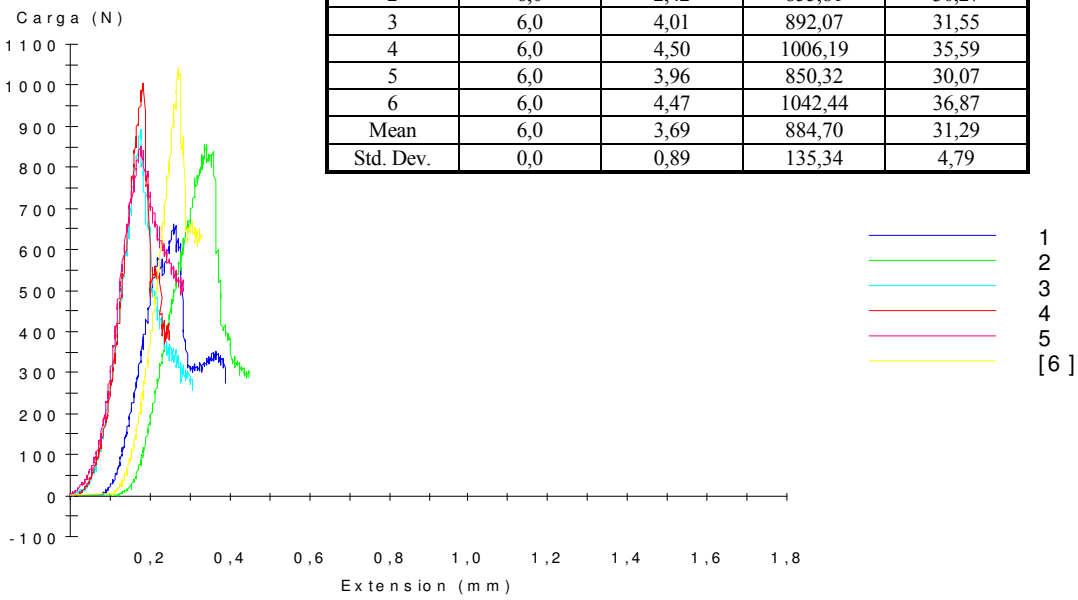
Anexo A: Resistencia a la compresión

- Parte "comparación de cementos":

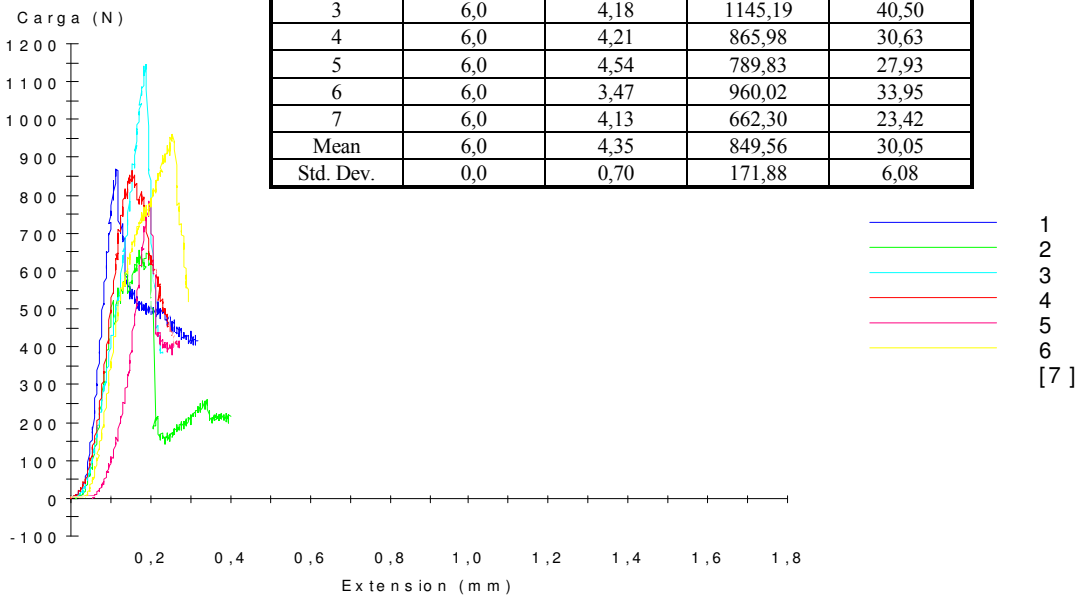
Cemento C2 - 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	2,75	661,38	23,39
2	6,0	2,42	855,81	30,27
3	6,0	4,01	892,07	31,55
4	6,0	4,50	1006,19	35,59
5	6,0	3,96	850,32	30,07
6	6,0	4,47	1042,44	36,87
Mean	6,0	3,69	884,70	31,29
Std. Dev.	0,0	0,89	135,34	4,79



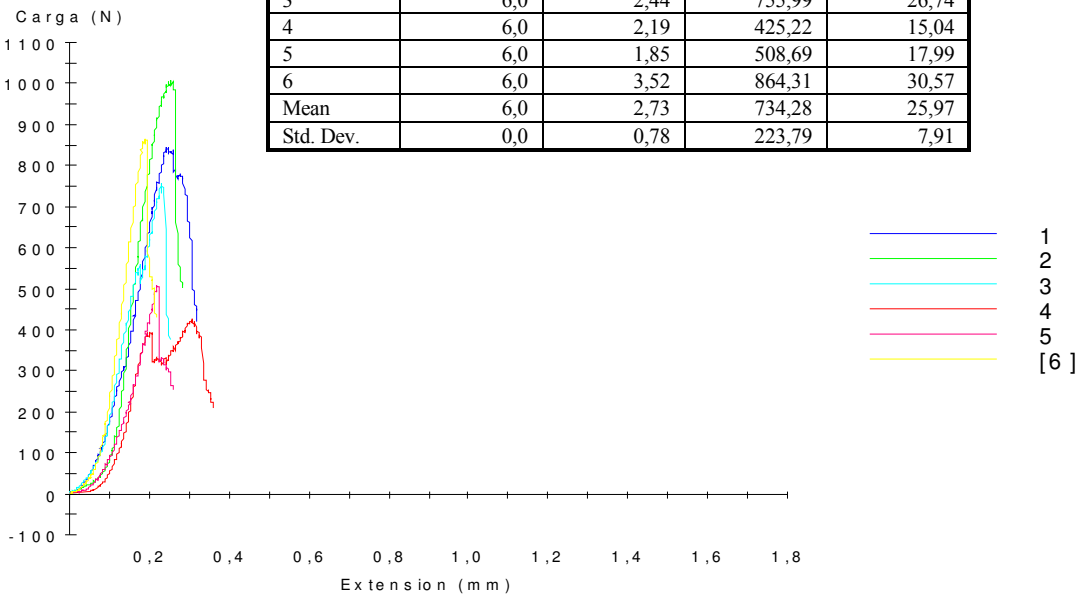
Cemento C3 - 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	5,77	869,89	30,77
2	6,0	4,17	653,74	23,12
3	6,0	4,18	1145,19	40,50
4	6,0	4,21	865,98	30,63
5	6,0	4,54	789,83	27,93
6	6,0	3,47	960,02	33,95
7	6,0	4,13	662,30	23,42
Mean	6,0	4,35	849,56	30,05
Std. Dev.	0,0	0,70	171,88	6,08



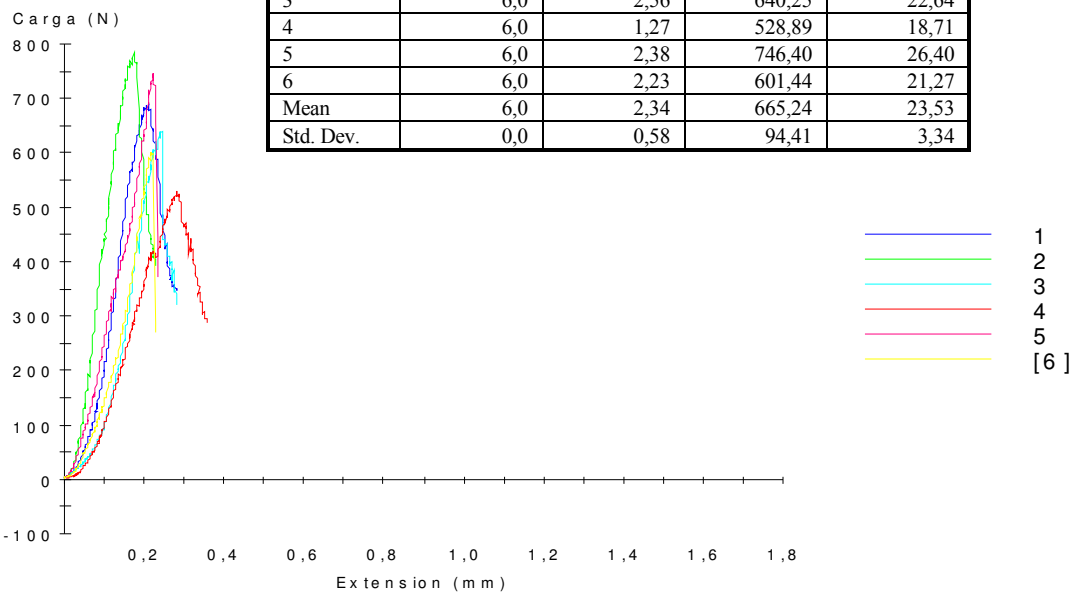
Cemento C4 - 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	2,56	844,16	29,86
2	6,0	3,84	1007,29	35,63
3	6,0	2,44	755,99	26,74
4	6,0	2,19	425,22	15,04
5	6,0	1,85	508,69	17,99
6	6,0	3,52	864,31	30,57
Mean	6,0	2,73	734,28	25,97
Std. Dev.	0,0	0,78	223,79	7,91



