490	245000	474	861	2730
SME Simulant	Isolok - 12 mL	HF	49	4	5	4	20	HIB08	6060	12900	75400	3580	< 220	1310	907	227000	438	799	2530
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	21	HIB06	6020	12900	79000	3480	< 212	1320	1340	243000	483	789	2590
SME Simulant	Coliwasa	HF	34	1	18	4	22	CH07	6480	13800	79900	3530	< 220	2020	1180	249000	502	838	2760
SME Simulant	Coliwasa	LF	63	1	13	4	23	CH04	6340	13600	83200	3610	< 215	2070	1520	244000	464	841	2680
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	24	HIB05	5950	12700	85400	3420	< 222	1410	1210	247000	479	790	2600
SME Simulant	Isolok - 12 mL	HF	58	4	3	4	25	HIB10	5670	12100	79500	3540	< 222	1500	1530	250000	483	771	2530
ARG-1	None	0	0	4	13	4	26	ARG-1B43	5080	14200	85000	7910	515	1300	< 958	225000	6810	202	944
SME Simulant	Coliwasa	HF	65	1	6	4	27	CH08	6320	13500	81500	3640	< 214	2590	1970	243000	465	842	2610
SME Simulant	Coliwasa	LF	38	1	16	4	28	CH03	6330	13400	81200	3590	< 202	2590	1470	247000	455	825	2720
SME Simulant	Isolok - 12 mL	HF	56	4	9	4	29	HIB09	6970	14900	84500	4210	< 230	2820	2420	233000	466	992	2680
ARG-1	None	0	0	2	1	5	1	ARG-1B21	5220	14600	84500	8090	792	547	< 888	226000	6900	203	971
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	6310	13500	80700	3490	< 225	< 283	< 903	248000	527	776	2730
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	6440	13700	89400	3840	< 228	1180	< 916	245000	503	871	2740
SME Simulant	Coliwasa	LF	20	1	2	5	4	CL02	6570	13900	79300	3530	< 240	1060	1130	247000	503	838	2670
SME Simulant	Coliwasa	LF	38	1	16	5	5	CH03	6400	13600	79700	3480	< 202	663	1170	248000	505	798	2750
SME Simulant	Coliwasa	LF	63	1	13	5	6	CH04	6450	13800	81700	3510	< 215	< 270	1110	245000	479	810	2730
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	6380	13600	82600	3600	< 230	1550	< 926	249000	496	819	2900
SME Simulant	Coliwasa	HF	23	1	28	5	8	CH06	6390	13600	80900	3520	< 224	1850	1300	248000	499	795	2760
SME Simulant	Coliwasa	LF	21	1	14	5	9	CH02	6400	13700	84000	3520	< 227	2420	1240	246000	481	799	2700
SME Simulant	Coliwasa	HF	3	1	20	5	10	CL05	6380	13500	78800	3450	< 226	1370	1680	249000	493	816	2720
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	6230	13300	86500	3440	< 229	1820	969	247000	474	790	2700
SME Simulant	Coliwasa	LF	40	1	19	5	12	CL03	6470	13700	80200	3610	< 213	880	1440	244000	485	813	2730
SME Simulant	Coliwasa	HF	18	1	26	5	13	CL06	6460	13800	74200	3620	< 238	1510	1260	248000	485	822	2750
SME Simulant	Coliwasa	HF	1	1	22	5	14	CH05	6440	13700	82700	4030	< 227	1690	1260	245000	487	877	2700
ARG-1	None	0	0	2	12	5	15	ARG-1B22	5260	14600	88100	8240	745	1570	< 976	229000	6930	203	980
SME Simulant	Coliwasa	HF	36	1	21	5	16	CL07	6300	13400	80400	3410	< 215	449	1090	247000	499	785	2730
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	6370	13500	80800	3460	< 231	< 290	< 926	248000	524	809	2770
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	6290	13300	82300	3520	< 233	< 292	< 934	249000	518	814	2640
SME Simulant	Coliwasa	HF	63	1	5	5	19	CL08	6310	13600	79900	3620	< 231	< 290	1280	242000	502	810	2760
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	6130	13100	79700	3420	< 204	< 256	< 819	249000	506	783	2720
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	6280	13500	82700	3540	< 228	< 286	< 914	244000	527	797	2780
SME Simulant	Coliwasa	HF	65	1	6	5	22	CH08	6320	13500	79700	3550	< 214	< 269	1000	241000	519	792	2700
SME Simulant	Coliwasa	HF	34	1	18	5	23	CH07	6450	13800	76800	3590	< 220	< 277	< 884	245000	533	832	2790
SME Simulant	Coliwasa	LF	1	1	12	5	24	CH01	6490	13900	80000	3530	< 232	< 292	< 933	244000	523	813	2720
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	6040	12900	78400	3350	< 203	< 255	< 815	251000	512	756	2730
SME Simulant	Coliwasa	LF	4	1	10	5	26	CL01	6320	13500	85800	3590	< 199	< 250	1090	239000	497	789	2730
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	6260	13400	80600	3370	< 219	< 275	< 880	247000	513	759	2800
SME Simulant	Coliwasa	LF	65	1	23	5	28	CL04	6360	13600	81800	3460	< 210	< 265	1030	243000	509	760	2780

Table C3. Phase 3 Elemental Concentration Measurements (part 2)

Type of Material	Sampler	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Mg (ug/g)	Mn (ug/g)	Na (ug/g)	Ni (ug/g)	P (ug/g)	Pb (ug/g)	S (ug/g)	Si (ug/g)	Ti (ug/g)	Zn (ug/g)	Zr (ug/g)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	5220	14600	84400	8250	784	< 301	< 961	227000	6970	182	952
ARG-1	None	0	0	3	1	6	1	ARG-1B31	5060	14100	85600	8270	685	1160	983	228000	6980	203	943
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	6080	12900	83700	3520	< 223	700	1970	237000	469	806	2640
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	6230	13300	85800	3480	< 225	521	1620	237000	478	814	2710
SME Simulant	Coliwasa	LF	20	1	2	6	4	CL02	6300	13400	79900	3650	< 240	< 302	1390	247000	508	852	2790
SME Simulant	Coliwasa	LF	38	1	16	6	5	CH03	6170	13100	80100	3530	< 202	< 254	1250	247000	501	799	2770
SME Simulant	Coliwasa	LF	63	1	13	6	6	CH04	6180	13200	81700	3540	< 215	< 270	1610	244000	500	802	2760
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	6190	13300	82800	3830	< 216	292	1450	238000	485	851	2560
SME Simulant	Coliwasa	HF	23	1	28	6	8	CH06	6110	13000	80700	3580	< 224	988	1870	247000	485	814	2770
SME Simulant	Coliwasa	LF	21	1	14	6	9	CH02	6100	13100	82800	3520	< 227	647	1500	244000	483	810	2740
SME Simulant	Coliwasa	HF	3	1	20	6	10	CL05	6120	13000	78200	3380	< 226	899	1440	247000	492	782	2720
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	6550	13900	85500	3670	< 226	1110	1830	233000	475	898	2750
SME Simulant	Coliwasa	LF	40	1	19	6	12	CL03	6150	13100	82400	3310	< 213	< 268	1190	242000	506	755	2800
SME Simulant	Coliwasa	HF	18	1	26	6	13	CL06	6220	13200	74300	3500	< 238	1180	1480	248000	496	817	2780
SME Simulant	Coliwasa	HF	1	1	22	6	14	CH05	6190	13200	82700	4080	< 227	1240	1930	245000	501	829	2720
ARG-1	None	0	0	3	12	6	15	ARG-1B32	5050	14100	85900	8520	663	490	< 946	229000	7010	194	1010
SME Simulant	Coliwasa	HF	36	1	21	6	16	CL07	6080	12900	81300	3400	< 215	412	1250	248000	507	807	2750
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	5840	12600	79400	3500	< 216	< 271	1250	250000	521	766	2660
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	8690	18300	104000	5200	< 221	414	2210	323000	667	1140	3380
SME Simulant	Coliwasa	HF	63	1	5	6	19	CL08	6090	13100	80600	3610	< 231	< 290	1300	242000	504	803	2810
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	6360	13600	81500	3600	< 229	< 288	1180	234000	497	812	2710
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	6300	13400	82600	3800	< 210	1120	1610	240000	486	888	2730
SME Simulant	Coliwasa	HF	65	1	6	6	22	CH08	6100	13000	81100	3420	< 214	< 269	1330	242000	507	760	2700
SME Simulant	Coliwasa	HF	34	1	18	6	23	CH07	6250	13300	78500	3500	< 220	1010	1490	247000	489	824	2790
SME Simulant	Coliwasa	LF	1	1	12	6	24	CH01	6260	13400	81400	3570	< 232	606	1260	244000	488	846	2730
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	5990	12700	87900	3570	< 214	836	1720	241000	481	807	2460
SME Simulant	Coliwasa	LF	4	1	10	6	26	CL01	6120	13100	87300	3570	< 199	918	1670	240000	476	807	2740
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	6650	13700	82500	3550	< 218	890	1440	244000	489	830	2820
SME Simulant	Coliwasa	LF	65	1	23	6	28	CL04	6180	13200	84000	3640	< 210	1360	1820	244000	473	836	2790
ARG-1	None	0	0	3	23	6	29	ARG-1B33	5040	14000	86400	8400	527	895	< 1000	227000	6970	192	947

Table C4. Phase 3 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	4.459	7.760	0.088	1.399	0.095	0.010	13.525	2.855	3.057
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	10.279	4.186	0.101	1.156	0.091	0.034	10.966	0.166	4.779
SME Simulant	Isolok - 3 mL	LF	8	1	27	1	3	LIS01	10.298	4.057	0.103	1.143	0.106	0.034	10.952	0.181	4.586
SME Simulant	Coliwasu - low	LF	20	1	2	1	4	CL02	10.166	4.121	0.103	1.181	0.113	0.038	10.980	0.192	4.500
SME Simulant	Coliwasu - high	LF	38	1	16	1	5	CH03	10.449	4.121	0.105	1.168	0.109	0.032	11.123	0.162	4.586
SME Simulant	Coliwasu - high	LF	63	1	13	1	6	CH04	10.525	4.089	0.106	1.187	0.111	0.037	11.223	0.172	4.543
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	10.014	4.057	0.099	1.094	0.088	0.031	10.594	0.180	4.607
SME Simulant	Coliwasu - high	HF	23	1	28	1	8	CH06	10.147	4.089	0.098	1.114	0.102	0.025	10.823	0.179	4.478
SME Simulant	Coliwasu - high	LF	21	1	14	1	9	CH02	10.373	4.186	0.102	1.143	0.106	0.036	11.109	0.182	4.564
SME Simulant	Coliwasu - low	HF	3	1	20	1	10	CL05	10.279	4.154	0.103	1.175	0.119	0.038	11.066	0.181	4.693
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	10.052	3.703	0.100	1.125	0.090	0.034	10.866	0.182	4.435
SME Simulant	Coliwasu - low	LF	40	1	19	1	12	CL03	10.430	3.864	0.103	1.150	0.111	0.030	11.094	0.170	4.457
SME Simulant	Coliwasu - low	HF	18	1	26	1	13	CL06	10.279	4.154	0.107	1.189	0.125	0.029	11.080	0.190	4.413
SME Simulant	Coliwasu - high	HF	1	1	22	1	14	CH05	10.354	3.864	0.102	1.152	0.127	0.038	11.152	0.182	4.564
ARG-1	None	0	0	1	15	1	15	ARG-1B12	4.459	7.953	0.090	1.413	0.097	0.003	13.897	2.590	3.057
SME Simulant	Coliwasu - low	HF	36	1	21	1	16	CL07	9.655	3.864	0.097	1.069	0.108	0.026	10.365	0.172	4.306
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	9.882	4.025	0.095	1.055	0.109	0.038	10.651	0.161	4.327
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	10.298	4.057	0.101	1.135	0.096	0.040	10.952	0.189	4.478
SME Simulant	Coliwasu - low	HF	63	1	5	1	19	CL08	10.392	4.025	0.104	1.157	0.122	0.035	11.152	0.185	4.413
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	10.298	4.186	0.102	1.147	0.095	0.038	11.109	0.172	4.478
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	10.430	3.928	0.100	1.126	0.088	0.041	11.094	0.179	4.500
SME Simulant	Coliwasu - high	HF	65	1	6	1	22	CH08	10.298	4.121	0.101	1.136	0.105	0.033	11.080	0.172	4.521
SME Simulant	Coliwasu - high	HF	34	1	18	1	23	CH07	10.298	4.154	0.102	1.152	0.104	0.038	11.066	0.176	4.478
SME Simulant	Coliwasu - high	LF	1	1	12	1	24	CH01	10.147	4.218	0.101	1.184	0.104	0.032	10.952	0.186	4.650
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	10.241	4.250	0.100	1.117	0.094	0.031	10.923	0.184	4.500
SME Simulant	Coliwasu - low	LF	4	1	10	1	26	CL01	10.354	4.218	0.105	1.133	0.102	0.031	11.052	0.159	4.478
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	10.241	4.121	0.099	1.114	0.093	0.029	10.851	0.201	4.413
SME Simulant	Coliwasu - low	LF	65	1	23	1	28	CL04	10.430	4.089	0.102	1.168	0.107	0.032	11.123	0.169	4.629
ARG-1	None	0	0	1	29	1	29	ARG-1B13	4.535	7.985	0.089	1.427	0.096	0.003	13.854	2.722	3.079
ARG-1	None	0	0	2	1	2	1	ARG-1B21	4.705	8.307	0.094	1.455	0.101	0.008	14.168	2.783	3.122
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	11.375	4.411	0.115	1.343	0.130	0.036	12.224	0.178	4.521
SME Simulant	Coliwasu - low	HF	36	1	21	2	3	CL07	10.468	4.186	0.103	1.166	0.111	0.037	11.094	0.172	4.715
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	11.035	3.993	0.107	1.215	0.127	0.036	11.738	0.164	4.521
SME Simulant	Coliwasu - high	HF	1	1	22	2	5	CH05	10.695	3.993	0.105	1.170	0.127	0.033	11.409	0.182	4.607
SME Simulant	Coliwasu - low	HF	3	1	20	2	6	CL05	10.600	4.315	0.104	1.175	0.118	0.037	11.352	0.181	4.672
SME Simulant	Coliwasu - high	HF	23	1	28	2	7	CH06	10.430	4.250	0.100	1.171	0.100	0.035	11.180	0.179	4.693
SME Simulant	Coliwasu - high	LF	1	1	12	2	8	CH01	10.411	4.218	0.102	1.213	0.105	0.041	11.209	0.186	4.650
SME Simulant	Coliwasu - low	LF	20	1	2	2	9	CL02	10.392	4.121	0.104	1.213	0.110	0.044	11.409	0.192	4.521
SME Simulant	Coliwasu - low	HF	63	1	5	2	10	CL08	10.562	3.993	0.103	1.139	0.119	0.036	11.338	0.185	4.392
SME Simulant	Coliwasu - high	HF	65	1	6	2	11	CH08	10.581	4.154	0.103	1.213	0.104	0.036	11.409	0.172	4.521
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	10.978	3.960	0.107	1.245	0.110	0.047	11.938	0.185	4.327
SME Simulant	Coliwasu - low	LF	4	1	10	2	13	CL01	10.638	4.186	0.107	1.203	0.104	0.031	11.452	0.159	4.457
SME Simulant	Coliwasu - low	HF	18	1	26	2	14	CL06	10.619	4.057	0.105	1.202	0.119	0.036	11.480	0.190	4.521
ARG-1	None	0	0	2	12	2	15	ARG-1B22	4.516	8.050	0.091	1.469	0.097	0.003	14.068	2.614	3.057
SME Simulant	Coliwasu - low	LF	65	1	23	2	16	CL04	10.543	3.928	0.102	1.174	0.102	0.038	11.323	0.169	4.435
SME Simulant	Coliwasu - low	LF	40	1	19	2	17	CL03	10.638	4.025	0.103	1.188	0.111	0.041	11.409	0.170	4.521
SME Simulant	Coliwasu - high	LF	38	1	16	2	18	CH03	10.449	4.057	0.104	1.156	0.108	0.037	11.309	0.162	4.435
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	11.091	3.960	0.112	1.249	0.126	0.044	12.081	0.174	4.457

Table C4. Phase 3 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
SME Simulant	Coliwasa - high	LF	21	1	14	2	20	CH02	10.373	4.154	0.103	1.198	0.105	0.033	11.209	0.182	4.478
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	10.732	4.025	0.106	1.272	0.127	0.030	11.695	0.172	4.478
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	11.054	3.864	0.109	1.198	0.124	0.037	11.895	0.170	4.198
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	10.884	3.832	0.103	1.184	0.105	0.037	11.595	0.175	4.500
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	10.827	3.993	0.107	1.252	0.110	0.035	11.852	0.183	4.564
SME Simulant	Coliwasa - high	HF	34	1	18	2	25	CH07	10.638	4.347	0.106	1.240	0.107	0.039	11.452	0.176	4.586
SME Simulant	Coliwasa - high	LF	63	1	13	2	26	CH04	10.468	3.767	0.102	1.188	0.103	0.041	11.252	0.172	4.500
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	10.997	3.284	0.102	1.455	0.115	0.041	11.781	0.173	4.478
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	11.280	3.574	0.111	1.277	0.113	0.035	12.253	0.175	4.392
ARG-1	None	0	0	2	23	2	29	ARG-1B23	4.629	7.696	0.089	1.469	0.106	0.003	14.025	2.903	3.100
ARG-1	None	0	0	3	1	3	1	ARG-1B31	4.705	7.953	0.090	1.427	0.096	0.003	14.083	2.710	3.165
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	10.090	4.315	0.097	1.117	0.104	0.047	10.580	0.178	5.081
SME Simulant	Coliwasa - low	HF	36	1	21	3	3	CL07	10.506	4.250	0.102	1.153	0.113	0.040	11.080	0.172	4.693
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	10.808	3.896	0.103	1.205	0.103	0.052	11.366	0.179	4.586
SME Simulant	Coliwasa - high	HF	1	1	22	3	5	CH05	10.808	3.896	0.104	1.192	0.126	0.052	11.480	0.182	4.758
SME Simulant	Coliwasa - low	HF	3	1	20	3	6	CL05	10.676	3.993	0.103	1.188	0.116	0.045	11.438	0.181	4.801
SME Simulant	Coliwasa - high	HF	23	1	28	3	7	CH06	10.392	4.186	0.100	1.164	0.102	0.033	11.052	0.179	4.629
SME Simulant	Coliwasa - high	LF	1	1	12	3	8	CH01	10.619	3.928	0.100	1.245	0.102	0.044	11.338	0.186	4.930
SME Simulant	Coliwasa - low	LF	20	1	2	3	9	CL02	10.619	4.218	0.106	1.226	0.118	0.041	11.495	0.192	4.715
SME Simulant	Coliwasa - low	HF	63	1	5	3	10	CL08	10.846	3.832	0.104	1.178	0.120	0.036	11.581	0.185	4.629
SME Simulant	Coliwasa - high	HF	65	1	6	3	11	CH08	10.676	4.025	0.102	1.181	0.105	0.038	11.395	0.172	4.715
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	10.468	3.799	0.101	1.170	0.105	0.037	11.137	0.186	4.779
SME Simulant	Coliwasa - low	LF	4	1	10	3	13	CL01	10.789	4.121	0.107	1.182	0.104	0.036	11.395	0.159	4.586
SME Simulant	Coliwasa - low	HF	18	1	26	3	14	CL06	10.827	4.121	0.107	1.242	0.126	0.047	11.523	0.190	4.672
ARG-1	None	0	0	3	12	3	15	ARG-1B32	4.686	7.824	0.092	1.455	0.103	0.003	14.226	2.867	3.143
SME Simulant	Coliwasa - low	LF	65	1	23	3	16	CL04	10.638	3.864	0.102	1.189	0.106	0.043	11.209	0.169	4.543
SME Simulant	Coliwasa - low	LF	40	1	19	3	17	CL03	10.581	3.960	0.104	1.175	0.112	0.041	11.266	0.170	4.650
SME Simulant	Coliwasa - high	LF	38	1	16	3	18	CH03	10.562	3.767	0.101	1.173	0.103	0.036	11.166	0.162	4.736
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	10.732	3.703	0.105	1.178	0.128	0.041	11.309	0.179	5.059
SME Simulant	Coliwasa - high	LF	21	1	14	3	20	CH02	10.732	4.089	0.103	1.164	0.106	0.036	11.280	0.182	4.736
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	10.638	4.121	0.103	1.178	0.103	0.043	11.280	0.173	4.822
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	10.808	3.960	0.098	1.364	0.123	0.040	11.295	0.179	4.758
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	10.014	3.896	0.094	1.073	0.099	0.043	10.265	0.166	4.801
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	9.580	4.089	0.089	0.953	0.096	0.040	9.865	0.179	5.275
SME Simulant	Coliwasa - high	HF	34	1	18	3	25	CH07	10.128	3.735	0.098	1.145	0.095	0.038	10.680	0.176	4.435
SME Simulant	Coliwasa - high	LF	63	1	13	3	26	CH04	10.884	3.960	0.107	1.222	0.113	0.042	11.552	0.172	4.822
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	10.676	3.960	0.102	1.168	0.107	0.051	11.223	0.184	4.801
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	9.844	3.896	0.097	1.125	0.095	0.036	10.179	0.176	5.059
ARG-1	None	0	0	3	23	3	29	ARG-1B33	4.573	7.599	0.091	1.441	0.095	0.003	13.868	2.698	3.186
ARG-1	None	0	0	4	1	4	1	ARG-1B41	4.554	7.921	0.095	1.469	0.098	0.003	14.083	2.771	3.186
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	10.392	4.379	0.105	1.175	0.107	0.032	11.052	0.174	4.779
SME Simulant	Coliwasa - low	HF	36	1	21	4	3	CL07	9.863	3.864	0.099	1.112	0.105	0.034	10.608	0.172	4.564
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	10.487	3.993	0.103	1.157	0.119	0.044	11.080	0.182	4.693
SME Simulant	Coliwasa - high	HF	1	1	22	4	5	CH05	10.713	3.928	0.106	1.189	0.130	0.040	11.380	0.182	4.844
SME Simulant	Coliwasa - low	HF	3	1	20	4	6	CL05	10.487	4.218	0.105	1.196	0.116	0.041	11.266	0.181	4.995
SME Simulant	Coliwasa - high	HF	23	1	28	4	7	CH06	10.638	4.315	0.107	1.168	0.105	0.026	11.352	0.179	4.736
SME Simulant	Coliwasa - high	LF	1	1	12	4	8	CH01	10.770	4.282	0.108	1.259	0.109	0.027	11.523	0.186	4.909
SME Simulant	Coliwasa - low	LF	20	1	2	4	9	CL02	10.354	4.057	0.107	1.194	0.111	0.033	11.280	0.192	4.629

Table C4. Phase 3 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
SME Simulant	Coliwasa - low	HF	63	1	5	4	10	CL08	10.808	3.832	0.108	1.188	0.117	0.033	11.423	0.185	4.607
SME Simulant	Coliwasa - high	HF	46	4	2	4	11	HIB07	10.600	4.089	0.105	1.164	0.125	0.035	11.309	0.181	4.607
SME Simulant	Isolok - 12 mL	LF	4	1	10	4	12	CL01	10.808	4.186	0.111	1.192	0.103	0.038	11.552	0.159	4.672
SME Simulant	Coliwasa - low	HF	18	1	26	4	13	CL06	10.657	4.057	0.108	1.202	0.121	0.033	11.480	0.190	4.650
ARG-1	Coliwasa - low	0	0	4	7	4	14	ARG-1B42	4.591	7.857	0.095	1.427	0.098	0.003	14.011	2.674	3.143
SME Simulant	None	LF	65	1	23	4	15	CL04	10.638	3.928	0.105	1.188	0.104	0.037	11.323	0.169	4.607
SME Simulant	Coliwasa - low	LF	40	1	19	4	16	CL03	10.695	4.025	0.108	1.175	0.111	0.032	11.466	0.170	4.715
SME Simulant	Coliwasa - low	LF	21	1	14	4	17	CH02	10.525	4.250	0.108	1.163	0.107	0.026	11.280	0.182	4.672
SME Simulant	Coliwasa - high	HF	7	4	12	4	18	HIB01	10.732	4.154	0.107	1.188	0.111	0.028	11.452	0.172	4.758
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	19	HIB03	10.827	3.928	0.107	1.188	0.114	0.033	11.609	0.159	4.758
SME Simulant	Coliwasa - high	HF	49	4	5	4	20	HIB08	10.147	3.638	0.105	1.170	0.155	0.031	10.923	0.176	4.263
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	21	HIB06	10.317	3.993	0.102	1.132	0.126	0.038	10.980	0.170	4.779
SME Simulant	Isolok - 12 mL	HF	64	1	18	4	22	CH07	10.808	4.121	0.108	1.222	0.105	0.030	11.623	0.176	4.736
SME Simulant	Isolok - 12 mL	LF	63	1	13	4	23	CH04	10.638	3.928	0.108	1.202	0.107	0.043	11.466	0.172	4.693
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	24	HIB05	10.354	3.896	0.103	1.112	0.107	0.041	10.937	0.178	4.779
SME Simulant	Coliwasa - high	HF	58	4	3	4	25	HIB10	9.958	4.121	0.101	1.089	0.108	0.024	10.565	0.178	4.866
ARG-1	Coliwasa - high	0	0	4	13	4	26	ARG-1B43	4.535	7.535	0.093	1.427	0.095	0.003	13.968	2.843	3.122
SME Simulant	Isolok - 12 mL	HF	65	1	6	4	27	CH08	10.808	4.057	0.107	1.198	0.106	0.036	11.509	0.172	4.693
SME Simulant	Isolok - 12 mL	LF	38	1	16	4	28	CH03	10.695	4.025	0.108	1.182	0.107	0.031	11.438	0.162	4.672
SME Simulant	None	HF	56	4	9	4	29	HIB09	11.488	3.928	0.121	1.291	0.144	0.045	12.538	0.184	4.500
ARG-1	None	0	0	2	1	5	1	ARG-1B21	4.743	8.050	0.093	1.469	0.103	0.011	14.011	2.554	3.229
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	10.789	3.896	0.103	1.203	0.114	0.056	11.295	0.180	4.844
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	10.902	4.282	0.114	1.248	0.109	0.046	11.380	0.182	5.038
SME Simulant	Coliwasa - low	LF	20	1	2	5	4	CL02	10.600	4.315	0.105	1.216	0.116	0.051	11.352	0.387	4.779
SME Simulant	Coliwasa - high	LF	38	1	16	5	5	CH03	10.695	4.057	0.103	1.168	0.109	0.041	11.252	0.162	4.799
SME Simulant	Coliwasa - high	LF	63	1	13	5	6	CH04	10.789	4.089	0.104	1.217	0.108	0.051	11.423	0.172	4.801
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	10.921	4.250	0.107	1.210	0.109	0.041	11.323	0.184	4.779
SME Simulant	Coliwasa - high	HF	23	1	28	5	8	CH06	10.827	4.282	0.105	1.192	0.105	0.039	11.280	0.179	4.822
SME Simulant	Coliwasa - high	LF	21	1	14	5	9	CH02	10.846	4.089	0.107	1.219	0.105	0.046	11.366	0.182	4.973
SME Simulant	Coliwasa - low	HF	3	1	20	5	10	CL05	10.676	4.154	0.101	1.154	0.115	0.048	11.209	0.181	4.607
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	10.581	3.864	0.104	1.170	0.103	0.048	11.023	0.184	4.693
SME Simulant	Coliwasa - low	LF	40	1	19	5	12	CL03	10.921	4.089	0.106	1.195	0.114	0.043	11.466	0.170	4.715
SME Simulant	Coliwasa - low	HF	18	1	26	5	13	CL06	10.808	4.186	0.109	1.228	0.126	0.046	11.352	0.190	4.779
SME Simulant	Coliwasa - high	HF	1	1	22	5	14	CH05	10.808	4.121	0.109	1.228	0.133	0.048	11.395	0.182	4.973
ARG-1	None	0	0	2	12	5	15	ARG-1B22	4.762	8.436	0.098	1.511	0.101	0.006	14.083	2.759	3.337
SME Simulant	Coliwasa - low	HF	36	1	21	5	16	CL07	10.581	4.121	0.103	1.209	0.113	0.048	11.152	0.172	4.822
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	10.713	4.121	0.106	1.227	0.112	0.048	11.338	0.185	4.844
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	10.543	4.154	0.106	1.187	0.107	0.054	11.094	0.186	4.952
SME Simulant	Coliwasa - low	HF	63	1	5	5	19	CL08	10.713	4.154	0.105	1.222	0.123	0.047	11.352	0.396	4.693
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	10.430	4.218	0.102	1.178	0.099	0.053	10.894	0.163	4.930
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	10.676	4.476	0.103	1.212	0.107	0.046	11.223	0.182	4.822
SME Simulant	Coliwasa - high	HF	65	1	6	5	22	CH08	10.695	4.443	0.103	1.160	0.110	0.047	11.266	0.172	4.801
SME Simulant	Coliwasa - high	HF	34	1	18	5	23	CH07	10.713	4.604	0.106	1.249	0.112	0.054	11.366	0.176	4.779
SME Simulant	Coliwasa - high	LF	1	1	12	5	24	CH01	10.525	4.572	0.103	1.265	0.111	0.046	11.295	0.186	4.930
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	10.373	4.282	0.099	1.168	0.108	0.049	10.794	0.163	5.059
SME Simulant	Coliwasa - low	LF	4	1	10	5	26	CL01	10.789	4.540	0.108	1.180	0.107	0.040	11.352	0.159	4.715
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	10.657	4.057	0.101	1.175	0.097	0.042	11.166	0.175	4.822
SME Simulant	Coliwasa - low	LF	65	1	23	5	28	CL04	10.770	4.186	0.102	1.212	0.106	0.048	11.309	0.169	4.736

Table C4. Phase 3 Oxide Concentration Measurements (part 1)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	Al2O3 (wt%)	B2O3 (wt%)	BaO (wt%)	CaO (wt%)	Cr2O3 (wt%)	CuO (wt%)	Fe2O3 (wt%)	K2O (wt%)	Li2O (wt%)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	4.762	8.758	0.093	1.539	0.116	0.017	14.054	2.831	3.229
ARG-1	None	0	0	3	1	6	1	ARG-1B31	4.743	8.146	0.092	1.469	0.102	0.003	14.111	2.602	3.100
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	10.525	4.154	0.101	1.168	0.107	0.040	11.180	0.179	4.478
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	10.940	4.057	0.101	1.173	0.106	0.039	11.552	0.180	4.543
SME Simulant	Coliwasa - low	LF	20	1	2	6	4	CL02	10.600	4.282	0.104	1.245	0.117	0.039	11.366	0.192	4.607
SME Simulant	Coliwasa - high	LF	38	1	16	6	5	CH03	10.676	4.057	0.101	1.160	0.109	0.032	11.309	0.162	4.543
SME Simulant	Coliwasa - high	LF	63	1	13	6	6	CH04	10.676	3.928	0.101	1.175	0.109	0.043	11.395	0.172	4.629
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	10.770	3.960	0.104	1.181	0.122	0.044	11.480	0.173	4.629
SME Simulant	Coliwasa - high	HF	23	1	28	6	8	CH06	10.657	4.250	0.101	1.220	0.106	0.036	11.280	0.179	4.607
SME Simulant	Coliwasa - high	LF	21	1	14	6	9	CH02	10.676	4.186	0.101	1.159	0.105	0.035	11.323	0.182	4.607
SME Simulant	Coliwasa - low	HF	3	1	20	6	10	CL05	10.543	3.896	0.099	1.203	0.113	0.043	11.195	0.181	4.693
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	11.280	3.960	0.108	1.314	0.114	0.040	11.981	0.181	4.413
SME Simulant	Coliwasa - low	LF	40	1	19	6	12	CL03	10.808	3.735	0.098	1.187	0.104	0.040	11.395	0.170	4.586
SME Simulant	Coliwasa - low	HF	18	1	26	6	13	CL06	10.657	3.993	0.103	1.198	0.120	0.035	11.352	0.190	4.543
SME Simulant	Coliwasa - high	HF	1	1	22	6	14	CH05	10.770	3.993	0.104	1.212	0.133	0.040	11.452	0.182	4.629
ARG-1	None	0	0	3	12	6	15	ARG-1B32	4.629	8.404	0.093	1.497	0.111	0.003	14.154	2.710	3.079
SME Simulant	Coliwasa - low	HF	36	1	21	6	16	CL07	10.562	4.025	0.100	1.202	0.114	0.040	11.152	0.172	4.650
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	10.525	4.121	0.097	1.133	0.103	0.028	10.966	0.173	4.672
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	14.946	5.055	0.142	1.819	0.155	0.060	15.870	0.177	6.480
SME Simulant	Coliwasa - low	HF	63	1	5	6	19	CL08	10.808	3.993	0.102	1.210	0.121	0.043	11.395	0.185	4.543
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	11.167	3.896	0.104	1.230	0.108	0.038	11.781	0.184	4.564
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	11.072	3.960	0.107	1.241	0.131	0.035	11.724	0.169	4.457
SME Simulant	Coliwasa - high	HF	65	1	6	6	22	CH08	10.713	4.025	0.099	1.177	0.105	0.039	11.309	0.172	4.650
SME Simulant	Coliwasa - high	HF	34	1	18	6	23	CH07	10.713	4.154	0.102	1.216	0.108	0.035	11.409	0.176	4.607
SME Simulant	Coliwasa - high	LF	1	1	12	6	24	CH01	10.543	4.250	0.102	1.216	0.110	0.039	11.280	0.186	4.758
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	10.827	3.735	0.102	1.195	0.112	0.032	11.237	0.172	4.392
SME Simulant	Coliwasa - low	LF	4	1	10	6	26	CL01	10.827	4.154	0.106	1.166	0.106	0.038	11.395	0.159	4.564
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	10.997	4.057	0.104	1.381	0.110	0.033	11.638	0.175	4.327
SME Simulant	Coliwasa - low	LF	65	1	23	6	28	CL04	10.770	4.057	0.103	1.223	0.111	0.037	11.380	0.169	4.564
ARG-1	None	0	0	3	23	6	29	ARG-1B33	4.762	8.179	0.093	1.469	0.106	0.003	13.997	2.494	3.100

Table C4. Phase 3 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
ARG-1	None	0	0	1	1	1	1	ARG-1B11	0.811	1.756	10.824	1.000	48.134	1.149	0.028	0.132	97.084
SME Simulant	Isolok - 3 mL	LF	18	1	9	1	2	LIS03	0.988	1.653	10.690	0.453	52.413	0.081	0.104	0.376	98.514
SME Simulant	Isolok - 3 mL	LF	8	1	7	1	3	LIS01	0.988	1.640	10.245	0.468	52.413	0.084	0.103	0.370	97.769
SME Simulant	Coliwasa - low	LF	20	1	2	1	4	CL02	1.015	1.691	10.218	0.450	52.413	0.083	0.106	0.367	97.737
SME Simulant	Coliwasa - high	LF	38	1	16	1	5	CH03	1.013	1.691	10.434	0.464	53.269	0.082	0.105	0.376	99.289
SME Simulant	Coliwasa - high	LF	63	1	13	1	6	CH04	1.017	1.691	10.595	0.476	52.199	0.083	0.106	0.370	98.529
SME Simulant	Isolok - 3 mL	LF	44	1	3	1	7	LIS07	0.957	1.588	10.002	0.425	53.696	0.085	0.096	0.367	97.981
SME Simulant	Coliwasa - high	HF	23	1	28	1	8	CH06	0.978	1.627	10.204	0.440	51.985	0.081	0.099	0.371	96.841
SME Simulant	Coliwasa - high	LF	21	1	14	1	9	CH02	0.998	1.666	10.730	0.454	52.413	0.080	0.103	0.374	98.621
SME Simulant	Coliwasa - low	HF	3	1	20	1	10	CL05	1.002	1.666	10.150	0.454	53.269	0.083	0.103	0.374	98.908
SME Simulant	Isolok - 3 mL	LF	12	1	25	1	11	LIS02	0.975	1.627	10.771	0.435	51.771	0.077	0.100	0.362	96.706
SME Simulant	Coliwasa - low	LF	40	1	19	1	12	CL03	0.998	1.666	10.487	0.453	51.557	0.079	0.104	0.371	97.125
SME Simulant	Coliwasa - low	HF	18	1	26	1	13	CL06	1.007	1.679	9.503	0.473	52.841	0.082	0.109	0.371	97.632
SME Simulant	Coliwasa - high	HF	1	1	22	1	14	CH05	1.000	1.666	10.487	0.503	51.985	0.080	0.102	0.370	97.727
ARG-1	None	0	0	1	15	1	15	ARG-1B12	0.827	1.795	10.986	1.042	49.204	1.169	0.025	0.135	98.743
SME Simulant	Coliwasa - low	HF	36	1	21	1	16	CL07	0.937	1.562	9.813	0.426	50.060	0.078	0.097	0.354	92.990
SME Simulant	Isolok - 3 mL	LF	31	1	24	1	17	LIS05	0.947	1.575	10.029	0.435	51.985	0.082	0.094	0.363	95.855
SME Simulant	Isolok - 3 mL	LF	58	1	4	1	18	LIS10	0.977	1.627	9.908	0.456	52.841	0.085	0.101	0.373	97.712
SME Simulant	Coliwasa - low	HF	63	1	5	1	19	CL08	0.990	1.653	10.218	0.472	51.985	0.077	0.104	0.373	97.457
SME Simulant	Isolok - 3 mL	LF	25	1	7	1	20	LIS04	0.992	1.653	10.892	0.459	51.985	0.083	0.102	0.374	98.164
SME Simulant	Isolok - 3 mL	LF	42	1	11	1	21	LIS06	0.995	1.653	10.083	0.435	53.910	0.085	0.098	0.374	99.120
SME Simulant	Coliwasa - high	HF	65	1	6	1	22	CH08	0.998	1.653	10.272	0.449	51.771	0.083	0.099	0.374	97.266
SME Simulant	Coliwasa - high	HF	34	1	18	1	23	CH07	1.008	1.679	9.894	0.444	52.199	0.081	0.101	0.377	97.351
SME Simulant	Coliwasa - high	LF	1	1	12	1	24	CH01	1.010	1.691	10.191	0.448	51.771	0.082	0.102	0.369	97.237
SME Simulant	Isolok - 3 mL	LF	54	1	17	1	25	LIS09	0.975	1.627	10.029	0.454	52.627	0.085	0.100	0.374	97.712
SME Simulant	Coliwasa - low	LF	4	1	10	1	26	CL01	0.985	1.640	10.959	0.448	50.915	0.081	0.099	0.371	97.131
SME Simulant	Isolok - 3 mL	LF	49	1	8	1	27	LIS08	0.972	1.627	10.312	0.439	51.129	0.081	0.096	0.369	96.189
SME Simulant	Coliwasa - low	LF	65	1	23	1	28	CL04	0.998	1.666	10.541	0.454	52.199	0.084	0.101	0.377	98.270
ARG-1	None	0	0	1	29	1	29	ARG-1B13	0.824	1.795	10.986	1.008	48.990	1.176	0.024	0.138	98.731
ARG-1	None	0	0	2	1	2	1	ARG-1B21	0.831	1.808	11.701	1.051	49.204	1.184	0.025	0.138	100.683
SME Simulant	Hydragard	HF	11	2	3	2	2	HHY02	1.098	1.834	10.272	0.514	51.129	0.083	0.117	0.382	99.762
SME Simulant	Coliwasa - low	HF	36	1	21	2	3	CL07	0.990	1.640	10.932	0.448	53.055	0.082	0.100	0.374	99.673
SME Simulant	Hydragard	HF	24	2	2	2	4	HHY04	1.028	1.717	10.905	0.468	52.413	0.083	0.101	0.388	100.038
SME Simulant	Coliwasa - high	HF	1	1	22	2	5	CH05	1.008	1.679	11.242	0.505	52.413	0.084	0.099	0.378	99.727
SME Simulant	Coliwasa - low	HF	3	1	20	2	6	CL05	1.015	1.691	10.757	0.454	53.483	0.087	0.101	0.381	100.523
SME Simulant	Coliwasa - high	HF	23	1	28	2	7	CH06	0.990	1.653	10.905	0.439	52.199	0.083	0.100	0.380	98.888
SME Simulant	Coliwasa - high	LF	1	1	12	2	8	CH01	1.015	1.691	10.986	0.445	51.985	0.083	0.101	0.371	98.815
SME Simulant	Coliwasa - low	LF	20	1	2	2	9	CL02	1.035	1.717	10.892	0.454	52.841	0.084	0.103	0.371	99.605
SME Simulant	Coliwasa - low	HF	63	1	5	2	10	CL08	0.987	1.653	10.824	0.467	51.343	0.081	0.102	0.373	97.695
SME Simulant	Coliwasa - high	HF	65	1	6	2	11	CH08	1.007	1.679	11.054	0.450	51.985	0.079	0.102	0.367	99.016
SME Simulant	Hydragard	HF	45	2	7	2	12	HHY07	1.048	1.743	10.932	0.480	51.129	0.079	0.108	0.377	98.794
SME Simulant	Coliwasa - low	LF	4	1	10	2	13	CL01	1.005	1.666	11.835	0.459	51.343	0.079	0.102	0.376	99.201
SME Simulant	Coliwasa - low	HF	18	1	26	2	14	CL06	1.022	1.704	10.231	0.448	53.269	0.085	0.103	0.382	99.574
ARG-1	None	0	0	2	12	2	15	ARG-1B22	0.823	1.795	11.647	1.029	48.562	1.168	0.024	0.139	99.151
SME Simulant	Coliwasa - low	LF	65	1	23	2	16	CL04	1.000	1.653	11.121	0.443	51.557	0.082	0.098	0.376	98.144
SME Simulant	Coliwasa - low	LF	40	1	19	2	17	CL03	1.005	1.666	11.256	0.454	51.557	0.081	0.101	0.377	98.703
SME Simulant	Coliwasa - high	LF	38	1	16	2	18	CH03	1.007	1.666	10.905	0.453	52.627	0.082	0.102	0.374	99.032
SME Simulant	Hydragard	HF	57	2	6	2	19	HHY09	1.078	1.782	11.229	0.496	50.274	0.082	0.111	0.378	98.724

Table C4. Phase 3 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
SME Simulant	Coliwasa - high	LF	21	1	14	2	20	CH02	0.988	1.640	11.215	0.457	51.771	0.078	0.102	0.367	98.453
SME Simulant	Hydragard	HF	6	2	4	2	21	HHY01	1.051	1.743	10.919	0.463	51.771	0.082	0.105	0.371	99.144
SME Simulant	Hydragard	HF	19	2	10	2	22	HHY03	1.063	1.743	10.703	0.466	52.627	0.084	0.106	0.389	99.830
SME Simulant	Hydragard	HF	50	2	5	2	23	HHY08	1.015	1.717	10.919	0.458	51.557	0.083	0.097	0.374	98.635
SME Simulant	Hydragard	HF	37	2	9	2	24	HHY06	1.065	1.782	11.108	0.481	50.701	0.077	0.108	0.369	98.613
SME Simulant	Coliwasa - high	HF	34	1	18	2	25	CH07	1.025	1.704	10.757	0.457	52.841	0.085	0.103	0.380	100.042
SME Simulant	Coliwasa - high	LF	63	1	13	2	26	CH04	0.998	1.666	11.108	0.442	51.557	0.079	0.099	0.365	97.905
SME Simulant	Hydragard	HF	32	2	8	2	27	HHY05	1.075	1.717	12.240	0.430	50.915	0.078	0.096	0.350	99.327
SME Simulant	Hydragard	HF	61	2	11	2	28	HHY10	1.091	1.821	11.256	0.482	50.060	0.076	0.112	0.381	98.488
ARG-1	None	0	0	2	23	2	29	ARG-1B23	0.823	1.782	11.782	0.985	48.776	1.173	0.021	0.135	99.497
ARG-1	None	0	0	3	1	3	1	ARG-1B31	0.847	1.834	11.525	1.010	49.204	1.169	0.025	0.133	99.980
SME Simulant	Isolok - 12 mL	LF	11	3	4	3	2	LIB02	0.952	1.588	11.067	0.442	53.269	0.083	0.098	0.354	99.459
SME Simulant	Coliwasa - low	HF	36	1	21	3	3	CL07	1.013	1.666	10.865	0.445	52.841	0.085	0.100	0.377	99.501
SME Simulant	Isolok - 12 mL	LF	26	3	8	3	4	LIB04	1.030	1.704	11.782	0.439	50.915	0.083	0.099	0.370	98.720
SME Simulant	Coliwasa - high	HF	1	1	22	3	5	CH05	1.041	1.730	11.081	0.508	52.627	0.083	0.101	0.374	100.144
SME Simulant	Coliwasa - low	HF	3	1	20	3	6	CL05	1.050	1.730	10.676	0.445	54.338	0.085	0.102	0.374	101.340
SME Simulant	Coliwasa - high	HF	23	1	28	3	7	CH06	1.007	1.653	10.609	0.452	51.771	0.081	0.101	0.367	97.878
SME Simulant	Coliwasa - high	LF	1	1	12	3	8	CH01	1.055	1.743	10.878	0.433	52.413	0.082	0.101	0.366	99.564
SME Simulant	Coliwasa - low	LF	20	1	2	3	9	CL02	1.070	1.769	10.811	0.468	53.483	0.081	0.110	0.371	100.892
SME Simulant	Coliwasa - low	HF	63	1	5	3	10	CL08	1.038	1.730	10.932	0.462	52.627	0.080	0.105	0.371	99.856
SME Simulant	Coliwasa - high	HF	65	1	6	3	11	CH08	1.033	1.704	10.892	0.453	52.199	0.080	0.106	0.365	99.239
SME Simulant	Isolok - 12 mL	LF	45	3	7	3	12	LIB07	0.997	1.653	10.690	0.458	53.269	0.080	0.099	0.358	99.386
SME Simulant	Coliwasa - low	LF	4	1	10	3	13	CL01	1.026	1.704	11.620	0.456	51.771	0.079	0.102	0.371	99.609
SME Simulant	Coliwasa - low	HF	18	1	26	3	14	CL06	1.056	1.756	10.164	0.466	53.910	0.082	0.109	0.377	100.777
ARG-1	None	0	0	3	12	3	15	ARG-1B32	0.857	1.859	11.593	1.033	49.204	1.168	0.026	0.132	100.272
SME Simulant	Coliwasa - low	LF	65	1	23	3	16	CL04	1.022	1.691	10.986	0.454	51.557	0.080	0.103	0.362	98.119
SME Simulant	Coliwasa - low	LF	40	1	19	3	17	CL03	1.025	1.691	11.027	0.464	51.129	0.080	0.105	0.369	97.952
SME Simulant	Coliwasa - high	LF	38	1	16	3	18	CH03	1.025	1.691	10.784	0.433	52.413	0.081	0.100	0.366	98.699
SME Simulant	Isolok - 12 mL	LF	56	3	11	3	19	LIB09	1.012	1.691	10.771	0.477	52.199	0.082	0.104	0.366	99.136
SME Simulant	Coliwasa - high	LF	21	1	14	3	20	CH02	1.025	1.704	11.256	0.454	52.413	0.080	0.103	0.370	99.834
SME Simulant	Isolok - 12 mL	LF	5	3	5	3	21	LIB01	1.030	1.704	11.121	0.456	53.269	0.084	0.104	0.369	100.597
SME Simulant	Isolok - 12 mL	LF	23	3	10	3	22	LIB03	1.018	1.691	11.418	0.458	53.055	0.083	0.110	0.357	100.815
SME Simulant	Isolok - 12 mL	LF	50	3	2	3	23	LIB08	0.894	1.485	11.013	0.414	53.483	0.081	0.090	0.350	98.260
SME Simulant	Isolok - 12 mL	LF	41	3	9	3	24	LIB06	0.834	1.382	10.892	0.403	54.980	0.083	0.087	0.342	99.169
SME Simulant	Coliwasa - high	HF	34	1	18	3	25	CH07	0.988	1.627	10.056	0.414	49.418	0.073	0.099	0.342	93.546
SME Simulant	Coliwasa - high	LF	63	1	13	3	26	CH04	1.061	1.756	11.377	0.468	53.269	0.086	0.106	0.374	101.371
SME Simulant	Isolok - 12 mL	LF	32	3	3	3	27	LIB05	1.020	1.691	11.215	0.456	53.269	0.082	0.105	0.361	100.471
SME Simulant	Isolok - 12 mL	LF	60	3	6	3	28	LIB10	0.917	1.511	10.932	0.410	52.841	0.081	0.091	0.349	97.639
ARG-1	None	0	0	3	23	3	29	ARG-1B33	0.839	1.821	11.593	1.007	48.562	1.156	0.024	0.133	98.688
ARG-1	None	0	0	4	1	4	1	ARG-1B41	0.857	1.872	11.593	1.029	48.562	1.161	0.024	0.128	99.406
SME Simulant	Isolok - 12 mL	HF	13	4	11	4	2	HIB02	1.028	1.704	10.339	0.456	53.910	0.085	0.103	0.362	100.184
SME Simulant	Coliwasa - low	HF	36	1	21	4	3	CL07	0.975	1.614	10.420	0.415	50.060	0.079	0.094	0.354	94.432
SME Simulant	Isolok - 12 mL	HF	25	4	4	4	4	HIB04	0.980	1.640	10.245	0.453	52.627	0.081	0.097	0.361	98.342
SME Simulant	Coliwasa - high	HF	1	1	22	4	5	CH05	1.040	1.730	11.121	0.504	51.985	0.080	0.103	0.367	99.444
SME Simulant	Coliwasa - low	HF	3	1	20	4	6	CL05	1.036	1.717	10.690	0.447	52.841	0.083	0.101	0.369	99.890
SME Simulant	Coliwasa - high	HF	23	1	28	4	7	CH06	1.038	1.730	10.946	0.462	52.627	0.078	0.106	0.367	99.981
SME Simulant	Coliwasa - high	LF	1	1	12	4	8	CH01	1.081	1.795	11.161	0.466	53.055	0.083	0.106	0.365	101.286
SME Simulant	Coliwasa - low	LF	20	1	2	4	9	CL02	1.060	1.756	10.771	0.448	51.985	0.078	0.105	0.355	98.514

Table C4. Phase 3 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
SME Simulant	Coliwasa - low	HF	63	1	5	4	10	CL08	1.035	1.730	11.013	0.461	51.985	0.074	0.104	0.363	99.066
SME Simulant	Coliwasa - high	HF	46	4	2	4	11	HIB07	1.031	1.704	11.633	0.464	51.557	0.080	0.102	0.357	99.145
SME Simulant	Isolok - 12 mL	LF	4	1	10	4	12	CL01	1.046	1.743	11.903	0.454	51.985	0.080	0.102	0.369	100.503
SME Simulant	Coliwasa - low	HF	18	1	26	4	13	CL06	1.055	1.756	10.164	0.456	53.055	0.077	0.104	0.371	99.536
ARG-1	Coliwasa - low	0	0	4	7	4	14	ARG-1B42	0.847	1.846	11.579	1.040	48.348	1.144	0.026	0.127	98.857
SME Simulant	None	LF	65	1	23	4	15	CL04	1.038	1.717	11.148	0.452	51.771	0.080	0.101	0.365	98.772
SME Simulant	Coliwasa - low	LF	40	1	19	4	16	CL03	1.046	1.743	11.256	0.467	51.771	0.079	0.105	0.367	99.331
SME Simulant	Coliwasa - low	LF	21	1	14	4	17	CH02	1.030	1.704	11.242	0.466	51.771	0.080	0.106	0.363	99.075
SME Simulant	Coliwasa - high	HF	7	4	12	4	18	HIB01	1.045	1.730	10.919	0.472	53.055	0.079	0.103	0.357	100.461
SME Simulant	Isolok - 12 mL	HF	21	4	6	4	19	HIB03	1.066	1.782	11.310	0.482	52.413	0.079	0.107	0.369	100.331
SME Simulant	Coliwasa - high	HF	49	4	5	4	20	HIB08	1.005	1.666	10.164	0.456	48.562	0.073	0.099	0.342	92.974
SME Simulant	Isolok - 12 mL	HF	38	4	8	4	21	HIB06	0.998	1.666	10.649	0.443	51.985	0.081	0.098	0.350	97.906
SME Simulant	Isolok - 12 mL	HF	34	1	18	4	22	CH07	1.075	1.782	10.771	0.449	53.269	0.084	0.104	0.373	100.835
SME Simulant	Isolok - 12 mL	LF	63	1	13	4	23	CH04	1.051	1.756	11.215	0.459	52.199	0.077	0.105	0.362	99.583
SME Simulant	Isolok - 12 mL	HF	33	4	10	4	24	HIB05	0.987	1.640	11.512	0.435	52.841	0.080	0.098	0.351	99.452
SME Simulant	Coliwasa - high	HF	58	4	3	4	25	HIB10	0.940	1.562	10.717	0.450	53.483	0.081	0.096	0.342	98.680
ARG-1	Coliwasa - high	0	0	4	13	4	26	ARG-1B43	0.842	1.834	11.458	1.007	48.134	1.136	0.025	0.128	98.184
SME Simulant	Isolok - 12 mL	HF	65	1	6	4	27	CH08	1.048	1.743	10.986	0.463	51.985	0.078	0.105	0.353	99.446
SME Simulant	Isolok - 12 mL	LF	38	1	16	4	28	CH03	1.050	1.730	10.946	0.457	52.841	0.076	0.103	0.367	99.988
SME Simulant	None	HF	56	4	9	4	29	HIB09	1.156	1.924	11.391	0.536	49.846	0.078	0.123	0.362	99.655
ARG-1	None	0	0	2	1	5	1	ARG-1B21	0.866	1.885	11.391	1.029	48.348	1.151	0.025	0.131	99.089
SME Simulant	Isolok - 3 mL	HF	20	2	16	5	2	HIS03	1.046	1.743	10.878	0.444	53.055	0.088	0.097	0.369	100.201
SME Simulant	Isolok - 3 mL	HF	9	2	21	5	3	HIS01	1.068	1.769	12.051	0.489	52.413	0.084	0.108	0.370	101.654
SME Simulant	Coliwasa - low	LF	20	1	2	5	4	CL02	1.090	1.795	10.690	0.449	52.841	0.084	0.104	0.361	100.334
SME Simulant	Coliwasa - high	LF	38	1	16	5	5	CH03	1.061	1.756	10.744	0.443	53.055	0.084	0.099	0.371	99.980
SME Simulant	Coliwasa - high	LF	63	1	13	5	6	CH04	1.070	1.782	11.013	0.447	52.413	0.080	0.101	0.369	100.030
SME Simulant	Isolok - 3 mL	HF	44	2	18	5	7	HIS07	1.058	1.756	11.134	0.458	53.269	0.083	0.102	0.392	101.178
SME Simulant	Coliwasa - high	HF	23	1	28	5	8	CH06	1.060	1.756	10.905	0.448	53.055	0.083	0.099	0.373	100.612
SME Simulant	Coliwasa - high	LF	21	1	14	5	9	CH02	1.061	1.769	11.323	0.448	52.627	0.080	0.099	0.365	100.707
SME Simulant	Coliwasa - low	HF	3	1	20	5	10	CL05	1.058	1.743	10.622	0.439	53.269	0.082	0.102	0.367	99.926
SME Simulant	Isolok - 3 mL	HF	14	2	15	5	11	HIS02	1.033	1.717	11.660	0.438	52.841	0.079	0.098	0.365	100.000
SME Simulant	Coliwasa - low	LF	40	1	19	5	12	CL03	1.073	1.769	10.811	0.459	52.199	0.081	0.101	0.369	99.683
SME Simulant	Coliwasa - low	HF	18	1	26	5	13	CL06	1.071	1.782	10.002	0.461	53.055	0.081	0.102	0.371	99.751
SME Simulant	Coliwasa - high	HF	1	1	22	5	14	CH05	1.068	1.769	11.148	0.513	52.413	0.081	0.109	0.365	100.463
ARG-1	None	0	0	2	12	5	15	ARG-1B22	0.872	1.885	11.876	1.049	48.990	1.156	0.025	0.132	101.077
SME Simulant	Coliwasa - low	HF	36	1	21	5	16	CL07	1.045	1.730	10.838	0.434	52.841	0.083	0.098	0.369	99.759
SME Simulant	Isolok - 3 mL	HF	31	2	19	5	17	HIS05	1.056	1.743	10.892	0.440	53.055	0.087	0.101	0.374	100.443
SME Simulant	Isolok - 3 mL	HF	60	2	22	5	18	HIS10	1.043	1.717	11.094	0.448	53.269	0.086	0.101	0.357	100.499
SME Simulant	Coliwasa - low	HF	63	1	5	5	19	CL08	1.046	1.756	10.771	0.461	51.771	0.084	0.101	0.373	99.167
SME Simulant	Isolok - 3 mL	HF	26	2	14	5	20	HIS04	1.017	1.691	10.744	0.435	53.269	0.084	0.097	0.367	99.772
SME Simulant	Isolok - 3 mL	HF	35	2	20	5	21	HIS06	1.041	1.743	11.148	0.450	52.199	0.088	0.099	0.376	99.991
SME Simulant	Coliwasa - high	HF	65	1	6	5	22	CH08	1.048	1.743	10.744	0.452	51.557	0.087	0.099	0.365	98.890
SME Simulant	Coliwasa - high	HF	34	1	18	5	23	CH07	1.070	1.782	10.353	0.457	52.413	0.089	0.104	0.377	99.804
SME Simulant	Coliwasa - high	LF	1	1	12	5	24	CH01	1.076	1.795	10.784	0.449	52.199	0.087	0.101	0.367	99.892
SME Simulant	Isolok - 3 mL	HF	54	2	17	5	25	HIS09	1.002	1.666	10.568	0.426	53.696	0.085	0.094	0.369	100.003
SME Simulant	Coliwasa - low	LF	4	1	10	5	26	CL01	1.048	1.743	11.566	0.457	51.129	0.083	0.098	0.369	99.483
SME Simulant	Isolok - 3 mL	HF	48	2	13	5	27	HIS08	1.038	1.730	10.865	0.429	52.841	0.086	0.094	0.378	99.754
SME Simulant	Coliwasa - low	LF	65	1	23	5	28	CL04	1.055	1.756	11.027	0.440	51.985	0.085	0.095	0.376	99.456

Table C4. Phase 3 Oxide Concentration Measurements (part 2)

Type of Material	Sampler Details	Flow Rate	Sample Order	Preparation Block	Preparation Sequence	Analytical Block	Analytical Sequence	Sample ID	MgO (wt%)	MnO (wt%)	Na2O (wt%)	NiO (wt%)	SiO2 (wt%)	TiO2 (wt%)	ZnO (wt%)	ZrO2 (wt%)	Sum (wt%)
ARG-1	None	0	0	2	23	5	29	ARG-1B23	0.866	1.885	11.377	1.050	48.562	1.163	0.023	0.129	100.452
ARG-1	None	0	0	3	1	6	1	ARG-1B31	0.839	1.821	11.539	1.052	48.776	1.164	0.025	0.127	99.712
SME Simulant	Hydragard	LF	15	3	21	6	2	LHY03	1.008	1.666	11.283	0.448	50.701	0.078	0.100	0.357	97.573
SME Simulant	Hydragard	LF	6	3	18	6	3	LHY01	1.033	1.717	11.566	0.443	50.701	0.080	0.101	0.366	98.698
SME Simulant	Coliwasa	LF	20	1	2	6	4	CL02	1.045	1.730	10.771	0.464	52.841	0.085	0.106	0.377	99.972
SME Simulant	Coliwasa	LF	38	1	16	6	5	CH03	1.023	1.691	10.797	0.449	52.841	0.084	0.099	0.374	99.508
SME Simulant	Coliwasa	LF	63	1	13	6	6	CH04	1.025	1.704	11.013	0.450	52.199	0.083	0.100	0.373	99.176
SME Simulant	Hydragard	LF	47	3	13	6	7	LHY07	1.026	1.717	11.161	0.487	50.915	0.081	0.106	0.346	98.304
SME Simulant	Coliwasa	HF	23	1	28	6	8	CH06	1.013	1.679	10.878	0.456	52.841	0.081	0.101	0.374	99.861
SME Simulant	Coliwasa	LF	21	1	14	6	9	CH02	1.012	1.691	11.161	0.448	52.199	0.081	0.101	0.370	99.436
SME Simulant	Coliwasa	HF	3	1	20	6	10	CL05	1.015	1.679	10.541	0.430	52.841	0.082	0.097	0.367	99.019
SME Simulant	Hydragard	LF	10	3	20	6	11	LHY02	1.086	1.795	11.525	0.467	49.846	0.079	0.112	0.371	98.674
SME Simulant	Coliwasa	LF	40	1	19	6	12	CL03	1.020	1.691	11.108	0.421	51.771	0.084	0.094	0.378	98.690
SME Simulant	Coliwasa	HF	18	1	26	6	13	CL06	1.031	1.704	10.016	0.445	53.055	0.083	0.102	0.376	99.001
SME Simulant	Coliwasa	HF	1	1	22	6	14	CH05	1.026	1.704	11.148	0.519	52.413	0.084	0.103	0.367	99.879
ARG-1	None	0	0	3	12	6	15	ARG-1B32	0.837	1.821	11.579	1.084	48.990	1.169	0.024	0.136	100.321
SME Simulant	Coliwasa	HF	36	1	21	6	16	CL07	1.008	1.666	10.959	0.433	53.055	0.085	0.100	0.371	99.694
SME Simulant	Hydragard	LF	30	3	14	6	17	LHY05	0.968	1.627	10.703	0.445	53.483	0.087	0.095	0.359	99.586
SME Simulant	Hydragard	LF	59	3	17	6	18	LHY10	1.441	2.363	14.019	0.662	69.099	0.111	0.142	0.457	132.998
SME Simulant	Coliwasa	HF	63	1	5	6	19	CL08	1.010	1.691	10.865	0.459	51.771	0.084	0.100	0.380	98.760
SME Simulant	Hydragard	LF	28	3	16	6	20	LHY04	1.055	1.756	10.986	0.458	50.060	0.083	0.101	0.366	97.937
SME Simulant	Hydragard	LF	37	3	15	6	21	LHY06	1.045	1.730	11.134	0.484	51.343	0.081	0.111	0.369	99.192
SME Simulant	Coliwasa	HF	65	1	6	6	22	CH08	1.012	1.679	10.932	0.435	51.771	0.085	0.095	0.365	98.661
SME Simulant	Coliwasa	HF	34	1	18	6	23	CH07	1.036	1.717	10.582	0.445	52.841	0.082	0.103	0.377	99.704
SME Simulant	Coliwasa	LF	1	1	12	6	24	CH01	1.038	1.730	10.973	0.454	52.199	0.081	0.105	0.369	99.435
SME Simulant	Hydragard	LF	53	3	19	6	25	LHY09	0.993	1.640	11.849	0.454	51.557	0.080	0.100	0.332	98.810
SME Simulant	Coliwasa	LF	4	1	10	6	26	CL01	1.015	1.691	11.768	0.454	51.343	0.079	0.100	0.370	99.335
SME Simulant	Hydragard	LF	48	3	22	6	27	LHY08	1.103	1.769	11.121	0.452	52.199	0.082	0.103	0.381	100.031
SME Simulant	Coliwasa	LF	65	1	23	6	28	CL04	1.025	1.704	11.323	0.463	52.199	0.079	0.104	0.377	99.689
ARG-1	None	0	0	3	23	6	29	ARG-1B33	0.836	1.808	11.647	1.069	48.562	1.163	0.024	0.128	99.437

**Table C5. Reference Calcine Oxide Concentrations for Low-Rheology SME Simulant
(Phase 3 Testing)**

Oxide	Targeted wt%
Al ₂ O ₃ (wt%)	10.869
B ₂ O ₃ (wt%)	4.259
BaO (wt%)	0.0919
CaO (wt%)	1.1462
Cr ₂ O ₃ (wt%)	0.0998
CuO (wt%)	0.0504
Fe ₂ O ₃ (wt%)	11.462
K ₂ O (wt%)	0.1591
Li ₂ O (wt%)	4.674
MgO (wt%)	1.014
MnO (wt%)	1.779
Na ₂ O (wt%)	11.659
NiO (wt%)	0.41
SiO ₂ (wt%)	50.985
TiO ₂ (wt%)	0.0711
ZnO (wt%)	0.0958
ZrO ₂ (wt%)	0.3547
Sum of Oxides (wt%)	99.553

Shaded rows indicate oxides that are at reportable concentrations and that are considered critical in the comparisons conducted as part of this study.

Table C6. Comparisons for Density and Solids from Low-Rheology (Phase 3) Testing

Density Measurements for Low Rheology Simulant

Comparisons	Sampler Mean (g/mL)	BL Mean (g/mL)	Difference (g/mL)	Difference (%)	Statistically Significant Bias	Sampler Std Dev	BL Std Dev	Statistically	g/mL	% of BL	n sampler	n BL
								Different	Bound on	Bound on		
								Variances	Bias (95%)	Bias (95%)		
Coliwasa High Location vs Coliwasa Low Location (BL)	1.2505	1.2591	-0.009	-0.7%	no	0.01080	0.00888	no	0.0193	1.5%	8	8
Hydragard (LF) vs Coliwasa	1.2501	1.2548	-0.005	-0.4%	no	0.00997	0.01057	no	0.0133	1.1%	10	16
Hydragard (HF) vs Coliwasa	1.2545	1.2548	0.000	0.0%	no	0.00738	0.01057	yes	0.0076	0.6%	10	16
Isolok - 12mL (LF) vs Coliwasa	1.2571	1.2548	0.002	0.2%	no	0.00985	0.01057	no	0.0191	1.5%	10	16
Isolok - 12mL (HF) vs Coliwasa	1.2503	1.2548	-0.004	-0.4%	no	0.00697	0.01057	yes	0.0116	0.9%	10	16

Weight Percent (wt%) Dried Solids for Low Rheology Simulant

Comparisons	Sampler Mean (wt%)	BL Mean (wt%)	Difference (wt%)	Difference (%)	Statistically Significant Bias	Sampler Std Dev	BL Std Dev	Statistically	wt%	% of BL	n sampler	n BL
								Different	Bound on	Bound on		
								Variances	Bias (95%)	Bias (95%)		
Coliwasa High Location vs Coliwasa Low Location (BL)	31.545	31.593	-0.047	-0.2%	no	0.09813	0.11889	no	0.1644	0.5%	8	8
Hydragard (LF) vs Coliwasa	30.866	31.569	-0.703	-2.2%	yes	0.10906	0.10813	no	0.7930	2.5%	10	16
Hydragard (HF) vs Coliwasa	30.751	31.569	-0.818	-2.6%	yes	0.11474	0.10813	no	0.9098	2.9%	10	16
Isolok - 12mL (LF) vs Coliwasa	31.585	31.569	0.016	0.1%	no	0.12651	0.10813	no	0.1122	0.4%	10	16
Isolok - 12mL (HF) vs Coliwasa	31.547	31.569	-0.022	-0.1%	no	0.09381	0.10813	no	0.1074	0.3%	10	16
Isolok - 3 mL (LF) vs Coliwasa	31.617	31.569	0.048	0.2%	no	0.13953	0.10813	no	0.1488	0.5%	10	16
Isolok - 3 mL (HF) vs Coliwasa	31.582	31.569	0.013	0.0%	no	0.20176	0.10813	no	0.1383	0.4%	10	16

Wt% Vitrified Solids for Low Rheology Simulant

Comparisons	Sampler Mean (wt%)	BL Mean (wt%)	Difference (wt%)	Difference (%)	Statistically Significant Bias	Sampler Std Dev	BL Std Dev	Statistically	wt%	% of BL	n sampler	n BL
								Different	Bound on	Bound on		
								Variances	Bias (95%)	Bias (95%)		
Coliwasa High Location vs Coliwasa Low Location (BL)	26.750	26.798	-0.047	-0.2%	no	0.09798	0.12803	no	0.1698	0.6%	8	8
Hydragard (LF) vs Coliwasa	25.980	26.774	-0.794	-3.0%	yes	0.11738	0.11283	no	0.8891	3.3%	10	16
Hydragard (HF) vs Coliwasa	25.908	26.774	-0.866	-3.2%	yes	0.14109	0.11283	no	0.9691	3.6%	10	16
Isolok - 12mL (LF) vs Coliwasa	26.757	26.774	-0.017	-0.1%	no	0.09440	0.11283	no	0.1052	0.4%	10	16
Isolok - 12mL (LF) scmd vs Coliwasa	26.780	26.774	0.006	0.0%	no	0.06384	0.11283	no	0.0912	0.3%	9	16
Isolok - 12mL (HF) vs Coliwasa	26.766	26.774	-0.008	0.0%	no	0.08579	0.11283	no	0.0939	0.4%	10	16
Isolok - 3 mL (LF) vs Coliwasa	26.835	26.774	0.061	0.2%	no	0.12886	0.11283	no	0.1603	0.6%	10	16
Isolok - 3 mL (HF) vs Coliwasa	26.939	26.774	0.165	0.6%	yes	0.20556	0.11283	yes	0.3190	1.2%	10	16

Table C7. Oxide Comparisons between the Low and High Coliwasa Samples for the Low-Rheology (Phase 3) Testing

Phase III - Low Rheology													
All Data													
Analytical Block	Oxide	Mean(Measured wt%) Coliwasa - low location	Mean(Measured wt%) Coliwasa - high location	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa - low location	Std Dev(Measured wt%) Coliwasa - high location	Sig. Diff	n low	n high
avg	Al/B	2.580	2.597	0.017	0.7%	no	0.1063	4.12	0.0791	0.0870	no	8	8
avg	Al ₂ O ₃ (wt%)	10.591	10.576	-0.014	-0.1%	no	0.1377	1.30	0.1482	0.0676	no	8	8
avg	B ₂ O ₃ (wt%)	4.112	4.077	-0.035	-0.8%	no	0.1513	3.68	0.1011	0.1156	no	8	8
avg	BaO (wt%)	0.104	0.104	0.000	0.4%	no	0.0023	2.18	0.0021	0.0011	no	8	8
avg	CaO (wt%)	1.189	1.186	-0.004	-0.3%	no	0.0254	2.14	0.0196	0.0211	no	8	8
avg	Cr ₂ O ₃ (wt%)	0.109	0.113	0.004	3.8%	no	0.0122	11.14	0.0065	0.0084	no	8	8
avg	CuO (wt%)	0.038	0.039	0.001	2.2%	no	0.0039	10.25	0.0020	0.0034	no	8	8
avg	Fe/Li	2.416	2.446	0.030	1.3%	no	0.0772	3.19	0.0518	0.0338	no	8	8
avg	Fe ₂ O ₃ (wt%)	11.289	11.278	-0.011	-0.1%	no	0.1419	1.26	0.1559	0.0731	no	8	8
avg	K ₂ O (wt%)	0.176	0.186	0.009	5.3%	no	0.0300	16.98	0.0244	0.0077	yes	8	8
avg	Li ₂ O (wt%)	4.676	4.613	-0.063	-1.3%	no	0.1283	2.74	0.0586	0.0635	no	8	8
avg	MgO (wt%)	1.029	1.026	-0.004	-0.3%	no	0.0185	1.80	0.0169	0.0101	no	8	8
avg	MnO (wt%)	1.710	1.703	-0.006	-0.4%	no	0.0320	1.87	0.0283	0.0182	no	8	8
avg	Na ₂ O (wt%)	10.850	10.789	-0.061	-0.6%	no	0.4499	4.15	0.4549	0.2362	no	8	8
avg	NiO (wt%)	0.458	0.452	-0.006	-1.3%	no	0.0233	5.09	0.0092	0.0208	no	8	8
avg	SiO ₂ (wt%)	52.297	52.266	-0.031	-0.1%	no	0.6511	1.25	0.7251	0.2707	yes	8	8
avg	Sum of Oxides (wt%)	99.181	98.962	-0.219	-0.2%	no	0.8178	0.82	0.6987	0.3676	no	8	8
avg	TiO ₂ (wt%)	0.082	0.082	0.000	-0.1%	no	0.0013	1.54	0.0012	0.0010	no	8	8
avg	ZnO (wt%)	0.102	0.102	0.000	-0.2%	no	0.0022	2.18	0.0024	0.0008	yes	8	8
avg	ZrO ₂ (wt%)	0.369	0.371	0.002	0.4%	no	0.0044	1.20	0.0028	0.0024	no	8	8
Phase III - Low Rheology													
Screened Data													
Analytical Block	Oxide	Mean(Measured wt%) Coliwasa - low location	Mean(Measured wt%) Coliwasa - high location	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa - low location	Std Dev(Measured wt%) Coliwasa - high location	Sig. Diff	n low	n high
avg	Al/B	2.597	2.580	-0.017	-0.7%	no	0.1063	4.09	0.0791	0.0870	no	8	8
avg	Al ₂ O ₃ (wt%)	10.576	10.591	0.014	0.1%	no	0.1377	1.30	0.1482	0.0676	no	8	8
avg	B ₂ O ₃ (wt%)	4.077	4.112	0.035	0.9%	no	0.1513	3.71	0.1011	0.1156	no	8	8
avg	BaO (wt%)	0.104	0.104	0.000	-0.4%	no	0.0023	2.17	0.0021	0.0011	no	8	8
avg	CaO (wt%)	1.186	1.189	0.004	0.3%	no	0.0254	2.14	0.0196	0.0211	no	8	8
avg	Cr ₂ O ₃ (wt%)	0.113	0.106	-0.007	-6.2%	yes	0.0125	11.04	0.0065	0.0017	yes	8	7
avg	CuO (wt%)	0.039	0.038	-0.001	-2.2%	no	0.0039	10.02	0.0020	0.0034	no	8	8
avg	Fe/Li	2.446	2.416	-0.030	-1.2%	no	0.0772	3.15	0.0518	0.0338	no	8	8
avg	Fe ₂ O ₃ (wt%)	11.330	11.289	-0.041	-0.4%	no	0.1121	0.99	0.0493	0.0731	no	7	8
avg	K ₂ O (wt%)	0.186	0.176	-0.009	-5.0%	no	0.0300	16.13	0.0244	0.0077	yes	8	8
avg	Li ₂ O (wt%)	4.595	4.676	0.081	1.8%	yes	0.1376	3.00	0.0280	0.0635	no	7	8
avg	MgO (wt%)	1.026	1.029	0.004	0.4%	no	0.0185	1.80	0.0169	0.0101	no	8	8
avg	MnO (wt%)	1.711	1.710	-0.002	-0.1%	no	0.0218	1.28	0.0178	0.0182	no	7	8
avg	Na ₂ O (wt%)	10.789	10.850	0.061	0.6%	no	0.4499	4.17	0.4549	0.2362	no	8	8
avg	NiO (wt%)	0.452	0.451	-0.001	-0.3%	no	0.0093	2.06	0.0092	0.0041	no	8	7
avg	SiO ₂ (wt%)	52.266	52.219	-0.046	-0.1%	no	0.6577	1.26	0.7251	0.1708	yes	8	7
avg	Sum of Oxides (wt%)	98.962	99.181	0.219	0.2%	no	0.8178	0.83	0.6987	0.3676	no	8	8
avg	TiO ₂ (wt%)	0.082	0.082	0.000	0.4%	no	0.0015	1.80	0.0012	0.0007	no	8	7
avg	ZnO (wt%)	0.102	0.102	0.000	0.2%	no	0.0022	2.18	0.0024	0.0008	yes	8	8
avg	ZrO ₂ (wt%)	0.371	0.369	-0.002	-0.4%	no	0.0044	1.20	0.0028	0.0024	no	8	8

Table C8. Oxide Comparisons between the Samplers for the Low-Rheology (Phase 3) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Al/B	2.521	2.518	-0.003	-0.1%	no	0.075	2.97	0.080	0.097	no	16	10
1	Isolok-LFR-3mL	Al2O3 (wt%)	10.286	10.203	-0.083	-0.8%	no	0.240	2.33	0.201	0.166	no	16	10
1	Isolok-LFR-3mL	B2O3 (wt%)	4.083	4.057	-0.026	-0.6%	no	0.138	3.37	0.119	0.156	no	16	10
1	Isolok-LFR-3mL	BaO (wt%)	0.103	0.100	-0.003	-2.5%	yes	0.005	4.50	0.003	0.002	no	16	10
1	Isolok-LFR-3mL	CaO (wt%)	1.154	1.121	-0.032	-2.8%	yes	0.058	5.01	0.031	0.029	no	16	10
1	Isolok-LFR-3mL	Cr2O3 (wt%)	0.111	0.095	-0.016	-14.3%	yes	0.022	20.12	0.008	0.007	no	16	10
1	Isolok-LFR-3mL	CuO (wt%)	0.033	0.035	0.002	5.3%	no	0.005	15.70	0.004	0.004	no	16	10
1	Isolok-LFR-3mL	Fe/Li	2.442	2.417	-0.025	-1.0%	no	0.072	2.94	0.048	0.068	no	16	10
1	Isolok-LFR-3mL	Fe2O3 (wt%)	11.027	10.896	-0.132	-1.2%	no	0.288	2.61	0.199	0.167	no	16	10
1	Isolok-LFR-3mL	K2O (wt%)	0.177	0.180	0.003	1.5%	no	0.011	6.36	0.010	0.011	no	16	10
1	Isolok-LFR-3mL	Li2O (wt%)	4.517	4.510	-0.007	-0.1%	no	0.097	2.15	0.099	0.124	no	16	10
1	Isolok-LFR-3mL	MgO (wt%)	0.997	0.977	-0.021	-2.1%	yes	0.035	3.56	0.019	0.015	no	16	10
1	Isolok-LFR-3mL	MnO (wt%)	1.662	1.627	-0.035	-2.1%	yes	0.060	3.61	0.033	0.027	no	16	10
1	Isolok-LFR-3mL	Na2O (wt%)	10.294	10.296	0.002	0.0%	no	0.302	2.93	0.360	0.359	no	16	10
1	Isolok-LFR-3mL	NiO (wt%)	0.457	0.446	-0.011	-2.4%	no	0.024	5.36	0.018	0.014	no	16	10
1	Isolok-LFR-3mL	SiO2 (wt%)	52.052	52.477	0.425	0.8%	no	1.106	2.13	0.799	0.850	no	16	10
1	Isolok-LFR-3mL	Sum (wt%)	97.507	97.572	0.065	0.1%	no	1.125	1.15	1.400	1.027	no	16	10
1	Isolok-LFR-3mL	TiO2 (wt%)	0.081	0.083	0.002	2.0%	no	0.003	4.26	0.002	0.003	no	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.102	0.100	-0.003	-2.8%	yes	0.005	5.35	0.003	0.003	no	16	10
1	Isolok-LFR-3mL	ZrO2 (wt%)	0.371	0.370	-0.001	-0.3%	no	0.005	1.44	0.005	0.005	no	16	10
2	Hydragard - HFR	Al/B	2.566	2.850	0.284	11.1%	yes	0.419	16.32	0.099	0.232	no	16	10
2	Hydragard - HFR	Al2O3 (wt%)	10.532	11.025	0.494	4.7%	yes	0.614	5.83	0.103	0.195	no	16	10
2	Hydragard - HFR	B2O3 (wt%)	4.109	3.890	-0.220	-5.3%	yes	0.400	9.74	0.150	0.297	no	16	10
2	Hydragard - HFR	BaO (wt%)	0.104	0.108	0.004	4.2%	yes	0.007	7.01	0.002	0.004	yes	16	10
2	Hydragard - HFR	CaO (wt%)	1.188	1.269	0.081	6.8%	yes	0.139	11.68	0.026	0.079	yes	16	10
2	Hydragard - HFR	Cr2O3 (wt%)	0.110	0.119	0.009	8.3%	yes	0.016	14.45	0.007	0.009	no	16	10
2	Hydragard - HFR	CuO (wt%)	0.037	0.038	0.001	1.9%	no	0.004	11.08	0.004	0.005	no	16	10
2	Hydragard - HFR	Fe/Li	2.495	2.681	0.186	7.5%	yes	0.250	10.04	0.068	0.091	no	16	10
2	Hydragard - HFR	Fe2O3 (wt%)	11.330	11.905	0.575	5.1%	yes	0.739	6.52	0.113	0.221	yes	16	10
2	Hydragard - HFR	K2O (wt%)	0.177	0.175	-0.002	-1.1%	no	0.009	5.03	0.010	0.006	no	16	10
2	Hydragard - HFR	Li2O (wt%)	4.544	4.444	-0.100	-2.2%	yes	0.186	4.10	0.099	0.110	no	16	10
2	Hydragard - HFR	MgO (wt%)	1.006	1.061	0.055	5.5%	yes	0.075	7.43	0.014	0.026	yes	16	10
2	Hydragard - HFR	MnO (wt%)	1.673	1.760	0.087	5.2%	yes	0.119	7.11	0.024	0.043	yes	16	10
2	Hydragard - HFR	Na2O (wt%)	11.001	11.048	0.047	0.4%	no	0.385	3.50	0.334	0.504	no	16	10
2	Hydragard - HFR	NiO (wt%)	0.455	0.474	0.019	4.2%	yes	0.034	7.57	0.015	0.023	no	16	10
2	Hydragard - HFR	SiO2 (wt%)	52.239	51.258	-0.981	-1.9%	yes	1.616	3.09	0.708	0.845	no	16	10
2	Hydragard - HFR	Sum (wt%)	99.062	99.135	0.073	0.1%	no	0.664	0.67	0.780	0.573	no	16	10
2	Hydragard - HFR	TiO2 (wt%)	0.082	0.081	-0.001	-1.7%	no	0.004	4.42	0.002	0.003	no	16	10
2	Hydragard - HFR	ZnO (wt%)	0.101	0.106	0.005	4.9%	yes	0.010	9.42	0.001	0.006	yes	16	10
2	Hydragard - HFR	ZrO2 (wt%)	0.375	0.376	0.001	0.4%	no	0.008	2.15	0.005	0.011	no	16	10