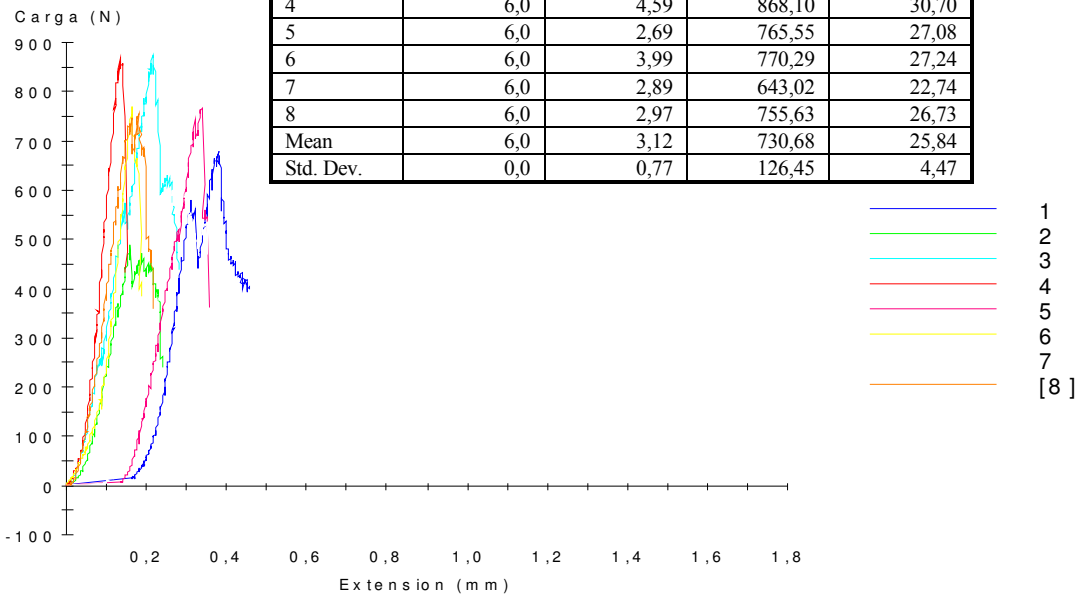
Cemento D1 - 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	2,63	690,71	24,43
2	6,0	2,99	783,74	27,72
3	6,0	2,56	640,25	22,64
4	6,0	1,27	528,89	18,71
5	6,0	2,38	746,40	26,40
6	6,0	2,23	601,44	21,27
Mean	6,0	2,34	665,24	23,53
Std. Dev.	0,0	0,58	94,41	3,34



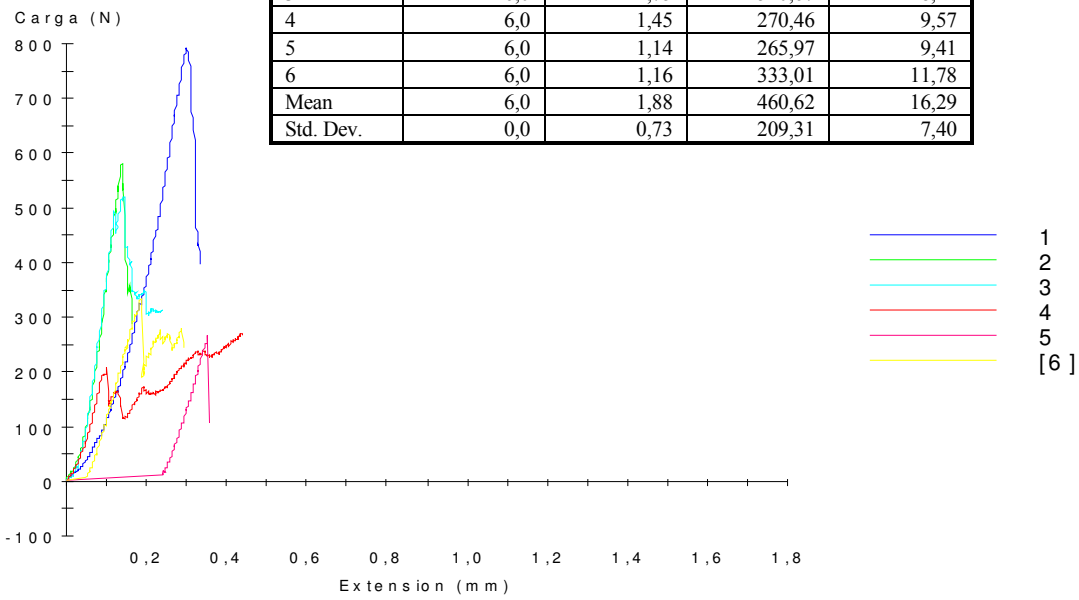
Cemento 1E - 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	2,97	679,95	24,05
2	6,0	2,31	488,40	17,27
3	6,0	2,56	874,49	30,93
4	6,0	4,59	868,10	30,70
5	6,0	2,69	765,55	27,08
6	6,0	3,99	770,29	27,24
7	6,0	2,89	643,02	22,74
8	6,0	2,97	755,63	26,73
Mean	6,0	3,12	730,68	25,84
Std. Dev.	0,0	0,77	126,45	4,47



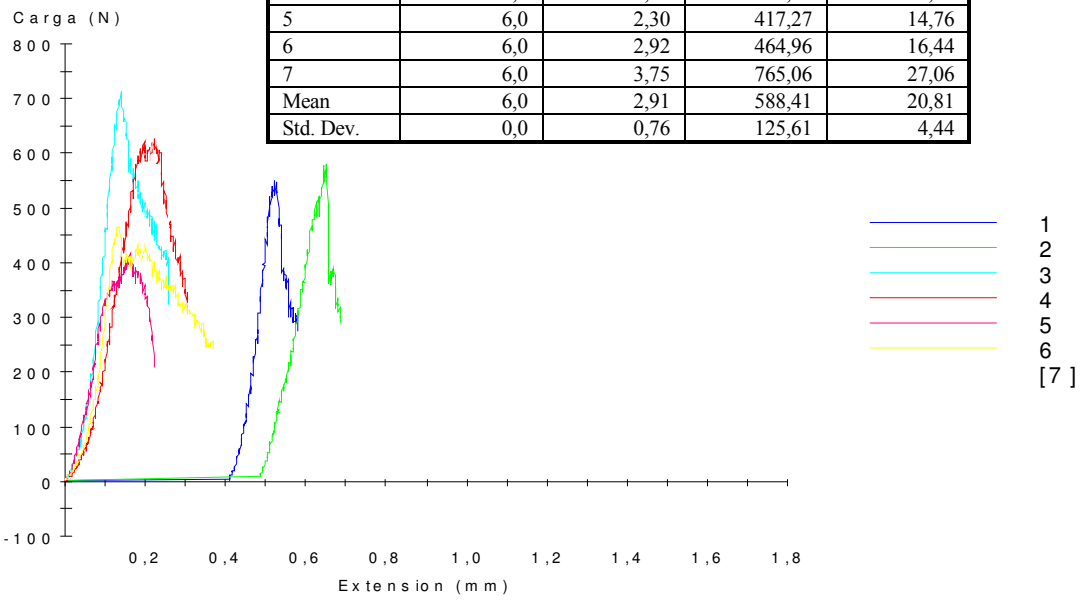
Cemento 2E - 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	2,08	793,53	28,07
2	6,0	2,68	580,11	20,52
3	6,0	2,75	520,67	18,42
4	6,0	1,45	270,46	9,57
5	6,0	1,14	265,97	9,41
6	6,0	1,16	333,01	11,78
Mean	6,0	1,88	460,62	16,29
Std. Dev.	0,0	0,73	209,31	7,40



Cemento 5E - 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	3,47	549,19	19,42
2	6,0	2,08	581,16	20,55
3	6,0	3,75	714,37	25,27
4	6,0	2,11	626,84	22,17
5	6,0	2,30	417,27	14,76
6	6,0	2,92	464,96	16,44
7	6,0	3,75	765,06	27,06
Mean	6,0	2,91	588,41	20,81
Std. Dev.	0,0	0,76	125,61	4,44

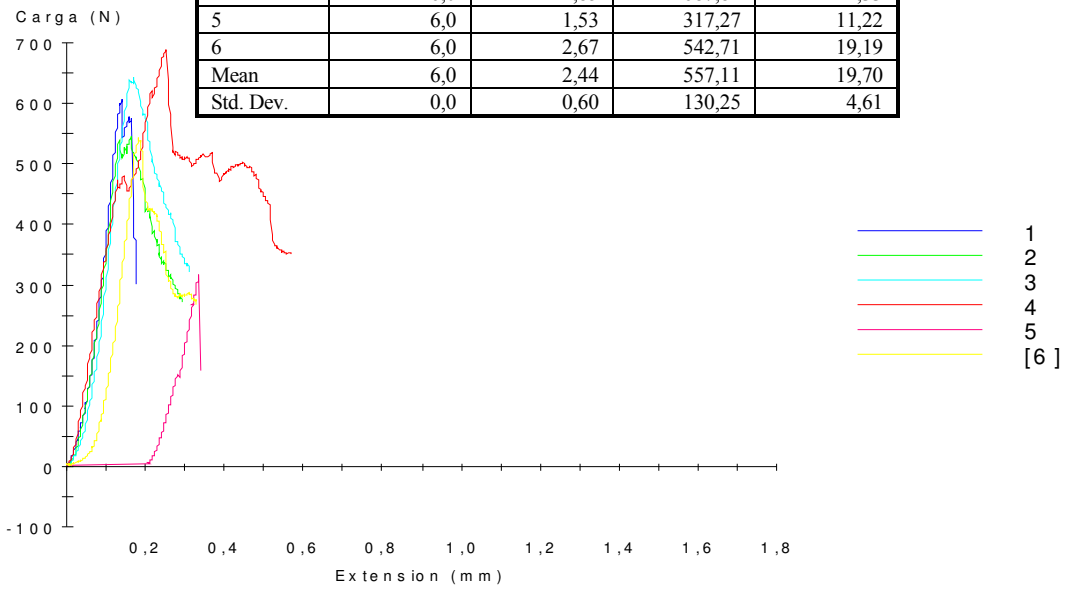


➢ Parte “estudio de un compuesto gelatina – fosfato de calcio”:

✓ *Fase líquida formada por gelatina y acelerante con L/P = 0,47*

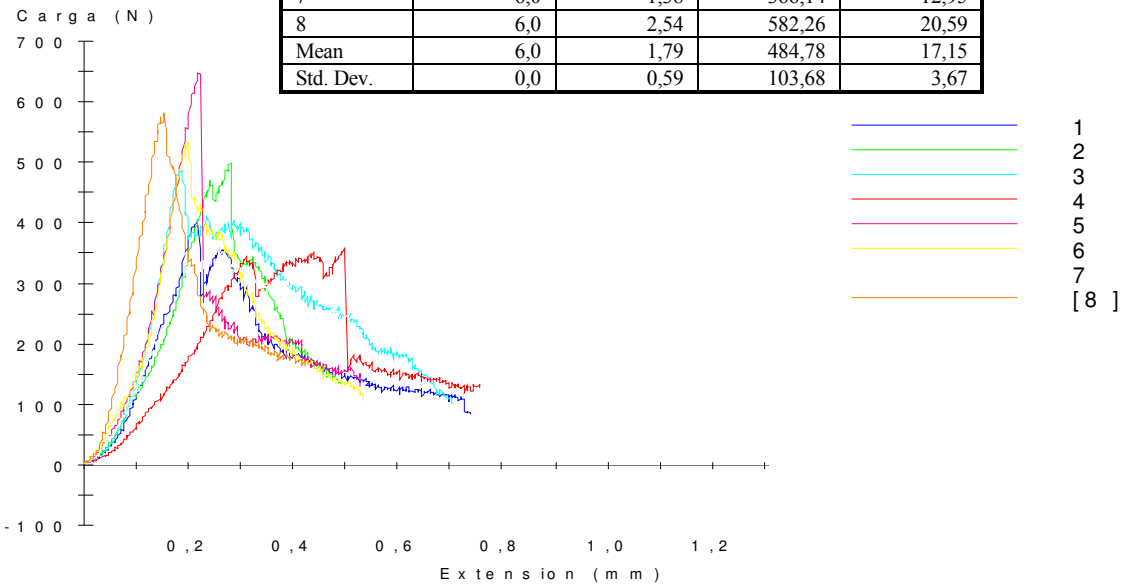
Ref A – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	3,01	606,56	21,45
2	6,0	2,77	545,09	19,28
3	6,0	2,84	643,21	22,75
4	6,0	1,85	687,82	24,33
5	6,0	1,53	317,27	11,22
6	6,0	2,67	542,71	19,19
Mean	6,0	2,44	557,11	19,70
Std. Dev.	0,0	0,60	130,25	4,61



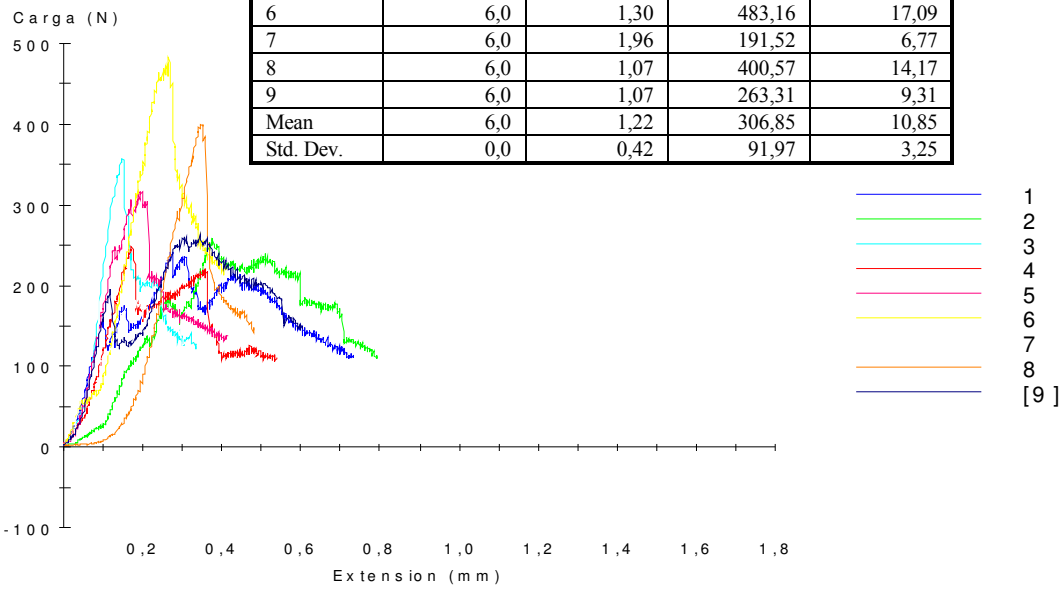
1G5A – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,49	405,42	14,34
2	6,0	1,51	498,68	17,64
3	6,0	2,17	487,91	17,26
4	6,0	0,80	356,96	12,63
5	6,0	2,21	647,43	22,90
6	6,0	2,24	533,46	18,87
7	6,0	1,38	366,14	12,95
8	6,0	2,54	582,26	20,59
Mean	6,0	1,79	484,78	17,15
Std. Dev.	0,0	0,59	103,68	3,67



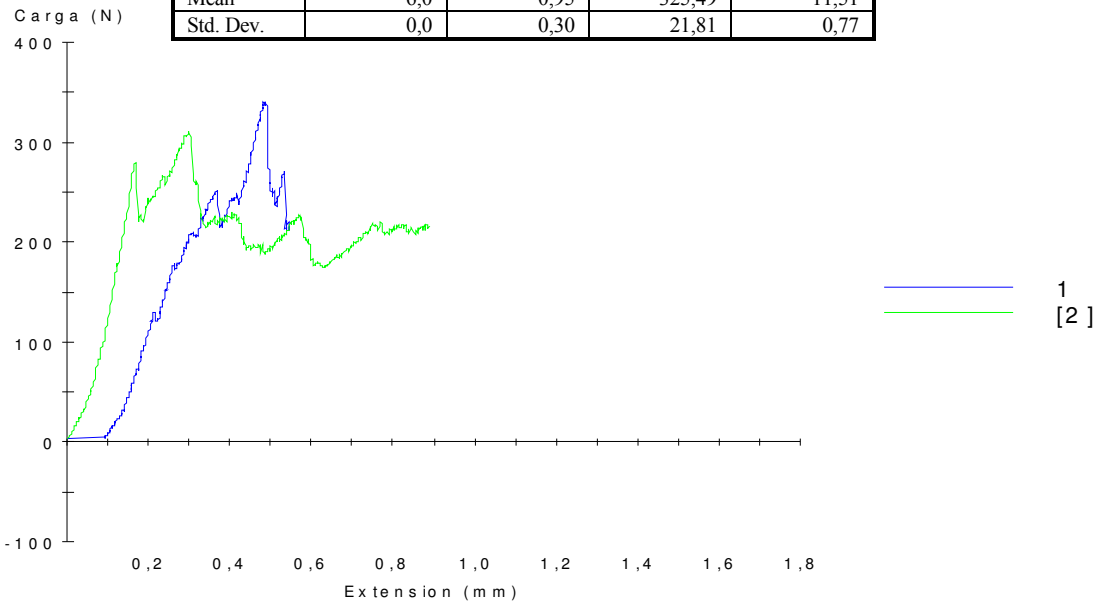
1G10A – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	0,92	241,53	8,54
2	6,0	0,74	258,49	9,14
3	6,0	1,84	357,45	12,64
4	6,0	0,86	249,02	8,81
5	6,0	1,24	316,64	11,20
6	6,0	1,30	483,16	17,09
7	6,0	1,96	191,52	6,77
8	6,0	1,07	400,57	14,17
9	6,0	1,07	263,31	9,31
Mean	6,0	1,22	306,85	10,85
Std. Dev.	0,0	0,42	91,97	3,25



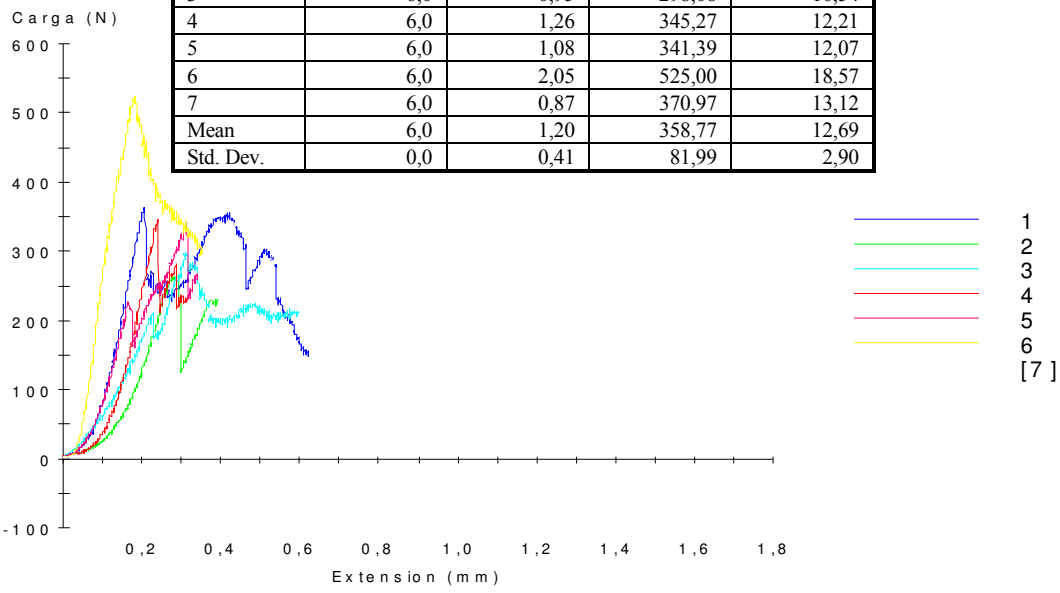
1G15A – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	0,74	340,91	12,06
2	6,0	1,17	310,07	10,97
Mean	6,0	0,95	325,49	11,51
Std. Dev.	0,0	0,30	21,81	0,77