Table C8. Oxide Comparisons between the Samplers for the Low-Rheology (Phase 3) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
3	Isolok-LFR-12mL	Al/B	2.666	2.621	-0.045	-1.7%	no	0.184	6.91	0.108	0.184	yes	16	10
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.643	10.366	-0.277	-2.6%	yes	0.605	5.68	0.192	0.447	yes	16	10
3	Isolok-LFR-12mL	B2O3 (wt%)	3.997	3.964	-0.033	-0.8%	no	0.169	4.24	0.158	0.174	no	16	10
3	Isolok-LFR-12mL	BaO (wt%)	0.103	0.099	-0.004	-4.0%	yes	0.008	7.46	0.003	0.005	yes	16	10
3	Isolok-LFR-12mL	CaO (wt%)	1.189	1.153	-0.036	-3.0%	no	0.111	9.33	0.030	0.104	yes	16	10
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.111	0.106	-0.004	-3.8%	no	0.012	11.14	0.009	0.011	no	16	10
3	Isolok-LFR-12mL	CuO (wt%)	0.041	0.043	0.002	6.0%	no	0.007	16.31	0.005	0.005	no	16	10
3	Isolok-LFR-12mL	Fe/Li	2.412	2.220	-0.192	-8.0%	yes	0.328	13.62	0.052	0.189	yes	16	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	11.308	10.850	-0.458	-4.1%	yes	0.875	7.74	0.234	0.569	yes	16	10
3	Isolok-LFR-12mL	K2O (wt%)	0.177	0.178	0.001	0.6%	no	0.007	4.05	0.010	0.006	yes	16	10
3	Isolok-LFR-12mL	Li2O (wt%)	4.691	4.902	0.212	4.5%	yes	0.366	7.81	0.117	0.206	yes	16	10
3	Isolok-LFR-12mL	MgO (wt%)	1.033	0.970	-0.063	-6.1%	yes	0.113	10.89	0.022	0.068	yes	16	10
3	Isolok-LFR-12mL	MnO (wt%)	1.709	1.610	-0.099	-5.8%	yes	0.182	10.66	0.039	0.114	yes	16	10
3	Isolok-LFR-12mL	Na2O (wt%)	10.876	11.090	0.214	2.0%	no	0.521	4.79	0.394	0.322	no	16	10
3	Isolok-LFR-12mL	NiO (wt%)	0.455	0.441	-0.014	-3.0%	no	0.032	7.02	0.020	0.025	no	16	10
3	Isolok-LFR-12mL	SiO2 (wt%)	52.386	53.055	0.669	1.3%	no	1.595	3.04	1.164	1.023	no	16	10
3	Isolok-LFR-12mL	Sum (wt%)	99.270	99.365	0.095	0.1%	no	1.442	1.45	1.886	1.031	no	16	10
3	Isolok-LFR-12mL	TiO2 (wt%)	0.081	0.082	0.001	1.2%	no	0.003	3.87	0.003	0.001	no	16	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.103	0.099	-0.005	-4.6%	no	0.010	9.90	0.003	0.008	yes	16	10
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.369	0.357	-0.011	-3.0%	yes	0.018	5.00	0.008	0.009	no	16	10
4	Isolok-HFR-12mL	Al/B	2.614	2.630	0.016	0.6%	no	0.124	4.75	0.102	0.165	no	16	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.619	10.530	-0.089	-0.8%	no	0.356	3.35	0.239	0.425	no	16	10
4	Isolok-HFR-12mL	B2O3 (wt%)	4.067	4.012	-0.055	-1.4%	no	0.195	4.80	0.150	0.195	no	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.107	0.106	-0.001	-0.9%	no	0.004	4.03	0.003	0.006	no	16	10
4	Isolok-HFR-12mL	CaO (wt%)	1.189	1.167	-0.023	-1.9%	no	0.057	4.79	0.030	0.055	no	16	10
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.110	0.122	0.011	10.3%	no	0.024	21.37	0.007	0.017	yes	16	10
4	Isolok-HFR-12mL	CuO (wt%)	0.034	0.035	0.001	4.0%	no	0.006	18.40	0.005	0.007	no	16	10
4	Isolok-HFR-12mL	Fe/Li	2.415	2.408	-0.006	-0.3%	no	0.131	5.44	0.064	0.171	yes	16	10
4	Isolok-HFR-12mL	Fe2O3 (wt%)	11.373	11.245	-0.129	-1.1%	no	0.527	4.63	0.229	0.542	yes	16	10
4	Isolok-HFR-12mL	K2O (wt%)	0.177	0.175	-0.002	-0.9%	no	0.009	4.98	0.010	0.007	no	16	10
4	Isolok-HFR-12mL	Li2O (wt%)	4.712	4.678	-0.034	-0.7%	no	0.152	3.23	0.115	0.179	no	16	10
4	Isolok-HFR-12mL	MgO (wt%)	1.044	1.024	-0.020	-1.9%	no	0.063	6.06	0.023	0.059	yes	16	10
4	Isolok-HFR-12mL	MnO (wt%)	1.734	1.702	-0.032	-1.9%	no	0.104	6.00	0.040	0.098	yes	16	10
4	Isolok-HFR-12mL	Na2O (wt%)	10.985	10.888	-0.097	-0.9%	no	0.476	4.33	0.391	0.548	no	16	10
4	Isolok-HFR-12mL	NiO (wt%)	0.458	0.465	0.007	1.5%	no	0.025	5.56	0.017	0.028	no	16	10
4	Isolok-HFR-12mL	SiO2 (wt%)	52.199	52.028	-0.171	-0.3%	no	1.398	2.68	0.773	1.663	yes	16	10
4	Isolok-HFR-12mL	Sum (wt%)	99.355	98.713	-0.642	-0.6%	no	2.133	2.15	1.502	2.190	no	16	10
4	Isolok-HFR-12mL	TiO2 (wt%)	0.079	0.080	0.000	0.6%	no	0.003	3.60	0.003	0.003	no	16	10
4	Isolok-HFR-12mL	ZnO (wt%)	0.103	0.103	0.000	-0.4%	no	0.005	4.78	0.003	0.008	no	16	10
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.364	0.355	-0.009	-2.6%	yes	0.015	4.21	0.006	0.009	no	16	10

Table C8. Oxide Comparisons between the Samplers for the Low-Rheology (Phase 3) Testing

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwas (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwas (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
5	Isolok-HFR-3mL	Al/B	2.531	2.567	0.036	1.4%	no	0.137	5.42	0.119	0.124	no	16	10
5	Isolok-HFR-3mL	Al2O3 (wt%)	10.735	10.659	-0.076	-0.7%	no	0.192	1.79	0.106	0.183	no	16	10
5	Isolok-HFR-3mL	B2O3 (wt%)	4.250	4.160	-0.090	-2.1%	no	0.246	5.79	0.188	0.186	no	16	10
5	Isolok-HFR-3mL	BaO (wt%)	0.105	0.105	-0.001	-0.5%	no	0.003	3.06	0.002	0.004	no	16	10
5	Isolok-HFR-3mL	CaO (wt%)	1.207	1.198	-0.009	-0.8%	no	0.034	2.80	0.031	0.027	no	16	10
5	Isolok-HFR-3mL	Cr2O3 (wt%)	0.113	0.106	-0.007	-6.3%	yes	0.013	11.44	0.008	0.005	no	16	10
5	Isolok-HFR-3mL	CuO (wt%)	0.046	0.048	0.002	4.0%	no	0.006	11.88	0.004	0.005	no	16	10
5	Isolok-HFR-3mL	Fe/Li	2.363	2.288	-0.075	-3.2%	yes	0.125	5.30	0.049	0.075	no	16	10
5	Isolok-HFR-3mL	Fe2O3 (wt%)	11.324	11.153	-0.171	-1.5%	yes	0.317	2.80	0.080	0.199	yes	16	10
5	Isolok-HFR-3mL	K2O (wt%)	0.202	0.179	-0.024	-11.7%	no	0.064	31.47	0.074	0.009	yes	16	10
5	Isolok-HFR-3mL	Li2O (wt%)	4.794	4.878	0.084	1.8%	no	0.172	3.58	0.099	0.115	no	16	10
5	Isolok-HFR-3mL	MgO (wt%)	1.062	1.040	-0.022	-2.1%	yes	0.035	3.31	0.012	0.020	no	16	10
5	Isolok-HFR-3mL	MnO (wt%)	1.764	1.728	-0.036	-2.1%	yes	0.057	3.22	0.019	0.031	no	16	10
5	Isolok-HFR-3mL	Na2O (wt%)	10.834	11.103	0.270	2.5%	no	0.598	5.52	0.362	0.445	no	16	10
5	Isolok-HFR-3mL	NiO (wt%)	0.453	0.446	-0.008	-1.7%	no	0.023	4.97	0.018	0.018	no	16	10
5	Isolok-HFR-3mL	SiO2 (wt%)	52.426	52.990	0.564	1.1%	yes	1.020	1.94	0.602	0.440	no	16	10
5	Isolok-HFR-3mL	Sum (wt%)	99.871	100.349	0.478	0.5%	yes	0.934	0.94	0.497	0.623	no	16	10
5	Isolok-HFR-3mL	TiO2 (wt%)	0.083	0.085	0.002	2.0%	no	0.004	4.64	0.003	0.003	no	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.101	0.099	-0.001	-1.5%	no	0.005	4.48	0.003	0.004	no	16	10
5	Isolok-HFR-3mL	ZrO2 (wt%)	0.369	0.372	0.002	0.7%	no	0.008	2.17	0.004	0.009	no	16	10
6	Hydragard-LFR	Al/B	2.635	2.736	0.101	3.8%	yes	0.200	7.58	0.106	0.130	no	16	9
6	Hydragard-LFR	Al2O3 (wt%)	10.687	10.900	0.213	2.0%	yes	0.419	3.92	0.093	0.265	yes	16	9
6	Hydragard-LFR	B2O3 (wt%)	4.061	3.989	-0.072	-1.8%	no	0.193	4.74	0.146	0.127	no	16	9
6	Hydragard-LFR	BaO (wt%)	0.102	0.103	0.001	1.4%	no	0.004	3.61	0.002	0.003	no	16	9
6	Hydragard-LFR	CaO (wt%)	1.198	1.224	0.026	2.2%	no	0.087	7.28	0.025	0.079	yes	16	9
6	Hydragard-LFR	Cr2O3 (wt%)	0.112	0.113	0.001	0.5%	no	0.008	6.74	0.008	0.009	no	16	9
6	Hydragard-LFR	CuO (wt%)	0.038	0.037	-0.002	-4.3%	no	0.005	13.20	0.003	0.005	no	16	9
6	Hydragard-LFR	Fe/Li	2.459	2.560	0.101	4.1%	yes	0.189	7.70	0.042	0.113	yes	16	9
6	Hydragard-LFR	Fe2O3 (wt%)	11.337	11.504	0.168	1.5%	no	0.418	3.69	0.081	0.324	yes	16	9
6	Hydragard-LFR	K2O (wt%)	0.177	0.176	-0.001	-0.5%	no	0.008	4.51	0.010	0.005	no	16	9
6	Hydragard-LFR	Li2O (wt%)	4.611	4.497	-0.114	-2.5%	yes	0.204	4.42	0.058	0.114	yes	16	9
6	Hydragard-LFR	MgO (wt%)	1.022	1.035	0.013	1.3%	no	0.046	4.53	0.011	0.043	yes	16	9
6	Hydragard-LFR	MnO (wt%)	1.697	1.713	0.016	0.9%	no	0.061	3.59	0.018	0.058	yes	16	9
6	Hydragard-LFR	Na2O (wt%)	10.927	11.259	0.332	3.0%	yes	0.648	5.93	0.379	0.343	no	16	9
6	Hydragard-LFR	NiO (wt%)	0.452	0.460	0.008	1.8%	no	0.025	5.60	0.022	0.016	no	16	9
6	Hydragard-LFR	SiO2 (wt%)	52.386	51.201	-1.186	-2.3%	yes	1.867	3.56	0.535	1.122	no	16	9
6	Hydragard-LFR	Sum (wt%)	99.364	98.756	-0.608	-0.6%	yes	1.104	1.11	0.435	0.774	no	16	9
6	Hydragard-LFR	TiO2 (wt%)	0.083	0.081	-0.001	-1.6%	no	0.003	3.84	0.002	0.003	no	16	9
6	Hydragard-LFR	ZnO (wt%)	0.101	0.103	0.003	2.6%	no	0.006	6.15	0.003	0.005	no	16	9
6	Hydragard-LFR	ZrO2 (wt%)	0.373	0.361	-0.012	-3.2%	yes	0.023	6.25	0.004	0.015	yes	16	9

Table C9. Oxide Comparisons between the Samplers for the Low-Rheology (Phase 3) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean (Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
1	Isolok-LFR-3mL	Al/B	2.521	2.518	-0.003	-0.1%	no	0.075	2.97	0.0799	0.0971	no	16	10
1	Isolok-LFR-3mL	Al2O3 (wt%)	10.328	10.203	-0.125	-1.2%	yes	0.240	2.32	0.1135	0.1662	no	15	10
1	Isolok-LFR-3mL	B2O3 (wt%)	4.134	4.096	-0.037	-0.9%	no	0.106	2.56	0.0551	0.0990	no	13	9
1	Isolok-LFR-3mL	BaO (wt%)	0.103	0.101	-0.002	-2.4%	yes	0.004	4.02	0.0022	0.0013	no	15	9
1	Isolok-LFR-3mL	CaO (wt%)	1.159	1.129	-0.031	-2.7%	yes	0.049	4.24	0.0222	0.0191	no	15	9
1	Isolok-LFR-3mL	Cr2O3 (wt%)	0.111	0.095	-0.016	-14.3%	yes	0.022	20.12	0.0081	0.0071	no	16	10
1	Isolok-LFR-3mL	CuO (wt%)	0.033	0.035	0.002	5.3%	no	0.005	15.70	0.0041	0.0041	no	16	10
1	Isolok-LFR-3mL	Fe/Li	2.442	2.417	-0.025	-1.0%	no	0.072	2.94	0.0482	0.0682	no	16	10
1	Isolok-LFR-3mL	Fe2O3 (wt%)	11.072	10.896	-0.176	-1.6%	yes	0.284	2.57	0.0957	0.1668	no	15	10
1	Isolok-LFR-3mL	K2O (wt%)	0.177	0.180	0.003	1.5%	no	0.011	6.36	0.0095	0.0114	no	16	10
1	Isolok-LFR-3mL	Li2O (wt%)	4.517	4.510	-0.007	-0.1%	no	0.097	2.15	0.0986	0.1240	no	16	10
1	Isolok-LFR-3mL	MgO (wt%)	1.001	0.977	-0.025	-2.5%	yes	0.035	3.54	0.0109	0.0154	no	15	10
1	Isolok-LFR-3mL	MnO (wt%)	1.668	1.627	-0.041	-2.5%	yes	0.060	3.62	0.0196	0.0265	no	15	10
1	Isolok-LFR-3mL	Na2O (wt%)	10.346	10.296	-0.050	-0.5%	no	0.326	3.15	0.3024	0.3595	no	15	10
1	Isolok-LFR-3mL	NiO (wt%)	0.457	0.446	-0.011	-2.4%	no	0.024	5.36	0.0177	0.0138	no	16	10
1	Isolok-LFR-3mL	SiO2 (wt%)	52.185	52.477	0.292	0.6%	no	0.899	1.72	0.6183	0.8501	no	15	10
1	Isolok-LFR-3mL	Sum (wt%)	97.808	97.572	-0.236	-0.2%	no	0.965	0.99	0.7392	1.0271	no	15	10
1	Isolok-LFR-3mL	TiO2 (wt%)	0.081	0.083	0.002	2.0%	no	0.003	4.26	0.0020	0.0027	no	16	10
1	Isolok-LFR-3mL	ZnO (wt%)	0.102	0.100	-0.003	-2.8%	yes	0.005	5.35	0.0032	0.0032	no	16	10
1	Isolok-LFR-3mL	ZrO2 (wt%)	0.372	0.370	-0.002	-0.6%	no	0.005	1.43	0.0028	0.0048	no	15	10
2	Hydragard - HFR	Al/B	2.566	2.794	0.228	8.9%	yes	0.336	13.08	0.0989	0.1615	no	16	9
2	Hydragard - HFR	Al2O3 (wt%)	10.532	11.025	0.494	4.7%	yes	0.614	5.83	0.1035	0.1946	no	16	10
2	Hydragard - HFR	B2O3 (wt%)	4.109	3.900	-0.209	-5.1%	yes	0.343	8.35	0.1496	0.1475	no	16	8
2	Hydragard - HFR	BaO (wt%)	0.104	0.108	0.004	4.2%	yes	0.007	7.01	0.0016	0.0039	yes	16	10
2	Hydragard - HFR	CaO (wt%)	1.188	1.248	0.060	5.1%	yes	0.091	7.63	0.0258	0.0478	no	16	9
2	Hydragard - HFR	Cr2O3 (wt%)	0.110	0.119	0.009	8.3%	yes	0.016	14.45	0.0075	0.0091	no	16	10
2	Hydragard - HFR	CuO (wt%)	0.037	0.038	0.001	1.9%	no	0.004	11.08	0.0036	0.0048	no	16	10
2	Hydragard - HFR	Fe/Li	2.495	2.681	0.186	7.5%	yes	0.250	10.04	0.0676	0.0913	no	16	10
2	Hydragard - HFR	Fe2O3 (wt%)	11.330	11.905	0.575	5.1%	yes	0.739	6.52	0.1131	0.2214	yes	16	10
2	Hydragard - HFR	K2O (wt%)	0.177	0.175	-0.002	-1.1%	no	0.009	5.03	0.0095	0.0061	no	16	10
2	Hydragard - HFR	Li2O (wt%)	4.544	4.444	-0.100	-2.2%	yes	0.186	4.10	0.0993	0.1099	no	16	10
2	Hydragard - HFR	MgO (wt%)	1.006	1.061	0.055	5.5%	yes	0.075	7.43	0.0139	0.0263	yes	16	10
2	Hydragard - HFR	MnO (wt%)	1.673	1.760	0.087	5.2%	yes	0.119	7.11	0.0236	0.0426	yes	16	10
2	Hydragard - HFR	Na2O (wt%)	10.997	10.996	0.000	0.0%	no	0.164	1.49	0.1716	0.1867	no	14	8
2	Hydragard - HFR	NiO (wt%)	0.451	0.474	0.022	5.0%	yes	0.039	8.64	0.0075	0.0227	yes	15	10
2	Hydragard - HFR	SiO2 (wt%)	52.239	51.258	-0.981	-1.9%	yes	1.616	3.09	0.7083	0.8450	no	16	10
2	Hydragard - HFR	Sum (wt%)	99.062	99.135	0.073	0.1%	no	0.664	0.67	0.7801	0.5730	no	16	10
2	Hydragard - HFR	TiO2 (wt%)	0.082	0.081	-0.001	-1.7%	no	0.004	4.42	0.0025	0.0029	no	16	10
2	Hydragard - HFR	ZnO (wt%)	0.101	0.106	0.005	4.9%	yes	0.010	9.42	0.0015	0.0064	yes	16	10
2	Hydragard - HFR	ZrO2 (wt%)	0.375	0.379	0.004	1.2%	no	0.009	2.49	0.0051	0.0069	no	16	9

Table C9. Oxide Comparisons between the Samplers for the Low-Rheology (Phase 3) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean (Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
3	Isolok-LFR-12mL	Al/B	2.666	2.621	-0.045	-1.7%	no	0.184	6.91	0.1079	0.1844	yes	16	10
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.677	10.366	-0.311	-2.9%	no	0.635	5.95	0.1382	0.4466	yes	15	10
3	Isolok-LFR-12mL	B2O3 (wt%)	3.997	3.964	-0.033	-0.8%	no	0.169	4.24	0.1577	0.1740	no	16	10
3	Isolok-LFR-12mL	BaO (wt%)	0.103	0.099	-0.004	-4.0%	yes	0.008	7.46	0.0026	0.0047	yes	16	10
3	Isolok-LFR-12mL	CaO (wt%)	1.189	1.152	-0.037	-3.1%	yes	0.068	5.74	0.0302	0.0430	no	16	8
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.111	0.106	-0.004	-3.8%	no	0.012	11.14	0.0090	0.0109	no	16	10
3	Isolok-LFR-12mL	CuO (wt%)	0.041	0.043	0.002	6.0%	no	0.007	16.31	0.0048	0.0054	no	16	10
3	Isolok-LFR-12mL	Fe/Li	2.412	2.220	-0.192	-8.0%	yes	0.328	13.62	0.0524	0.1892	yes	16	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	11.350	10.850	-0.500	-4.4%	yes	0.912	8.04	0.1693	0.5693	yes	15	10
3	Isolok-LFR-12mL	K2O (wt%)	0.177	0.179	0.002	1.4%	no	0.008	4.52	0.0095	0.0038	yes	16	9
3	Isolok-LFR-12mL	Li2O (wt%)	4.708	4.902	0.194	4.1%	yes	0.347	7.38	0.0982	0.2063	yes	15	10
3	Isolok-LFR-12mL	MgO (wt%)	1.033	0.970	-0.063	-6.1%	yes	0.113	10.89	0.0216	0.0681	yes	16	10
3	Isolok-LFR-12mL	MnO (wt%)	1.709	1.610	-0.099	-5.8%	yes	0.182	10.66	0.0394	0.1144	yes	16	10
3	Isolok-LFR-12mL	Na2O (wt%)	10.881	11.090	0.209	1.9%	no	0.470	4.32	0.2917	0.3223	no	14	10
3	Isolok-LFR-12mL	NiO (wt%)	0.454	0.441	-0.013	-2.8%	no	0.031	6.82	0.0117	0.0246	yes	14	10
3	Isolok-LFR-12mL	SiO2 (wt%)	52.584	53.081	0.497	0.9%	no	1.187	2.26	0.8828	0.4033	no	15	8
3	Isolok-LFR-12mL	Sum (wt%)	99.652	99.365	-0.286	-0.3%	no	1.218	1.22	1.1470	1.0306	no	15	10
3	Isolok-LFR-12mL	TiO2 (wt%)	0.082	0.082	0.000	0.5%	no	0.002	2.48	0.0022	0.0013	no	15	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.103	0.099	-0.005	-4.6%	no	0.010	9.90	0.0032	0.0075	yes	16	10
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.370	0.357	-0.013	-3.5%	yes	0.020	5.35	0.0045	0.0093	yes	15	10
4	Isolok-HFR-12mL	Al/B	2.614	2.630	0.016	0.6%	no	0.124	4.75	0.1018	0.1653	no	16	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.669	10.424	-0.246	-2.3%	yes	0.463	4.34	0.1328	0.2748	yes	15	9
4	Isolok-HFR-12mL	B2O3 (wt%)	4.067	4.012	-0.055	-1.4%	no	0.195	4.80	0.1504	0.1945	no	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.107	0.104	-0.003	-2.7%	yes	0.005	4.35	0.0010	0.0022	yes	14	9
4	Isolok-HFR-12mL	CaO (wt%)	1.190	1.153	-0.037	-3.1%	yes	0.064	5.41	0.0149	0.0346	yes	14	9
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.110	0.122	0.011	10.3%	no	0.024	21.37	0.0074	0.0165	yes	16	10
4	Isolok-HFR-12mL	CuO (wt%)	0.034	0.035	0.001	4.0%	no	0.006	18.40	0.0051	0.0069	no	16	10
4	Isolok-HFR-12mL	Fe/Li	2.415	2.366	-0.049	-2.0%	no	0.122	5.04	0.0636	0.1146	no	16	9
4	Isolok-HFR-12mL	Fe2O3 (wt%)	11.424	11.101	-0.323	-2.8%	yes	0.568	4.97	0.1081	0.3137	yes	15	9
4	Isolok-HFR-12mL	K2O (wt%)	0.177	0.175	-0.002	-0.9%	no	0.009	4.98	0.0095	0.0072	no	16	10
4	Isolok-HFR-12mL	Li2O (wt%)	4.678	4.724	0.046	1.0%	no	0.124	2.65	0.0693	0.1098	no	14	9
4	Isolok-HFR-12mL	MgO (wt%)	1.046	1.009	-0.037	-3.6%	yes	0.067	6.39	0.0117	0.0381	yes	14	9
4	Isolok-HFR-12mL	MnO (wt%)	1.742	1.677	-0.065	-3.7%	yes	0.114	6.55	0.0241	0.0627	yes	15	9
4	Isolok-HFR-12mL	Na2O (wt%)	10.923	10.888	-0.035	-0.3%	no	0.449	4.11	0.3149	0.5479	yes	15	10
4	Isolok-HFR-12mL	NiO (wt%)	0.458	0.457	-0.001	-0.2%	no	0.010	2.18	0.0069	0.0144	no	14	9
4	Isolok-HFR-12mL	SiO2 (wt%)	52.342	52.028	-0.314	-0.6%	no	1.521	2.91	0.5404	1.6626	yes	15	10
4	Isolok-HFR-12mL	Sum (wt%)	99.683	99.351	-0.333	-0.3%	no	1.045	1.05	0.7563	0.9075	no	15	9
4	Isolok-HFR-12mL	TiO2 (wt%)	0.079	0.080	0.001	0.7%	no	0.003	3.35	0.0027	0.0012	no	16	8
4	Isolok-HFR-12mL	ZnO (wt%)	0.104	0.101	-0.003	-3.2%	yes	0.006	5.95	0.0016	0.0036	yes	15	9
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.365	0.355	-0.010	-2.8%	yes	0.016	4.38	0.0053	0.0089	no	15	10

Table C9. Oxide Comparisons between the Samplers for the Low-Rheology (Phase 3) Testing (screened data)

Analytical Block	Sampler	Oxide	Mean (Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
5	Isolok-HFR-3mL	Al/B	2.531	2.567	0.036	1.4%	no	0.137	5.42	0.1194	0.1243	no	16	10
5	Isolok-HFR-3mL	Al2O3 (wt%)	10.735	10.659	-0.076	-0.7%	no	0.192	1.79	0.1055	0.1831	no	16	10
5	Isolok-HFR-3mL	B2O3 (wt%)	4.250	4.160	-0.090	-2.1%	no	0.246	5.79	0.1881	0.1858	no	16	10
5	Isolok-HFR-3mL	BaO (wt%)	0.105	0.105	-0.001	-0.5%	no	0.003	3.06	0.0025	0.0042	no	16	10
5	Isolok-HFR-3mL	CaO (wt%)	1.207	1.198	-0.009	-0.8%	no	0.034	2.79	0.0308	0.0268	no	16	10
5	Isolok-HFR-3mL	Cr2O3 (wt%)	0.112	0.106	-0.006	-5.2%	yes	0.011	9.61	0.0061	0.0054	no	15	10
5	Isolok-HFR-3mL	CuO (wt%)	0.046	0.048	0.002	5.2%	no	0.006	12.84	0.0036	0.0049	no	15	10
5	Isolok-HFR-3mL	Fe/Li	2.363	2.288	-0.075	-3.2%	yes	0.125	5.30	0.0490	0.0748	no	16	10
5	Isolok-HFR-3mL	Fe2O3 (wt%)	11.324	11.153	-0.171	-1.5%	yes	0.317	2.80	0.0801	0.1988	yes	16	10
5	Isolok-HFR-3mL	K2O (wt%)	0.175	0.179	0.003	1.9%	no	0.011	6.20	0.0089	0.0088	no	14	10
5	Isolok-HFR-3mL	Li2O (wt%)	4.794	4.878	0.084	1.8%	no	0.172	3.58	0.0987	0.1149	no	16	10
5	Isolok-HFR-3mL	MgO (wt%)	1.062	1.040	-0.022	-2.1%	yes	0.035	3.31	0.0124	0.0197	no	16	10
5	Isolok-HFR-3mL	MnO (wt%)	1.764	1.728	-0.036	-2.1%	yes	0.057	3.22	0.0194	0.0309	no	16	10
5	Isolok-HFR-3mL	Na2O (wt%)	10.841	10.998	0.157	1.5%	no	0.396	3.65	0.2374	0.3126	no	14	9
5	Isolok-HFR-3mL	NiO (wt%)	0.450	0.441	-0.009	-1.9%	yes	0.016	3.66	0.0083	0.0103	no	15	9
5	Isolok-HFR-3mL	SiO2 (wt%)	52.426	52.990	0.564	1.1%	yes	1.020	1.94	0.6024	0.4402	no	16	10
5	Isolok-HFR-3mL	Sum (wt%)	99.871	100.349	0.478	0.5%	yes	0.934	0.94	0.4966	0.6235	no	16	10
5	Isolok-HFR-3mL	TiO2 (wt%)	0.083	0.085	0.002	2.0%	no	0.004	4.64	0.0026	0.0027	no	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.100	0.099	-0.001	-0.9%	no	0.004	3.65	0.0025	0.0042	no	15	10
5	Isolok-HFR-3mL	ZrO2 (wt%)	0.369	0.369	0.000	0.1%	no	0.005	1.27	0.0043	0.0064	no	16	9
6	Hydragard-LFR	Al/B	2.635	2.736	0.101	3.8%	yes	0.200	7.58	0.1055	0.1305	no	16	9
6	Hydragard-LFR	Al2O3 (wt%)	10.687	10.900	0.213	2.0%	yes	0.419	3.92	0.0933	0.2648	yes	16	9
6	Hydragard-LFR	B2O3 (wt%)	4.061	3.989	-0.072	-1.8%	no	0.193	4.74	0.1463	0.1272	no	16	9
6	Hydragard-LFR	BaO (wt%)	0.102	0.103	0.001	1.4%	no	0.004	3.61	0.0021	0.0034	no	16	9
6	Hydragard-LFR	CaO (wt%)	1.198	1.224	0.026	2.2%	no	0.070	5.82	0.0252	0.0788	no	16	9
6	Hydragard-LFR	Cr2O3 (wt%)	0.111	0.113	0.002	1.8%	no	0.009	8.19	0.0055	0.0088	yes	15	9
6	Hydragard-LFR	CuO (wt%)	0.038	0.037	-0.002	-4.3%	no	0.005	13.20	0.0033	0.0049	no	16	9
6	Hydragard-LFR	Fe/Li	2.459	2.560	0.101	4.1%	yes	0.189	7.70	0.0421	0.1129	yes	16	9
6	Hydragard-LFR	Fe2O3 (wt%)	11.337	11.504	0.168	1.5%	no	0.418	3.69	0.0806	0.3237	yes	16	9
6	Hydragard-LFR	K2O (wt%)	0.177	0.176	-0.001	-0.5%	no	0.008	4.51	0.0095	0.0050	no	16	9
6	Hydragard-LFR	Li2O (wt%)	4.611	4.497	-0.114	-2.5%	yes	0.204	4.42	0.0584	0.1136	yes	16	9
6	Hydragard-LFR	MgO (wt%)	1.022	1.035	0.013	1.3%	no	0.046	4.53	0.0111	0.0428	yes	16	9
6	Hydragard-LFR	MnO (wt%)	1.697	1.713	0.016	0.9%	no	0.061	3.59	0.0182	0.0581	yes	16	9
6	Hydragard-LFR	Na2O (wt%)	10.932	11.259	0.327	3.0%	yes	0.569	5.20	0.2182	0.3430	no	14	9
6	Hydragard-LFR	NiO (wt%)	0.447	0.460	0.013	2.8%	yes	0.025	5.55	0.0126	0.0162	no	15	9
6	Hydragard-LFR	SiO2 (wt%)	52.386	51.201	-1.186	-2.3%	yes	1.867	3.56	0.5348	1.1219	no	16	9
6	Hydragard-LFR	Sum (wt%)	99.364	98.756	-0.608	-0.6%	yes	1.104	1.11	0.4354	0.7741	no	16	9
6	Hydragard-LFR	TiO2 (wt%)	0.083	0.080	-0.002	-2.5%	yes	0.004	4.40	0.0019	0.0015	no	16	8
6	Hydragard-LFR	ZnO (wt%)	0.101	0.103	0.002	2.2%	no	0.006	5.58	0.0029	0.0052	no	15	9
6	Hydragard-LFR	ZrO2 (wt%)	0.373	0.361	-0.012	-3.2%	yes	0.023	6.25	0.0044	0.0146	yes	16	9

Table C10. Phase 3 (Low-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwas	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwas (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
2	Hydragard - HFR	Al/B	2.566	2.794	0.228	8.9%	yes	0.336	13.08	0.0989	0.1615	no	16	9
6	Hydragard-LFR	Al/B	2.635	2.736	0.101	3.8%	yes	0.200	7.58	0.1055	0.1305	no	16	9
3	Isolok-LFR-12mL	Al/B	2.666	2.621	-0.045	-1.7%	no	0.184	6.91	0.1079	0.1844	yes	16	10
5	Isolok-HFR-3mL	Al/B	2.531	2.567	0.036	1.4%	no	0.137	5.42	0.1194	0.1243	no	16	10
4	Isolok-HFR-12mL	Al/B	2.614	2.630	0.016	0.6%	no	0.124	4.75	0.1018	0.1653	no	16	10
1	Isolok-LFR-3mL	Al/B	2.521	2.518	-0.003	-0.1%	no	0.075	2.97	0.0799	0.0971	no	16	10
3	Isolok-LFR-12mL	Al2O3 (wt%)	10.677	10.366	-0.311	-2.9%	no	0.635	5.95	0.1382	0.4466	yes	15	10
2	Hydragard - HFR	Al2O3 (wt%)	10.532	11.025	0.494	4.7%	yes	0.614	5.83	0.1035	0.1946	no	16	10
4	Isolok-HFR-12mL	Al2O3 (wt%)	10.669	10.424	-0.246	-2.3%	yes	0.463	4.34	0.1328	0.2748	yes	15	9
6	Hydragard-LFR	Al2O3 (wt%)	10.687	10.900	0.213	2.0%	yes	0.419	3.92	0.0933	0.2648	yes	16	9
1	Isolok-LFR-3mL	Al2O3 (wt%)	10.328	10.203	-0.125	-1.2%	yes	0.240	2.32	0.1135	0.1662	no	15	10
5	Isolok-HFR-3mL	Al2O3 (wt%)	10.735	10.659	-0.076	-0.7%	no	0.192	1.79	0.1055	0.1831	no	16	10
2	Hydragard - HFR	B2O3 (wt%)	4.109	3.900	-0.209	-5.1%	yes	0.343	8.35	0.1496	0.1475	no	16	8
5	Isolok-HFR-3mL	B2O3 (wt%)	4.250	4.160	-0.090	-2.1%	no	0.246	5.79	0.1881	0.1858	no	16	10
4	Isolok-HFR-12mL	B2O3 (wt%)	4.067	4.012	-0.055	-1.4%	no	0.195	4.80	0.1504	0.1945	no	16	10
6	Hydragard-LFR	B2O3 (wt%)	4.061	3.989	-0.072	-1.8%	no	0.193	4.74	0.1463	0.1272	no	16	9
3	Isolok-LFR-12mL	B2O3 (wt%)	3.997	3.964	-0.033	-0.8%	no	0.169	4.24	0.1577	0.1740	no	16	10
1	Isolok-LFR-3mL	B2O3 (wt%)	4.134	4.096	-0.037	-0.9%	no	0.106	2.56	0.0551	0.0990	no	13	9
3	Isolok-LFR-12mL	BaO (wt%)	0.103	0.099	-0.004	-4.0%	yes	0.008	7.46	0.0026	0.0047	yes	16	10
2	Hydragard - HFR	BaO (wt%)	0.104	0.108	0.004	4.2%	yes	0.007	7.01	0.0016	0.0039	yes	16	10
4	Isolok-HFR-12mL	BaO (wt%)	0.107	0.104	-0.003	-2.7%	yes	0.005	4.35	0.0010	0.0022	yes	14	9
1	Isolok-LFR-3mL	BaO (wt%)	0.103	0.101	-0.002	-2.4%	yes	0.004	4.02	0.0022	0.0013	no	15	9
6	Hydragard-LFR	BaO (wt%)	0.102	0.103	0.001	1.4%	no	0.004	3.61	0.0021	0.0034	no	16	9
5	Isolok-HFR-3mL	BaO (wt%)	0.105	0.105	-0.001	-0.5%	no	0.003	3.06	0.0025	0.0042	no	16	10
2	Hydragard - HFR	CaO (wt%)	1.188	1.248	0.060	5.1%	yes	0.091	7.63	0.0258	0.0478	no	16	9
6	Hydragard-LFR	CaO (wt%)	1.198	1.224	0.026	2.2%	no	0.070	5.82	0.0252	0.0788	no	16	9
3	Isolok-LFR-12mL	CaO (wt%)	1.189	1.152	-0.037	-3.1%	yes	0.068	5.74	0.0302	0.0430	no	16	8
4	Isolok-HFR-12mL	CaO (wt%)	1.190	1.153	-0.037	-3.1%	yes	0.064	5.41	0.0149	0.0346	yes	14	9
1	Isolok-LFR-3mL	CaO (wt%)	1.159	1.129	-0.031	-2.7%	yes	0.049	4.24	0.0222	0.0191	no	15	9
5	Isolok-HFR-3mL	CaO (wt%)	1.207	1.198	-0.009	-0.8%	no	0.034	2.79	0.0308	0.0268	no	16	10
4	Isolok-HFR-12mL	Cr2O3 (wt%)	0.110	0.122	0.011	10.3%	no	0.024	21.37	0.0074	0.0165	yes	16	10
1	Isolok-LFR-3mL	Cr2O3 (wt%)	0.111	0.095	-0.016	-14.3%	yes	0.022	20.12	0.0081	0.0071	no	16	10
2	Hydragard - HFR	Cr2O3 (wt%)	0.110	0.119	0.009	8.3%	yes	0.016	14.45	0.0075	0.0091	no	16	10
3	Isolok-LFR-12mL	Cr2O3 (wt%)	0.111	0.106	-0.004	-3.8%	no	0.012	11.14	0.0090	0.0109	no	16	10
5	Isolok-HFR-3mL	Cr2O3 (wt%)	0.112	0.106	-0.006	-5.2%	yes	0.011	9.61	0.0061	0.0054	no	15	10
6	Hydragard-LFR	Cr2O3 (wt%)	0.111	0.113	0.002	1.8%	no	0.009	8.19	0.0055	0.0088	yes	15	9
4	Isolok-HFR-12mL	CuO (wt%)	0.034	0.035	0.001	4.0%	no	0.006	18.40	0.0051	0.0069	no	16	10

Table C10. Phase 3 (Low-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwas	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwas (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
3	Isolok-LFR-12mL	CuO (wt%)	0.041	0.043	0.002	6.0%	no	0.007	16.31	0.0048	0.0054	no	16	10
1	Isolok-LFR-3mL	CuO (wt%)	0.033	0.035	0.002	5.3%	no	0.005	15.70	0.0041	0.0041	no	16	10
6	Hydragard-LFR	CuO (wt%)	0.038	0.037	-0.002	-4.3%	no	0.005	13.20	0.0033	0.0049	no	16	9
5	Isolok-HFR-3mL	CuO (wt%)	0.046	0.048	0.002	5.2%	no	0.006	12.84	0.0036	0.0049	no	15	10
2	Hydragard - HFR	CuO (wt%)	0.037	0.038	0.001	1.9%	no	0.004	11.08	0.0036	0.0048	no	16	10
3	Isolok-LFR-12mL	Fe/Li	2.412	2.220	-0.192	-8.0%	yes	0.328	13.62	0.0524	0.1892	yes	16	10
2	Hydragard - HFR	Fe/Li	2.495	2.681	0.186	7.5%	yes	0.250	10.04	0.0676	0.0913	no	16	10
6	Hydragard-LFR	Fe/Li	2.459	2.560	0.101	4.1%	yes	0.189	7.70	0.0421	0.1129	yes	16	9
5	Isolok-HFR-3mL	Fe/Li	2.363	2.288	-0.075	-3.2%	yes	0.125	5.30	0.0490	0.0748	no	16	10
4	Isolok-HFR-12mL	Fe/Li	2.415	2.366	-0.049	-2.0%	no	0.122	5.04	0.0636	0.1146	no	16	9
1	Isolok-LFR-3mL	Fe/Li	2.442	2.417	-0.025	-1.0%	no	0.072	2.94	0.0482	0.0682	no	16	10
3	Isolok-LFR-12mL	Fe2O3 (wt%)	11.350	10.850	-0.500	-4.4%	yes	0.912	8.04	0.1693	0.5693	yes	15	10
2	Hydragard - HFR	Fe2O3 (wt%)	11.330	11.905	0.575	5.1%	yes	0.739	6.52	0.1131	0.2214	yes	16	10
4	Isolok-HFR-12mL	Fe2O3 (wt%)	11.424	11.101	-0.323	-2.8%	yes	0.568	4.97	0.1081	0.3137	yes	15	9
6	Hydragard-LFR	Fe2O3 (wt%)	11.337	11.504	0.168	1.5%	no	0.418	3.69	0.0806	0.3237	yes	16	9
5	Isolok-HFR-3mL	Fe2O3 (wt%)	11.324	11.153	-0.171	-1.5%	yes	0.317	2.80	0.0801	0.1988	yes	16	10
1	Isolok-LFR-3mL	Fe2O3 (wt%)	11.072	10.896	-0.176	-1.6%	yes	0.284	2.57	0.0957	0.1668	no	15	10
1	Isolok-LFR-3mL	K2O (wt%)	0.177	0.180	0.003	1.5%	no	0.011	6.36	0.0095	0.0114	no	16	10
5	Isolok-HFR-3mL	K2O (wt%)	0.175	0.179	0.003	1.9%	no	0.011	6.20	0.0089	0.0088	no	14	10
2	Hydragard - HFR	K2O (wt%)	0.177	0.175	-0.002	-1.1%	no	0.009	5.03	0.0095	0.0061	no	16	10
4	Isolok-HFR-12mL	K2O (wt%)	0.177	0.175	-0.002	-0.9%	no	0.009	4.98	0.0095	0.0072	no	16	10
3	Isolok-LFR-12mL	K2O (wt%)	0.177	0.179	0.002	1.4%	no	0.008	4.52	0.0095	0.0038	yes	16	9
6	Hydragard-LFR	K2O (wt%)	0.177	0.176	-0.001	-0.5%	no	0.008	4.51	0.0095	0.0050	no	16	9
3	Isolok-LFR-12mL	Li2O (wt%)	4.708	4.902	0.194	4.1%	yes	0.347	7.38	0.0982	0.2063	yes	15	10
6	Hydragard-LFR	Li2O (wt%)	4.611	4.497	-0.114	-2.5%	yes	0.204	4.42	0.0584	0.1136	yes	16	9
2	Hydragard - HFR	Li2O (wt%)	4.544	4.444	-0.100	-2.2%	yes	0.186	4.10	0.0993	0.1099	no	16	10
5	Isolok-HFR-3mL	Li2O (wt%)	4.794	4.878	0.084	1.8%	no	0.172	3.58	0.0987	0.1149	no	16	10
4	Isolok-HFR-12mL	Li2O (wt%)	4.678	4.724	0.046	1.0%	no	0.124	2.65	0.0693	0.1098	no	14	9
1	Isolok-LFR-3mL	Li2O (wt%)	4.517	4.510	-0.007	-0.1%	no	0.097	2.15	0.0986	0.1240	no	16	10
3	Isolok-LFR-12mL	MgO (wt%)	1.033	0.970	-0.063	-6.1%	yes	0.113	10.89	0.0216	0.0681	yes	16	10
2	Hydragard - HFR	MgO (wt%)	1.006	1.061	0.055	5.5%	yes	0.075	7.43	0.0139	0.0263	yes	16	10
4	Isolok-HFR-12mL	MgO (wt%)	1.046	1.009	-0.037	-3.6%	yes	0.067	6.39	0.0117	0.0381	yes	14	9
6	Hydragard-LFR	MgO (wt%)	1.022	1.035	0.013	1.3%	no	0.046	4.53	0.0111	0.0428	yes	16	9
1	Isolok-LFR-3mL	MgO (wt%)	1.001	0.977	-0.025	-2.5%	yes	0.035	3.54	0.0109	0.0154	no	15	10
5	Isolok-HFR-3mL	MgO (wt%)	1.062	1.040	-0.022	-2.1%	yes	0.035	3.31	0.0124	0.0197	no	16	10
3	Isolok-LFR-12mL	MnO (wt%)	1.709	1.610	-0.099	-5.8%	yes	0.182	10.66	0.0394	0.1144	yes	16	10
2	Hydragard - HFR	MnO (wt%)	1.673	1.760	0.087	5.2%	yes	0.119	7.11	0.0236	0.0426	yes	16	10

Table C10. Phase 3 (Low-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

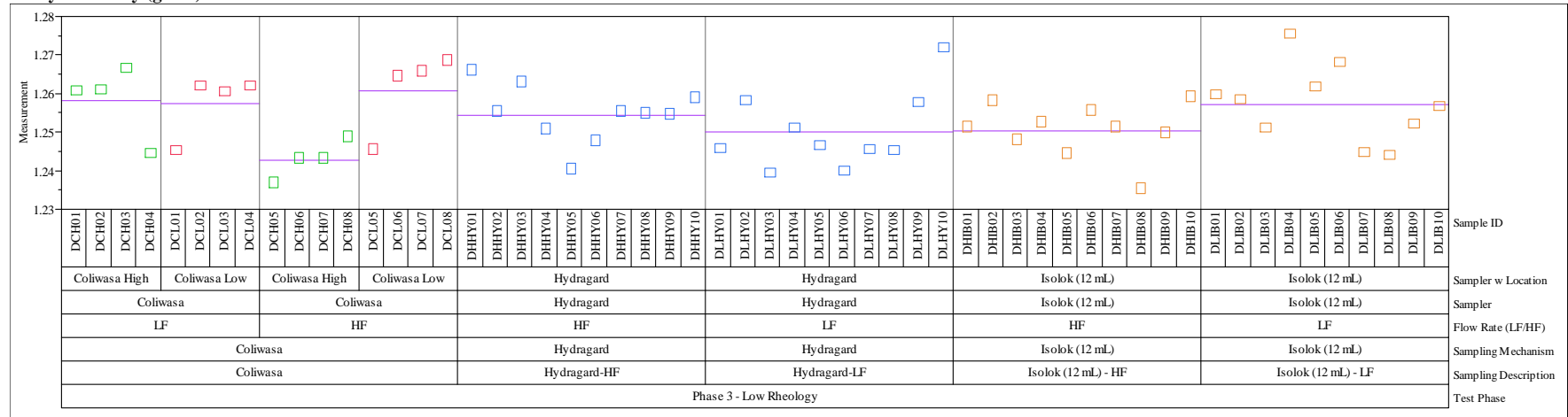
Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwas	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwas (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
4	Isolok-HFR-12mL	MnO (wt%)	1.742	1.677	-0.065	-3.7%	yes	0.114	6.55	0.0241	0.0627	yes	15	9
1	Isolok-LFR-3mL	MnO (wt%)	1.668	1.627	-0.041	-2.5%	yes	0.060	3.62	0.0196	0.0265	no	15	10
6	Hydragard-LFR	MnO (wt%)	1.697	1.713	0.016	0.9%	no	0.061	3.59	0.0182	0.0581	yes	16	9
5	Isolok-HFR-3mL	MnO (wt%)	1.764	1.728	-0.036	-2.1%	yes	0.057	3.22	0.0194	0.0309	no	16	10
6	Hydragard-LFR	Na2O (wt%)	10.932	11.259	0.327	3.0%	yes	0.569	5.20	0.2182	0.3430	no	14	9
3	Isolok-LFR-12mL	Na2O (wt%)	10.881	11.090	0.209	1.9%	no	0.470	4.32	0.2917	0.3223	no	14	10
4	Isolok-HFR-12mL	Na2O (wt%)	10.923	10.888	-0.035	-0.3%	no	0.449	4.11	0.3149	0.5479	yes	15	10
5	Isolok-HFR-3mL	Na2O (wt%)	10.841	10.998	0.157	1.5%	no	0.396	3.65	0.2374	0.3126	no	14	9
1	Isolok-LFR-3mL	Na2O (wt%)	10.346	10.296	-0.050	-0.5%	no	0.326	3.15	0.3024	0.3595	no	15	10
2	Hydragard - HFR	Na2O (wt%)	10.997	10.996	0.000	0.0%	no	0.164	1.49	0.1716	0.1867	no	14	8
2	Hydragard - HFR	NiO (wt%)	0.451	0.474	0.022	5.0%	yes	0.039	8.64	0.0075	0.0227	yes	15	10
3	Isolok-LFR-12mL	NiO (wt%)	0.454	0.441	-0.013	-2.8%	no	0.031	6.82	0.0117	0.0246	yes	14	10
6	Hydragard-LFR	NiO (wt%)	0.447	0.460	0.013	2.8%	yes	0.025	5.55	0.0126	0.0162	no	15	9
1	Isolok-LFR-3mL	NiO (wt%)	0.457	0.446	-0.011	-2.4%	no	0.024	5.36	0.0177	0.0138	no	16	10
5	Isolok-HFR-3mL	NiO (wt%)	0.450	0.441	-0.009	-1.9%	yes	0.016	3.66	0.0083	0.0103	no	15	9
4	Isolok-HFR-12mL	NiO (wt%)	0.458	0.457	-0.001	-0.2%	no	0.010	2.18	0.0069	0.0144	no	14	9
6	Hydragard-LFR	SiO2 (wt%)	52.386	51.201	-1.186	-2.3%	yes	1.867	3.56	0.5348	1.1219	no	16	9
2	Hydragard - HFR	SiO2 (wt%)	52.239	51.258	-0.981	-1.9%	yes	1.616	3.09	0.7083	0.8450	no	16	10
4	Isolok-HFR-12mL	SiO2 (wt%)	52.342	52.028	-0.314	-0.6%	no	1.521	2.91	0.5404	1.6626	yes	15	10
3	Isolok-LFR-12mL	SiO2 (wt%)	52.584	53.081	0.497	0.9%	no	1.187	2.26	0.8828	0.4033	no	15	8
5	Isolok-HFR-3mL	SiO2 (wt%)	52.426	52.990	0.564	1.1%	yes	1.020	1.94	0.6024	0.4402	no	16	10
1	Isolok-LFR-3mL	SiO2 (wt%)	52.185	52.477	0.292	0.6%	no	0.899	1.72	0.6183	0.8501	no	15	10
3	Isolok-LFR-12mL	Sum of Oxides (wt%)	99.652	99.365	-0.286	-0.3%	no	1.218	1.22	1.1470	1.0306	no	15	10
6	Hydragard-LFR	Sum of Oxides (wt%)	99.364	98.756	-0.608	-0.6%	yes	1.104	1.11	0.4354	0.7741	no	16	9
4	Isolok-HFR-12mL	Sum of Oxides (wt%)	99.683	99.351	-0.333	-0.3%	no	1.045	1.05	0.7563	0.9075	no	15	9
1	Isolok-LFR-3mL	Sum of Oxides (wt%)	97.808	97.572	-0.236	-0.2%	no	0.965	0.99	0.7392	1.0271	no	15	10
5	Isolok-HFR-3mL	Sum of Oxides (wt%)	99.871	100.349	0.478	0.5%	yes	0.934	0.94	0.4966	0.6235	no	16	10
2	Hydragard - HFR	Sum of Oxides (wt%)	99.062	99.135	0.073	0.1%	no	0.664	0.67	0.7801	0.5730	no	16	10
5	Isolok-HFR-3mL	TiO2 (wt%)	0.083	0.085	0.002	2.0%	no	0.004	4.64	0.0026	0.0027	no	16	10
2	Hydragard - HFR	TiO2 (wt%)	0.082	0.081	-0.001	-1.7%	no	0.004	4.42	0.0025	0.0029	no	16	10
6	Hydragard-LFR	TiO2 (wt%)	0.083	0.080	-0.002	-2.5%	yes	0.004	4.40	0.0019	0.0015	no	16	8
1	Isolok-LFR-3mL	TiO2 (wt%)	0.081	0.083	0.002	2.0%	no	0.003	4.26	0.0020	0.0027	no	16	10
4	Isolok-HFR-12mL	TiO2 (wt%)	0.079	0.080	0.001	0.7%	no	0.003	3.35	0.0027	0.0012	no	16	8
3	Isolok-LFR-12mL	TiO2 (wt%)	0.082	0.082	0.000	0.5%	no	0.002	2.48	0.0022	0.0013	no	15	10
3	Isolok-LFR-12mL	ZnO (wt%)	0.103	0.099	-0.005	-4.6%	no	0.010	9.90	0.0032	0.0075	yes	16	10
2	Hydragard - HFR	ZnO (wt%)	0.101	0.106	0.005	4.9%	yes	0.010	9.42	0.0015	0.0064	yes	16	10
4	Isolok-HFR-12mL	ZnO (wt%)	0.104	0.101	-0.003	-3.2%	yes	0.006	5.95	0.0016	0.0036	yes	15	9

Table C10. Phase 3 (Low-Rheology) Sampler Comparisons Grouped by Analytical Block (screened data)

Analytical Block	Sampler	Oxide	Mean(Measured wt%) Coliwasa (low+high)	Mean(Measured wt%) Other Sampler	Diff	% Diff	Sig. Diff	Bias Bnd	% Rel Bias Bnd	Std Dev(Measured wt%) Coliwasa (low+high)	Std Dev(Measured wt%) Other Sampler	Sig. Diff	n Col	n Other
6	Hydragard-LFR	ZnO (wt%)	0.101	0.103	0.002	2.2%	no	0.006	5.58	0.0029	0.0052	no	15	9
1	Isolok-LFR-3mL	ZnO (wt%)	0.102	0.100	-0.003	-2.8%	yes	0.005	5.35	0.0032	0.0032	no	16	10
5	Isolok-HFR-3mL	ZnO (wt%)	0.100	0.099	-0.001	-0.9%	no	0.004	3.65	0.0025	0.0042	no	15	10
6	Hydragard-LFR	ZrO2 (wt%)	0.373	0.361	-0.012	-3.2%	yes	0.023	6.25	0.0044	0.0146	yes	16	9
3	Isolok-LFR-12mL	ZrO2 (wt%)	0.370	0.357	-0.013	-3.5%	yes	0.020	5.35	0.0045	0.0093	yes	15	10
4	Isolok-HFR-12mL	ZrO2 (wt%)	0.365	0.355	-0.010	-2.8%	yes	0.016	4.38	0.0053	0.0089	no	15	10
2	Hydragard - HFR	ZrO2 (wt%)	0.375	0.379	0.004	1.2%	no	0.009	2.49	0.0051	0.0069	no	16	9
1	Isolok-LFR-3mL	ZrO2 (wt%)	0.372	0.370	-0.002	-0.6%	no	0.005	1.43	0.0028	0.0048	no	15	10
5	Isolok-HFR-3mL	ZrO2 (wt%)	0.369	0.369	0.000	0.1%	no	0.005	1.27	0.0043	0.0064	no	16	9

Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Analyte=density (g/mL)



Analyte=wt% dried solids

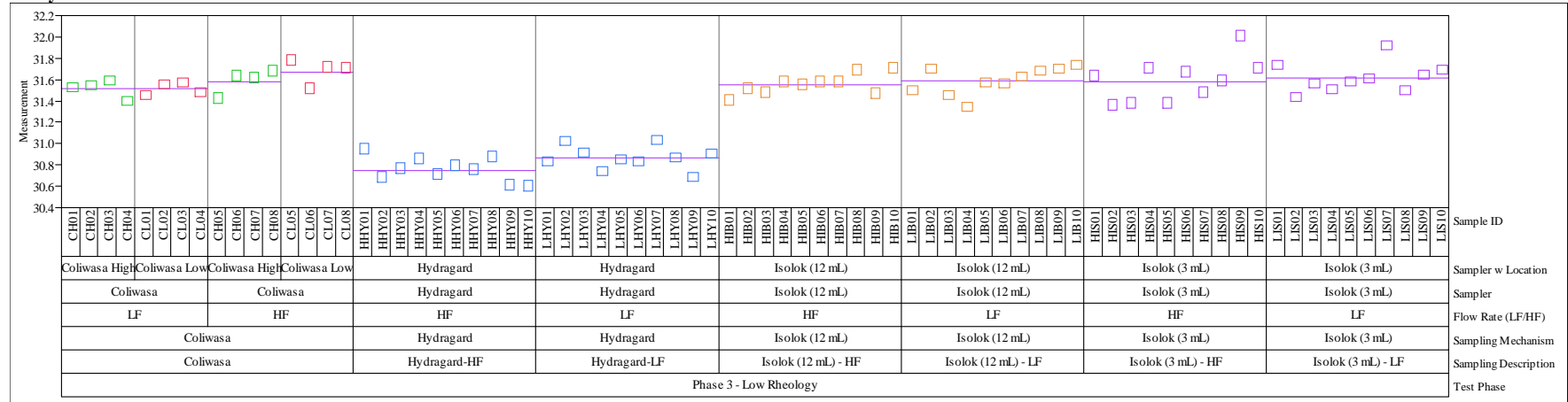
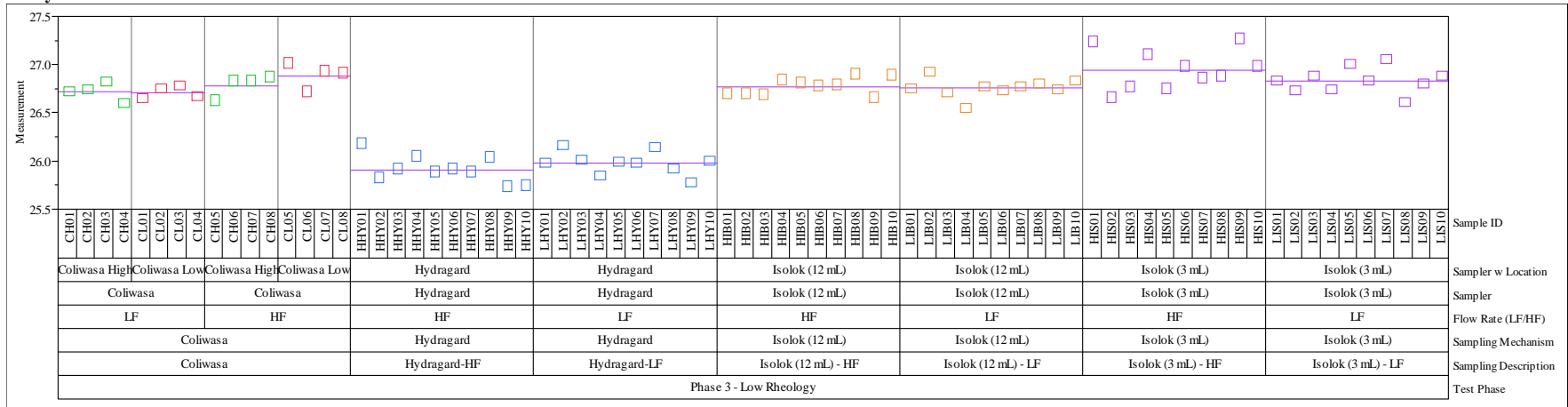


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Analyte=wt% vitrified solids



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=A/B

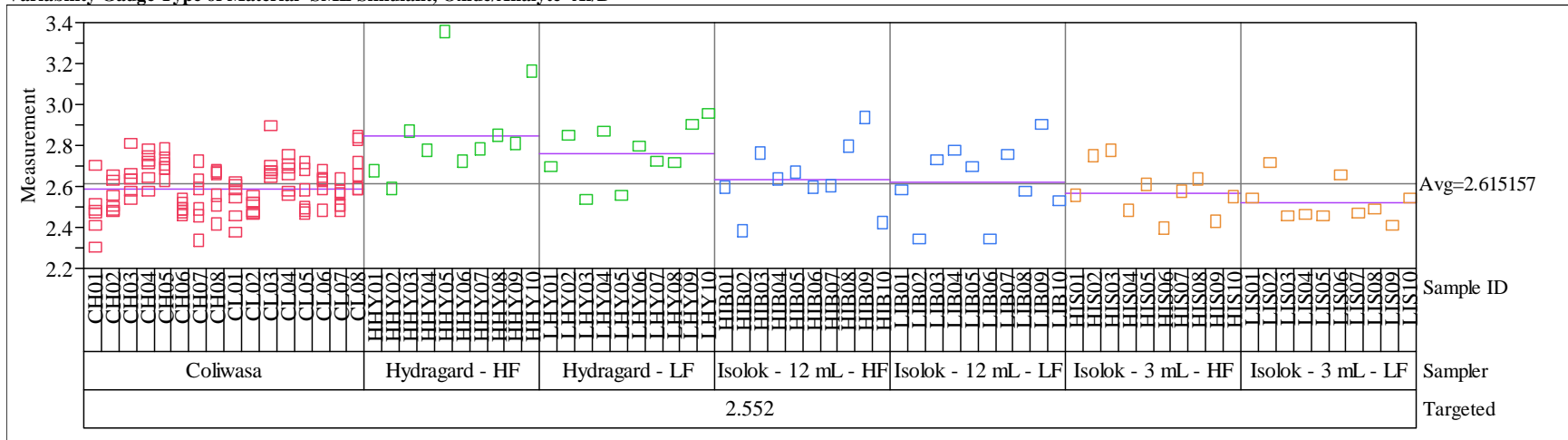
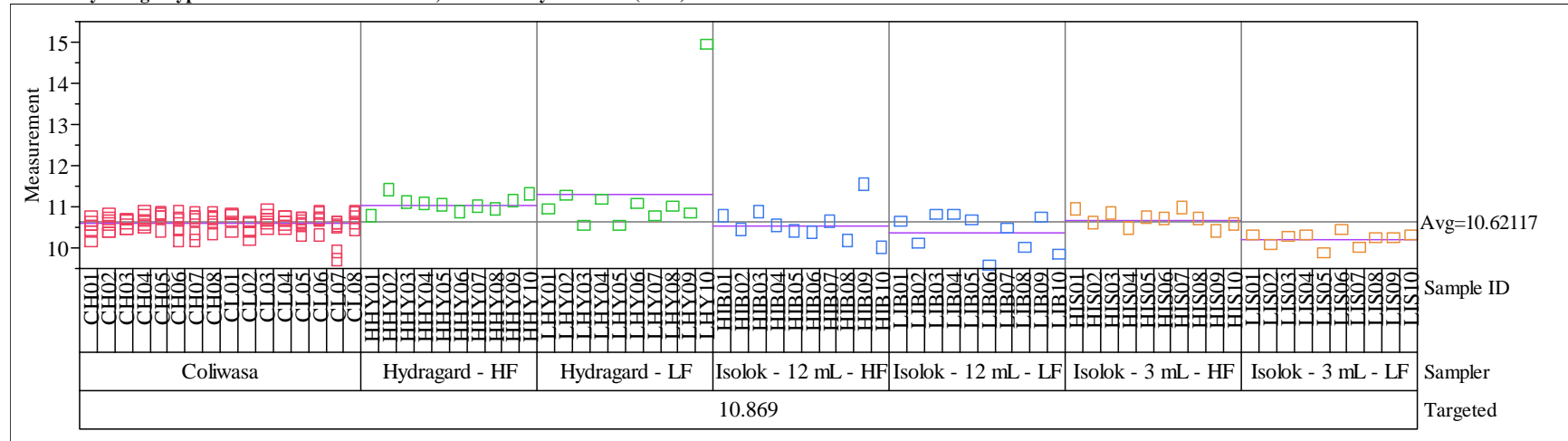


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=Al2O3 (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=B2O3 (wt%)

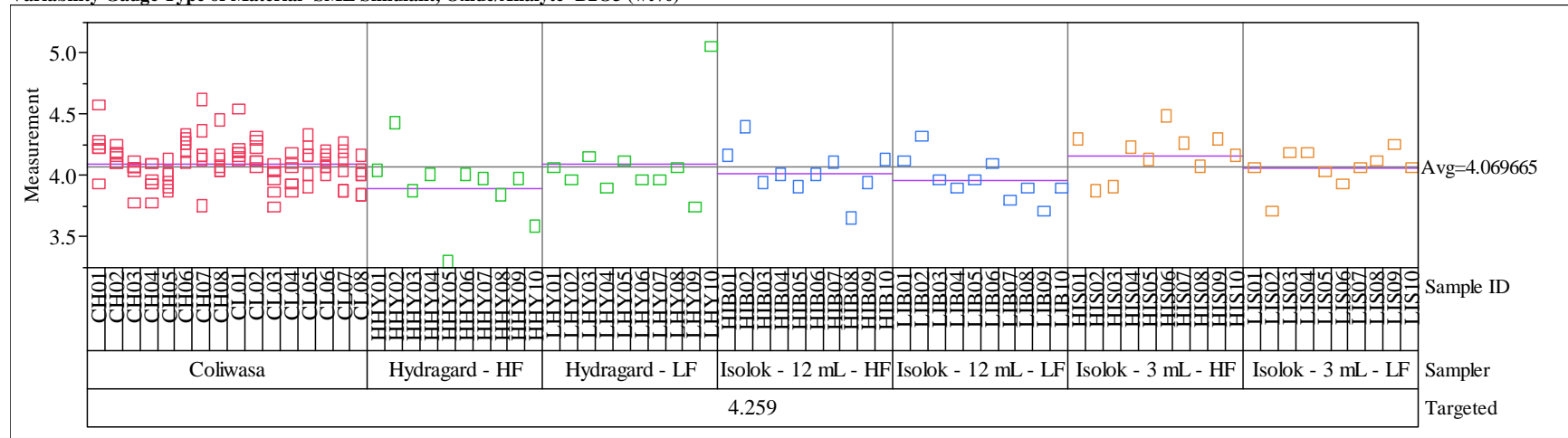
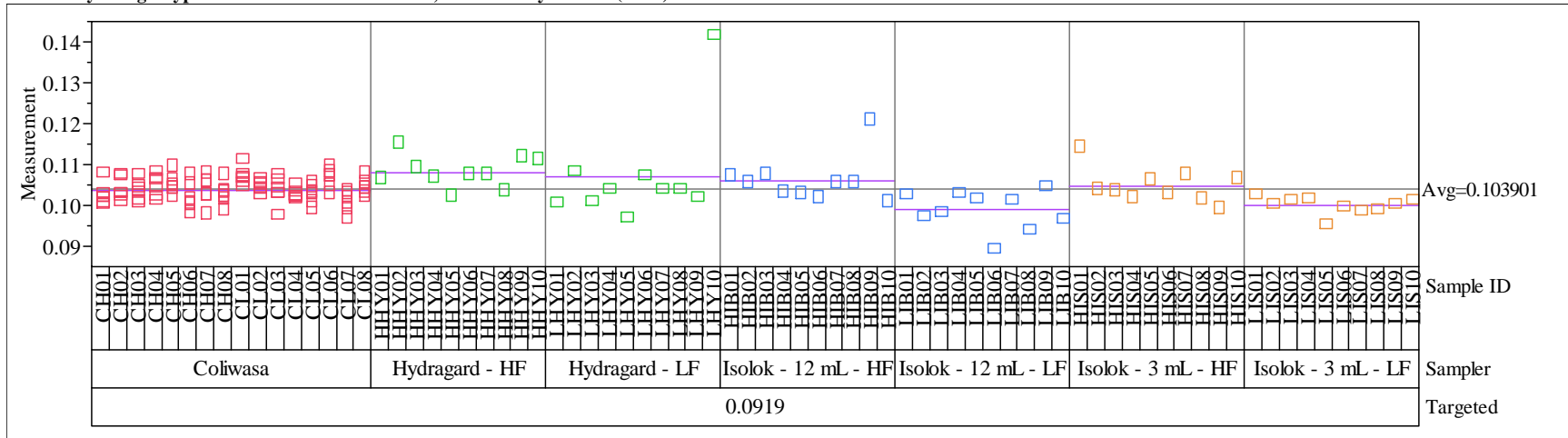


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=BaO (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=CaO (wt%)

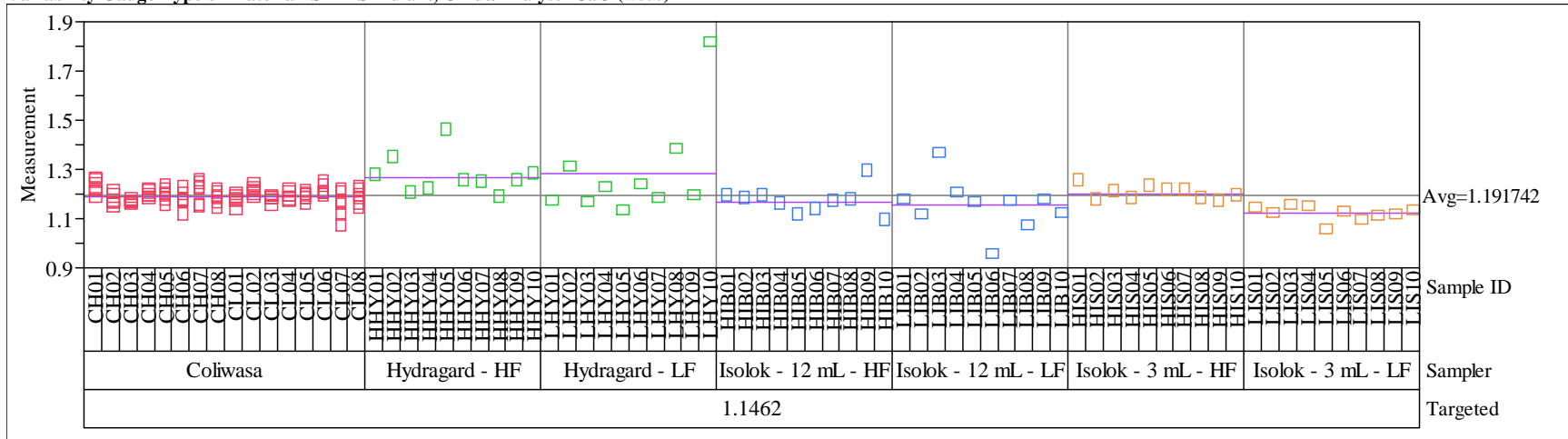
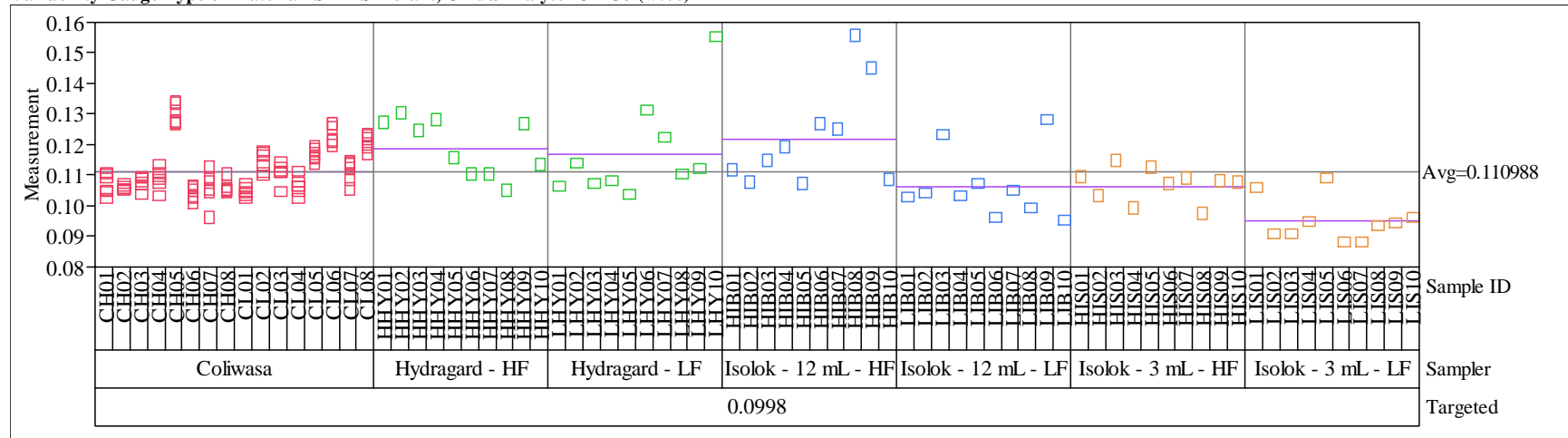


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=Cr2O3 (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=CuO (wt%)

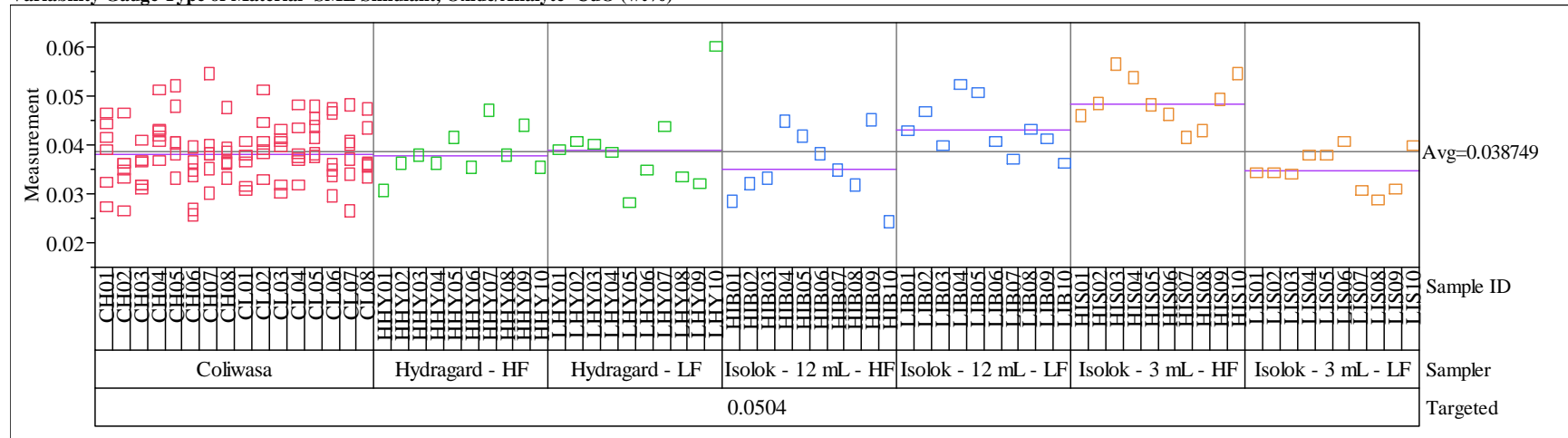
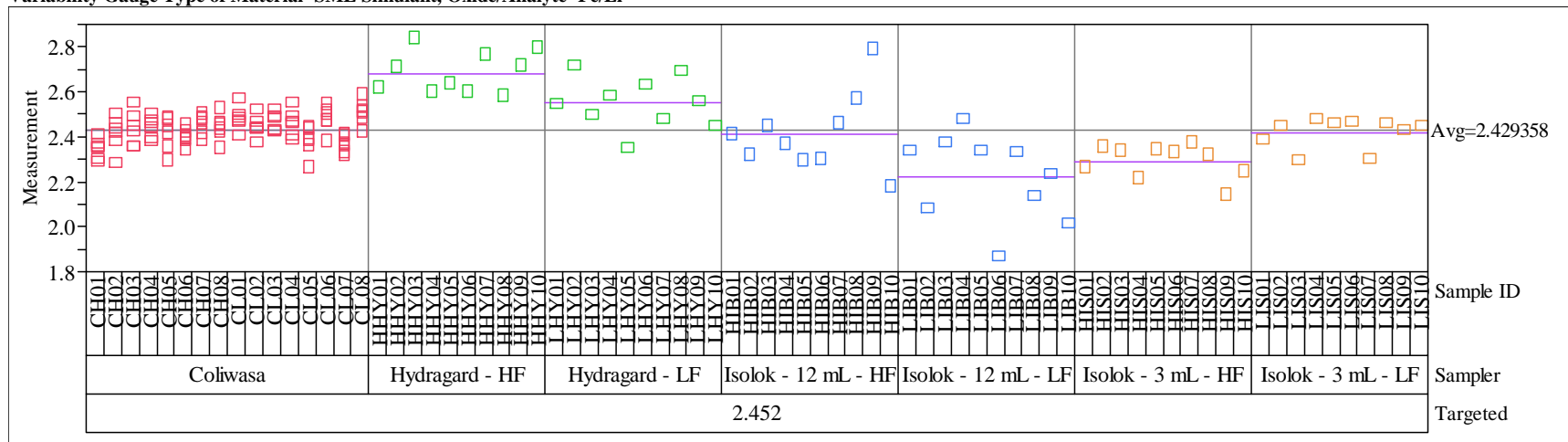


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=Fe/Li



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=Fe2O3 (wt%)

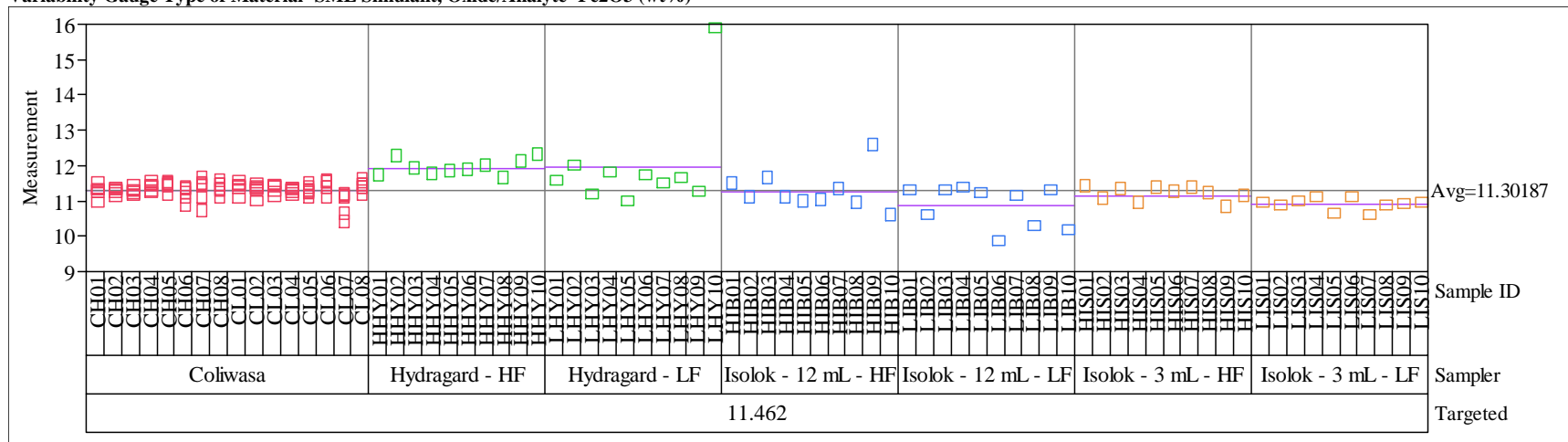
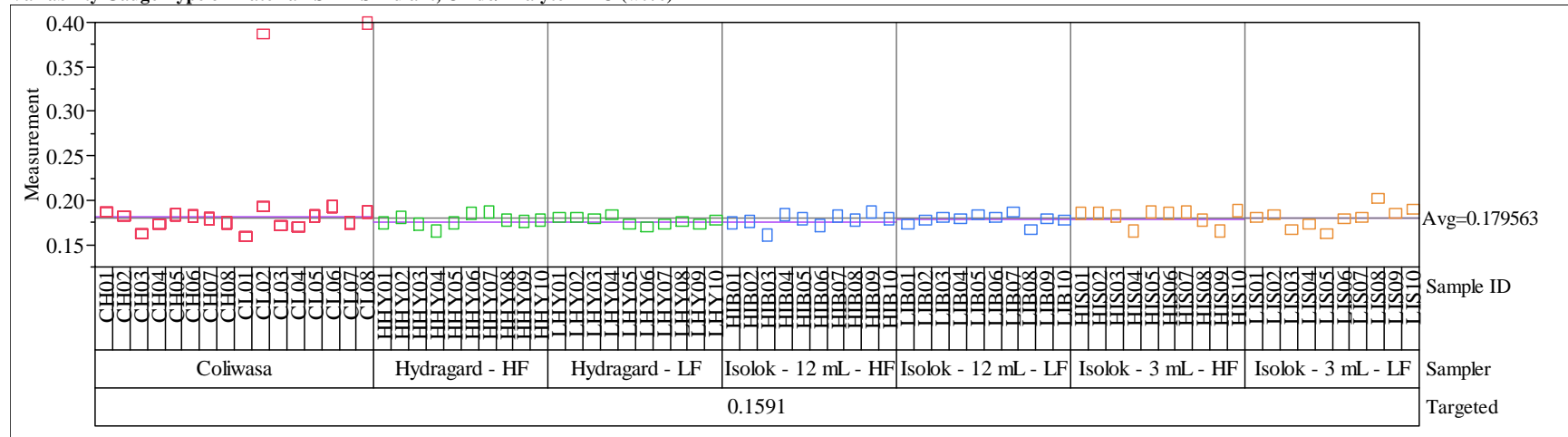


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=K2O (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=Li2O (wt%)

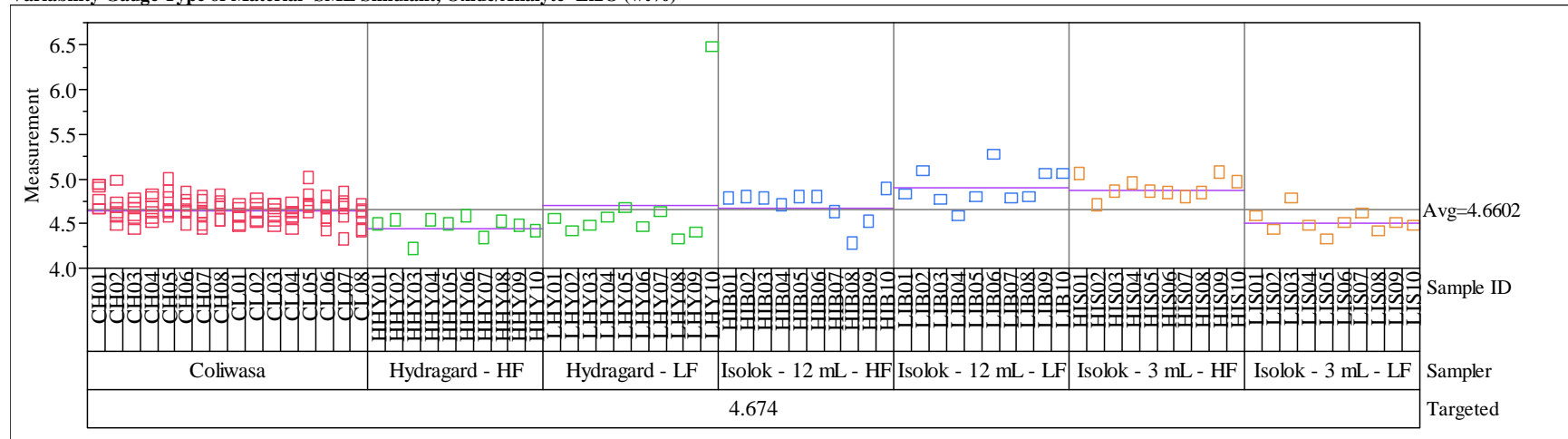
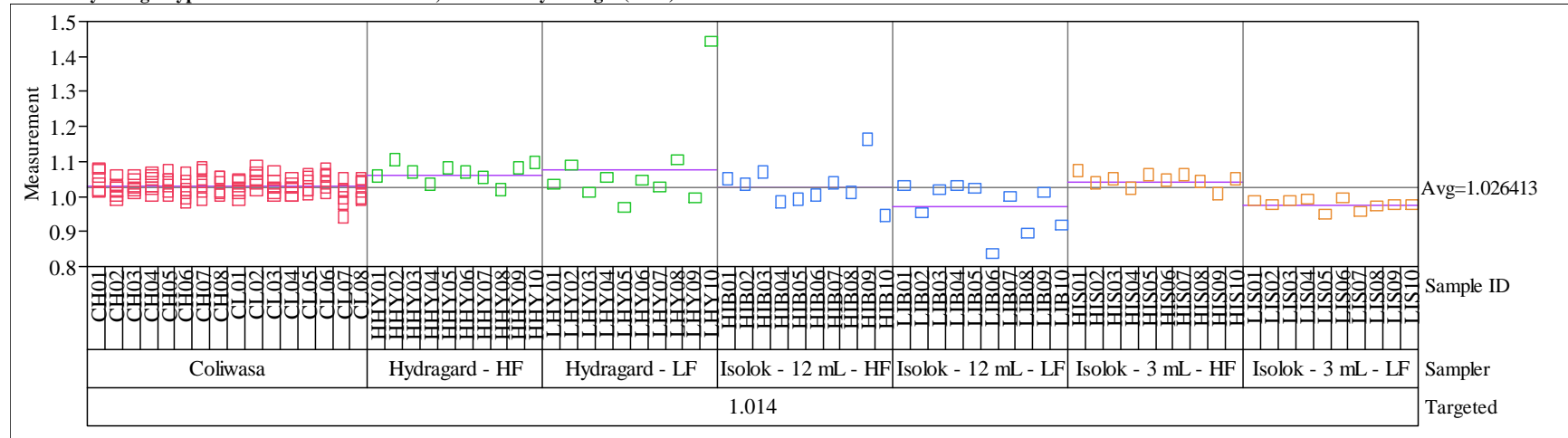


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=MgO (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=MnO (wt%)

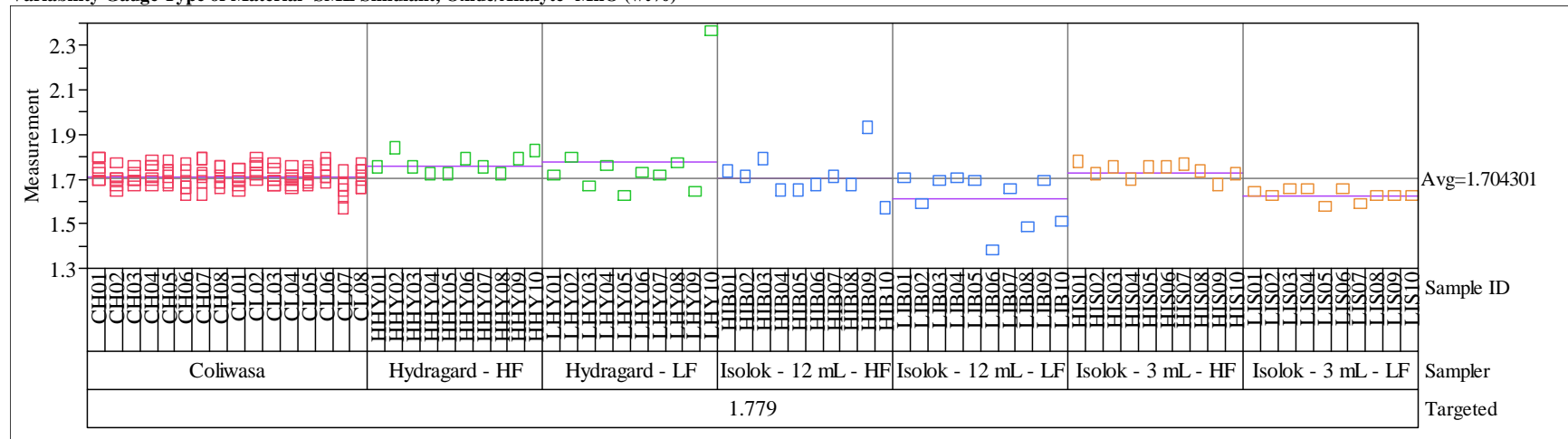
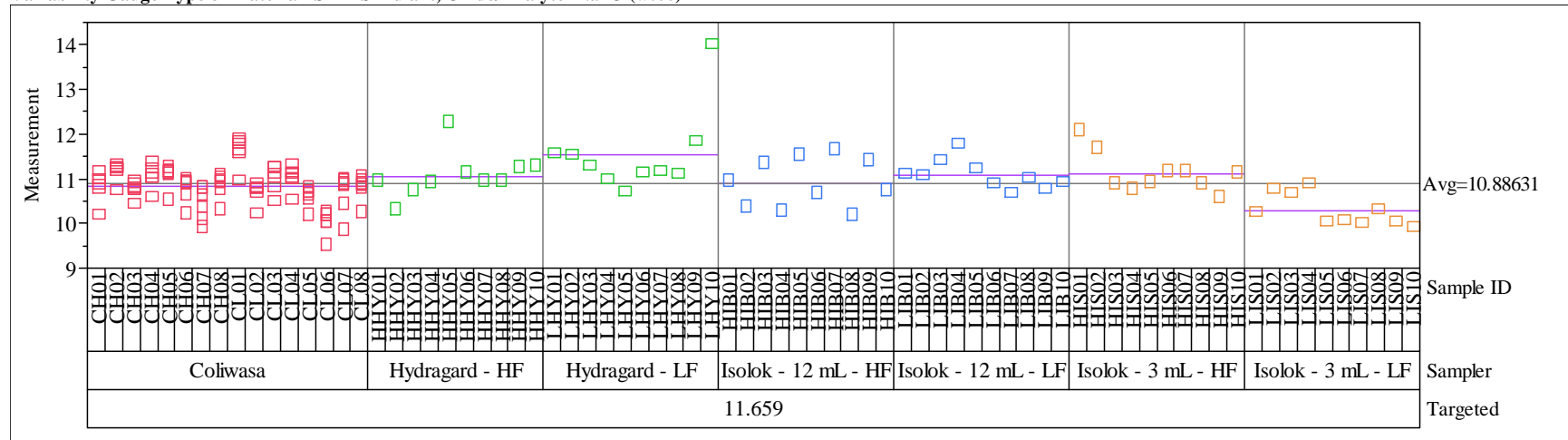


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=Na2O (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=NiO (wt%)

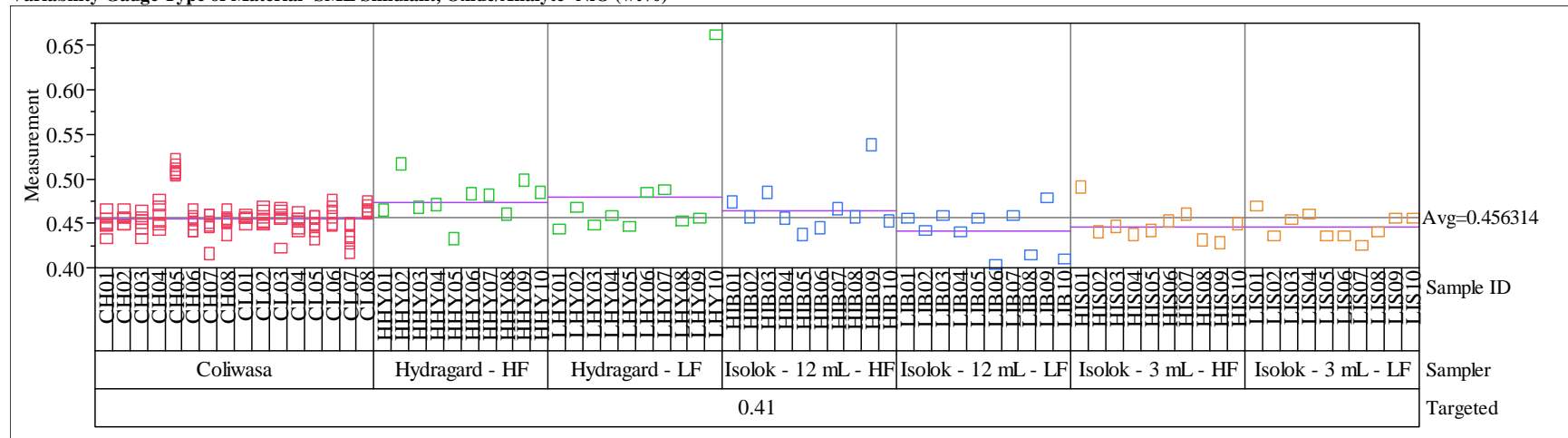
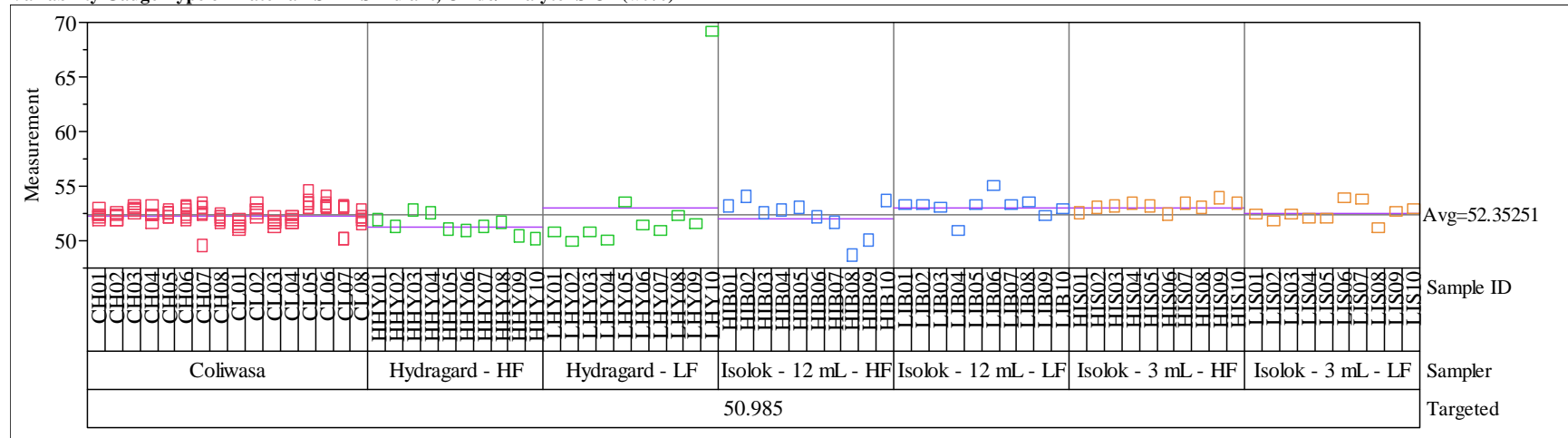


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=SiO2 (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=Sum of Oxides (wt%)

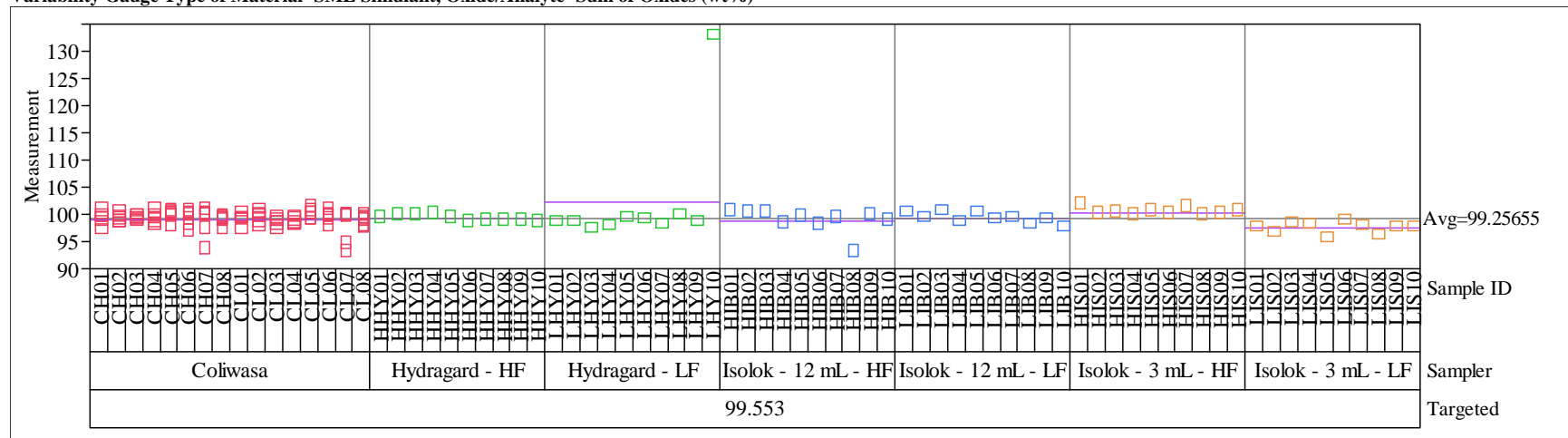
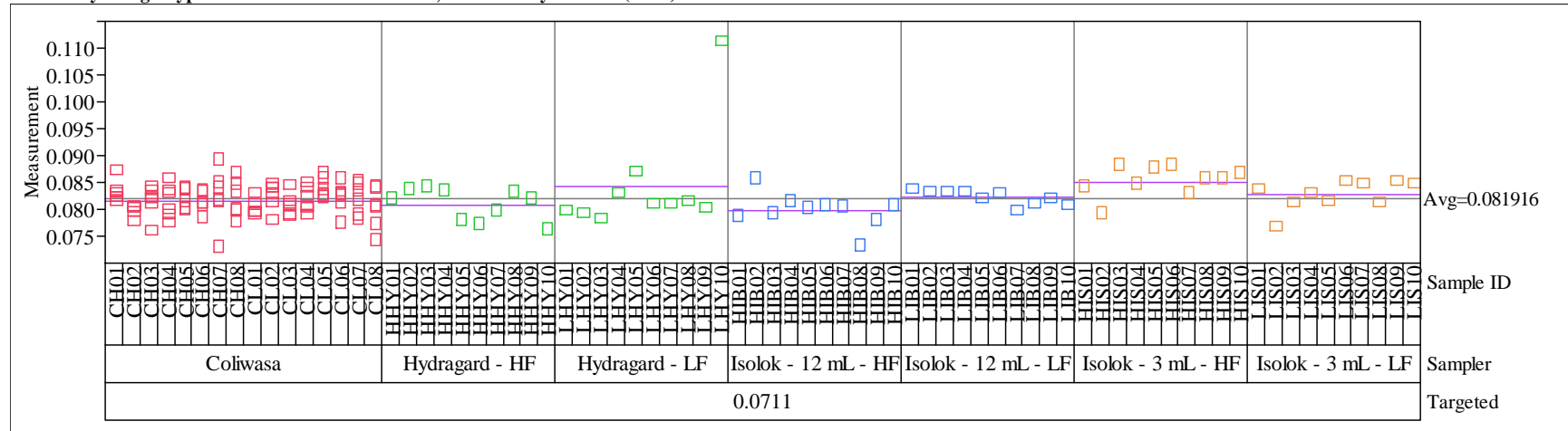


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=TiO2 (wt%)



Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=ZnO (wt%)

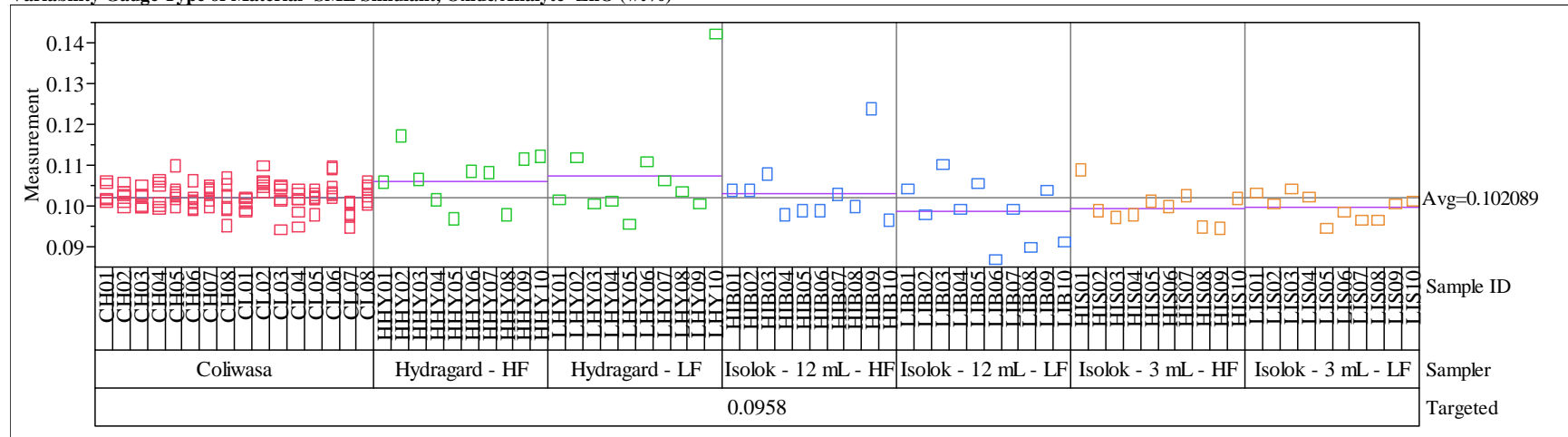


Exhibit C1. Density, Weight Percent Solids, and Oxide Measurements from the Low-Rheology (Phase 3) Testing

Variability Gauge Type of Material=SME Simulant, Oxide/Analyte=ZrO2 (wt%)

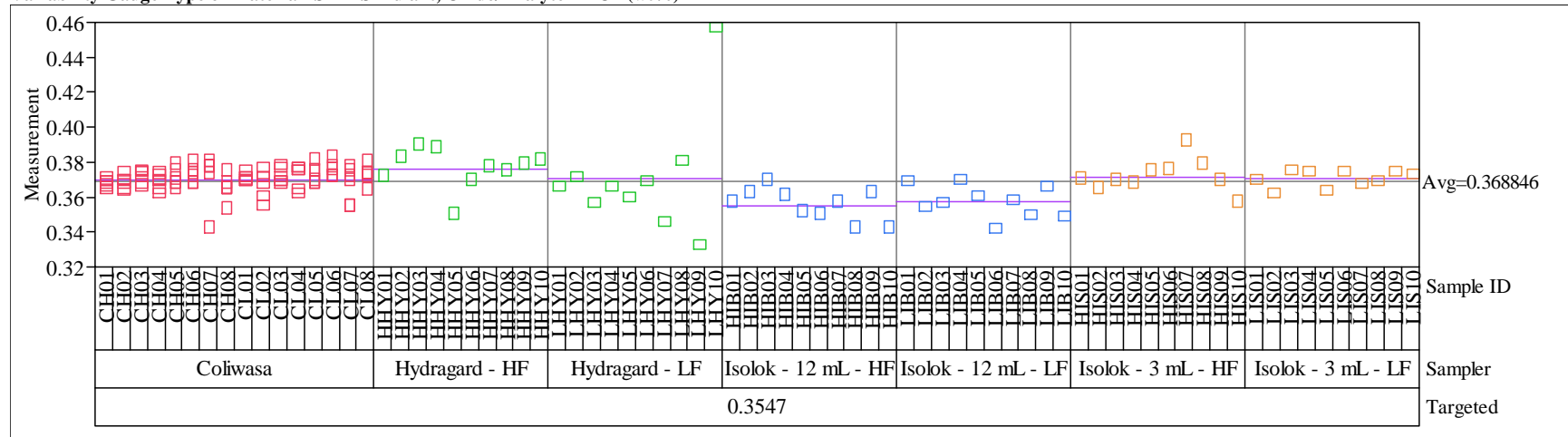
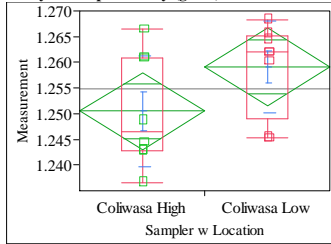


Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler w Location Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.179
Adj Rsquare	0.120357
Root Mean Square Error	0.009912
Mean of Response	1.254805
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	0.00866	t Ratio	1.747107
Std Err Dif	0.00496	DF	14
Upper CL Dif	0.01929	Prob > t	0.1025
Lower CL Dif	-0.00197	Prob > t	0.0513
Confidence	0.95	Prob < t	0.9487

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.00029991	0.000300	3.0524	0.1025
Error	14	0.00137554	0.000098		
C. Total	15	0.00167545			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	1.25048	0.00350	1.2430	1.2580
Coliwasa Low	8	1.25913	0.00350	1.2516	1.2667

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	1.25048	0.010849	0.00384	1.2414	1.2595
Coliwasa Low	8	1.25913	0.008877	0.00314	1.2517	1.2666

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	0.00866	t Ratio	1.747107
Std Err Dif	0.00496	DF	13.47219
Upper CL Dif	0.01933	Prob > t	0.1034
Lower CL Dif	-0.00201	Prob > t	0.0517
Confidence	0.95	Prob < t	0.9483

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.0108490	0.0092351	0.0087784
Coliwasa Low	8	0.0088772	0.0069162	0.0058942

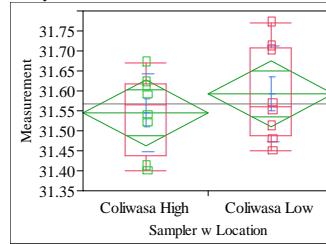
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5789	1	14	0.4594
Brown-Forsythe	0.6941	1	14	0.4187
Levene	0.9696	1	14	0.3415
Bartlett	0.2611	1	.	0.6094
F Test 2-sided	1.4936	7	7	0.6097

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.0524	1	13.472	0.1034

t Test
1.7471

Oneway Analysis of Measurement By Sampler w Location Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.051461
Adj Rsquare	-0.01629
Root Mean Square Error	0.109005
Mean of Response	31.56875
Observations (or Sum Wgts)	16

t Test

Coliwasa Low-Coliwasa High
Assuming equal variances

Difference	0.04750	t Ratio	0.871518
Std Err Dif	0.05450	DF	14
Upper CL Dif	0.16440	Prob > t	0.3982
Lower CL Dif	-0.06940	Prob > t	0.1991
Confidence	0.95	Prob < t	0.8009

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.00902500	0.009025	0.7595	0.3982
Error	14	0.16635000	0.011882		
C. Total	15	0.17537500			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa High	8	31.5450	0.03854	31.462	31.628
Coliwasa Low	8	31.5925	0.03854	31.510	31.675

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa High	8	31.5450	0.098125	0.03469	31.463	31.627
Coliwasa Low	8	31.5925	0.118894	0.04204	31.493	31.692

t Test

Coliwasa Low-Coliwasa High
Assuming unequal variances

Difference	0.04750	t Ratio	0.871518
Std Err Dif	0.05450	DF	13.51389
Upper CL Dif	0.16479	Prob > t	0.3987
Lower CL Dif	-0.06979	Prob > t	0.1993
Confidence	0.95	Prob < t	0.8007

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa High	8	0.0981253	0.0775000	0.0775000
Coliwasa Low	8	0.1188937	0.1006250	0.0950000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.6084	1	14	0.4484
Brown-Forsythe	0.2970	1	14	0.5944
Levene	0.8029	1	14	0.3854
Bartlett	0.2393	1	.	0.6247
F Test 2-sided	1.4681	7	7	0.6250

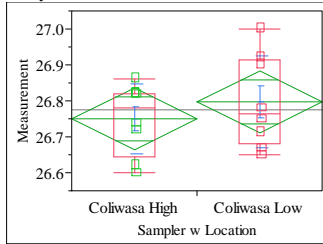
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7595	1	13.514	0.3987

t Test
0.8715

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler w Location Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.047257
Adj Rsquare	-0.0208
Root Mean Square Error	0.114002
Mean of Response	26.77375
Observations (or Sum Wgts)	16

t Test

Coliwas Low-Coliwas High
Assuming equal variances

Difference	0.04750	t Ratio	0.83332
Std Err Dif	0.05700	DF	14
Upper CL Dif	0.16975	Prob > t	0.4187
Lower CL Dif	-0.07475	Prob > t	0.2093
Confidence	0.95	Prob < t	0.7907

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler w Location	1	0.00902500	0.009025	0.6944	0.4187
Error	14	0.18195000	0.012996		
C. Total	15	0.19097500			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas High	8	26.7500	0.04031	26.664	26.836
Coliwas Low	8	26.7975	0.04031	26.711	26.884

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas High	8	26.7500	0.097980	0.03464	26.668	26.832
Coliwas Low	8	26.7975	0.128035	0.04527	26.690	26.905

t Test

Coliwas Low-Coliwas High
Assuming unequal variances

Difference	0.04750	t Ratio	0.83332
Std Err Dif	0.05700	DF	13.10498
Upper CL Dif	0.17054	Prob > t	0.4196
Lower CL Dif	-0.07554	Prob > t	0.2098
Confidence	0.95	Prob < t	0.7902

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas High	8	0.0979796	0.0800000	0.0800000
Coliwas Low	8	0.1280346	0.1068750	0.1025000

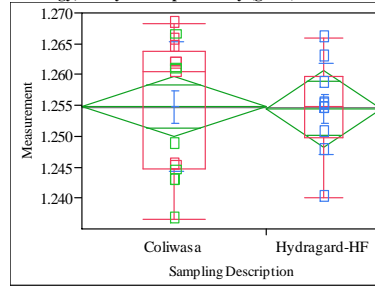
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0411	1	14	0.3249
Brown-Forsythe	0.4547	1	14	0.5111
Levene	1.0273	1	14	0.3280
Bartlett	0.4622	1	.	0.4966
F Test 2-sided	1.7076	7	7	0.4970

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6944	1	13.105	0.4196

t Test
0.8333

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.00031
Adj Rsquare	-0.04134
Root Mean Square Error	0.009499
Mean of Response	1.254678
Observations (or Sum Wgts)	26

t Test

Hydragard-HF-Coliwas
Assuming equal variances

Difference	-0.00033	t Ratio	-0.0863
Std Err Dif	0.00383	DF	24
Upper CL Dif	0.00757	Prob > t	0.9319
Lower CL Dif	-0.00823	Prob > t	0.5340
Confidence	0.95	Prob < t	0.4660

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00000067	6.72e-7	0.0074	0.9319
Error	24	0.00216532	0.000090		
C. Total	25	0.00216599			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.25481	0.00237	1.2499	1.2597
Hydragard-HF	10	1.25447	0.00300	1.2483	1.2607

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.25481	0.010569	0.00264	1.2492	1.2604
Hydragard-HF	10	1.25447	0.007378	0.00233	1.2492	1.2598

t Test

Hydragard-HF-Coliwas
Assuming unequal variances

Difference	-0.00033	t Ratio	-0.09375
Std Err Dif	0.00352	DF	23.59903
Upper CL Dif	0.00695	Prob > t	0.9261
Lower CL Dif	-0.00761	Prob > t	0.5370
Confidence	0.95	Prob < t	0.4630

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0105687	0.0096992	0.0090052
Hydragard-HF	10	0.0073777	0.0050673	0.0050540

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.9068	1	24	0.1011
Brown-Forsythe	2.0149	1	24	0.1686
Levene	7.8558	1	24	0.0099
Bartlett	1.2870	1	.	0.2566
F Test 2-sided	2.0521	15	9	0.2776

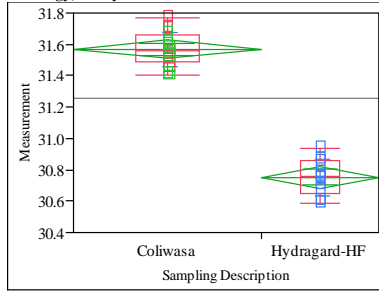
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0088	1	23.599	0.9261

t Test
0.0938

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.933349
Adj Rsquare	0.930572
Root Mean Square Error	0.110654
Mean of Response	31.25423
Observations (or Sum Wgts)	26

t Test

Hydragard-HF-Coliwasas
Assuming equal variances

Difference	-0.81775	t Ratio	-18.3327
Std Err Dif	0.04461	DF	24
Upper CL Dif	-0.72569	Prob > t	<.0001
Lower CL Dif	-0.90981	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	4.1151696	4.11517	336.0865	<.0001
Error	24	0.2938650	0.01224		
C. Total	25	4.4090346			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	16	31.5688	0.02766	31.512	31.626
Hydragard-HF	10	30.7510	0.03499	30.679	30.823

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	16	31.5688	0.108128	0.02703	31.511	31.626
Hydragard-HF	10	30.7510	0.114741	0.03628	30.669	30.833

t Test

Hydragard-HF-Coliwasas
Assuming unequal variances

Difference	-0.81775	t Ratio	-18.073
Std Err Dif	0.04525	DF	18.36803
Upper CL Dif	-0.72283	Prob > t	<.0001
Lower CL Dif	-0.91267	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	16	0.1081280	0.0862500	0.0862500
Hydragard-HF	10	0.1147413	0.0890000	0.0890000

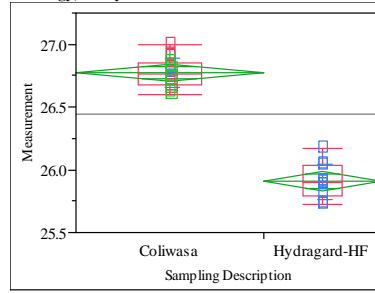
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0680	1	24	0.7965
Brown-Forsythe	0.0115	1	24	0.9154
Levene	0.0117	1	24	0.9148
Bartlett	0.0383	1	.	0.8449
F Test 2-sided	1.1261	9	15	0.8056

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
326.6351	1	18.368	<.0001

t Test
18.0730

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.925714
Adj Rsquare	0.922619
Root Mean Square Error	0.124187
Mean of Response	26.44077
Observations (or Sum Wgts)	26

t Test

Hydragard-HF-Coliwasas
Assuming equal variances

Difference	-0.86575	t Ratio	-17.2938
Std Err Dif	0.05006	DF	24
Upper CL Dif	-0.76243	Prob > t	<.0001
Lower CL Dif	-0.96907	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	4.6124496	4.61245	299.0768	<.0001
Error	24	0.3701350	0.01542		
C. Total	25	4.9825846			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas	16	26.7738	0.03105	26.710	26.838
Hydragard-HF	10	25.9080	0.03927	25.827	25.989

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas	16	26.7738	0.112835	0.02821	26.714	26.834
Hydragard-HF	10	25.9080	0.141091	0.04462	25.807	26.009

t Test

Hydragard-HF-Coliwasas
Assuming unequal variances

Difference	-0.86575	t Ratio	-16.401
Std Err Dif	0.05279	DF	16.09058
Upper CL Dif	-0.75390	Prob > t	<.0001
Lower CL Dif	-0.97760	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas	16	0.1128347	0.0912500	0.0912500
Hydragard-HF	10	0.1410910	0.1040000	0.1040000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7823	1	24	0.3852
Brown-Forsythe	0.1824	1	24	0.6732
Levene	0.1865	1	24	0.6697
Bartlett	0.5535	1	.	0.4569
F Test 2-sided	1.5636	9	15	0.4267

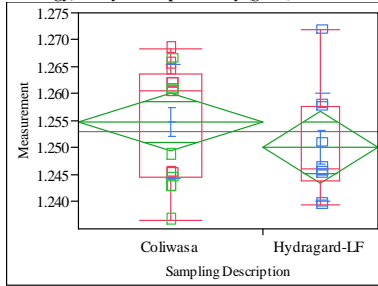
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
268.9937	1	16.091	<.0001

t Test
16.4010

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.050198
Adj Rsquare	0.010623
Root Mean Square Error	0.010349
Mean of Response	1.252998
Observations (or Sum Wgts)	26

t Test

Hydragard-LF-Coliwasa
Assuming equal variances

Difference	-0.00470	t Ratio	-1.12624
Std Err Dif	0.00417	DF	24
Upper CL Dif	0.00391	Prob > t	0.2712
Lower CL Dif	-0.01331	Prob > t	0.8644
Confidence	0.95	Prob < t	0.1356

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00013584	0.000136	1.2684	0.2712
Error	24	0.00257034	0.000107		
C. Total	25	0.00270618			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.00259	1.2495	1.2601
Hydragard-LF	10	1.25011	0.00327	1.2434	1.2569

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.010569	0.00264	1.2492	1.2604
Hydragard-LF	10	1.25011	0.009972	0.00315	1.2430	1.2572

t Test

Hydragard-LF-Coliwasa
Assuming unequal variances

Difference	-0.00470	t Ratio	-1.14207
Std Err Dif	0.00411	DF	20.12254
Upper CL Dif	0.00388	Prob > t	0.2668
Lower CL Dif	-0.01328	Prob > t	0.8666
Confidence	0.95	Prob < t	0.1334

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0105687	0.0096992	0.0090052
Hydragard-LF	10	0.0099716	0.0076602	0.0069505

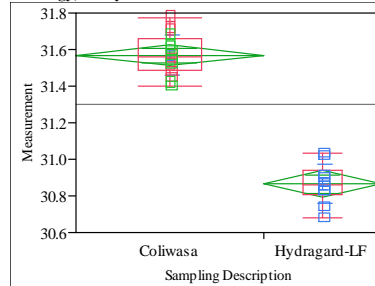
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0622	1	24	0.8052
Brown-Forsythe	0.4209	1	24	0.5226
Levene	1.2836	1	24	0.2684
Bartlett	0.0360	1	.	0.8495
F Test 2-sided	1.1233	15	9	0.8889

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.3043	1	20.123	0.2668

t Test
1.1421

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.914975
Adj Rsquare	0.911432
Root Mean Square Error	0.108477
Mean of Response	31.29846
Observations (or Sum Wgts)	26

t Test

Hydragard-LF-Coliwasa
Assuming equal variances

Difference	-0.70275	t Ratio	-16.0707
Std Err Dif	0.04373	DF	24
Upper CL Dif	-0.61250	Prob > t	<.0001
Lower CL Dif	-0.79300	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	3.0391235	3.03912	258.2687	<.0001
Error	24	0.2824150	0.01177		
C. Total	25	3.3215385			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.02712	31.513	31.625
Hydragard-LF	10	30.8660	0.03430	30.795	30.937

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Hydragard-LF	10	30.8660	0.109057	0.03449	30.788	30.944

t Test

Hydragard-LF-Coliwasa
Assuming unequal variances

Difference	-0.70275	t Ratio	-16.0377
Std Err Dif	0.04382	DF	19.12496
Upper CL Dif	-0.61108	Prob > t	<.0001
Lower CL Dif	-0.79442	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Hydragard-LF	10	0.1090566	0.0800000	0.0800000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0012	1	24	0.9726
Brown-Forsythe	0.0571	1	24	0.8131
Levene	0.0580	1	24	0.8117
Bartlett	0.0008	1	.	0.9776
F Test 2-sided	1.0172	9	15	0.9375

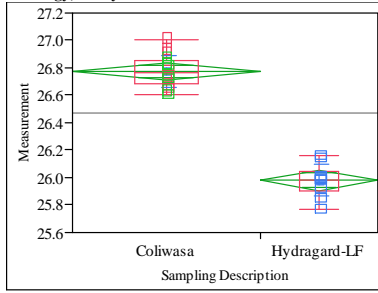
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
257.2091	1	19.125	<.0001

t Test
16.0377

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.924865
Adj Rsquare	0.921735
Root Mean Square Error	0.11456
Mean of Response	26.46846
Observations (or Sum Wgts)	26

t Test

Hydragard-LF-Coliwasa
Assuming equal variances

Difference	-0.79375	t Ratio	-17.188
Std Err Dif	0.04618	DF	24
Upper CL Dif	-0.69844	Prob > t	<.0001
Lower CL Dif	-0.88906	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	3.8771635	3.87716	295.4264	<.0001
Error	24	0.3149750	0.01312		
C. Total	25	4.1921385			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02864	26.715	26.833
Hydragard-LF	10	25.9800	0.03623	25.905	26.055

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Hydragard-LF	10	25.9800	0.117379	0.03712	25.896	26.064

t Test

Hydragard-LF-Coliwasa
Assuming unequal variances

Difference	-0.79375	t Ratio	-17.0256
Std Err Dif	0.04662	DF	18.66277
Upper CL Dif	-0.69605	Prob > t	<.0001
Lower CL Dif	-0.89145	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Hydragard-LF	10	0.1173788	0.0800000	0.0800000

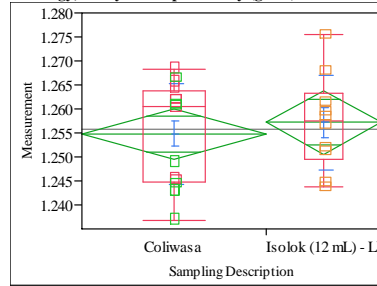
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0231	1	24	0.8804
Brown-Forsythe	0.1568	1	24	0.6956
Levene	0.1587	1	24	0.6938
Bartlett	0.0169	1	.	0.8966
F Test 2-sided	1.0822	9	15	0.8569

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
289.8721	1	18.663	<.0001

t Test
17.0256

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.013003
Adj Rsquare	-0.02812
Root Mean Square Error	0.010304
Mean of Response	1.255703
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.00234	t Ratio	0.562292
Std Err Dif	0.00415	DF	24
Upper CL Dif	0.01091	Prob > t	0.5791
Lower CL Dif	-0.00624	Prob > t	0.2896
Confidence	0.95	Prob < t	0.7104

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00003357	0.000034	0.3162	0.5791
Error	24	0.00254836	0.000106		
C. Total	25	0.00258194			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.00258	1.2495	1.2601
Isolok (12 mL) - LF	10	1.25714	0.00326	1.2504	1.2639

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.010569	0.00264	1.2492	1.2604
Isolok (12 mL) - LF	10	1.25714	0.009848	0.00311	1.2501	1.2642

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.00234	t Ratio	0.571893
Std Err Dif	0.00408	DF	20.30632
Upper CL Dif	0.01085	Prob > t	0.5737
Lower CL Dif	-0.00618	Prob > t	0.2868
Confidence	0.95	Prob < t	0.7132

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0105687	0.0096992	0.0090052
Isolok (12 mL) - LF	10	0.0098484	0.0074677	0.0074677

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1258	1	24	0.7260
Brown-Forsythe	0.2848	1	24	0.5985
Levene	1.5148	1	24	0.2303
Bartlett	0.0530	1	.	0.8180
F Test 2-sided	1.1516	15	9	0.8571

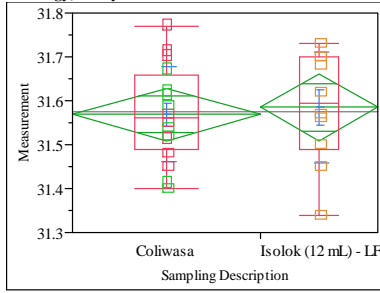
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3271	1	20.306	0.5737

t Test
0.5719

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.005062
Adj Rsquare	-0.03639
Root Mean Square Error	0.115366
Mean of Response	31.575
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.01625	t Ratio	0.34942
Std Err Dif	0.04651	DF	24
Upper CL Dif	0.11223	Prob > t	0.7298
Lower CL Dif	-0.07973	Prob > t	0.3649
Confidence	0.95	Prob < t	0.6351

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00162500	0.001625	0.1221	0.7298
Error	24	0.31942500	0.013309		
C. Total	25	0.32105000			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.02884	31.509	31.628
Isolok (12 mL) - LF	10	31.5850	0.03648	31.510	31.660

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Isolok (12 mL) - LF	10	31.5850	0.126513	0.04001	31.494	31.676

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.01625	t Ratio	0.336555
Std Err Dif	0.04828	DF	16.97131
Upper CL Dif	0.11813	Prob > t	0.7406
Lower CL Dif	-0.08563	Prob > t	0.3703
Confidence	0.95	Prob < t	0.6297

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Isolok (12 mL) - LF	10	0.1265131	0.1010000	0.1010000

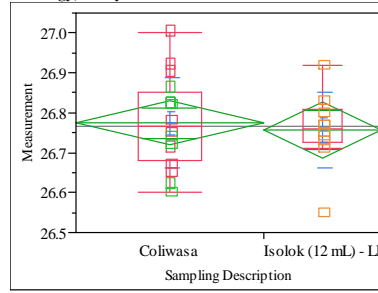
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.4142	1	24	0.5259
Brown-Forsythe	0.3194	1	24	0.5772
Levene	0.3266	1	24	0.5730
Bartlett	0.2714	1	.	0.6024
F Test 2-sided	1.3690	9	15	0.5676

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1133	1	16.971	0.7406

t Test
0.3366

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.006326
Adj Rsquare	-0.03508
Root Mean Square Error	0.106299
Mean of Response	26.76731
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming equal variances

Difference	-0.01675	t Ratio	-0.3909
Std Err Dif	0.04285	DF	24
Upper CL Dif	0.07169	Prob > t	0.6993
Lower CL Dif	-0.10519	Prob > t	0.6503
Confidence	0.95	Prob < t	0.3497

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00172654	0.001727	0.1528	0.6993
Error	24	0.27118500	0.011299		
C. Total	25	0.27291154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02657	26.719	26.829
Isolok (12 mL) - LF	10	26.7570	0.03361	26.688	26.826

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Isolok (12 mL) - LF	10	26.7570	0.094405	0.02985	26.689	26.825

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming unequal variances

Difference	-0.01675	t Ratio	-0.40782
Std Err Dif	0.04107	DF	21.81273
Upper CL Dif	0.06847	Prob > t	0.6874
Lower CL Dif	-0.10197	Prob > t	0.6563
Confidence	0.95	Prob < t	0.3437

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Isolok (12 mL) - LF	10	0.0944046	0.0610000	0.0610000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3408	1	24	0.5648
Brown-Forsythe	1.3241	1	24	0.2612
Levene	1.3414	1	24	0.2582
Bartlett	0.3307	1	.	0.5652
F Test 2-sided	1.4286	15	9	0.5993

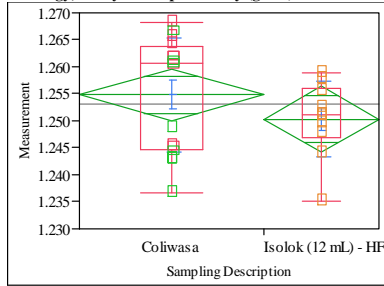
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1663	1	21.813	0.6874

t Test
0.4078

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.055402
Adj Rsquare	0.016044
Root Mean Square Error	0.009383
Mean of Response	1.253079
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming equal variances

Difference	-0.00449	t Ratio	-1.18644
Std Err Dif	0.00378	DF	24
Upper CL Dif	0.00332	Prob > t	0.2471
Lower CL Dif	-0.01229	Prob > t	0.8765
Confidence	0.95	Prob < t	0.1235

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00012394	0.000124	1.4076	0.2471
Error	24	0.00211309	0.000088		
C. Total	25	0.00223703			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.00235	1.2500	1.2596
Isolok (12 mL) - HF	10	1.25032	0.00297	1.2442	1.2564

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.010569	0.00264	1.2492	1.2604
Isolok (12 mL) - HF	10	1.25032	0.006973	0.00221	1.2453	1.2553

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming unequal variances

Difference	-0.00449	t Ratio	-1.30401
Std Err Dif	0.00344	DF	23.87111
Upper CL Dif	0.00262	Prob > t	0.2047
Lower CL Dif	-0.01159	Prob > t	0.8977
Confidence	0.95	Prob < t	0.1023

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0105687	0.0096992	0.0090052
Isolok (12 mL) - HF	10	0.0069733	0.0049263	0.0047917

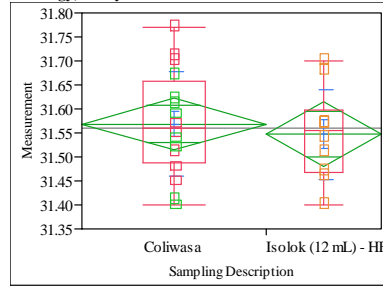
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.4932	1	24	0.0739
Brown-Forsythe	2.3378	1	24	0.1393
Levene	9.2124	1	24	0.0057
Bartlett	1.6970	1	.	0.1927
F Test 2-sided	2.2970	15	9	0.2097

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.7004	1	23.871	0.2047

t Test
1.3040

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.011306
Adj Rsquare	-0.02989
Root Mean Square Error	0.102994
Mean of Response	31.56038
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming equal variances

Difference	-0.02175	t Ratio	-0.52387
Std Err Dif	0.04152	DF	24
Upper CL Dif	0.06394	Prob > t	0.6052
Lower CL Dif	-0.10744	Prob > t	0.6974
Confidence	0.95	Prob < t	0.3026

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00291115	0.002911	0.2744	0.6052
Error	24	0.25458500	0.010608		
C. Total	25	0.25749615			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.02575	31.516	31.622
Isolok (12 mL) - HF	10	31.5470	0.03257	31.480	31.614

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.622
Isolok (12 mL) - HF	10	31.5470	0.093814	0.02967	31.480	31.614

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming unequal variances

Difference	-0.02175	t Ratio	-0.54192
Std Err Dif	0.04014	DF	21.32767
Upper CL Dif	0.06164	Prob > t	0.5935
Lower CL Dif	-0.10514	Prob > t	0.7033
Confidence	0.95	Prob < t	0.2967

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Isolok (12 mL) - HF	10	0.0938142	0.0710000	0.0710000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3198	1	24	0.5770
Brown-Forsythe	0.3947	1	24	0.5358
Levene	0.4034	1	24	0.5314
Bartlett	0.2113	1	.	0.6457
F Test 2-sided	1.3284	15	9	0.6819

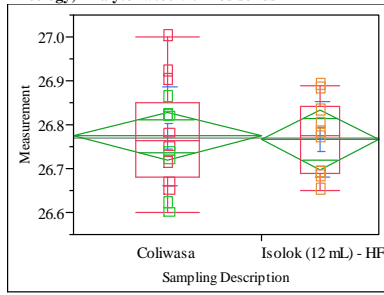
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2937	1	21.328	0.5935

t Test
0.5419

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.001435
Adj Rsquare	-0.04017
Root Mean Square Error	0.103524
Mean of Response	26.77077
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming equal variances

Difference	-0.00775	t Ratio	-0.18571
Std Err Dif	0.04173	DF	24
Upper CL Dif	0.07838	Prob > t	0.8542
Lower CL Dif	-0.09388	Prob > t	0.5729
Confidence	0.95	Prob < t	0.4271

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00036962	0.000370	0.0345	0.8542
Error	24	0.25721500	0.010717		
C. Total	25	0.25758462			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02588	26.720	26.827
Isolok (12 mL) - HF	10	26.7660	0.03274	26.698	26.834

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Isolok (12 mL) - HF	10	26.7660	0.085790	0.02713	26.705	26.827

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming unequal variances

Difference	-0.00775	t Ratio	-0.19802
Std Err Dif	0.03914	DF	22.91188
Upper CL Dif	0.07323	Prob > t	0.8448
Lower CL Dif	-0.08873	Prob > t	0.5776
Confidence	0.95	Prob < t	0.4224

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Isolok (12 mL) - HF	10	0.0857904	0.0708000	0.0700000

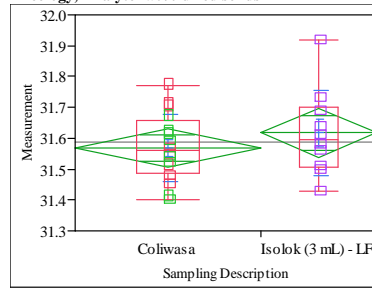
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0592	1	24	0.3137
Brown-Forsythe	0.8659	1	24	0.3614
Levene	0.8362	1	24	0.3696
Bartlett	0.7640	1	.	0.3821
F Test 2-sided	1.7298	15	9	0.4095

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0392	1	22.912	0.8448

t Test
0.1980

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.03926
Adj Rsquare	-0.00077
Root Mean Square Error	0.120862
Mean of Response	31.58731
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.04825	t Ratio	0.990329
Std Err Dif	0.04872	DF	24
Upper CL Dif	0.14881	Prob > t	0.3319
Lower CL Dif	-0.05231	Prob > t	0.1659
Confidence	0.95	Prob < t	0.8341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.01432654	0.014327	0.9808	0.3319
Error	24	0.35058500	0.014608		
C. Total	25	0.36491154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.03022	31.506	31.631
Isolok (3 mL) - LF	10	31.6170	0.03822	31.538	31.696

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Isolok (3 mL) - LF	10	31.6170	0.139527	0.04412	31.517	31.717

t Test

Isolok (3 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.04825	t Ratio	0.932464
Std Err Dif	0.05174	DF	15.6974
Upper CL Dif	0.15812	Prob > t	0.3652
Lower CL Dif	-0.06162	Prob > t	0.1826
Confidence	0.95	Prob < t	0.8174

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Isolok (3 mL) - LF	10	0.1395270	0.1024000	0.1010000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.7059	1	24	0.4091
Brown-Forsythe	0.2369	1	24	0.6308
Levene	0.3040	1	24	0.5865
Bartlett	0.7224	1	.	0.3954
F Test 2-sided	1.6651	9	15	0.3677

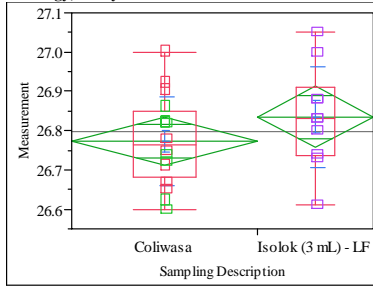
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8695	1	15.697	0.3652

t Test
0.9325

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.06351
Adj Rsquare	0.024489
Root Mean Square Error	0.119098
Mean of Response	26.79731
Observations (or Sum Wgts)	26

t Test

Iselok (3 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.06125	t Ratio	1.275776
Std Err Dif	0.04801	DF	24
Upper CL Dif	0.16034	Prob > t	0.2142
Lower CL Dif	-0.03784	Prob > t	0.1071
Confidence	0.95	Prob < t	0.8929

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.02308654	0.023087	1.6276	0.2142
Error	24	0.34042500	0.014184		
C. Total	25	0.36351154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02977	26.712	26.835
Iselok (3 mL) - LF	10	26.8350	0.03766	26.757	26.913

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Iselok (3 mL) - LF	10	26.8350	0.128863	0.04075	26.743	26.927

t Test

Iselok (3 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.06125	t Ratio	1.235853
Std Err Dif	0.04956	DF	17.30757
Upper CL Dif	0.16567	Prob > t	0.2330
Lower CL Dif	-0.04317	Prob > t	0.1165
Confidence	0.95	Prob < t	0.8835

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Iselok (3 mL) - LF	10	0.1288625	0.0940000	0.0930000

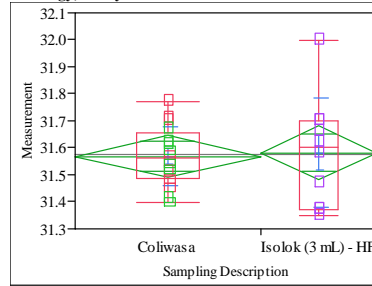
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.2642	1	24	0.6120
Brown-Forsythe	0.0037	1	24	0.9520
Levene	0.0094	1	24	0.9236
Bartlett	0.1936	1	.	0.6600
F Test 2-sided	1.3043	9	15	0.6237

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.5273	1	17.308	0.2330

t Test
1.2359

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.00199
Adj Rsquare	-0.03959
Root Mean Square Error	0.150241
Mean of Response	31.57385
Observations (or Sum Wgts)	26

t Test

Iselok (3 mL) - HF-Coliwasa
Assuming equal variances

Difference	0.01325	t Ratio	0.218777
Std Err Dif	0.06056	DF	24
Upper CL Dif	0.13825	Prob > t	0.8287
Lower CL Dif	-0.11175	Prob > t	0.4143
Confidence	0.95	Prob < t	0.5857

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00108038	0.001080	0.0479	0.8287
Error	24	0.54173500	0.022572		
C. Total	25	0.54281538			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.03756	31.491	31.646
Iselok (3 mL) - HF	10	31.5820	0.04751	31.484	31.680

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Iselok (3 mL) - HF	10	31.5820	0.201759	0.06380	31.438	31.726

t Test

Iselok (3 mL) - HF-Coliwasa
Assuming unequal variances

Difference	0.01325	t Ratio	0.191219
Std Err Dif	0.06929	DF	12.28371
Upper CL Dif	0.16384	Prob > t	0.8515
Lower CL Dif	-0.13734	Prob > t	0.4257
Confidence	0.95	Prob < t	0.5743

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Iselok (3 mL) - HF	10	0.2017589	0.1540000	0.1540000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.3538	1	24	0.0795
Brown-Forsythe	3.5677	1	24	0.0711
Levene	3.6536	1	24	0.0680
Bartlett	4.3627	1	.	0.0367
F Test 2-sided	3.4817	9	15	0.0323

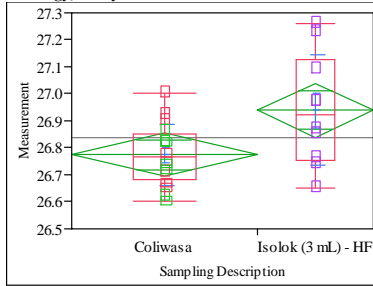
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0366	1	12.284	0.8515

t Test
0.1912

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.227301
Adj Rsquare	0.195106
Root Mean Square Error	0.154281
Mean of Response	26.83731
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL) - HF-Coliwasa
Assuming equal variances

Difference	0.165250	t Ratio	2.657061
Std Err Dif	0.062193	DF	24
Upper CL Dif	0.293610	Prob > t	0.0138
Lower CL Dif	0.036890	Prob > t	0.0069
Confidence	0.95	Prob < t	0.9931

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.16804654	0.168047	7.0600	0.0138
Error	24	0.57126500	0.023803		
C. Total	25	0.73931154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.03857	26.694	26.853
Isolok (3 mL) - HF	10	26.9390	0.04879	26.838	27.040

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Isolok (3 mL) - HF	10	26.9390	0.205559	0.06500	26.792	27.086

t Test

Isolok (3 mL) - HF-Coliwasa
Assuming unequal variances

Difference	0.165250	t Ratio	2.332055
Std Err Dif	0.070860	DF	12.44412
Upper CL Dif	0.319032	Prob > t	0.0372
Lower CL Dif	0.011468	Prob > t	0.0186
Confidence	0.95	Prob < t	0.9814

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Isolok (3 mL) - HF	10	0.2055589	0.1650000	0.1650000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.7356	1	24	0.0248
Brown-Forsythe	4.7080	1	24	0.0401
Levene	4.8453	1	24	0.0376
Bartlett	4.0372	1	.	0.0445
F Test 2-sided	3.3188	9	15	0.0393

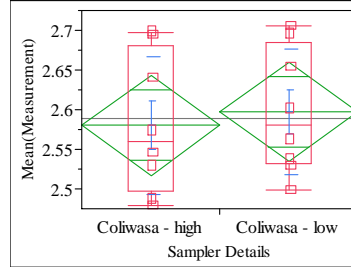
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.4385	1	12.444	0.0372

t Test

2.3321

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Al/B



Oneway Anova Summary of Fit

Rsquare	0.011912
Adj Rsquare	-0.05867
Root Mean Square Error	0.083171
Mean of Response	2.588802
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.01708	t Ratio	0.410827
Std Err Dif	0.04159	DF	14
Upper CL Dif	0.10628	Prob > t	0.6874
Lower CL Dif	-0.07211	Prob > t	0.3437
Confidence	0.95	Prob < t	0.6563

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00116751	0.001168	0.1688	0.6874
Error	14	0.09684407	0.006917		
C. Total	15	0.09801158			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	2.58026	0.02941	2.5172	2.6433
Coliwasa - low	8	2.59734	0.02941	2.5343	2.6604

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	2.58026	0.087043	0.03077	2.5075	2.6530
Coliwasa - low	8	2.59734	0.079110	0.02797	2.5312	2.6635

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.01708	t Ratio	0.410827
Std Err Dif	0.04159	DF	13.87405
Upper CL Dif	0.10635	Prob > t	0.6875
Lower CL Dif	-0.07218	Prob > t	0.3437
Confidence	0.95	Prob < t	0.6563

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0870432	0.0724234	0.0703177
Coliwasa - low	8	0.0791098	0.0660145	0.0660145

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1906	1	14	0.6691
Brown-Forsythe	0.0367	1	14	0.8509
Levene	0.1149	1	14	0.7397
Bartlett	0.0596	1	.	0.8072
F Test 2-sided	1.2106	7	7	0.8074

Welch Anova testing Means Equal, allowing Std Devs Not Equal

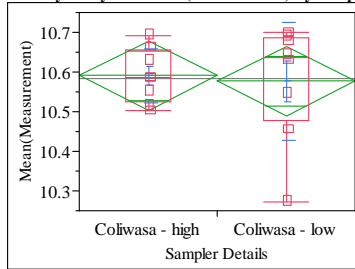
F Ratio	DFNum	DFDen	Prob > F
0.1688	1	13.874	0.6875

t Test

0.4108

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Al2O3 (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.004305
Adj Rsquare	-0.06682
Root Mean Square Error	0.115205
Mean of Response	10.58356
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.01417	t Ratio	-0.24602
Std Err Dif	0.05760	DF	14
Upper CL Dif	0.10937	Prob > t	0.8092
Lower CL Dif	-0.13772	Prob > t	0.5954
Confidence	0.95	Prob < t	0.4046

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00080330	0.000803	0.0605	0.8092
Error	14	0.18580961	0.013272		
C. Total	15	0.18661291			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	10.5906	0.04073	10.503	10.678
Coliwasa - low	8	10.5765	0.04073	10.489	10.664

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	10.5906	0.067626	0.02391	10.534	10.647
Coliwasa - low	8	10.5765	0.148226	0.05241	10.453	10.700

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.01417	t Ratio	-0.24602
Std Err Dif	0.05760	DF	9.793093
Upper CL Dif	0.11454	Prob > t	0.8107
Lower CL Dif	-0.14289	Prob > t	0.5946
Confidence	0.95	Prob < t	0.4054

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0676260	0.0527485	0.0519613
Coliwasa - low	8	0.1482260	0.1145509	0.1007733

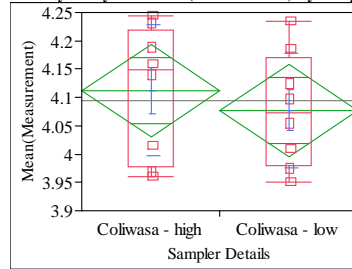
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7219	1	14	0.2106
Brown-Forsythe	1.1946	1	14	0.2928
Levene	3.6516	1	14	0.0767
Bartlett	3.6677	1	.	0.0555
F Test 2-sided	4.8042	7	7	0.0553

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0605	1	9.7931	0.8107

t Test
0.2460

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=B2O3 (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.028644
Adj Rsquare	-0.04074
Root Mean Square Error	0.108578
Mean of Response	4.09464
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.03488	t Ratio	-0.64253
Std Err Dif	0.05429	DF	14
Upper CL Dif	0.08156	Prob > t	0.5309
Lower CL Dif	-0.15132	Prob > t	0.7345
Confidence	0.95	Prob < t	0.2655

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00486709	0.004867	0.4128	0.5309
Error	14	0.16504892	0.011789		
C. Total	15	0.16991600			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	4.11208	0.03839	4.0297	4.1944
Coliwasa - low	8	4.07720	0.03839	3.9949	4.1595

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	4.11208	0.115589	0.04087	4.0154	4.2087
Coliwasa - low	8	4.07720	0.101082	0.03574	3.9927	4.1617

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.03488	t Ratio	-0.64253
Std Err Dif	0.05429	DF	13.75554
Upper CL Dif	0.08175	Prob > t	0.5311
Lower CL Dif	-0.15152	Prob > t	0.7345
Confidence	0.95	Prob < t	0.2655

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.1155890	0.0989448	0.0925721
Coliwasa - low	8	0.1010821	0.0818391	0.0818391

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3472	1	14	0.5651
Brown-Forsythe	0.1205	1	14	0.7337
Levene	0.4943	1	14	0.4935
Bartlett	0.1172	1	.	0.7321
F Test 2-sided	1.3076	7	7	0.7324

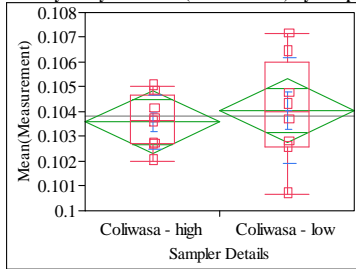
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4128	1	13.756	0.5311

t Test
0.6425

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=BaO (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.020618
Adj Rsquare	-0.04934
Root Mean Square Error	0.00168
Mean of Response	0.103811
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.00046	t Ratio	0.542886
Std Err Dif	0.00084	DF	14
Upper CL Dif	0.00226	Prob > t	0.5957
Lower CL Dif	-0.00135	Prob > t	0.2979
Confidence	0.95	Prob < t	0.7021

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.0000083	8.3139e-7	0.2947	0.5957
Error	14	0.00003949	2.8209e-6		
C. Total	15	0.00004032			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.103583	0.00059	0.10231	0.10486
Coliwasa - low	8	0.104039	0.00059	0.10277	0.10531

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.103583	0.001077	0.00038	0.10268	0.10448
Coliwasa - low	8	0.104039	0.002117	0.00075	0.10227	0.10581

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.00046	t Ratio	0.542886
Std Err Dif	0.00084	DF	10.397
Upper CL Dif	0.00232	Prob > t	0.5987
Lower CL Dif	-0.00141	Prob > t	0.2993
Confidence	0.95	Prob < t	0.7007

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0010772	0.0008513	0.0008513
Coliwasa - low	8	0.0021170	0.0016189	0.0016189

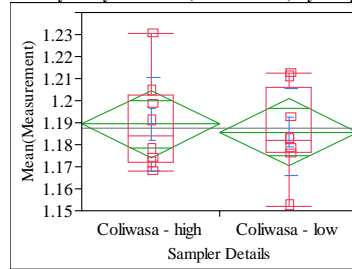
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7238	1	14	0.1211
Brown-Forsythe	2.5854	1	14	0.1302
Levene	2.5925	1	14	0.1297
Bartlett	2.7798	1	.	0.0955
F Test 2-sided	3.8624	7	7	0.0954

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2947	1	10.397	0.5987

t Test
0.5429

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=CaO (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.008633
Adj Rsquare	-0.06218
Root Mean Square Error	0.02037
Mean of Response	1.187484
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.00356	t Ratio	-0.34917
Std Err Dif	0.01018	DF	14
Upper CL Dif	0.01829	Prob > t	0.7322
Lower CL Dif	-0.02540	Prob > t	0.6339
Confidence	0.95	Prob < t	0.3661

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00005059	0.000051	0.1219	0.7322
Error	14	0.00580908	0.000415		
C. Total	15	0.00585967			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	1.18926	0.00720	1.1738	1.2047
Coliwasa - low	8	1.18571	0.00720	1.1703	1.2012

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	1.18926	0.021123	0.00747	1.1716	1.2069
Coliwasa - low	8	1.18571	0.019588	0.00693	1.1693	1.2021

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.00356	t Ratio	-0.34917
Std Err Dif	0.01018	DF	13.92107
Upper CL Dif	0.01830	Prob > t	0.7322
Lower CL Dif	-0.02541	Prob > t	0.6339
Confidence	0.95	Prob < t	0.3661

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0211230	0.0164989	0.0164989
Coliwasa - low	8	0.0195880	0.0144876	0.0136422

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0422	1	14	0.8401
Brown-Forsythe	0.1854	1	14	0.6734
Levene	0.1160	1	14	0.7384
Bartlett	0.0371	1	.	0.8472
F Test 2-sided	1.1629	7	7	0.8473

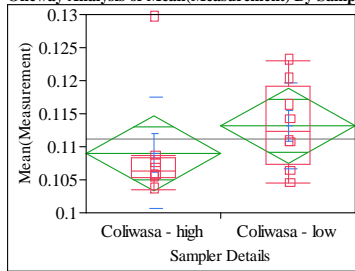
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1219	1	13.921	0.7322

t Test
0.3492

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Cr2O3 (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.079973
Adj Rsquare	0.014256
Root Mean Square Error	0.00748
Mean of Response	0.111117
Observations (or Sum Wgts)	16

t Test

Coliwasas - low-Coliwasas - high
Assuming equal variances

Difference	0.00413	t Ratio	1.10315
Std Err Dif	0.00374	DF	14
Upper CL Dif	0.01215	Prob > t	0.2886
Lower CL Dif	-0.00390	Prob > t	0.1443
Confidence	0.95	Prob < t	0.8557

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00006809	0.000068	1.2169	0.2886
Error	14	0.00078338	0.000056		
C. Total	15	0.00085147			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas - high	8	0.109054	0.00264	0.10338	0.11473
Coliwasas - low	8	0.113180	0.00264	0.10751	0.11885

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas - high	8	0.109054	0.008378	0.00296	0.10205	0.11606
Coliwasas - low	8	0.113180	0.006459	0.00228	0.10778	0.11858

t Test

Coliwasas - low-Coliwasas - high
Assuming unequal variances

Difference	0.00413	t Ratio	1.10315
Std Err Dif	0.00374	DF	13.14852
Upper CL Dif	0.01220	Prob > t	0.2897
Lower CL Dif	-0.00394	Prob > t	0.1449
Confidence	0.95	Prob < t	0.8551

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas - high	8	0.0083782	0.0050928	0.0040499
Coliwasas - low	8	0.0064588	0.0051917	0.0051917

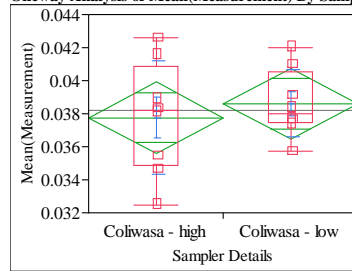
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1941	1	14	0.6663
Brown-Forsythe	0.1454	1	14	0.7087
Levene	0.0015	1	14	0.9694
Bartlett	0.4374	1	.	0.5084
F Test 2-sided	1.6827	7	7	0.5088

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2169	1	13.149	0.2897

t Test
1.1032

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=CuO (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.024795
Adj Rsquare	-0.04486
Root Mean Square Error	0.002824
Mean of Response	0.038186
Observations (or Sum Wgts)	16

t Test

Coliwasas - low-Coliwasas - high
Assuming equal variances

Difference	0.00084	t Ratio	0.596618
Std Err Dif	0.00141	DF	14
Upper CL Dif	0.00387	Prob > t	0.5603
Lower CL Dif	-0.00219	Prob > t	0.2801
Confidence	0.95	Prob < t	0.7199

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00000284	2.8383e-6	0.3560	0.5603
Error	14	0.00011163	7.9737e-6		
C. Total	15	0.00011447			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas - high	8	0.037765	0.00100	0.03562	0.03991
Coliwasas - low	8	0.038608	0.00100	0.03647	0.04075

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas - high	8	0.037765	0.003433	0.00121	0.03490	0.04063
Coliwasas - low	8	0.038608	0.002041	0.00072	0.03690	0.04031

t Test

Coliwasas - low-Coliwasas - high
Assuming unequal variances

Difference	0.00084	t Ratio	0.596618
Std Err Dif	0.00141	DF	11.39877
Upper CL Dif	0.00394	Prob > t	0.5624
Lower CL Dif	-0.00225	Prob > t	0.2812
Confidence	0.95	Prob < t	0.7188

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas - high	8	0.0034326	0.0026672	0.0025844
Coliwasas - low	8	0.0020407	0.0015778	0.0015022

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.2232	1	14	0.1581
Brown-Forsythe	1.4628	1	14	0.2465
Levene	1.9098	1	14	0.1886
Bartlett	1.6924	1	.	0.1933
F Test 2-sided	2.8293	7	7	0.1934

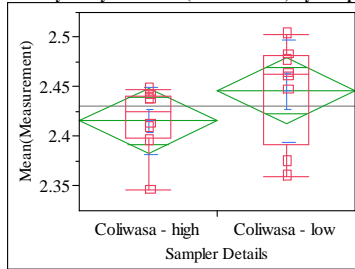
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3560	1	11.399	0.5624

t Test
0.5966

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Fe/Li



**Oneway Anova
Summary of Fit**

Rsquare	0.120098
Adj Rsquare	0.057248
Root Mean Square Error	0.043745
Mean of Response	2.430778
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.03024	t Ratio	1.382341
Std Err Dif	0.02187	DF	14
Upper CL Dif	0.07715	Prob > t	0.1885
Lower CL Dif	-0.01668	Prob > t	0.0943
Confidence	0.95	Prob < t	0.9057

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00365665	0.003657	1.9109	0.1885
Error	14	0.02679049	0.001914		
C. Total	15	0.03044714			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	2.41566	0.01547	2.3825	2.4488
Coliwasa - low	8	2.44590	0.01547	2.4127	2.4791

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	2.41566	0.033826	0.01196	2.3874	2.4439
Coliwasa - low	8	2.44590	0.051798	0.01831	2.4026	2.4892

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.03024	t Ratio	1.382341
Std Err Dif	0.02187	DF	12.05163
Upper CL Dif	0.07787	Prob > t	0.1919
Lower CL Dif	-0.01740	Prob > t	0.0960
Confidence	0.95	Prob < t	0.9040

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0338258	0.0252881	0.0252881
Coliwasa - low	8	0.0517980	0.0396271	0.0357634

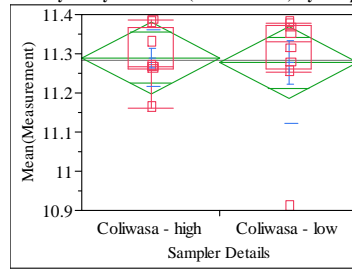
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2306	1	14	0.2860
Brown-Forsythe	0.4311	1	14	0.5221
Levene	1.2636	1	14	0.2799
Bartlett	1.1521	1	.	0.2831
F Test 2-sided	2.3449	7	7	0.2834

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.9109	1	12.052	0.1919

t Test
1.3823

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Fe2O3 (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.002462
Adj Rsquare	-0.06879
Root Mean Square Error	0.121779
Mean of Response	11.28331
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.01132	t Ratio	-0.18589
Std Err Dif	0.06089	DF	14
Upper CL Dif	0.11928	Prob > t	0.8552
Lower CL Dif	-0.14191	Prob > t	0.5724
Confidence	0.95	Prob < t	0.4276

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00051243	0.000512	0.0346	0.8552
Error	14	0.20762216	0.014830		
C. Total	15	0.20813459			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	11.2890	0.04306	11.197	11.381
Coliwasa - low	8	11.2777	0.04306	11.185	11.370

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	11.2890	0.073078	0.02584	11.228	11.350
Coliwasa - low	8	11.2777	0.155949	0.05514	11.147	11.408

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.01132	t Ratio	-0.18589
Std Err Dif	0.06089	DF	9.932813
Upper CL Dif	0.12448	Prob > t	0.8563
Lower CL Dif	-0.14711	Prob > t	0.5719
Confidence	0.95	Prob < t	0.4281

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0730778	0.0560710	0.0503374
Coliwasa - low	8	0.1559485	0.0981429	0.0890584

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8521	1	14	0.3716
Brown-Forsythe	0.5547	1	14	0.4687
Levene	0.9403	1	14	0.3487
Bartlett	3.4413	1	.	0.0636
F Test 2-sided	4.5540	7	7	0.0634

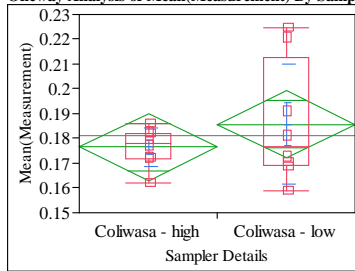
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0346	1	9.9328	0.8563

t Test
0.1859

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=K2O (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.070173
Adj Rsquare	0.003757
Root Mean Square Error	0.018067
Mean of Response	0.181117
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.00929	t Ratio	1.027891
Std Err Dif	0.00903	DF	14
Upper CL Dif	0.02866	Prob > t	0.3214
Lower CL Dif	-0.01009	Prob > t	0.1607
Confidence	0.95	Prob < t	0.8393

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00034488	0.000345	1.0566	0.3214
Error	14	0.00456983	0.000326		
C. Total	15	0.00491471			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.176474	0.00639	0.16277	0.19017
Coliwasa - low	8	0.185759	0.00639	0.17206	0.19946

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.176474	0.007659	0.00271	0.17007	0.18288
Coliwasa - low	8	0.185759	0.024376	0.00862	0.16538	0.20614

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.00929	t Ratio	1.027891
Std Err Dif	0.00903	DF	8.368923
Upper CL Dif	0.02996	Prob > t	0.3328
Lower CL Dif	-0.01139	Prob > t	0.1664
Confidence	0.95	Prob < t	0.8336

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0076593	0.0058724	0.0058724
Coliwasa - low	8	0.0243756	0.0194367	0.0181694

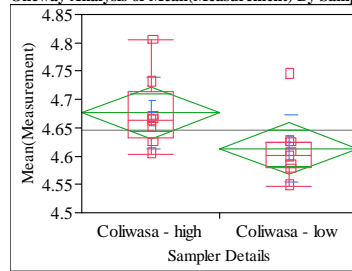
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.7148	1	14	0.0476
Brown-Forsythe	3.5869	1	14	0.0791
Levene	8.1023	1	14	0.0129
Bartlett	7.3000	1	.	0.0069
F Test 2-sided	10.1283	7	7	0.0068

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0566	1	8.3689	0.3328

t Test
1.0279

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Li2O (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.231832
Adj Rsquare	0.176963
Root Mean Square Error	0.061097
Mean of Response	4.644882
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.06279	t Ratio	-2.05552
Std Err Dif	0.03055	DF	14
Upper CL Dif	0.00273	Prob > t	0.0590
Lower CL Dif	-0.12831	Prob > t	0.9705
Confidence	0.95	Prob < t	0.0295

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.01577180	0.015772	4.2252	0.0590
Error	14	0.05225938	0.003733		
C. Total	15	0.06803118			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	4.67628	0.02160	4.6299	4.7226
Coliwasa - low	8	4.61349	0.02160	4.5672	4.6598

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	4.67628	0.063488	0.02245	4.6232	4.7294
Coliwasa - low	8	4.61349	0.058608	0.02072	4.5645	4.6625

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.06279	t Ratio	-2.05552
Std Err Dif	0.03055	DF	13.91136
Upper CL Dif	0.00277	Prob > t	0.0591
Lower CL Dif	-0.12835	Prob > t	0.9704
Confidence	0.95	Prob < t	0.0296

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0634884	0.0453006	0.0412639
Coliwasa - low	8	0.0586076	0.0383485	0.0367787

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0288	1	14	0.8677
Brown-Forsythe	0.0371	1	14	0.8500
Levene	0.1124	1	14	0.7424
Bartlett	0.0418	1	.	0.8381
F Test 2-sided	1.1735	7	7	0.8382

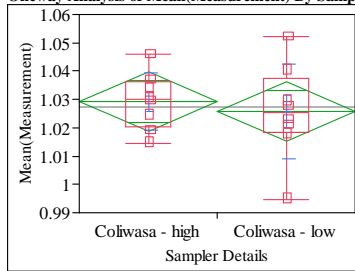
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.2252	1	13.911	0.0591

t Test
2.0555

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=MgO (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.018786
Adj Rsquare	-0.0513
Root Mean Square Error	0.01388
Mean of Response	1.027524
Observations (or Sum Wgts)	16

t Test

Coliwasas - low-Coliwasas - high
Assuming equal variances

Difference	-0.00359	t Ratio	-0.51772
Std Err Dif	0.00694	DF	14
Upper CL Dif	0.01129	Prob > t	0.6127
Lower CL Dif	-0.01848	Prob > t	0.6936
Confidence	0.95	Prob < t	0.3064

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00005164	0.000052	0.2680	0.6127
Error	14	0.00269717	0.000193		
C. Total	15	0.00274881			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas - high	8	1.02932	0.00491	1.0188	1.0398
Coliwasas - low	8	1.02573	0.00491	1.0152	1.0363

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas - high	8	1.02932	0.010062	0.00356	1.0209	1.0377
Coliwasas - low	8	1.02573	0.016854	0.00596	1.0116	1.0398

t Test

Coliwasas - low-Coliwasas - high
Assuming unequal variances

Difference	-0.00359	t Ratio	-0.51772
Std Err Dif	0.00694	DF	11.4272
Upper CL Dif	0.01161	Prob > t	0.6145
Lower CL Dif	-0.01880	Prob > t	0.6927
Confidence	0.95	Prob < t	0.3073

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas - high	8	0.0100619	0.0075833	0.0074623
Coliwasas - low	8	0.0168544	0.0116772	0.0116772

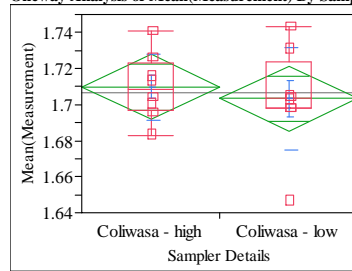
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.1623	1	14	0.2992
Brown-Forsythe	0.8516	1	14	0.3717
Levene	0.8188	1	14	0.3808
Bartlett	1.6665	1	.	0.1967
F Test 2-sided	2.8059	7	7	0.1969

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2680	1	11.427	0.6145

t Test
0.5177

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=MnO (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.020571
Adj Rsquare	-0.04939
Root Mean Square Error	0.023811
Mean of Response	1.706536
Observations (or Sum Wgts)	16

t Test

Coliwasas - low-Coliwasas - high
Assuming equal variances

Difference	-0.00646	t Ratio	-0.54226
Std Err Dif	0.01191	DF	14
Upper CL Dif	0.01908	Prob > t	0.5962
Lower CL Dif	-0.03199	Prob > t	0.7019
Confidence	0.95	Prob < t	0.2981

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00016672	0.000167	0.2940	0.5962
Error	14	0.00793771	0.000567		
C. Total	15	0.00810443			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas - high	8	1.70976	0.00842	1.6917	1.7278
Coliwasas - low	8	1.70331	0.00842	1.6853	1.7214

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas - high	8	1.70976	0.018188	0.00643	1.6946	1.7250
Coliwasas - low	8	1.70331	0.028340	0.01002	1.6796	1.7270

t Test

Coliwasas - low-Coliwasas - high
Assuming unequal variances

Difference	-0.00646	t Ratio	-0.54226
Std Err Dif	0.01191	DF	11.92982
Upper CL Dif	0.01950	Prob > t	0.5976
Lower CL Dif	-0.03241	Prob > t	0.7012
Confidence	0.95	Prob < t	0.2988

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas - high	8	0.0181877	0.0139880	0.0139880
Coliwasas - low	8	0.0283402	0.0172160	0.0172160

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7704	1	14	0.3949
Brown-Forsythe	0.1455	1	14	0.7086
Levene	0.1458	1	14	0.7083
Bartlett	1.2452	1	.	0.2645
F Test 2-sided	2.4280	7	7	0.2647

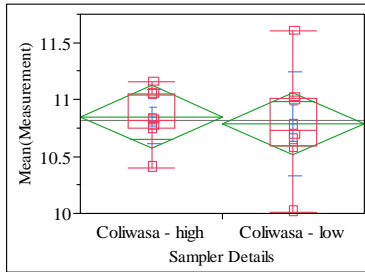
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2940	1	11.93	0.5976

t Test
0.5423

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Na2O (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.008086
Adj Rsquare	-0.06277
Root Mean Square Error	0.362445
Mean of Response	10.81939
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.06122	t Ratio	-0.33783
Std Err Dif	0.18122	DF	14
Upper CL Dif	0.32746	Prob > t	0.7405
Lower CL Dif	-0.44990	Prob > t	0.6297
Confidence	0.95	Prob < t	0.3703

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.0149924	0.014992	0.1141	0.7405
Error	14	1.8391250	0.131366		
C. Total	15	1.8541174			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	10.8500	0.12814	10.575	11.125
Coliwasa - low	8	10.7888	0.12814	10.514	11.064

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	10.8500	0.236198	0.08351	10.653	11.047
Coliwasa - low	8	10.7888	0.454910	0.16083	10.408	11.169

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.06122	t Ratio	-0.33783
Std Err Dif	0.18122	DF	10.51852
Upper CL Dif	0.33988	Prob > t	0.7421
Lower CL Dif	-0.46233	Prob > t	0.6289
Confidence	0.95	Prob < t	0.3711

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.2361976	0.1740465	0.1687808
Coliwasa - low	8	0.4549097	0.3143227	0.3097592

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.4118	1	14	0.2545
Brown-Forsythe	1.2693	1	14	0.2788
Levene	1.3665	1	14	0.2619
Bartlett	2.6261	1	.	0.1051
F Test 2-sided	3.7094	7	7	0.1051

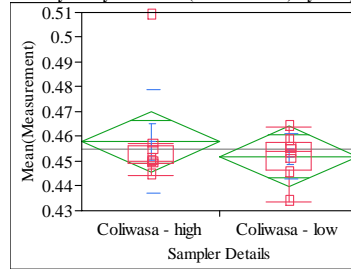
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1141	1	10.519	0.7421

t Test

0.3378

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=NiO (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.038791
Adj Rsquare	-0.02987
Root Mean Square Error	0.016083
Mean of Response	0.454892
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.00604	t Ratio	-0.75166
Std Err Dif	0.00804	DF	14
Upper CL Dif	0.01120	Prob > t	0.4647
Lower CL Dif	-0.02329	Prob > t	0.7676
Confidence	0.95	Prob < t	0.2324

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00014614	0.000146	0.5650	0.4647
Error	14	0.00362114	0.000259		
C. Total	15	0.00376728			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.457914	0.00569	0.44572	0.47011
Coliwasa - low	8	0.451870	0.00569	0.43967	0.46407

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.457914	0.020817	0.00736	0.44051	0.47532
Coliwasa - low	8	0.451870	0.009163	0.00324	0.44421	0.45953

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.00604	t Ratio	-0.75166
Std Err Dif	0.00804	DF	9.614655
Upper CL Dif	0.01197	Prob > t	0.4703
Lower CL Dif	-0.02406	Prob > t	0.7649
Confidence	0.95	Prob < t	0.2351

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0208167	0.0126654	0.0097293
Coliwasa - low	8	0.0091635	0.0065149	0.0061769

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7986	1	14	0.3866
Brown-Forsythe	0.2297	1	14	0.6391
Levene	1.0601	1	14	0.3207
Bartlett	3.9789	1	.	0.0461
F Test 2-sided	5.1607	7	7	0.0459

Welch Anova testing Means Equal, allowing Std Devs Not Equal

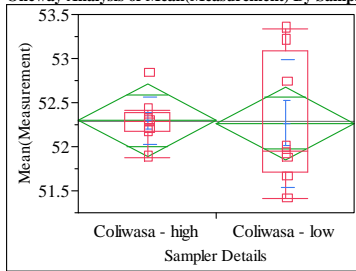
F Ratio	DFNum	DFDen	Prob > F
0.5650	1	9.6147	0.4703

t Test

0.7517

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=SiO2 (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.000928
Adj Rsquare	-0.07043
Root Mean Square Error	0.547276
Mean of Response	52.28137
Observations (or Sum Wgts)	16

t Test

Coliwasas - low-Coliwasas - high
Assuming equal variances

Difference	-0.03120	t Ratio	-0.11401
Std Err Dif	0.27364	DF	14
Upper CL Dif	0.55570	Prob > t	0.9108
Lower CL Dif	-0.61809	Prob > t	0.5446
Confidence	0.95	Prob < t	0.4554

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.0038933	0.003893	0.0130	0.9108
Error	14	4.1931550	0.299511		
C. Total	15	4.1970482			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas - high	8	52.2970	0.19349	51.882	52.712
Coliwasas - low	8	52.2658	0.19349	51.851	52.681

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas - high	8	52.2970	0.270703	0.09571	52.071	52.523
Coliwasas - low	8	52.2658	0.725081	0.25635	51.660	52.872

t Test

Coliwasas - low-Coliwasas - high
Assuming unequal variances

Difference	-0.03120	t Ratio	-0.11401
Std Err Dif	0.27364	DF	8.914191
Upper CL Dif	0.58872	Prob > t	0.9118
Lower CL Dif	-0.65112	Prob > t	0.5441
Confidence	0.95	Prob < t	0.4559

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas - high	8	0.2707031	0.1693613	0.1693613
Coliwasas - low	8	0.7250807	0.6183914	0.5481956

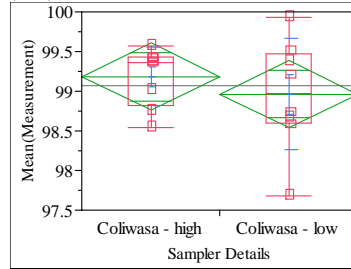
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.1046	1	14	0.0269
Brown-Forsythe	3.4037	1	14	0.0863
Levene	12.4844	1	14	0.0033
Bartlett	5.5220	1	.	0.0188
F Test 2-sided	7.1744	7	7	0.0186

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0130	1	8.9142	0.9118

t Test
0.1140

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Sum of Oxides (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.042156
Adj Rsquare	-0.02626
Root Mean Square Error	0.558252
Mean of Response	99.07151
Observations (or Sum Wgts)	16

t Test

Coliwasas - low-Coliwasas - high
Assuming equal variances

Difference	-0.21910	t Ratio	-0.78496
Std Err Dif	0.27913	DF	14
Upper CL Dif	0.37956	Prob > t	0.4456
Lower CL Dif	-0.81777	Prob > t	0.7772
Confidence	0.95	Prob < t	0.2228