1G20A – 0,47:

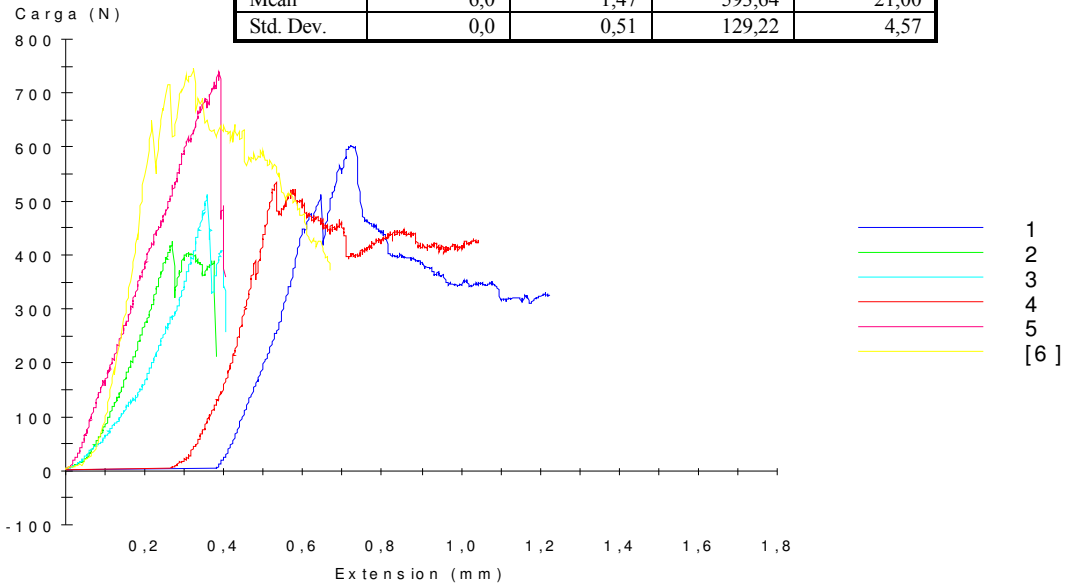
Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,31	363,38	12,85
2	6,0	0,87	267,33	9,45
3	6,0	0,95	298,08	10,54
4	6,0	1,26	345,27	12,21
5	6,0	1,08	341,39	12,07
6	6,0	2,05	525,00	18,57
7	6,0	0,87	370,97	13,12
Mean	6,0	1,20	358,77	12,69
Std. Dev.	0,0	0,41	81,99	2,90



✓ *Fase líquida formada por gelatina y agua con L/P = 0,47*

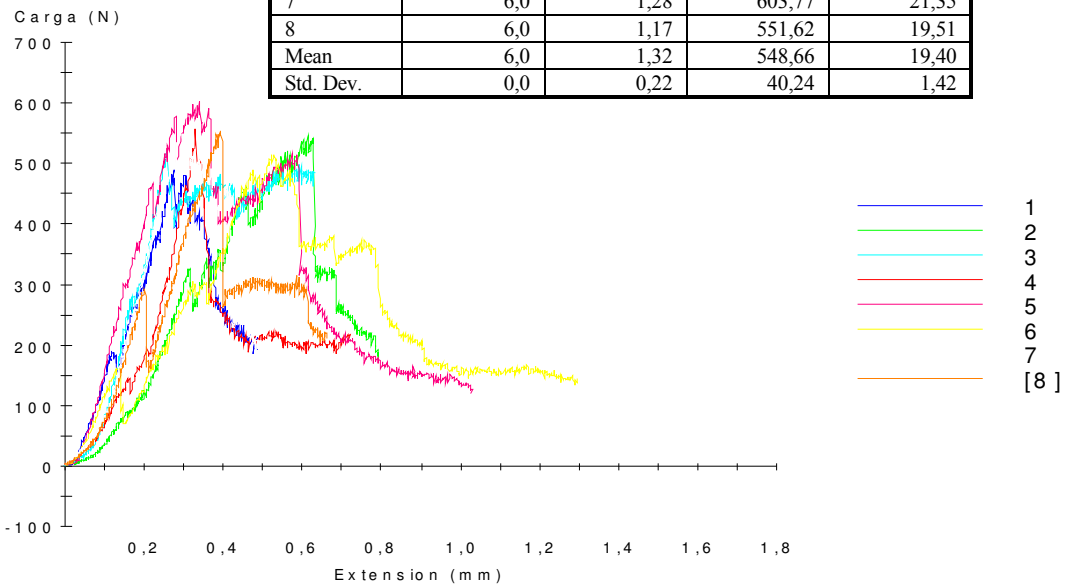
Ref W – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,28	602,51	21,31
2	6,0	1,10	425,74	15,06
3	6,0	1,28	511,46	18,09
4	6,0	1,69	534,87	18,92
5	6,0	1,05	740,25	26,18
6	6,0	2,39	747,01	26,42
Mean	6,0	1,47	593,64	21,00
Std. Dev.	0,0	0,51	129,22	4,57



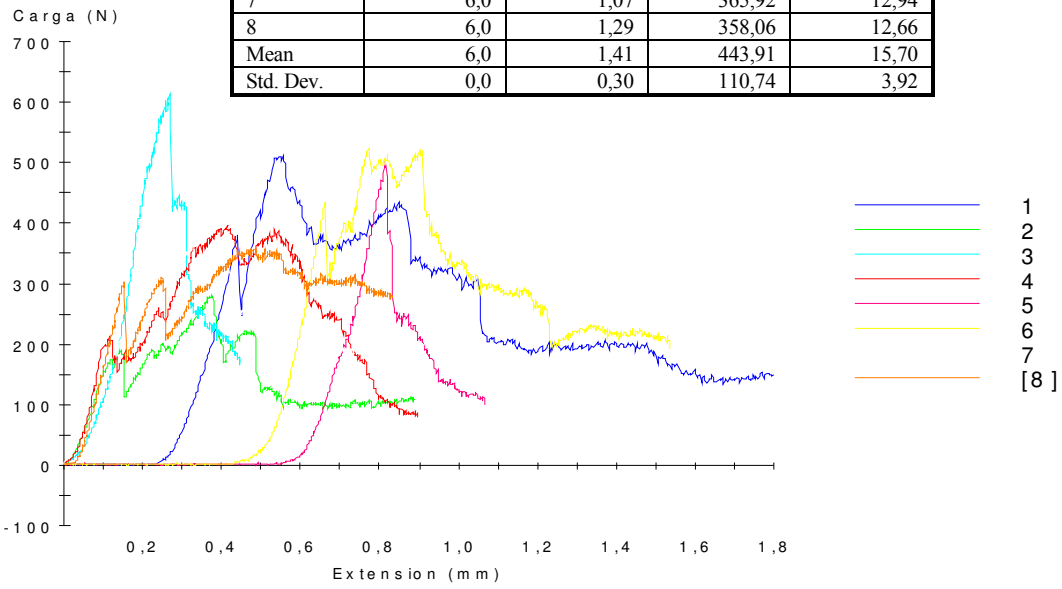
1G5W – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,48	489,04	17,30
2	6,0	1,15	546,93	19,34
3	6,0	1,61	523,95	18,53
4	6,0	1,54	557,49	19,72
5	6,0	1,35	602,18	21,30
6	6,0	0,98	514,30	18,19
7	6,0	1,28	603,77	21,35
8	6,0	1,17	551,62	19,51
Mean	6,0	1,32	548,66	19,40
Std. Dev.	0,0	0,22	40,24	1,42



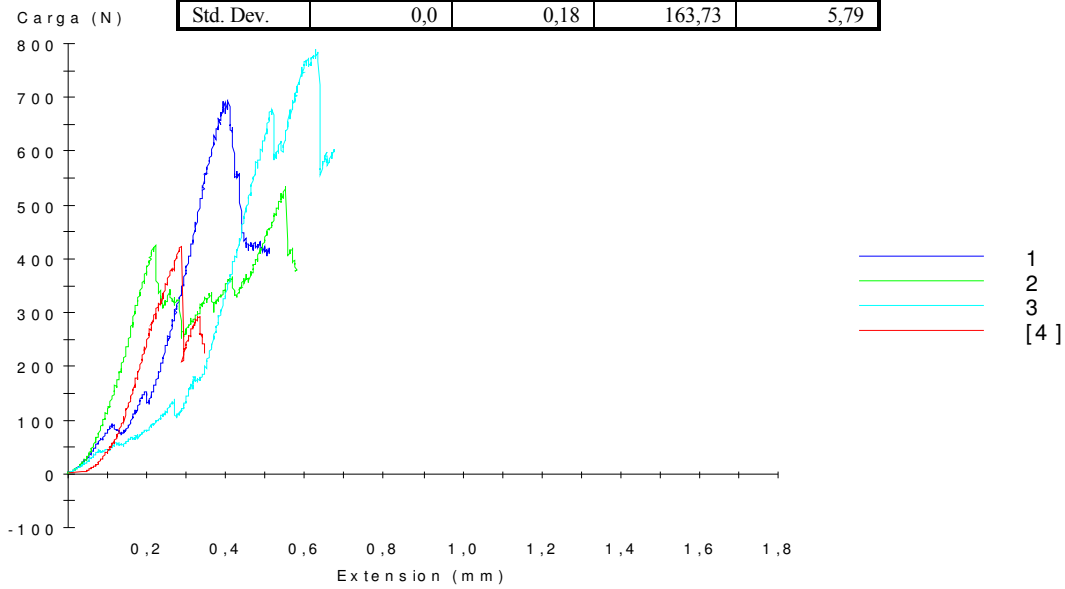
1G10W – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,70	512,28	18,12
2	6,0	0,95	279,71	9,89
3	6,0	1,83	613,82	21,71
4	6,0	1,36	396,43	14,02
5	6,0	1,47	502,21	17,76
6	6,0	1,58	522,83	18,49
7	6,0	1,07	365,92	12,94
8	6,0	1,29	358,06	12,66
Mean	6,0	1,41	443,91	15,70
Std. Dev.	0,0	0,30	110,74	3,92