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.1920218	0.192022	0.6162	0.4456
Error	14	4.3630350	0.311645		
C. Total	15	4.5550568			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasas - high	8	99.1811	0.19737	98.758	99.604
Coliwasas - low	8	98.9620	0.19737	98.539	99.385

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasas - high	8	99.1811	0.367584	0.12996	98.874	99.488
Coliwasas - low	8	98.9620	0.698694	0.24703	98.378	99.546

t Test

Coliwasas - low-Coliwasas - high
Assuming unequal variances

Difference	-0.21910	t Ratio	-0.78496
Std Err Dif	0.27913	DF	10.59922
Upper CL Dif	0.39810	Prob > t	0.4497
Lower CL Dif	-0.83630	Prob > t	0.7752
Confidence	0.95	Prob < t	0.2248

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasas - high	8	0.3675835	0.3082538	0.2649063
Coliwasas - low	8	0.6986938	0.5459874	0.5459874

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8603	1	14	0.1941
Brown-Forsythe	2.6290	1	14	0.1272
Levene	2.5984	1	14	0.1293
Bartlett	2.5278	1	.	0.1119
F Test 2-sided	3.6129	7	7	0.1118

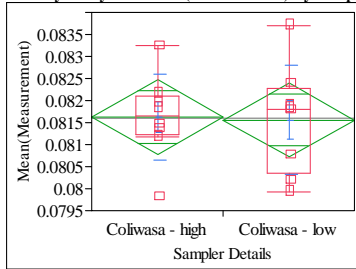
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6162	1	10.599	0.4497

t Test
0.7850

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=TiO2 (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.001007
Adj Rsquare	-0.07035
Root Mean Square Error	0.001112
Mean of Response	0.081595
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-6.6e-5	t Ratio	-0.1188
Std Err Dif	0.00056	DF	14
Upper CL Dif	0.00113	Prob > t	0.9071
Lower CL Dif	-0.00126	Prob > t	0.5464
Confidence	0.95	Prob < t	0.4536

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	1.74372e-8	1.7437e-8	0.0141	0.9071
Error	14	0.00001730	1.2356e-6		
C. Total	15	0.00001732			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.081628	0.00039	0.08078	0.08247
Coliwasa - low	8	0.081562	0.00039	0.08072	0.08240

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.081628	0.000976	0.00034	0.08081	0.08244
Coliwasa - low	8	0.081562	0.001233	0.00044	0.08053	0.08259

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-6.6e-5	t Ratio	-0.1188
Std Err Dif	0.00056	DF	13.29883
Upper CL Dif	0.00113	Prob > t	0.9072
Lower CL Dif	-0.00126	Prob > t	0.5464
Confidence	0.95	Prob < t	0.4536

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0009756	0.0006672	0.0006672
Coliwasa - low	8	0.0012326	0.0009426	0.0008861

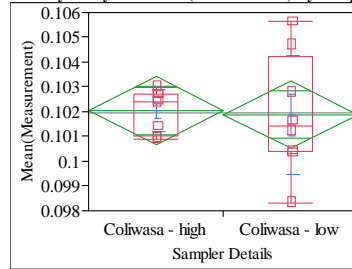
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3797	1	14	0.5476
Brown-Forsythe	0.3390	1	14	0.5697
Levene	0.6407	1	14	0.4368
Bartlett	0.3539	1	.	0.5519
F Test 2-sided	1.5961	7	7	0.5523

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0141	1	13.299	0.9072

t Test
0.1188

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=ZnO (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.002569
Adj Rsquare	-0.06868
Root Mean Square Error	0.001803
Mean of Response	0.101965
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.00017	t Ratio	-0.18988
Std Err Dif	0.00090	DF	14
Upper CL Dif	0.00176	Prob > t	0.8521
Lower CL Dif	-0.00210	Prob > t	0.5739
Confidence	0.95	Prob < t	0.4261

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00000012	1.1718e-7	0.0361	0.8521
Error	14	0.00004550	3.2502e-6		
C. Total	15	0.00004562			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.102050	0.00064	0.10068	0.10342
Coliwasa - low	8	0.101879	0.00064	0.10051	0.10325

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.102050	0.000842	0.00030	0.10135	0.10275
Coliwasa - low	8	0.101879	0.002407	0.00085	0.09987	0.10389

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.00017	t Ratio	-0.18988
Std Err Dif	0.00090	DF	8.6887
Upper CL Dif	0.00188	Prob > t	0.8538
Lower CL Dif	-0.00222	Prob > t	0.5731
Confidence	0.95	Prob < t	0.4269

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0008420	0.0007294	0.0006509
Coliwasa - low	8	0.0024065	0.0018627	0.0018076

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.0358	1	14	0.0642
Brown-Forsythe	4.0252	1	14	0.0645
Levene	5.3315	1	14	0.0367
Bartlett	6.1735	1	.	0.0130
F Test 2-sided	8.1680	7	7	0.0128

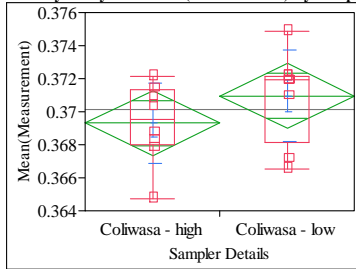
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0361	1	8.6887	0.8538

t Test
0.1899

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=ZrO2 (wt%)



**Oneway Anova
Summary of Fit**

Rsquare	0.104853
Adj Rsquare	0.040913
Root Mean Square Error	0.002593
Mean of Response	0.370133
Observations (or Sum Wgts)	16

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.00166	t Ratio	1.280579
Std Err Dif	0.00130	DF	14
Upper CL Dif	0.00444	Prob > t	0.2212
Lower CL Dif	-0.00112	Prob > t	0.1106
Confidence	0.95	Prob < t	0.8894

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00001103	0.000011	1.6399	0.2212
Error	14	0.00009414	6.724e-6		
C. Total	15	0.00010517			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	0.369303	0.00092	0.36734	0.37127
Coliwasa - low	8	0.370963	0.00092	0.36900	0.37293

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	0.369303	0.002404	0.00085	0.36729	0.37131
Coliwasa - low	8	0.370963	0.002770	0.00098	0.36865	0.37328

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.00166	t Ratio	1.280579
Std Err Dif	0.00130	DF	13.72763
Upper CL Dif	0.00445	Prob > t	0.2216
Lower CL Dif	-0.00113	Prob > t	0.1108
Confidence	0.95	Prob < t	0.8892

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0024036	0.0018855	0.0018855
Coliwasa - low	8	0.0027698	0.0020543	0.0018011

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1633	1	14	0.6922
Brown-Forsythe	0.0084	1	14	0.9283
Levene	0.0500	1	14	0.8263
Bartlett	0.1309	1	.	0.7175
F Test 2-sided	1.3279	7	7	0.7177

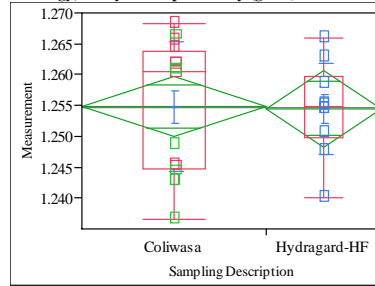
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6399	1	13.728	0.2216

t Test

1.2806

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



**Oneway Anova
Summary of Fit**

Rsquare	0.00031
Adj Rsquare	-0.04134
Root Mean Square Error	0.009499
Mean of Response	1.254678
Observations (or Sum Wgts)	26

t Test

Hydragard-HF-Coliwasa
Assuming equal variances

Difference	-0.00033	t Ratio	-0.0863
Std Err Dif	0.00383	DF	24
Upper CL Dif	0.00757	Prob > t	0.9319
Lower CL Dif	-0.00823	Prob > t	0.5340
Confidence	0.95	Prob < t	0.4660

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00000067	6.72e-7	0.0074	0.9319
Error	24	0.00216532	0.000090		
C. Total	25	0.00216599			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.00237	1.2499	1.2597
Hydragard-HF	10	1.25447	0.00300	1.2483	1.2607

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.010569	0.00264	1.2492	1.2604
Hydragard-HF	10	1.25447	0.007378	0.00233	1.2492	1.2598

t Test

Hydragard-HF-Coliwasa
Assuming unequal variances

Difference	-0.00033	t Ratio	-0.09375
Std Err Dif	0.00352	DF	23.59903
Upper CL Dif	0.00695	Prob > t	0.9261
Lower CL Dif	-0.00761	Prob > t	0.5370
Confidence	0.95	Prob < t	0.4630

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0105687	0.0096992	0.0090052
Hydragard-HF	10	0.0073777	0.0050673	0.0050540

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.9068	1	24	0.1011
Brown-Forsythe	2.0149	1	24	0.1686
Levene	7.8558	1	24	0.0099
Bartlett	1.2870	1	.	0.2566
F Test 2-sided	2.0521	15	9	0.2776

Welch Anova testing Means Equal, allowing Std Devs Not Equal

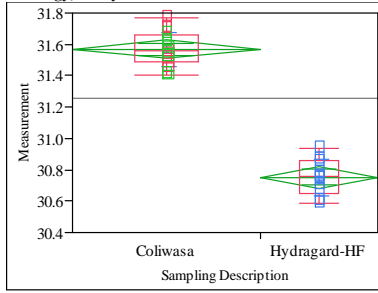
F Ratio	DFNum	DFDen	Prob > F
0.0088	1	23.599	0.9261

t Test

0.0938

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.933349
Adj Rsquare	0.930572
Root Mean Square Error	0.110654
Mean of Response	31.25423
Observations (or Sum Wgts)	26

t Test

Hydragard-HF-Coliwasa
Assuming equal variances

Difference	-0.81775	t Ratio	-18.3327
Std Err Dif	0.04461	DF	24
Upper CL Dif	-0.72569	Prob > t	<.0001
Lower CL Dif	-0.90981	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	4.1151696	4.11517	336.0865	<.0001
Error	24	0.2938650	0.01224		
C. Total	25	4.4090346			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.02766	31.512	31.626
Hydragard-HF	10	30.7510	0.03499	30.679	30.823

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Hydragard-HF	10	30.7510	0.114741	0.03628	30.669	30.833

t Test

Hydragard-HF-Coliwasa
Assuming unequal variances

Difference	-0.81775	t Ratio	-18.073
Std Err Dif	0.04525	DF	18.36803
Upper CL Dif	-0.72283	Prob > t	<.0001
Lower CL Dif	-0.91267	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Hydragard-HF	10	0.1147413	0.0890000	0.0890000

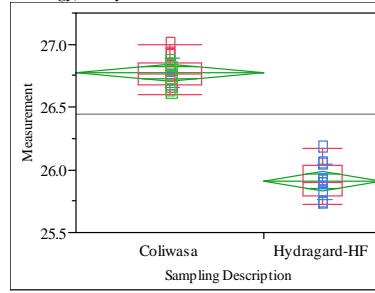
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0680	1	24	0.7965
Brown-Forsythe	0.0115	1	24	0.9154
Levene	0.0117	1	24	0.9148
Bartlett	0.0383	1	.	0.8449
F Test 2-sided	1.1261	9	15	0.8056

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
326.6351	1	18.368	<.0001

t Test
18.0730

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.925714
Adj Rsquare	0.922619
Root Mean Square Error	0.124187
Mean of Response	26.44077
Observations (or Sum Wgts)	26

t Test

Hydragard-HF-Coliwasa
Assuming equal variances

Difference	-0.86575	t Ratio	-17.2938
Std Err Dif	0.05006	DF	24
Upper CL Dif	-0.76243	Prob > t	<.0001
Lower CL Dif	-0.96907	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	4.6124496	4.61245	299.0768	<.0001
Error	24	0.3701350	0.01542		
C. Total	25	4.9825846			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.03105	26.710	26.838
Hydragard-HF	10	25.9080	0.03927	25.827	25.989

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Hydragard-HF	10	25.9080	0.141091	0.04462	25.807	26.009

t Test

Hydragard-HF-Coliwasa
Assuming unequal variances

Difference	-0.86575	t Ratio	-16.401
Std Err Dif	0.05279	DF	16.09058
Upper CL Dif	-0.75390	Prob > t	<.0001
Lower CL Dif	-0.97760	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Hydragard-HF	10	0.1410910	0.1040000	0.1040000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7823	1	24	0.3852
Brown-Forsythe	0.1824	1	24	0.6732
Levene	0.1865	1	24	0.6697
Bartlett	0.5535	1	.	0.4569
F Test 2-sided	1.5636	9	15	0.4267

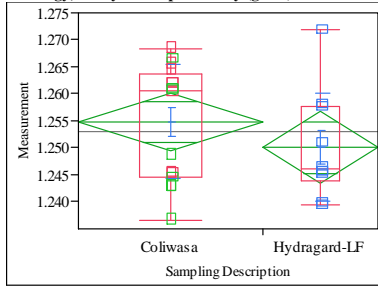
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
268.9937	1	16.091	<.0001

t Test
16.4010

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.050198
Adj Rsquare	0.010623
Root Mean Square Error	0.010349
Mean of Response	1.252998
Observations (or Sum Wgts)	26

t Test

Hydragard-LF-Coliwasa
Assuming equal variances

Difference	-0.00470	t Ratio	-1.12624
Std Err Dif	0.00417	DF	24
Upper CL Dif	0.00391	Prob > t	0.2712
Lower CL Dif	-0.01331	Prob > t	0.8644
Confidence	0.95	Prob < t	0.1356

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00013584	0.000136	1.2684	0.2712
Error	24	0.00257034	0.000107		
C. Total	25	0.00270618			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.00259	1.2495	1.2601
Hydragard-LF	10	1.25011	0.00327	1.2434	1.2569

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.010569	0.00264	1.2492	1.2604
Hydragard-LF	10	1.25011	0.009972	0.00315	1.2430	1.2572

t Test

Hydragard-LF-Coliwasa
Assuming unequal variances

Difference	-0.00470	t Ratio	-1.14207
Std Err Dif	0.00411	DF	20.12254
Upper CL Dif	0.00388	Prob > t	0.2668
Lower CL Dif	-0.01328	Prob > t	0.8666
Confidence	0.95	Prob < t	0.1334

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0105687	0.0096992	0.0090052
Hydragard-LF	10	0.0099716	0.0076602	0.0069505

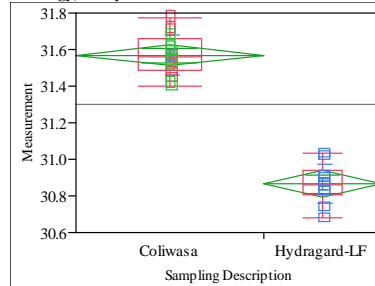
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0622	1	24	0.8052
Brown-Forsythe	0.4209	1	24	0.5226
Levene	1.2836	1	24	0.2684
Bartlett	0.0360	1	.	0.8495
F Test 2-sided	1.1233	15	9	0.8889

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.3043	1	20.123	0.2668

t Test
1.1421

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.914975
Adj Rsquare	0.911432
Root Mean Square Error	0.108477
Mean of Response	31.29846
Observations (or Sum Wgts)	26

t Test

Hydragard-LF-Coliwasa
Assuming equal variances

Difference	-0.70275	t Ratio	-16.0707
Std Err Dif	0.04373	DF	24
Upper CL Dif	-0.61250	Prob > t	<.0001
Lower CL Dif	-0.79300	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	3.0391235	3.03912	258.2687	<.0001
Error	24	0.2824150	0.01177		
C. Total	25	3.3215385			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.02712	31.513	31.625
Hydragard-LF	10	30.8660	0.03430	30.795	30.937

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Hydragard-LF	10	30.8660	0.109057	0.03449	30.788	30.944

t Test

Hydragard-LF-Coliwasa
Assuming unequal variances

Difference	-0.70275	t Ratio	-16.0377
Std Err Dif	0.04382	DF	19.12496
Upper CL Dif	-0.61108	Prob > t	<.0001
Lower CL Dif	-0.79442	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Hydragard-LF	10	0.1090566	0.0800000	0.0800000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0012	1	24	0.9726
Brown-Forsythe	0.0571	1	24	0.8131
Levene	0.0580	1	24	0.8117
Bartlett	0.0008	1	.	0.9776
F Test 2-sided	1.0172	9	15	0.9375

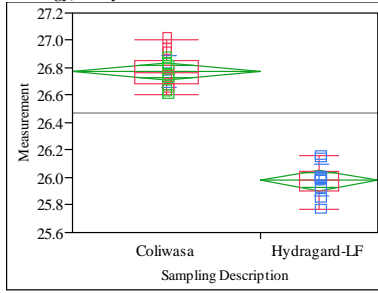
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
257.2091	1	19.125	<.0001

t Test
16.0377

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.924865
Adj Rsquare	0.921735
Root Mean Square Error	0.11456
Mean of Response	26.46846
Observations (or Sum Wgts)	26

t Test

Hydragard-LF-Coliwasa
Assuming equal variances

Difference	-0.79375	t Ratio	-17.188
Std Err Dif	0.04618	DF	24
Upper CL Dif	-0.69844	Prob > t	<.0001
Lower CL Dif	-0.88906	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	3.8771635	3.87716	295.4264	<.0001
Error	24	0.3149750	0.01312		
C. Total	25	4.1921385			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02864	26.715	26.833
Hydragard-LF	10	25.9800	0.03623	25.905	26.055

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Hydragard-LF	10	25.9800	0.117379	0.03712	25.896	26.064

t Test

Hydragard-LF-Coliwasa
Assuming unequal variances

Difference	-0.79375	t Ratio	-17.0256
Std Err Dif	0.04662	DF	18.66277
Upper CL Dif	-0.69605	Prob > t	<.0001
Lower CL Dif	-0.89145	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Hydragard-LF	10	0.1173788	0.0800000	0.0800000

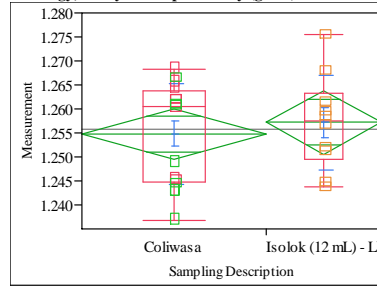
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0231	1	24	0.8804
Brown-Forsythe	0.1568	1	24	0.6956
Levene	0.1587	1	24	0.6938
Bartlett	0.0169	1	.	0.8966
F Test 2-sided	1.0822	9	15	0.8569

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
289.8721	1	18.663	<.0001

t Test
17.0256

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.013003
Adj Rsquare	-0.02812
Root Mean Square Error	0.010304
Mean of Response	1.255703
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.00234	t Ratio	0.562292
Std Err Dif	0.00415	DF	24
Upper CL Dif	0.01091	Prob > t	0.5791
Lower CL Dif	-0.00624	Prob > t	0.2896
Confidence	0.95	Prob < t	0.7104

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00003357	0.000034	0.3162	0.5791
Error	24	0.00254836	0.000106		
C. Total	25	0.00258194			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.00258	1.2495	1.2601
Isolok (12 mL) - LF	10	1.25714	0.00326	1.2504	1.2639

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.010569	0.00264	1.2492	1.2604
Isolok (12 mL) - LF	10	1.25714	0.009848	0.00311	1.2501	1.2642

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.00234	t Ratio	0.571893
Std Err Dif	0.00408	DF	20.30632
Upper CL Dif	0.01085	Prob > t	0.5737
Lower CL Dif	-0.00618	Prob > t	0.2868
Confidence	0.95	Prob < t	0.7132

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0105687	0.0096992	0.0090052
Isolok (12 mL) - LF	10	0.0098484	0.0074677	0.0074677

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1258	1	24	0.7260
Brown-Forsythe	0.2848	1	24	0.5985
Levene	1.5148	1	24	0.2303
Bartlett	0.0530	1	.	0.8180
F Test 2-sided	1.1516	15	9	0.8571

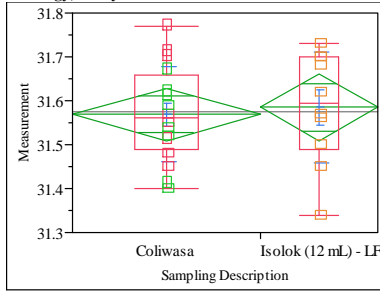
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3271	1	20.306	0.5737

t Test
0.5719

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.005062
Adj Rsquare	-0.03639
Root Mean Square Error	0.115366
Mean of Response	31.575
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.01625	t Ratio	0.34942
Std Err Dif	0.04651	DF	24
Upper CL Dif	0.11223	Prob > t	0.7298
Lower CL Dif	-0.07973	Prob > t	0.3649
Confidence	0.95	Prob < t	0.6351

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00162500	0.001625	0.1221	0.7298
Error	24	0.31942500	0.013309		
C. Total	25	0.32105000			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.02884	31.509	31.628
Isolok (12 mL) - LF	10	31.5850	0.03648	31.510	31.660

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Isolok (12 mL) - LF	10	31.5850	0.126513	0.04001	31.494	31.676

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.01625	t Ratio	0.336555
Std Err Dif	0.04828	DF	16.97131
Upper CL Dif	0.11813	Prob > t	0.7406
Lower CL Dif	-0.08563	Prob > t	0.3703
Confidence	0.95	Prob < t	0.6297

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Isolok (12 mL) - LF	10	0.1265131	0.1010000	0.1010000

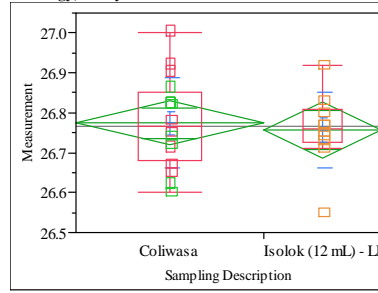
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4142	1	24	0.5259
Brown-Forsythe	0.3194	1	24	0.5772
Levene	0.3266	1	24	0.5730
Bartlett	0.2714	1	.	0.6024
F Test 2-sided	1.3690	9	15	0.5676

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1133	1	16.971	0.7406

t Test
0.3366

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.006326
Adj Rsquare	-0.03508
Root Mean Square Error	0.106299
Mean of Response	26.76731
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming equal variances

Difference	-0.01675	t Ratio	-0.3909
Std Err Dif	0.04285	DF	24
Upper CL Dif	0.07169	Prob > t	0.6993
Lower CL Dif	-0.10519	Prob > t	0.6503
Confidence	0.95	Prob < t	0.3497

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00172654	0.001727	0.1528	0.6993
Error	24	0.27118500	0.011299		
C. Total	25	0.27291154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02657	26.719	26.829
Isolok (12 mL) - LF	10	26.7570	0.03361	26.688	26.826

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Isolok (12 mL) - LF	10	26.7570	0.094405	0.02985	26.689	26.825

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming unequal variances

Difference	-0.01675	t Ratio	-0.40782
Std Err Dif	0.04107	DF	21.81273
Upper CL Dif	0.06847	Prob > t	0.6874
Lower CL Dif	-0.10197	Prob > t	0.6563
Confidence	0.95	Prob < t	0.3437

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Isolok (12 mL) - LF	10	0.0944046	0.0610000	0.0610000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3408	1	24	0.5648
Brown-Forsythe	1.3241	1	24	0.2612
Levene	1.3414	1	24	0.2582
Bartlett	0.3307	1	.	0.5652
F Test 2-sided	1.4286	15	9	0.5993

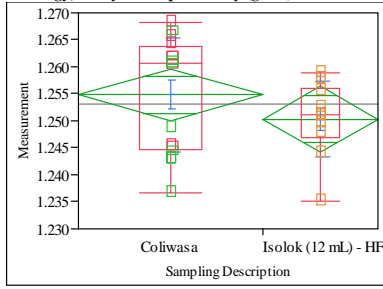
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1663	1	21.813	0.6874

t Test
0.4078

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=sample density (g/mL)



Oneway Anova Summary of Fit

Rsquare	0.055402
Adj Rsquare	0.016044
Root Mean Square Error	0.009383
Mean of Response	1.253079
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming equal variances

Difference	-0.00449	t Ratio	-1.18644
Std Err Dif	0.00378	DF	24
Upper CL Dif	0.00332	Prob > t	0.2471
Lower CL Dif	-0.01229	Prob > t	0.8765
Confidence	0.95	Prob < t	0.1235

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00012394	0.000124	1.4076	0.2471
Error	24	0.00211309	0.000088		
C. Total	25	0.00223703			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.00235	1.2500	1.2596
Isolok (12 mL) - HF	10	1.25032	0.00297	1.2442	1.2564

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.25481	0.010569	0.00264	1.2492	1.2604
Isolok (12 mL) - HF	10	1.25032	0.006973	0.00221	1.2453	1.2553

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming unequal variances

Difference	-0.00449	t Ratio	-1.30401
Std Err Dif	0.00344	DF	23.87111
Upper CL Dif	0.00262	Prob > t	0.2047
Lower CL Dif	-0.01159	Prob > t	0.8977
Confidence	0.95	Prob < t	0.1023

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0105687	0.0096992	0.0090052
Isolok (12 mL) - HF	10	0.0069733	0.0049263	0.0047917

Test F Ratio DFNum DFDen p-Value

O'Brien[.5]	3.4932	1	24	0.0739
Brown-Forsythe	2.3378	1	24	0.1393
Levene	9.2124	1	24	0.0057
Bartlett	1.6970	1	.	0.1927
F Test 2-sided	2.2970	15	9	0.2097

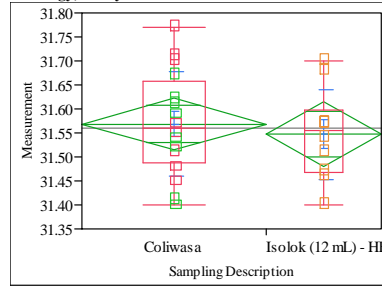
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.7004	1	23.871	0.2047

t Test

1.3040

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.011306
Adj Rsquare	-0.02989
Root Mean Square Error	0.102994
Mean of Response	31.56038
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming equal variances

Difference	-0.02175	t Ratio	-0.52387
Std Err Dif	0.04152	DF	24
Upper CL Dif	0.06394	Prob > t	0.6052
Lower CL Dif	-0.10744	Prob > t	0.6974
Confidence	0.95	Prob < t	0.3026

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00291115	0.002911	0.2744	0.6052
Error	24	0.25458500	0.010608		
C. Total	25	0.25749615			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.02575	31.516	31.622
Isolok (12 mL) - HF	10	31.5470	0.03257	31.480	31.614

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.622
Isolok (12 mL) - HF	10	31.5470	0.093814	0.02967	31.480	31.614

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming unequal variances

Difference	-0.02175	t Ratio	-0.54192
Std Err Dif	0.04014	DF	21.32767
Upper CL Dif	0.06164	Prob > t	0.5935
Lower CL Dif	-0.10514	Prob > t	0.7033
Confidence	0.95	Prob < t	0.2967

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Isolok (12 mL) - HF	10	0.0938142	0.0710000	0.0710000

Test F Ratio DFNum DFDen p-Value

O'Brien[.5]	0.3198	1	24	0.5770
Brown-Forsythe	0.3947	1	24	0.5358
Levene	0.4034	1	24	0.5314
Bartlett	0.2113	1	.	0.6457
F Test 2-sided	1.3284	15	9	0.6819

Welch Anova testing Means Equal, allowing Std Devs Not Equal

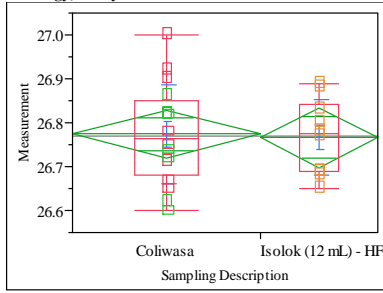
F Ratio	DFNum	DFDen	Prob > F
0.2937	1	21.328	0.5935

t Test

0.5419

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.001435
Adj Rsquare	-0.04017
Root Mean Square Error	0.103524
Mean of Response	26.77077
Observations (or Sum Wgts)	26

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming equal variances

Difference	-0.00775	t Ratio	-0.18571
Std Err Dif	0.04173	DF	24
Upper CL Dif	0.07838	Prob > t	0.8542
Lower CL Dif	-0.09388	Prob > t	0.5729
Confidence	0.95	Prob < t	0.4271

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00036962	0.000370	0.0345	0.8542
Error	24	0.25721500	0.010717		
C. Total	25	0.25758462			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02588	26.720	26.827
Isolok (12 mL) - HF	10	26.7660	0.03274	26.698	26.834

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Isolok (12 mL) - HF	10	26.7660	0.085790	0.02713	26.705	26.827

t Test

Isolok (12 mL) - HF-Coliwasa
Assuming unequal variances

Difference	-0.00775	t Ratio	-0.19802
Std Err Dif	0.03914	DF	22.91188
Upper CL Dif	0.07323	Prob > t	0.8448
Lower CL Dif	-0.08873	Prob > t	0.5776
Confidence	0.95	Prob < t	0.4224

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Isolok (12 mL) - HF	10	0.0857904	0.0708000	0.0700000

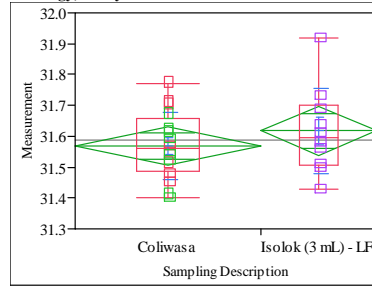
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0592	1	24	0.3137
Brown-Forsythe	0.8659	1	24	0.3614
Levene	0.8362	1	24	0.3696
Bartlett	0.7640	1	.	0.3821
F Test 2-sided	1.7298	15	9	0.4095

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.0392	DFNum	1	DFDen	22.912	Prob > F	0.8448
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t Test
0.1980

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



**Oneway Anova
Summary of Fit**

Rsquare	0.03926
Adj Rsquare	-0.00077
Root Mean Square Error	0.120862
Mean of Response	31.58731
Observations (or Sum Wgts)	26

t Test

Isolok (3 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.04825	t Ratio	0.990329
Std Err Dif	0.04872	DF	24
Upper CL Dif	0.14881	Prob > t	0.3319
Lower CL Dif	-0.05231	Prob > t	0.1659
Confidence	0.95	Prob < t	0.8341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.01432654	0.014327	0.9808	0.3319
Error	24	0.35058500	0.014608		
C. Total	25	0.36491154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.03022	31.506	31.631
Isolok (3 mL) - LF	10	31.6170	0.03822	31.538	31.696

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Isolok (3 mL) - LF	10	31.6170	0.139527	0.04412	31.517	31.717

t Test

Isolok (3 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.04825	t Ratio	0.932464
Std Err Dif	0.05174	DF	15.6974
Upper CL Dif	0.15812	Prob > t	0.3652
Lower CL Dif	-0.06162	Prob > t	0.1826
Confidence	0.95	Prob < t	0.8174

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Isolok (3 mL) - LF	10	0.1395270	0.1024000	0.1010000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.7059	1	24	0.4091
Brown-Forsythe	0.2369	1	24	0.6308
Levene	0.3040	1	24	0.5865
Bartlett	0.7224	1	.	0.3954
F Test 2-sided	1.6651	9	15	0.3677

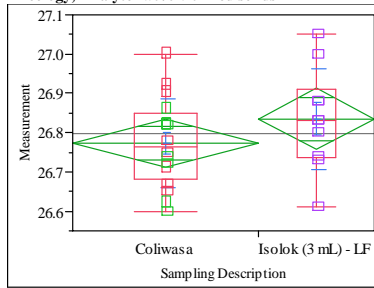
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.8695	DFNum	1	DFDen	15.697	Prob > F	0.3652
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t Test
0.9325

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.06351
Adj Rsquare	0.024489
Root Mean Square Error	0.119098
Mean of Response	26.79731
Observations (or Sum Wgts)	26

t Test

Iselok (3 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.06125	t Ratio	1.275776
Std Err Dif	0.04801	DF	24
Upper CL Dif	0.16034	Prob > t	0.2142
Lower CL Dif	-0.03784	Prob > t	0.1071
Confidence	0.95	Prob < t	0.8929

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.02308654	0.023087	1.6276	0.2142
Error	24	0.34042500	0.014184		
C. Total	25	0.36351154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02977	26.712	26.835
Iselok (3 mL) - LF	10	26.8350	0.03766	26.757	26.913

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Iselok (3 mL) - LF	10	26.8350	0.128863	0.04075	26.743	26.927

t Test

Iselok (3 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.06125	t Ratio	1.235853
Std Err Dif	0.04956	DF	17.30757
Upper CL Dif	0.16567	Prob > t	0.2330
Lower CL Dif	-0.04317	Prob > t	0.1165
Confidence	0.95	Prob < t	0.8835

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Iselok (3 mL) - LF	10	0.1288625	0.0940000	0.0930000

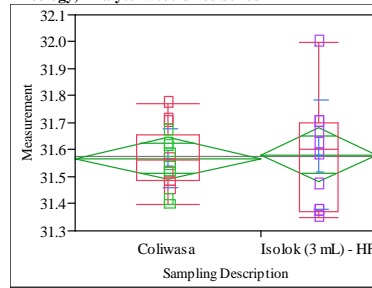
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2642	1	24	0.6120
Brown-Forsythe	0.0037	1	24	0.9520
Levene	0.0094	1	24	0.9236
Bartlett	0.1936	1	.	0.6600
F Test 2-sided	1.3043	9	15	0.6237

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.5273	1	17.308	0.2330

t Test
1.2359

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% dried solids



Oneway Anova Summary of Fit

Rsquare	0.00199
Adj Rsquare	-0.03959
Root Mean Square Error	0.150241
Mean of Response	31.57385
Observations (or Sum Wgts)	26

t Test

Iselok (3 mL) - HF-Coliwasa
Assuming equal variances

Difference	0.01325	t Ratio	0.218777
Std Err Dif	0.06056	DF	24
Upper CL Dif	0.13825	Prob > t	0.8287
Lower CL Dif	-0.11175	Prob > t	0.4143
Confidence	0.95	Prob < t	0.5857

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00108038	0.001080	0.0479	0.8287
Error	24	0.54173500	0.022572		
C. Total	25	0.54281538			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.03756	31.491	31.646
Iselok (3 mL) - HF	10	31.5820	0.04751	31.484	31.680

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	31.5688	0.108128	0.02703	31.511	31.626
Iselok (3 mL) - HF	10	31.5820	0.201759	0.06380	31.438	31.726

t Test

Iselok (3 mL) - HF-Coliwasa
Assuming unequal variances

Difference	0.01325	t Ratio	0.191219
Std Err Dif	0.06929	DF	12.28371
Upper CL Dif	0.16384	Prob > t	0.8515
Lower CL Dif	-0.13734	Prob > t	0.4257
Confidence	0.95	Prob < t	0.5743

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1081280	0.0862500	0.0862500
Iselok (3 mL) - HF	10	0.2017589	0.1540000	0.1540000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.3538	1	24	0.0795
Brown-Forsythe	3.5677	1	24	0.0711
Levene	3.6536	1	24	0.0680
Bartlett	4.3627	1	.	0.0367
F Test 2-sided	3.4817	9	15	0.0323

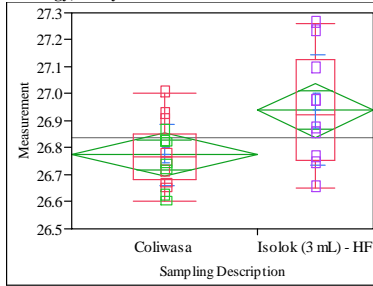
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0366	1	12.284	0.8515

t Test
0.1912

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



**Oneway Anova
Summary of Fit**

Rsquare	0.227301
Adj Rsquare	0.195106
Root Mean Square Error	0.154281
Mean of Response	26.83731
Observations (or Sum Wgts)	26

t Test

Islok (3 mL) - HF-Coliwasa
Assuming equal variances

Difference	0.165250	t Ratio	2.657061
Std Err Dif	0.062193	DF	24
Upper CL Dif	0.293610	Prob > t	0.0138
Lower CL Dif	0.036890	Prob > t	0.0069
Confidence	0.95	Prob < t	0.9931

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.16804654	0.168047	7.0600	0.0138
Error	24	0.57126500	0.023803		
C. Total	25	0.73931154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.03857	26.694	26.853
Islok (3 mL) - HF	10	26.9390	0.04879	26.838	27.040

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Islok (3 mL) - HF	10	26.9390	0.205559	0.06500	26.792	27.086

t Test

Islok (3 mL) - HF-Coliwasa
Assuming unequal variances

Difference	0.165250	t Ratio	2.332055
Std Err Dif	0.070860	DF	12.44412
Upper CL Dif	0.319032	Prob > t	0.0372
Lower CL Dif	0.011468	Prob > t	0.0186
Confidence	0.95	Prob < t	0.9814

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Islok (3 mL) - HF	10	0.2055589	0.1650000	0.1650000

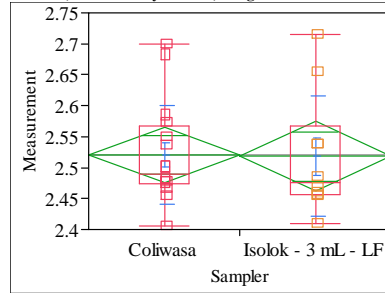
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.7356	1	24	0.0248
Brown-Forsythe	4.7080	1	24	0.0401
Levene	4.8453	1	24	0.0376
Bartlett	4.0372	1	.	0.0445
F Test 2-sided	3.3188	9	15	0.0393

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	5.4385	DFNum	1	DFDen	12.444	Prob > F	0.0372
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t Test
2.3321

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Al/B, Targeted=2.552



**Oneway Anova
Summary of Fit**

Rsquare	0.000269
Adj Rsquare	-0.04139
Root Mean Square Error	0.086739
Mean of Response	2.519724
Observations (or Sum Wgts)	26

t Test

Islok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00281	t Ratio	-0.08038
Std Err Dif	0.03497	DF	24
Upper CL Dif	0.06936	Prob > t	0.9366
Lower CL Dif	-0.07498	Prob > t	0.5317
Confidence	0.95	Prob < t	0.4683

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004861	0.000049	0.0065	0.9366
Error	24	0.18056764	0.007524		
C. Total	25	0.18061625			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.52080	0.02168	2.4760	2.5656
Islok - 3 mL - LF	10	2.51799	0.02743	2.4614	2.5746

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.52080	0.079897	0.01997	2.4760	2.5634
Islok - 3 mL - LF	10	2.51799	0.097076	0.03070	2.4486	2.5874

t Test

Islok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00281	t Ratio	-0.07674
Std Err Dif	0.03662	DF	16.46334
Upper CL Dif	0.07465	Prob > t	0.9398
Lower CL Dif	-0.08027	Prob > t	0.5301
Confidence	0.95	Prob < t	0.4699

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0798975	0.0619843	0.0564631
Islok - 3 mL - LF	10	0.0970759	0.0748546	0.0682185

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3946	1	24	0.5358
Brown-Forsythe	0.1768	1	24	0.6779
Levene	0.3879	1	24	0.5393
Bartlett	0.4191	1	.	0.5174
F Test 2-sided	1.4762	9	15	0.4851

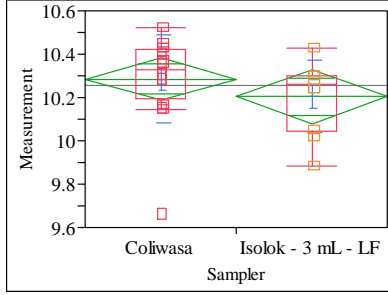
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.0059	DFNum	1	DFDen	16.463	Prob > F	0.9398
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t Test
0.0767

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



Oneway Anova
Summary of Fit

Rsquare	0.046974
Adj Rsquare	0.007264
Root Mean Square Error	0.188546
Mean of Response	10.25417
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.08267	t Ratio	-1.08763
Std Err Dif	0.07601	DF	24
Upper CL Dif	0.07420	Prob > t	0.2876
Lower CL Dif	-0.23953	Prob > t	0.8562
Confidence	0.95	Prob < t	0.1438

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.04205296	0.042053	1.1829	0.2876
Error	24	0.85319099	0.035550		
C. Total	25	0.89524395			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.2860	0.04714	10.189	10.383
Isolok - 3 mL - LF	10	10.2033	0.05962	10.080	10.326

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.2860	0.200783	0.05020	10.179	10.393
Isolok - 3 mL - LF	10	10.2033	0.166161	0.05254	10.084	10.322

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.08267	t Ratio	-1.13759
Std Err Dif	0.07267	DF	21.95244
Upper CL Dif	0.06806	Prob > t	0.2676
Lower CL Dif	-0.23339	Prob > t	0.8662
Confidence	0.95	Prob < t	0.1338

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2007825	0.1304936	0.1275412
Isolok - 3 mL - LF	10	0.1661614	0.1322650	0.1171490

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1287	1	24	0.7230
Brown-Forsythe	0.0311	1	24	0.8616
Levene	0.0011	1	24	0.9733
Bartlett	0.3716	1	.	0.5421
F Test 2-sided	1.4601	15	9	0.5755

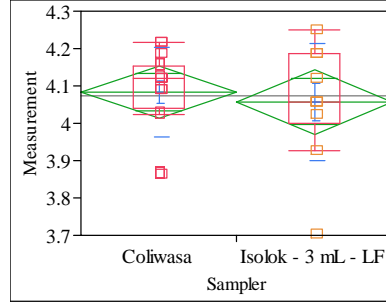
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2941	1	21.952	0.2676

t Test

1.1376

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



Oneway Anova
Summary of Fit

Rsquare	0.009661
Adj Rsquare	-0.0316
Root Mean Square Error	0.134126
Mean of Response	4.073174
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.02616	t Ratio	-0.48387
Std Err Dif	0.05407	DF	24
Upper CL Dif	0.08543	Prob > t	0.6329
Lower CL Dif	-0.13775	Prob > t	0.6836
Confidence	0.95	Prob < t	0.3164

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00421190	0.004212	0.2341	0.6329
Error	24	0.43175224	0.017990		
C. Total	25	0.43596414			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.08324	0.03353	4.0140	4.1524
Isolok - 3 mL - LF	10	4.05707	0.04241	3.9695	4.1446

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.08324	0.119451	0.02986	4.0196	4.1469
Isolok - 3 mL - LF	10	4.05707	0.155536	0.04918	3.9458	4.1683

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.02616	t Ratio	-0.45466
Std Err Dif	0.05754	DF	15.58758
Upper CL Dif	0.09608	Prob > t	0.6556
Lower CL Dif	-0.14841	Prob > t	0.6722
Confidence	0.95	Prob < t	0.3278

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1194513	0.0895535	0.0825099
Isolok - 3 mL - LF	10	0.1555359	0.1030368	0.1030368

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5940	1	24	0.4484
Brown-Forsythe	0.2592	1	24	0.6153
Levene	0.1361	1	24	0.7154
Bartlett	0.7751	1	.	0.3787
F Test 2-sided	1.6954	9	15	0.3517

Welch Anova testing Means Equal, allowing Std Devs Not Equal

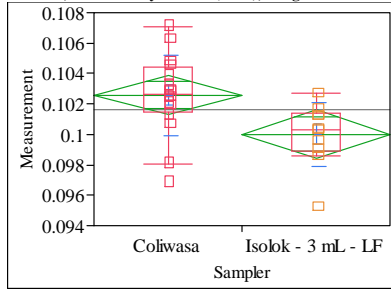
F Ratio	DFNum	DFDen	Prob > F
0.2067	1	15.588	0.6556

t Test

0.4547

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=BaO (wt%), Targeted=0.0919



Oneway Anova
Summary of Fit

Rsquare	0.219512
Adj Rsquare	0.186992
Root Mean Square Error	0.002457
Mean of Response	0.101589
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00257	t Ratio	-2.59807
Std Err Dif	0.00099	DF	24
Upper CL Dif	-0.00053	Prob > t	0.0158
Lower CL Dif	-0.00462	Prob > t	0.9921
Confidence	0.95	Prob < t	0.0079

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004076	0.000041	6.7500	0.0158
Error	24	0.00014492	6.038e-6		
C. Total	25	0.00018567			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.102578	0.00061	0.10131	0.10385
Isolok - 3 mL - LF	10	0.100005	0.00078	0.09840	0.10161

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.102578	0.002651	0.00066	0.10117	0.10399
Isolok - 3 mL - LF	10	0.100005	0.002095	0.00066	0.09851	0.10150

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00257	t Ratio	-2.74614
Std Err Dif	0.00094	DF	22.50093
Upper CL Dif	-0.00063	Prob > t	0.0116
Lower CL Dif	-0.00451	Prob > t	0.9942
Confidence	0.95	Prob < t	0.0058

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0026508	0.0018701	0.0018701
Isolok - 3 mL - LF	10	0.0020954	0.0015140	0.0014626

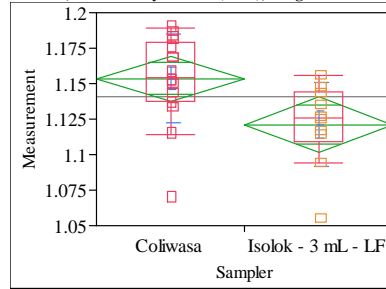
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4198	1	24	0.5232
Brown-Forsythe	0.3573	1	24	0.5556
Levene	0.2837	1	24	0.5992
Bartlett	0.5675	1	.	0.4513
F Test 2-sided	1.6003	15	9	0.4815

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.5413	1	22.501	0.0116

t Test
2.7461

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=CaO (wt%), Targeted=1.1462



Oneway Anova
Summary of Fit

Rsquare	0.225318
Adj Rsquare	0.193039
Root Mean Square Error	0.030479
Mean of Response	1.141155
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03246	t Ratio	-2.64205
Std Err Dif	0.01229	DF	24
Upper CL Dif	-0.00710	Prob > t	0.0143
Lower CL Dif	-0.05782	Prob > t	0.9929
Confidence	0.95	Prob < t	0.0071

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00648459	0.006485	6.9804	0.0143
Error	24	0.02229517	0.000929		
C. Total	25	0.02877976			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.15364	0.00762	1.1379	1.1694
Isolok - 3 mL - LF	10	1.12118	0.00964	1.1013	1.1411

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.15364	0.031116	0.00778	1.1371	1.1702
Isolok - 3 mL - LF	10	1.12118	0.029387	0.00929	1.1002	1.1422

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03246	t Ratio	-2.67854
Std Err Dif	0.01212	DF	20.10761
Upper CL Dif	-0.00719	Prob > t	0.0144
Lower CL Dif	-0.05773	Prob > t	0.9928
Confidence	0.95	Prob < t	0.0072

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0311156	0.0225621	0.0225621
Isolok - 3 mL - LF	10	0.0293873	0.0210440	0.0202884

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0208	1	24	0.8865
Brown-Forsythe	0.0745	1	24	0.7872
Levene	0.0350	1	24	0.8531
Bartlett	0.0348	1	.	0.8520
F Test 2-sided	1.1211	15	9	0.8915

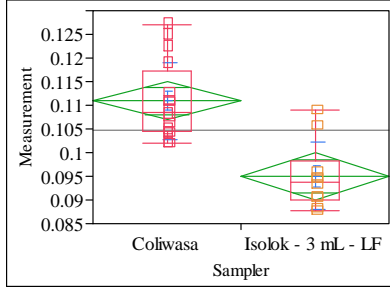
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.1746	1	20.108	0.0144

t Test
2.6785

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



Oneway Anova
Summary of Fit

Rsquare	0.519586
Adj Rsquare	0.499569
Root Mean Square Error	0.007736
Mean of Response	0.104825
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.01589	t Ratio	-5.09479
Std Err Dif	0.00312	DF	24
Upper CL Dif	-0.00945	Prob > t	<.0001
Lower CL Dif	-0.02232	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00155333	0.001553	25.9569	<.0001
Error	24	0.00143622	0.000060		
C. Total	25	0.00298955			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.110935	0.00193	0.10694	0.11493
Isolok - 3 mL - LF	10	0.095048	0.00245	0.09000	0.10010

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.110935	0.008088	0.00202	0.10663	0.11525
Isolok - 3 mL - LF	10	0.095048	0.007110	0.00225	0.08996	0.10013

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.01589	t Ratio	-5.25395
Std Err Dif	0.00302	DF	21.14456
Upper CL Dif	-0.00960	Prob > t	<.0001
Lower CL Dif	-0.02217	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0080878	0.0063580	0.0061022
Isolok - 3 mL - LF	10	0.0071105	0.0051185	0.0049548

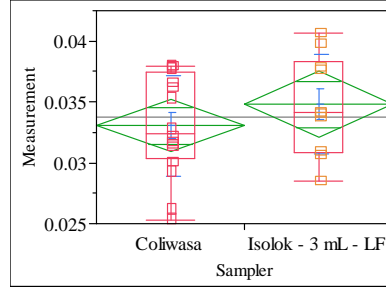
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2127	1	24	0.6488
Brown-Forsythe	0.2789	1	24	0.6023
Levene	0.4302	1	24	0.5182
Bartlett	0.1743	1	.	0.6763
F Test 2-sided	1.2938	15	9	0.7132

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
27.6040	1	21.145	<.0001

t Test
5.2540

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=CuO (wt%), Targeted=0.0504



Oneway Anova
Summary of Fit

Rsquare	0.044519
Adj Rsquare	0.004707
Root Mean Square Error	0.004122
Mean of Response	0.033731
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00176	t Ratio	1.057466
Std Err Dif	0.00166	DF	24
Upper CL Dif	0.00519	Prob > t	0.3008
Lower CL Dif	-0.00167	Prob > t	0.1504
Confidence	0.95	Prob < t	0.8496

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001900	0.000019	1.1182	0.3008
Error	24	0.00040783	0.000017		
C. Total	25	0.00042683			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.033055	0.00103	0.03093	0.03518
Isolok - 3 mL - LF	10	0.034813	0.00130	0.03212	0.03750

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.033055	0.004144	0.00104	0.03085	0.03526
Isolok - 3 mL - LF	10	0.034813	0.004086	0.00129	0.03189	0.03774

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00176	t Ratio	1.061043
Std Err Dif	0.00166	DF	19.46389
Upper CL Dif	0.00522	Prob > t	0.3017
Lower CL Dif	-0.00170	Prob > t	0.1508
Confidence	0.95	Prob < t	0.8492

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0041438	0.0034513	0.0034033
Isolok - 3 mL - LF	10	0.0040860	0.0033448	0.0032171

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0042	1	24	0.9489
Brown-Forsythe	0.0393	1	24	0.8446
Levene	0.0159	1	24	0.9008
Bartlett	0.0021	1	.	0.9633
F Test 2-sided	1.0285	15	9	1.0000

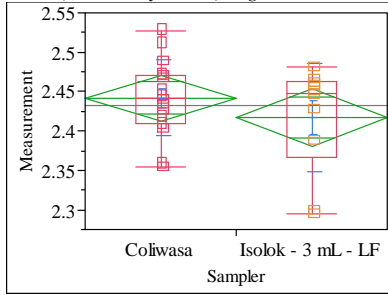
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.1258	1	19.464	0.3017

t Test
1.0610

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Fe/Li, Targeted=2.452



Oneway Anova
Summary of Fit

Rsquare	0.046753
Adj Rsquare	0.007034
Root Mean Square Error	0.05655
Mean of Response	2.432391
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.02473	t Ratio	-1.08494
Std Err Dif	0.02280	DF	24
Upper CL Dif	0.02232	Prob > t	0.2887
Lower CL Dif	-0.07178	Prob > t	0.8556
Confidence	0.95	Prob < t	0.1444

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00376422	0.003764	1.1771	0.2887
Error	24	0.07674929	0.003198		
C. Total	25	0.08051351			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.44190	0.01414	2.4127	2.4711
Isolok - 3 mL - LF	10	2.41717	0.01788	2.3803	2.4541

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.44190	0.048239	0.01206	2.4162	2.4676
Isolok - 3 mL - LF	10	2.41717	0.068187	0.02156	2.3684	2.4659

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.02473	t Ratio	-1.00107
Std Err Dif	0.02471	DF	14.651
Upper CL Dif	0.02804	Prob > t	0.3330
Lower CL Dif	-0.07750	Prob > t	0.8335
Confidence	0.95	Prob < t	0.1665

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0482388	0.0369253	0.0369253
Isolok - 3 mL - LF	10	0.0681865	0.0538974	0.0461345

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5155	1	24	0.2302
Brown-Forsythe	0.2911	1	24	0.5945
Levene	1.6436	1	24	0.2121
Bartlett	1.3398	1	.	0.2471
F Test 2-sided	1.9980	9	15	0.2268

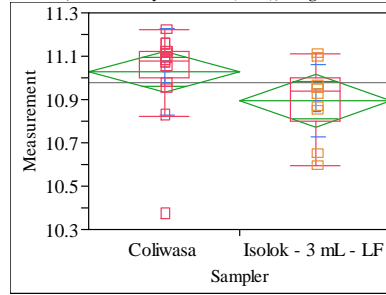
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0021	1	14.651	0.3330

t Test

1.0011

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



Oneway Anova
Summary of Fit

Rsquare	0.112014
Adj Rsquare	0.075015
Root Mean Square Error	0.187783
Mean of Response	10.9768
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.13171	t Ratio	-1.73996
Std Err Dif	0.07570	DF	24
Upper CL Dif	0.02452	Prob > t	0.0947
Lower CL Dif	-0.28794	Prob > t	0.9527
Confidence	0.95	Prob < t	0.0473

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.10675580	0.106756	3.0275	0.0947
Error	24	0.84630241	0.035263		
C. Total	25	0.95305821			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.0275	0.04695	10.931	11.124
Isolok - 3 mL - LF	10	10.8957	0.05938	10.773	11.018

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.0275	0.199320	0.04983	10.921	11.134
Isolok - 3 mL - LF	10	10.8957	0.166792	0.05274	10.776	11.015

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.13171	t Ratio	-1.8152
Std Err Dif	0.07256	DF	21.81057
Upper CL Dif	0.01885	Prob > t	0.0833
Lower CL Dif	-0.28227	Prob > t	0.9584
Confidence	0.95	Prob < t	0.0416

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1993201	0.1237584	0.1045468
Isolok - 3 mL - LF	10	0.1667915	0.1240980	0.1186651

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0930	1	24	0.7630
Brown-Forsythe	0.0497	1	24	0.8255
Levene	0.0000	1	24	0.9951
Bartlett	0.3301	1	.	0.5656
F Test 2-sided	1.4281	15	9	0.5997

Welch Anova testing Means Equal, allowing Std Devs Not Equal

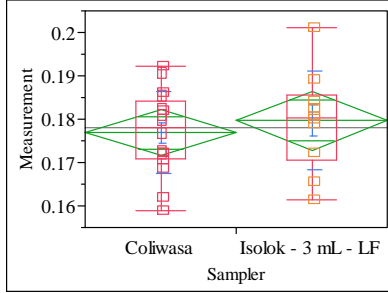
F Ratio	DFNum	DFDen	Prob > F
3.2949	1	21.811	0.0833

t Test

1.8152

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Oneway Anova
Summary of Fit

Rsquare	0.017703
Adj Rsquare	-0.02323
Root Mean Square Error	0.010252
Mean of Response	0.177933
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00272	t Ratio	0.657671
Std Err Dif	0.00413	DF	24
Upper CL Dif	0.01125	Prob > t	0.5170
Lower CL Dif	-0.00581	Prob > t	0.2585
Confidence	0.95	Prob < t	0.7415

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004546	0.000045	0.4325	0.5170
Error	24	0.00252232	0.000105		
C. Total	25	0.00256778			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.00256	0.17160	0.18218
Isolok - 3 mL - LF	10	0.179606	0.00324	0.17291	0.18630

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.009502	0.00238	0.17182	0.18195
Isolok - 3 mL - LF	10	0.179606	0.011392	0.00360	0.17146	0.18776

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00272	t Ratio	0.629846
Std Err Dif	0.00432	DF	16.64109
Upper CL Dif	0.01184	Prob > t	0.5373
Lower CL Dif	-0.00640	Prob > t	0.2687
Confidence	0.95	Prob < t	0.7313

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0095021	0.0077923	0.0077923
Isolok - 3 mL - LF	10	0.0113918	0.0080467	0.0079504

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.4524	1	24	0.5076
Brown-Forsythe	0.0039	1	24	0.9507
Levene	0.0106	1	24	0.9189
Bartlett	0.3630	1	.	0.5468
F Test 2-sided	1.4373	9	15	0.5136

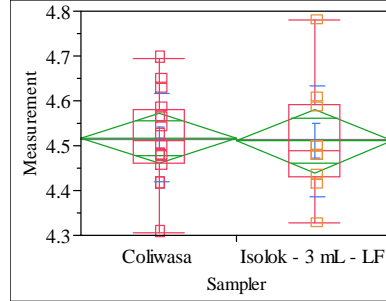
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3967	1	16.641	0.5373

t Test

0.6298

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Oneway Anova
Summary of Fit

Rsquare	0.00098
Adj Rsquare	-0.04065
Root Mean Square Error	0.108799
Mean of Response	4.514466
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00673	t Ratio	-0.1534
Std Err Dif	0.04386	DF	24
Upper CL Dif	0.08379	Prob > t	0.8794
Lower CL Dif	-0.09725	Prob > t	0.5603
Confidence	0.95	Prob < t	0.4397

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00027854	0.000279	0.0235	0.8794
Error	24	0.28409521	0.011837		
C. Total	25	0.28437375			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.51705	0.02720	4.4609	4.5732
Isolok - 3 mL - LF	10	4.51033	0.03441	4.4393	4.5813

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.51705	0.098570	0.02464	4.4645	4.5696
Isolok - 3 mL - LF	10	4.51033	0.123987	0.03921	4.4216	4.5990

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00673	t Ratio	-0.14528
Std Err Dif	0.04631	DF	16.01533
Upper CL Dif	0.09144	Prob > t	0.8863
Lower CL Dif	-0.10489	Prob > t	0.5568
Confidence	0.95	Prob < t	0.4432

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0985701	0.0766971	0.0766971
Isolok - 3 mL - LF	10	0.1239866	0.0882689	0.0839631

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5000	1	24	0.4863
Brown-Forsythe	0.0625	1	24	0.8048
Levene	0.1765	1	24	0.6782
Bartlett	0.5836	1	.	0.4449
F Test 2-sided	1.5822	9	15	0.4152

Welch Anova testing Means Equal, allowing Std Devs Not Equal

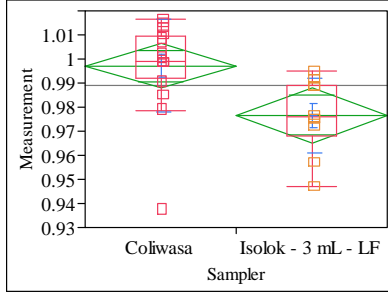
F Ratio	DFNum	DFDen	Prob > F
0.0211	1	16.015	0.8863

t Test

0.1453

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=MgO (wt%), Targeted=1.014



Oneway Anova
Summary of Fit

Rsquare	0.253613
Adj Rsquare	0.222514
Root Mean Square Error	0.017881
Mean of Response	0.98924
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.02058	t Ratio	-2.85568
Std Err Dif	0.00721	DF	24
Upper CL Dif	-0.00571	Prob > t	0.0087
Lower CL Dif	-0.03546	Prob > t	0.9956
Confidence	0.95	Prob < t	0.0044

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00260730	0.002607	8.1549	0.0087
Error	24	0.00767331	0.000320		
C. Total	25	0.01028062			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.997157	0.00447	0.98793	1.0064
Isolok - 3 mL - LF	10	0.976573	0.00565	0.96490	0.9882

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.997157	0.019203	0.00480	0.98692	1.0074
Isolok - 3 mL - LF	10	0.976573	0.015427	0.00488	0.96554	0.9876

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.02058	t Ratio	-3.00734
Std Err Dif	0.00684	DF	22.31515
Upper CL Dif	-0.00640	Prob > t	0.0064
Lower CL Dif	-0.03477	Prob > t	0.9968
Confidence	0.95	Prob < t	0.0032

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0192031	0.0122818	0.0117117
Isolok - 3 mL - LF	10	0.0154270	0.0114423	0.0114423

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1654	1	24	0.6878
Brown-Forsythe	0.0025	1	24	0.9603
Levene	0.0263	1	24	0.8724
Bartlett	0.4941	1	.	0.4821
F Test 2-sided	1.5494	15	9	0.5135

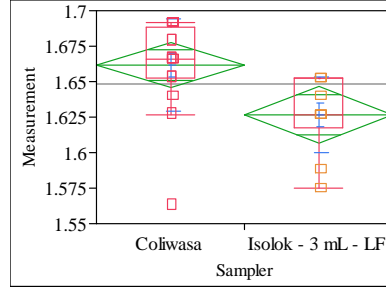
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.0441	1	22.315	0.0064

t Test

3.0073

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=MnO (wt%), Targeted=1.779



Oneway Anova
Summary of Fit

Rsquare	0.249865
Adj Rsquare	0.218609
Root Mean Square Error	0.030446
Mean of Response	1.648266
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03470	t Ratio	-2.82741
Std Err Dif	0.01227	DF	24
Upper CL Dif	-0.00937	Prob > t	0.0093
Lower CL Dif	-0.06003	Prob > t	0.9953
Confidence	0.95	Prob < t	0.0047

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00741021	0.007410	7.9942	0.0093
Error	24	0.02224667	0.000927		
C. Total	25	0.02965688			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.66161	0.00761	1.6459	1.6773
Isolok - 3 mL - LF	10	1.62691	0.00963	1.6070	1.6468

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.66161	0.032569	0.00814	1.6443	1.6790
Isolok - 3 mL - LF	10	1.62691	0.026532	0.00839	1.6079	1.6459

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03470	t Ratio	-2.96807
Std Err Dif	0.01169	DF	22.1483
Upper CL Dif	-0.01046	Prob > t	0.0071
Lower CL Dif	-0.05894	Prob > t	0.9965
Confidence	0.95	Prob < t	0.0035

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0325692	0.0216881	0.0201750
Isolok - 3 mL - LF	10	0.0265316	0.0180768	0.0180768

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1640	1	24	0.6891
Brown-Forsythe	0.0511	1	24	0.8231
Levene	0.1682	1	24	0.6854
Bartlett	0.4346	1	.	0.5097
F Test 2-sided	1.5069	15	9	0.5421

Welch Anova testing Means Equal, allowing Std Devs Not Equal

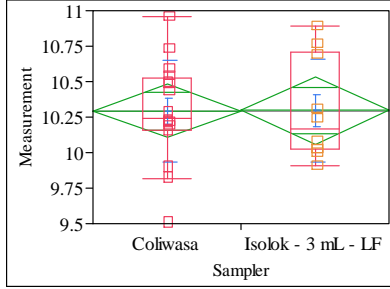
F Ratio	DFNum	DFDen	Prob > F
8.8094	1	22.148	0.0071

t Test

2.9681

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Oneway Anova
Summary of Fit

Rsquare	0.000011
Adj Rsquare	-0.04166
Root Mean Square Error	0.359916
Mean of Response	10.29457
Observations (or Sum Wgts)	26

t Test

Iselok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00236	t Ratio	0.016259
Std Err Dif	0.14509	DF	24
Upper CL Dif	0.30180	Prob > t	0.9872
Lower CL Dif	-0.29709	Prob > t	0.4936
Confidence	0.95	Prob < t	0.5064

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0000342	0.000034	0.0003	0.9872
Error	24	3.1089468	0.129539		
C. Total	25	3.1089811			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.2937	0.08998	10.108	10.479
Iselok - 3 mL - LF	10	10.2960	0.11382	10.061	10.531

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.2937	0.360192	0.09005	10.102	10.486
Iselok - 3 mL - LF	10	10.2960	0.359455	0.11367	10.039	10.553

t Test

Iselok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00236	t Ratio	0.016267
Std Err Dif	0.14502	DF	19.28386
Upper CL Dif	0.30558	Prob > t	0.9872
Lower CL Dif	-0.30086	Prob > t	0.4936
Confidence	0.95	Prob < t	0.5064

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3601919	0.2723381	0.2696000
Iselok - 3 mL - LF	10	0.3594554	0.2960208	0.2857760

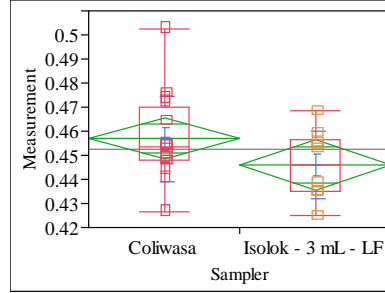
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0001	1	24	0.9941
Brown-Forsythe	0.0288	1	24	0.8667
Levene	0.0792	1	24	0.7808
Bartlett	0.0000	1	.	0.9946
F Test 2-sided	1.0041	15	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0003	1	19.284	0.9872

t Test
0.0163

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=NiO (wt%), Targeted=0.41



Oneway Anova
Summary of Fit

Rsquare	0.102294
Adj Rsquare	0.064889
Root Mean Square Error	0.016344
Mean of Response	0.452716
Observations (or Sum Wgts)	26

t Test

Iselok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.01090	t Ratio	-1.65372
Std Err Dif	0.00659	DF	24
Upper CL Dif	0.00270	Prob > t	0.1112
Lower CL Dif	-0.02449	Prob > t	0.9444
Confidence	0.95	Prob < t	0.0556

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00073057	0.000731	2.7348	0.1112
Error	24	0.00641134	0.000267		
C. Total	25	0.00714192			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.456907	0.00409	0.44847	0.46534
Iselok - 3 mL - LF	10	0.446011	0.00517	0.43534	0.45668

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.456907	0.017678	0.00442	0.44749	0.46633
Iselok - 3 mL - LF	10	0.446011	0.013839	0.00438	0.43611	0.45591

t Test

Iselok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.01090	t Ratio	-1.75183
Std Err Dif	0.00622	DF	22.60877
Upper CL Dif	0.00198	Prob > t	0.0934
Lower CL Dif	-0.02377	Prob > t	0.9533
Confidence	0.95	Prob < t	0.0467

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0176779	0.0129934	0.0120092
Iselok - 3 mL - LF	10	0.0138391	0.0120888	0.0120888

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3912	1	24	0.5376
Brown-Forsythe	0.0003	1	24	0.9856
Levene	0.0538	1	24	0.8186
Bartlett	0.6141	1	.	0.4333
F Test 2-sided	1.6317	15	9	0.4628

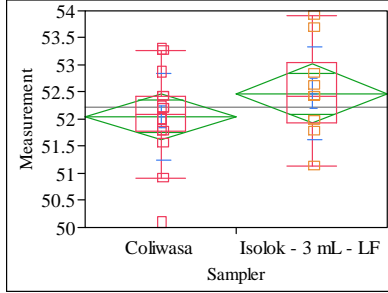
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.0689	1	22.609	0.0934

t Test
1.7518

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Oneway Anova
Summary of Fit

Rsquare	0.064677
Adj Rsquare	0.025705
Root Mean Square Error	0.818751
Mean of Response	52.21538
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.4252	t Ratio	1.28825
Std Err Dif	0.3300	DF	24
Upper CL Dif	1.1064	Prob > t	0.2099
Lower CL Dif	-0.2560	Prob > t	0.1050
Confidence	0.95	Prob < t	0.8950

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.112511	1.11251	1.6596	0.2099
Error	24	16.088481	0.67035		
C. Total	25	17.200992			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	52.0518	0.20469	51.629	52.474
Isolok - 3 mL - LF	10	52.4770	0.25891	51.943	53.011

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	52.0518	0.799380	0.19985	51.626	52.478
Isolok - 3 mL - LF	10	52.4770	0.850056	0.26881	51.869	53.085

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.4252	t Ratio	1.269367
Std Err Dif	0.3350	DF	18.33701
Upper CL Dif	1.1280	Prob > t	0.2202
Lower CL Dif	-0.2776	Prob > t	0.1101
Confidence	0.95	Prob < t	0.8899

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.7993800	0.5481956	0.5481956
Isolok - 3 mL - LF	10	0.8500559	0.6332328	0.6203970

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0363	1	24	0.8505
Brown-Forsythe	0.1027	1	24	0.7514
Levene	0.1469	1	24	0.7049
Bartlett	0.0411	1	.	0.8394
F Test 2-sided	1.1308	9	15	0.8002

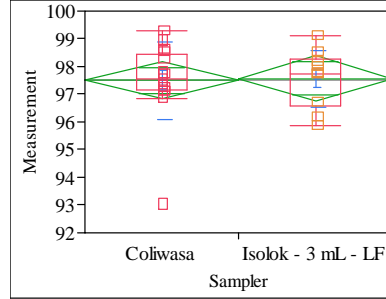
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6113	1	18.337	0.2202

t Test

1.2694

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Oneway Anova
Summary of Fit

Rsquare	0.000675
Adj Rsquare	-0.04096
Root Mean Square Error	1.273204
Mean of Response	97.532
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.0654	t Ratio	0.127343
Std Err Dif	0.5132	DF	24
Upper CL Dif	1.1246	Prob > t	0.8997
Lower CL Dif	-0.9939	Prob > t	0.4499
Confidence	0.95	Prob < t	0.5501

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.026287	0.02629	0.0162	0.8997
Error	24	38.905187	1.62105		
C. Total	25	38.931475			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	97.5069	0.31830	96.850	98.164
Isolok - 3 mL - LF	10	97.5722	0.40262	96.741	98.403

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	97.5069	1.40028	0.35007	96.761	98.253
Isolok - 3 mL - LF	10	97.5722	1.02705	0.32478	96.838	98.307

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.0654	t Ratio	0.136868
Std Err Dif	0.4775	DF	23.2394
Upper CL Dif	1.0526	Prob > t	0.8923
Lower CL Dif	-0.9219	Prob > t	0.4462
Confidence	0.95	Prob < t	0.5538

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.400277	0.8320699	0.8320699
Isolok - 3 mL - LF	10	1.027054	0.7934778	0.7376368

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2537	1	24	0.6191
Brown-Forsythe	0.0580	1	24	0.8117
Levene	0.0102	1	24	0.9203
Bartlett	0.9692	1	.	0.3249
F Test 2-sided	1.8588	15	9	0.3496

Welch Anova testing Means Equal, allowing Std Devs Not Equal

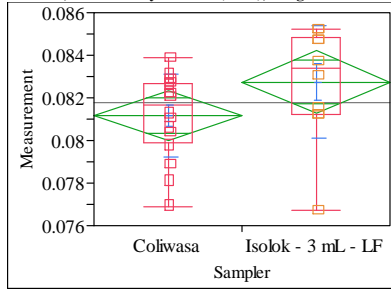
F Ratio	DFNum	DFDen	Prob > F
0.0187	1	23.239	0.8923

t Test

0.1369

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



Oneway Anova
Summary of Fit

Rsquare	0.113854
Adj Rsquare	0.076932
Root Mean Square Error	0.002247
Mean of Response	0.08177
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00159	t Ratio	1.756013
Std Err Dif	0.00091	DF	24
Upper CL Dif	0.00346	Prob > t	0.0918
Lower CL Dif	-0.00028	Prob > t	0.0459
Confidence	0.95	Prob < t	0.9541

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001557	0.000016	3.0836	0.0918
Error	24	0.00012122	5.051e-6		
C. Total	25	0.00013679			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.081159	0.00056	0.08000	0.08232
Isolok - 3 mL - LF	10	0.082749	0.00071	0.08128	0.08422

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.081159	0.001960	0.00049	0.08011	0.08220
Isolok - 3 mL - LF	10	0.082749	0.002658	0.00084	0.08085	0.08465

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00159	t Ratio	1.635166
Std Err Dif	0.00097	DF	15.11303
Upper CL Dif	0.00366	Prob > t	0.1227
Lower CL Dif	-0.00048	Prob > t	0.0613
Confidence	0.95	Prob < t	0.9387

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0019604	0.0015624	0.0015533
Isolok - 3 mL - LF	10	0.0026577	0.0020483	0.0019849

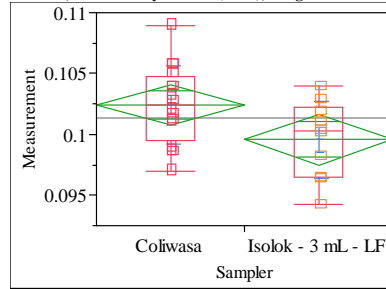
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8280	1	24	0.3719
Brown-Forsythe	0.5364	1	24	0.4710
Levene	0.8672	1	24	0.3610
Bartlett	1.0334	1	.	0.3094
F Test 2-sided	1.8380	9	15	0.2857

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.6738	1	15.113	0.1227

t Test
1.6352

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



Oneway Anova
Summary of Fit

Rsquare	0.169921
Adj Rsquare	0.135334
Root Mean Square Error	0.003175
Mean of Response	0.101317
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00284	t Ratio	-2.21651
Std Err Dif	0.00128	DF	24
Upper CL Dif	-0.00020	Prob > t	0.0364
Lower CL Dif	-0.00548	Prob > t	0.9818
Confidence	0.95	Prob < t	0.0182

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004952	0.000050	4.9129	0.0364
Error	24	0.00024189	0.000010		
C. Total	25	0.00029140			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.102408	0.00079	0.10077	0.10405
Isolok - 3 mL - LF	10	0.099572	0.00100	0.09750	0.10164

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.102408	0.003185	0.00080	0.10071	0.10411
Isolok - 3 mL - LF	10	0.099572	0.003158	0.00100	0.09731	0.10183

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00284	t Ratio	-2.22111
Std Err Dif	0.00128	DF	19.38254
Upper CL Dif	-0.00017	Prob > t	0.0384
Lower CL Dif	-0.00551	Prob > t	0.9808
Confidence	0.95	Prob < t	0.0192

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0031849	0.0025129	0.0025129
Isolok - 3 mL - LF	10	0.0031576	0.0026041	0.0024772

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0012	1	24	0.9724
Brown-Forsythe	0.0022	1	24	0.9626
Levene	0.0168	1	24	0.8979
Bartlett	0.0008	1	.	0.9774
F Test 2-sided	1.0174	15	9	1.0000

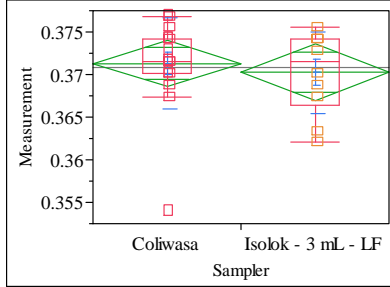
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.9333	1	19.383	0.0384

t Test
2.2211

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Oneway Anova
Summary of Fit

Rsquare	0.010431
Adj Rsquare	-0.0308
Root Mean Square Error	0.005163
Mean of Response	0.370899
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00105	t Ratio	-0.50297
Std Err Dif	0.00208	DF	24
Upper CL Dif	0.00325	Prob > t	0.6196
Lower CL Dif	-0.00534	Prob > t	0.6902
Confidence	0.95	Prob < t	0.3098

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000674	6.744e-6	0.2530	0.6196
Error	24	0.00063982	0.000027		
C. Total	25	0.00064656			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.371301	0.00129	0.36864	0.37397
Isolok - 3 mL - LF	10	0.370254	0.00163	0.36688	0.37362

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.371301	0.005378	0.00134	0.36844	0.37417
Isolok - 3 mL - LF	10	0.370254	0.004784	0.00151	0.36683	0.37368

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00105	t Ratio	-0.51723
Std Err Dif	0.00202	DF	20.97777
Upper CL Dif	0.00316	Prob > t	0.6104
Lower CL Dif	-0.00526	Prob > t	0.6948
Confidence	0.95	Prob < t	0.3052

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0053778	0.0032715	0.0032082
Isolok - 3 mL - LF	10	0.0047843	0.0039173	0.0039173

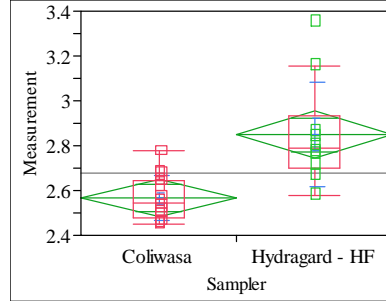
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0505	1	24	0.8242
Brown-Forsythe	0.2205	1	24	0.6429
Levene	0.1955	1	24	0.6623
Bartlett	0.1441	1	.	0.7043
F Test 2-sided	1.2635	15	9	0.7417

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2675	1	20.978	0.6104

t Test
0.5172

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Al/B, Targeted=2.552



Oneway Anova
Summary of Fit

Rsquare	0.439689
Adj Rsquare	0.416342
Root Mean Square Error	0.162214
Mean of Response	2.675217
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.283778	t Ratio	4.339738
Std Err Dif	0.065391	DF	24
Upper CL Dif	0.418738	Prob > t	0.0002
Lower CL Dif	0.148819	Prob > t	0.0001
Confidence	0.95	Prob < t	0.9999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.4955703	0.495570	18.8333	0.0002
Error	24	0.6315236	0.026313		
C. Total	25	1.1270939			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.56607	0.04055	2.4824	2.6498
Hydragard - HF	10	2.84985	0.05130	2.7440	2.9557

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.56607	0.098929	0.02473	2.5134	2.6188
Hydragard - HF	10	2.84985	0.232073	0.07339	2.6838	3.0159

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.283778	t Ratio	3.664341
Std Err Dif	0.077443	DF	11.07472
Upper CL Dif	0.454090	Prob > t	0.0037
Lower CL Dif	0.113467	Prob > t	0.0018
Confidence	0.95	Prob < t	0.9982

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0989291	0.0824976	0.0801678
Hydragard - HF	10	0.2320725	0.1631311	0.1513743

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.7019	1	24	0.0663
Brown-Forsythe	2.1545	1	24	0.1551
Levene	3.7435	1	24	0.0649
Bartlett	8.0250	1	.	0.0046
F Test 2-sided	5.5030	9	15	0.0039

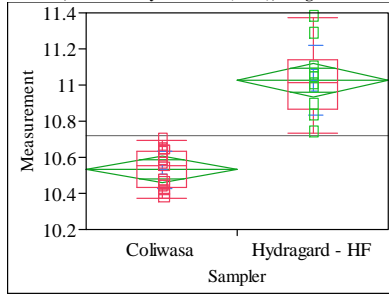
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
13.4274	1	11.075	0.0037

t Test
3.6643

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.749436
Adj Rsquare	0.738995
Root Mean Square Error	0.144532
Mean of Response	10.72146
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.493632	t Ratio	8.472528
Std Err Dif	0.058263	DF	24
Upper CL Dif	0.613880	Prob > t	<.0001
Lower CL Dif	0.373384	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.4995226	1.49952	71.7837	<.0001
Error	24	0.5013468	0.02089		
C. Total	25	2.0008694			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.5316	0.03613	10.457	10.606
Hydragard - HF	10	11.0252	0.04570	10.931	11.120

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.5316	0.103463	0.02587	10.476	10.587
Hydragard - HF	10	11.0252	0.194587	0.06153	10.886	11.164

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.493632	t Ratio	7.395328
Std Err Dif	0.066749	DF	12.23237
Upper CL Dif	0.638760	Prob > t	<.0001
Lower CL Dif	0.348504	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1034634	0.0912274	0.0897512
Hydragard - HF	10	0.1945869	0.1417125	0.1417125

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.4083	1	24	0.0465
Brown-Forsythe	2.2183	1	24	0.1494
Levene	2.2492	1	24	0.1467
Bartlett	4.4727	1	.	0.0344
F Test 2-sided	3.5372	9	15	0.0302

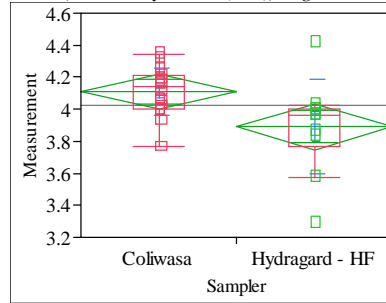
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
54.6909	1	12.232	<.0001

t Test

7.3953

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.208624
Adj Rsquare	0.17565
Root Mean Square Error	0.216731
Mean of Response	4.024875
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.21976	t Ratio	-2.51534
Std Err Dif	0.08737	DF	24
Upper CL Dif	-0.03944	Prob > t	0.0190
Lower CL Dif	-0.40008	Prob > t	0.9905
Confidence	0.95	Prob < t	0.0095

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.2971917	0.297192	6.3269	0.0190
Error	24	1.1273379	0.046972		
C. Total	25	1.4245297			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.10940	0.05418	3.9976	4.2212
Hydragard - HF	10	3.88964	0.06854	3.7482	4.0311

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.10940	0.149590	0.03740	4.0297	4.1891
Hydragard - HF	10	3.88964	0.296588	0.09379	3.6775	4.1018

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.21976	t Ratio	-2.17646
Std Err Dif	0.10097	DF	11.90874
Upper CL Dif	0.00042	Prob > t	0.0504
Lower CL Dif	-0.43994	Prob > t	0.9748
Confidence	0.95	Prob < t	0.0252

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1495897	0.1182307	0.1167214
Hydragard - HF	10	0.2965884	0.2009218	0.1867542

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7102	1	24	0.1127
Brown-Forsythe	1.1618	1	24	0.2918
Levene	2.0198	1	24	0.1681
Bartlett	5.2388	1	.	0.0221
F Test 2-sided	3.9310	9	15	0.0192

Welch Anova testing Means Equal, allowing Std Devs Not Equal

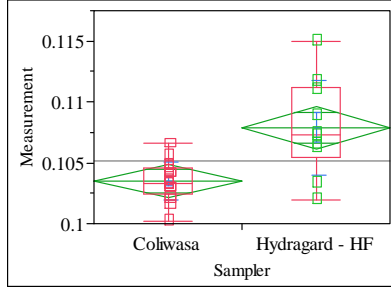
F Ratio	DFNum	DFDen	Prob > F
4.7370	1	11.909	0.0504

t Test

2.1765

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=BaO (wt%), Targeted=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.404738
Adj Rsquare	0.379936
Root Mean Square Error	0.002697
Mean of Response	0.105196
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.004392	t Ratio	4.039605
Std Err Dif	0.001087	DF	24
Upper CL Dif	0.006636	Prob > t	0.0005
Lower CL Dif	0.002148	Prob > t	0.0002
Confidence	0.95	Prob < t	0.9998

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00011871	0.000119	16.3184	0.0005
Error	24	0.00017459	7.274e-6		
C. Total	25	0.00029329			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103507	0.00067	0.10211	0.10490
Hydragard - HF	10	0.107899	0.00085	0.10614	0.10966

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103507	0.001573	0.00039	0.10267	0.10434
Hydragard - HF	10	0.107899	0.003908	0.00124	0.10510	0.11069

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.004392	t Ratio	3.386539
Std Err Dif	0.001297	DF	10.84917
Upper CL Dif	0.007251	Prob > t	0.0062
Lower CL Dif	0.001533	Prob > t	0.0031
Confidence	0.95	Prob < t	0.9969

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0015734	0.0011941	0.0011933
Hydragard - HF	10	0.0039080	0.0029788	0.0028806

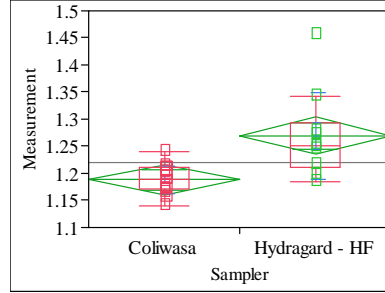
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.1335	1	24	0.0207
Brown-Forsythe	5.7640	1	24	0.0245
Levene	7.4625	1	24	0.0116
Bartlett	9.0809	1	.	0.0026
F Test 2-sided	6.1691	9	15	0.0022

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
11.4686	1	10.849	0.0062

t Test
3.3865

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=CaO (wt%), Targeted=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.377076
Adj Rsquare	0.351121
Root Mean Square Error	0.052761
Mean of Response	1.219188
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.081066	t Ratio	3.81156
Std Err Dif	0.021268	DF	24
Upper CL Dif	0.124962	Prob > t	0.0008
Lower CL Dif	0.037170	Prob > t	0.0004
Confidence	0.95	Prob < t	0.9996

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.04044136	0.040441	14.5280	0.0008
Error	24	0.06680846	0.002784		
C. Total	25	0.10724982			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.18801	0.01319	1.1608	1.2152
Hydragard - HF	10	1.26907	0.01668	1.2346	1.3035

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.18801	0.025838	0.00646	1.1742	1.2018
Hydragard - HF	10	1.26907	0.079439	0.02512	1.2122	1.3259

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.081066	t Ratio	3.125391
Std Err Dif	0.025938	DF	10.20272
Upper CL Dif	0.138704	Prob > t	0.0105
Lower CL Dif	0.023428	Prob > t	0.0053
Confidence	0.95	Prob < t	0.9947

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0258377	0.0207366	0.0207257
Hydragard - HF	10	0.0794388	0.0542890	0.0509309

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.3618	1	24	0.0792
Brown-Forsythe	3.6121	1	24	0.0694
Levene	5.4593	1	24	0.0281
Bartlett	13.4421	1	.	0.0002
F Test 2-sided	9.4527	9	15	0.0002

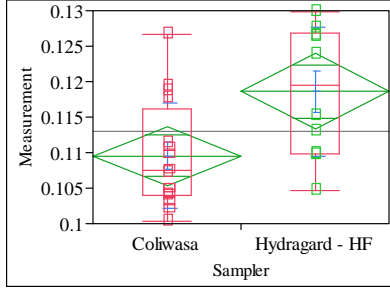
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.7681	1	10.203	0.0105

t Test
3.1254

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



Oneway Anova
Summary of Fit

Rsquare	0.242137
Adj Rsquare	0.21056
Root Mean Square Error	0.008123
Mean of Response	0.113044
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.009067	t Ratio	2.769116
Std Err Dif	0.003274	DF	24
Upper CL Dif	0.015826	Prob > t	0.0107
Lower CL Dif	0.002309	Prob > t	0.0053
Confidence	0.95	Prob < t	0.9947

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00050596	0.000506	7.6680	0.0107
Error	24	0.00158358	0.000066		
C. Total	25	0.00208954			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.109556	0.00203	0.10536	0.11375
Hydragard - HF	10	0.118623	0.00257	0.11332	0.12393

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.109556	0.007467	0.00187	0.10558	0.11354
Hydragard - HF	10	0.118623	0.009112	0.00288	0.11211	0.12514

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.009067	t Ratio	2.641066
Std Err Dif	0.003433	DF	16.40707
Upper CL Dif	0.016331	Prob > t	0.0175
Lower CL Dif	0.001804	Prob > t	0.0088
Confidence	0.95	Prob < t	0.9912

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0074672	0.0059389	0.0057094
Hydragard - HF	10	0.0091116	0.0081557	0.0081557

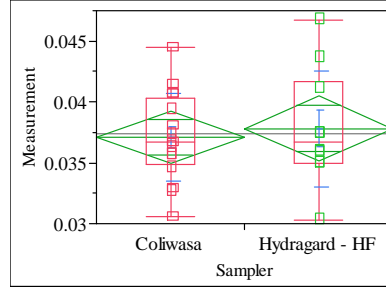
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8385	1	24	0.3689
Brown-Forsythe	1.8538	1	24	0.1860
Levene	2.0497	1	24	0.1651
Bartlett	0.4380	1	.	0.5081
F Test 2-sided	1.4889	9	15	0.4761

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.9752	1	16.407	0.0175

t Test
2.6411

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=CuO (wt%), Targeted=0.0504



Oneway Anova
Summary of Fit

Rsquare	0.007747
Adj Rsquare	-0.0336
Root Mean Square Error	0.00408
Mean of Response	0.037366
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00071	t Ratio	0.432882
Std Err Dif	0.00164	DF	24
Upper CL Dif	0.00411	Prob > t	0.6690
Lower CL Dif	-0.00268	Prob > t	0.3345
Confidence	0.95	Prob < t	0.6655

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000312	3.119e-6	0.1874	0.6690
Error	24	0.00039951	0.000017		
C. Total	25	0.00040263			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.037092	0.00102	0.03499	0.03920
Hydragard - HF	10	0.037804	0.00129	0.03514	0.04047

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.037092	0.003614	0.00090	0.03517	0.03902
Hydragard - HF	10	0.037804	0.004756	0.00150	0.03440	0.04121

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00071	t Ratio	0.405795
Std Err Dif	0.00175	DF	15.46207
Upper CL Dif	0.00444	Prob > t	0.6905
Lower CL Dif	-0.00302	Prob > t	0.3452
Confidence	0.95	Prob < t	0.6548

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0036144	0.0027823	0.0027305
Hydragard - HF	10	0.0047557	0.0035801	0.0034299

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9687	1	24	0.3348
Brown-Forsythe	0.4059	1	24	0.5301
Levene	0.6374	1	24	0.4325
Bartlett	0.8384	1	.	0.3599
F Test 2-sided	1.7312	9	15	0.3338

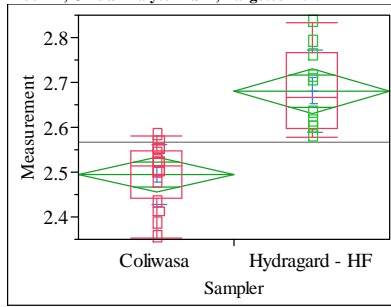
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1647	1	15.462	0.6905

t Test
0.4058

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Fe/Li, Targeted=2.452



**Oneway Anova
Summary of Fit**

Rsquare	0.597488
Adj Rsquare	0.580717
Root Mean Square Error	0.077339
Mean of Response	2.56638
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.186082	t Ratio	5.968717
Std Err Dif	0.031176	DF	24
Upper CL Dif	0.250426	Prob > t	<.0001
Lower CL Dif	0.121737	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.21308548	0.213085	35.6256	<.0001
Error	24	0.14354999	0.005981		
C. Total	25	0.35663547			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.49481	0.01933	2.4549	2.5347
Hydragard - HF	10	2.68089	0.02446	2.6304	2.7314

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.49481	0.067619	0.01690	2.4588	2.5308
Hydragard - HF	10	2.68089	0.091266	0.02886	2.6156	2.7462

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.186082	t Ratio	5.563443
Std Err Dif	0.033447	DF	15.16393
Upper CL Dif	0.257306	Prob > t	<.0001
Lower CL Dif	0.114858	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0676190	0.0527781	0.0507038
Hydragard - HF	10	0.0912659	0.0784223	0.0784223

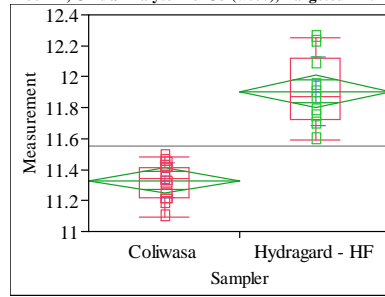
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8636	1	24	0.1849
Brown-Forsythe	2.3525	1	24	0.1382
Levene	2.5914	1	24	0.1205
Bartlett	1.0031	1	.	0.3166
F Test 2-sided	1.8217	9	15	0.2926

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
30.9519	1	15.164	<.0001

t Test
5.5634

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



**Oneway Anova
Summary of Fit**

Rsquare	0.762587
Adj Rsquare	0.752694
Root Mean Square Error	0.162385
Mean of Response	11.55143
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.574739	t Ratio	8.78006
Std Err Dif	0.065460	DF	24
Upper CL Dif	0.709841	Prob > t	<.0001
Lower CL Dif	0.439637	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.0327716	2.03277	77.0895	<.0001
Error	24	0.6328559	0.02637		
C. Total	25	2.6656274			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3304	0.04060	11.247	11.414
Hydragard - HF	10	11.9051	0.05135	11.799	12.011

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3304	0.113058	0.02826	11.270	11.391
Hydragard - HF	10	11.9051	0.221391	0.07001	11.747	12.063

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.574739	t Ratio	7.612432
Std Err Dif	0.075500	DF	11.98194
Upper CL Dif	0.739268	Prob > t	<.0001
Lower CL Dif	0.410211	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1130578	0.0920369	0.0911434
Hydragard - HF	10	0.2213907	0.1749953	0.1729937

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.5726	1	24	0.0170
Brown-Forsythe	4.6272	1	24	0.0417
Levene	5.3191	1	24	0.0300
Bartlett	5.0537	1	.	0.0246
F Test 2-sided	3.8346	9	15	0.0214

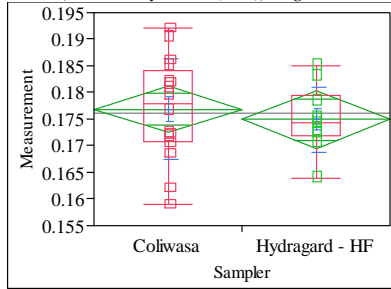
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
57.9491	1	11.982	<.0001

t Test
7.6124

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=K2O (wt%), Targeted=0.1591



**Oneway Anova
Summary of Fit**

Rsquare	0.013262
Adj Rsquare	-0.02785
Root Mean Square Error	0.008385
Mean of Response	0.17615
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00192	t Ratio	-0.56795
Std Err Dif	0.00338	DF	24
Upper CL Dif	0.00506	Prob > t	0.5753
Lower CL Dif	-0.00890	Prob > t	0.7123
Confidence	0.95	Prob < t	0.2877

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002268	0.000023	0.3226	0.5753
Error	24	0.00168756	0.000070		
C. Total	25	0.00171024			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.00210	0.17256	0.18121
Hydragard - HF	10	0.174968	0.00265	0.16950	0.18044

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.009502	0.00238	0.17182	0.18195
Hydragard - HF	10	0.174968	0.006085	0.00192	0.17062	0.17932

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00192	t Ratio	-0.62801
Std Err Dif	0.00306	DF	23.95426
Upper CL Dif	0.00439	Prob > t	0.5359
Lower CL Dif	-0.00823	Prob > t	0.7320
Confidence	0.95	Prob < t	0.2680

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0095021	0.0077923	0.0077923
Hydragard - HF	10	0.0060846	0.0043366	0.0042763

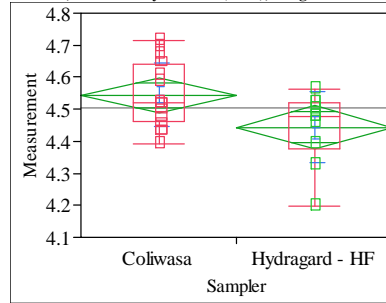
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.0717	1	24	0.1630
Brown-Forsythe	3.2844	1	24	0.0825
Levene	3.3404	1	24	0.0801
Bartlett	1.9347	1	.	0.1642
F Test 2-sided	2.4388	15	9	0.1794

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3944	1	23.954	0.5359

t Test
0.6280

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Li2O (wt%), Targeted=4.674



**Oneway Anova
Summary of Fit**

Rsquare	0.194695
Adj Rsquare	0.161141
Root Mean Square Error	0.103374
Mean of Response	4.505357
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.10038	t Ratio	-2.40881
Std Err Dif	0.04167	DF	24
Upper CL Dif	-0.01437	Prob > t	0.0240
Lower CL Dif	-0.18638	Prob > t	0.9880
Confidence	0.95	Prob < t	0.0120

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.06200576	0.062006	5.8024	0.0240
Error	24	0.25647074	0.010686		
C. Total	25	0.31847650			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.54396	0.02584	4.4906	4.5973
Hydragard - HF	10	4.44359	0.03269	4.3761	4.5111

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.54396	0.099273	0.02482	4.4911	4.5969
Hydragard - HF	10	4.44359	0.109871	0.03474	4.3650	4.5222

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.10038	t Ratio	-2.35092
Std Err Dif	0.04270	DF	17.75419
Upper CL Dif	-0.01059	Prob > t	0.0305
Lower CL Dif	-0.19017	Prob > t	0.9848
Confidence	0.95	Prob < t	0.0152

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0992730	0.0824157	0.0766971
Hydragard - HF	10	0.1098706	0.0826714	0.0731986

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1279	1	24	0.7237
Brown-Forsythe	0.0140	1	24	0.9068
Levene	0.0001	1	24	0.9913
Bartlett	0.1124	1	.	0.7374
F Test 2-sided	1.2249	9	15	0.6996

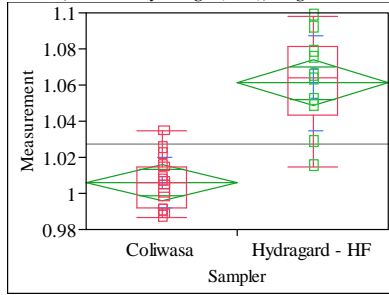
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.5268	1	17.754	0.0305

t Test
2.3509

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=MgO (wt%), Targeted=1.014



**Oneway Anova
Summary of Fit**

Rsquare	0.673134
Adj Rsquare	0.659515
Root Mean Square Error	0.019471
Mean of Response	1.027189
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.055180	t Ratio	7.030263
Std Err Dif	0.007849	DF	24
Upper CL Dif	0.071379	Prob > t	<.0001
Lower CL Dif	0.038981	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01873738	0.018737	49.4246	<.0001
Error	24	0.00909865	0.000379		
C. Total	25	0.02783604			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.00597	0.00487	0.9959	1.0160
Hydragard - HF	10	1.06115	0.00616	1.0484	1.0739

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.00597	0.013859	0.00346	0.9986	1.0134
Hydragard - HF	10	1.06115	0.026283	0.00831	1.0423	1.0799

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.055180	t Ratio	6.127802
Std Err Dif	0.009005	DF	12.17921
Upper CL Dif	0.074768	Prob > t	<.0001
Lower CL Dif	0.035592	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0138595	0.0105717	0.0105717
Hydragard - HF	10	0.0262835	0.0204303	0.0200654

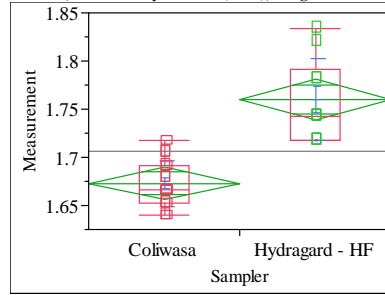
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.9606	1	24	0.0356
Brown-Forsythe	3.9673	1	24	0.0579
Levene	4.5765	1	24	0.0428
Bartlett	4.5897	1	.	0.0322
F Test 2-sided	3.5964	9	15	0.0282

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
37.5500	1	12.179	<.0001

t Test
6.1278

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=MnO (wt%), Targeted=1.779



**Oneway Anova
Summary of Fit**

Rsquare	0.65362
Adj Rsquare	0.639187
Root Mean Square Error	0.032068
Mean of Response	1.70637
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.086995	t Ratio	6.72964
Std Err Dif	0.012927	DF	24
Upper CL Dif	0.113675	Prob > t	<.0001
Lower CL Dif	0.060314	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.04657268	0.046573	45.2881	<.0001
Error	24	0.02468077	0.001028		
C. Total	25	0.07125345			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.67291	0.00802	1.6564	1.6895
Hydragard - HF	10	1.75991	0.01014	1.7390	1.7808

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.67291	0.023559	0.00589	1.6604	1.6855
Hydragard - HF	10	1.75991	0.042629	0.01348	1.7294	1.7904

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.086995	t Ratio	5.913563
Std Err Dif	0.014711	DF	12.49092
Upper CL Dif	0.118908	Prob > t	<.0001
Lower CL Dif	0.055081	Prob > t	<.0001
Confidence	0.95	Prob < t	1.0000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0235592	0.0194689	0.0185610
Hydragard - HF	10	0.0426292	0.0356371	0.0322800

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.4773	1	24	0.0279
Brown-Forsythe	2.2399	1	24	0.1475
Levene	6.5260	1	24	0.0174
Bartlett	3.9471	1	.	0.0470
F Test 2-sided	3.2741	9	15	0.0415

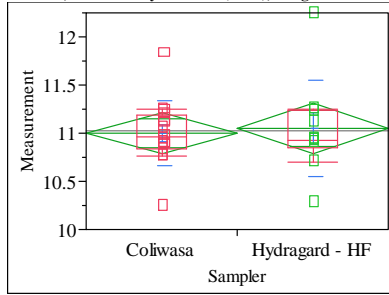
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
34.9702	1	12.491	<.0001

t Test
5.9136

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Oneway Anova
Summary of Fit

Rsquare	0.003398
Adj Rsquare	-0.03813
Root Mean Square Error	0.406213
Mean of Response	11.01938
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.04684	t Ratio	0.286064
Std Err Dif	0.16375	DF	24
Upper CL Dif	0.38481	Prob > t	0.7773
Lower CL Dif	-0.29112	Prob > t	0.3886
Confidence	0.95	Prob < t	0.6114

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0135032	0.013503	0.0818	0.7773
Error	24	3.9602237	0.165009		
C. Total	25	3.9737269			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.0014	0.10155	10.792	11.211
Hydragard - HF	10	11.0482	0.12846	10.783	11.313

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.0014	0.333835	0.08346	10.823	11.179
Hydragard - HF	10	11.0482	0.504263	0.15946	10.687	11.409

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.04684	t Ratio	0.260265
Std Err Dif	0.17998	DF	13.9767
Upper CL Dif	0.43293	Prob > t	0.7985
Lower CL Dif	-0.33924	Prob > t	0.3992
Confidence	0.95	Prob < t	0.6008

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3338353	0.2276856	0.2257900
Hydragard - HF	10	0.5042633	0.3278336	0.3046480

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8756	1	24	0.3587
Brown-Forsythe	0.3834	1	24	0.5416
Levene	0.7205	1	24	0.4044
Bartlett	1.9084	1	.	0.1671
F Test 2-sided	2.2817	9	15	0.1519

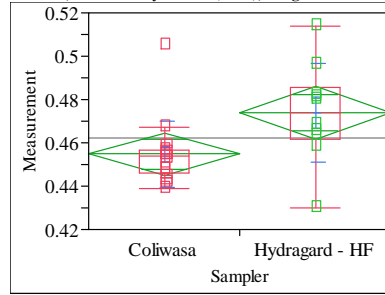
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0677	1	13.977	0.7985

t Test

0.2603

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=NiO (wt%), Targeted=0.41



Oneway Anova
Summary of Fit

Rsquare	0.21648
Adj Rsquare	0.183833
Root Mean Square Error	0.018419
Mean of Response	0.462113
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.019119	t Ratio	2.575072
Std Err Dif	0.007425	DF	24
Upper CL Dif	0.034443	Prob > t	0.0166
Lower CL Dif	0.003795	Prob > t	0.0083
Confidence	0.95	Prob < t	0.9917

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00224953	0.002250	6.6310	0.0166
Error	24	0.00814186	0.000339		
C. Total	25	0.01039139			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.454760	0.00460	0.44526	0.46426
Hydragard - HF	10	0.473879	0.00582	0.46186	0.48590

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.454760	0.015255	0.00381	0.44663	0.46289
Hydragard - HF	10	0.473879	0.022733	0.00719	0.45762	0.49014

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.019119	t Ratio	2.349439
Std Err Dif	0.008138	DF	14.10829
Upper CL Dif	0.036561	Prob > t	0.0339
Lower CL Dif	0.001678	Prob > t	0.0169
Confidence	0.95	Prob < t	0.9831

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0152550	0.0089274	0.0087484
Hydragard - HF	10	0.0227331	0.0167970	0.0167970

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8921	1	24	0.3543
Brown-Forsythe	2.3245	1	24	0.1404
Levene	2.2611	1	24	0.1457
Bartlett	1.7844	1	.	0.1816
F Test 2-sided	2.2207	9	15	0.1654

Welch Anova testing Means Equal, allowing Std Devs Not Equal

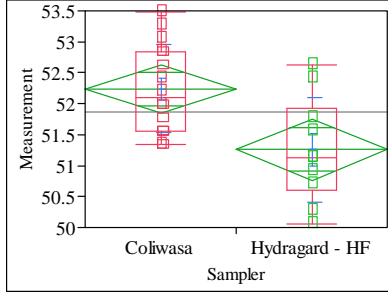
F Ratio	DFNum	DFDen	Prob > F
5.5199	1	14.108	0.0339

t Test

2.3494

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Oneway Anova
Summary of Fit

Rsquare	0.298169
Adj Rsquare	0.268926
Root Mean Square Error	0.762431
Mean of Response	51.86157
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.9814	t Ratio	-3.19316
Std Err Dif	0.3073	DF	24
Upper CL Dif	-0.3471	Prob > t	0.0039
Lower CL Dif	-1.6157	Prob > t	0.9980
Confidence	0.95	Prob < t	0.0020

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	5.927099	5.92710	10.1963	0.0039
Error	24	13.951207	0.58130		
C. Total	25	19.878306			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	52.2390	0.19061	51.846	52.632
Hydragard - HF	10	51.2576	0.24110	50.760	51.755

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	52.2390	0.708315	0.17708	51.862	52.616
Hydragard - HF	10	51.2576	0.844956	0.26720	50.653	51.862

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.9814	t Ratio	-3.06163
Std Err Dif	0.3205	DF	16.70797
Upper CL Dif	-0.3042	Prob > t	0.0072
Lower CL Dif	-1.6586	Prob > t	0.9964
Confidence	0.95	Prob < t	0.0036

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.7083151	0.6066921	0.6016781
Hydragard - HF	10	0.8449558	0.6674616	0.6417900

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7112	1	24	0.4074
Brown-Forsythe	0.0522	1	24	0.8212
Levene	0.1512	1	24	0.7008
Bartlett	0.3432	1	.	0.5580
F Test 2-sided	1.4230	9	15	0.5245

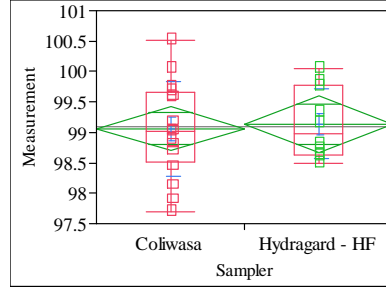
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.3736	1	16.708	0.0072

t Test

3.0616

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Oneway Anova
Summary of Fit

Rsquare	0.002722
Adj Rsquare	-0.03883
Root Mean Square Error	0.709538
Mean of Response	99.09045
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.07321	t Ratio	0.255962
Std Err Dif	0.28602	DF	24
Upper CL Dif	0.66354	Prob > t	0.8002
Lower CL Dif	-0.51711	Prob > t	0.4001
Confidence	0.95	Prob < t	0.5999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.032984	0.032984	0.0655	0.8002
Error	24	12.082663	0.503444		
C. Total	25	12.115647			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.0623	0.17738	98.696	99.428
Hydragard - HF	10	99.1355	0.22438	98.672	99.599

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.0623	0.780070	0.19502	98.647	99.478
Hydragard - HF	10	99.1355	0.573006	0.18120	98.726	99.545

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.07321	t Ratio	0.275018
Std Err Dif	0.26621	DF	23.2269
Upper CL Dif	0.62360	Prob > t	0.7857
Lower CL Dif	-0.47718	Prob > t	0.3929
Confidence	0.95	Prob < t	0.6071

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.7800699	0.6135462	0.6097831
Hydragard - HF	10	0.5730064	0.4846898	0.4846898

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2639	1	24	0.2720
Brown-Forsythe	0.5657	1	24	0.4593
Levene	0.6609	1	24	0.4242
Bartlett	0.9603	1	.	0.3271
F Test 2-sided	1.8533	15	9	0.3519

Welch Anova testing Means Equal, allowing Std Devs Not Equal

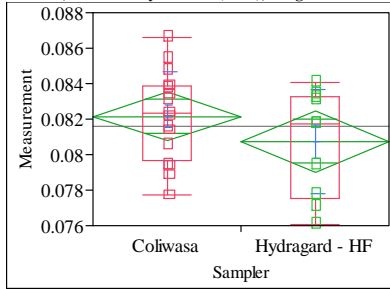
F Ratio	DFNum	DFDen	Prob > F
0.0756	1	23.227	0.7857

t Test

0.2750

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



Oneway Anova
Summary of Fit

Rsquare	0.065779
Adj Rsquare	0.026853
Root Mean Square Error	0.002674
Mean of Response	0.08161
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00140	t Ratio	-1.29994
Std Err Dif	0.00108	DF	24
Upper CL Dif	0.00082	Prob > t	0.2060
Lower CL Dif	-0.00363	Prob > t	0.8970
Confidence	0.95	Prob < t	0.1030

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001208	0.000012	1.6899	0.2060
Error	24	0.00017158	7.149e-6		
C. Total	25	0.00018366			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.082149	0.00067	0.08077	0.08353
Hydragard - HF	10	0.080748	0.00085	0.07900	0.08249

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.082149	0.002497	0.00062	0.08082	0.08348
Hydragard - HF	10	0.080748	0.002945	0.00093	0.07864	0.08285

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00140	t Ratio	-1.24979
Std Err Dif	0.00112	DF	16.86463
Upper CL Dif	0.00097	Prob > t	0.2284
Lower CL Dif	-0.00377	Prob > t	0.8858
Confidence	0.95	Prob < t	0.1142

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0024972	0.0020120	0.0020016
Hydragard - HF	10	0.0029446	0.0025487	0.0023519

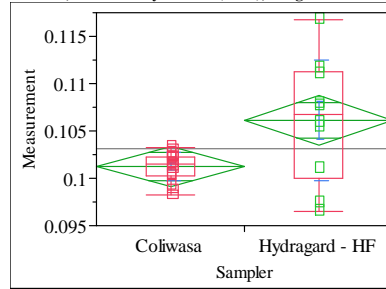
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6740	1	24	0.4197
Brown-Forsythe	0.2909	1	24	0.5946
Levene	1.0166	1	24	0.3234
Bartlett	0.2993	1	.	0.5843
F Test 2-sided	1.3905	9	15	0.5500

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.5620	1	16.865	0.2284

t Test
1.2498

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



Oneway Anova
Summary of Fit

Rsquare	0.268291
Adj Rsquare	0.237803
Root Mean Square Error	0.004105
Mean of Response	0.103098
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.004909	t Ratio	2.966467
Std Err Dif	0.001655	DF	24
Upper CL Dif	0.008325	Prob > t	0.0067
Lower CL Dif	0.001494	Prob > t	0.0034
Confidence	0.95	Prob < t	0.9966

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00014831	0.000148	8.7999	0.0067
Error	24	0.00040448	0.000017		
C. Total	25	0.00055279			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.101210	0.00103	0.09909	0.10333
Hydragard - HF	10	0.106119	0.00130	0.10344	0.10880

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.101210	0.001492	0.00037	0.10041	0.10201
Hydragard - HF	10	0.106119	0.006421	0.00203	0.10153	0.11071

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.004909	t Ratio	2.377854
Std Err Dif	0.002065	DF	9.611061
Upper CL Dif	0.009535	Prob > t	0.0397
Lower CL Dif	0.000284	Prob > t	0.0199
Confidence	0.95	Prob < t	0.9801

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0014920	0.0011894	0.0011592
Hydragard - HF	10	0.0064212	0.0048921	0.0048921

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	10.0825	1	24	0.0041
Brown-Forsythe	13.7365	1	24	0.0011
Levene	14.2072	1	24	0.0009
Bartlett	21.3441	1	.	<.0001
F Test 2-sided	18.5222	9	15	<.0001

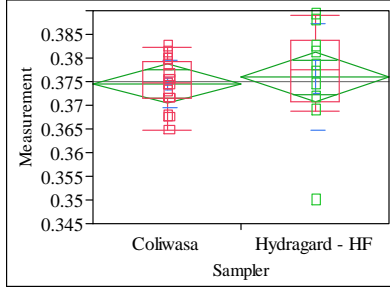
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.6542	1	9.6111	0.0397

t Test
2.3779

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



**Oneway Anova
Summary of Fit**

Rsquare	0.00804
Adj Rsquare	-0.03329
Root Mean Square Error	0.007978
Mean of Response	0.375055
Observations (or Sum Wgts)	26

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00142	t Ratio	0.441042
Std Err Dif	0.00322	DF	24
Upper CL Dif	0.00806	Prob > t	0.6631
Lower CL Dif	-0.00522	Prob > t	0.3316
Confidence	0.95	Prob < t	0.6684

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001238	0.000012	0.1945	0.6631
Error	24	0.00152742	0.000064		
C. Total	25	0.00153980			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.374509	0.00199	0.37039	0.37863
Hydragard - HF	10	0.375928	0.00252	0.37072	0.38113

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.374509	0.005114	0.00128	0.37178	0.37723
Hydragard - HF	10	0.375928	0.011231	0.00355	0.36789	0.38396

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00142	t Ratio	0.375766
Std Err Dif	0.00377	DF	11.36941
Upper CL Dif	0.00969	Prob > t	0.7140
Lower CL Dif	-0.00686	Prob > t	0.3570
Confidence	0.95	Prob < t	0.6430

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0051140	0.0040524	0.0040524
Hydragard - HF	10	0.0112305	0.0078887	0.0076996

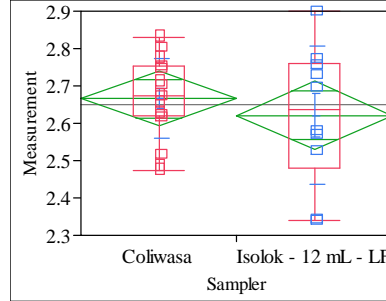
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.6664	1	24	0.1155
Brown-Forsythe	2.8068	1	24	0.1068
Levene	3.3837	1	24	0.0782
Bartlett	6.8719	1	.	0.0088
F Test 2-sided	4.8225	9	15	0.0075

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1412	1	11.369	0.7140

t Test
0.3758

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Al/B, Targeted=2.552



**Oneway Anova
Summary of Fit**

Rsquare	0.025628
Adj Rsquare	-0.01497
Root Mean Square Error	0.141508
Mean of Response	2.649026
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.04532	t Ratio	-0.79451
Std Err Dif	0.05704	DF	24
Upper CL Dif	0.07241	Prob > t	0.4347
Lower CL Dif	-0.16305	Prob > t	0.7827
Confidence	0.95	Prob < t	0.2173

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01264047	0.012640	0.6312	0.4347
Error	24	0.48058856	0.020025		
C. Total	25	0.49322903			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.66646	0.03538	2.5934	2.7395
Isolok - 12 mL - LF	10	2.62114	0.04475	2.5288	2.7135

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.66646	0.107927	0.02698	2.6089	2.7240
Isolok - 12 mL - LF	10	2.62114	0.184350	0.05830	2.4893	2.7530

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.04532	t Ratio	-0.70553
Std Err Dif	0.06424	DF	12.91334
Upper CL Dif	0.09355	Prob > t	0.4930
Lower CL Dif	-0.18419	Prob > t	0.7535
Confidence	0.95	Prob < t	0.2465

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1079269	0.0839512	0.0832960
Isolok - 12 mL - LF	10	0.1843503	0.1492653	0.1492653

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	4.3152	1	24	0.0486
Brown-Forsythe	4.2746	1	24	0.0496
Levene	4.3445	1	24	0.0479
Bartlett	3.2203	1	.	0.0727
F Test 2-sided	2.9176	9	15	0.0648

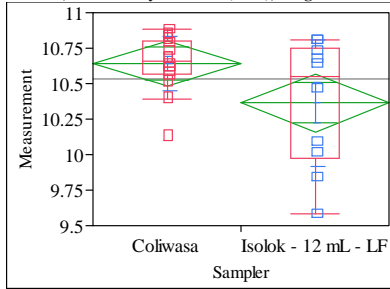
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4978	1	12.913	0.4930

t Test
0.7055

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.167393
Adj Rsquare	0.132701
Root Mean Square Error	0.312611
Mean of Response	10.53614
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.27681	t Ratio	-2.19661
Std Err Dif	0.12602	DF	24
Upper CL Dif	-0.01672	Prob > t	0.0379
Lower CL Dif	-0.53690	Prob > t	0.9810
Confidence	0.95	Prob < t	0.0190

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.4715369	0.471537	4.8251	0.0379
Error	24	2.3454139	0.097726		
C. Total	25	2.8169508			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.6426	0.07815	10.481	10.804
Isolok - 12 mL - LF	10	10.3658	0.09886	10.162	10.570

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.6426	0.191515	0.04788	10.541	10.745
Isolok - 12 mL - LF	10	10.3658	0.446622	0.14123	10.046	10.685

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.27681	t Ratio	-1.85619
Std Err Dif	0.14913	DF	11.09951
Upper CL Dif	0.05106	Prob > t	0.0901
Lower CL Dif	-0.60468	Prob > t	0.9549
Confidence	0.95	Prob < t	0.0451

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1915149	0.1369887	0.1369887
Isolok - 12 mL - LF	10	0.4466225	0.3869696	0.3665630

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	8.8011	1	24	0.0067
Brown-Forsythe	7.3810	1	24	0.0120
Levene	16.8510	1	24	0.0004
Bartlett	7.9189	1	.	0.0049
F Test 2-sided	5.4385	9	15	0.0041

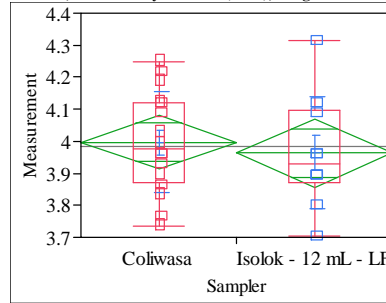
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.4454	1	11.1	0.0901

t Test

1.8562

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.010277
Adj Rsquare	-0.03096
Root Mean Square Error	0.164006
Mean of Response	3.984007
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03300	t Ratio	-0.49921
Std Err Dif	0.06611	DF	24
Upper CL Dif	0.10345	Prob > t	0.6222
Lower CL Dif	-0.16945	Prob > t	0.6889
Confidence	0.95	Prob < t	0.3111

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00670315	0.006703	0.2492	0.6222
Error	24	0.64554833	0.026898		
C. Total	25	0.65225148			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	3.99670	0.04100	3.9121	4.0813
Isolok - 12 mL - LF	10	3.96370	0.05186	3.8567	4.0707

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	3.99670	0.157687	0.03942	3.9127	4.0807
Isolok - 12 mL - LF	10	3.96370	0.174027	0.05503	3.8392	4.0882

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03300	t Ratio	-0.48754
Std Err Dif	0.06770	DF	17.79505
Upper CL Dif	0.10934	Prob > t	0.6318
Lower CL Dif	-0.17534	Prob > t	0.6841
Confidence	0.95	Prob < t	0.3159

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1576875	0.1292991	0.1287960
Isolok - 12 mL - LF	10	0.1740269	0.1268641	0.1255761

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1461	1	24	0.7057
Brown-Forsythe	0.0063	1	24	0.9372
Levene	0.0040	1	24	0.9499
Bartlett	0.1062	1	.	0.7445
F Test 2-sided	1.2180	9	15	0.7066

Welch Anova testing Means Equal, allowing Std Devs Not Equal

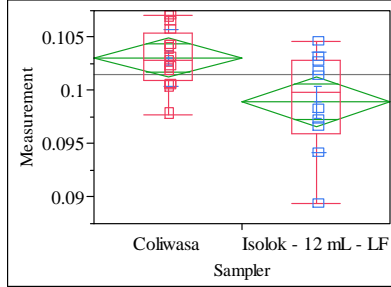
F Ratio	DFNum	DFDen	Prob > F
0.2377	1	17.795	0.6318

t Test

0.4875

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=BaO (wt%), Targeted=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.256751
Adj Rsquare	0.225782
Root Mean Square Error	0.003574
Mean of Response	0.101486
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	-0.00415	t Ratio	-2.87935
Std Err Dif	0.00144	DF	24
Upper CL Dif	-0.00117	Prob > t	0.0083
Lower CL Dif	-0.00712	Prob > t	0.9959
Confidence	0.95	Prob < t	0.0041

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00010587	0.000106	8.2907	0.0083
Error	24	0.00030648	0.000013		
C. Total	25	0.00041235			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	0.103081	0.00089	0.10124	0.10492
Isolok - 12 mL - LF	10	0.098933	0.00113	0.09660	0.10127

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	0.103081	0.002650	0.00066	0.10167	0.10449
Isolok - 12 mL - LF	10	0.098933	0.004728	0.00150	0.09555	0.10232

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.00415	t Ratio	-2.53654
Std Err Dif	0.00164	DF	12.58993
Upper CL Dif	-0.00060	Prob > t	0.0253
Lower CL Dif	-0.00769	Prob > t	0.9873
Confidence	0.95	Prob < t	0.0127

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0026498	0.0021074	0.0021074
Isolok - 12 mL - LF	10	0.0047277	0.0038073	0.0038073

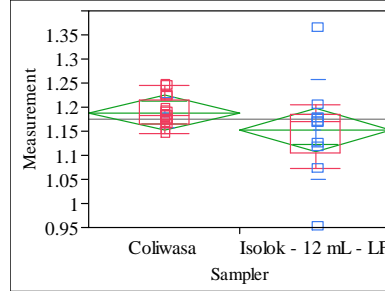
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.4670	1	24	0.0749
Brown-Forsythe	4.3168	1	24	0.0486
Levene	4.7172	1	24	0.0400
Bartlett	3.7632	1	.	0.0524
F Test 2-sided	3.1832	9	15	0.0464

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.4340	1	12.59	0.0253

t Test
2.5365

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=CaO (wt%), Targeted=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.065606
Adj Rsquare	0.026672
Root Mean Square Error	0.068084
Mean of Response	1.175005
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwas
Assuming equal variances

Difference	-0.03563	t Ratio	-1.29811
Std Err Dif	0.02745	DF	24
Upper CL Dif	0.02102	Prob > t	0.2066
Lower CL Dif	-0.09227	Prob > t	0.8967
Confidence	0.95	Prob < t	0.1033

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00781103	0.007811	1.6851	0.2066
Error	24	0.11124943	0.004635		
C. Total	25	0.11906046			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.18871	0.01702	1.1536	1.2238
Isolok - 12 mL - LF	10	1.15308	0.02153	1.1086	1.1975

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.18871	0.030157	0.00754	1.1726	1.2048
Isolok - 12 mL - LF	10	1.15308	0.104141	0.03293	1.0786	1.2276

t Test

Isolok - 12 mL - LF-Coliwas
Assuming unequal variances

Difference	-0.03563	t Ratio	-1.05455
Std Err Dif	0.03378	DF	9.951691
Upper CL Dif	0.03970	Prob > t	0.3166
Lower CL Dif	-0.11095	Prob > t	0.8417
Confidence	0.95	Prob < t	0.1583

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0301569	0.0230212	0.0221249
Isolok - 12 mL - LF	10	0.1041409	0.0689526	0.0659023

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.8642	1	24	0.0610
Brown-Forsythe	4.4692	1	24	0.0451
Levene	5.6421	1	24	0.0259
Bartlett	16.0514	1	.	<.0001
F Test 2-sided	11.9253	9	15	<.0001

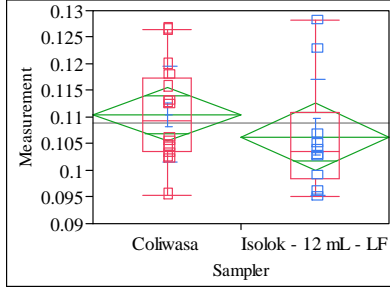
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.1121	1	9.9517	0.3166

t Test
1.0546

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



Oneway Anova
Summary of Fit

Rsquare	0.045571
Adj Rsquare	0.005804
Root Mean Square Error	0.009742
Mean of Response	0.108889
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00420	t Ratio	-1.07048
Std Err Dif	0.00393	DF	24
Upper CL Dif	0.00390	Prob > t	0.2950
Lower CL Dif	-0.01231	Prob > t	0.8525
Confidence	0.95	Prob < t	0.1475

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00010876	0.000109	1.1459	0.2950
Error	24	0.00227776	0.000095		
C. Total	25	0.00238652			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.110506	0.00244	0.10548	0.11553
Isolok - 12 mL - LF	10	0.106302	0.00308	0.09994	0.11266

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.110506	0.008976	0.00224	0.10572	0.11529
Isolok - 12 mL - LF	10	0.106302	0.010900	0.00345	0.09850	0.11410

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00420	t Ratio	-1.02212
Std Err Dif	0.00411	DF	16.47012
Upper CL Dif	0.00449	Prob > t	0.3215
Lower CL Dif	-0.01290	Prob > t	0.8392
Confidence	0.95	Prob < t	0.1608

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0089758	0.0074998	0.0074998
Isolok - 12 mL - LF	10	0.0109000	0.0078371	0.0071472

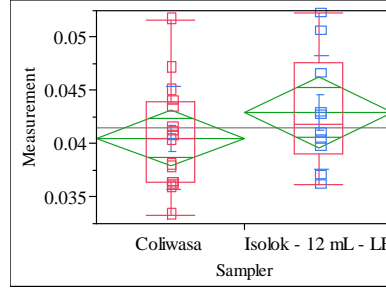
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4878	1	24	0.4916
Brown-Forsythe	0.0190	1	24	0.8916
Levene	0.0220	1	24	0.8833
Bartlett	0.4169	1	.	0.5185
F Test 2-sided	1.4747	9	15	0.4862

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0447	1	16.47	0.3215

t Test
1.0221

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=CuO (wt%), Targeted=0.0504



Oneway Anova
Summary of Fit

Rsquare	0.05561
Adj Rsquare	0.01626
Root Mean Square Error	0.005038
Mean of Response	0.041463
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00241	t Ratio	1.188794
Std Err Dif	0.00203	DF	24
Upper CL Dif	0.00661	Prob > t	0.2462
Lower CL Dif	-0.00178	Prob > t	0.1231
Confidence	0.95	Prob < t	0.8769

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003587	0.000036	1.4132	0.2462
Error	24	0.00060921	0.000025		
C. Total	25	0.00064508			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.040535	0.00126	0.03794	0.04313
Isolok - 12 mL - LF	10	0.042949	0.00159	0.03966	0.04624

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.040535	0.004822	0.00121	0.03797	0.04310
Isolok - 12 mL - LF	10	0.042949	0.005379	0.00170	0.03910	0.04680

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00241	t Ratio	1.158071
Std Err Dif	0.00208	DF	17.64237
Upper CL Dif	0.00680	Prob > t	0.2623
Lower CL Dif	-0.00197	Prob > t	0.1311
Confidence	0.95	Prob < t	0.8689

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0048223	0.0037789	0.0037789
Isolok - 12 mL - LF	10	0.0053788	0.0041234	0.0040684

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1691	1	24	0.6846
Brown-Forsythe	0.0546	1	24	0.8173
Levene	0.0832	1	24	0.7755
Bartlett	0.1305	1	.	0.7179
F Test 2-sided	1.2441	9	15	0.6805

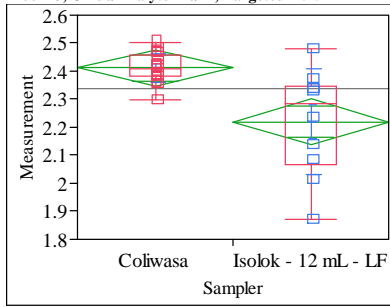
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.3411	1	17.642	0.2623

t Test
1.1581

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Fe/Li, Targeted=2.452



**Oneway Anova
Summary of Fit**

Rsquare	0.383769
Adj Rsquare	0.358093
Root Mean Square Error	0.123045
Mean of Response	2.337761
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.19176	t Ratio	-3.86606
Std Err Dif	0.04960	DF	24
Upper CL Dif	-0.08939	Prob > t	0.0007
Lower CL Dif	-0.29413	Prob > t	0.9996
Confidence	0.95	Prob < t	0.0004

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.22629167	0.226292	14.9464	0.0007
Error	24	0.36336453	0.015140		
C. Total	25	0.58965620			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.41152	0.03076	2.3480	2.4750
Isolok - 12 mL - LF	10	2.21975	0.03891	2.1394	2.3001

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.41152	0.052380	0.01310	2.3836	2.4394
Isolok - 12 mL - LF	10	2.21975	0.189212	0.05983	2.0844	2.3551

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.19176	t Ratio	-3.13079
Std Err Dif	0.06125	DF	9.869225
Upper CL Dif	-0.05504	Prob > t	0.0108
Lower CL Dif	-0.32848	Prob > t	0.9946
Confidence	0.95	Prob < t	0.0054

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0523801	0.0398799	0.0398799
Isolok - 12 mL - LF	10	0.1892117	0.1552550	0.1521522

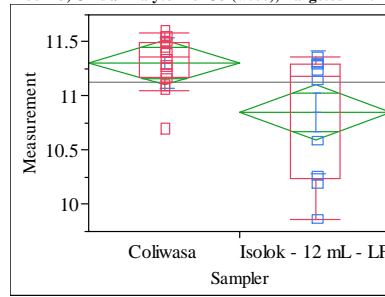
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	9.2203	1	24	0.0057
Brown-Forsythe	12.7392	1	24	0.0016
Levene	20.2937	1	24	0.0001
Bartlett	17.0994	1	.	<.0001
F Test 2-sided	13.0486	9	15	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	9.8018	DFNum	1	DFDen	9.8692	Prob > F	0.0108
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t Test
3.1308

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



**Oneway Anova
Summary of Fit**

Rsquare	0.256676
Adj Rsquare	0.225704
Root Mean Square Error	0.394701
Mean of Response	11.13186
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.45804	t Ratio	-2.87878
Std Err Dif	0.15911	DF	24
Upper CL Dif	-0.12966	Prob > t	0.0083
Lower CL Dif	-0.78642	Prob > t	0.9959
Confidence	0.95	Prob < t	0.0041

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.2910816	1.29108	8.2874	0.0083
Error	24	3.7389286	0.15579		
C. Total	25	5.0300102			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3080	0.09868	11.104	11.512
Isolok - 12 mL - LF	10	10.8500	0.12482	10.592	11.108

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3080	0.234137	0.05853	11.183	11.433
Isolok - 12 mL - LF	10	10.8500	0.569271	0.18002	10.443	11.257

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.45804	t Ratio	-2.4197
Std Err Dif	0.18930	DF	10.93037
Upper CL Dif	-0.04108	Prob > t	0.0342
Lower CL Dif	-0.87500	Prob > t	0.9829
Confidence	0.95	Prob < t	0.0171

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2341375	0.1779306	0.1742447
Isolok - 12 mL - LF	10	0.5692708	0.5021106	0.4446367

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	10.2683	1	24	0.0038
Brown-Forsythe	4.4605	1	24	0.0453
Levene	21.8233	1	24	<.0001
Bartlett	8.6806	1	.	0.0032
F Test 2-sided	5.9115	9	15	0.0027

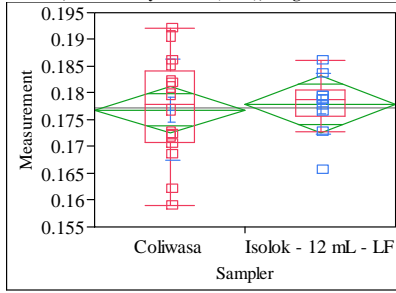
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	5.8549	DFNum	1	DFDen	10.93	Prob > F	0.0342
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t Test
2.4197

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Oneway Anova
Summary of Fit

Rsquare	0.003975
Adj Rsquare	-0.03753
Root Mean Square Error	0.008267
Mean of Response	0.177285
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00103	t Ratio	0.309494
Std Err Dif	0.00333	DF	24
Upper CL Dif	0.00791	Prob > t	0.7596
Lower CL Dif	-0.00585	Prob > t	0.3798
Confidence	0.95	Prob < t	0.6202

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000655	6.547e-6	0.0958	0.7596
Error	24	0.00164037	0.000068		
C. Total	25	0.00164691			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.00207	0.17262	0.18115
Isolok - 12 mL - LF	10	0.177919	0.00261	0.17252	0.18332

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.009502	0.00238	0.17182	0.18195
Isolok - 12 mL - LF	10	0.177919	0.005637	0.00178	0.17389	0.18195

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00103	t Ratio	0.347284
Std Err Dif	0.00297	DF	23.97776
Upper CL Dif	0.00716	Prob > t	0.7314
Lower CL Dif	-0.00510	Prob > t	0.3657
Confidence	0.95	Prob < t	0.6343

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0095021	0.0077923	0.0077923
Isolok - 12 mL - LF	10	0.0056372	0.0038065	0.0036138

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4682	1	24	0.1293
Brown-Forsythe	4.5509	1	24	0.0433
Levene	4.4779	1	24	0.0449
Bartlett	2.5984	1	.	0.1070
F Test 2-sided	2.8413	15	9	0.1177

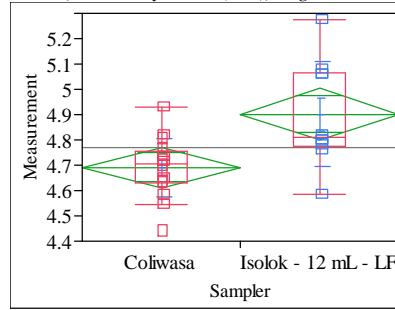
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1206	1	23.978	0.7314

t Test

0.3473

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Oneway Anova
Summary of Fit

Rsquare	0.31905
Adj Rsquare	0.290677
Root Mean Square Error	0.156478
Mean of Response	4.771986
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.211522	t Ratio	3.35334
Std Err Dif	0.063078	DF	24
Upper CL Dif	0.341709	Prob > t	0.0026
Lower CL Dif	0.081336	Prob > t	0.0013
Confidence	0.95	Prob < t	0.9987

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.27533376	0.275334	11.2449	0.0026
Error	24	0.58764574	0.024485		
C. Total	25	0.86297950			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.69063	0.03912	4.6099	4.7714
Isolok - 12 mL - LF	10	4.90215	0.04948	4.8000	5.0043

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.69063	0.116833	0.02921	4.6284	4.7529
Isolok - 12 mL - LF	10	4.90215	0.206262	0.06523	4.7546	5.0497

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.211522	t Ratio	2.959725
Std Err Dif	0.071467	DF	12.66582
Upper CL Dif	0.366332	Prob > t	0.0113
Lower CL Dif	0.056712	Prob > t	0.0057
Confidence	0.95	Prob < t	0.9943

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1168333	0.0864524	0.0861160
Isolok - 12 mL - LF	10	0.2062619	0.1730932	0.1571617

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.8354	1	24	0.0619
Brown-Forsythe	2.4310	1	24	0.1320
Levene	6.5816	1	24	0.0170
Bartlett	3.6281	1	.	0.0568
F Test 2-sided	3.1168	9	15	0.0504

Welch Anova testing Means Equal, allowing Std Devs Not Equal

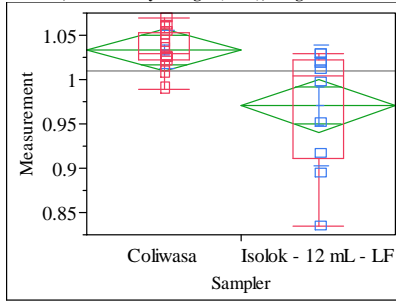
F Ratio	DFNum	DFDen	Prob > F
8.7600	1	12.666	0.0113

t Test

2.9597

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=MgO (wt%), Targeted=1.014



Oneway Anova
Summary of Fit

Rsquare	0.33477
Adj Rsquare	0.307052
Root Mean Square Error	0.045084
Mean of Response	1.009139
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.06316	t Ratio	-3.4753
Std Err Dif	0.01817	DF	24
Upper CL Dif	-0.02565	Prob > t	0.0020
Lower CL Dif	-0.10067	Prob > t	0.9990
Confidence	0.95	Prob < t	0.0010

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.02454922	0.024549	12.0777	0.0020
Error	24	0.04878245	0.002033		
C. Total	25	0.07333167			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.03343	0.01127	1.0102	1.0567
Isolok - 12 mL - LF	10	0.97027	0.01426	0.9408	0.9997

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.03343	0.021581	0.00540	1.0219	1.0449
Isolok - 12 mL - LF	10	0.97027	0.068147	0.02155	0.9215	1.0190

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.06316	t Ratio	-2.84313
Std Err Dif	0.02222	DF	10.13969
Upper CL Dif	-0.01375	Prob > t	0.0172
Lower CL Dif	-0.11257	Prob > t	0.9914
Confidence	0.95	Prob < t	0.0086

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0215810	0.0171401	0.0171012
Isolok - 12 mL - LF	10	0.0681472	0.0568465	0.0515731

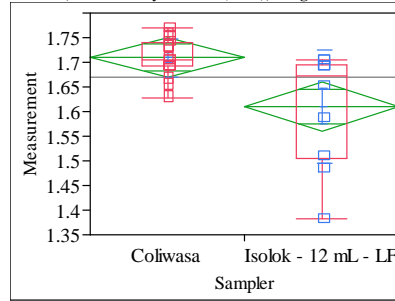
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	7.2520	1	24	0.0127
Brown-Forsythe	6.0187	1	24	0.0218
Levene	19.7891	1	24	0.0002
Bartlett	14.0288	1	.	0.0002
F Test 2-sided	9.9713	9	15	0.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.0834	1	10.14	0.0172

t Test
2.8431

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=MnO (wt%), Targeted=1.779



Oneway Anova
Summary of Fit

Rsquare	0.299994
Adj Rsquare	0.270827
Root Mean Square Error	0.076654
Mean of Response	1.671111
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.09910	t Ratio	-3.20709
Std Err Dif	0.03090	DF	24
Upper CL Dif	-0.03532	Prob > t	0.0038
Lower CL Dif	-0.16287	Prob > t	0.9981
Confidence	0.95	Prob < t	0.0019

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.06043527	0.060435	10.2854	0.0038
Error	24	0.14101990	0.005876		
C. Total	25	0.20145516			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.70923	0.01916	1.6697	1.7488
Isolok - 12 mL - LF	10	1.61013	0.02424	1.5601	1.6602

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.70923	0.039412	0.00985	1.6882	1.7302
Isolok - 12 mL - LF	10	1.61013	0.114368	0.03617	1.5283	1.6919

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.09910	t Ratio	-2.64375
Std Err Dif	0.03748	DF	10.35131
Upper CL Dif	-0.01596	Prob > t	0.0239
Lower CL Dif	-0.18224	Prob > t	0.9880
Confidence	0.95	Prob < t	0.0120

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0394116	0.0312713	0.0306660
Isolok - 12 mL - LF	10	0.1143682	0.0950323	0.0865104

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.9603	1	24	0.0144
Brown-Forsythe	5.1222	1	24	0.0329
Levene	17.1250	1	24	0.0004
Bartlett	12.2015	1	.	0.0005
F Test 2-sided	8.4210	9	15	0.0004

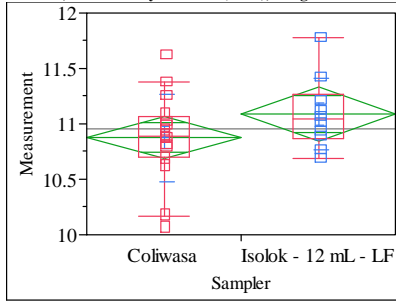
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.9894	1	10.351	0.0239

t Test
2.6437

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Oneway Anova
Summary of Fit

Rsquare	0.079519
Adj Rsquare	0.041165
Root Mean Square Error	0.368965
Mean of Response	10.9582
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.21416	t Ratio	1.439903
Std Err Dif	0.14873	DF	24
Upper CL Dif	0.52114	Prob > t	0.1628
Lower CL Dif	-0.09281	Prob > t	0.0814
Confidence	0.95	Prob < t	0.9186

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.2822523	0.282252	2.0733	0.1628
Error	24	3.2672507	0.136135		
C. Total	25	3.5495030			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.8758	0.09224	10.685	11.066
Isolok - 12 mL - LF	10	11.0900	0.11668	10.849	11.331

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.8758	0.394305	0.09858	10.666	11.086
Isolok - 12 mL - LF	10	11.0900	0.322335	0.10193	10.859	11.321

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.21416	t Ratio	1.510319
Std Err Dif	0.14180	DF	22.10548
Upper CL Dif	0.50816	Prob > t	0.1451
Lower CL Dif	-0.07983	Prob > t	0.0726
Confidence	0.95	Prob < t	0.9274

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3943054	0.2707584	0.2704425
Isolok - 12 mL - LF	10	0.3223352	0.2350912	0.2305080

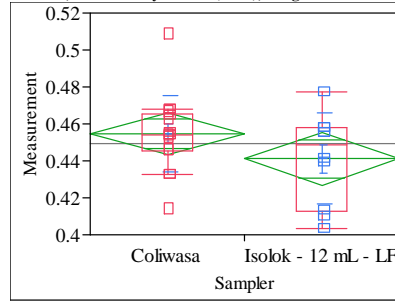
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3263	1	24	0.5731
Brown-Forsythe	0.1480	1	24	0.7039
Levene	0.1219	1	24	0.7301
Bartlett	0.4202	1	.	0.5168
F Test 2-sided	1.4964	15	9	0.5494

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.2811	1	22.105	0.1451

t Test
1.5103

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=NiO (wt%), Targeted=0.41



Oneway Anova
Summary of Fit

Rsquare	0.087063
Adj Rsquare	0.049024
Root Mean Square Error	0.022143
Mean of Response	0.449486
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.01350	t Ratio	-1.51287
Std Err Dif	0.00893	DF	24
Upper CL Dif	0.00492	Prob > t	0.1434
Lower CL Dif	-0.03193	Prob > t	0.9283
Confidence	0.95	Prob < t	0.0717

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00112227	0.001122	2.2888	0.1434
Error	24	0.01176801	0.000490		
C. Total	25	0.01289028			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.454680	0.00554	0.44325	0.46611
Isolok - 12 mL - LF	10	0.441176	0.00700	0.42672	0.45563

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.454680	0.020496	0.00512	0.44376	0.46560
Isolok - 12 mL - LF	10	0.441176	0.024646	0.00779	0.42355	0.45881

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.01350	t Ratio	-1.44785
Std Err Dif	0.00933	DF	16.60088
Upper CL Dif	0.00621	Prob > t	0.1663
Lower CL Dif	-0.03322	Prob > t	0.9169
Confidence	0.95	Prob < t	0.0831

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0204959	0.0136496	0.0135998
Isolok - 12 mL - LF	10	0.0246459	0.0198001	0.0197238

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3606	1	24	0.5538
Brown-Forsythe	1.0134	1	24	0.3241
Levene	1.1480	1	24	0.2946
Bartlett	0.3753	1	.	0.5401
F Test 2-sided	1.4460	9	15	0.5071

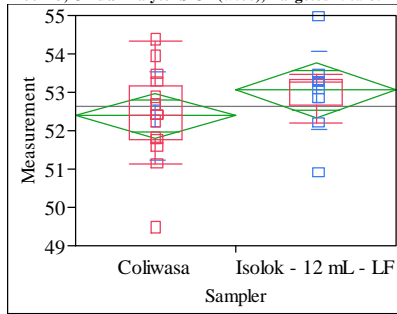
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.0963	1	16.601	0.1663

t Test
1.4478

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



**Oneway Anova
Summary of Fit**

Rsquare	0.084661
Adj Rsquare	0.046522
Root Mean Square Error	1.113113
Mean of Response	52.64324
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.6685	t Ratio	1.489896
Std Err Dif	0.4487	DF	24
Upper CL Dif	1.5946	Prob > t	0.1493
Lower CL Dif	-0.2576	Prob > t	0.0746
Confidence	0.95	Prob < t	0.9254

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.750363	2.75036	2.2198	0.1493
Error	24	29.736488	1.23902		
C. Total	25	32.486851			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	52.3861	0.27828	51.812	52.960
Isolok - 12 mL - LF	10	53.0546	0.35200	52.328	53.781

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	52.3861	1.16358	0.29089	51.766	53.006
Isolok - 12 mL - LF	10	53.0546	1.02349	0.32366	52.322	53.787

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.6685	t Ratio	1.536253
Std Err Dif	0.4352	DF	21.13742
Upper CL Dif	1.5732	Prob > t	0.1393
Lower CL Dif	-0.2361	Prob > t	0.0697
Confidence	0.95	Prob < t	0.9303

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.163577	0.8089228	0.8022375
Isolok - 12 mL - LF	10	1.023491	0.6417900	0.5990040

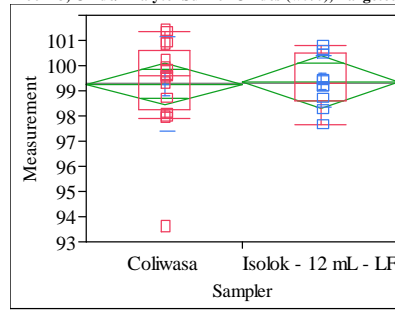
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1059	1	24	0.7477
Brown-Forsythe	0.3738	1	24	0.5467
Levene	0.2724	1	24	0.6065
Bartlett	0.1729	1	.	0.6775
F Test 2-sided	1.2925	15	9	0.7144

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3601	1	21.137	0.1393

t Test
1.5363

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



**Oneway Anova
Summary of Fit**

Rsquare	0.000885
Adj Rsquare	-0.04075
Root Mean Square Error	1.619236
Mean of Response	99.30673
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.0952	t Ratio	0.145776
Std Err Dif	0.6527	DF	24
Upper CL Dif	1.4423	Prob > t	0.8853
Lower CL Dif	-1.2520	Prob > t	0.4427
Confidence	0.95	Prob < t	0.5573

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.055718	0.05572	0.0213	0.8853
Error	24	62.926179	2.62192		
C. Total	25	62.981896			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.2701	0.40481	98.435	100.11
Isolok - 12 mL - LF	10	99.3653	0.51205	98.308	100.42

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.2701	1.88622	0.47156	98.265	100.28
Isolok - 12 mL - LF	10	99.3653	1.03056	0.32589	98.628	100.10

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.0952	t Ratio	0.166
Std Err Dif	0.5732	DF	23.72871
Upper CL Dif	1.2789	Prob > t	0.8696
Lower CL Dif	-1.0886	Prob > t	0.4348
Confidence	0.95	Prob < t	0.5652

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.886225	1.273320	1.207732
Isolok - 12 mL - LF	10	1.030562	0.780356	0.780356

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7804	1	24	0.3858
Brown-Forsythe	0.7669	1	24	0.3899
Levene	1.1617	1	24	0.2918
Bartlett	3.4003	1	.	0.0652
F Test 2-sided	3.3500	15	9	0.0723

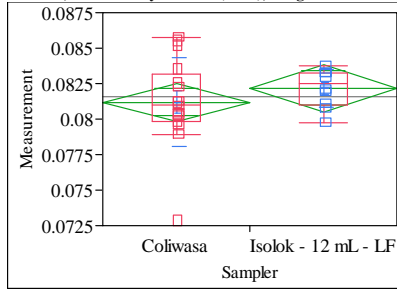
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0276	1	23.729	0.8696

t Test
0.1660

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



**Oneway Anova
Summary of Fit**

Rsquare	0.035588
Adj Rsquare	-0.0046
Root Mean Square Error	0.002589
Mean of Response	0.081578
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00098	t Ratio	0.941078
Std Err Dif	0.00104	DF	24
Upper CL Dif	0.00314	Prob > t	0.3560
Lower CL Dif	-0.00117	Prob > t	0.1780
Confidence	0.95	Prob < t	0.8220

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000593	5.9347e-6	0.8856	0.3560
Error	24	0.00016083	6.7011e-6		
C. Total	25	0.00016676			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.081200	0.00065	0.07986	0.08254
Isolok - 12 mL - LF	10	0.082182	0.00082	0.08049	0.08387

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.081200	0.003111	0.00078	0.07954	0.08286
Isolok - 12 mL - LF	10	0.082182	0.001321	0.00042	0.08124	0.08313

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00098	t Ratio	1.112575
Std Err Dif	0.00088	DF	21.8677
Upper CL Dif	0.00281	Prob > t	0.2780
Lower CL Dif	-0.00085	Prob > t	0.1390
Confidence	0.95	Prob < t	0.8610

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0031106	0.0021332	0.0021163
Isolok - 12 mL - LF	10	0.0013205	0.0010842	0.0010842

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.5531	1	24	0.2247
Brown-Forsythe	1.9893	1	24	0.1712
Levene	2.1311	1	24	0.1573
Bartlett	6.3192	1	.	0.0119
F Test 2-sided	5.5484	15	9	0.0135

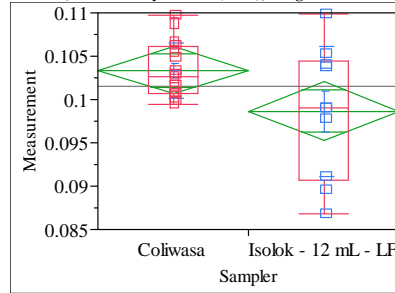
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2378	1	21.868	0.2780

t Test

1.1126

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



**Oneway Anova
Summary of Fit**

Rsquare	0.171533
Adj Rsquare	0.137014
Root Mean Square Error	0.005247
Mean of Response	0.101552
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00471	t Ratio	-2.22916
Std Err Dif	0.00211	DF	24
Upper CL Dif	-0.00035	Prob > t	0.0354
Lower CL Dif	-0.00908	Prob > t	0.9823
Confidence	0.95	Prob < t	0.0177

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00013679	0.000137	4.9692	0.0354
Error	24	0.00066066	0.000028		
C. Total	25	0.00079745			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103365	0.00131	0.10066	0.10607
Isolok - 12 mL - LF	10	0.098650	0.00166	0.09523	0.10207

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103365	0.003190	0.00080	0.10167	0.10506
Isolok - 12 mL - LF	10	0.098650	0.007513	0.00238	0.09328	0.10402

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00471	t Ratio	-1.88128
Std Err Dif	0.00251	DF	11.05841
Upper CL Dif	0.00080	Prob > t	0.0865
Lower CL Dif	-0.01023	Prob > t	0.9567
Confidence	0.95	Prob < t	0.0433

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0031901	0.0026413	0.0025830
Isolok - 12 mL - LF	10	0.0075130	0.0058755	0.0057883

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	9.0119	1	24	0.0062
Brown-Forsythe	6.6171	1	24	0.0167
Levene	7.5791	1	24	0.0111
Bartlett	8.0958	1	.	0.0044
F Test 2-sided	5.5463	9	15	0.0037

Welch Anova testing Means Equal, allowing Std Devs Not Equal

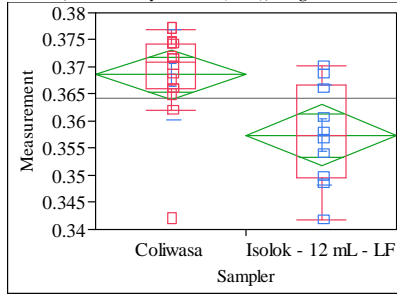
F Ratio	DFNum	DFDen	Prob > F
3.5392	1	11.058	0.0865

t Test

1.8813

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Oneway Anova
Summary of Fit

Rsquare	0.296849
Adj Rsquare	0.267551
Root Mean Square Error	0.008711
Mean of Response	0.3643
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.01118	t Ratio	-3.18309
Std Err Dif	0.00351	DF	24
Upper CL Dif	-0.00393	Prob > t	0.0040
Lower CL Dif	-0.01843	Prob > t	0.9980
Confidence	0.95	Prob < t	0.0020

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00076889	0.000769	10.1321	0.0040
Error	24	0.00182129	0.000076		
C. Total	25	0.00259018			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.368600	0.00218	0.36410	0.37309
Isolok - 12 mL - LF	10	0.357422	0.00275	0.35174	0.36311

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.368600	0.008369	0.00209	0.36414	0.37306
Isolok - 12 mL - LF	10	0.357422	0.009254	0.00293	0.35080	0.36404

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.01118	t Ratio	-3.10724
Std Err Dif	0.00360	DF	17.76682
Upper CL Dif	-0.00361	Prob > t	0.0062
Lower CL Dif	-0.01874	Prob > t	0.9969
Confidence	0.95	Prob < t	0.0031

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0083688	0.0054454	0.0052343
Isolok - 12 mL - LF	10	0.0092540	0.0072943	0.0072943

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0553	1	24	0.8161
Brown-Forsythe	0.6753	1	24	0.4193
Levene	0.6197	1	24	0.4389
Bartlett	0.1105	1	.	0.7396
F Test 2-sided	1.2228	9	15	0.7018

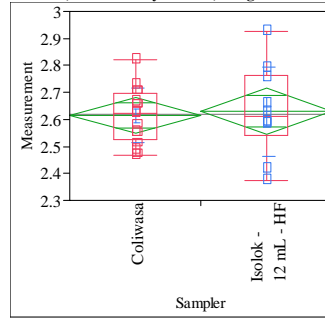
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.6549	1	17.767	0.0062

t Test

3.1072

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Al/B, Targeted=2.552



Oneway Anova
Summary of Fit

Rsquare	0.004129
Adj Rsquare	-0.03737
Root Mean Square Error	0.129339
Mean of Response	2.620135
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.01645	t Ratio	0.315434
Std Err Dif	0.05214	DF	24
Upper CL Dif	0.12405	Prob > t	0.7552
Lower CL Dif	-0.09116	Prob > t	0.3776
Confidence	0.95	Prob < t	0.6224

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00166448	0.001664	0.0995	0.7552
Error	24	0.40148809	0.016729		
C. Total	25	0.40315258			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.61381	0.03233	2.5471	2.6805
Isolok - 12 mL - HF	10	2.63026	0.04090	2.5458	2.7147

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.61381	0.101809	0.02545	2.5596	2.6681
Isolok - 12 mL - HF	10	2.63026	0.165332	0.05228	2.5120	2.7485

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01645	t Ratio	0.28283
Std Err Dif	0.05815	DF	13.32241
Upper CL Dif	0.14176	Prob > t	0.7817
Lower CL Dif	-0.10887	Prob > t	0.3908
Confidence	0.95	Prob < t	0.6092

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1018088	0.0833742	0.0823067
Isolok - 12 mL - HF	10	0.1653322	0.1211870	0.1204340

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.9164	1	24	0.1006
Brown-Forsythe	1.3917	1	24	0.2497
Levene	1.4726	1	24	0.2368
Bartlett	2.6412	1	.	0.1041
F Test 2-sided	2.6372	9	15	0.0936

Welch Anova testing Means Equal, allowing Std Devs Not Equal

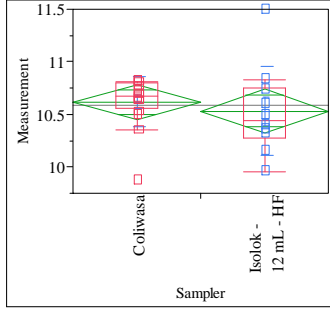
F Ratio	DFNum	DFDen	Prob > F
0.0800	1	13.322	0.7817

t Test

0.2828

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



**Oneway Anova
Summary of Fit**

Rsquare	0.019195
Adj Rsquare	-0.02167
Root Mean Square Error	0.321449
Mean of Response	10.58483
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.08881	t Ratio	-0.68534
Std Err Dif	0.12958	DF	24
Upper CL Dif	0.17863	Prob > t	0.4997
Lower CL Dif	-0.35625	Prob > t	0.7502
Confidence	0.95	Prob < t	0.2498

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0485329	0.048533	0.4697	0.4997
Error	24	2.4799037	0.103329		
C. Total	25	2.5284366			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.6190	0.08036	10.453	10.785
Isolok - 12 mL - HF	10	10.5302	0.10165	10.320	10.740

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.6190	0.238905	0.05973	10.492	10.746
Isolok - 12 mL - HF	10	10.5302	0.424757	0.13432	10.226	10.834

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.08881	t Ratio	-0.60412
Std Err Dif	0.14700	DF	12.6149
Upper CL Dif	0.22976	Prob > t	0.5565
Lower CL Dif	-0.40737	Prob > t	0.7218
Confidence	0.95	Prob < t	0.2782

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2389053	0.1558837	0.1440744
Isolok - 12 mL - HF	10	0.4247571	0.3053432	0.2966515

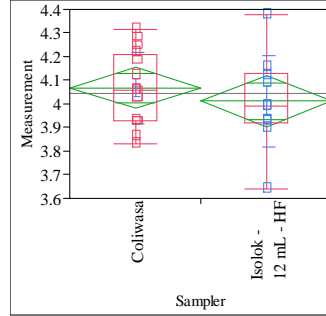
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6522	1	24	0.2109
Brown-Forsythe	2.4534	1	24	0.1304
Levene	2.8471	1	24	0.1045
Bartlett	3.7182	1	.	0.0538
F Test 2-sided	3.1610	9	15	0.0477

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3650	1	12.615	0.5565

t Test
0.6041

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



**Oneway Anova
Summary of Fit**

Rsquare	0.026781
Adj Rsquare	-0.01377
Root Mean Square Error	0.16832
Mean of Response	4.045928
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.05514	t Ratio	-0.81266
Std Err Dif	0.06785	DF	24
Upper CL Dif	0.08490	Prob > t	0.4244
Lower CL Dif	-0.19518	Prob > t	0.7878
Confidence	0.95	Prob < t	0.2122

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01871081	0.018711	0.6604	0.4244
Error	24	0.67995632	0.028332		
C. Total	25	0.69866713			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.06714	0.04208	3.9803	4.1540
Isolok - 12 mL - HF	10	4.01200	0.05323	3.9021	4.1219

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.06714	0.150439	0.03761	3.9870	4.1473
Isolok - 12 mL - HF	10	4.01200	0.194501	0.06151	3.8729	4.1511

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.05514	t Ratio	-0.76484
Std Err Dif	0.07209	DF	15.67371
Upper CL Dif	0.09795	Prob > t	0.4557
Lower CL Dif	-0.20823	Prob > t	0.7721
Confidence	0.95	Prob < t	0.2279

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1504392	0.1212494	0.1187338
Isolok - 12 mL - HF	10	0.1945014	0.1390997	0.1352358

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7523	1	24	0.3943
Brown-Forsythe	0.1453	1	24	0.7065
Levene	0.1873	1	24	0.6690
Bartlett	0.7336	1	.	0.3917
F Test 2-sided	1.6716	9	15	0.3642

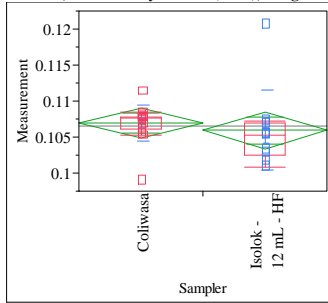
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5850	1	15.674	0.4557

t Test
0.7648

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=BaO (wt%), Targeted=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.016399
Adj Rsquare	-0.02458
Root Mean Square Error	0.003963
Mean of Response	0.106544
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00101	t Ratio	-0.63256
Std Err Dif	0.00160	DF	24
Upper CL Dif	0.00229	Prob > t	0.5330
Lower CL Dif	-0.00431	Prob > t	0.7335
Confidence	0.95	Prob < t	0.2665

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000628	6.283e-6	0.4001	0.5330
Error	24	0.00037685	0.000016		
C. Total	25	0.00038314			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.106933	0.00099	0.10489	0.10898
Isolok - 12 mL - HF	10	0.105922	0.00125	0.10334	0.10851

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.106933	0.002551	0.00064	0.10557	0.10829
Isolok - 12 mL - HF	10	0.105922	0.005570	0.00176	0.10194	0.10991

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00101	t Ratio	-0.53938
Std Err Dif	0.00187	DF	11.39693
Upper CL Dif	0.00310	Prob > t	0.6000
Lower CL Dif	-0.00512	Prob > t	0.7000
Confidence	0.95	Prob < t	0.3000

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0025511	0.0015457	0.0013817
Isolok - 12 mL - HF	10	0.0055701	0.0033696	0.0031597

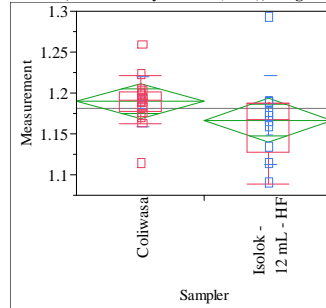
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.4817	1	24	0.2353
Brown-Forsythe	1.8208	1	24	0.1898
Levene	2.1829	1	24	0.1526
Bartlett	6.7751	1	.	0.0092
F Test 2-sided	4.7674	9	15	0.0079

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2909	1	11.397	0.6000

t Test
0.5394

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=CaO (wt%), Targeted=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.072734
Adj Rsquare	0.034098
Root Mean Square Error	0.04114
Mean of Response	1.180656
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02275	t Ratio	-1.37206
Std Err Dif	0.01658	DF	24
Upper CL Dif	0.01147	Prob > t	0.1827
Lower CL Dif	-0.05698	Prob > t	0.9086
Confidence	0.95	Prob < t	0.0914

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00318626	0.003186	1.8825	0.1827
Error	24	0.04062067	0.001693		
C. Total	25	0.04380693			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.18941	0.01029	1.1682	1.2106
Isolok - 12 mL - HF	10	1.16665	0.01301	1.1398	1.1935

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.18941	0.030233	0.00756	1.1733	1.2055
Isolok - 12 mL - HF	10	1.16665	0.054681	0.01729	1.1275	1.2058

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02275	t Ratio	-1.20576
Std Err Dif	0.01887	DF	12.49379
Upper CL Dif	0.01818	Prob > t	0.2502
Lower CL Dif	-0.06369	Prob > t	0.8749
Confidence	0.95	Prob < t	0.1251

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0302325	0.0186268	0.0186268
Isolok - 12 mL - HF	10	0.0546815	0.0358195	0.0358195

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7498	1	24	0.1984
Brown-Forsythe	1.9605	1	24	0.1743
Levene	1.9630	1	24	0.1740
Bartlett	3.9417	1	.	0.0471
F Test 2-sided	3.2714	9	15	0.0416

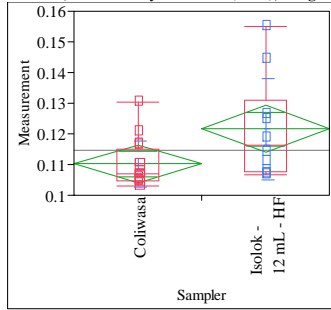
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.4539	1	12.494	0.2502

t Test
1.2058

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



**Oneway Anova
Summary of Fit**

Rsquare	0.194656
Adj Rsquare	0.1611
Root Mean Square Error	0.011706
Mean of Response	0.114567
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.011366	t Ratio	2.408515
Std Err Dif	0.004719	DF	24
Upper CL Dif	0.021105	Prob > t	0.0241
Lower CL Dif	0.001626	Prob > t	0.0120
Confidence	0.95	Prob < t	0.9880

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00079496	0.000795	5.8009	0.0241
Error	24	0.00328895	0.000137		
C. Total	25	0.00408390			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.110196	0.00293	0.10416	0.11624
Isolok - 12 mL - HF	10	0.121561	0.00370	0.11392	0.12920

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.110196	0.007415	0.00185	0.10624	0.11415
Isolok - 12 mL - HF	10	0.121561	0.016547	0.00523	0.10972	0.13340

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.01137	t Ratio	2.047404
Std Err Dif	0.00555	DF	11.29389
Upper CL Dif	0.02355	Prob > t	0.0646
Lower CL Dif	-0.00081	Prob > t	0.0323
Confidence	0.95	Prob < t	0.9677

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0074147	0.0055609	0.0050334
Isolok - 12 mL - HF	10	0.0165472	0.0128095	0.0122336

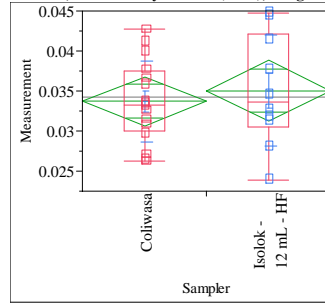
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	4.3068	1	24	0.0488
Brown-Forsythe	4.2324	1	24	0.0507
Levene	6.7282	1	24	0.0159
Bartlett	7.1464	1	.	0.0075
F Test 2-sided	4.9804	9	15	0.0064

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.1919	1	11.294	0.0646

t Test
2.0474

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=CuO (wt%), Targeted=0.0504



**Oneway Anova
Summary of Fit**

Rsquare	0.013331
Adj Rsquare	-0.02778
Root Mean Square Error	0.005842
Mean of Response	0.034213
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00134	t Ratio	0.569438
Std Err Dif	0.00235	DF	24
Upper CL Dif	0.00620	Prob > t	0.5744
Lower CL Dif	-0.00352	Prob > t	0.2872
Confidence	0.95	Prob < t	0.7128

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001107	0.000011	0.3243	0.5744
Error	24	0.00081906	0.000034		
C. Total	25	0.00083013			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.033697	0.00146	0.03068	0.03671
Isolok - 12 mL - HF	10	0.035038	0.00185	0.03123	0.03885

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.033697	0.005091	0.00127	0.03098	0.03641
Isolok - 12 mL - HF	10	0.035038	0.006914	0.00219	0.03009	0.03998

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00134	t Ratio	0.530048
Std Err Dif	0.00253	DF	15.09345
Upper CL Dif	0.00673	Prob > t	0.6038
Lower CL Dif	-0.00405	Prob > t	0.3019
Confidence	0.95	Prob < t	0.6981

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0050912	0.0040038	0.0039666
Isolok - 12 mL - HF	10	0.0069142	0.0055930	0.0054954

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.9118	1	24	0.1795
Brown-Forsythe	1.1976	1	24	0.2847
Levene	1.4936	1	24	0.2335
Bartlett	1.0452	1	.	0.3066
F Test 2-sided	1.8443	9	15	0.2831

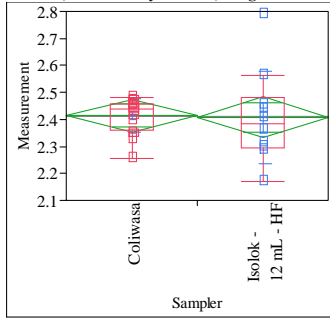
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2810	1	15.093	0.6038

t Test
0.5300

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Fe/Li, Targeted=2.452



**Oneway Anova
Summary of Fit**

Rsquare	0.000798
Adj Rsquare	-0.04084
Root Mean Square Error	0.116341
Mean of Response	2.412087
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00649	t Ratio	-0.13844
Std Err Dif	0.04690	DF	24
Upper CL Dif	0.09030	Prob > t	0.8910
Lower CL Dif	-0.10329	Prob > t	0.5545
Confidence	0.95	Prob < t	0.4455

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00025942	0.000259	0.0192	0.8910
Error	24	0.32484669	0.013535		
C. Total	25	0.32510611			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.41458	0.02909	2.3546	2.4746
Isolok - 12 mL - HF	10	2.40809	0.03679	2.3322	2.4840

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.41458	0.063563	0.01589	2.3807	2.4485
Isolok - 12 mL - HF	10	2.40809	0.171349	0.05419	2.2855	2.5307

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00649	t Ratio	-0.11498
Std Err Dif	0.05647	DF	10.56778
Upper CL Dif	0.11841	Prob > t	0.9106
Lower CL Dif	-0.13140	Prob > t	0.5447
Confidence	0.95	Prob < t	0.4553

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0635630	0.0499235	0.0449501
Isolok - 12 mL - HF	10	0.1713485	0.1222474	0.1220128

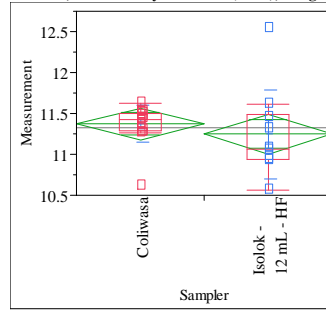
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.7355	1	24	0.0652
Brown-Forsythe	5.4856	1	24	0.0278
Levene	5.7004	1	24	0.0252
Bartlett	10.6812	1	.	0.0011
F Test 2-sided	7.2669	9	15	0.0009