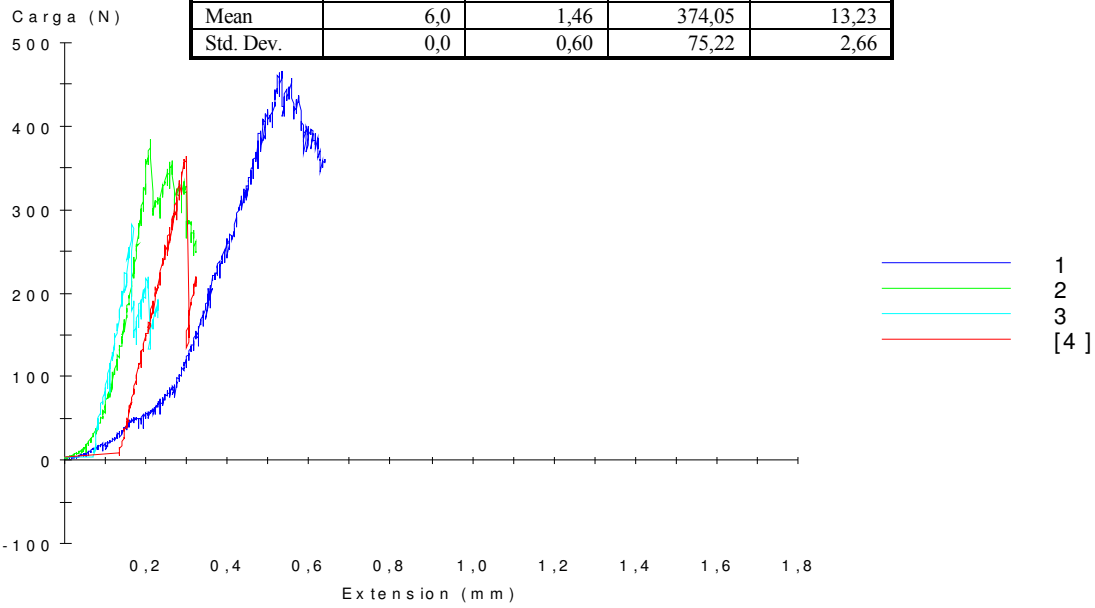
1G15W – 0,47:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,54	693,65	24,53
2	6,0	1,34	535,21	18,93
3	6,0	1,39	789,75	27,93
4	6,0	1,11	421,52	14,91
Mean	6,0	1,34	610,03	21,58
Std. Dev.	0,0	0,18	163,73	5,79



1G20W – 0,47:

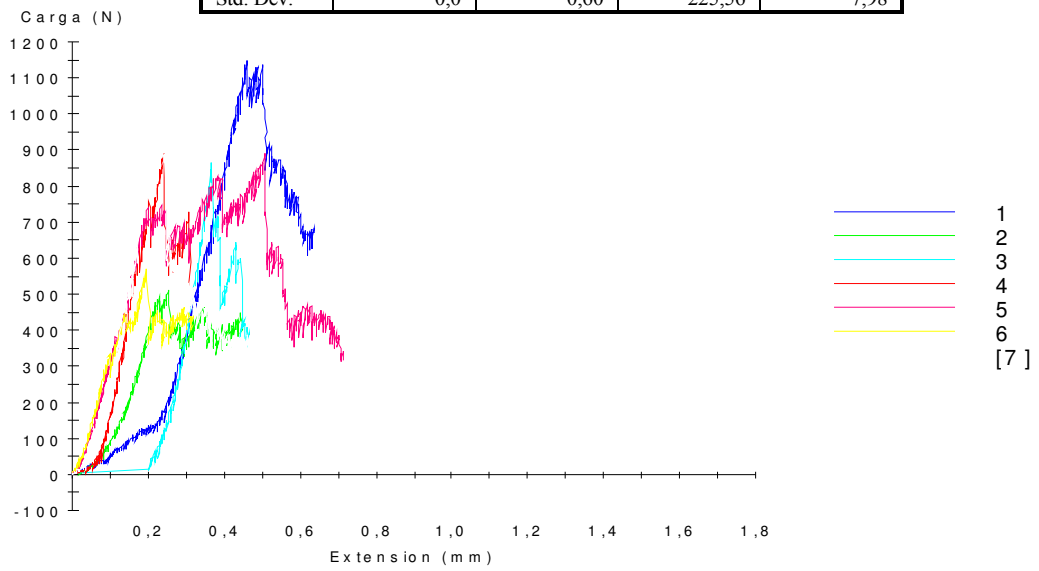
Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	0,82	465,79	16,47
2	6,0	1,95	384,46	13,60
3	6,0	2,00	282,76	10,00
4	6,0	1,07	363,19	12,85
Mean	6,0	1,46	374,05	13,23
Std. Dev.	0,0	0,60	75,22	2,66



✓ *Fase líquida formada por gelatina y agua con L/P = 0,35*

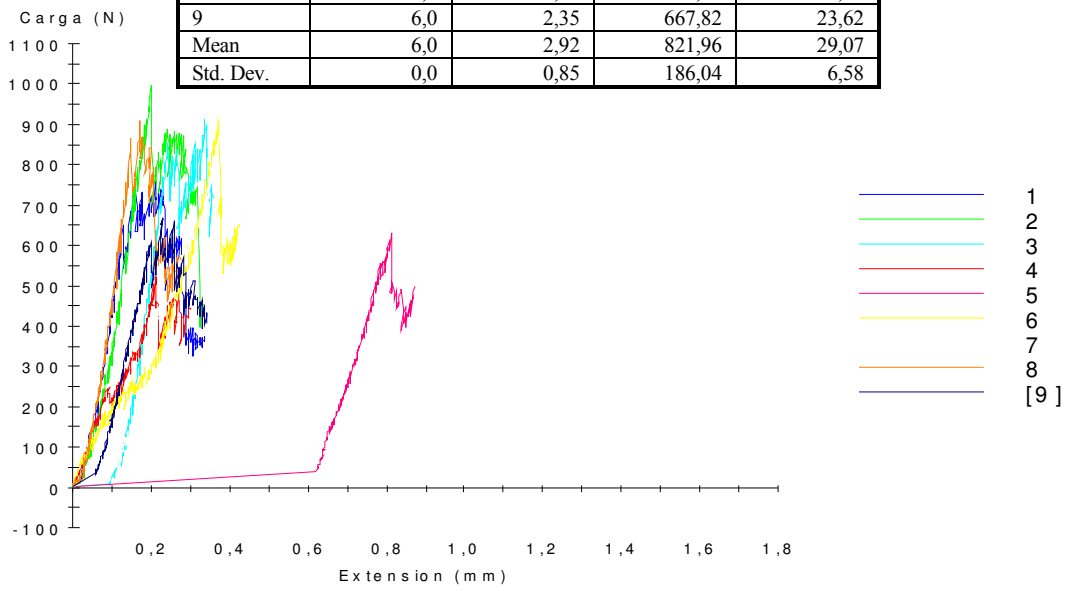
Ref W – 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	2,57	1147,59	40,59
2	6,0	2,05	512,92	18,14
3	6,0	3,45	865,17	30,60
4	6,0	3,07	892,05	31,55
5	6,0	2,46	889,55	31,46
6	6,0	2,20	569,75	20,15
7	6,0	3,55	997,59	35,28
Mean	6,0	2,76	839,23	29,68
Std. Dev.	0,0	0,60	225,56	7,98



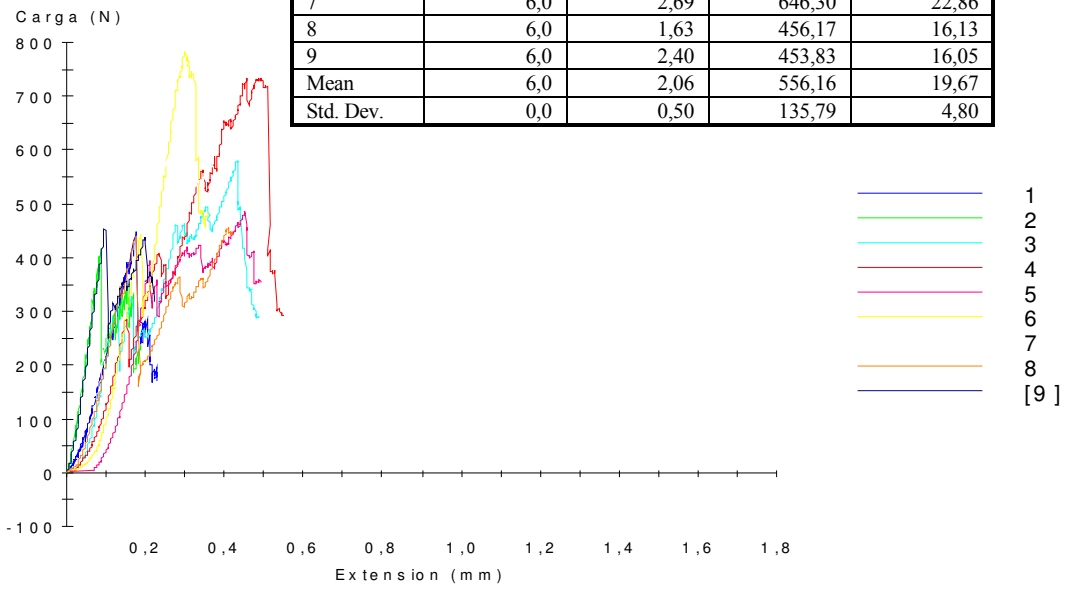
1G5W – 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	3,56	759,23	26,85
2	6,0	3,85	998,59	35,32
3	6,0	3,49	911,49	32,24
4	6,0	2,34	522,70	18,49
5	6,0	1,96	631,81	22,35
6	6,0	2,21	913,04	32,29
7	6,0	2,30	1083,20	38,31
8	6,0	4,23	909,75	32,18
9	6,0	2,35	667,82	23,62
Mean	6,0	2,92	821,96	29,07
Std. Dev.	0,0	0,85	186,04	6,58