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0132	1	10.568	0.9106

t Test
0.1150

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



**Oneway Anova
Summary of Fit**

Rsquare	0.028805
Adj Rsquare	-0.01166
Root Mean Square Error	0.378336
Mean of Response	11.32377
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.12867	t Ratio	-0.84369
Std Err Dif	0.15251	DF	24
Upper CL Dif	0.18610	Prob > t	0.4072
Lower CL Dif	-0.44344	Prob > t	0.7964
Confidence	0.95	Prob < t	0.2036

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1018876	0.101888	0.7118	0.4072
Error	24	3.4353193	0.143138		
C. Total	25	3.5372070			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3733	0.09458	11.178	11.568
Isolok - 12 mL - HF	10	11.2446	0.11964	10.998	11.492

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3733	0.229169	0.05729	11.251	11.495
Isolok - 12 mL - HF	10	11.2446	0.542376	0.17151	10.857	11.633

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.12867	t Ratio	-0.71157
Std Err Dif	0.18083	DF	11.03805
Upper CL Dif	0.26916	Prob > t	0.4915
Lower CL Dif	-0.52651	Prob > t	0.7543
Confidence	0.95	Prob < t	0.2457

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.2291686	0.1411829	0.1340344
Isolok - 12 mL - HF	10	0.5423760	0.3860190	0.3531359

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.3512	1	24	0.1383
Brown-Forsythe	3.1199	1	24	0.0901
Levene	5.4439	1	24	0.0283
Bartlett	8.1852	1	.	0.0042
F Test 2-sided	5.6013	9	15	0.0036

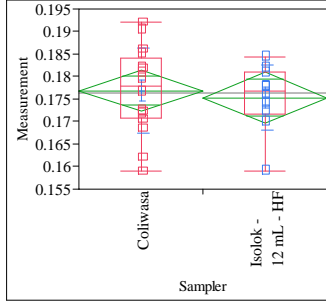
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5063	1	11.038	0.4915

t Test
0.7116

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Oneway Anova Summary of Fit

Rsquare	0.008121
Adj Rsquare	-0.03321
Root Mean Square Error	0.008722
Mean of Response	0.176289
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00156	t Ratio	-0.44328
Std Err Dif	0.00352	DF	24
Upper CL Dif	0.00570	Prob > t	0.6615
Lower CL Dif	-0.00881	Prob > t	0.6692
Confidence	0.95	Prob < t	0.3308

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001495	0.000015	0.1965	0.6615
Error	24	0.00182556	0.000076		
C. Total	25	0.00184050			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.00218	0.17239	0.18139
Isolok - 12 mL - HF	10	0.175330	0.00276	0.16964	0.18102

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.009502	0.00238	0.17182	0.18195
Isolok - 12 mL - HF	10	0.175330	0.007236	0.00229	0.17015	0.18051

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00156	t Ratio	-0.4725
Std Err Dif	0.00330	DF	22.89686
Upper CL Dif	0.00527	Prob > t	0.6410
Lower CL Dif	-0.00838	Prob > t	0.6795
Confidence	0.95	Prob < t	0.3205

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0095021	0.0077923	0.0077923
Isolok - 12 mL - HF	10	0.0072357	0.0052280	0.0051196

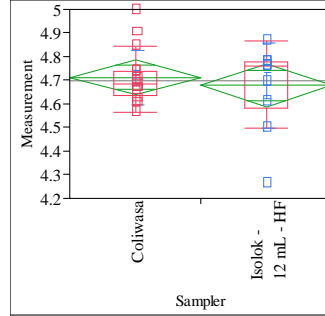
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8239	1	24	0.3731
Brown-Forsythe	1.6696	1	24	0.2086
Levene	1.6723	1	24	0.2083
Bartlett	0.7558	1	.	0.3846
F Test 2-sided	1.7246	15	9	0.4121

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2233	1	22.897	0.6410

t Test
0.4725

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Oneway Anova Summary of Fit

Rsquare	0.014359
Adj Rsquare	-0.02671
Root Mean Square Error	0.142255
Mean of Response	4.699118
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.03391	t Ratio	-0.5913
Std Err Dif	0.05734	DF	24
Upper CL Dif	0.08445	Prob > t	0.5598
Lower CL Dif	-0.15226	Prob > t	0.7201
Confidence	0.95	Prob < t	0.2799

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00707547	0.007075	0.3496	0.5598
Error	24	0.48567621	0.020237		
C. Total	25	0.49275169			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.71216	0.03556	4.6388	4.7856
Isolok - 12 mL - HF	10	4.67825	0.04499	4.5854	4.7711

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.71216	0.114698	0.02867	4.6510	4.7733
Isolok - 12 mL - HF	10	4.67825	0.178992	0.05660	4.5502	4.8063

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.03391	t Ratio	-0.5344
Std Err Dif	0.06345	DF	13.67201
Upper CL Dif	0.10249	Prob > t	0.6016
Lower CL Dif	-0.17030	Prob > t	0.6992
Confidence	0.95	Prob < t	0.3008

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1146979	0.0827521	0.0780426
Isolok - 12 mL - HF	10	0.1789916	0.1330492	0.1141037

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2645	1	24	0.2719
Brown-Forsythe	0.5725	1	24	0.4566
Levene	1.8767	1	24	0.1834
Bartlett	2.2238	1	.	0.1359
F Test 2-sided	2.4353	9	15	0.1229

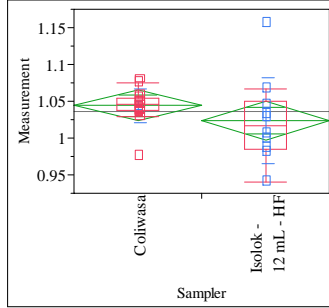
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2856	1	13.672	0.6016

t Test
0.5344

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=MgO (wt%), Targeted=1.014



**Oneway Anova
Summary of Fit**

Rsquare	0.061243
Adj Rsquare	0.022128
Root Mean Square Error	0.040314
Mean of Response	1.036182
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02033	t Ratio	-1.25129
Std Err Dif	0.01625	DF	24
Upper CL Dif	0.01321	Prob > t	0.2229
Lower CL Dif	-0.05388	Prob > t	0.8886
Confidence	0.95	Prob < t	0.1114

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00254467	0.002545	1.5657	0.2229
Error	24	0.03900552	0.001625		
C. Total	25	0.04155019			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.04400	0.01008	1.0232	1.0648
Isolok - 12 mL - HF	10	1.02367	0.01275	0.9974	1.0500

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.04400	0.023057	0.00576	1.0317	1.0563
Isolok - 12 mL - HF	10	1.02367	0.058719	0.01857	0.9817	1.0657

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02033	t Ratio	-1.04589
Std Err Dif	0.01944	DF	10.75834
Upper CL Dif	0.02258	Prob > t	0.3185
Lower CL Dif	-0.06325	Prob > t	0.8407
Confidence	0.95	Prob < t	0.1593

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0230575	0.0144972	0.0141992
Isolok - 12 mL - HF	10	0.0587185	0.0416233	0.0416233

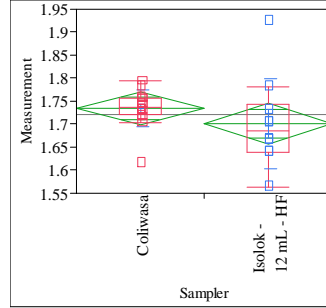
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.1553	1	24	0.0884
Brown-Forsythe	5.8296	1	24	0.0237
Levene	5.9328	1	24	0.0227
Bartlett	9.5587	1	.	0.0020
F Test 2-sided	6.4853	9	15	0.0017

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	1.0939	DFNum	1	DFDen	10.758	Prob > F	0.3185
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t Test
1.0459

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=MnO (wt%), Targeted=1.779



**Oneway Anova
Summary of Fit**

Rsquare	0.055664
Adj Rsquare	0.016317
Root Mean Square Error	0.067662
Mean of Response	1.721766
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.03244	t Ratio	-1.18941
Std Err Dif	0.02728	DF	24
Upper CL Dif	0.02385	Prob > t	0.2459
Lower CL Dif	-0.08873	Prob > t	0.8770
Confidence	0.95	Prob < t	0.1230

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00647658	0.006477	1.4147	0.2459
Error	24	0.10987456	0.004578		
C. Total	25	0.11635114			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.73424	0.01692	1.6993	1.7692
Isolok - 12 mL - HF	10	1.70180	0.02140	1.6576	1.7460

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.73424	0.039649	0.00991	1.7131	1.7554
Isolok - 12 mL - HF	10	1.70180	0.097920	0.03096	1.6318	1.7718

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.03244	t Ratio	-0.99781
Std Err Dif	0.03251	DF	10.8705
Upper CL Dif	0.03922	Prob > t	0.3401
Lower CL Dif	-0.10411	Prob > t	0.8300
Confidence	0.95	Prob < t	0.1700

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0396488	0.0250170	0.0250170
Isolok - 12 mL - HF	10	0.0979195	0.0671424	0.0671424

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.9464	1	24	0.0990
Brown-Forsythe	4.5429	1	24	0.0435
Levene	4.7844	1	24	0.0387
Bartlett	8.9734	1	.	0.0027
F Test 2-sided	6.0993	9	15	0.0023

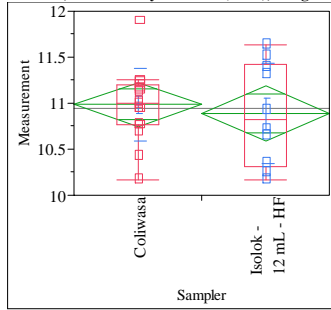
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.9956	DFNum	1	DFDen	10.87	Prob > F	0.3401
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t Test
0.9978

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Na2O (wt%), Targeted=11.659



**Oneway Anova
Summary of Fit**

Rsquare	0.011406
Adj Rsquare	-0.02979
Root Mean Square Error	0.45595
Mean of Response	10.94732
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.09672	t Ratio	-0.52622
Std Err Dif	0.18380	DF	24
Upper CL Dif	0.28262	Prob > t	0.6036
Lower CL Dif	-0.47606	Prob > t	0.6982
Confidence	0.95	Prob < t	0.3018

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0575666	0.057567	0.2769	0.6036
Error	24	4.9893769	0.207891		
C. Total	25	5.0469435			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.9845	0.11399	10.749	11.220
Isolok - 12 mL - HF	10	10.8878	0.14418	10.590	11.185

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.9845	0.390529	0.09763	10.776	11.193
Isolok - 12 mL - HF	10	10.8878	0.547894	0.17326	10.496	11.280

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.09672	t Ratio	-0.48633
Std Err Dif	0.19887	DF	14.73187
Upper CL Dif	0.32784	Prob > t	0.6339
Lower CL Dif	-0.52128	Prob > t	0.6831
Confidence	0.95	Prob < t	0.3169

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3905286	0.2731806	0.2729700
Isolok - 12 mL - HF	10	0.5478938	0.4650600	0.4650600

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.9068	1	24	0.1800
Brown-Forsythe	3.2300	1	24	0.0849
Levene	3.3308	1	24	0.0805
Bartlett	1.2818	1	.	0.2576
F Test 2-sided	1.9683	9	15	0.2367

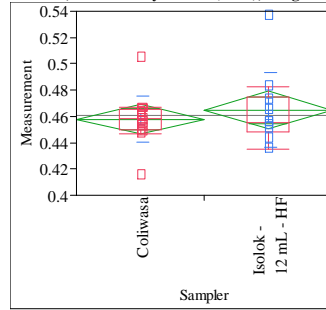
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.2365	1	14.732	0.6339

t Test

0.4863

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=NiO (wt%), Targeted=0.41



**Oneway Anova
Summary of Fit**

Rsquare	0.02436
Adj Rsquare	-0.01629
Root Mean Square Error	0.022224
Mean of Response	0.460449
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00694	t Ratio	0.774109
Std Err Dif	0.00896	DF	24
Upper CL Dif	0.02543	Prob > t	0.4464
Lower CL Dif	-0.01156	Prob > t	0.2232
Confidence	0.95	Prob < t	0.7768

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00029598	0.000296	0.5992	0.4464
Error	24	0.01185393	0.000494		
C. Total	25	0.01214990			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.457782	0.00556	0.44631	0.46925
Isolok - 12 mL - HF	10	0.464717	0.00703	0.45021	0.47922

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.457782	0.017494	0.00437	0.44846	0.46710
Isolok - 12 mL - HF	10	0.464717	0.028408	0.00898	0.44439	0.48504

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00694	t Ratio	0.694099
Std Err Dif	0.00999	DF	13.32268
Upper CL Dif	0.02847	Prob > t	0.4995
Lower CL Dif	-0.01460	Prob > t	0.2498
Confidence	0.95	Prob < t	0.7502

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0174940	0.0106572	0.0106572
Isolok - 12 mL - HF	10	0.0284084	0.0191893	0.0173060

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9801	1	24	0.3320
Brown-Forsythe	0.8283	1	24	0.3718
Levene	1.6920	1	24	0.2057
Bartlett	2.6408	1	.	0.1042
F Test 2-sided	2.6370	9	15	0.0936

Welch Anova testing Means Equal, allowing Std Devs Not Equal

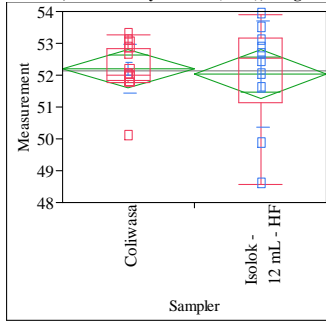
F Ratio	DFNum	DFDen	Prob > F
0.4818	1	13.323	0.4995

t Test

0.6941

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



**Oneway Anova
Summary of Fit**

Rsquare	0.005297
Adj Rsquare	-0.03615
Root Mean Square Error	1.187585
Mean of Response	52.1331
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.1711	t Ratio	-0.3575
Std Err Dif	0.4787	DF	24
Upper CL Dif	0.8169	Prob > t	0.7238
Lower CL Dif	-1.1592	Prob > t	0.6381
Confidence	0.95	Prob < t	0.3619

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.180248	0.18025	0.1278	0.7238
Error	24	33.848567	1.41036		
C. Total	25	34.028815			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	52.1989	0.29690	51.586	52.812
Isolok - 12 mL - HF	10	52.0278	0.37555	51.253	52.803

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	52.1989	0.77331	0.19333	51.787	52.611
Isolok - 12 mL - HF	10	52.0278	1.66261	0.52576	50.838	53.217

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.1711	t Ratio	-0.30552
Std Err Dif	0.5602	DF	11.47247
Upper CL Dif	1.0556	Prob > t	0.7654
Lower CL Dif	-1.3979	Prob > t	0.6173
Confidence	0.95	Prob < t	0.3827

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.773311	0.561566	0.534825
Isolok - 12 mL - HF	10	1.662609	1.232237	1.155222

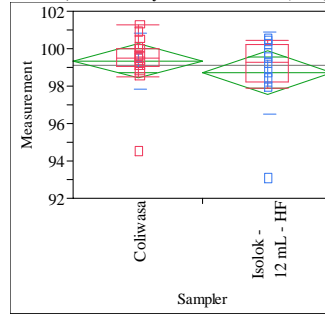
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.5451	1	24	0.0719
Brown-Forsythe	2.9794	1	24	0.0972
Levene	4.8780	1	24	0.0370
Bartlett	6.5178	1	.	0.0107
F Test 2-sided	4.6224	9	15	0.0092

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0933	1	11.472	0.7654

t Test
0.3055

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



**Oneway Anova
Summary of Fit**

Rsquare	0.031888
Adj Rsquare	-0.00845
Root Mean Square Error	1.791642
Mean of Response	99.10813
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.6421	t Ratio	-0.88911
Std Err Dif	0.7222	DF	24
Upper CL Dif	0.8485	Prob > t	0.3828
Lower CL Dif	-2.1328	Prob > t	0.8086
Confidence	0.95	Prob < t	0.1914

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.537563	2.53756	0.7905	0.3828
Error	24	77.039506	3.20998		
C. Total	25	79.577069			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.3551	0.44791	98.431	100.28
Isolok - 12 mL - HF	10	98.7130	0.56657	97.544	99.88

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.3551	1.50246	0.37562	98.555	100.16
Isolok - 12 mL - HF	10	98.7130	2.19035	0.69265	97.146	100.28

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.6421	t Ratio	-0.81497
Std Err Dif	0.7879	DF	14.32822
Upper CL Dif	1.0442	Prob > t	0.4284
Lower CL Dif	-2.3285	Prob > t	0.7858
Confidence	0.95	Prob < t	0.2142

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	1.502460	0.867592	0.845138
Isolok - 12 mL - HF	10	2.190350	1.389954	1.303639

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4916	1	24	0.4899
Brown-Forsythe	0.5932	1	24	0.4487
Levene	0.8823	1	24	0.3569
Bartlett	1.5919	1	.	0.2071
F Test 2-sided	2.1253	9	15	0.1892

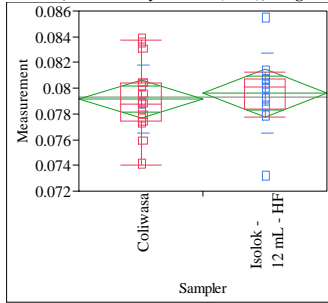
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6642	1	14.328	0.4284

t Test
0.8150

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



Oneway Anova Summary of Fit

Rsquare	0.007389
Adj Rsquare	-0.03397
Root Mean Square Error	0.002839
Mean of Response	0.079333
Observations (or Sum Wgts)	26

t Test

Iselok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00048	t Ratio	0.422678
Std Err Dif	0.00114	DF	24
Upper CL Dif	0.00285	Prob > t	0.6763
Lower CL Dif	-0.00188	Prob > t	0.3381
Confidence	0.95	Prob < t	0.6619

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000144	1.4399e-6	0.1787	0.6763
Error	24	0.00019343	8.0596e-6		
C. Total	25	0.00019487			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.079147	0.00071	0.07768	0.08061
Iselok - 12 mL - HF	10	0.079630	0.00090	0.07778	0.08148

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.079147	0.002672	0.00067	0.07772	0.08057
Iselok - 12 mL - HF	10	0.079630	0.003097	0.00098	0.07741	0.08185

t Test

Iselok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00048	t Ratio	0.408035
Std Err Dif	0.00119	DF	17.10328
Upper CL Dif	0.00298	Prob > t	0.6883
Lower CL Dif	-0.00202	Prob > t	0.3442
Confidence	0.95	Prob < t	0.6558

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0026723	0.0020746	0.0020225
Iselok - 12 mL - HF	10	0.0030969	0.0020216	0.0019682

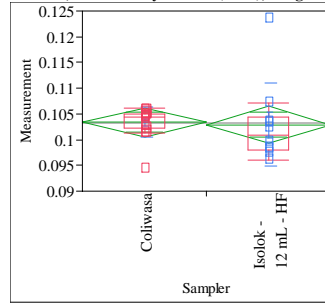
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1973	1	24	0.6609
Brown-Forsythe	0.0046	1	24	0.9464
Levene	0.0049	1	24	0.9445
Bartlett	0.2390	1	.	0.6249
F Test 2-sided	1.3430	9	15	0.5895

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1665	1	17.103	0.6883

t Test
0.4080

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



Oneway Anova Summary of Fit

Rsquare	0.001737
Adj Rsquare	-0.03986
Root Mean Square Error	0.005402
Mean of Response	0.103194
Observations (or Sum Wgts)	26

t Test

Iselok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00045	t Ratio	-0.20436
Std Err Dif	0.00218	DF	24
Upper CL Dif	0.00405	Prob > t	0.8398
Lower CL Dif	-0.00494	Prob > t	0.5801
Confidence	0.95	Prob < t	0.4199

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000122	1.219e-6	0.0418	0.8398
Error	24	0.00070038	0.000029		
C. Total	25	0.00070159			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.103365	0.00135	0.10058	0.10615
Iselok - 12 mL - HF	10	0.102920	0.00171	0.09939	0.10645

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.103365	0.002893	0.00072	0.10182	0.10491
Iselok - 12 mL - HF	10	0.102920	0.007992	0.00253	0.09720	0.10864

t Test

Iselok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00045	t Ratio	-0.16929
Std Err Dif	0.00263	DF	10.49182
Upper CL Dif	0.00538	Prob > t	0.8688
Lower CL Dif	-0.00627	Prob > t	0.5656
Confidence	0.95	Prob < t	0.4344

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0028926	0.0020111	0.0018205
Iselok - 12 mL - HF	10	0.0079921	0.0051485	0.0050290

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.0957	1	24	0.1606
Brown-Forsythe	3.3639	1	24	0.0791
Levene	3.9228	1	24	0.0592
Bartlett	11.1812	1	.	0.0008
F Test 2-sided	7.6339	9	15	0.0007

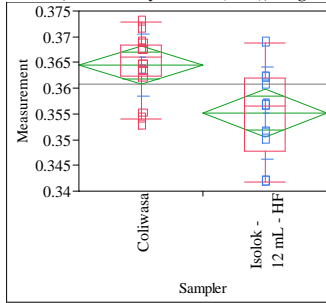
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0287	1	10.492	0.8688

t Test
0.1693

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Oneway Anova
Summary of Fit

Rsquare	0.299625
Adj Rsquare	0.270442
Root Mean Square Error	0.007229
Mean of Response	0.360871
Observations (or Sum Wgts)	26

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00934	t Ratio	-3.20427
Std Err Dif	0.00291	DF	24
Upper CL Dif	-0.00332	Prob > t	0.0038
Lower CL Dif	-0.01535	Prob > t	0.9981
Confidence	0.95	Prob < t	0.0019

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00053654	0.000537	10.2673	0.0038
Error	24	0.00125416	0.000052		
C. Total	25	0.00179069			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.364463	0.00181	0.36073	0.36819
Isolok - 12 mL - HF	10	0.355125	0.00229	0.35041	0.35984

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.364463	0.005985	0.00150	0.36127	0.36765
Isolok - 12 mL - HF	10	0.355125	0.008925	0.00282	0.34874	0.36151

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00934	t Ratio	-2.92305
Std Err Dif	0.00319	DF	14.10102
Upper CL Dif	-0.00249	Prob > t	0.0111
Lower CL Dif	-0.01618	Prob > t	0.9945
Confidence	0.95	Prob < t	0.0055

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0059847	0.0045378	0.0044745
Isolok - 12 mL - HF	10	0.0089251	0.0071863	0.0068891

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5494	1	24	0.1234
Brown-Forsythe	1.6481	1	24	0.2115
Levene	2.5374	1	24	0.1243
Bartlett	1.7910	1	.	0.1808
F Test 2-sided	2.2240	9	15	0.1647

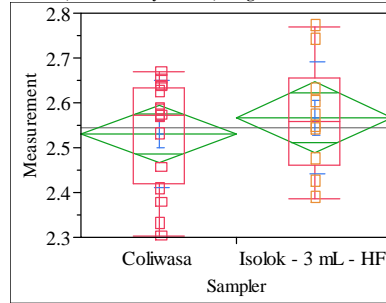
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.5442	1	14.101	0.0111

t Test

2.9231

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Al/B, Targeted=2.552



Oneway Anova
Summary of Fit

Rsquare	0.022429
Adj Rsquare	-0.0183
Root Mean Square Error	0.121243
Mean of Response	2.544463
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.03627	t Ratio	0.742058
Std Err Dif	0.04887	DF	24
Upper CL Dif	0.13714	Prob > t	0.4653
Lower CL Dif	-0.06460	Prob > t	0.2326
Confidence	0.95	Prob < t	0.7674

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00809454	0.008095	0.5506	0.4653
Error	24	0.35279941	0.014700		
C. Total	25	0.36089394			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.53051	0.03031	2.4680	2.5931
Isolok - 3 mL - HF	10	2.56678	0.03834	2.4877	2.6459

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.53051	0.119374	0.02984	2.4669	2.5941
Isolok - 3 mL - HF	10	2.56678	0.124297	0.03931	2.4779	2.6557

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.03627	t Ratio	0.734884
Std Err Dif	0.04935	DF	18.64884
Upper CL Dif	0.13969	Prob > t	0.4716
Lower CL Dif	-0.06716	Prob > t	0.2358
Confidence	0.95	Prob < t	0.7642

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1193736	0.0982936	0.0887329
Isolok - 3 mL - HF	10	0.1242974	0.0938973	0.0938973

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0294	1	24	0.8654
Brown-Forsythe	0.0237	1	24	0.8790
Levene	0.0259	1	24	0.8734
Bartlett	0.0177	1	.	0.8942
F Test 2-sided	1.0842	9	15	0.8545

Welch Anova testing Means Equal, allowing Std Devs Not Equal

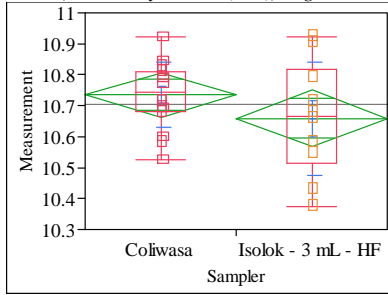
F Ratio	DFNum	DFDen	Prob > F
0.5401	1	18.649	0.4716

t Test

0.7349

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



Oneway Anova
Summary of Fit

Rsquare	0.070589
Adj Rsquare	0.031864
Root Mean Square Error	0.139738
Mean of Response	10.70547
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.07605	t Ratio	-1.35011
Std Err Dif	0.05633	DF	24
Upper CL Dif	0.04021	Prob > t	0.1896
Lower CL Dif	-0.19231	Prob > t	0.9052
Confidence	0.95	Prob < t	0.0948

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.03559362	0.035594	1.8228	0.1896
Error	24	0.46864365	0.019527		
C. Total	25	0.50423727			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.7347	0.03493	10.663	10.807
Isolok - 3 mL - HF	10	10.6587	0.04419	10.567	10.750

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.7347	0.105514	0.02638	10.678	10.791
Isolok - 3 mL - HF	10	10.6587	0.183075	0.05789	10.528	10.790

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.07605	t Ratio	-1.19542
Std Err Dif	0.06362	DF	12.79396
Upper CL Dif	0.06161	Prob > t	0.2536
Lower CL Dif	-0.21372	Prob > t	0.8732
Confidence	0.95	Prob < t	0.1268

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1055135	0.0850275	0.0850275
Isolok - 3 mL - HF	10	0.1830747	0.1417125	0.1417125

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	4.6753	1	24	0.0408
Brown-Forsythe	3.0912	1	24	0.0915
Levene	3.1192	1	24	0.0901
Bartlett	3.4110	1	.	0.0648
F Test 2-sided	3.0105	9	15	0.0576

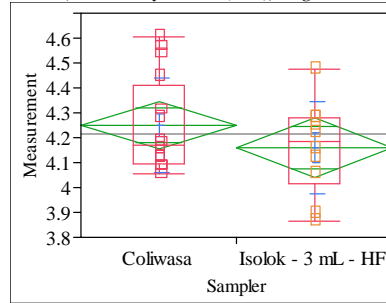
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.4290	1	12.794	0.2536

t Test

1.1954

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



Oneway Anova
Summary of Fit

Rsquare	0.05611
Adj Rsquare	0.016781
Root Mean Square Error	0.187244
Mean of Response	4.215592
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.09016	t Ratio	-1.19444
Std Err Dif	0.07548	DF	24
Upper CL Dif	0.06563	Prob > t	0.2440
Lower CL Dif	-0.24594	Prob > t	0.8780
Confidence	0.95	Prob < t	0.1220

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.05002044	0.050020	1.4267	0.2440
Error	24	0.84144708	0.035060		
C. Total	25	0.89146751			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.25027	0.04681	4.1537	4.3469
Isolok - 3 mL - HF	10	4.16011	0.05921	4.0379	4.2823

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.25027	0.188119	0.04703	4.1500	4.3505
Isolok - 3 mL - HF	10	4.16011	0.185777	0.05875	4.0272	4.2930

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.09016	t Ratio	-1.19805
Std Err Dif	0.07525	DF	19.44104
Upper CL Dif	0.06711	Prob > t	0.2453
Lower CL Dif	-0.24742	Prob > t	0.8773
Confidence	0.95	Prob < t	0.1227

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1881186	0.1569701	0.1408706
Isolok - 3 mL - HF	10	0.1857770	0.1416756	0.1416756

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0025	1	24	0.9604
Brown-Forsythe	0.0002	1	24	0.9883
Levene	0.1402	1	24	0.7114
Bartlett	0.0017	1	.	0.9673
F Test 2-sided	1.0254	15	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

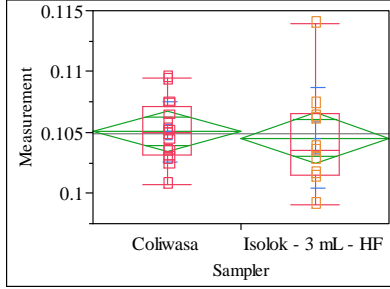
F Ratio	DFNum	DFDen	Prob > F
1.4353	1	19.441	0.2453

t Test

1.1980

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=BaO (wt%), Targeted=0.0919



**Oneway Anova
Summary of Fit**

Rsquare	0.007096
Adj Rsquare	-0.03428
Root Mean Square Error	0.00321
Mean of Response	0.104857
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00054	t Ratio	-0.41415
Std Err Dif	0.00129	DF	24
Upper CL Dif	0.00213	Prob > t	0.6824
Lower CL Dif	-0.00321	Prob > t	0.6588
Confidence	0.95	Prob < t	0.3412

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000177	1.767e-6	0.1715	0.6824
Error	24	0.00024731	0.000010		
C. Total	25	0.00024908			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.105063	0.00080	0.10341	0.10672
Isolok - 3 mL - HF	10	0.104527	0.00102	0.10243	0.10662

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.105063	0.002477	0.00062	0.10374	0.10638
Isolok - 3 mL - HF	10	0.104527	0.004154	0.00131	0.10156	0.10750

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00054	t Ratio	-0.36905
Std Err Dif	0.00145	DF	13.05913
Upper CL Dif	0.00260	Prob > t	0.7180
Lower CL Dif	-0.00367	Prob > t	0.6410
Confidence	0.95	Prob < t	0.3590

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0024772	0.0019399	0.0019399
Isolok - 3 mL - HF	10	0.0041536	0.0030860	0.0029252

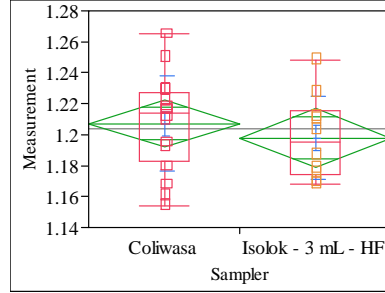
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8585	1	24	0.1855
Brown-Forsythe	1.2916	1	24	0.2670
Levene	2.1117	1	24	0.1591
Bartlett	3.0014	1	.	0.0832
F Test 2-sided	2.8114	9	15	0.0744

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1362	1	13.059	0.7180

t Test
0.3691

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=CaO (wt%), Targeted=1.1462



**Oneway Anova
Summary of Fit**

Rsquare	0.02511
Adj Rsquare	-0.01551
Root Mean Square Error	0.029358
Mean of Response	1.203581
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00930	t Ratio	-0.78623
Std Err Dif	0.01183	DF	24
Upper CL Dif	0.01512	Prob > t	0.4394
Lower CL Dif	-0.03373	Prob > t	0.7803
Confidence	0.95	Prob < t	0.2197

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00053278	0.000533	0.6182	0.4394
Error	24	0.02068550	0.000862		
C. Total	25	0.02121829			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.20716	0.00734	1.1920	1.2223
Isolok - 3 mL - HF	10	1.19786	0.00928	1.1787	1.2170

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.20716	0.030814	0.00770	1.1907	1.2236
Isolok - 3 mL - HF	10	1.19786	0.026756	0.00846	1.1787	1.2170

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00930	t Ratio	-0.81317
Std Err Dif	0.01144	DF	21.31708
Upper CL Dif	0.01447	Prob > t	0.4251
Lower CL Dif	-0.03308	Prob > t	0.7874
Confidence	0.95	Prob < t	0.2126

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0308142	0.0242237	0.0234366
Isolok - 3 mL - HF	10	0.0267557	0.0222473	0.0222473

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2834	1	24	0.5994
Brown-Forsythe	0.0270	1	24	0.8709
Levene	0.0909	1	24	0.7657
Bartlett	0.2091	1	.	0.6475
F Test 2-sided	1.3264	15	9	0.6837

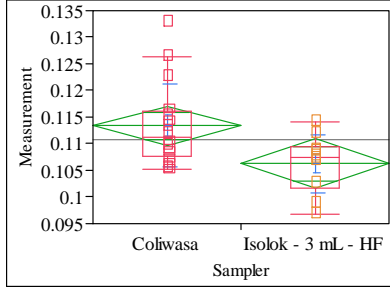
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6612	1	21.317	0.4251

t Test
0.8132

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



Oneway Anova
Summary of Fit

Rsquare	0.20697
Adj Rsquare	0.173927
Root Mean Square Error	0.007046
Mean of Response	0.110677
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00711	t Ratio	-2.50273
Std Err Dif	0.00284	DF	24
Upper CL Dif	-0.00125	Prob > t	0.0195
Lower CL Dif	-0.01297	Prob > t	0.9902
Confidence	0.95	Prob < t	0.0098

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00031099	0.000311	6.2637	0.0195
Error	24	0.00119159	0.000050		
C. Total	25	0.00150258			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.113411	0.00176	0.10978	0.11705
Isolok - 3 mL - HF	10	0.106302	0.00223	0.10170	0.11090

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.113411	0.007854	0.00196	0.10923	0.11760
Isolok - 3 mL - HF	10	0.106302	0.005441	0.00172	0.10241	0.11019

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00711	t Ratio	-2.72313
Std Err Dif	0.00261	DF	23.64485
Upper CL Dif	-0.00172	Prob > t	0.0120
Lower CL Dif	-0.01250	Prob > t	0.9940
Confidence	0.95	Prob < t	0.0060

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0078537	0.0058898	0.0056728
Isolok - 3 mL - HF	10	0.0054405	0.0041480	0.0039025

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8621	1	24	0.3624
Brown-Forsythe	0.7547	1	24	0.3936
Levene	0.9646	1	24	0.3358
Bartlett	1.3399	1	.	0.2471
F Test 2-sided	2.0838	15	9	0.2675

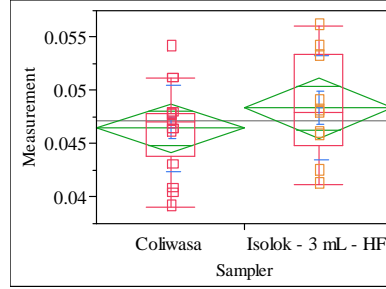
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.4154	1	23.645	0.0120

t Test

2.7231

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=CuO (wt%), Targeted=0.0504



Oneway Anova
Summary of Fit

Rsquare	0.044702
Adj Rsquare	0.004898
Root Mean Square Error	0.004381
Mean of Response	0.047193
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00187	t Ratio	1.059744
Std Err Dif	0.00177	DF	24
Upper CL Dif	0.00552	Prob > t	0.2998
Lower CL Dif	-0.00177	Prob > t	0.1499
Confidence	0.95	Prob < t	0.8501

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002155	0.000022	1.1231	0.2998
Error	24	0.00046058	0.000019		
C. Total	25	0.00048214			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.046473	0.00110	0.04421	0.04873
Isolok - 3 mL - HF	10	0.048345	0.00139	0.04549	0.05120

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.046473	0.004038	0.00101	0.04432	0.04862
Isolok - 3 mL - HF	10	0.048345	0.004899	0.00155	0.04484	0.05185

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00187	t Ratio	1.012072
Std Err Dif	0.00185	DF	16.48161
Upper CL Dif	0.00578	Prob > t	0.3261
Lower CL Dif	-0.00204	Prob > t	0.1631
Confidence	0.95	Prob < t	0.8369

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0040378	0.0028752	0.0028322
Isolok - 3 mL - HF	10	0.0048992	0.0037854	0.0037304

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.6372	1	24	0.4326
Brown-Forsythe	0.5981	1	24	0.4469
Levene	0.6614	1	24	0.4241
Bartlett	0.4132	1	.	0.5204
F Test 2-sided	1.4722	9	15	0.4880

Welch Anova testing Means Equal, allowing Std Devs Not Equal

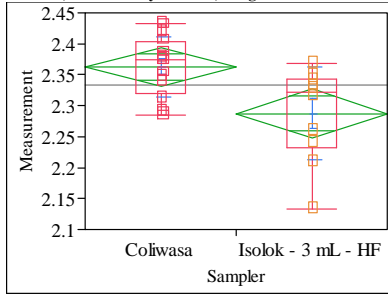
F Ratio	DFNum	DFDen	Prob > F
1.0243	1	16.482	0.3261

t Test

1.0121

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Fe/Li, Targeted=2.452



**Oneway Anova
Summary of Fit**

Rsquare	0.288382
Adj Rsquare	0.258731
Root Mean Square Error	0.059952
Mean of Response	2.333927
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.07537	t Ratio	-3.11865
Std Err Dif	0.02417	DF	24
Upper CL Dif	-0.02549	Prob > t	0.0047
Lower CL Dif	-0.12525	Prob > t	0.9977
Confidence	0.95	Prob < t	0.0023

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.03495708	0.034957	9.7260	0.0047
Error	24	0.08626084	0.003594		
C. Total	25	0.12121793			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.36292	0.01499	2.3320	2.3938
Isolok - 3 mL - HF	10	2.28755	0.01896	2.2484	2.3267

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.36292	0.048968	0.01224	2.3368	2.3890
Isolok - 3 mL - HF	10	2.28755	0.074754	0.02364	2.2341	2.3410

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.07537	t Ratio	-2.83119
Std Err Dif	0.02662	DF	13.87578
Upper CL Dif	-0.01822	Prob > t	0.0134
Lower CL Dif	-0.13251	Prob > t	0.9933
Confidence	0.95	Prob < t	0.0067

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0489676	0.0400536	0.0385259
Isolok - 3 mL - HF	10	0.0747540	0.0614696	0.0559009

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.1940	1	24	0.1516
Brown-Forsythe	0.9895	1	24	0.3298
Levene	2.9701	1	24	0.0977
Bartlett	2.0083	1	.	0.1564
F Test 2-sided	2.3305	9	15	0.1420

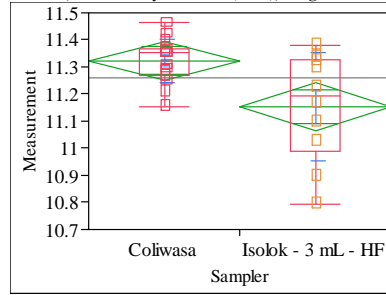
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.0156	1	13.876	0.0134

t Test

2.8312

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



**Oneway Anova
Summary of Fit**

Rsquare	0.284765
Adj Rsquare	0.254963
Root Mean Square Error	0.137251
Mean of Response	11.25834
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.17103	t Ratio	-3.09118
Std Err Dif	0.05533	DF	24
Upper CL Dif	-0.05684	Prob > t	0.0050
Lower CL Dif	-0.28522	Prob > t	0.9975
Confidence	0.95	Prob < t	0.0025

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.18000326	0.180003	9.5554	0.0050
Error	24	0.45210889	0.018838		
C. Total	25	0.63211215			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3241	0.03431	11.253	11.395
Isolok - 3 mL - HF	10	11.1531	0.04340	11.064	11.243

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3241	0.080109	0.02003	11.281	11.367
Isolok - 3 mL - HF	10	11.1531	0.198843	0.06288	11.011	11.295

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.17103	t Ratio	-2.59164
Std Err Dif	0.06599	DF	10.85158
Upper CL Dif	-0.02554	Prob > t	0.0253
Lower CL Dif	-0.31652	Prob > t	0.9873
Confidence	0.95	Prob < t	0.0127

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0801089	0.0633312	0.0598687
Isolok - 3 mL - HF	10	0.1988431	0.1612702	0.1586967

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	7.8949	1	24	0.0097
Brown-Forsythe	8.3681	1	24	0.0080
Levene	11.0803	1	24	0.0028
Bartlett	9.0686	1	.	0.0026
F Test 2-sided	6.1611	9	15	0.0022

Welch Anova testing Means Equal, allowing Std Devs Not Equal

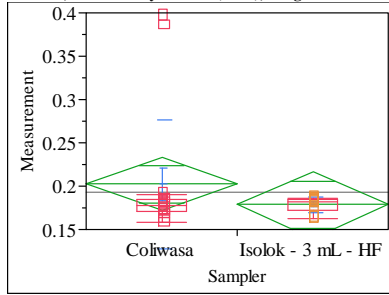
F Ratio	DFNum	DFDen	Prob > F
6.7166	1	10.852	0.0253

t Test

2.5916

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Oneway Anova
Summary of Fit

Rsquare	0.039824
Adj Rsquare	-0.00018
Root Mean Square Error	0.059022
Mean of Response	0.19313
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02374	t Ratio	-0.99771
Std Err Dif	0.02379	DF	24
Upper CL Dif	0.02537	Prob > t	0.3284
Lower CL Dif	-0.07284	Prob > t	0.8358
Confidence	0.95	Prob < t	0.1642

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00346769	0.003468	0.9954	0.3284
Error	24	0.08360682	0.003484		
C. Total	25	0.08707451			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.202260	0.01476	0.17181	0.23271
Isolok - 3 mL - HF	10	0.178522	0.01866	0.14000	0.21704

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.202260	0.074349	0.01859	0.16264	0.24188
Isolok - 3 mL - HF	10	0.178522	0.008757	0.00277	0.17226	0.18479

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02374	t Ratio	-1.26318
Std Err Dif	0.01879	DF	15.66038
Upper CL Dif	0.01617	Prob > t	0.2250
Lower CL Dif	-0.06365	Prob > t	0.8875
Confidence	0.95	Prob < t	0.1125

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0743490	0.0473088	0.0331641
Isolok - 3 mL - HF	10	0.0087567	0.0068903	0.0057821

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.6667	1	24	0.2090
Brown-Forsythe	1.4713	1	24	0.2369
Levene	5.0986	1	24	0.0333
Bartlett	26.2298	1	.	<.0001
F Test 2-sided	72.0884	15	9	<.0001

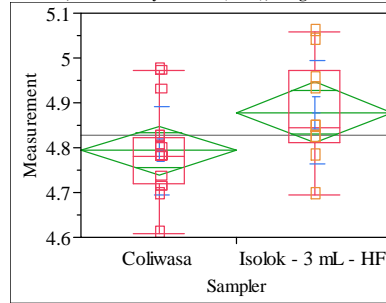
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.5956	1	15.66	0.2250

t Test

1.2632

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Oneway Anova
Summary of Fit

Rsquare	0.141435
Adj Rsquare	0.105661
Root Mean Square Error	0.105088
Mean of Response	4.826636
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.08423	t Ratio	1.988369
Std Err Dif	0.04236	DF	24
Upper CL Dif	0.17166	Prob > t	0.0583
Lower CL Dif	-0.00320	Prob > t	0.0291
Confidence	0.95	Prob < t	0.9709

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.04366194	0.043662	3.9536	0.0583
Error	24	0.26504545	0.011044		
C. Total	25	0.30870739			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.79424	0.02627	4.7400	4.8485
Isolok - 3 mL - HF	10	4.87847	0.03323	4.8099	4.9471

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.79424	0.098727	0.02468	4.7416	4.8468
Isolok - 3 mL - HF	10	4.87847	0.114911	0.03634	4.7963	4.9607

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.08423	t Ratio	1.917521
Std Err Dif	0.04393	DF	17.04329
Upper CL Dif	0.17689	Prob > t	0.0721
Lower CL Dif	-0.00843	Prob > t	0.0360
Confidence	0.95	Prob < t	0.9640

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0987268	0.0704738	0.0686237
Isolok - 3 mL - HF	10	0.1149110	0.0930053	0.0861160

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3334	1	24	0.5690
Brown-Forsythe	0.3452	1	24	0.5623
Levene	0.7567	1	24	0.3930
Bartlett	0.2534	1	.	0.6147
F Test 2-sided	1.3547	9	15	0.5795

Welch Anova testing Means Equal, allowing Std Devs Not Equal

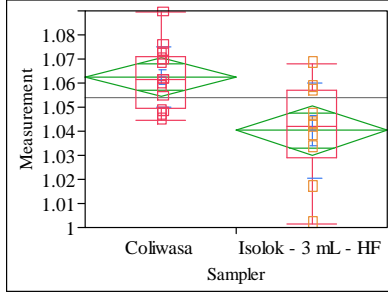
F Ratio	DFNum	DFDen	Prob > F
3.6769	1	17.043	0.0721

t Test

1.9175

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=MgO (wt%), Targeted=1.014



Oneway Anova
Summary of Fit

Rsquare	0.342687
Adj Rsquare	0.315299
Root Mean Square Error	0.015569
Mean of Response	1.053913
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.02220	t Ratio	-3.53727
Std Err Dif	0.00628	DF	24
Upper CL Dif	-0.00925	Prob > t	0.0017
Lower CL Dif	-0.03515	Prob > t	0.9992
Confidence	0.95	Prob < t	0.0008

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00303300	0.003033	12.5123	0.0017
Error	24	0.00581764	0.000242		
C. Total	25	0.00885064			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.06245	0.00389	1.0544	1.0705
Isolok - 3 mL - HF	10	1.04025	0.00492	1.0301	1.0504

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.06245	0.012435	0.00311	1.0558	1.0691
Isolok - 3 mL - HF	10	1.04025	0.019715	0.00623	1.0261	1.0544

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.02220	t Ratio	-3.18671
Std Err Dif	0.00697	DF	13.52996
Upper CL Dif	-0.00721	Prob > t	0.0068
Lower CL Dif	-0.03719	Prob > t	0.9966
Confidence	0.95	Prob < t	0.0034

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0124349	0.0099887	0.0098462
Isolok - 3 mL - HF	10	0.0197153	0.0143277	0.0140956

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.2941	1	24	0.1429
Brown-Forsythe	1.1397	1	24	0.2963
Levene	1.2823	1	24	0.2687
Bartlett	2.3857	1	.	0.1225
F Test 2-sided	2.5137	9	15	0.1105

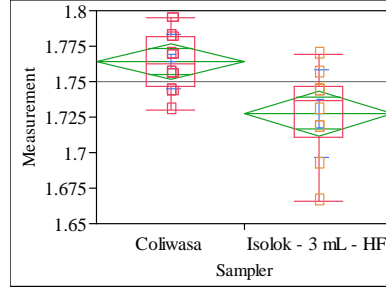
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.1551	1	13.53	0.0068

t Test

3.1867

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=MnO (wt%), Targeted=1.779



Oneway Anova
Summary of Fit

Rsquare	0.365246
Adj Rsquare	0.338798
Root Mean Square Error	0.024349
Mean of Response	1.750073
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.03648	t Ratio	-3.71617
Std Err Dif	0.00982	DF	24
Upper CL Dif	-0.01622	Prob > t	0.0011
Lower CL Dif	-0.05673	Prob > t	0.9995
Confidence	0.95	Prob < t	0.0005

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00818786	0.008188	13.8099	0.0011
Error	24	0.01422953	0.000593		
C. Total	25	0.02241739			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.76410	0.00609	1.7515	1.7767
Isolok - 3 mL - HF	10	1.72763	0.00770	1.7117	1.7435

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.76410	0.019368	0.00484	1.7538	1.7744
Isolok - 3 mL - HF	10	1.72763	0.030917	0.00978	1.7055	1.7497

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.03648	t Ratio	-3.34335
Std Err Dif	0.01091	DF	13.47019
Upper CL Dif	-0.01299	Prob > t	0.0051
Lower CL Dif	-0.05996	Prob > t	0.9975
Confidence	0.95	Prob < t	0.0025

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0193680	0.0161400	0.0161400
Isolok - 3 mL - HF	10	0.0309170	0.0237581	0.0232416

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4509	1	24	0.1306
Brown-Forsythe	1.3498	1	24	0.2567
Levene	1.9405	1	24	0.1764
Bartlett	2.4569	1	.	0.1170
F Test 2-sided	2.5481	9	15	0.1055

Welch Anova testing Means Equal, allowing Std Devs Not Equal

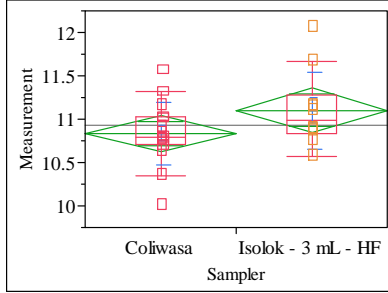
F Ratio	DFNum	DFDen	Prob > F
11.1780	1	13.47	0.0051

t Test

3.3434

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Oneway Anova
Summary of Fit

Rsquare	0.106943
Adj Rsquare	0.069732
Root Mean Square Error	0.394751
Mean of Response	10.93746
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.26977	t Ratio	1.69528
Std Err Dif	0.15913	DF	24
Upper CL Dif	0.59820	Prob > t	0.1030
Lower CL Dif	-0.05866	Prob > t	0.0515
Confidence	0.95	Prob < t	0.9485

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.4478464	0.447846	2.8740	0.1030
Error	24	3.7398794	0.155828		
C. Total	25	4.1877258			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.8337	0.09869	10.630	11.037
Isolok - 3 mL - HF	10	11.1035	0.12483	10.846	11.361

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.8337	0.361529	0.09038	10.641	11.026
Isolok - 3 mL - HF	10	11.1035	0.444638	0.14061	10.785	11.422

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.26977	t Ratio	1.613927
Std Err Dif	0.16715	DF	16.30392
Upper CL Dif	0.62358	Prob > t	0.1257
Lower CL Dif	-0.08404	Prob > t	0.0629
Confidence	0.95	Prob < t	0.9371

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3615294	0.2480109	0.2451675
Isolok - 3 mL - HF	10	0.4446380	0.3159712	0.3140840

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.3768	1	24	0.5451
Brown-Forsythe	0.3625	1	24	0.5527
Levene	0.3882	1	24	0.5391
Bartlett	0.4738	1	.	0.4913
F Test 2-sided	1.5126	9	15	0.4599

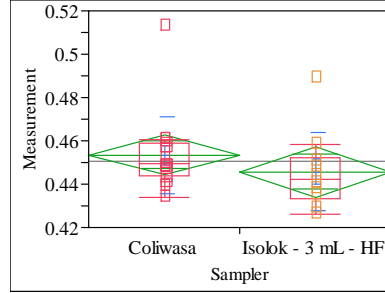
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.6048	1	16.304	0.1257

t Test

1.6139

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=NiO (wt%), Targeted=0.41



Oneway Anova
Summary of Fit

Rsquare	0.046152
Adj Rsquare	0.006408
Root Mean Square Error	0.017796
Mean of Response	0.450514
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00773	t Ratio	-1.07761
Std Err Dif	0.00717	DF	24
Upper CL Dif	0.00708	Prob > t	0.2919
Lower CL Dif	-0.02254	Prob > t	0.8540
Confidence	0.95	Prob < t	0.1460

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00036775	0.000368	1.1612	0.2919
Error	24	0.00760055	0.000317		
C. Total	25	0.00796830			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.453487	0.00445	0.44431	0.46267
Isolok - 3 mL - HF	10	0.445757	0.00563	0.43414	0.45737

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.453487	0.017717	0.00443	0.44405	0.46293
Isolok - 3 mL - HF	10	0.445757	0.017926	0.00567	0.43293	0.45858

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00773	t Ratio	-1.07457
Std Err Dif	0.00719	DF	19.07717
Upper CL Dif	0.00732	Prob > t	0.2960
Lower CL Dif	-0.02278	Prob > t	0.8520
Confidence	0.95	Prob < t	0.1480

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0177170	0.0107765	0.0100209
Isolok - 3 mL - HF	10	0.0179262	0.0124196	0.0120888

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0005	1	24	0.9830
Brown-Forsythe	0.1275	1	24	0.7242
Levene	0.0949	1	24	0.7606
Bartlett	0.0015	1	.	0.9692
F Test 2-sided	1.0238	9	15	0.9292

Welch Anova testing Means Equal, allowing Std Devs Not Equal

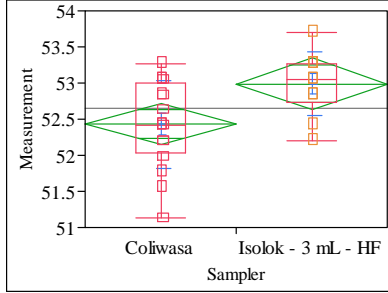
F Ratio	DFNum	DFDen	Prob > F
1.1547	1	19.077	0.2960

t Test

1.0746

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Oneway Anova
Summary of Fit

Rsquare	0.214208
Adj Rsquare	0.181467
Root Mean Square Error	0.547227
Mean of Response	52.64324
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.56424	t Ratio	2.557818
Std Err Dif	0.22059	DF	24
Upper CL Dif	1.01952	Prob > t	0.0173
Lower CL Dif	0.10896	Prob > t	0.0086
Confidence	0.95	Prob < t	0.9914

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.9591828	1.95918	6.5424	0.0173
Error	24	7.1869853	0.29946		
C. Total	25	9.1461681			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	52.4262	0.13681	52.144	52.709
Isolok - 3 mL - HF	10	52.9905	0.17305	52.633	53.348

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	52.4262	0.602401	0.15060	52.105	52.747
Isolok - 3 mL - HF	10	52.9905	0.440162	0.13919	52.676	53.305

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.564240	t Ratio	2.75142
Std Err Dif	0.205072	DF	23.2709
Upper CL Dif	0.988192	Prob > t	0.0113
Lower CL Dif	0.140289	Prob > t	0.0056
Confidence	0.95	Prob < t	0.9944

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.6024007	0.4696432	0.4679719
Isolok - 3 mL - HF	10	0.4401624	0.3337308	0.3208950

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0362	1	24	0.3189
Brown-Forsythe	1.1844	1	24	0.2873
Levene	1.0723	1	24	0.3107
Bartlett	0.9922	1	.	0.3192
F Test 2-sided	1.8730	15	9	0.3436

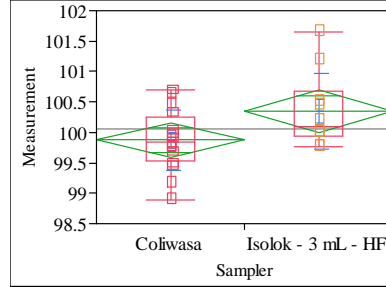
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.5703	1	23.271	0.0113

t Test

2.7514

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Oneway Anova
Summary of Fit

Rsquare	0.163684
Adj Rsquare	0.128837
Root Mean Square Error	0.547657
Mean of Response	100.055
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.478475	t Ratio	2.167321
Std Err Dif	0.220768	DF	24
Upper CL Dif	0.934117	Prob > t	0.0404
Lower CL Dif	0.022832	Prob > t	0.0202
Confidence	0.95	Prob < t	0.9798

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.4088494	1.40885	4.6973	0.0404
Error	24	7.1982882	0.29993		
C. Total	25	8.6071376			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.871	0.13691	99.588	100.15
Isolok - 3 mL - HF	10	100.349	0.17318	99.992	100.71

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.871	0.496642	0.12416	99.606	100.14
Isolok - 3 mL - HF	10	100.349	0.623475	0.19716	99.903	100.80

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.47847	t Ratio	2.05356
Std Err Dif	0.23300	DF	16.04025
Upper CL Dif	0.97231	Prob > t	0.0567
Lower CL Dif	-0.01536	Prob > t	0.0283
Confidence	0.95	Prob < t	0.9717

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4966421	0.3719066	0.3719066
Isolok - 3 mL - HF	10	0.6234748	0.4750573	0.4452841

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5962	1	24	0.4476
Brown-Forsythe	0.2194	1	24	0.6438
Levene	0.5759	1	24	0.4553
Bartlett	0.5735	1	.	0.4489
F Test 2-sided	1.5760	9	15	0.4190

Welch Anova testing Means Equal, allowing Std Devs Not Equal

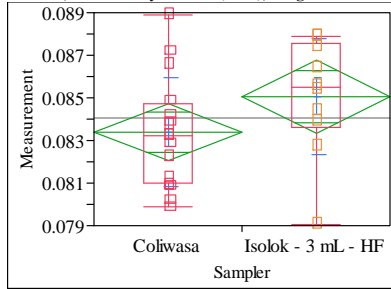
F Ratio	DFNum	DFDen	Prob > F
4.2171	1	16.04	0.0567

t Test

2.0536

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



**Oneway Anova
Summary of Fit**

Rsquare	0.094266
Adj Rsquare	0.056527
Root Mean Square Error	0.002634
Mean of Response	0.084035
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00168	t Ratio	1.580456
Std Err Dif	0.00106	DF	24
Upper CL Dif	0.00387	Prob > t	0.1271
Lower CL Dif	-0.00051	Prob > t	0.0635
Confidence	0.95	Prob < t	0.9365

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001734	0.000017	2.4978	0.1271
Error	24	0.00016657	6.94e-6		
C. Total	25	0.00018391			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.083390	0.00066	0.08203	0.08475
Isolok - 3 mL - HF	10	0.085068	0.00083	0.08335	0.08679

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.083390	0.002576	0.00064	0.08202	0.08476
Isolok - 3 mL - HF	10	0.085068	0.002728	0.00086	0.08312	0.08702

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00168	t Ratio	1.558855
Std Err Dif	0.00108	DF	18.39883
Upper CL Dif	0.00394	Prob > t	0.1361
Lower CL Dif	-0.00058	Prob > t	0.0680
Confidence	0.95	Prob < t	0.9320

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0025765	0.0019690	0.0019495
Isolok - 3 mL - HF	10	0.0027284	0.0020350	0.0019682

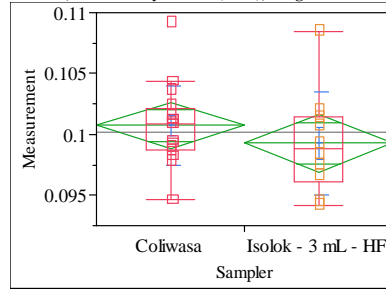
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0361	1	24	0.8509
Brown-Forsythe	0.0008	1	24	0.9783
Levene	0.0102	1	24	0.9205
Bartlett	0.0356	1	.	0.8503
F Test 2-sided	1.1214	9	15	0.8110

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.4300	1	18.399	0.1361

t Test
1.5589

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



**Oneway Anova
Summary of Fit**

Rsquare	0.040801
Adj Rsquare	0.000835
Root Mean Square Error	0.003641
Mean of Response	0.100173
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00148	t Ratio	-1.01039
Std Err Dif	0.00147	DF	24
Upper CL Dif	0.00155	Prob > t	0.3224
Lower CL Dif	-0.00451	Prob > t	0.8388
Confidence	0.95	Prob < t	0.1612

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001353	0.000014	1.0209	0.3224
Error	24	0.00031812	0.000013		
C. Total	25	0.00033165			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.100743	0.00091	0.09886	0.10262
Isolok - 3 mL - HF	10	0.099260	0.00115	0.09688	0.10164

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.100743	0.003266	0.00082	0.09900	0.10248
Isolok - 3 mL - HF	10	0.099260	0.004191	0.00133	0.09626	0.10226

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00148	t Ratio	-0.95257
Std Err Dif	0.00156	DF	15.76646
Upper CL Dif	0.00182	Prob > t	0.3552
Lower CL Dif	-0.00479	Prob > t	0.8224
Confidence	0.95	Prob < t	0.1776

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0032663	0.0022902	0.0022795
Isolok - 3 mL - HF	10	0.0041911	0.0030722	0.0030622

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.4795	1	24	0.4953
Brown-Forsythe	0.6297	1	24	0.4352
Levene	0.6459	1	24	0.4295
Bartlett	0.6906	1	.	0.4060
F Test 2-sided	1.6465	9	15	0.3779

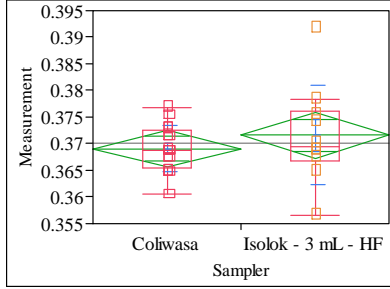
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9074	1	15.766	0.3552

t Test
0.9526

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



**Oneway Anova
Summary of Fit**

Rsquare	0.035163
Adj Rsquare	-0.00504
Root Mean Square Error	0.006628
Mean of Response	0.370067
Observations (or Sum Wgts)	26

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00250	t Ratio	0.935243
Std Err Dif	0.00267	DF	24
Upper CL Dif	0.00801	Prob > t	0.3590
Lower CL Dif	-0.00302	Prob > t	0.1795
Confidence	0.95	Prob < t	0.8205

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003843	0.000038	0.8747	0.3590
Error	24	0.00105447	0.000044		
C. Total	25	0.00109290			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.369106	0.00166	0.36569	0.37253
Isolok - 3 mL - HF	10	0.371605	0.00210	0.36728	0.37593

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.369106	0.004286	0.00107	0.36682	0.37139
Isolok - 3 mL - HF	10	0.371605	0.009303	0.00294	0.36495	0.37826

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00250	t Ratio	0.798148
Std Err Dif	0.00313	DF	11.4253
Upper CL Dif	0.00936	Prob > t	0.4411
Lower CL Dif	-0.00436	Prob > t	0.2205
Confidence	0.95	Prob < t	0.7795

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0042858	0.0032926	0.0032082
Isolok - 3 mL - HF	10	0.0093032	0.0066459	0.0063488

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.9820	1	24	0.0970
Brown-Forsythe	2.7216	1	24	0.1120
Levene	3.7803	1	24	0.0637
Bartlett	6.6770	1	.	0.0098
F Test 2-sided	4.7119	9	15	0.0084

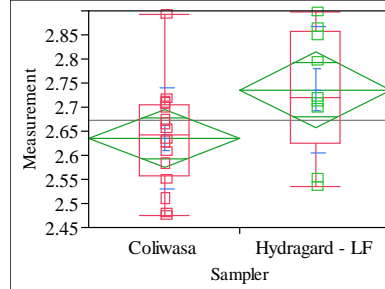
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6370	1	11.425	0.4411

t Test

0.7981

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Al/B, Targeted=2.552



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.161538
Adj Rsquare	0.125083
Root Mean Square Error	0.114816
Mean of Response	2.671409
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.100705	t Ratio	2.105037
Std Err Dif	0.047840	DF	23
Upper CL Dif	0.199670	Prob > t	0.0464
Lower CL Dif	0.001740	Prob > t	0.0232
Confidence	0.95	Prob < t	0.9768

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.05841544	0.058415	4.4312	0.0464
Error	23	0.30320491	0.013183		
C. Total	24	0.36162035			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.63516	0.02870	2.5758	2.6945
Hydragard - LF	9	2.73586	0.03827	2.6567	2.8150

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.63516	0.105508	0.02638	2.5789	2.6914
Hydragard - LF	9	2.73586	0.130492	0.04350	2.6356	2.8362

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.10071	t Ratio	1.979656
Std Err Dif	0.05087	DF	13.95871
Upper CL Dif	0.20984	Prob > t	0.0678
Lower CL Dif	-0.00843	Prob > t	0.0339
Confidence	0.95	Prob < t	0.9661

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1055080	0.0782704	0.0782704
Hydragard - LF	9	0.1304922	0.1034236	0.1025799

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5698	1	23	0.4580
Brown-Forsythe	0.6868	1	23	0.4158
Levene	0.7696	1	23	0.3894
Bartlett	0.4658	1	.	0.4949
F Test 2-sided	1.5297	8	15	0.4551

Welch Anova testing Means Equal, allowing Std Devs Not Equal

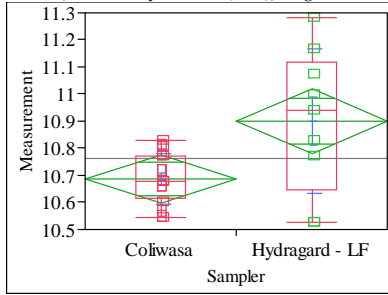
F Ratio	DFNum	DFDen	Prob > F
3.9190	1	13.959	0.0678

t Test

1.9797

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.273971
Adj Rsquare	0.242404
Root Mean Square Error	0.173383
Mean of Response	10.7641
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.212831	t Ratio	2.946044
Std Err Dif	0.072243	DF	23
Upper CL Dif	0.362277	Prob > t	0.0073
Lower CL Dif	0.063385	Prob > t	0.0036
Confidence	0.95	Prob < t	0.9964

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.26091136	0.260911	8.6792	0.0073
Error	23	0.69142080	0.030062		
C. Total	24	0.95233216			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.6875	0.04335	10.598	10.777
Hydragard - LF	9	10.9003	0.05779	10.781	11.020

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.6875	0.093303	0.02333	10.638	10.737
Hydragard - LF	9	10.9003	0.264774	0.08826	10.697	11.104

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.212831	t Ratio	2.331421
Std Err Dif	0.091288	DF	9.132851
Upper CL Dif	0.418882	Prob > t	0.0442
Lower CL Dif	0.006780	Prob > t	0.0221
Confidence	0.95	Prob < t	0.9779

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0933025	0.0746943	0.0732181
Hydragard - LF	9	0.2647736	0.2122772	0.2141433

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	10.4279	1	23	0.0037
Brown-Forsythe	12.3700	1	23	0.0018
Levene	12.7555	1	23	0.0016
Bartlett	11.2596	1	.	0.0008
F Test 2-sided	8.0531	8	15	0.0006

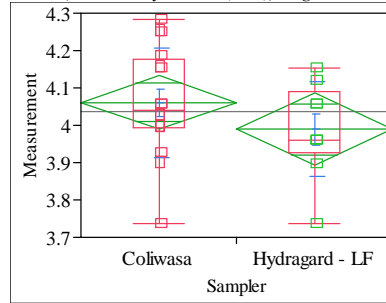
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.4355	1	9.1329	0.0442

t Test

2.3314

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.062146
Adj Rsquare	0.02137
Root Mean Square Error	0.139973
Mean of Response	4.035179
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.07200	t Ratio	-1.23454
Std Err Dif	0.05832	DF	23
Upper CL Dif	0.04865	Prob > t	0.2295
Lower CL Dif	-0.19265	Prob > t	0.8853
Confidence	0.95	Prob < t	0.1147

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.02986029	0.029860	1.5241	0.2295
Error	23	0.45062300	0.019592		
C. Total	24	0.48048328			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.06110	0.03499	3.9887	4.1335
Hydragard - LF	9	3.98910	0.04666	3.8926	4.0856

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.06110	0.146320	0.03658	3.9831	4.1391
Hydragard - LF	9	3.98910	0.127221	0.04241	3.8913	4.0869

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.07200	t Ratio	-1.28563
Std Err Dif	0.05600	DF	18.78685
Upper CL Dif	0.04531	Prob > t	0.2142
Lower CL Dif	-0.18931	Prob > t	0.8929
Confidence	0.95	Prob < t	0.1071

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1463196	0.1137027	0.1126965
Hydragard - LF	9	0.1272211	0.0961995	0.0930193

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1918	1	23	0.6655
Brown-Forsythe	0.2797	1	23	0.6020
Levene	0.2529	1	23	0.6198
Bartlett	0.1886	1	.	0.6641
F Test 2-sided	1.3228	15	8	0.7103

Welch Anova testing Means Equal, allowing Std Devs Not Equal

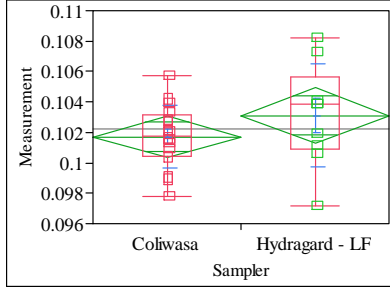
F Ratio	DFNum	DFDen	Prob > F
1.6529	1	18.787	0.2142

t Test

1.2856

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=BaO (wt%), Targeted=0.0919



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.067511
Adj Rsquare	0.026968
Root Mean Square Error	0.00262
Mean of Response	0.102213
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00141	t Ratio	1.290411
Std Err Dif	0.00109	DF	23
Upper CL Dif	0.00367	Prob > t	0.2097
Lower CL Dif	-0.00085	Prob > t	0.1049
Confidence	0.95	Prob < t	0.8951

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001143	0.000011	1.6652	0.2097
Error	23	0.00015791	6.865e-6		
C. Total	24	0.00016934			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.101706	0.00066	0.10035	0.10306
Hydragard - LF	9	0.103115	0.00087	0.10131	0.10492

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.101706	0.002089	0.00052	0.10059	0.10282
Hydragard - LF	9	0.103115	0.003400	0.00113	0.10050	0.10573

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00141	t Ratio	1.129038
Std Err Dif	0.00125	DF	11.48092
Upper CL Dif	0.00414	Prob > t	0.2819
Lower CL Dif	-0.00132	Prob > t	0.1410
Confidence	0.95	Prob < t	0.8590

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0020886	0.0015840	0.0015840
Hydragard - LF	9	0.0033999	0.0025859	0.0025059

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7590	1	23	0.1103
Brown-Forsythe	1.7069	1	23	0.2043
Levene	2.3093	1	23	0.1422
Bartlett	2.5113	1	.	0.1130
F Test 2-sided	2.6499	8	15	0.0988

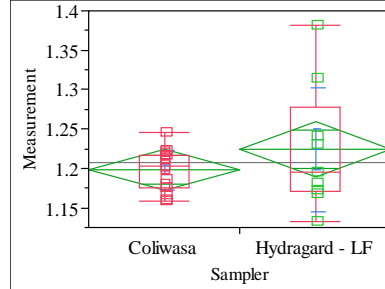
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2747	1	11.481	0.2819

t Test

1.1290

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=CaO (wt%), Targeted=1.1462



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.06172
Adj Rsquare	0.020926
Root Mean Square Error	0.050753
Mean of Response	1.207342
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.02601	t Ratio	1.23002
Std Err Dif	0.02115	DF	23
Upper CL Dif	0.06976	Prob > t	0.2311
Lower CL Dif	-0.01773	Prob > t	0.1156
Confidence	0.95	Prob < t	0.8844

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00389721	0.003897	1.5129	0.2311
Error	23	0.05924574	0.002576		
C. Total	24	0.06314295			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.19798	0.01269	1.1717	1.2242
Hydragard - LF	9	1.22399	0.01692	1.1890	1.2590

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.19798	0.025202	0.00630	1.1845	1.2114
Hydragard - LF	9	1.22399	0.078834	0.02628	1.1634	1.2846

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.02601	t Ratio	0.962577
Std Err Dif	0.02702	DF	8.930501
Upper CL Dif	0.08721	Prob > t	0.3611
Lower CL Dif	-0.03519	Prob > t	0.1805
Confidence	0.95	Prob < t	0.8195

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0252023	0.0206929	0.0202009
Hydragard - LF	9	0.0788340	0.0599756	0.0583000

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.7687	1	23	0.0248
Brown-Forsythe	6.3522	1	23	0.0191
Levene	10.2110	1	23	0.0040
Bartlett	13.2985	1	.	0.0003
F Test 2-sided	9.7847	8	15	0.0002

Welch Anova testing Means Equal, allowing Std Devs Not Equal

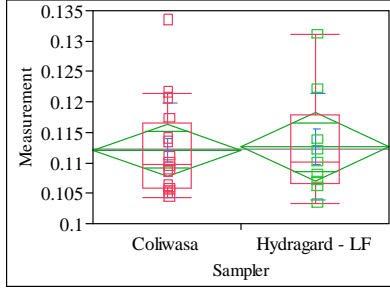
F Ratio	DFNum	DFDen	Prob > F
0.9266	1	8.9305	0.3611

t Test

0.9626

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.00105
Adj Rsquare	-0.04238
Root Mean Square Error	0.008161
Mean of Response	0.112286
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00053	t Ratio	0.155514
Std Err Dif	0.00340	DF	23
Upper CL Dif	0.00756	Prob > t	0.8778
Lower CL Dif	-0.00651	Prob > t	0.4389
Confidence	0.95	Prob < t	0.5611

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000161	1.611e-6	0.0242	0.8778
Error	23	0.00153186	0.000067		
C. Total	24	0.00153347			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.112096	0.00204	0.10787	0.11632
Hydragard - LF	9	0.112624	0.00272	0.10700	0.11825

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.112096	0.007790	0.00195	0.10794	0.11625
Hydragard - LF	9	0.112624	0.008815	0.00294	0.10585	0.11940

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00053	t Ratio	0.150012
Std Err Dif	0.00353	DF	15.02529
Upper CL Dif	0.00804	Prob > t	0.8828
Lower CL Dif	-0.00698	Prob > t	0.4414
Confidence	0.95	Prob < t	0.5586

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0077897	0.0058533	0.0054901
Hydragard - LF	9	0.0088152	0.0064743	0.0062524

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1101	1	23	0.7430
Brown-Forsythe	0.0908	1	23	0.7658
Levene	0.0843	1	23	0.7742
Bartlett	0.1556	1	.	0.6932
F Test 2-sided	1.2806	8	15	0.6465

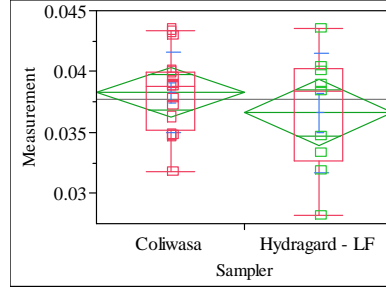
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0225	1	15.025	0.8828

t Test

0.1500

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=CuO (wt%), Targeted=0.0504



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.042431
Adj Rsquare	0.000797
Root Mean Square Error	0.003941
Mean of Response	0.037669
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00166	t Ratio	-1.00953
Std Err Dif	0.00164	DF	23
Upper CL Dif	0.00174	Prob > t	0.3232
Lower CL Dif	-0.00505	Prob > t	0.8384
Confidence	0.95	Prob < t	0.1616

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001583	0.000016	1.0191	0.3232
Error	23	0.00035724	0.000016		
C. Total	24	0.00037307			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.038266	0.00099	0.03623	0.04030
Hydragard - LF	9	0.036608	0.00131	0.03389	0.03933

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.038266	0.003324	0.00083	0.03649	0.04004
Hydragard - LF	9	0.036608	0.004893	0.00163	0.03285	0.04037

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00166	t Ratio	-0.90562
Std Err Dif	0.00183	DF	12.25053
Upper CL Dif	0.00232	Prob > t	0.3826
Lower CL Dif	-0.00564	Prob > t	0.8087
Confidence	0.95	Prob < t	0.1913

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0033235	0.0026102	0.0025427
Hydragard - LF	9	0.0048933	0.0040830	0.0039362

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4173	1	23	0.1337
Brown-Forsythe	1.7249	1	23	0.2020
Levene	2.9268	1	23	0.1006
Bartlett	1.5728	1	.	0.2098
F Test 2-sided	2.1677	8	15	0.1870

Welch Anova testing Means Equal, allowing Std Devs Not Equal

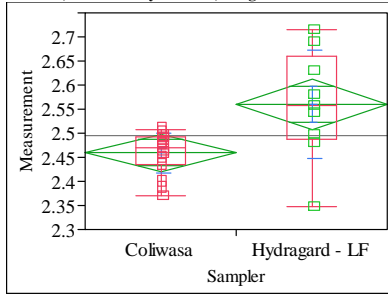
F Ratio	DFNum	DFDen	Prob > F
0.8202	1	12.251	0.3826

t Test

0.9056

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Fe/Li, Targeted=2.452



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.314619
Adj Rsquare	0.28482
Root Mean Square Error	0.074781
Mean of Response	2.49539
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.101244	t Ratio	3.249307
Std Err Dif	0.031159	DF	23
Upper CL Dif	0.165701	Prob > t	0.0035
Lower CL Dif	0.036787	Prob > t	0.0018
Confidence	0.95	Prob < t	0.9982

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.05904196	0.059042	10.5580	0.0035
Error	23	0.12861958	0.005592		
C. Total	24	0.18766154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.45894	0.01870	2.4203	2.4976
Hydragard - LF	9	2.56019	0.02493	2.5086	2.6118

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.45894	0.042118	0.01053	2.4365	2.4814
Hydragard - LF	9	2.56019	0.112922	0.03764	2.4734	2.6470

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.101244	t Ratio	2.590315
Std Err Dif	0.039086	DF	9.270779
Upper CL Dif	0.189270	Prob > t	0.0285
Lower CL Dif	0.013218	Prob > t	0.0143
Confidence	0.95	Prob < t	0.9857

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0421182	0.0326870	0.0313272
Hydragard - LF	9	0.1129217	0.0833456	0.0849148

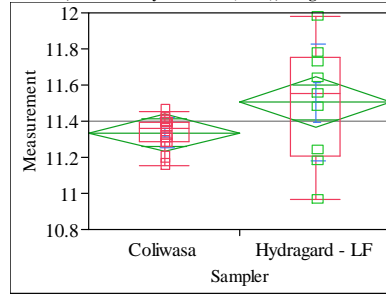
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.8101	1	23	0.0243
Brown-Forsythe	7.5412	1	23	0.0115
Levene	6.9376	1	23	0.0148
Bartlett	10.1280	1	.	0.0015
F Test 2-sided	7.1881	8	15	0.0011

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.7097	1	9.2708	0.0285

t Test
2.5903

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.147527
Adj Rsquare	0.110463
Root Mean Square Error	0.201727
Mean of Response	11.397
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.16769	t Ratio	1.995078
Std Err Dif	0.08405	DF	23
Upper CL Dif	0.34157	Prob > t	0.0580
Lower CL Dif	-0.00618	Prob > t	0.0290
Confidence	0.95	Prob < t	0.9710

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1619745	0.161974	3.9803	0.0580
Error	23	0.9359541	0.040694		
C. Total	24	1.0979286			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3366	0.05043	11.232	11.441
Hydragard - LF	9	11.5043	0.06724	11.365	11.643

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3366	0.080618	0.02015	11.294	11.380
Hydragard - LF	9	11.5043	0.323741	0.10791	11.255	11.753

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.16769	t Ratio	1.527532
Std Err Dif	0.10978	DF	8.562271
Upper CL Dif	0.41798	Prob > t	0.1627
Lower CL Dif	-0.08260	Prob > t	0.0813
Confidence	0.95	Prob < t	0.9187

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0806176	0.0635546	0.0616558
Hydragard - LF	9	0.3237410	0.2562870	0.2589346

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	10.5923	1	23	0.0035
Brown-Forsythe	16.8914	1	23	0.0004
Levene	17.5640	1	23	0.0003
Bartlett	19.0085	1	.	<.0001
F Test 2-sided	16.1263	8	15	<.0001

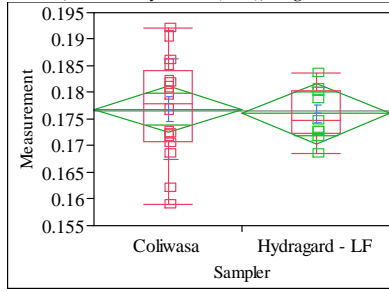
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3334	1	8.5623	0.1627

t Test
1.5275

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.002876
Adj Rsquare	-0.04048
Root Mean Square Error	0.008223
Mean of Response	0.17657
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00088	t Ratio	-0.25758
Std Err Dif	0.00343	DF	23
Upper CL Dif	0.00621	Prob > t	0.7990
Lower CL Dif	-0.00797	Prob > t	0.6005
Confidence	0.95	Prob < t	0.3995

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000449	4.486e-6	0.0663	0.7990
Error	23	0.00155517	0.000068		
C. Total	24	0.00155966			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.00206	0.17264	0.18114
Hydragard - LF	9	0.176005	0.00274	0.17034	0.18168

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.009502	0.00238	0.17182	0.18195
Hydragard - LF	9	0.176005	0.005010	0.00167	0.17215	0.17986

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00088	t Ratio	-0.30392
Std Err Dif	0.00290	DF	22.97051
Upper CL Dif	0.00512	Prob > t	0.7639
Lower CL Dif	-0.00689	Prob > t	0.6180
Confidence	0.95	Prob < t	0.3820

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0095021	0.0077923	0.0077923
Hydragard - LF	9	0.0050101	0.0042979	0.0043499

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.1173	1	23	0.0907
Brown-Forsythe	3.4744	1	23	0.0751
Levene	3.8754	1	23	0.0612
Bartlett	3.4206	1	.	0.0644
F Test 2-sided	3.5970	15	8	0.0733

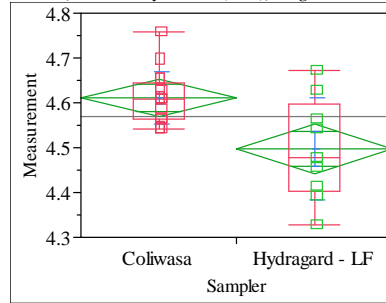
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0924	1	22.971	0.7639

t Test

0.3039

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.326668
Adj Rsquare	0.297392
Root Mean Square Error	0.081959
Mean of Response	4.570176
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.11407	t Ratio	-3.34043
Std Err Dif	0.03415	DF	23
Upper CL Dif	-0.04343	Prob > t	0.0028
Lower CL Dif	-0.18472	Prob > t	0.9986
Confidence	0.95	Prob < t	0.0014

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.07495391	0.074954	11.1585	0.0028
Error	23	0.15449606	0.006717		
C. Total	24	0.22944997			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.61124	0.02049	4.5689	4.6536
Hydragard - LF	9	4.49717	0.02732	4.4407	4.5537

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.61124	0.058417	0.01460	4.5801	4.6424
Hydragard - LF	9	4.49717	0.113638	0.03788	4.4098	4.5845

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.11407	t Ratio	-2.8099
Std Err Dif	0.04060	DF	10.43214
Upper CL Dif	-0.02412	Prob > t	0.0178
Lower CL Dif	-0.20402	Prob > t	0.9911
Confidence	0.95	Prob < t	0.0089

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0584166	0.0427216	0.0417124
Hydragard - LF	9	0.1136379	0.0930265	0.0932923

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.7454	1	23	0.0250
Brown-Forsythe	6.7333	1	23	0.0162
Levene	7.0716	1	23	0.0140
Bartlett	4.6976	1	.	0.0302
F Test 2-sided	3.7842	8	15	0.0255

Welch Anova testing Means Equal, allowing Std Devs Not Equal

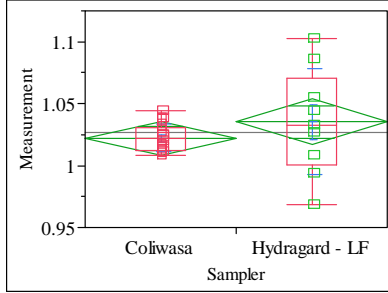
F Ratio	DFNum	DFDen	Prob > F
7.8956	1	10.432	0.0178

t Test

2.8099

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=MgO (wt%), Targeted=1.014



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.057319
Adj Rsquare	0.016333
Root Mean Square Error	0.026783
Mean of Response	1.026886
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.01320	t Ratio	1.18258
Std Err Dif	0.01116	DF	23
Upper CL Dif	0.03628	Prob > t	0.2491
Lower CL Dif	-0.00989	Prob > t	0.1245
Confidence	0.95	Prob < t	0.8755

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00100321	0.001003	1.3985	0.2491
Error	23	0.01649907	0.000717		
C. Total	24	0.01750228			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.02213	0.00670	1.0083	1.0360
Hydragard - LF	9	1.03533	0.00893	1.0169	1.0538

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.02213	0.0110974	0.00277	1.0162	1.0280
Hydragard - LF	9	1.03533	0.042796	0.01427	1.0024	1.0682

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.01320	t Ratio	0.908123
Std Err Dif	0.01453	DF	8.610056
Upper CL Dif	0.04630	Prob > t	0.3885
Lower CL Dif	-0.01991	Prob > t	0.1943
Confidence	0.95	Prob < t	0.8057

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0110974	0.0091206	0.0091206
Hydragard - LF	9	0.0427957	0.0326747	0.0331660

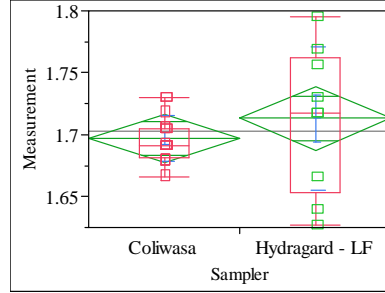
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	9.6572	1	23	0.0050
Brown-Forsythe	14.2841	1	23	0.0010
Levene	13.2206	1	23	0.0014
Bartlett	18.0424	1	.	<.0001
F Test 2-sided	14.8716	8	15	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8247	1	8.6101	0.3885

t Test
0.9081

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=MnO (wt%), Targeted=1.779



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.043374
Adj Rsquare	0.001781
Root Mean Square Error	0.0373
Mean of Response	1.702835
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.01587	t Ratio	1.021189
Std Err Dif	0.01554	DF	23
Upper CL Dif	0.04802	Prob > t	0.3178
Lower CL Dif	-0.01628	Prob > t	0.1589
Confidence	0.95	Prob < t	0.8411

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00145088	0.001451	1.0428	0.3178
Error	23	0.03199977	0.001391		
C. Total	24	0.03345065			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.69712	0.00933	1.6778	1.7164
Hydragard - LF	9	1.71299	0.01243	1.6873	1.7387

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.69712	0.018241	0.00456	1.6874	1.7068
Hydragard - LF	9	1.71299	0.058104	0.01937	1.6683	1.7577

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.01587	t Ratio	0.797632
Std Err Dif	0.01990	DF	8.897041
Upper CL Dif	0.06096	Prob > t	0.4458
Lower CL Dif	-0.02922	Prob > t	0.2229
Confidence	0.95	Prob < t	0.7771

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0182413	0.0144251	0.0137190
Hydragard - LF	9	0.0581040	0.0459093	0.0444747

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	12.5004	1	23	0.0018
Brown-Forsythe	10.5628	1	23	0.0035
Levene	13.5363	1	23	0.0012
Bartlett	13.6911	1	.	0.0002
F Test 2-sided	10.1461	8	15	0.0002

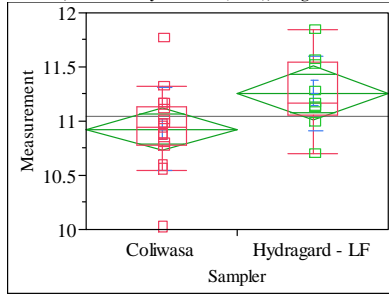
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6362	1	8.897	0.4458

t Test
0.7976

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.169697
Adj Rsquare	0.133597
Root Mean Square Error	0.367033
Mean of Response	11.04659
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.331571	t Ratio	2.168115
Std Err Dif	0.152930	DF	23
Upper CL Dif	0.647931	Prob > t	0.0407
Lower CL Dif	0.015210	Prob > t	0.0204
Confidence	0.95	Prob < t	0.9796

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.6332488	0.633249	4.7007	0.0407
Error	23	3.0983996	0.134713		
C. Total	24	3.7316484			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.9272	0.09176	10.737	11.117
Hydragard - LF	9	11.2588	0.12234	11.006	11.512

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.9272	0.379229	0.09481	10.725	11.129
Hydragard - LF	9	11.2588	0.342998	0.11433	10.995	11.522

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.331571	t Ratio	2.232388
Std Err Dif	0.148527	DF	18.1959
Upper CL Dif	0.643374	Prob > t	0.0384
Lower CL Dif	0.019767	Prob > t	0.0192
Confidence	0.95	Prob < t	0.9808

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.3792291	0.2550669	0.2544350
Hydragard - LF	9	0.3429977	0.2639417	0.2561200

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0656	1	23	0.8001
Brown-Forsythe	0.0002	1	23	0.9878
Levene	0.0073	1	23	0.9327
Bartlett	0.0981	1	.	0.7541
F Test 2-sided	1.2224	15	8	0.8025

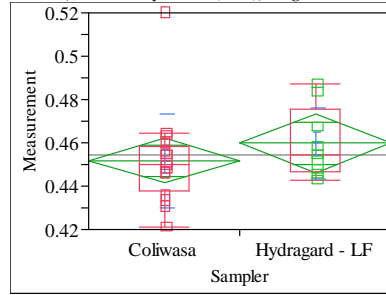
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.9836	1	18.196	0.0384

t Test

2.2324

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=NiO (wt%), Targeted=0.41



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.039152
Adj Rsquare	-0.00262
Root Mean Square Error	0.01998
Mean of Response	0.454639
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00806	t Ratio	0.968091
Std Err Dif	0.00832	DF	23
Upper CL Dif	0.02528	Prob > t	0.3431
Lower CL Dif	-0.00916	Prob > t	0.1715
Confidence	0.95	Prob < t	0.8285

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00037411	0.000374	0.9372	0.3431
Error	23	0.00918118	0.000399		
C. Total	24	0.00955530			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.451738	0.00499	0.44140	0.46207
Hydragard - LF	9	0.459797	0.00666	0.44602	0.47357

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.451738	0.021710	0.00543	0.44017	0.46331
Hydragard - LF	9	0.459797	0.016246	0.00542	0.44731	0.47228

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00806	t Ratio	1.051144
Std Err Dif	0.00767	DF	20.89769
Upper CL Dif	0.02401	Prob > t	0.3052
Lower CL Dif	-0.00789	Prob > t	0.1526
Confidence	0.95	Prob < t	0.8474

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0217097	0.0135203	0.0133612
Hydragard - LF	9	0.0162462	0.0130078	0.0123008

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2385	1	23	0.6299
Brown-Forsythe	0.0281	1	23	0.8683
Levene	0.0074	1	23	0.9324
Bartlett	0.7796	1	.	0.3773
F Test 2-sided	1.7857	15	8	0.4116

Welch Anova testing Means Equal, allowing Std Devs Not Equal

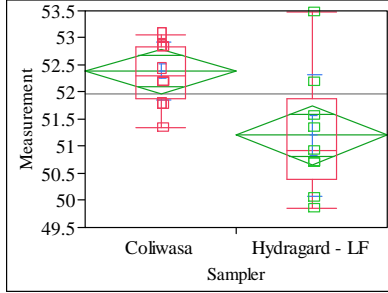
F Ratio	DFNum	DFDen	Prob > F
1.1049	1	20.898	0.3052

t Test

1.0511

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.360529
Adj Rsquare	0.332726
Root Mean Square Error	0.790132
Mean of Response	51.95932
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-1.1855	t Ratio	-3.601
Std Err Dif	0.3292	DF	23
Upper CL Dif	-0.5045	Prob > t	0.0015
Lower CL Dif	-1.8666	Prob > t	0.9992
Confidence	0.95	Prob < t	0.0008

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	8.095556	8.09556	12.9672	0.0015
Error	23	14.359097	0.62431		
C. Total	24	22.454652			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	52.3861	0.19753	51.977	52.795
Hydragard - LF	9	51.2006	0.26338	50.656	51.745

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	52.3861	0.53482	0.13371	52.101	52.671
Hydragard - LF	9	51.2006	1.12186	0.37395	50.338	52.063

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-1.1855	t Ratio	-2.98519
Std Err Dif	0.3971	DF	10.08827
Upper CL Dif	-0.3017	Prob > t	0.0136
Lower CL Dif	-2.0694	Prob > t	0.9932
Confidence	0.95	Prob < t	0.0068

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.534825	0.4546012	0.4546012
Hydragard - LF	9	1.121858	0.8398733	0.8319500

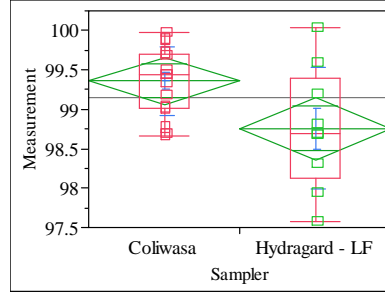
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.7558	1	23	0.0650
Brown-Forsythe	3.3070	1	23	0.0820
Levene	4.1804	1	23	0.0525
Bartlett	5.8120	1	.	0.0159
F Test 2-sided	4.4000	8	15	0.0132

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.9113	1	10.088	0.0136

t Test
2.9852

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.217833
Adj Rsquare	0.183825
Root Mean Square Error	0.576231
Mean of Response	99.145
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.6077	t Ratio	-2.5309
Std Err Dif	0.2401	DF	23
Upper CL Dif	-0.1110	Prob > t	0.0187
Lower CL Dif	-1.1043	Prob > t	0.9907
Confidence	0.95	Prob < t	0.0093

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.1268874	2.12689	6.4055	0.0187
Error	23	7.6369747	0.33204		
C. Total	24	9.7638621			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.3638	0.14406	99.066	99.662
Hydragard - LF	9	98.7561	0.19208	98.359	99.153

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.3638	0.435355	0.10884	99.132	99.596
Hydragard - LF	9	98.7561	0.774110	0.25804	98.161	99.351

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.6077	t Ratio	-2.16982
Std Err Dif	0.2801	DF	10.91553
Upper CL Dif	0.0093	Prob > t	0.0530
Lower CL Dif	-1.2246	Prob > t	0.9735
Confidence	0.95	Prob < t	0.0265

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4353546	0.3629705	0.3541027
Hydragard - LF	9	0.7741099	0.5767855	0.5729941

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.4997	1	23	0.0449
Brown-Forsythe	2.2755	1	23	0.1450
Levene	2.3893	1	23	0.1358
Bartlett	3.5136	1	.	0.0609
F Test 2-sided	3.1617	8	15	0.0523

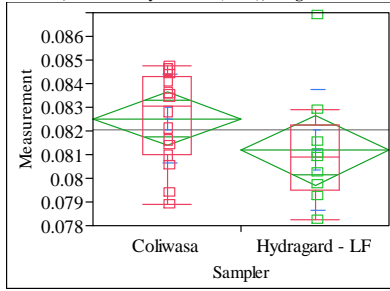
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.7081	1	10.916	0.0530

t Test
2.1698

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.088115
Adj Rsquare	0.048467
Root Mean Square Error	0.002141
Mean of Response	0.082046
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00133	t Ratio	-1.49079
Std Err Dif	0.00089	DF	23
Upper CL Dif	0.00052	Prob > t	0.1496
Lower CL Dif	-0.00317	Prob > t	0.9252
Confidence	0.95	Prob < t	0.0748

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001019	0.000010	2.2225	0.1496
Error	23	0.00010541	4.583e-6		
C. Total	24	0.00011559			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.082524	0.00054	0.08142	0.08363
Hydragard - LF	9	0.081195	0.00071	0.07972	0.08267

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.082524	0.001896	0.00047	0.08151	0.08353
Hydragard - LF	9	0.081195	0.002536	0.00085	0.07925	0.08314

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00133	t Ratio	-1.37192
Std Err Dif	0.00097	DF	13.13074
Upper CL Dif	0.00076	Prob > t	0.1931
Lower CL Dif	-0.00342	Prob > t	0.9035
Confidence	0.95	Prob < t	0.0965

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0018964	0.0016107	0.0015846
Hydragard - LF	9	0.0025362	0.0017298	0.0016865

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.7091	1	23	0.4084
Brown-Forsythe	0.0305	1	23	0.8629
Levene	0.0508	1	23	0.8236
Bartlett	0.8800	1	.	0.3482
F Test 2-sided	1.7885	8	15	0.3159

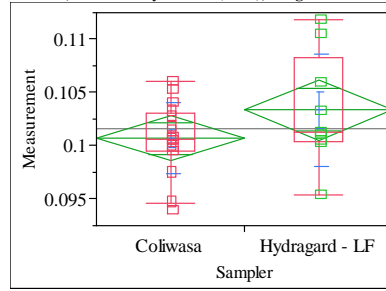
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.8822	1	13.131	0.1931

t Test

1.3719

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.094138
Adj Rsquare	0.054753
Root Mean Square Error	0.004113
Mean of Response	0.10165
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00265	t Ratio	1.546021
Std Err Dif	0.00171	DF	23
Upper CL Dif	0.00619	Prob > t	0.1357
Lower CL Dif	-0.00090	Prob > t	0.0679
Confidence	0.95	Prob < t	0.9321

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004044	0.000040	2.3902	0.1357
Error	23	0.00038909	0.000017		
C. Total	24	0.00042953			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.100697	0.00103	0.09857	0.10282
Hydragard - LF	9	0.103346	0.00137	0.10051	0.10618

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.100697	0.003356	0.00084	0.09891	0.10248
Hydragard - LF	9	0.103346	0.005246	0.00175	0.09931	0.10738

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00265	t Ratio	1.366047
Std Err Dif	0.00194	DF	11.77349
Upper CL Dif	0.00688	Prob > t	0.1975
Lower CL Dif	-0.00159	Prob > t	0.0987
Confidence	0.95	Prob < t	0.9013

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0033557	0.0024351	0.0024351
Hydragard - LF	9	0.0052462	0.0040479	0.0038450

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.5701	1	23	0.1225
Brown-Forsythe	1.3303	1	23	0.2606
Levene	2.3482	1	23	0.1391
Bartlett	2.1073	1	.	0.1466
F Test 2-sided	2.4441	8	15	0.1292

Welch Anova testing Means Equal, allowing Std Devs Not Equal

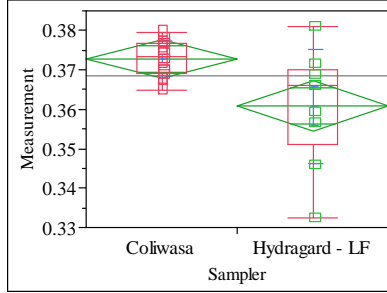
F Ratio	DFNum	DFDen	Prob > F
1.8661	1	11.773	0.1975

t Test

1.3660

Exhibit C2. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Excluded Rows

1

Oneway Anova

Summary of Fit

Rsquare	0.294761
Adj Rsquare	0.264099
Root Mean Square Error	0.009294
Mean of Response	0.368498
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.01201	t Ratio	-3.10049
Std Err Dif	0.00387	DF	23
Upper CL Dif	-0.00400	Prob > t	0.0050
Lower CL Dif	-0.02002	Prob > t	0.9975
Confidence	0.95	Prob < t	0.0025

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00083042	0.000830	9.6131	0.0050
Error	23	0.00198685	0.000086		
C. Total	24	0.00281728			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.372821	0.00232	0.36801	0.37763
Hydragard - LF	9	0.360814	0.00310	0.35440	0.36722

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.372821	0.004412	0.00110	0.37047	0.37517
Hydragard - LF	9	0.360814	0.014556	0.00485	0.34963	0.37200

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.01201	t Ratio	-2.41319
Std Err Dif	0.00498	DF	8.835573
Upper CL Dif	-0.00072	Prob > t	0.0395
Lower CL Dif	-0.02329	Prob > t	0.9802
Confidence	0.95	Prob < t	0.0198

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0044117	0.0037147	0.0037147
Hydragard - LF	9	0.0145555	0.0109398	0.0103561

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.8266	1	23	0.0241
Brown-Forsythe	5.5311	1	23	0.0276
Levene	10.0381	1	23	0.0043
Bartlett	14.4630	1	.	0.0001
F Test 2-sided	10.8854	8	15	0.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

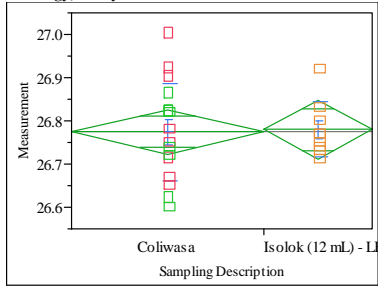
F Ratio	DFNum	DFDen	Prob > F
5.8235	1	8.8356	0.0395

t Test

2.4132

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampling Description Test Phase=Phase 3 - Low Rheology, Analyte=wt% vitrified solids



Oneway Anova Summary of Fit

Rsquare	0.001005
Adj Rsquare	-0.04243
Root Mean Square Error	0.098593
Mean of Response	26.776
Observations (or Sum Wgts)	25

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming equal variances

Difference	0.00625	t Ratio	0.15214
Std Err Dif	0.04108	DF	23
Upper CL Dif	0.09123	Prob > t	0.8804
Lower CL Dif	-0.07873	Prob > t	0.4402
Confidence	0.95	Prob < t	0.5598

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampling Description	1	0.00022500	0.000225	0.0231	0.8804
Error	23	0.22357500	0.009721		
C. Total	24	0.22380000			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.02465	26.723	26.825
Isolok (12 mL) - LF	9	26.7800	0.03286	26.712	26.848

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	26.7738	0.112835	0.02821	26.714	26.834
Isolok (12 mL) - LF	9	26.7800	0.063836	0.02128	26.731	26.829

t Test

Isolok (12 mL) - LF-Coliwasa
Assuming unequal variances

Difference	0.00625	t Ratio	0.176882
Std Err Dif	0.03533	DF	22.97772
Upper CL Dif	0.07935	Prob > t	0.8612
Lower CL Dif	-0.06685	Prob > t	0.4306
Confidence	0.95	Prob < t	0.5694

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1128347	0.0912500	0.0912500
Isolok (12 mL) - LF	9	0.0638357	0.0466667	0.0433333

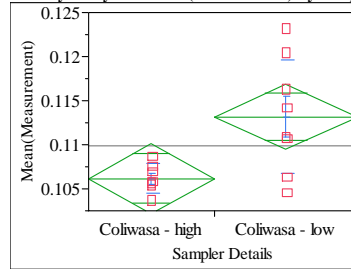
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4405	1	23	0.1319
Brown-Forsythe	4.0248	1	23	0.0567
Levene	3.7219	1	23	0.0661
Bartlett	2.7706	1	.	0.0960
F Test 2-sided	3.1243	15	8	0.1084

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0313	1	22.978	0.8612

t Test
0.1769

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Cr2O3 (wt%)



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.374186
Adj Rsquare	0.326046
Root Mean Square Error	0.004876
Mean of Response	0.109896
Observations (or Sum Wgts)	15

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.007036	t Ratio	2.787997
Std Err Dif	0.002524	DF	13
Upper CL Dif	0.012488	Prob > t	0.0154
Lower CL Dif	0.001584	Prob > t	0.0077
Confidence	0.95	Prob < t	0.9923

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00018483	0.000185	7.7729	0.0154
Error	13	0.00030912	0.000024		
C. Total	14	0.00049394			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	7	0.106143	0.00184	0.10216	0.11013
Coliwasa - low	8	0.113180	0.00172	0.10946	0.11690

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	7	0.106143	0.001688	0.00064	0.10458	0.10770
Coliwasa - low	8	0.113180	0.006459	0.00228	0.10778	0.11858

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.007036	t Ratio	2.96755
Std Err Dif	0.002371	DF	8.078497
Upper CL Dif	0.012494	Prob > t	0.0177
Lower CL Dif	0.001578	Prob > t	0.0089
Confidence	0.95	Prob < t	0.9911

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	7	0.0016883	0.0013025	0.0012667
Coliwasa - low	8	0.0064588	0.0051917	0.0051917

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.1819	1	13	0.0404
Brown-Forsythe	8.4704	1	13	0.0122
Levene	8.9955	1	13	0.0103
Bartlett	8.1601	1	.	0.0043
F Test 2-sided	14.6348	7	6	0.0044

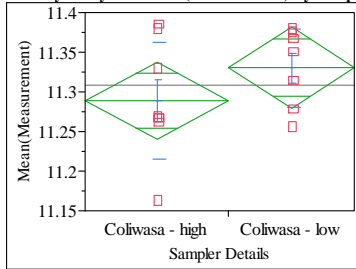
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.8064	1	8.0785	0.0177

t Test
2.9675

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Fe2O3 (wt%)



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.109626
Adj Rsquare	0.041136
Root Mean Square Error	0.06323
Mean of Response	11.30829
Observations (or Sum Wgts)	15

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.04140	t Ratio	1.265151
Std Err Dif	0.03272	DF	13
Upper CL Dif	0.11210	Prob > t	0.2280
Lower CL Dif	-0.02930	Prob > t	0.1140
Confidence	0.95	Prob < t	0.8860

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00639932	0.006399	1.6006	0.2280
Error	13	0.05197474	0.003998		
C. Total	14	0.05837406			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	11.2890	0.02236	11.241	11.337
Coliwasa - low	7	11.3304	0.02390	11.279	11.382

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	11.2890	0.073078	0.02584	11.228	11.350
Coliwasa - low	7	11.3304	0.049316	0.01864	11.285	11.376

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.04140	t Ratio	1.299541
Std Err Dif	0.03186	DF	12.29658
Upper CL Dif	0.11063	Prob > t	0.2176
Lower CL Dif	-0.02783	Prob > t	0.1088
Confidence	0.95	Prob < t	0.8912

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0730778	0.0560710	0.0503374
Coliwasa - low	7	0.0493156	0.0415294	0.0411890

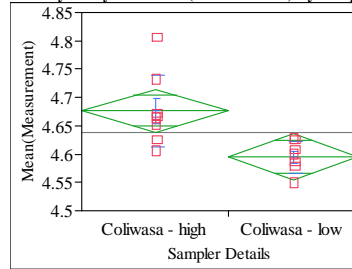
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.0025	1	13	0.3350
Brown-Forsythe	0.1512	1	13	0.7037
Levene	0.6958	1	13	0.4193
Bartlett	0.8873	1	.	0.3462
F Test 2-sided	2.1958	7	6	0.3570

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6888	1	12.297	0.2176

t Test
1.2995

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=Li2O (wt%)



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.428853
Adj Rsquare	0.384919
Root Mean Square Error	0.050325
Mean of Response	4.638303
Observations (or Sum Wgts)	15

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.08137	t Ratio	-3.1243
Std Err Dif	0.02605	DF	13
Upper CL Dif	-0.02511	Prob > t	0.0081
Lower CL Dif	-0.13764	Prob > t	0.9960
Confidence	0.95	Prob < t	0.0040

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.02472142	0.024721	9.7612	0.0081
Error	13	0.03292398	0.002533		
C. Total	14	0.05764540			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	4.67628	0.01779	4.6378	4.7147
Coliwasa - low	7	4.59490	0.01902	4.5538	4.6360

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	4.67628	0.063488	0.02245	4.6232	4.7294
Coliwasa - low	7	4.59490	0.028014	0.01059	4.5690	4.6208

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.08137	t Ratio	-3.27879
Std Err Dif	0.02482	DF	9.89036
Upper CL Dif	-0.02599	Prob > t	0.0084
Lower CL Dif	-0.13676	Prob > t	0.9958
Confidence	0.95	Prob < t	0.0042

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0634884	0.0453006	0.0412639
Coliwasa - low	7	0.0280135	0.0212361	0.0225542

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5241	1	13	0.2388
Brown-Forsythe	0.9808	1	13	0.3401
Levene	2.1053	1	13	0.1705
Bartlett	3.5051	1	.	0.0612
F Test 2-sided	5.1363	7	6	0.0637

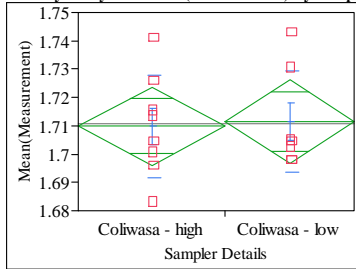
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.7505	1	9.8904	0.0084

t Test
3.2788

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=MnO (wt%)



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.002522
Adj Rsquare	-0.07421
Root Mean Square Error	0.018019
Mean of Response	1.710553
Observations (or Sum Wgts)	15

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.00169	t Ratio	0.181311
Std Err Dif	0.00933	DF	13
Upper CL Dif	0.02184	Prob > t	0.8589
Lower CL Dif	-0.01846	Prob > t	0.4295
Confidence	0.95	Prob < t	0.5705

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00001067	0.000011	0.0329	0.8589
Error	13	0.00422092	0.000325		
C. Total	14	0.00423159			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	8	1.70976	0.00637	1.6960	1.7235
Coliwasa - low	7	1.71145	0.00681	1.6967	1.7262

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	8	1.70976	0.018188	0.00643	1.6946	1.7250
Coliwasa - low	7	1.71145	0.017820	0.00674	1.6950	1.7279

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.00169	t Ratio	0.181577
Std Err Dif	0.00931	DF	12.80435
Upper CL Dif	0.02184	Prob > t	0.8588
Lower CL Dif	-0.01846	Prob > t	0.4294
Confidence	0.95	Prob < t	0.5706

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	8	0.0181877	0.0139880	0.0139880
Coliwasa - low	7	0.0178203	0.0144052	0.0113749

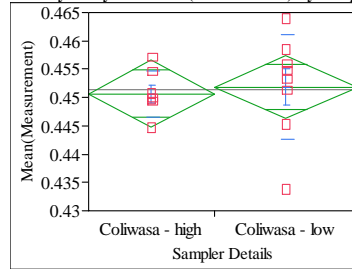
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0033	1	13	0.9548
Brown-Forsythe	0.1571	1	13	0.6982
Levene	0.0070	1	13	0.9345
Bartlett	0.0025	1	.	0.9602
F Test 2-sided	1.0417	7	6	0.9766

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0330	1	12.804	0.8588

t Test
0.1816

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=NiO (wt%)



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.007664
Adj Rsquare	-0.06867
Root Mean Square Error	0.007274
Mean of Response	0.451313
Observations (or Sum Wgts)	15

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.00119	t Ratio	0.316872
Std Err Dif	0.00376	DF	13
Upper CL Dif	0.00933	Prob > t	0.7564
Lower CL Dif	-0.00694	Prob > t	0.3782
Confidence	0.95	Prob < t	0.6218

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.00000531	5.313e-6	0.1004	0.7564
Error	13	0.00068791	0.000053		
C. Total	14	0.00069322			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	7	0.450677	0.00275	0.44474	0.45662
Coliwasa - low	8	0.451870	0.00257	0.44631	0.45743

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	7	0.450677	0.004085	0.00154	0.44690	0.45446
Coliwasa - low	8	0.451870	0.009163	0.00324	0.44421	0.45953

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.00119	t Ratio	0.332407
Std Err Dif	0.00359	DF	9.942443
Upper CL Dif	0.00920	Prob > t	0.7465
Lower CL Dif	-0.00681	Prob > t	0.3732
Confidence	0.95	Prob < t	0.6268

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	7	0.0040850	0.0029086	0.0027874
Coliwasa - low	8	0.0091635	0.0065149	0.0061769

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.4918	1	13	0.2436
Brown-Forsythe	1.5128	1	13	0.2405
Levene	2.1831	1	13	0.1633
Bartlett	3.4265	1	.	0.0642
F Test 2-sided	5.0319	7	6	0.0668

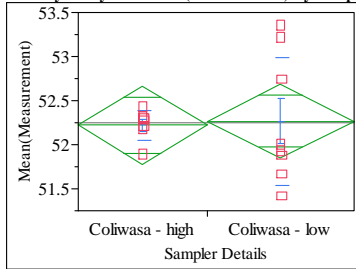
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1105	1	9.9424	0.7465

t Test
0.3324

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=SiO2 (wt%)



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.002088
Adj Rsquare	-0.07467
Root Mean Square Error	0.544572
Mean of Response	52.24408
Observations (or Sum Wgts)	15

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	0.04648	t Ratio	0.16491
Std Err Dif	0.28184	DF	13
Upper CL Dif	0.65536	Prob > t	0.8716
Lower CL Dif	-0.56241	Prob > t	0.4358
Confidence	0.95	Prob < t	0.5642

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.0080651	0.008065	0.0272	0.8716
Error	13	3.8552672	0.296559		
C. Total	14	3.8633322			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	7	52.2193	0.20583	51.775	52.664
Coliwasa - low	8	52.2658	0.19254	51.850	52.682

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	7	52.2193	0.170818	0.06456	52.061	52.377
Coliwasa - low	8	52.2658	0.725081	0.25635	51.660	52.872

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	0.04648	t Ratio	0.175817
Std Err Dif	0.26436	DF	7.879186
Upper CL Dif	0.65772	Prob > t	0.8649
Lower CL Dif	-0.56477	Prob > t	0.4324
Confidence	0.95	Prob < t	0.5676

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	7	0.1708183	0.1193351	0.1171521
Coliwasa - low	8	0.7250807	0.6183914	0.5481956

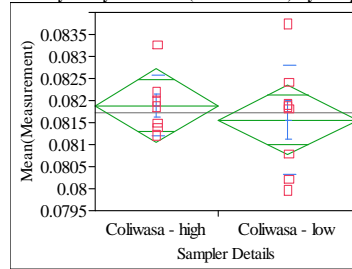
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.7843	1	13	0.0218
Brown-Forsythe	4.1449	1	13	0.0627
Levene	17.3593	1	13	0.0011
Bartlett	9.1922	1	.	0.0024
F Test 2-sided	18.0179	7	6	0.0025

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0309	1	7.8792	0.8649

t Test
0.1758

Oneway Analysis of Mean(Measurement) By Sampler Details Oxide/Analyte=TiO2 (wt%)



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.028332
Adj Rsquare	-0.04641
Root Mean Square Error	0.00102
Mean of Response	0.081713
Observations (or Sum Wgts)	15

t Test

Coliwasa - low-Coliwasa - high
Assuming equal variances

Difference	-0.00033	t Ratio	-0.61567
Std Err Dif	0.00053	DF	13
Upper CL Dif	0.00082	Prob > t	0.5487
Lower CL Dif	-0.00147	Prob > t	0.7256
Confidence	0.95	Prob < t	0.2744

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler Details	1	0.0000039	3.9472e-7	0.3791	0.5487
Error	13	0.00001354	1.0413e-6		
C. Total	14	0.00001393			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa - high	7	0.081887	0.00039	0.08105	0.08272
Coliwasa - low	8	0.081562	0.00036	0.08078	0.08234

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa - high	7	0.081887	0.000696	0.00026	0.08124	0.08253
Coliwasa - low	8	0.081562	0.001233	0.00044	0.08053	0.08259

t Test

Coliwasa - low-Coliwasa - high
Assuming unequal variances

Difference	-0.00033	t Ratio	-0.6389
Std Err Dif	0.00051	DF	11.27905
Upper CL Dif	0.00079	Prob > t	0.5356
Lower CL Dif	-0.00144	Prob > t	0.7322
Confidence	0.95	Prob < t	0.2678

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa - high	7	0.0006955	0.0004868	0.0004964
Coliwasa - low	8	0.0012326	0.0009426	0.0008861

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5887	1	13	0.2297
Brown-Forsythe	1.2191	1	13	0.2896
Levene	2.1135	1	13	0.1697
Bartlett	1.8153	1	.	0.1779
F Test 2-sided	3.1406	7	6	0.1845

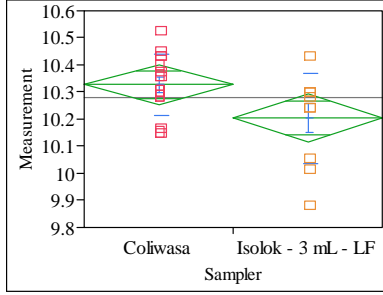
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4082	1	11.279	0.5356

t Test
0.6389

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.178652
Adj Rsquare	0.142941
Root Mean Square Error	0.136572
Mean of Response	10.27812
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.12471	t Ratio	-2.23668
Std Err Dif	0.05576	DF	23
Upper CL Dif	-0.00937	Prob > t	0.0353
Lower CL Dif	-0.24005	Prob > t	0.9824
Confidence	0.95	Prob < t	0.0176

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.09331102	0.093311	5.0027	0.0353
Error	23	0.42899646	0.018652		
C. Total	24	0.52230748			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.3280	0.03526	10.255	10.401
Isolok - 3 mL - LF	10	10.2033	0.04319	10.114	10.293

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.3280	0.113550	0.02932	10.265	10.391
Isolok - 3 mL - LF	10	10.2033	0.166161	0.05254	10.084	10.322

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.12471	t Ratio	-2.07255
Std Err Dif	0.06017	DF	14.56852
Upper CL Dif	0.00388	Prob > t	0.0564
Lower CL Dif	-0.25329	Prob > t	0.9718
Confidence	0.95	Prob < t	0.0282

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1135498	0.0911999	0.0894363
Isolok - 3 mL - LF	10	0.1661614	0.1322650	0.1171490

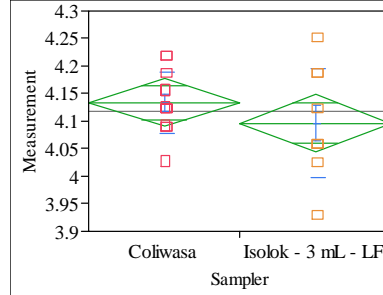
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.8584	1	23	0.1860
Brown-Forsythe	0.4943	1	23	0.4891
Levene	1.7999	1	23	0.1928
Bartlett	1.5667	1	.	0.2107
F Test 2-sided	2.1414	9	14	0.1948

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.2955	1	14.569	0.0564

t Test
2.0725

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



Excluded Rows
4

Oneway Anova
Summary of Fit

Rsquare	0.06099
Adj Rsquare	0.014039
Root Mean Square Error	0.07573
Mean of Response	4.118545
Observations (or Sum Wgts)	22

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03743	t Ratio	-1.13975
Std Err Dif	0.03284	DF	20
Upper CL Dif	0.03107	Prob > t	0.2679
Lower CL Dif	-0.10593	Prob > t	0.8661
Confidence	0.95	Prob < t	0.1339

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00744996	0.007450	1.2990	0.2679
Error	20	0.11470105	0.005735		
C. Total	21	0.12215102			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	13	4.13386	0.02100	4.0900	4.1777
Isolok - 3 mL - LF	9	4.09643	0.02524	4.0438	4.1491

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	13	4.13386	0.055051	0.01527	4.1006	4.1671
Isolok - 3 mL - LF	9	4.09643	0.098953	0.03298	4.0204	4.1725

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03743	t Ratio	-1.02974
Std Err Dif	0.03635	DF	11.44531
Upper CL Dif	0.04219	Prob > t	0.3244
Lower CL Dif	-0.11705	Prob > t	0.8378
Confidence	0.95	Prob < t	0.1622

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	13	0.0550507	0.0430590	0.0421064
Isolok - 3 mL - LF	9	0.0989534	0.0795037	0.0751310

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.4133	1	20	0.0795
Brown-Forsythe	2.0429	1	20	0.1684
Levene	4.1908	1	20	0.0540
Bartlett	3.2054	1	.	0.0734
F Test 2-sided	3.2310	8	12	0.0665

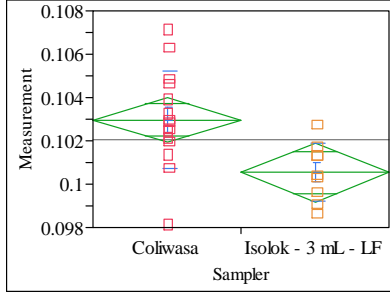
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.0604	1	11.445	0.3244

t Test
1.0297

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=BaO (wt%), Targeted=0.0919



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.283078
Adj Rsquare	0.250491
Root Mean Square Error	0.001955
Mean of Response	0.102053
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00243	t Ratio	-2.94733
Std Err Dif	0.00082	DF	22
Upper CL Dif	-0.00072	Prob > t	0.0074
Lower CL Dif	-0.00414	Prob > t	0.9963
Confidence	0.95	Prob < t	0.0037

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003319	0.000033	8.6867	0.0074
Error	22	0.00008405	3.821e-6		
C. Total	23	0.00011724			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.102964	0.00050	0.10192	0.10401
Isolok - 3 mL - LF	9	0.100535	0.00065	0.09918	0.10189

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.102964	0.002233	0.00058	0.10173	0.10420
Isolok - 3 mL - LF	9	0.100535	0.001335	0.00045	0.09951	0.10156

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00243	t Ratio	-3.33515
Std Err Dif	0.00073	DF	21.99079
Upper CL Dif	-0.00092	Prob > t	0.0030
Lower CL Dif	-0.00394	Prob > t	0.9985
Confidence	0.95	Prob < t	0.0015

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0022327	0.0016048	0.0016003
Isolok - 3 mL - LF	9	0.0013353	0.0010724	0.0010669

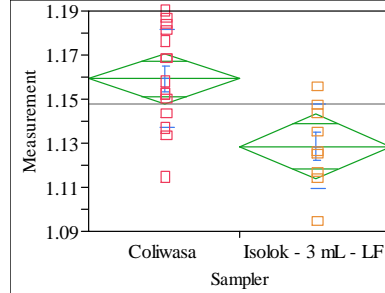
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.3496	1	22	0.2578
Brown-Forsythe	0.9803	1	22	0.3329
Levene	1.0001	1	22	0.3282
Bartlett	2.2591	1	.	0.1328
F Test 2-sided	2.7959	14	8	0.1475

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
11.1232	1	21.991	0.0030

t Test
3.3351

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=CaO (wt%), Targeted=1.1462



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.352173
Adj Rsquare	0.322727
Root Mean Square Error	0.021089
Mean of Response	1.147752
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03075	t Ratio	-3.45828
Std Err Dif	0.00889	DF	22
Upper CL Dif	-0.01231	Prob > t	0.0022
Lower CL Dif	-0.04919	Prob > t	0.9989
Confidence	0.95	Prob < t	0.0011

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00531924	0.005319	11.9597	0.0022
Error	22	0.00978480	0.000445		
C. Total	23	0.01510404			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	1.15928	0.00545	1.1480	1.1706
Isolok - 3 mL - LF	9	1.12853	0.00703	1.1140	1.1431

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	1.15928	0.022167	0.00572	1.1470	1.1716
Isolok - 3 mL - LF	9	1.12853	0.019058	0.00635	1.1139	1.1432

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03075	t Ratio	-3.59634
Std Err Dif	0.00855	DF	19.07591
Upper CL Dif	-0.01286	Prob > t	0.0019
Lower CL Dif	-0.04864	Prob > t	0.9990
Confidence	0.95	Prob < t	0.0010

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0221667	0.0183326	0.0185627
Isolok - 3 mL - LF	9	0.0190583	0.0148557	0.0147693

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.3018	1	22	0.5883
Brown-Forsythe	0.6364	1	22	0.4335
Levene	0.5426	1	22	0.4692
Bartlett	0.2146	1	.	0.6432
F Test 2-sided	1.3528	14	8	0.6846

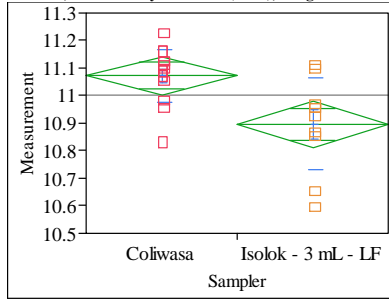
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
12.9336	1	19.076	0.0019

t Test
3.5963

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.328863
Adj Rsquare	0.299683
Root Mean Square Error	0.12831
Mean of Response	11.00126
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.17585	t Ratio	-3.35711
Std Err Dif	0.05238	DF	23
Upper CL Dif	-0.06749	Prob > t	0.0027
Lower CL Dif	-0.28421	Prob > t	0.9986
Confidence	0.95	Prob < t	0.0014

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.18554588	0.185546	11.2702	0.0027
Error	23	0.37865880	0.016463		
C. Total	24	0.56420467			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	11.0716	0.03313	11.003	11.140
Isolok - 3 mL - LF	10	10.8957	0.04058	10.812	10.980

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	11.0716	0.095724	0.02472	11.019	11.125
Isolok - 3 mL - LF	10	10.8957	0.166792	0.05274	10.776	11.015

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.17585	t Ratio	-3.01905
Std Err Dif	0.05825	DF	12.98405
Upper CL Dif	-0.05000	Prob > t	0.0099
Lower CL Dif	-0.30171	Prob > t	0.9951
Confidence	0.95	Prob < t	0.0049

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0957243	0.0655756	0.0638599
Isolok - 3 mL - LF	10	0.1667915	0.1240980	0.1186651

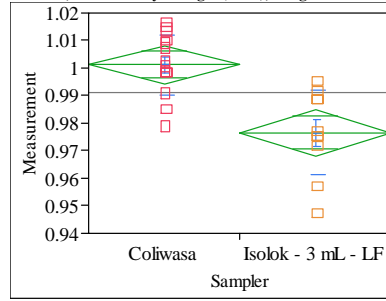
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7608	1	23	0.1102
Brown-Forsythe	2.1260	1	23	0.1583
Levene	2.9511	1	23	0.0993
Bartlett	3.3277	1	.	0.0681
F Test 2-sided	3.0360	9	14	0.0615

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	9.1146	DFNum	1	DFDen	12.984	Prob > F	0.0099
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t Test
3.0190

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=MgO (wt%), Targeted=1.014



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.488227
Adj Rsquare	0.465976
Root Mean Square Error	0.012863
Mean of Response	0.991332
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.02460	t Ratio	-4.68421
Std Err Dif	0.00525	DF	23
Upper CL Dif	-0.01374	Prob > t	0.0001
Lower CL Dif	-0.03546	Prob > t	0.9999
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00363040	0.003630	21.9418	0.0001
Error	23	0.00380548	0.000165		
C. Total	24	0.00743589			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	1.00117	0.00332	0.99430	1.0080
Isolok - 3 mL - LF	10	0.97657	0.00407	0.96816	0.9850

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	1.00117	0.010901	0.00281	0.99513	1.0072
Isolok - 3 mL - LF	10	0.97657	0.015427	0.00488	0.96554	0.9876

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.02460	t Ratio	-4.36746
Std Err Dif	0.00563	DF	14.9254
Upper CL Dif	-0.01259	Prob > t	0.0006
Lower CL Dif	-0.03661	Prob > t	0.9997
Confidence	0.95	Prob < t	0.0003

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0109007	0.0083726	0.0084021
Isolok - 3 mL - LF	10	0.0154270	0.0114423	0.0114423

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5087	1	23	0.2318
Brown-Forsythe	0.8697	1	23	0.3607
Levene	0.9001	1	23	0.3526
Bartlett	1.3026	1	.	0.2537
F Test 2-sided	2.0029	9	14	0.2356

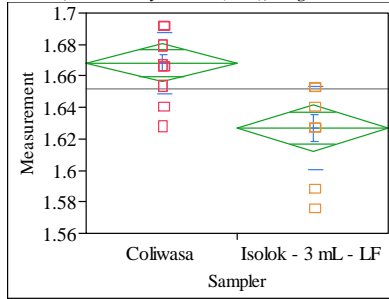
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	19.0747	DFNum	1	DFDen	14.925	Prob > F	0.0006
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t Test
4.3675

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=MnO (wt%), Targeted=1.779



Excluded Rows
1

Oneway Anova Summary of Fit

Rsquare	0.466019
Adj Rsquare	0.442803
Root Mean Square Error	0.02259
Mean of Response	1.651703
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.04132	t Ratio	-4.48026
Std Err Dif	0.00922	DF	23
Upper CL Dif	-0.02224	Prob > t	0.0002
Lower CL Dif	-0.06040	Prob > t	0.9999
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01024326	0.010243	20.0727	0.0002
Error	23	0.01173707	0.000510		
C. Total	24	0.02198033			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	1.66823	0.00583	1.6562	1.6803
Isolok - 3 mL - LF	10	1.62691	0.00714	1.6121	1.6417

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	1.66823	0.019643	0.00507	1.6574	1.6791
Isolok - 3 mL - LF	10	1.62691	0.026532	0.00839	1.6079	1.6459

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.04132	t Ratio	-4.21451
Std Err Dif	0.00980	DF	15.45274
Upper CL Dif	-0.02048	Prob > t	0.0007
Lower CL Dif	-0.06216	Prob > t	0.9996
Confidence	0.95	Prob < t	0.0004

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0196427	0.0151501	0.0146336
Isolok - 3 mL - LF	10	0.0265316	0.0180768	0.0180768

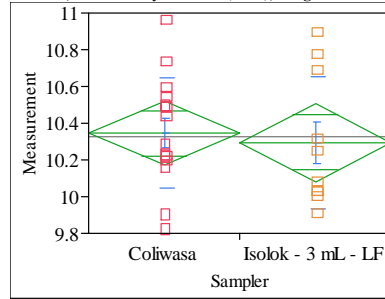
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.0756	1	23	0.3105
Brown-Forsythe	0.3054	1	23	0.5859
Levene	0.2352	1	23	0.6323
Bartlett	0.9742	1	.	0.3236
F Test 2-sided	1.8244	9	14	0.3022

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
17.7621	1	15.453	0.0007

t Test
4.2145

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Excluded Rows
1

Oneway Anova Summary of Fit

Rsquare	0.006182
Adj Rsquare	-0.03703
Root Mean Square Error	0.325896
Mean of Response	10.32622
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.05033	t Ratio	-0.37825
Std Err Dif	0.13305	DF	23
Upper CL Dif	0.22490	Prob > t	0.7087
Lower CL Dif	-0.32555	Prob > t	0.6456
Confidence	0.95	Prob < t	0.3544

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0151958	0.015196	0.1431	0.7087
Error	23	2.4427935	0.106208		
C. Total	24	2.4579893			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.3463	0.08415	10.172	10.520
Isolok - 3 mL - LF	10	10.2960	0.10306	10.083	10.509

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.3463	0.302362	0.07807	10.179	10.514
Isolok - 3 mL - LF	10	10.2960	0.359455	0.11367	10.039	10.553

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.05033	t Ratio	-0.36495
Std Err Dif	0.13790	DF	17.05391
Upper CL Dif	0.24054	Prob > t	0.7196
Lower CL Dif	-0.34119	Prob > t	0.6402
Confidence	0.95	Prob < t	0.3598

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.3023621	0.2413220	0.2399440
Isolok - 3 mL - LF	10	0.3594554	0.2960208	0.2857760

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5191	1	23	0.4785
Brown-Forsythe	0.2833	1	23	0.5997
Levene	0.5958	1	23	0.4480
Bartlett	0.3197	1	.	0.5718
F Test 2-sided	1.4133	9	14	0.5419

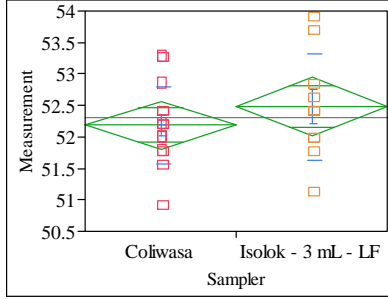
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.1332	1	17.054	0.7196

t Test
0.3649

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.041469
Adj Rsquare	-0.00021
Root Mean Square Error	0.717936
Mean of Response	52.30161
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	0.29237	t Ratio	0.997526
Std Err Dif	0.29310	DF	23
Upper CL Dif	0.89869	Prob > t	0.3289
Lower CL Dif	-0.31394	Prob > t	0.1644
Confidence	0.95	Prob < t	0.8356

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.512885	0.512885	0.9951	0.3289
Error	23	11.854931	0.515432		
C. Total	24	12.367816			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	52.1847	0.18537	51.801	52.568
Isolok - 3 mL - LF	10	52.4770	0.22703	52.007	52.947

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	52.1847	0.618268	0.15964	51.842	52.527
Isolok - 3 mL - LF	10	52.4770	0.850056	0.26881	51.869	53.085

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.29237	t Ratio	0.935171
Std Err Dif	0.31264	DF	15.24824
Upper CL Dif	0.95780	Prob > t	0.3643
Lower CL Dif	-0.37306	Prob > t	0.1821
Confidence	0.95	Prob < t	0.8179

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.6182681	0.4430728	0.4421220
Isolok - 3 mL - LF	10	0.8500559	0.6332328	0.6203970

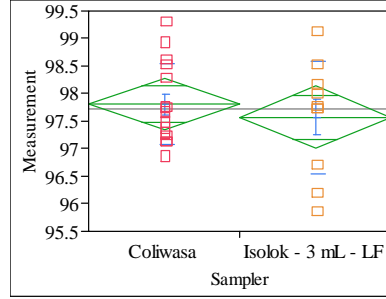
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.2318	1	23	0.2785
Brown-Forsythe	0.8569	1	23	0.3642
Levene	1.0183	1	23	0.3234
Bartlett	1.0935	1	.	0.2957
F Test 2-sided	1.8903	9	14	0.2755

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.8745	DFNum	1	DFDen	15.248	Prob > F	0.3643
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t Test
0.9352

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.019083
Adj Rsquare	-0.02357
Root Mean Square Error	0.863343
Mean of Response	97.71368
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.23576	t Ratio	-0.66891
Std Err Dif	0.35246	DF	23
Upper CL Dif	0.49335	Prob > t	0.5102
Lower CL Dif	-0.96488	Prob > t	0.7449
Confidence	0.95	Prob < t	0.2551

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.333508	0.333508	0.4474	0.5102
Error	23	17.143299	0.745361		
C. Total	24	17.476807			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	97.8080	0.22291	97.347	98.269
Isolok - 3 mL - LF	10	97.5722	0.27301	97.007	98.137

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	97.8080	0.73920	0.19086	97.399	98.217
Isolok - 3 mL - LF	10	97.5722	1.02705	0.32478	96.838	98.307

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.2358	t Ratio	-0.62585
Std Err Dif	0.3767	DF	15.12944
Upper CL Dif	0.5666	Prob > t	0.5407
Lower CL Dif	-1.0381	Prob > t	0.7296
Confidence	0.95	Prob < t	0.2704

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.739195	0.6101160	0.5843872
Isolok - 3 mL - LF	10	1.027054	0.7934778	0.7376368

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7350	1	23	0.2007
Brown-Forsythe	0.4418	1	23	0.5129
Levene	0.8815	1	23	0.3576
Bartlett	1.1674	1	.	0.2799
F Test 2-sided	1.9305	9	14	0.2605

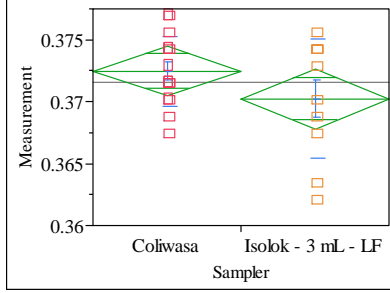
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.3917	DFNum	1	DFDen	15.129	Prob > F	0.5407
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t Test
0.6258

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=1, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.084317
Adj Rsquare	0.044504
Root Mean Square Error	0.003714
Mean of Response	0.371578
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.00221	t Ratio	-1.45528
Std Err Dif	0.00152	DF	23
Upper CL Dif	0.00093	Prob > t	0.1591
Lower CL Dif	-0.00534	Prob > t	0.9204
Confidence	0.95	Prob < t	0.0796

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002921	0.000029	2.1179	0.1591
Error	23	0.00031719	0.000014		
C. Total	24	0.00034639			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.372461	0.00096	0.37048	0.37444
Isolok - 3 mL - LF	10	0.370254	0.00117	0.36782	0.37268

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.372461	0.002818	0.00073	0.37090	0.37402
Isolok - 3 mL - LF	10	0.370254	0.004784	0.00151	0.36683	0.37368

t Test

Isolok - 3 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.00221	t Ratio	-1.31421
Std Err Dif	0.00168	DF	13.1913
Upper CL Dif	0.00142	Prob > t	0.2112
Lower CL Dif	-0.00583	Prob > t	0.8944
Confidence	0.95	Prob < t	0.1056

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0028181	0.0023174	0.0022513
Isolok - 3 mL - LF	10	0.0047843	0.0039173	0.0039173

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.3836	1	23	0.0475
Brown-Forsythe	3.2680	1	23	0.0837
Levene	4.2469	1	23	0.0508
Bartlett	3.0260	1	.	0.0819
F Test 2-sided	2.8822	9	14	0.0743

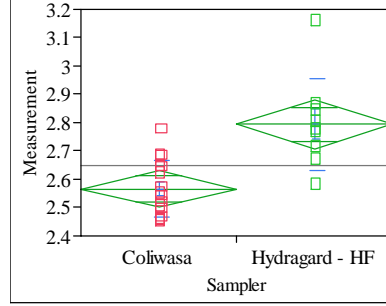
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.7272	1	13.191	0.2112

t Test

1.3142

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Al/B, Targeted=2.552



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.458088
Adj Rsquare	0.434527
Root Mean Square Error	0.124314
Mean of Response	2.648293
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.228393	t Ratio	4.409343
Std Err Dif	0.051797	DF	23
Upper CL Dif	0.335544	Prob > t	0.0002
Lower CL Dif	0.121241	Prob > t	0.0001
Confidence	0.95	Prob < t	0.9999

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.30045966	0.300460	19.4423	0.0002
Error	23	0.35543989	0.015454		
C. Total	24	0.65589955			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.56607	0.03108	2.5018	2.6304
Hydragard - HF	9	2.79446	0.04144	2.7087	2.8802

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.56607	0.098929	0.02473	2.5134	2.6188
Hydragard - HF	9	2.79446	0.161491	0.05383	2.6703	2.9186

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.228393	t Ratio	3.855365
Std Err Dif	0.059240	DF	11.46157
Upper CL Dif	0.358141	Prob > t	0.0025
Lower CL Dif	0.098644	Prob > t	0.0012
Confidence	0.95	Prob < t	0.9988

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0989291	0.0824976	0.0801678
Hydragard - HF	9	0.1614912	0.1066538	0.1050515

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.4877	1	23	0.2349
Brown-Forsythe	0.4958	1	23	0.4884
Levene	0.5362	1	23	0.4714
Bartlett	2.5404	1	.	0.1110
F Test 2-sided	2.6647	8	15	0.0970

Welch Anova testing Means Equal, allowing Std Devs Not Equal

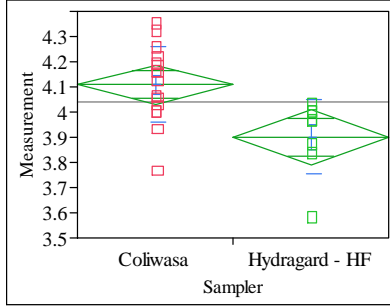
F Ratio	DFNum	DFDen	Prob > F
14.8638	1	11.462	0.0025

t Test

3.8554

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.323774
Adj Rsquare	0.293037
Root Mean Square Error	0.148925
Mean of Response	4.039633
Observations (or Sum Wgts)	24

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	-0.20929	t Ratio	-3.24554
Std Err Dif	0.06449	DF	22
Upper CL Dif	-0.07556	Prob > t	0.0037
Lower CL Dif	-0.34303	Prob > t	0.9981
Confidence	0.95	Prob < t	0.0019

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.23362010	0.233620	10.5335	0.0037
Error	22	0.48793252	0.022179		
C. Total	23	0.72155262			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	4.10940	0.03723	4.0322	4.1866
Hydragard - HF	8	3.90010	0.05265	3.7909	4.0093

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	4.10940	0.149590	0.03740	4.0297	4.1891
Hydragard - HF	8	3.90010	0.147492	0.05215	3.7768	4.0234

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	-0.20929	t Ratio	-3.26155
Std Err Dif	0.06417	DF	14.28841
Upper CL Dif	-0.07192	Prob > t	0.0056
Lower CL Dif	-0.34666	Prob > t	0.9972
Confidence	0.95	Prob < t	0.0028

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.1495897	0.1182307	0.1167214
Hydragard - HF	8	0.1474916	0.1076654	0.0925721

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0015	1	22	0.9694
Brown-Forsythe	0.2813	1	22	0.6012
Levene	0.0764	1	22	0.7849
Bartlett	0.0018	1	.	0.9662
F Test 2-sided	1.0287	15	7	1.0000

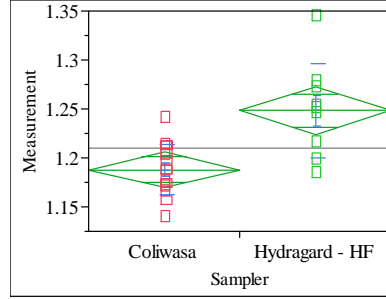
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.6377	1	14.288	0.0056

t Test

3.2615

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=CaO (wt%), Targeted=1.1462



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.425774
Adj Rsquare	0.400808
Root Mean Square Error	0.035096
Mean of Response	1.209748
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwas
Assuming equal variances

Difference	0.060389	t Ratio	4.129639
Std Err Dif	0.014623	DF	23
Upper CL Dif	0.090640	Prob > t	0.0004
Lower CL Dif	0.030138	Prob > t	0.0002
Confidence	0.95	Prob < t	0.9998

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.02100581	0.021006	17.0539	0.0004
Error	23	0.02832976	0.001232		
C. Total	24	0.04933557			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwas	16	1.18801	0.00877	1.1699	1.2062
Hydragard - HF	9	1.24840	0.01170	1.2242	1.2726

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwas	16	1.18801	0.025838	0.00646	1.1742	1.2018
Hydragard - HF	9	1.24840	0.047849	0.01595	1.2116	1.2852

t Test

Hydragard - HF-Coliwas
Assuming unequal variances

Difference	0.060389	t Ratio	3.509379
Std Err Dif	0.017208	DF	10.68618
Upper CL Dif	0.098400	Prob > t	0.0051
Lower CL Dif	0.022379	Prob > t	0.0026
Confidence	0.95	Prob < t	0.9974

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwas	16	0.0258377	0.0207366	0.0207257
Hydragard - HF	9	0.0478486	0.0338572	0.0340472

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.0727	1	23	0.0929
Brown-Forsythe	2.1291	1	23	0.1581
Levene	2.0486	1	23	0.1658
Bartlett	4.0292	1	.	0.0447
F Test 2-sided	3.4295	8	15	0.0381

Welch Anova testing Means Equal, allowing Std Devs Not Equal

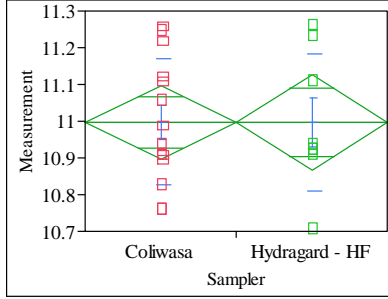
F Ratio	DFNum	DFDen	Prob > F
12.3157	1	10.686	0.0051

t Test

3.5094

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Excluded Rows

4

Oneway Anova
Summary of Fit

Rsquare	1.882e-6
Adj Rsquare	-0.05
Root Mean Square Error	0.177042
Mean of Response	10.99662
Observations (or Sum Wgts)	22

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	-0.00048	t Ratio	-0.00614
Std Err Dif	0.07847	DF	20
Upper CL Dif	0.16319	Prob > t	0.9952
Lower CL Dif	-0.16416	Prob > t	0.5024
Confidence	0.95	Prob < t	0.4976

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000118	1.18e-6	0.0000	0.9952
Error	20	0.62687492	0.031344		
C. Total	21	0.62687610			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	10.9968	0.04732	10.898	11.095
Hydragard - HF	8	10.9963	0.06259	10.866	11.127

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	10.9968	0.171587	0.04586	10.898	11.096
Hydragard - HF	8	10.9963	0.186750	0.06603	10.840	11.152

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	-0.00048	t Ratio	-0.00599
Std Err Dif	0.08039	DF	13.66973
Upper CL Dif	0.17233	Prob > t	0.9953
Lower CL Dif	-0.17329	Prob > t	0.5023
Confidence	0.95	Prob < t	0.4977

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.1715869	0.1449788	0.1434657
Hydragard - HF	8	0.1867496	0.1508075	0.1348000

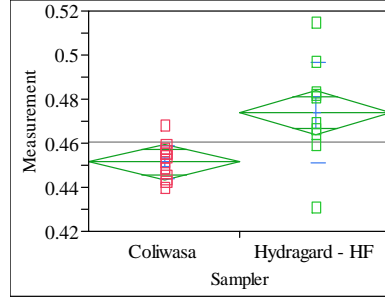
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1364	1	20	0.7158
Brown-Forsythe	0.0302	1	20	0.8638
Levene	0.0230	1	20	0.8811
Bartlett	0.0627	1	.	0.8022
F Test 2-sided	1.1845	7	13	0.7504

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0000	1	13.67	0.9953

t Test
0.0060

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=NiO (wt%), Targeted=0.41



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.358337
Adj Rsquare	0.330438
Root Mean Square Error	0.015365
Mean of Response	0.460391
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.022481	t Ratio	3.583899
Std Err Dif	0.006273	DF	23
Upper CL Dif	0.035457	Prob > t	0.0016
Lower CL Dif	0.009505	Prob > t	0.0008
Confidence	0.95	Prob < t	0.9992

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00303233	0.003032	12.8443	0.0016
Error	23	0.00542991	0.000236		
C. Total	24	0.00846223			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.451398	0.00397	0.44319	0.45960
Hydragard - HF	10	0.473879	0.00486	0.46383	0.48393

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.451398	0.007458	0.00193	0.44727	0.45553
Hydragard - HF	10	0.473879	0.022733	0.00719	0.45762	0.49014

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.022481	t Ratio	3.020684
Std Err Dif	0.007442	DF	10.30386
Upper CL Dif	0.038997	Prob > t	0.0125
Lower CL Dif	0.005964	Prob > t	0.0062
Confidence	0.95	Prob < t	0.9938

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0074582	0.0059610	0.0059383
Hydragard - HF	10	0.0227331	0.0167970	0.0167970

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.6578	1	23	0.0416
Brown-Forsythe	7.6742	1	23	0.0109
Levene	7.8072	1	23	0.0103
Bartlett	12.6023	1	.	0.0004
F Test 2-sided	9.2906	9	14	0.0003

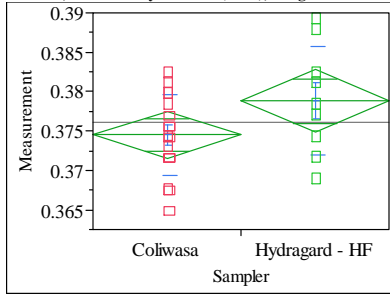
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
9.1245	1	10.304	0.0125

t Test
3.0207

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=2, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Excluded Rows

1

Oneway Anova

Summary of Fit

Rsquare	0.121946
Adj Rsquare	0.083769
Root Mean Square Error	0.005794
Mean of Response	0.376063
Observations (or Sum Wgts)	25

t Test

Hydragard - HF-Coliwasa
Assuming equal variances

Difference	0.00432	t Ratio	1.787254
Std Err Dif	0.00241	DF	23
Upper CL Dif	0.00931	Prob > t	0.0871
Lower CL Dif	-0.00068	Prob > t	0.0435
Confidence	0.95	Prob < t	0.9565

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00010725	0.000107	3.1943	0.0871
Error	23	0.00077224	0.000034		
C. Total	24	0.00087949			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.374509	0.00145	0.37151	0.37751
Hydragard - HF	9	0.378824	0.00193	0.37483	0.38282

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.374509	0.005114	0.00128	0.37178	0.37723
Hydragard - HF	9	0.378824	0.006891	0.00230	0.37353	0.38412

t Test

Hydragard - HF-Coliwasa
Assuming unequal variances

Difference	0.00432	t Ratio	1.64135
Std Err Dif	0.00263	DF	13.05574
Upper CL Dif	0.00999	Prob > t	0.1246
Lower CL Dif	-0.00136	Prob > t	0.0623
Confidence	0.95	Prob < t	0.9377

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0051140	0.0040524	0.0040524
Hydragard - HF	9	0.0068914	0.0054699	0.0055533

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.6893	1	23	0.2066
Brown-Forsythe	1.2496	1	23	0.2752
Levene	1.1082	1	23	0.3034
Bartlett	0.9273	1	.	0.3356
F Test 2-sided	1.8159	8	15	0.3040

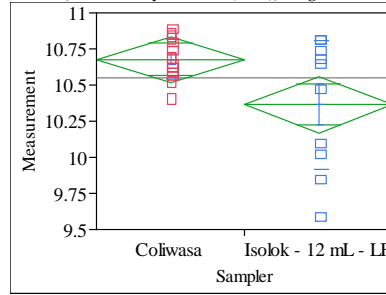
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.6940	1	13.056	0.1246

t Test

1.6414

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



Excluded Rows

1

Oneway Anova

Summary of Fit

Rsquare	0.219726
Adj Rsquare	0.185801
Root Mean Square Error	0.299465
Mean of Response	10.55248
Observations (or Sum Wgts)	25

t Test

Isokol - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.31114	t Ratio	-2.54496
Std Err Dif	0.12226	DF	23
Upper CL Dif	-0.05823	Prob > t	0.0181
Lower CL Dif	-0.56404	Prob > t	0.9909
Confidence	0.95	Prob < t	0.0091

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.5808399	0.580840	6.4768	0.0181
Error	23	2.0626295	0.089680		
C. Total	24	2.6434694			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.6769	0.07732	10.517	10.837
Isokol - 12 mL - LF	10	10.3658	0.09470	10.170	10.562

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.6769	0.138199	0.03568	10.600	10.753
Isokol - 12 mL - LF	10	10.3658	0.446622	0.14123	10.046	10.685

t Test

Isokol - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.31114	t Ratio	-2.13587
Std Err Dif	0.14567	DF	10.15903
Upper CL Dif	0.01275	Prob > t	0.0580
Lower CL Dif	-0.63503	Prob > t	0.9710
Confidence	0.95	Prob < t	0.0290

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1381989	0.1098429	0.1095910
Isokol - 12 mL - LF	10	0.4466225	0.3869696	0.3665630

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	11.9504	1	23	0.0021
Brown-Forsythe	10.2537	1	23	0.0040
Levene	27.5859	1	23	<.0001
Bartlett	13.8172	1	.	0.0002
F Test 2-sided	10.4441	9	14	0.0002

Welch Anova testing Means Equal, allowing Std Devs Not Equal

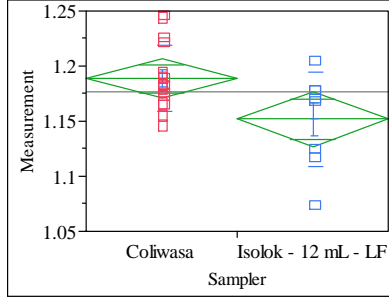
F Ratio	DFNum	DFDen	Prob > F
4.5620	1	10.159	0.0580

t Test

2.1359

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=CaO (wt%), Targeted=1.1462



Excluded Rows

2

Oneway Anova Summary of Fit

Rsquare	0.215517
Adj Rsquare	0.179859
Root Mean Square Error	0.034749
Mean of Response	1.176377
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.03699	t Ratio	-2.45844
Std Err Dif	0.01505	DF	22
Upper CL Dif	-0.00579	Prob > t	0.0223
Lower CL Dif	-0.06820	Prob > t	0.9889
Confidence	0.95	Prob < t	0.0111

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00729792	0.007298	6.0439	0.0223
Error	22	0.02656449	0.001207		
C. Total	23	0.03386241			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.18871	0.00869	1.1707	1.2067
Isolok - 12 mL - LF	8	1.15172	0.01229	1.1262	1.1772

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.18871	0.030157	0.00754	1.1726	1.2048
Isolok - 12 mL - LF	8	1.15172	0.042967	0.01519	1.1158	1.1876

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.03699	t Ratio	-2.18123
Std Err Dif	0.01696	DF	10.57364
Upper CL Dif	0.00052	Prob > t	0.0527
Lower CL Dif	-0.07450	Prob > t	0.9736
Confidence	0.95	Prob < t	0.0264

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0301569	0.0230212	0.0221249
Isolok - 12 mL - LF	8	0.0429667	0.0351112	0.0309573

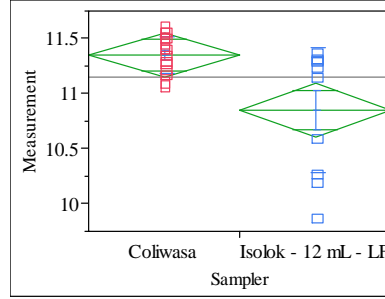
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.6294	1	22	0.2151
Brown-Forsythe	0.6416	1	22	0.4317
Levene	2.0858	1	22	0.1628
Bartlett	1.2136	1	.	0.2706
F Test 2-sided	2.0300	7	15	0.2366

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.7578	1	10.574	0.0527

t Test
2.1812

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.311261
Adj Rsquare	0.281316
Root Mean Square Error	0.379818
Mean of Response	11.14994
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.49992	t Ratio	-3.22403
Std Err Dif	0.15506	DF	23
Upper CL Dif	-0.17915	Prob > t	0.0038
Lower CL Dif	-0.82068	Prob > t	0.9981
Confidence	0.95	Prob < t	0.0019

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.4995106	1.49951	10.3944	0.0038
Error	23	3.3180186	0.14426		
C. Total	24	4.8175292			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	11.3499	0.09807	11.147	11.553
Isolok - 12 mL - LF	10	10.8500	0.12011	10.602	11.098

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	11.3499	0.169325	0.04372	11.256	11.444
Isolok - 12 mL - LF	10	10.8500	0.569271	0.18002	10.443	11.257

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.49992	t Ratio	-2.69858
Std Err Dif	0.18525	DF	10.07045
Upper CL Dif	-0.08754	Prob > t	0.0222
Lower CL Dif	-0.91229	Prob > t	0.9889
Confidence	0.95	Prob < t	0.0111

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1693254	0.1411908	0.1382043
Isolok - 12 mL - LF	10	0.5692708	0.5021106	0.4446367

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	13.5139	1	23	0.0013
Brown-Forsythe	5.9570	1	23	0.0228
Levene	36.1083	1	23	<.0001
Bartlett	14.6570	1	.	0.0001
F Test 2-sided	11.3030	9	14	0.0001

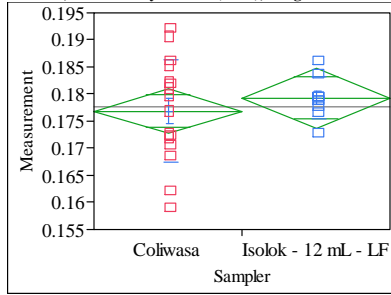
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.2824	1	10.07	0.0222

t Test
2.6986

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.021973
Adj Rsquare	-0.02055
Root Mean Square Error	0.008002
Mean of Response	0.177751
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00240	t Ratio	0.718844
Std Err Dif	0.00333	DF	23
Upper CL Dif	0.00929	Prob > t	0.4795
Lower CL Dif	-0.00450	Prob > t	0.2397
Confidence	0.95	Prob < t	0.7603

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003309	0.000033	0.5167	0.4795
Error	23	0.00147262	0.000064		
C. Total	24	0.00150571			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.00200	0.17275	0.18103
Isolok - 12 mL - LF	9	0.179285	0.00267	0.17377	0.18480

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.009502	0.00238	0.17182	0.18195
Isolok - 12 mL - LF	9	0.179285	0.003845	0.00128	0.17633	0.18224

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00240	t Ratio	0.887911
Std Err Dif	0.00270	DF	21.57549
Upper CL Dif	0.00800	Prob > t	0.3844
Lower CL Dif	-0.00321	Prob > t	0.1922
Confidence	0.95	Prob < t	0.8078

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0095021	0.0077923	0.0077923
Isolok - 12 mL - LF	9	0.0038448	0.0025877	0.0025430

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.2018	1	23	0.0519
Brown-Forsythe	7.8769	1	23	0.0100
Levene	8.1402	1	23	0.0090
Bartlett	6.2616	1	.	0.0123
F Test 2-sided	6.1079	15	8	0.0144

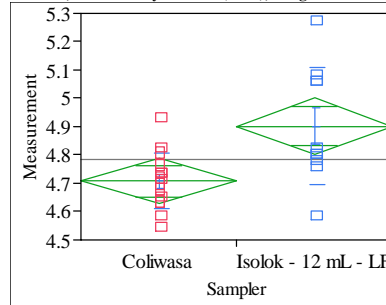
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.7884	1	21.575	0.3844

t Test

0.8879

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.304664
Adj Rsquare	0.274432
Root Mean Square Error	0.150062
Mean of Response	4.785466
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.194479	t Ratio	3.174511
Std Err Dif	0.061263	DF	23
Upper CL Dif	0.321210	Prob > t	0.0042
Lower CL Dif	0.067747	Prob > t	0.0021
Confidence	0.95	Prob < t	0.9979

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.22693163	0.226932	10.0775	0.0042
Error	23	0.51792794	0.022519		
C. Total	24	0.74485957			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	4.70767	0.03875	4.6275	4.7878
Isolok - 12 mL - LF	10	4.90215	0.04745	4.8040	5.0003

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	4.70767	0.098210	0.02536	4.6533	4.7621
Isolok - 12 mL - LF	10	4.90215	0.206262	0.06523	4.7546	5.0497

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.194479	t Ratio	2.779002
Std Err Dif	0.069981	DF	11.75352
Upper CL Dif	0.347311	Prob > t	0.0170
Lower CL Dif	0.041647	Prob > t	0.0085
Confidence	0.95	Prob < t	0.9915

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0982098	0.0736770	0.0731986
Isolok - 12 mL - LF	10	0.2062619	0.1730932	0.1571617

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.3520	1	23	0.0300
Brown-Forsythe	3.5624	1	23	0.0718
Levene	9.9636	1	23	0.0044
Bartlett	5.8724	1	.	0.0154
F Test 2-sided	4.4109	9	14	0.0135

Welch Anova testing Means Equal, allowing Std Devs Not Equal

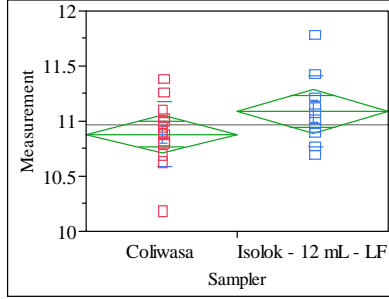
F Ratio	DFNum	DFDen	Prob > F
7.7229	1	11.754	0.0170

t Test

2.7790

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Excluded Rows

2

Oneway Anova
Summary of Fit

Rsquare	0.110729
Adj Rsquare	0.070308
Root Mean Square Error	0.304617
Mean of Response	10.96823
Observations (or Sum Wgts)	24

t Test

Islok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.20875	t Ratio	1.655103
Std Err Dif	0.12612	DF	22
Upper CL Dif	0.47031	Prob > t	0.1121
Lower CL Dif	-0.05282	Prob > t	0.0561
Confidence	0.95	Prob < t	0.9439

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.2541904	0.254190	2.7394	0.1121
Error	22	2.0414177	0.092792		
C. Total	23	2.2956081			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	10.8812	0.08141	10.712	11.050
Islok - 12 mL - LF	10	11.0900	0.09633	10.890	11.290

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	10.8812	0.291721	0.07797	10.713	11.050
Islok - 12 mL - LF	10	11.0900	0.322335	0.10193	10.859	11.321

t Test

Islok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.20875	t Ratio	1.626642
Std Err Dif	0.12833	DF	18.27978
Upper CL Dif	0.47806	Prob > t	0.1209
Lower CL Dif	-0.06057	Prob > t	0.0605
Confidence	0.95	Prob < t	0.9395

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2917214	0.1973857	0.1973857
Islok - 12 mL - LF	10	0.3223352	0.2350912	0.2305080

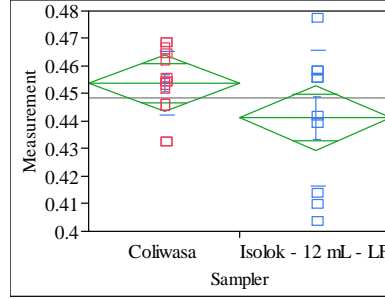
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.0753	1	22	0.7864
Brown-Forsythe	0.1423	1	22	0.7097
Levene	0.1934	1	22	0.6644
Bartlett	0.1022	1	.	0.7492
F Test 2-sided	1.2209	9	13	0.7208

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.6460	1	18.28	0.1209

t Test
1.6266

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=NiO (wt%), Targeted=0.41



Excluded Rows

2

Oneway Anova
Summary of Fit

Rsquare	0.11406
Adj Rsquare	0.07379
Root Mean Square Error	0.018157
Mean of Response	0.448556
Observations (or Sum Wgts)	24

t Test

Islok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.01265	t Ratio	-1.68297
Std Err Dif	0.00752	DF	22
Upper CL Dif	0.00294	Prob > t	0.1065
Lower CL Dif	-0.02824	Prob > t	0.9467
Confidence	0.95	Prob < t	0.0533

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00093380	0.000934	2.8324	0.1065
Error	22	0.00725316	0.000330		
C. Total	23	0.00818696			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.453828	0.00485	0.44376	0.46389
Islok - 12 mL - LF	10	0.441176	0.00574	0.42927	0.45308

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	0.453828	0.011722	0.00313	0.44706	0.46060
Islok - 12 mL - LF	10	0.441176	0.024646	0.00779	0.42355	0.45881

t Test

Islok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.01265	t Ratio	-1.50625
Std Err Dif	0.00840	DF	11.92801
Upper CL Dif	0.00566	Prob > t	0.1580
Lower CL Dif	-0.03097	Prob > t	0.9210
Confidence	0.95	Prob < t	0.0790

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0117224	0.008815	0.0088166
Islok - 12 mL - LF	10	0.0246459	0.0198001	0.0197238

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	7.2148	1	22	0.0135
Brown-Forsythe	5.4096	1	22	0.0296
Levene	6.8657	1	22	0.0156
Bartlett	5.6107	1	.	0.0179
F Test 2-sided	4.4203	9	13	0.0160

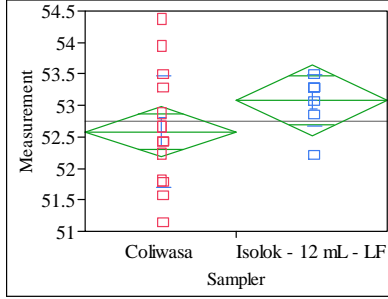
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.2688	1	11.928	0.1580

t Test
1.5063

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Excluded Rows
3

Oneway Anova
Summary of Fit

Rsquare	0.096759
Adj Rsquare	0.053748
Root Mean Square Error	0.757472
Mean of Response	52.757
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.4974	t Ratio	1.499873
Std Err Dif	0.3316	DF	21
Upper CL Dif	1.1870	Prob > t	0.1485
Lower CL Dif	-0.1923	Prob > t	0.0743
Confidence	0.95	Prob < t	0.9257

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	1.290752	1.29075	2.2496	0.1485
Error	21	12.049055	0.57376		
C. Total	22	13.339807			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	52.5840	0.19558	52.177	52.991
Isolok - 12 mL - LF	8	53.0814	0.26781	52.524	53.638

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	52.5840	0.882797	0.22794	52.095	53.073
Isolok - 12 mL - LF	8	53.0814	0.403278	0.14258	52.744	53.419

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.4974	t Ratio	1.850002
Std Err Dif	0.2689	DF	20.74663
Upper CL Dif	1.0569	Prob > t	0.0786
Lower CL Dif	-0.0621	Prob > t	0.0393
Confidence	0.95	Prob < t	0.9607

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.8827969	0.6674616	0.6560520
Isolok - 12 mL - LF	8	0.4032777	0.2874684	0.2406713

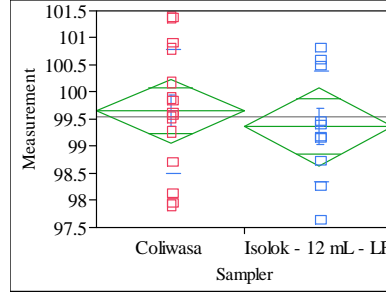
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.6745	1	21	0.1169
Brown-Forsythe	3.2319	1	21	0.0866
Levene	3.3622	1	21	0.0809
Bartlett	4.2992	1	.	0.0381
F Test 2-sided	4.7920	14	7	0.0446

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.4225	1	20.747	0.0786

t Test
1.8500

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.017292
Adj Rsquare	-0.02543
Root Mean Square Error	1.102917
Mean of Response	99.53716
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.2864	t Ratio	-0.63617
Std Err Dif	0.4503	DF	23
Upper CL Dif	0.6450	Prob > t	0.5309
Lower CL Dif	-1.2179	Prob > t	0.7345
Confidence	0.95	Prob < t	0.2655

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.492309	0.49231	0.4047	0.5309
Error	23	27.977775	1.21642		
C. Total	24	28.470084			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	99.6517	0.28477	99.063	100.24
Isolok - 12 mL - LF	10	99.3653	0.34877	98.644	100.09

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	99.6517	1.14702	0.29616	99.017	100.29
Isolok - 12 mL - LF	10	99.3653	1.03056	0.32589	98.628	100.10

t Test

Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.2864	t Ratio	-0.65048
Std Err Dif	0.4404	DF	20.85835
Upper CL Dif	0.6297	Prob > t	0.5225
Lower CL Dif	-1.2026	Prob > t	0.7388
Confidence	0.95	Prob < t	0.2612

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	1.147023	0.8868522	0.8870769
Isolok - 12 mL - LF	10	1.030562	0.7803563	0.7803563

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.2126	1	23	0.6490
Brown-Forsythe	0.1542	1	23	0.6981
Levene	0.1551	1	23	0.6973
Bartlett	0.1180	1	.	0.7312
F Test 2-sided	1.2388	14	9	0.7646

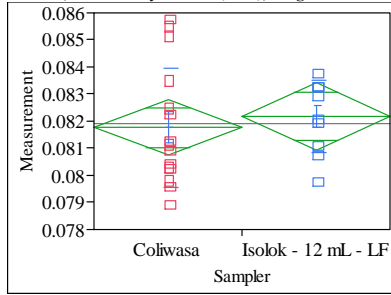
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.4231	1	20.858	0.5225

t Test
0.6505

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



Excluded Rows
1
Oneway Anova
Summary of Fit

Rsquare	0.012239
Adj Rsquare	-0.03071
Root Mean Square Error	0.001913
Mean of Response	0.081932
Observations (or Sum Wgts)	25

t Test
Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	0.00042	t Ratio	0.533838
Std Err Dif	0.00078	DF	23
Upper CL Dif	0.00203	Prob > t	0.5986
Lower CL Dif	-0.00120	Prob > t	0.2993
Confidence	0.95	Prob < t	0.7007

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000104	1.0433e-6	0.2850	0.5986
Error	23	0.00008420	3.661e-6		
C. Total	24	0.00008525			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.081765	0.00049	0.08074	0.08279
Isolok - 12 mL - LF	10	0.082182	0.00061	0.08093	0.08343

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.081765	0.002212	0.00057	0.08054	0.08299
Isolok - 12 mL - LF	10	0.082182	0.001321	0.00042	0.08124	0.08313

t Test
Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	0.00042	t Ratio	0.589362
Std Err Dif	0.00071	DF	22.82309
Upper CL Dif	0.00188	Prob > t	0.5614
Lower CL Dif	-0.00105	Prob > t	0.2807
Confidence	0.95	Prob < t	0.7193

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0022121	0.0018192	0.0017125
Isolok - 12 mL - LF	10	0.0013205	0.0010842	0.0010842

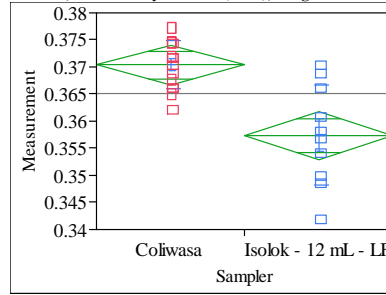
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.8273	1	23	0.1062
Brown-Forsythe	1.4822	1	23	0.2358
Levene	3.2693	1	23	0.0837
Bartlett	2.4969	1	.	0.1141
F Test 2-sided	2.8062	14	9	0.1241

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3473	1	22.823	0.5614

t Test
0.5894

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=3, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Excluded Rows
1
Oneway Anova
Summary of Fit