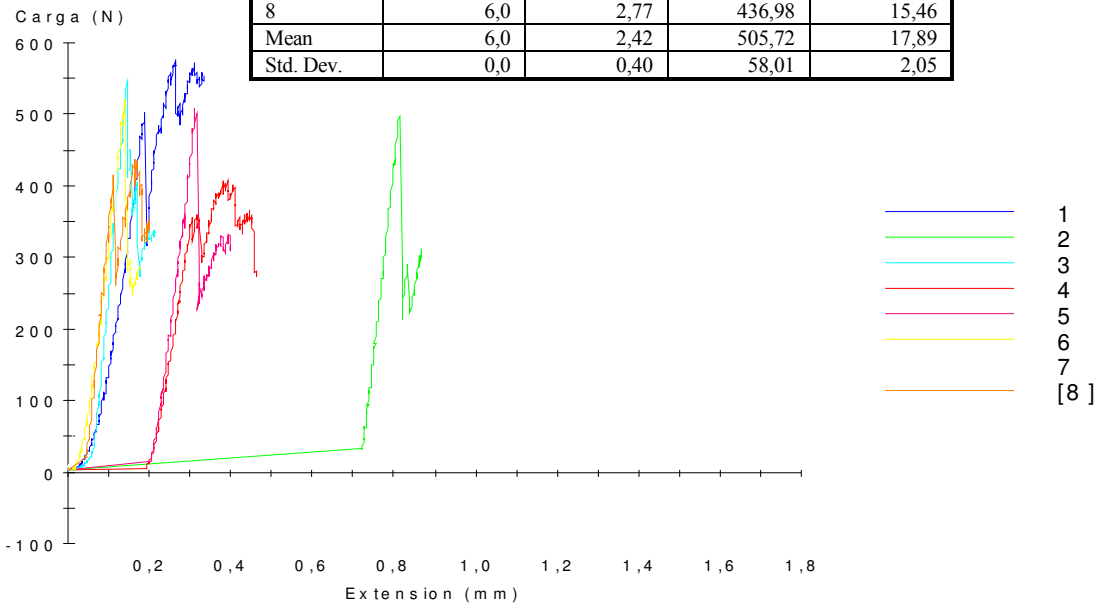
1G10W – 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,49	448,86	15,88
2	6,0	2,69	418,09	14,79
3	6,0	1,86	579,91	20,51
4	6,0	1,43	733,69	25,95
5	6,0	1,92	485,92	17,19
6	6,0	2,42	782,70	27,68
7	6,0	2,69	646,30	22,86
8	6,0	1,63	456,17	16,13
9	6,0	2,40	453,83	16,05
Mean	6,0	2,06	556,16	19,67
Std. Dev.	0,0	0,50	135,79	4,80



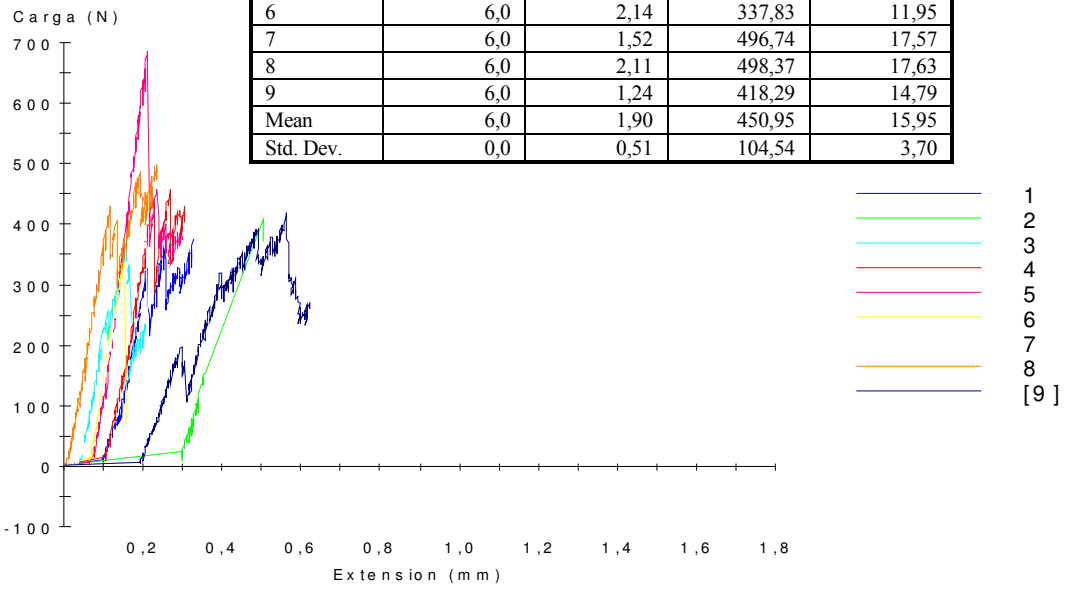
1G15W – 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	2,14	575,79	20,36
2	6,0	2,43	495,98	17,54
3	6,0	2,91	545,90	19,31
4	6,0	1,63	407,78	14,42
5	6,0	2,54	508,02	17,97
6	6,0	2,33	520,69	18,42
7	6,0	2,58	554,61	19,62
8	6,0	2,77	436,98	15,46
Mean	6,0	2,42	505,72	17,89
Std. Dev.	0,0	0,40	58,01	2,05



1G20W – 0,35:

Specimen #	Diameter mm	Modulus GPa	Peak Load N	Peak Stress MPa
1	6,0	1,77	376,76	13,33
2	6,0	1,24	406,76	14,39
3	6,0	1,93	375,32	13,27
4	6,0	2,52	460,97	16,30
5	6,0	2,67	687,47	24,31
6	6,0	2,14	337,83	11,95
7	6,0	1,52	496,74	17,57
8	6,0	2,11	498,37	17,63
9	6,0	1,24	418,29	14,79
Mean	6,0	1,90	450,95	15,95
Std. Dev.	0,0	0,51	104,54	3,70



Anexo B: Distribución del tamaño de partícula por difracción láser

- Parte "comparación de cementos":

Cemento C2:

Beckman Coulter LS Particle Size Analyzer

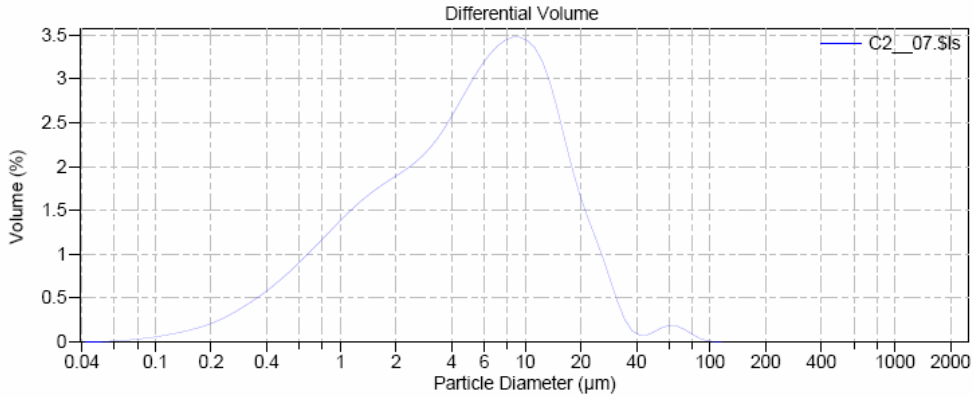
UNIVERSITAT DE BARCELONA

Membre de: XARXA DE CENTRES DE SUPORT A LA INNOVACIÓ TECNOLÒGICA

Page 1
19 Sep 2005

SCT U.B. Informe 3321/2005

File name:	C:\LS13320\Resultados\P25\P25_3321\C2__07.$ls C2__07.$ls		
File ID:	C2		
Operator:	Ricard		
Reg SCT:	3321/2005		
Run number:	7		
Comment 2:	5 min Ultrasounds (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.21%		
LS 13 320	Universal Liquid Module		
Start time:	12:10 19 Sep 2005	Run length:	92 seconds
Pump speed:	60%		
Obscuration:	12%	PIDS Obscur:	51%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) C2__07.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	7.737 µm	S.D.:	8.774 µm
Median:	5.285 µm	C.V.:	113%
D(3,2):	1.890 µm	Skewness:	3.372 Right skewed
Mode:	9.370 µm	Kurtosis:	18.80 Leptokurtic

d_{10}: 0.788 µm d_{50}: 5.285 µm d_{90}: 17.10 µm

<10%	<25%	<50%	<75%	<95%
0.788 µm	1.947 µm	5.285 µm	10.60 µm	22.45 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.15%	13.2%	72.8%	99.998%	100%

Cemento C3:

Beckman Coulter LS Particle Size Analyzer

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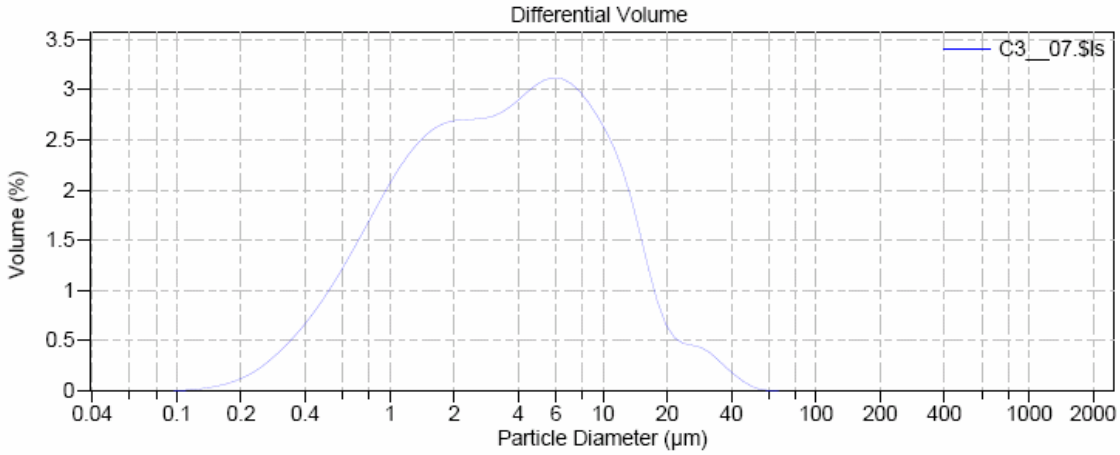
SCT U.B. Informe 3320/2005

File name:	C:\LS13320\Resultados\P25\P25_3321\C3__07.$ls C3__07.$ls		
File ID:	C3		
Operator:	Ricard		
Reg SCT:	3321/2005		
Run number:	7		
Comment 2:	5 min Ultrasounds (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.24%		
LS 13 320	Universal Liquid Module		
Start time:	13:01 19 Sep 2005	Run length:	63 seconds
Pump speed:	60%		
Obscuration:	11%	PIDS Obscur:	55%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) C3__07.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	5.522 µm	S.D.:	6.146 µm
Median:	3.438 µm	C.V.:	111%
D(3,2):	1.782 µm	Skewness:	2.580 Right skewed
Mode:	5.878 µm	Kurtosis:	9.353 Leptokurtic

d_{10}: 0.739 µm d_{50}: 3.438 µm d_{90}: 12.63 µm

<10%	<25%	<50%	<75%	<95%
0.739 µm	1.443 µm	3.438 µm	7.452 µm	16.72 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.00034%	15.9%	84.0%	100%	100%

Cemento C4:

Beckman Coulter LS Particle Size Analyzer

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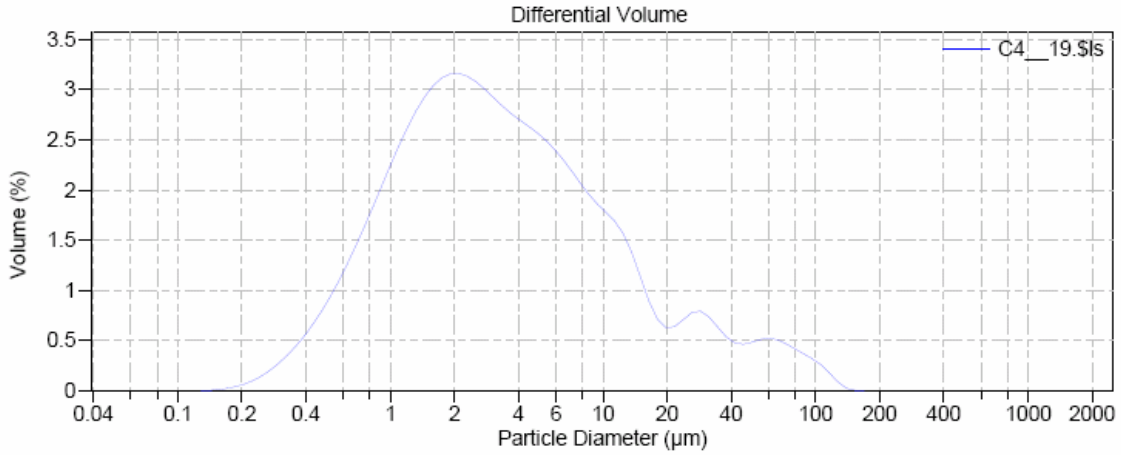
SCT U.B. Informe 3321/2005

File name:	C:\LS13320\Resultados\P25\P25_3321\C4__19.$ls C4__19.$ls		
File ID:	C4		
Operator:	Ricard		
Reg SCT:	3321/2005		
Run number:	19		
Comment 2:	5 min Ultrasounds (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.30%		
LS 13 320	Universal Liquid Module		
Start time:	15:26 19 Sep 2005	Run length:	63 seconds
Pump speed:	60%		
Obscuration:	10%	PIDS Obscur:	52%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) C4__19.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	8.652 µm	S.D.:	16.25 µm
Median:	3.060 µm	C.V.:	188%
D(3,2):	1.868 µm	Skewness:	3.848 Right skewed
Mode:	2.107 µm	Kurtosis:	16.94 Leptokurtic

d_{10}: 0.792 µm d_{50}: 3.060 µm d_{90}: 20.32 µm

<10%	<25%	<50%	<75%	<95%
0.792 µm	1.433 µm	3.060 µm	7.626 µm	40.24 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0%	15.0%	80.7%	99.4%	100%

Cemento D1:

Beckman Coulter LS Particle Size Analyzer

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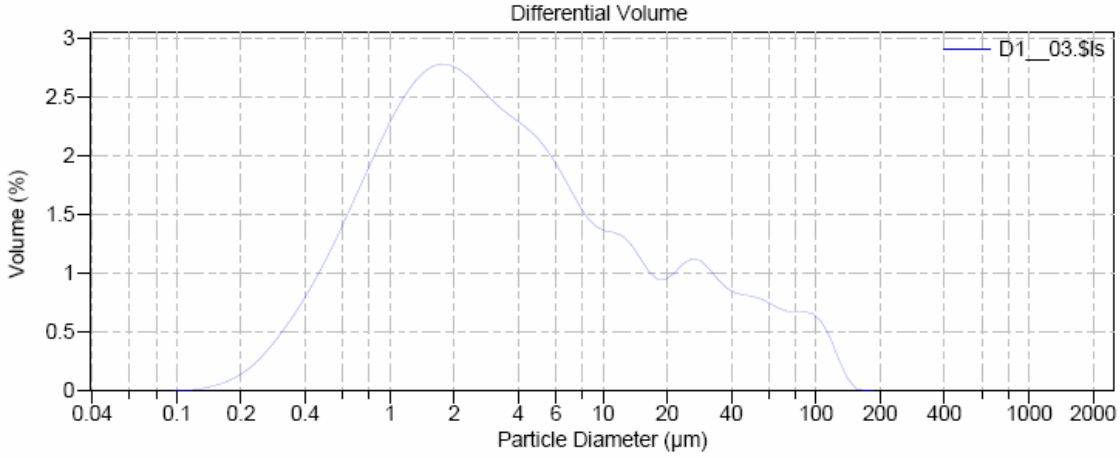
SCT U.B. Informe 3683/2005

File name:	C:\LS13320\Resultados\P25\P25_3683\D1__03.$ls D1__03.$ls		
File ID:	D1		
Operator:	Ricard		
Reg SCT:	3683/2005		
Run number:	3		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.34%		
LS 13 320	Universal Liquid Module		
Start time:	12:54 13 Oct 2005	Run length:	62 seconds
Pump speed:	60%		
Obscuration:	11%	PIDS Obscur:	65%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) D1__03.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	11.89 µm	S.D.:	21.84 µm
Median:	3.067 µm	C.V.:	184%
D(3,2):	1.671 µm	Skewness:	3.019 Right skewed
Mode:	1.748 µm	Kurtosis:	9.662 Leptokurtic

d_{10}: 0.670 µm d_{50}: 3.067 µm d_{90}: 35.28 µm

<10%	<25%	<50%	<75%	<95%
0.670 µm	1.286 µm	3.067 µm	10.07 µm	62.28 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.00024%	18.4%	74.9%	98.5%	100%

Cemento 1E:

Beckman Coulter LS Particle Size Analyzer

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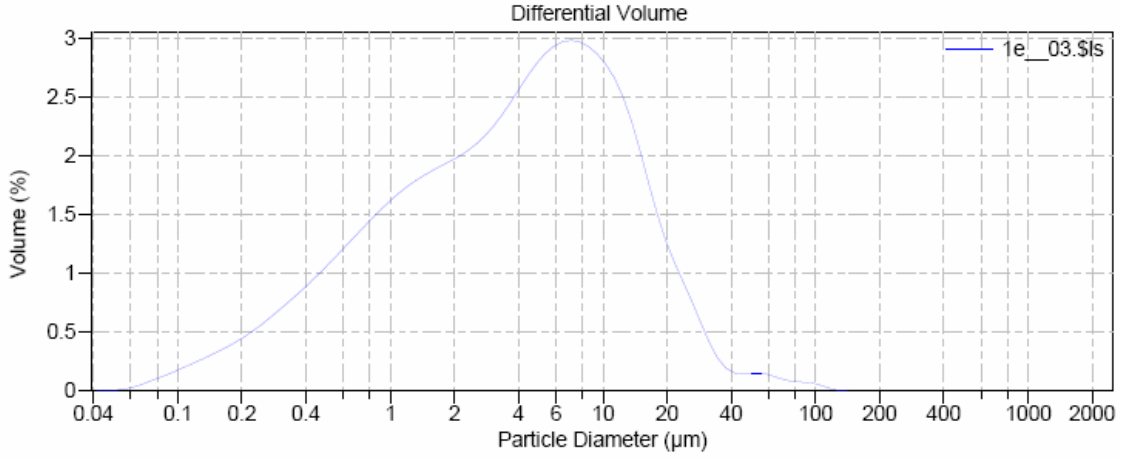
SCT U.B. Informe 3684/2005