Rsquare	0.489449
Adj Rsquare	0.467251
Root Mean Square Error	0.006765
Mean of Response	0.365202
Observations (or Sum Wgts)	25

t Test
Isolok - 12 mL - LF-Coliwasa
Assuming equal variances

Difference	-0.01297	t Ratio	-4.69568
Std Err Dif	0.00276	DF	23
Upper CL Dif	-0.00725	Prob > t	<.0001
Lower CL Dif	-0.01868	Prob > t	1.0000
Confidence	0.95	Prob < t	<.0001

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00100896	0.001009	22.0494	<.0001
Error	23	0.00105246	0.000046		
C. Total	24	0.00206143			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.370389	0.00175	0.36678	0.37400
Isolok - 12 mL - LF	10	0.357422	0.00214	0.35300	0.36185

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.370389	0.004486	0.00116	0.36791	0.37287
Isolok - 12 mL - LF	10	0.357422	0.009254	0.00293	0.35080	0.36404

t Test
Isolok - 12 mL - LF-Coliwasa
Assuming unequal variances

Difference	-0.01297	t Ratio	-4.1203
Std Err Dif	0.00315	DF	11.85367
Upper CL Dif	-0.00610	Prob > t	0.0015
Lower CL Dif	-0.01983	Prob > t	0.9993
Confidence	0.95	Prob < t	0.0007

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0044859	0.0036742	0.0036021
Isolok - 12 mL - LF	10	0.0092540	0.0072943	0.0072943

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.6545	1	23	0.0168
Brown-Forsythe	5.4773	1	23	0.0283
Levene	5.6891	1	23	0.0257
Bartlett	5.6010	1	.	0.0180
F Test 2-sided	4.2556	9	14	0.0158

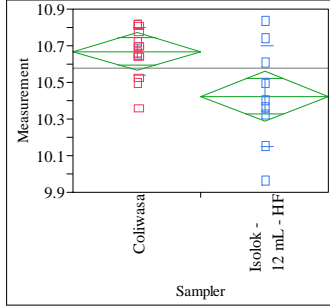
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
16.9768	1	11.854	0.0015

t Test
4.1203

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.285134
Adj Rsquare	0.25264
Root Mean Square Error	0.196665
Mean of Response	10.57726
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.24564	t Ratio	-2.96226
Std Err Dif	0.08292	DF	22
Upper CL Dif	-0.07367	Prob > t	0.0072
Lower CL Dif	-0.41760	Prob > t	0.9964
Confidence	0.95	Prob < t	0.0036

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.3393931	0.339393	8.7750	0.0072
Error	22	0.8509001	0.038677		
C. Total	23	1.1902932			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.6694	0.05078	10.564	10.775
Isolok - 12 mL - HF	9	10.4237	0.06556	10.288	10.560

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.6694	0.132778	0.03428	10.596	10.743
Isolok - 12 mL - HF	9	10.4237	0.274791	0.09160	10.213	10.635

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.24564	t Ratio	-2.51154
Std Err Dif	0.09780	DF	10.28309
Upper CL Dif	-0.02853	Prob > t	0.0302
Lower CL Dif	-0.46274	Prob > t	0.9849
Confidence	0.95	Prob < t	0.0151

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1327782	0.0999336	0.0982540
Isolok - 12 mL - HF	9	0.2747907	0.2113441	0.2120439

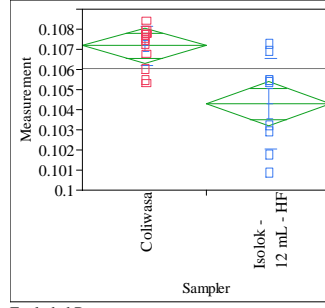
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.0285	1	22	0.0353
Brown-Forsythe	4.9870	1	22	0.0360
Levene	5.1354	1	22	0.0356
Bartlett	5.3764	1	.	0.0204
F Test 2-sided	4.2830	8	14	0.0173

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.3078	1	10.283	0.0302

t Test
2.5115

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=BaO (wt%), Targeted=0.0919



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.464269
Adj Rsquare	0.438758
Root Mean Square Error	0.001586
Mean of Response	0.106053
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00289	t Ratio	-4.266
Std Err Dif	0.00068	DF	21
Upper CL Dif	-0.00148	Prob > t	0.0003
Lower CL Dif	-0.00430	Prob > t	0.9998
Confidence	0.95	Prob < t	0.0002

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00004577	0.000046	18.1988	0.0003
Error	21	0.00005282	2.515e-6		
C. Total	22	0.00009859			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.107184	0.00042	0.10630	0.10807
Isolok - 12 mL - HF	9	0.104294	0.00053	0.10319	0.10539

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	0.107184	0.000975	0.00026	0.10662	0.10775
Isolok - 12 mL - HF	9	0.104294	0.002249	0.00075	0.10257	0.10602

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00289	t Ratio	-3.64241
Std Err Dif	0.00079	DF	9.962395
Upper CL Dif	-0.00112	Prob > t	0.0045
Lower CL Dif	-0.00466	Prob > t	0.9977
Confidence	0.95	Prob < t	0.0023

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0009753	0.0007656	0.0006859
Isolok - 12 mL - HF	9	0.0022486	0.0019215	0.0018236

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	9.1328	1	21	0.0065
Brown-Forsythe	5.4521	1	21	0.0295
Levene	13.5054	1	21	0.0014
Bartlett	6.7081	1	.	0.0096
F Test 2-sided	5.3155	8	13	0.0082

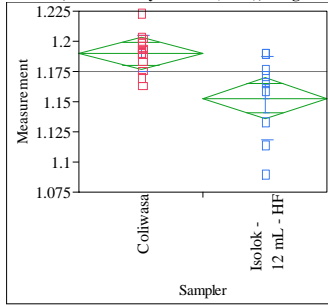
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
13.2671	1	9.9624	0.0045

t Test
3.6424

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=CaO (wt%), Targeted=1.1462



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare 0.376859
Adj Rsquare 0.347185
Root Mean Square Error 0.024389
Mean of Response 1.175389
Observations (or Sum Wgts) 23

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference -0.03713 t Ratio -3.56374
Std Err Dif 0.01042 DF 21
Upper CL Dif -0.01546 Prob > |t| 0.0018
Lower CL Dif -0.05880 Prob > t 0.9991
Confidence 0.95 Prob < t 0.0009

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00755429	0.007554	12.7002	0.0018
Error	21	0.01249113	0.000595		
C. Total	22	0.02004543			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	1.18992	0.00652	1.1764	1.2035
Isolok - 12 mL - HF	9	1.15279	0.00813	1.1359	1.1697

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	1.18992	0.014906	0.00398	1.1813	1.1985
Isolok - 12 mL - HF	9	1.15279	0.034646	0.01155	1.1262	1.1794

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference -0.03713 t Ratio -3.03971
Std Err Dif 0.01222 DF 9.930761
Upper CL Dif -0.00989 Prob > |t| 0.0126
Lower CL Dif -0.06438 Prob > t 0.9937
Confidence 0.95 Prob < t 0.0063

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0149062	0.0107938	0.0107938
Isolok - 12 mL - HF	9	0.0346457	0.0278804	0.0262739

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.3715	1	21	0.0306
Brown-Forsythe	4.7152	1	21	0.0415
Levene	8.6918	1	21	0.0077
Bartlett	6.8328	1	.	0.0089
F Test 2-sided	5.4021	8	13	0.0076

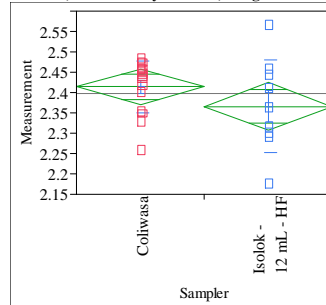
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio 9.2398 DFNum 1 DFDen 9.9308 Prob > F 0.0126

t Test

3.0397

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Fe/Li, Targeted=2.452



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare 0.075746
Adj Rsquare 0.035561
Root Mean Square Error 0.084868
Mean of Response 2.397106
Observations (or Sum Wgts) 25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference -0.04855 t Ratio -1.37293
Std Err Dif 0.03536 DF 23
Upper CL Dif 0.02460 Prob > |t| 0.1830
Lower CL Dif -0.12170 Prob > t 0.9085
Confidence 0.95 Prob < t 0.0915

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01357644	0.013576	1.8849	0.1830
Error	23	0.16566029	0.007203		
C. Total	24	0.17923673			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.41458	0.02122	2.3707	2.4585
Isolok - 12 mL - HF	9	2.36603	0.02829	2.3075	2.4246

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.41458	0.063563	0.01589	2.3807	2.4485
Isolok - 12 mL - HF	9	2.36603	0.114595	0.03820	2.2779	2.4541

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference -0.04855 t Ratio -1.17348
Std Err Dif 0.04137 DF 10.83549
Upper CL Dif 0.04268 Prob > |t| 0.2658
Lower CL Dif -0.13978 Prob > t 0.8671
Confidence 0.95 Prob < t 0.1329

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0635630	0.0499235	0.0449501
Isolok - 12 mL - HF	9	0.1145952	0.0888405	0.0933830

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.2391	1	23	0.0850
Brown-Forsythe	4.5974	1	23	0.0428
Levene	3.6648	1	23	0.0681
Bartlett	3.6851	1	.	0.0549
F Test 2-sided	3.2503	8	15	0.0470

Welch Anova testing Means Equal, allowing Std Devs Not Equal

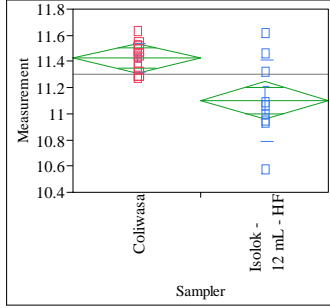
F Ratio 1.3771 DFNum 1 DFDen 10.835 Prob > F 0.2658

t Test

1.1735

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.382201
Adj Rsquare	0.35412
Root Mean Square Error	0.207925
Mean of Response	11.30297
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.32343	t Ratio	-3.68922
Std Err Dif	0.08767	DF	22
Upper CL Dif	-0.14162	Prob > t	0.0013
Lower CL Dif	-0.50524	Prob > t	0.9994
Confidence	0.95	Prob < t	0.0006

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.5884139	0.588414	13.6103	0.0013
Error	22	0.9511246	0.043233		
C. Total	23	1.5395384			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	11.4243	0.05369	11.313	11.536
Isolok - 12 mL - HF	9	11.1008	0.06931	10.957	11.245

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	11.4243	0.108138	0.02792	11.364	11.484
Isolok - 12 mL - HF	9	11.1008	0.313730	0.10458	10.860	11.342

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.32343	t Ratio	-2.98809
Std Err Dif	0.10824	DF	9.15463
Upper CL Dif	-0.07920	Prob > t	0.0150
Lower CL Dif	-0.56766	Prob > t	0.9925
Confidence	0.95	Prob < t	0.0075

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.1081382	0.0885779	0.0886414
Isolok - 12 mL - HF	9	0.3137297	0.2372243	0.2303406

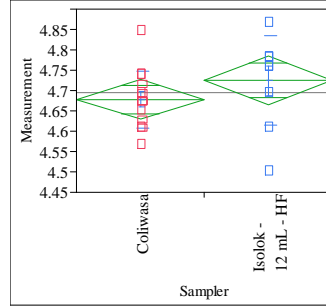
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.3698	1	22	0.0193
Brown-Forsythe	6.5169	1	22	0.0181
Levene	8.3631	1	22	0.0085
Bartlett	11.1622	1	.	0.0008
F Test 2-sided	8.4169	8	14	0.0007

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.9287	1	9.1546	0.0150

t Test
2.9881

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.069259
Adj Rsquare	0.024938
Root Mean Square Error	0.087018
Mean of Response	4.69613
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.04648	t Ratio	1.250063
Std Err Dif	0.03718	DF	21
Upper CL Dif	0.12379	Prob > t	0.2250
Lower CL Dif	-0.03084	Prob > t	0.1125
Confidence	0.95	Prob < t	0.8875

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.01183279	0.011833	1.5627	0.2250
Error	21	0.15901655	0.007572		
C. Total	22	0.17084933			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	4.67794	0.02326	4.6296	4.7263
Isolok - 12 mL - HF	9	4.72442	0.02901	4.6641	4.7847

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	4.67794	0.069341	0.01853	4.6379	4.7180
Isolok - 12 mL - HF	9	4.72442	0.109835	0.03661	4.6400	4.8088

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.04648	t Ratio	1.13258
Std Err Dif	0.04103	DF	12.13444
Upper CL Dif	0.13577	Prob > t	0.2793
Lower CL Dif	-0.04282	Prob > t	0.1396
Confidence	0.95	Prob < t	0.8604

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0693408	0.0500879	0.0492091
Isolok - 12 mL - HF	9	0.1098354	0.0829265	0.0717633

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.5041	1	21	0.2336
Brown-Forsythe	0.6547	1	21	0.4275
Levene	2.0009	1	21	0.1719
Bartlett	2.0719	1	.	0.1500
F Test 2-sided	2.5090	8	13	0.1358

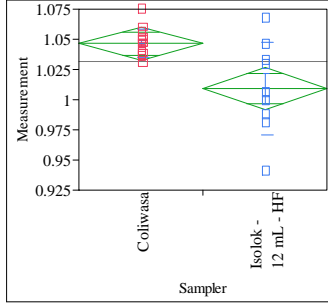
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.2827	1	12.134	0.2793

t Test
1.1326

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=MgO (wt%), Targeted=1.014



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.362561
Adj Rsquare	0.332206
Root Mean Square Error	0.025251
Mean of Response	1.031679
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.03729	t Ratio	-3.45605
Std Err Dif	0.01079	DF	21
Upper CL Dif	-0.01485	Prob > t	0.0024
Lower CL Dif	-0.05972	Prob > t	0.9988
Confidence	0.95	Prob < t	0.0012

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00761590	0.007616	11.9443	0.0024
Error	21	0.01338996	0.000638		
C. Total	22	0.02100586			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	1.04627	0.00675	1.0322	1.0603
Isolok - 12 mL - HF	9	1.00898	0.00842	0.9915	1.0265

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	1.04627	0.011662	0.00312	1.0395	1.0530
Isolok - 12 mL - HF	9	1.00898	0.038115	0.01270	0.9797	1.0383

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.03729	t Ratio	-2.8502
Std Err Dif	0.01308	DF	8.971901
Upper CL Dif	-0.00768	Prob > t	0.0191
Lower CL Dif	-0.06689	Prob > t	0.9904
Confidence	0.95	Prob < t	0.0096

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0116620	0.0086638	0.0086468
Isolok - 12 mL - HF	9	0.0381149	0.0299313	0.0302179

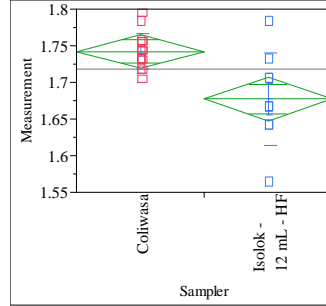
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.3673	1	21	0.0198
Brown-Forsythe	12.3995	1	21	0.0020
Levene	12.1686	1	21	0.0022
Bartlett	12.8378	1	.	0.0003
F Test 2-sided	10.6818	8	13	0.0003

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.1237	1	8.9719	0.0191

t Test
2.8502

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=MnO (wt%), Targeted=1.779



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.375726
Adj Rsquare	0.34735
Root Mean Square Error	0.042453
Mean of Response	1.717834
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.06513	t Ratio	-3.63881
Std Err Dif	0.01790	DF	22
Upper CL Dif	-0.02801	Prob > t	0.0014
Lower CL Dif	-0.10226	Prob > t	0.9993
Confidence	0.95	Prob < t	0.0007

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.02386362	0.023864	13.2410	0.0014
Error	22	0.03964966	0.001802		
C. Total	23	0.06351328			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	1.74226	0.01096	1.7195	1.7650
Isolok - 12 mL - HF	9	1.67713	0.01415	1.6478	1.7065

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	1.74226	0.024140	0.00623	1.7289	1.7556
Isolok - 12 mL - HF	9	1.67713	0.062741	0.02091	1.6289	1.7254

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.06513	t Ratio	-2.98468
Std Err Dif	0.02182	DF	9.441672
Upper CL Dif	-0.01612	Prob > t	0.0146
Lower CL Dif	-0.11415	Prob > t	0.9927
Confidence	0.95	Prob < t	0.0073

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0241397	0.0181342	0.0180768
Isolok - 12 mL - HF	9	0.0627410	0.0471846	0.0459093

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.6969	1	22	0.0413
Brown-Forsythe	5.6470	1	22	0.0266
Levene	7.1144	1	22	0.0141
Bartlett	9.0993	1	.	0.0026
F Test 2-sided	6.7552	8	14	0.0021

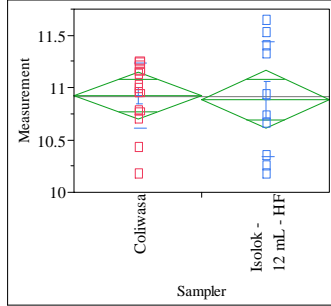
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
8.9083	1	9.4417	0.0146

t Test
2.9847

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.001845
Adj Rsquare	-0.04155
Root Mean Square Error	0.421686
Mean of Response	10.90909
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.03550	t Ratio	-0.2062
Std Err Dif	0.17215	DF	23
Upper CL Dif	0.32063	Prob > t	0.8385
Lower CL Dif	-0.39162	Prob > t	0.5808
Confidence	0.95	Prob < t	0.4192

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0075604	0.007560	0.0425	0.8385
Error	23	4.0898347	0.177819		
C. Total	24	4.0973951			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	10.9233	0.10888	10.698	11.149
Isolok - 12 mL - HF	10	10.8878	0.13335	10.612	11.164

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	10.9233	0.314886	0.08130	10.749	11.098
Isolok - 12 mL - HF	10	10.8878	0.547894	0.17326	10.496	11.280

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.03550	t Ratio	-0.18547
Std Err Dif	0.19139	DF	12.99498
Upper CL Dif	0.37799	Prob > t	0.8557
Lower CL Dif	-0.44898	Prob > t	0.5721
Confidence	0.95	Prob < t	0.4279

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.3148862	0.2402436	0.2318560
Isolok - 12 mL - HF	10	0.5478938	0.4650600	0.4650600

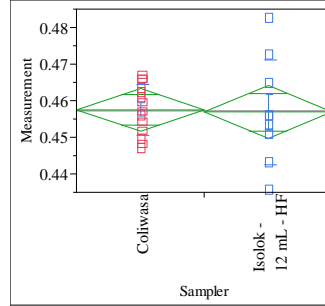
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	6.2396	1	23	0.0201
Brown-Forsythe	6.1022	1	23	0.0213
Levene	6.5722	1	23	0.0174
Bartlett	3.3111	1	.	0.0688
F Test 2-sided	3.0275	9	14	0.0622

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0344	1	12.995	0.8557

t Test
0.1855

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=NiO (wt%), Targeted=0.41



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.001269
Adj Rsquare	-0.04629
Root Mean Square Error	0.010417
Mean of Response	0.45727
Observations (or Sum Wgts)	23

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00073	t Ratio	-0.16337
Std Err Dif	0.00445	DF	21
Upper CL Dif	0.00853	Prob > t	0.8718
Lower CL Dif	-0.00998	Prob > t	0.5641
Confidence	0.95	Prob < t	0.4359

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000290	2.897e-6	0.0267	0.8718
Error	21	0.00227899	0.000109		
C. Total	22	0.00228188			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.457555	0.00278	0.45176	0.46334
Isolok - 12 mL - HF	9	0.456828	0.00347	0.44961	0.46405

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	0.457555	0.006893	0.00184	0.45357	0.46153
Isolok - 12 mL - HF	9	0.456828	0.014411	0.00480	0.44575	0.46790

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00073	t Ratio	-0.14134
Std Err Dif	0.00514	DF	10.3879
Upper CL Dif	0.01068	Prob > t	0.8903
Lower CL Dif	-0.01213	Prob > t	0.5548
Confidence	0.95	Prob < t	0.4452

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0068928	0.0058171	0.0058171
Isolok - 12 mL - HF	9	0.0144107	0.0107456	0.0103214

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.5413	1	21	0.0451
Brown-Forsythe	2.6977	1	21	0.1154
Levene	3.6478	1	21	0.0699
Bartlett	5.2751	1	.	0.0216
F Test 2-sided	4.3711	8	13	0.0187

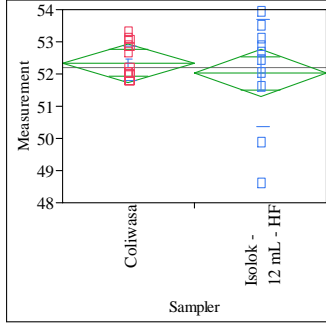
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.0200	1	10.388	0.8903

t Test
0.1413

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.019984
Adj Rsquare	-0.02263
Root Mean Square Error	1.122243
Mean of Response	52.21603
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.3138	t Ratio	-0.68484
Std Err Dif	0.4582	DF	23
Upper CL Dif	0.6340	Prob > t	0.5003
Lower CL Dif	-1.2615	Prob > t	0.7499
Confidence	0.95	Prob < t	0.2501

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.590687	0.59069	0.4690	0.5003
Error	23	28.966855	1.25943		
C. Total	24	29.557542			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	52.3415	0.28976	51.742	52.941
Isolok - 12 mL - HF	10	52.0278	0.35488	51.294	52.762

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	52.3415	0.54040	0.13953	52.042	52.641
Isolok - 12 mL - HF	10	52.0278	1.66261	0.52576	50.838	53.217

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.3138	t Ratio	-0.57681
Std Err Dif	0.5440	DF	10.2796
Upper CL Dif	0.8938	Prob > t	0.5765
Lower CL Dif	-1.5213	Prob > t	0.7118
Confidence	0.95	Prob < t	0.2882

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.540399	0.484908	0.442122
Isolok - 12 mL - HF	10	1.662609	1.232237	1.155222

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.8639	1	23	0.0377
Brown-Forsythe	4.1237	1	23	0.0540
Levene	7.5151	1	23	0.0116
Bartlett	12.7937	1	.	0.0003
F Test 2-sided	9.4657	9	14	0.0003

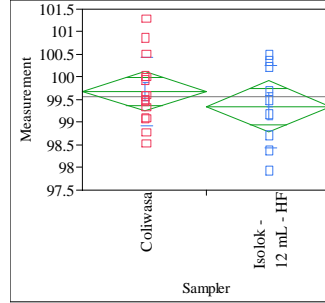
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3327	1	10.28	0.5765

t Test

0.5768

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.040917
Adj Rsquare	-0.00268
Root Mean Square Error	0.814564
Mean of Response	99.55854
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.3327	t Ratio	-0.9688
Std Err Dif	0.3435	DF	22
Upper CL Dif	0.3795	Prob > t	0.3432
Lower CL Dif	-1.0450	Prob > t	0.8284
Confidence	0.95	Prob < t	0.1716

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.622758	0.622758	0.9386	0.3432
Error	22	14.597309	0.663514		
C. Total	23	15.220067			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	99.6833	0.21032	99.247	100.12
Isolok - 12 mL - HF	9	99.3506	0.27152	98.787	99.91

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	99.6833	0.756333	0.19528	99.264	100.10
Isolok - 12 mL - HF	9	99.3506	0.907520	0.30251	98.653	100.05

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.3327	t Ratio	-0.9241
Std Err Dif	0.3601	DF	14.60754
Upper CL Dif	0.4365	Prob > t	0.3704
Lower CL Dif	-1.1020	Prob > t	0.8148
Confidence	0.95	Prob < t	0.1852

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.756333	0.5843035	0.5643410
Isolok - 12 mL - HF	9	0.9075205	0.7400247	0.7513367

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5378	1	22	0.4711
Brown-Forsythe	0.8323	1	22	0.3715
Levene	0.6599	1	22	0.4253
Bartlett	0.3311	1	.	0.5650
F Test 2-sided	1.4397	8	14	0.5263

Welch Anova testing Means Equal, allowing Std Devs Not Equal

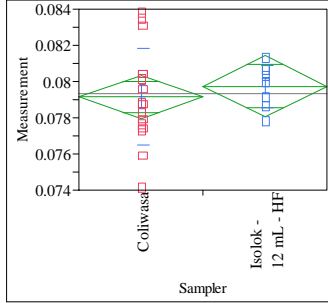
F Ratio	DFNum	DFDen	Prob > F
0.8540	1	14.608	0.3704

t Test

0.9241

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.015317
Adj Rsquare	-0.02944
Root Mean Square Error	0.002305
Mean of Response	0.079341
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00058	t Ratio	0.584998
Std Err Dif	0.00100	DF	22
Upper CL Dif	0.00265	Prob > t	0.5645
Lower CL Dif	-0.00149	Prob > t	0.2823
Confidence	0.95	Prob < t	0.7177

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000182	1.8177e-6	0.3422	0.5645
Error	22	0.00011685	5.3115e-6		
C. Total	23	0.00011867			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.079147	0.00058	0.07795	0.08034
Isolok - 12 mL - HF	8	0.079730	0.00081	0.07804	0.08142

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.079147	0.002672	0.00067	0.07772	0.08057
Isolok - 12 mL - HF	8	0.079730	0.001179	0.00042	0.07874	0.08072

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00058	t Ratio	0.741305
Std Err Dif	0.00079	DF	21.85599
Upper CL Dif	0.00222	Prob > t	0.4664
Lower CL Dif	-0.00105	Prob > t	0.2332
Confidence	0.95	Prob < t	0.7668

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0026723	0.0020746	0.0020225
Isolok - 12 mL - HF	8	0.0011795	0.0009591	0.0009174

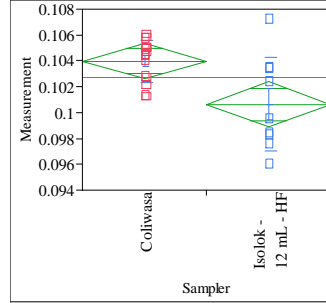
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	2.8268	1	22	0.1068
Brown-Forsythe	2.9635	1	22	0.0992
Levene	3.5931	1	22	0.0712
Bartlett	4.6826	1	.	0.0305
F Test 2-sided	5.1333	15	7	0.0362

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.5495	1	21.856	0.4664

t Test
0.7413

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.307042
Adj Rsquare	0.275544
Root Mean Square Error	0.002536
Mean of Response	0.102722
Observations (or Sum Wgts)	24

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00334	t Ratio	-3.12217
Std Err Dif	0.00107	DF	22
Upper CL Dif	-0.00112	Prob > t	0.0050
Lower CL Dif	-0.00556	Prob > t	0.9975
Confidence	0.95	Prob < t	0.0025

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00006271	0.000063	9.7480	0.0050
Error	22	0.00014152	6.433e-6		
C. Total	23	0.00020423			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.103974	0.00065	0.10262	0.10533
Isolok - 12 mL - HF	9	0.100635	0.00085	0.09888	0.10239

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.103974	0.001615	0.00042	0.10308	0.10487
Isolok - 12 mL - HF	9	0.100635	0.003623	0.00121	0.09785	0.10342

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00334	t Ratio	-2.61338
Std Err Dif	0.00128	DF	9.941049
Upper CL Dif	-0.00049	Prob > t	0.0260
Lower CL Dif	-0.00619	Prob > t	0.9870
Confidence	0.95	Prob < t	0.0130

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0016151	0.0013377	0.0012697
Isolok - 12 mL - HF	9	0.0036228	0.0030490	0.0030428

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	6.5342	1	22	0.0180
Brown-Forsythe	7.6352	1	22	0.0113
Levene	11.6860	1	22	0.0025
Bartlett	6.5989	1	.	0.0102
F Test 2-sided	5.0313	8	14	0.0085

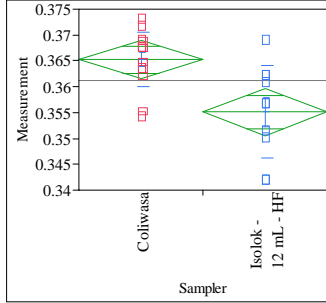
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
6.8298	1	9.941	0.0260

t Test
2.6134

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=4, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Excluded Rows

1
Oneway Anova Summary of Fit

Rsquare	0.35828
Adj Rsquare	0.330379
Root Mean Square Error	0.006925
Mean of Response	0.361204
Observations (or Sum Wgts)	25

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.01013	t Ratio	-3.58346
Std Err Dif	0.00283	DF	23
Upper CL Dif	-0.00428	Prob > t	0.0016
Lower CL Dif	-0.01598	Prob > t	0.9992
Confidence	0.95	Prob < t	0.0008

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00061582	0.000616	12.8412	0.0016
Error	23	0.00110301	0.000048		
C. Total	24	0.00171883			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.365256	0.00179	0.36156	0.36896
Isolok - 12 mL - HF	10	0.355125	0.00219	0.35060	0.35966

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.365256	0.005252	0.00136	0.36235	0.36816
Isolok - 12 mL - HF	10	0.355125	0.008925	0.00282	0.34874	0.36151

t Test

Isolok - 12 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.01013	t Ratio	-3.23553
Std Err Dif	0.00313	DF	13.1826
Upper CL Dif	-0.00338	Prob > t	0.0064
Lower CL Dif	-0.01689	Prob > t	0.9968
Confidence	0.95	Prob < t	0.0032

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0052515	0.0039263	0.0037822
Isolok - 12 mL - HF	10	0.0089251	0.0071863	0.0068891

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.6716	1	23	0.0679
Brown-Forsythe	2.6326	1	23	0.1183
Levene	4.1271	1	23	0.0539
Bartlett	3.0381	1	.	0.0813
F Test 2-sided	2.8884	9	14	0.0737

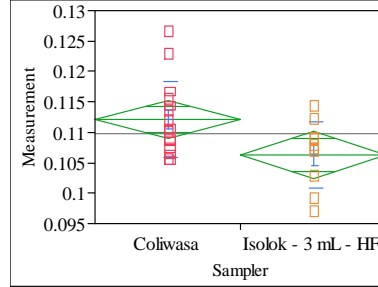
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
10.4687	1	13.183	0.0064

t Test

3.2355

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



Excluded Rows

1
Oneway Anova Summary of Fit

Rsquare	0.203875
Adj Rsquare	0.169261
Root Mean Square Error	0.005876
Mean of Response	0.109795
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00582	t Ratio	-2.42692
Std Err Dif	0.00240	DF	23
Upper CL Dif	-0.00086	Prob > t	0.0235
Lower CL Dif	-0.01078	Prob > t	0.9883
Confidence	0.95	Prob < t	0.0117

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00020338	0.000203	5.8900	0.0235
Error	23	0.00079418	0.000035		
C. Total	24	0.00099755			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.112124	0.00152	0.10899	0.11526
Isolok - 3 mL - HF	10	0.106302	0.00186	0.10246	0.11015

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.112124	0.006140	0.00159	0.10872	0.11552
Isolok - 3 mL - HF	10	0.106302	0.005441	0.00172	0.10241	0.11019

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00582	t Ratio	-2.4886
Std Err Dif	0.00234	DF	21.02684
Upper CL Dif	-0.00096	Prob > t	0.0213
Lower CL Dif	-0.01069	Prob > t	0.9894
Confidence	0.95	Prob < t	0.0106

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0061399	0.0047200	0.0046381
Isolok - 3 mL - HF	10	0.0054405	0.0041480	0.0039025

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.1435	1	23	0.7083
Brown-Forsythe	0.2043	1	23	0.6555
Levene	0.1568	1	23	0.6958
Bartlett	0.1502	1	.	0.6984
F Test 2-sided	1.2736	14	9	0.7313

Welch Anova testing Means Equal, allowing Std Devs Not Equal

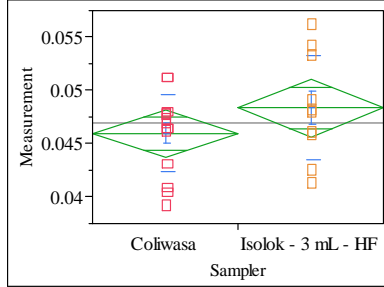
F Ratio	DFNum	DFDen	Prob > F
6.1931	1	21.027	0.0213

t Test

2.4886

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=CuO (wt%), Targeted=0.0504



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.078416
Adj Rsquare	0.038347
Root Mean Square Error	0.004165
Mean of Response	0.046917
Observations (or Sum Wgts)	25

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00238	t Ratio	1.398937
Std Err Dif	0.00170	DF	23
Upper CL Dif	0.00590	Prob > t	0.1752
Lower CL Dif	-0.00114	Prob > t	0.0876
Confidence	0.95	Prob < t	0.9124

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00003394	0.000034	1.9570	0.1752
Error	23	0.00039890	0.000017		
C. Total	24	0.00043284			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.045966	0.00108	0.04374	0.04819
Isolok - 3 mL - HF	10	0.048345	0.00132	0.04562	0.05107

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.045966	0.003614	0.00093	0.04396	0.04797
Isolok - 3 mL - HF	10	0.048345	0.004899	0.00155	0.04484	0.05185

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00238	t Ratio	1.315055
Std Err Dif	0.00181	DF	15.41122
Upper CL Dif	0.00622	Prob > t	0.2077
Lower CL Dif	-0.00147	Prob > t	0.1039
Confidence	0.95	Prob < t	0.8961

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0036142	0.0027339	0.0025620
Isolok - 3 mL - HF	10	0.0048992	0.0037854	0.0037304

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.5973	1	23	0.2189
Brown-Forsythe	1.0833	1	23	0.3088
Levene	1.0634	1	23	0.3132
Bartlett	0.9977	1	.	0.3179
F Test 2-sided	1.8375	9	14	0.2967

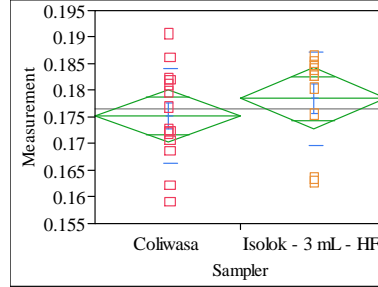
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.7294	1	15.411	0.2077

t Test

1.3151

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Excluded Rows
2

Oneway Anova
Summary of Fit

Rsquare	0.035741
Adj Rsquare	-0.00809
Root Mean Square Error	0.008814
Mean of Response	0.176599
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00330	t Ratio	0.903023
Std Err Dif	0.00365	DF	22
Upper CL Dif	0.01086	Prob > t	0.3763
Lower CL Dif	-0.00427	Prob > t	0.1881
Confidence	0.95	Prob < t	0.8119

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00006335	0.000063	0.8155	0.3763
Error	22	0.00170911	0.000078		
C. Total	23	0.00177246			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	0.175226	0.00236	0.17034	0.18011
Isolok - 3 mL - HF	10	0.178522	0.00279	0.17274	0.18430

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	0.175226	0.008853	0.00237	0.17011	0.18034
Isolok - 3 mL - HF	10	0.178522	0.008757	0.00277	0.17226	0.18479

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00330	t Ratio	0.904752
Std Err Dif	0.00364	DF	19.67795
Upper CL Dif	0.01090	Prob > t	0.3765
Lower CL Dif	-0.00431	Prob > t	0.1883
Confidence	0.95	Prob < t	0.8117

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.0088534	0.0071846	0.0071846
Isolok - 3 mL - HF	10	0.0087567	0.0068903	0.0057821

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.0016	1	22	0.9686
Brown-Forsythe	0.3077	1	22	0.5847
Levene	0.0217	1	22	0.8842
Bartlett	0.0012	1	.	0.9721
F Test 2-sided	1.0222	13	9	1.0000

Welch Anova testing Means Equal, allowing Std Devs Not Equal

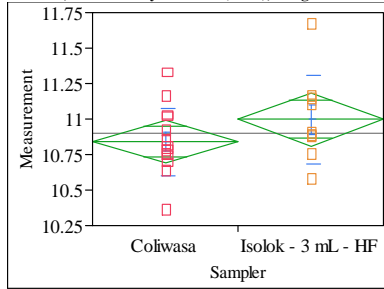
F Ratio	DFNum	DFDen	Prob > F
0.8186	1	19.678	0.3765

t Test

0.9048

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Excluded Rows
3

**Oneway Anova
Summary of Fit**

Rsquare	0.082251
Adj Rsquare	0.038549
Root Mean Square Error	0.268494
Mean of Response	10.90239
Observations (or Sum Wgts)	23

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.15737	t Ratio	1.371886
Std Err Dif	0.11471	DF	21
Upper CL Dif	0.39593	Prob > t	0.1846
Lower CL Dif	-0.08119	Prob > t	0.0923
Confidence	0.95	Prob < t	0.9077

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1356772	0.135677	1.8821	0.1846
Error	21	1.5138740	0.072089		
C. Total	22	1.6495512			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	10.8408	0.07176	10.692	10.990
Isolok - 3 mL - HF	9	10.9982	0.08950	10.812	11.184

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	10.8408	0.237350	0.06343	10.704	10.978
Isolok - 3 mL - HF	9	10.9982	0.312553	0.10418	10.758	11.238

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.15737	t Ratio	1.290193
Std Err Dif	0.12198	DF	13.85889
Upper CL Dif	0.41924	Prob > t	0.2181
Lower CL Dif	-0.10449	Prob > t	0.1090
Confidence	0.95	Prob < t	0.8910

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2373504	0.1731767	0.1685000
Isolok - 3 mL - HF	9	0.3125532	0.2319891	0.2216711

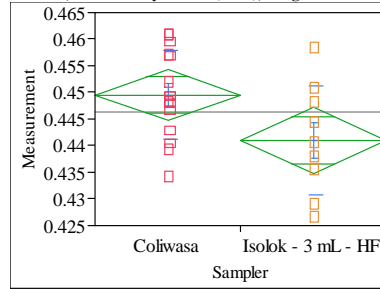
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.5661	1	21	0.4601
Brown-Forsythe	0.4054	1	21	0.5312
Levene	0.6527	1	21	0.4282
Bartlett	0.7366	1	.	0.3908
F Test 2-sided	1.7341	8	13	0.3629

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6646	1	13.859	0.2181

t Test
1.2902

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=NiO (wt%), Targeted=0.41



Excluded Rows
2

**Oneway Anova
Summary of Fit**

Rsquare	0.185397
Adj Rsquare	0.148369
Root Mean Square Error	0.009052
Mean of Response	0.446329
Observations (or Sum Wgts)	24

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00854	t Ratio	-2.23763
Std Err Dif	0.00382	DF	22
Upper CL Dif	-0.00062	Prob > t	0.0357
Lower CL Dif	-0.01645	Prob > t	0.9822
Confidence	0.95	Prob < t	0.0178

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00041023	0.000410	5.0070	0.0357
Error	22	0.00180248	0.000082		
C. Total	23	0.00221271			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.449532	0.00234	0.44468	0.45438
Isolok - 3 mL - HF	9	0.440992	0.00302	0.43473	0.44725

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.449532	0.008253	0.00213	0.44496	0.45410
Isolok - 3 mL - HF	9	0.440992	0.010301	0.00343	0.43307	0.44891

t Test

Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00854	t Ratio	-2.11324
Std Err Dif	0.00404	DF	14.15015
Upper CL Dif	0.00012	Prob > t	0.0528
Lower CL Dif	-0.01720	Prob > t	0.9736
Confidence	0.95	Prob < t	0.0264

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0082533	0.0065152	0.0064473
Isolok - 3 mL - HF	9	0.0103008	0.0081377	0.0083419

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	0.8650	1	22	0.3624
Brown-Forsythe	0.7857	1	22	0.3850
Levene	0.5718	1	22	0.4576
Bartlett	0.4919	1	.	0.4831
F Test 2-sided	1.5577	8	14	0.4474

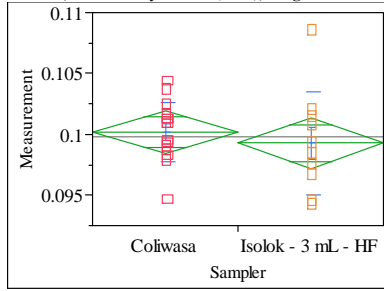
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.4658	1	14.15	0.0528

t Test
2.1132

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.020572
Adj Rsquare	-0.02201
Root Mean Square Error	0.003246
Mean of Response	0.099813
Observations (or Sum Wgts)	25

t Test
Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	-0.00092	t Ratio	-0.69505
Std Err Dif	0.00133	DF	23
Upper CL Dif	0.00182	Prob > t	0.4940
Lower CL Dif	-0.00366	Prob > t	0.7530
Confidence	0.95	Prob < t	0.2470

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000509	5.091e-6	0.4831	0.4940
Error	23	0.00024239	0.000011		
C. Total	24	0.00024748			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.100182	0.00084	0.09845	0.10192
Isolok - 3 mL - HF	10	0.099260	0.00103	0.09714	0.10138

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.100182	0.002454	0.00063	0.09882	0.10154
Isolok - 3 mL - HF	10	0.099260	0.004191	0.00133	0.09626	0.10226

t Test
Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	-0.00092	t Ratio	-0.62706
Std Err Dif	0.00147	DF	13.14241
Upper CL Dif	0.00225	Prob > t	0.5414
Lower CL Dif	-0.00409	Prob > t	0.7293
Confidence	0.95	Prob < t	0.2707

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0024539	0.0019187	0.0018755
Isolok - 3 mL - HF	10	0.0041911	0.0030722	0.0030622

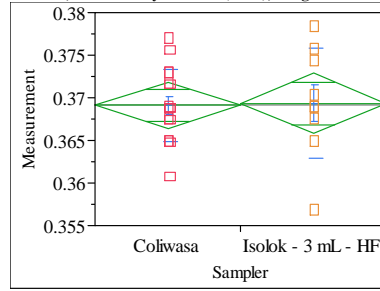
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.9397	1	23	0.1770
Brown-Forsythe	1.8598	1	23	0.1858
Levene	1.9789	1	23	0.1729
Bartlett	3.0947	1	.	0.0785
F Test 2-sided	2.9171	9	14	0.0711

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.3932	DFNum	1	DFDen	13.142	Prob > F	0.5414
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t Test
0.6271

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=5, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.000657
Adj Rsquare	-0.04279
Root Mean Square Error	0.005126
Mean of Response	0.369201
Observations (or Sum Wgts)	25

t Test
Isolok - 3 mL - HF-Coliwasa
Assuming equal variances

Difference	0.00026	t Ratio	0.122973
Std Err Dif	0.00214	DF	23
Upper CL Dif	0.00468	Prob > t	0.9032
Lower CL Dif	-0.00416	Prob > t	0.4516
Confidence	0.95	Prob < t	0.5484

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00000040	3.974e-7	0.0151	0.9032
Error	23	0.00060437	0.000026		
C. Total	24	0.00060477			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.369106	0.00128	0.36646	0.37176
Isolok - 3 mL - HF	9	0.369369	0.00171	0.36583	0.37290

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.369106	0.004286	0.00107	0.36682	0.37139
Isolok - 3 mL - HF	9	0.369369	0.006411	0.00214	0.36444	0.37430

t Test
Isolok - 3 mL - HF-Coliwasa
Assuming unequal variances

Difference	0.00026	t Ratio	0.109867
Std Err Dif	0.00239	DF	12.11879
Upper CL Dif	0.00547	Prob > t	0.9143
Lower CL Dif	-0.00494	Prob > t	0.4572
Confidence	0.95	Prob < t	0.5428

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0042858	0.0032926	0.0032082
Isolok - 3 mL - HF	9	0.0064114	0.0045694	0.0045027

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	1.6167	1	23	0.2163
Brown-Forsythe	0.8464	1	23	0.3671
Levene	0.8888	1	23	0.3556
Bartlett	1.7070	1	.	0.1914
F Test 2-sided	2.2379	8	15	0.1701

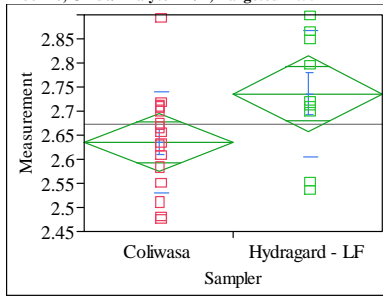
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	0.0121	DFNum	1	DFDen	12.119	Prob > F	0.9143
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t Test
0.1099

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Al/B, Targeted=2.552



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.161538
Adj Rsquare	0.125083
Root Mean Square Error	0.114816
Mean of Response	2.671409
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.100705	t Ratio	2.105037
Std Err Dif	0.047840	DF	23
Upper CL Dif	0.199670	Prob > t	0.0464
Lower CL Dif	0.001740	Prob > t	0.0232
Confidence	0.95	Prob < t	0.9768

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.05841544	0.058415	4.4312	0.0464
Error	23	0.30320491	0.013183		
C. Total	24	0.36162035			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.63516	0.02870	2.5758	2.6945
Hydragard - LF	9	2.73586	0.03827	2.6567	2.8150

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.63516	0.105508	0.02638	2.5789	2.6914
Hydragard - LF	9	2.73586	0.130492	0.04350	2.6356	2.8362

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.10071	t Ratio	1.979656
Std Err Dif	0.05087	DF	13.95871
Upper CL Dif	0.20984	Prob > t	0.0678
Lower CL Dif	-0.00843	Prob > t	0.0339
Confidence	0.95	Prob < t	0.9661

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1055080	0.0782704	0.0782704
Hydragard - LF	9	0.1304922	0.1034236	0.1025799

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.5698	1	23	0.4580
Brown-Forsythe	0.6868	1	23	0.4158
Levene	0.7696	1	23	0.3894
Bartlett	0.4658	1	.	0.4949
F Test 2-sided	1.5297	8	15	0.4551

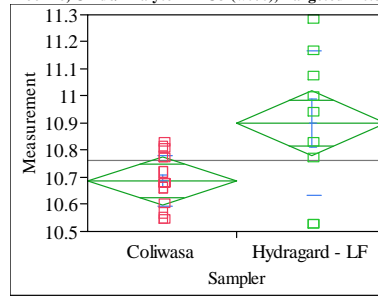
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.9190	1	13.959	0.0678

t Test

1.9797

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Al2O3 (wt%), Targeted=10.869



Excluded Rows
1

**Oneway Anova
Summary of Fit**

Rsquare	0.273971
Adj Rsquare	0.242404
Root Mean Square Error	0.173383
Mean of Response	10.7641
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.212831	t Ratio	2.946044
Std Err Dif	0.072243	DF	23
Upper CL Dif	0.362277	Prob > t	0.0073
Lower CL Dif	0.063385	Prob > t	0.0036
Confidence	0.95	Prob < t	0.9964

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.26091136	0.260911	8.6792	0.0073
Error	23	0.69142080	0.030062		
C. Total	24	0.95233216			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	10.6875	0.04335	10.598	10.777
Hydragard - LF	9	10.9003	0.05779	10.781	11.020

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	10.6875	0.093303	0.02333	10.638	10.737
Hydragard - LF	9	10.9003	0.264774	0.08826	10.697	11.104

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.212831	t Ratio	2.331421
Std Err Dif	0.091288	DF	9.132851
Upper CL Dif	0.418882	Prob > t	0.0442
Lower CL Dif	0.006780	Prob > t	0.0221
Confidence	0.95	Prob < t	0.9779

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0933025	0.0746943	0.0732181
Hydragard - LF	9	0.2647736	0.2122772	0.2141433

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	10.4279	1	23	0.0037
Brown-Forsythe	12.3700	1	23	0.0018
Levene	12.7555	1	23	0.0016
Bartlett	11.2596	1	.	0.0008
F Test 2-sided	8.0531	8	15	0.0006

Welch Anova testing Means Equal, allowing Std Devs Not Equal

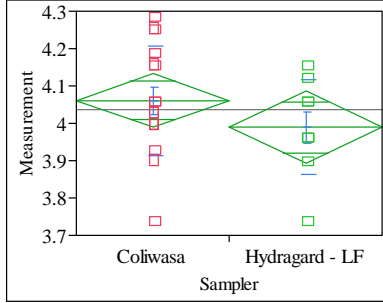
F Ratio	DFNum	DFDen	Prob > F
5.4355	1	9.1329	0.0442

t Test

2.3314

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=B2O3 (wt%), Targeted=4.259



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.062146
Adj Rsquare	0.02137
Root Mean Square Error	0.139973
Mean of Response	4.035179
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.07200	t Ratio	-1.23454
Std Err Dif	0.05832	DF	23
Upper CL Dif	0.04865	Prob > t	0.2295
Lower CL Dif	-0.19265	Prob > t	0.8853
Confidence	0.95	Prob < t	0.1147

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.02986029	0.029860	1.5241	0.2295
Error	23	0.45062300	0.019592		
C. Total	24	0.48048328			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.06110	0.03499	3.9887	4.1335
Hydragard - LF	9	3.98910	0.04666	3.8926	4.0856

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.06110	0.146320	0.03658	3.9831	4.1391
Hydragard - LF	9	3.98910	0.127221	0.04241	3.8913	4.0869

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.07200	t Ratio	-1.28563
Std Err Dif	0.05600	DF	18.78685
Upper CL Dif	0.04531	Prob > t	0.2142
Lower CL Dif	-0.18931	Prob > t	0.8929
Confidence	0.95	Prob < t	0.1071

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.1463196	0.1137027	0.1126965
Hydragard - LF	9	0.1272211	0.0961995	0.0930193

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.1918	1	23	0.6655
Brown-Forsythe	0.2797	1	23	0.6020
Levene	0.2529	1	23	0.6198
Bartlett	0.1886	1	.	0.6641
F Test 2-sided	1.3228	15	8	0.7103

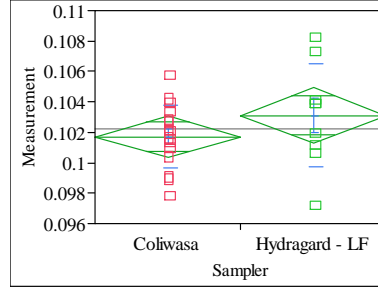
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.6529	1	18.787	0.2142

t Test

1.2856

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=BaO (wt%), Targeted=0.0919



Excluded Rows

1

Oneway Anova Summary of Fit

Rsquare	0.067511
Adj Rsquare	0.026968
Root Mean Square Error	0.00262
Mean of Response	0.102213
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00141	t Ratio	1.290411
Std Err Dif	0.00109	DF	23
Upper CL Dif	0.00367	Prob > t	0.2097
Lower CL Dif	-0.00085	Prob > t	0.1049
Confidence	0.95	Prob < t	0.8951

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001143	0.000011	1.6652	0.2097
Error	23	0.00015791	6.865e-6		
C. Total	24	0.00016934			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.101706	0.00066	0.10035	0.10306
Hydragard - LF	9	0.103115	0.00087	0.10131	0.10492

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.101706	0.002089	0.00052	0.10059	0.10282
Hydragard - LF	9	0.103115	0.003400	0.00113	0.10050	0.10573

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00141	t Ratio	1.129038
Std Err Dif	0.00125	DF	11.48092
Upper CL Dif	0.00414	Prob > t	0.2819
Lower CL Dif	-0.00132	Prob > t	0.1410
Confidence	0.95	Prob < t	0.8590

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0020886	0.0015840	0.0015840
Hydragard - LF	9	0.0033999	0.0025859	0.0025059

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.7590	1	23	0.1103
Brown-Forsythe	1.7069	1	23	0.2043
Levene	2.3093	1	23	0.1422
Bartlett	2.5113	1	.	0.1130
F Test 2-sided	2.6499	8	15	0.0988

Welch Anova testing Means Equal, allowing Std Devs Not Equal

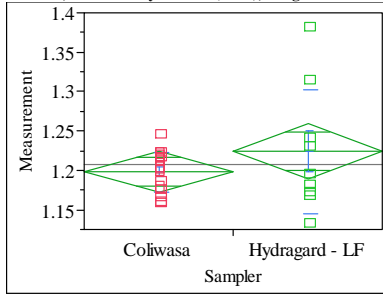
F Ratio	DFNum	DFDen	Prob > F
1.2747	1	11.481	0.2819

t Test

1.1290

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=CaO (wt%), Targeted=1.1462



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.06172
Adj Rsquare	0.020926
Root Mean Square Error	0.050753
Mean of Response	1.207342
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.02601	t Ratio	1.23002
Std Err Dif	0.02115	DF	23
Upper CL Dif	0.06976	Prob > t	0.2311
Lower CL Dif	-0.01773	Prob > t	0.1156
Confidence	0.95	Prob < t	0.8844

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00389721	0.003897	1.5129	0.2311
Error	23	0.05924574	0.002576		
C. Total	24	0.06314295			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.19798	0.01269	1.1717	1.2242
Hydragard - LF	9	1.22399	0.01692	1.1890	1.2590

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.19798	0.025202	0.00630	1.1845	1.2114
Hydragard - LF	9	1.22399	0.078834	0.02628	1.1634	1.2846

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.02601	t Ratio	0.962577
Std Err Dif	0.02702	DF	8.930501
Upper CL Dif	0.08721	Prob > t	0.3611
Lower CL Dif	-0.03519	Prob > t	0.1805
Confidence	0.95	Prob < t	0.8195

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0252023	0.0206929	0.0202009
Hydragard - LF	9	0.0788340	0.0599756	0.0583000

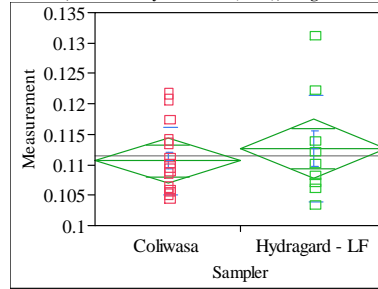
Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.7687	1	23	0.0248
Brown-Forsythe	6.3522	1	23	0.0191
Levene	10.2110	1	23	0.0040
Bartlett	13.2985	1	.	0.0003
F Test 2-sided	9.7847	8	15	0.0002

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.9266	1	8.9305	0.3611

t Test
0.9626

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Cr2O3 (wt%), Targeted=0.0998



Excluded Rows
2

Oneway Anova
Summary of Fit

Rsquare	0.019766
Adj Rsquare	-0.02479
Root Mean Square Error	0.006916
Mean of Response	0.11141
Observations (or Sum Wgts)	24

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00194	t Ratio	0.666053
Std Err Dif	0.00292	DF	22
Upper CL Dif	0.00799	Prob > t	0.5123
Lower CL Dif	-0.00411	Prob > t	0.2562
Confidence	0.95	Prob < t	0.7438

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002122	0.000021	0.4436	0.5123
Error	22	0.00105235	0.000048		
C. Total	23	0.00107357			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.110682	0.00179	0.10698	0.11439
Hydragard - LF	9	0.112624	0.00231	0.10784	0.11741

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.110682	0.005547	0.00143	0.10761	0.11375
Hydragard - LF	9	0.112624	0.008815	0.00294	0.10585	0.11940

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00194	t Ratio	0.594194
Std Err Dif	0.00327	DF	11.86926
Upper CL Dif	0.00907	Prob > t	0.5635
Lower CL Dif	-0.00519	Prob > t	0.2818
Confidence	0.95	Prob < t	0.7182

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0055465	0.0044121	0.0042971
Hydragard - LF	9	0.0088152	0.0064743	0.0062524

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	1.7502	1	22	0.1994
Brown-Forsythe	0.9200	1	22	0.3479
Levene	1.3738	1	22	0.2537
Bartlett	2.1879	1	.	0.1391
F Test 2-sided	2.5259	8	14	0.1239

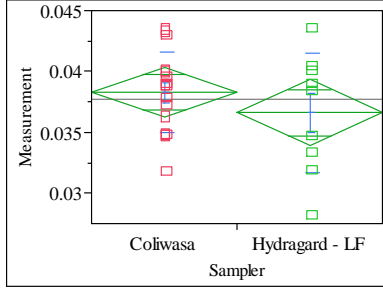
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.3531	1	11.869	0.5635

t Test
0.5942

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=CuO (wt%), Targeted=0.0504



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.042431
Adj Rsquare	0.000797
Root Mean Square Error	0.003941
Mean of Response	0.037669
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00166	t Ratio	-1.00953
Std Err Dif	0.00164	DF	23
Upper CL Dif	0.00174	Prob > t	0.3232
Lower CL Dif	-0.00505	Prob > t	0.8384
Confidence	0.95	Prob < t	0.1616

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00001583	0.000016	1.0191	0.3232
Error	23	0.00035724	0.000016		
C. Total	24	0.00037307			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.038266	0.00099	0.03623	0.04030
Hydragard - LF	9	0.036608	0.00131	0.03389	0.03933

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.038266	0.003324	0.00083	0.03649	0.04004
Hydragard - LF	9	0.036608	0.004893	0.00163	0.03285	0.04037

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00166	t Ratio	-0.90562
Std Err Dif	0.00183	DF	12.25053
Upper CL Dif	0.00232	Prob > t	0.3826
Lower CL Dif	-0.00564	Prob > t	0.8087
Confidence	0.95	Prob < t	0.1913

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0033235	0.0026102	0.0025427
Hydragard - LF	9	0.0048933	0.0040830	0.0039362

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.4173	1	23	0.1337
Brown-Forsythe	1.7249	1	23	0.2020
Levene	2.9268	1	23	0.1006
Bartlett	1.5728	1	.	0.2098
F Test 2-sided	2.1677	8	15	0.1870

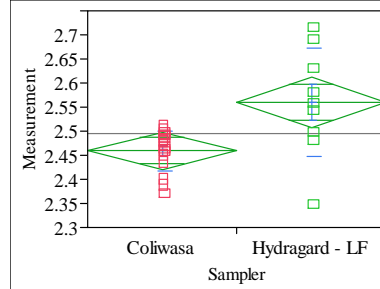
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.8202	1	12.251	0.3826

t Test

0.9056

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Fe/Li, Targeted=2.452



Excluded Rows

1

Oneway Anova
Summary of Fit

Rsquare	0.314619
Adj Rsquare	0.28482
Root Mean Square Error	0.074781
Mean of Response	2.49539
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.101244	t Ratio	3.249307
Std Err Dif	0.031159	DF	23
Upper CL Dif	0.165701	Prob > t	0.0035
Lower CL Dif	0.036787	Prob > t	0.0018
Confidence	0.95	Prob < t	0.9982

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.05904196	0.059042	10.5580	0.0035
Error	23	0.12861958	0.005592		
C. Total	24	0.18766154			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	2.45894	0.01870	2.4203	2.4976
Hydragard - LF	9	2.56019	0.02493	2.5086	2.6118

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	2.45894	0.042118	0.01053	2.4365	2.4814
Hydragard - LF	9	2.56019	0.112922	0.03764	2.4734	2.6470

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.101244	t Ratio	2.590315
Std Err Dif	0.039086	DF	9.270779
Upper CL Dif	0.189270	Prob > t	0.0285
Lower CL Dif	0.013218	Prob > t	0.0143
Confidence	0.95	Prob < t	0.9857

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0421182	0.0326870	0.0313272
Hydragard - LF	9	0.1129217	0.0833456	0.0849148

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.8101	1	23	0.0243
Brown-Forsythe	7.5412	1	23	0.0115
Levene	6.9376	1	23	0.0148
Bartlett	10.1280	1	.	0.0015
F Test 2-sided	7.1881	8	15	0.0011

Welch Anova testing Means Equal, allowing Std Devs Not Equal

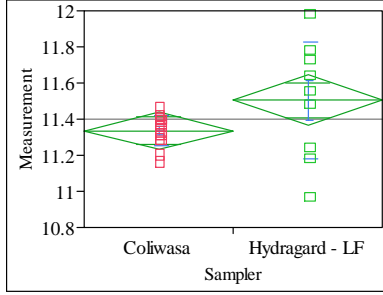
F Ratio	DFNum	DFDen	Prob > F
6.7097	1	9.2708	0.0285

t Test

2.5903

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Fe2O3 (wt%), Targeted=11.462



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.147527
Adj Rsquare	0.110463
Root Mean Square Error	0.201727
Mean of Response	11.397
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.16769	t Ratio	1.995078
Std Err Dif	0.08405	DF	23
Upper CL Dif	0.34157	Prob > t	0.0580
Lower CL Dif	-0.00618	Prob > t	0.0290
Confidence	0.95	Prob < t	0.9710

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.1619745	0.161974	3.9803	0.0580
Error	23	0.9359541	0.040694		
C. Total	24	1.0979286			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	11.3366	0.05043	11.232	11.441
Hydragard - LF	9	11.5043	0.06724	11.365	11.643

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	11.3366	0.080618	0.02015	11.294	11.380
Hydragard - LF	9	11.5043	0.323741	0.10791	11.255	11.753

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.16769	t Ratio	1.527532
Std Err Dif	0.10978	DF	8.562271
Upper CL Dif	0.41798	Prob > t	0.1627
Lower CL Dif	-0.08260	Prob > t	0.0813
Confidence	0.95	Prob < t	0.9187

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0806176	0.0635546	0.0616558
Hydragard - LF	9	0.3237410	0.2562870	0.2589346

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	10.5923	1	23	0.0035
Brown-Forsythe	16.8914	1	23	0.0004
Levene	17.5640	1	23	0.0003
Bartlett	19.0085	1	.	<.0001
F Test 2-sided	16.1263	8	15	<.0001

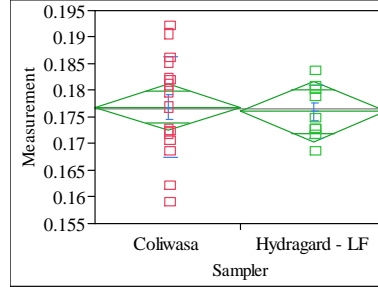
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
2.3334	1	8.5623	0.1627

t Test

1.5275

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=K2O (wt%), Targeted=0.1591



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.002876
Adj Rsquare	-0.04048
Root Mean Square Error	0.008223
Mean of Response	0.17657
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00088	t Ratio	-0.25758
Std Err Dif	0.00343	DF	23
Upper CL Dif	0.00621	Prob > t	0.7990
Lower CL Dif	-0.00797	Prob > t	0.6005
Confidence	0.95	Prob < t	0.3995

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.0000449	4.486e-6	0.0663	0.7990
Error	23	0.00155517	0.000068		
C. Total	24	0.00155966			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.00206	0.17264	0.18114
Hydragard - LF	9	0.176005	0.00274	0.17034	0.18168

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.176888	0.009502	0.00238	0.17182	0.18195
Hydragard - LF	9	0.176005	0.005010	0.00167	0.17215	0.17986

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00088	t Ratio	-0.30392
Std Err Dif	0.00290	DF	22.97051
Upper CL Dif	0.00512	Prob > t	0.7639
Lower CL Dif	-0.00689	Prob > t	0.6180
Confidence	0.95	Prob < t	0.3820

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0095021	0.0077923	0.0077923
Hydragard - LF	9	0.0050101	0.0042979	0.0043499

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[5]	3.1173	1	23	0.0907
Brown-Forsythe	3.4744	1	23	0.0751
Levene	3.8754	1	23	0.0612
Bartlett	3.4206	1	.	0.0644
F Test 2-sided	3.5970	15	8	0.0733

Welch Anova testing Means Equal, allowing Std Devs Not Equal

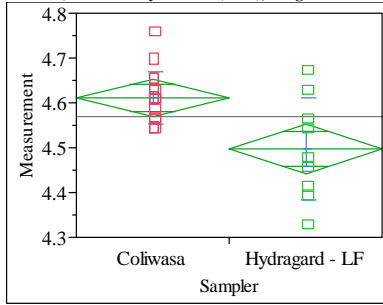
F Ratio	DFNum	DFDen	Prob > F
0.0924	1	22.971	0.7639

t Test

0.3039

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Li2O (wt%), Targeted=4.674



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.326668
Adj Rsquare	0.297392
Root Mean Square Error	0.081959
Mean of Response	4.570176
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.11407	t Ratio	-3.34043
Std Err Dif	0.03415	DF	23
Upper CL Dif	-0.04343	Prob > t	0.0028
Lower CL Dif	-0.18472	Prob > t	0.9986
Confidence	0.95	Prob < t	0.0014

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.07495391	0.074954	11.1585	0.0028
Error	23	0.15449606	0.006717		
C. Total	24	0.22944997			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	4.61124	0.02049	4.5689	4.6536
Hydragard - LF	9	4.49717	0.02732	4.4407	4.5537

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	4.61124	0.058417	0.01460	4.5801	4.6424
Hydragard - LF	9	4.49717	0.113638	0.03788	4.4098	4.5845

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.11407	t Ratio	-2.8099
Std Err Dif	0.04060	DF	10.43214
Upper CL Dif	-0.02412	Prob > t	0.0178
Lower CL Dif	-0.20402	Prob > t	0.9911
Confidence	0.95	Prob < t	0.0089

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0584166	0.0427216	0.0417124
Hydragard - LF	9	0.1136379	0.0930265	0.0932923

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.7454	1	23	0.0250
Brown-Forsythe	6.7333	1	23	0.0162
Levene	7.0716	1	23	0.0140
Bartlett	4.6976	1	.	0.0302
F Test 2-sided	3.7842	8	15	0.0255

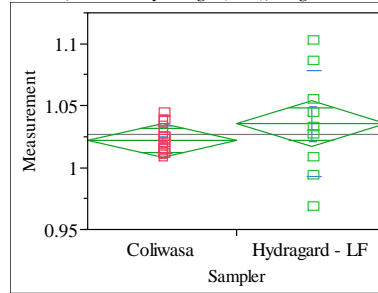
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
7.8956	1	10.432	0.0178

t Test

2.8099

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=MgO (wt%), Targeted=1.014



Excluded Rows

1

**Oneway Anova
Summary of Fit**

Rsquare	0.057319
Adj Rsquare	0.016333
Root Mean Square Error	0.026783
Mean of Response	1.026886
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.01320	t Ratio	1.18258
Std Err Dif	0.01116	DF	23
Upper CL Dif	0.03628	Prob > t	0.2491
Lower CL Dif	-0.00989	Prob > t	0.1245
Confidence	0.95	Prob < t	0.8755

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00100321	0.001003	1.3985	0.2491
Error	23	0.01649907	0.000717		
C. Total	24	0.01750228			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.02213	0.00670	1.0083	1.0360
Hydragard - LF	9	1.03533	0.00893	1.0169	1.0538

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.02213	0.011097	0.00277	1.0162	1.0280
Hydragard - LF	9	1.03533	0.042796	0.01427	1.0024	1.0682

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.01320	t Ratio	0.908123
Std Err Dif	0.01453	DF	8.610056
Upper CL Dif	0.04630	Prob > t	0.3885
Lower CL Dif	-0.01991	Prob > t	0.1943
Confidence	0.95	Prob < t	0.8057

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0110974	0.0091206	0.0091206
Hydragard - LF	9	0.0427957	0.0326747	0.0331660

Test

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	9.6572	1	23	0.0050
Brown-Forsythe	14.2841	1	23	0.0010
Levene	13.2206	1	23	0.0014
Bartlett	18.0424	1	.	<.0001
F Test 2-sided	14.8716	8	15	<.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

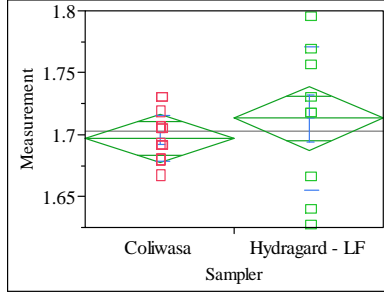
F Ratio	DFNum	DFDen	Prob > F
0.8247	1	8.6101	0.3885

t Test

0.9081

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=MnO (wt%), Targeted=1.779



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.043374
Adj Rsquare	0.001781
Root Mean Square Error	0.0373
Mean of Response	1.702835
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.01587	t Ratio	1.021189
Std Err Dif	0.01554	DF	23
Upper CL Dif	0.04802	Prob > t	0.3178
Lower CL Dif	-0.01628	Prob > t	0.1589
Confidence	0.95	Prob < t	0.8411

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00145088	0.001451	1.0428	0.3178
Error	23	0.03199977	0.001391		
C. Total	24	0.03345065			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	1.69712	0.00933	1.6778	1.7164
Hydragard - LF	9	1.71299	0.01243	1.6873	1.7387

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	1.69712	0.018241	0.00456	1.6874	1.7068
Hydragard - LF	9	1.71299	0.058104	0.01937	1.6683	1.7577

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.01587	t Ratio	0.797632
Std Err Dif	0.01990	DF	8.897041
Upper CL Dif	0.06096	Prob > t	0.4458
Lower CL Dif	-0.02922	Prob > t	0.2229
Confidence	0.95	Prob < t	0.7771

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0182413	0.0144251	0.0137190
Hydragard - LF	9	0.0581040	0.0459093	0.0444747

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	12.5004	1	23	0.0018
Brown-Forsythe	10.5628	1	23	0.0035
Levene	13.5363	1	23	0.0012
Bartlett	13.6911	1	.	0.0002
F Test 2-sided	10.1461	8	15	0.0002

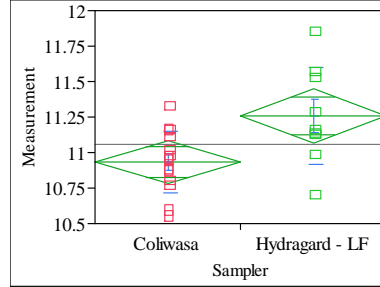
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
0.6362	1	8.897	0.4458

t Test

0.7976

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Na2O (wt%), Targeted=11.659



Excluded Rows
3

Oneway Anova
Summary of Fit

Rsquare	0.272394
Adj Rsquare	0.237747
Root Mean Square Error	0.272561
Mean of Response	11.06005
Observations (or Sum Wgts)	23

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.326516	t Ratio	2.803889
Std Err Dif	0.116451	DF	21
Upper CL Dif	0.568689	Prob > t	0.0106
Lower CL Dif	0.084343	Prob > t	0.0053
Confidence	0.95	Prob < t	0.9947

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.5840506	0.584051	7.8618	0.0106
Error	21	1.5600847	0.074290		
C. Total	22	2.1441353			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	14	10.9323	0.07285	10.781	11.084
Hydragard - LF	9	11.2588	0.09085	11.070	11.448

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	14	10.9323	0.218193	0.05831	10.806	11.058
Hydragard - LF	9	11.2588	0.342998	0.11433	10.995	11.522

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.326516	t Ratio	2.54404
Std Err Dif	0.128345	DF	12.19579
Upper CL Dif	0.605659	Prob > t	0.0255
Lower CL Dif	0.047372	Prob > t	0.0127
Confidence	0.95	Prob < t	0.9873

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	14	0.2181929	0.1656114	0.1656114
Hydragard - LF	9	0.3429977	0.2639417	0.2561200

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	2.2299	1	21	0.1502
Brown-Forsythe	1.3976	1	21	0.2503
Levene	2.0257	1	21	0.1693
Bartlett	2.0038	1	.	0.1569
F Test 2-sided	2.4712	8	13	0.1422

Welch Anova testing Means Equal, allowing Std Devs Not Equal

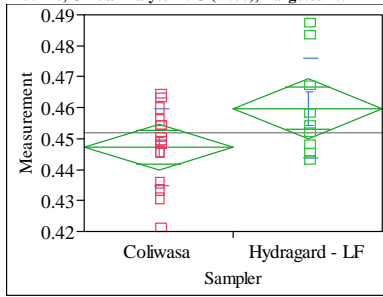
F Ratio	DFNum	DFDen	Prob > F
6.4721	1	12.196	0.0255

t Test

2.5440

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=NiO (wt%), Targeted=0.41



Excluded Rows
2

Oneway Anova
Summary of Fit

Rsquare	0.169992
Adj Rsquare	0.132264
Root Mean Square Error	0.014028
Mean of Response	0.45195
Observations (or Sum Wgts)	24

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.012555	t Ratio	2.122677
Std Err Dif	0.005915	DF	22
Upper CL Dif	0.024822	Prob > t	0.0453
Lower CL Dif	0.000289	Prob > t	0.0226
Confidence	0.95	Prob < t	0.9774

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00088670	0.000887	4.5058	0.0453
Error	22	0.00432946	0.000197		
C. Total	23	0.00521616			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.447241	0.00362	0.43973	0.45475
Hydragard - LF	9	0.459797	0.00468	0.45010	0.46949

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.447241	0.012587	0.00325	0.44027	0.45421
Hydragard - LF	9	0.459797	0.016246	0.00542	0.44731	0.47228

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.01256	t Ratio	1.987953
Std Err Dif	0.00632	DF	13.77865
Upper CL Dif	0.02612	Prob > t	0.0671
Lower CL Dif	-0.00101	Prob > t	0.0335
Confidence	0.95	Prob < t	0.9665

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0125867	0.0098067	0.0096710
Hydragard - LF	9	0.0162462	0.0130078	0.0123008

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.9938	1	22	0.3297
Brown-Forsythe	0.4496	1	22	0.5095
Levene	0.9296	1	22	0.3454
Bartlett	0.6548	1	.	0.4184
F Test 2-sided	1.6660	8	14	0.3856

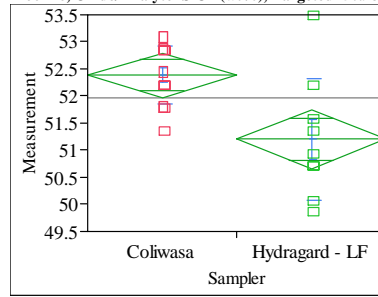
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.9520	1	13.779	0.0671

t Test

1.9880

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=SiO2 (wt%), Targeted=50.985



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.360529
Adj Rsquare	0.332726
Root Mean Square Error	0.790132
Mean of Response	51.95932
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-1.1855	t Ratio	-3.601
Std Err Dif	0.3292	DF	23
Upper CL Dif	-0.5045	Prob > t	0.0015
Lower CL Dif	-1.8666	Prob > t	0.9992
Confidence	0.95	Prob < t	0.0008

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	8.095556	8.09556	12.9672	0.0015
Error	23	14.359097	0.62431		
C. Total	24	22.454652			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	52.3861	0.19753	51.977	52.795
Hydragard - LF	9	51.2006	0.26338	50.656	51.745

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	52.3861	0.53482	0.13371	52.101	52.671
Hydragard - LF	9	51.2006	1.12186	0.37395	50.338	52.063

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-1.1855	t Ratio	-2.98519
Std Err Dif	0.3971	DF	10.08827
Upper CL Dif	-0.3017	Prob > t	0.0136
Lower CL Dif	-2.0694	Prob > t	0.9932
Confidence	0.95	Prob < t	0.0068

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.534825	0.4546012	0.4546012
Hydragard - LF	9	1.121858	0.8398733	0.8319500

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.7558	1	23	0.0650
Brown-Forsythe	3.3070	1	23	0.0820
Levene	4.1804	1	23	0.0525
Bartlett	5.8120	1	.	0.0159
F Test 2-sided	4.4000	8	15	0.0132

Welch Anova testing Means Equal, allowing Std Devs Not Equal

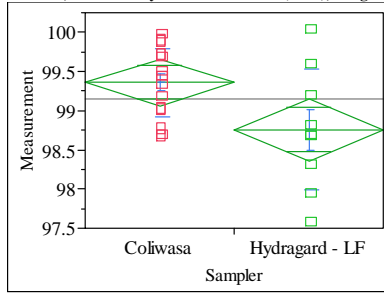
F Ratio	DFNum	DFDen	Prob > F
8.9113	1	10.088	0.0136

t Test

2.9852

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=Sum of Oxides (wt%), Targeted=99.553



Excluded Rows
1

Oneway Anova
Summary of Fit

Rsquare	0.217833
Adj Rsquare	0.183825
Root Mean Square Error	0.576231
Mean of Response	99.145
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.6077	t Ratio	-2.5309
Std Err Dif	0.2401	DF	23
Upper CL Dif	-0.1110	Prob > t	0.0187
Lower CL Dif	-1.1043	Prob > t	0.9907
Confidence	0.95	Prob < t	0.0093

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	2.1268874	2.12689	6.4055	0.0187
Error	23	7.6369747	0.33204		
C. Total	24	9.7638621			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	99.3638	0.14406	99.066	99.662
Hydragard - LF	9	98.7561	0.19208	98.359	99.153

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	99.3638	0.435355	0.10884	99.132	99.596
Hydragard - LF	9	98.7561	0.774110	0.25804	98.161	99.351

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.6077	t Ratio	-2.16982
Std Err Dif	0.2801	DF	10.91553
Upper CL Dif	0.0093	Prob > t	0.0530
Lower CL Dif	-1.2246	Prob > t	0.9735
Confidence	0.95	Prob < t	0.0265

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.4353546	0.3629705	0.3541027
Hydragard - LF	9	0.7741099	0.5767855	0.5729941

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	4.4997	1	23	0.0449
Brown-Forsythe	2.2755	1	23	0.1450
Levene	2.3893	1	23	0.1358
Bartlett	3.5136	1	.	0.0609
F Test 2-sided	3.1617	8	15	0.0523

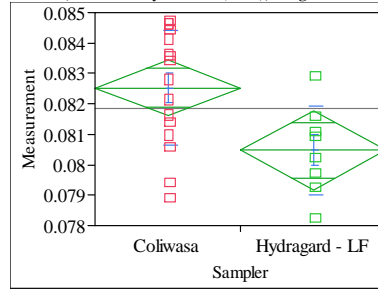
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
4.7081	1	10.916	0.0530

t Test

2.1698

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=TiO2 (wt%), Targeted=0.0711



Excluded Rows
2

Oneway Anova
Summary of Fit

Rsquare	0.24465
Adj Rsquare	0.210316
Root Mean Square Error	0.001768
Mean of Response	0.081843
Observations (or Sum Wgts)	24

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.00204	t Ratio	-2.66938
Std Err Dif	0.00077	DF	22
Upper CL Dif	-0.00046	Prob > t	0.0140
Lower CL Dif	-0.00363	Prob > t	0.9930
Confidence	0.95	Prob < t	0.0070

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002227	0.000022	7.1256	0.0140
Error	22	0.00006875	3.125e-6		
C. Total	23	0.00009102			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.082524	0.00044	0.08161	0.08344
Hydragard - LF	8	0.080481	0.00062	0.07918	0.08178

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.082524	0.001896	0.00047	0.08151	0.08353
Hydragard - LF	8	0.080481	0.001454	0.00051	0.07927	0.08170

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.00204	t Ratio	-2.92171
Std Err Dif	0.00070	DF	17.92045
Upper CL Dif	-0.00057	Prob > t	0.0091
Lower CL Dif	-0.00351	Prob > t	0.9954
Confidence	0.95	Prob < t	0.0046

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0018964	0.0016107	0.0015846
Hydragard - LF	8	0.0014541	0.0011259	0.0011259

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	0.8899	1	22	0.3557
Brown-Forsythe	1.0646	1	22	0.3134
Levene	1.6125	1	22	0.2174
Bartlett	0.5936	1	.	0.4410
F Test 2-sided	1.7009	15	7	0.4881

Welch Anova testing Means Equal, allowing Std Devs Not Equal

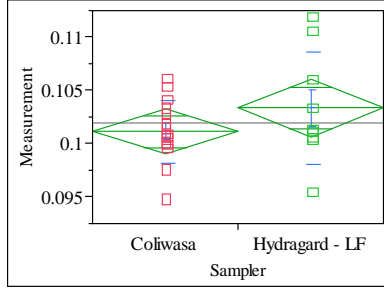
F Ratio	DFNum	DFDen	Prob > F
8.5364	1	17.92	0.0091

t Test

2.9217

Exhibit C3. Statistical Comparisons for Low-Rheology (Phase 3) Simulant Testing (screened data)

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=ZnO (wt%), Targeted=0.0958



Excluded Rows

2

Oneway Anova

Summary of Fit

Rsquare	0.074053
Adj Rsquare	0.031965
Root Mean Square Error	0.003937
Mean of Response	0.10197
Observations (or Sum Wgts)	24

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	0.00220	t Ratio	1.326447
Std Err Dif	0.00166	DF	22
Upper CL Dif	0.00564	Prob > t	0.1983
Lower CL Dif	-0.00124	Prob > t	0.0991
Confidence	0.95	Prob < t	0.9009

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00002727	0.000027	1.7595	0.1983
Error	22	0.00034101	0.000016		
C. Total	23	0.00036828			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	15	0.101144	0.00102	0.09904	0.10325
Hydragard - LF	9	0.103346	0.00131	0.10062	0.10607

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	15	0.101144	0.002938	0.00076	0.09952	0.10277
Hydragard - LF	9	0.103346	0.005246	0.00175	0.09931	0.10738

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	0.00220	t Ratio	1.155157
Std Err Dif	0.00191	DF	11.06965
Upper CL Dif	0.00639	Prob > t	0.2724
Lower CL Dif	-0.00199	Prob > t	0.1362
Confidence	0.95	Prob < t	0.8638

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	15	0.0029378	0.0021621	0.0021660
Hydragard - LF	9	0.0052462	0.0040479	0.0038450

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	3.6050	1	22	0.0708
Brown-Forsythe	1.9827	1	22	0.1731
Levene	3.5658	1	22	0.0722
Bartlett	3.4319	1	.	0.0639
F Test 2-sided	3.1890	8	14	0.0558

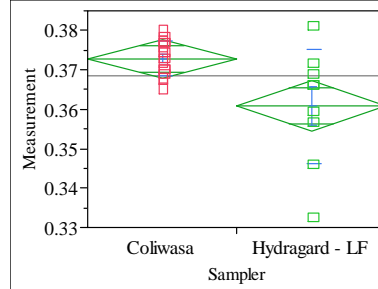
Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.3344	1	11.07	0.2724

t Test

1.1552

Oneway Analysis of Measurement By Sampler Type of Material=SME Simulant, Analytical Block=6, Oxide/Analyte=ZrO2 (wt%), Targeted=0.3547



Excluded Rows

1

Oneway Anova

Summary of Fit

Rsquare	0.294761
Adj Rsquare	0.264099
Root Mean Square Error	0.009294
Mean of Response	0.368498
Observations (or Sum Wgts)	25

t Test

Hydragard - LF-Coliwasa
Assuming equal variances

Difference	-0.01201	t Ratio	-3.10049
Std Err Dif	0.00387	DF	23
Upper CL Dif	-0.00400	Prob > t	0.0050
Lower CL Dif	-0.02002	Prob > t	0.9975
Confidence	0.95	Prob < t	0.0025

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Sampler	1	0.00083042	0.000830	9.6131	0.0050
Error	23	0.00198685	0.000086		
C. Total	24	0.00281728			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Coliwasa	16	0.372821	0.00232	0.36801	0.37763
Hydragard - LF	9	0.360814	0.00310	0.35440	0.36722

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Coliwasa	16	0.372821	0.004412	0.00110	0.37047	0.37517
Hydragard - LF	9	0.360814	0.014556	0.00485	0.34963	0.37200

t Test

Hydragard - LF-Coliwasa
Assuming unequal variances

Difference	-0.01201	t Ratio	-2.41319
Std Err Dif	0.00498	DF	8.835573
Upper CL Dif	-0.00072	Prob > t	0.0395
Lower CL Dif	-0.02329	Prob > t	0.9802
Confidence	0.95	Prob < t	0.0198

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
Coliwasa	16	0.0044117	0.0037147	0.0037147
Hydragard - LF	9	0.0145555	0.0109398	0.0103561

Test	F Ratio	DFNum	DFDen	p-Value
O'Brien[.5]	5.8266	1	23	0.0241
Brown-Forsythe	5.5311	1	23	0.0276
Levene	10.0381	1	23	0.0043
Bartlett	14.4630	1	.	0.0001
F Test 2-sided	10.8854	8	15	0.0001

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
5.8235	1	8.8356	0.0395

t Test

2.4132