File name:	C:\LS13320\Resultados\P25\P25_3684\1e__03.$ls 1e__03.$ls		
File ID:	1E		
Operator:	Ricard		
Reg SCT:	3684/2005		
Run number:	3		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.22%		
LS 13 320	Universal Liquid Module		
Start time:	14:42 13 Oct 2005	Run length:	63 seconds
Pump speed:	60%		
Obscuration:	7%	PIDS Obscur:	44%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 1e__03.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	6.833 µm	S.D.:	9.337 µm
Median:	4.004 µm	C.V.:	137%
D(3,2):	1.246 µm	Skewness:	4.397 Right skewed
Mode:	7.083 µm	Kurtosis:	31.19 Leptokurtic

d_{10}: 0.499 µm d_{50}: 4.004 µm d_{90}: 15.70 µm

<10%	<25%	<50%	<75%	<95%
0.499 µm	1.313 µm	4.004 µm	9.014 µm	21.64 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.57%	20.0%	78.2%	99.9%	100%

Cemento 2E:

Beckman Coulter LS Particle Size Analyzer

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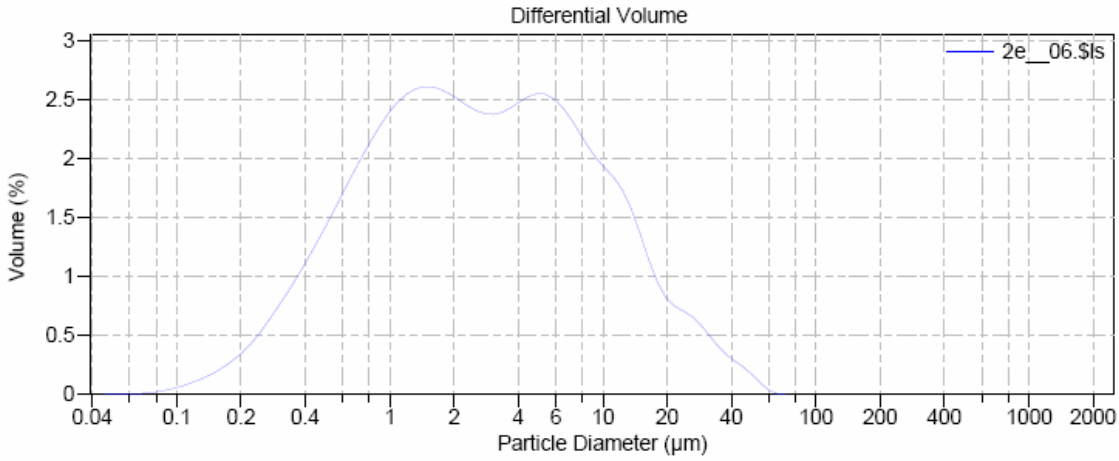
SCT U.B. Informe 3684/2005

File name:	C:\LS13320\Resultados\P25\P25_3684\2e__06.$ls 2e__06.$ls		
File ID:	2E		
Operator:	Ricard		
Reg SCT:	3684/2005		
Run number:	6		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.30%		
LS 13 320	Universal Liquid Module		
Start time:	14:57 13 Oct 2005	Run length:	63 seconds
Pump speed:	60%		
Obscuration:	11%	PIDS Obscur:	66%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 2e__06.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	5.425 µm	S.D.:	7.400 µm
Median:	2.604 µm	C.V.:	136%
D(3,2):	1.259 µm	Skewness:	2.927 Right skewed
Mode:	1.451 µm	Kurtosis:	10.96 Leptokurtic

d_{10}: 0.513 µm d_{50}: 2.604 µm d_{90}: 13.50 µm

<10%	<25%	<50%	<75%	<95%
0.513 µm	1.038 µm	2.604 µm	6.707 µm	20.20 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.13%	24.0%	84.2%	100%	100%

Cemento 5E:

Beckman Coulter LS Particle Size Analyzer

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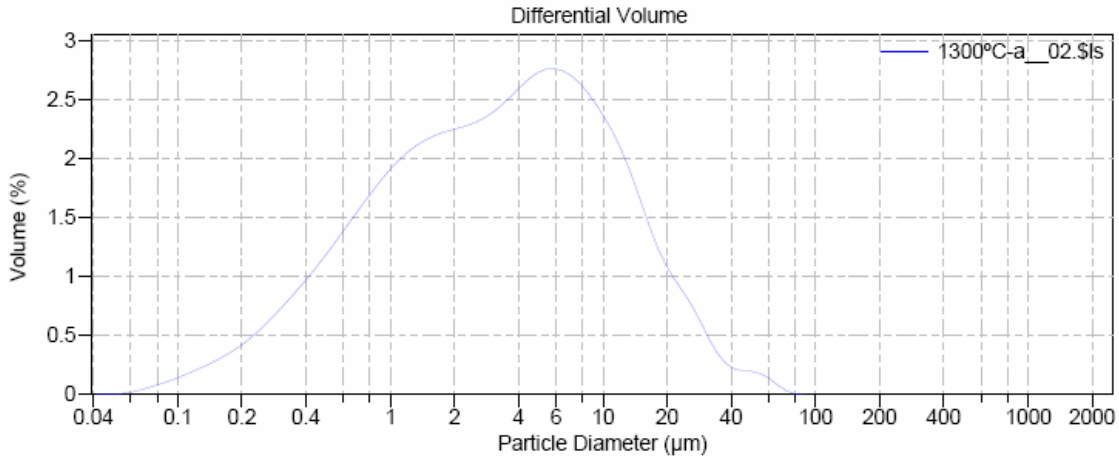
SCT U.B. Informe 3683/2005

File name:	C:\LS13320\Resultados\P25\P25_3683\1300ºC-a__02.$ls 1300ºC-a__02.$ls		
File ID:	1300ºC-a		
Operator:	Ricard		
Reg SCT:	3683/2005		
Run number:	2		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.27%		
LS 13 320	Universal Liquid Module		
Start time:	13:08 13 Oct 2005	Run length:	62 seconds
Pump speed:	60%		
Obscuration:	7%	PIDS Obscur:	53%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 1300ºC-a__02.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	6.134 µm	S.D.:	8.025 µm
Median:	3.316 µm	C.V.:	131%
D(3,2):	1.231 µm	Skewness:	3.072 Right skewed
Mode:	5.878 µm	Kurtosis:	13.47 Leptokurtic

d_{10}: 0.500 µm d_{50}: 3.316 µm d_{90}: 14.92 µm

<10%	<25%	<50%	<75%	<95%
0.500 µm	1.174 µm	3.316 µm	7.941 µm	21.40 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.43%	21.6%	81.2%	100%	100%

- Parte “Búsqueda de protocolos para el molino planetario de bolas”:

8:30:30

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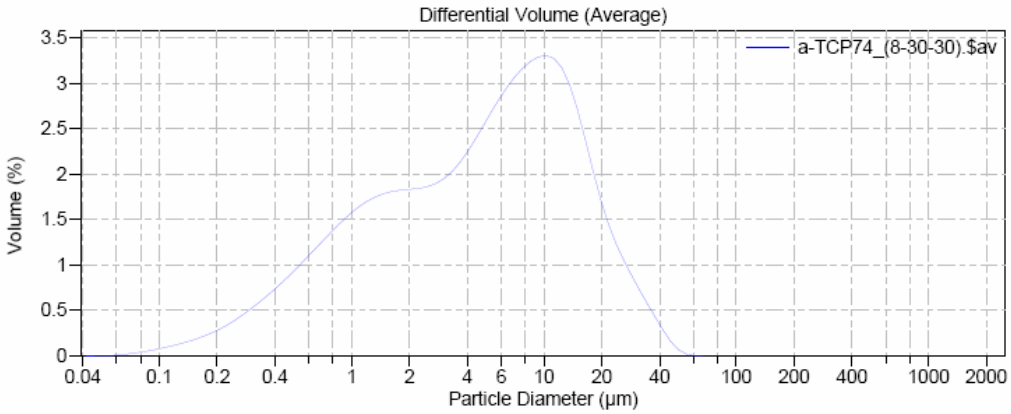
1 Mar 2005

SCT U.B. Informe 817/2005

File name: C:\LS13320\Resultados\P25\P25_817\a-TCP74_(8-30-30).$av
a-TCP74_(8-30-30).$av
File ID: a-TCP74
Sample ID: (8-30-30)
Operator: Ricard
Reg SCT: 817/2005
Comment 1: 5 min Ultrsons
Optical model: Fraunhofer.rfd PIDS included
LS 13 320 Universal Liquid Module
Run length: 62 seconds
Pump speed: 70%
Fluid: Ethanol
Average of 3 files:
a-TCP74_(8-30-30)_04.$ls
a-TCP74_(8-30-30)_05.$ls
a-TCP74_(8-30-30)_06.$ls



Volume Statistics (Arithmetic) a-TCP74_(8-30-30).$av

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	7.517 µm	S.D.:	7.818 µm
Median:	5.058 µm	C.V.:	104%
D(3,2):	1.620 µm	Skewness:	1.792 Right skewed
Mode:	10.29 µm	Kurtosis:	3.970 Leptokurtic

d_{10}: 0.649 µm d_{50}: 5.058 µm d_{90}: 17.70 µm

<10%	<25%	<50%	<75%	<95%
0.649 µm	1.597 µm	5.058 µm	10.83 µm	23.48 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.22%	16.4%	72.2%	100%	100%

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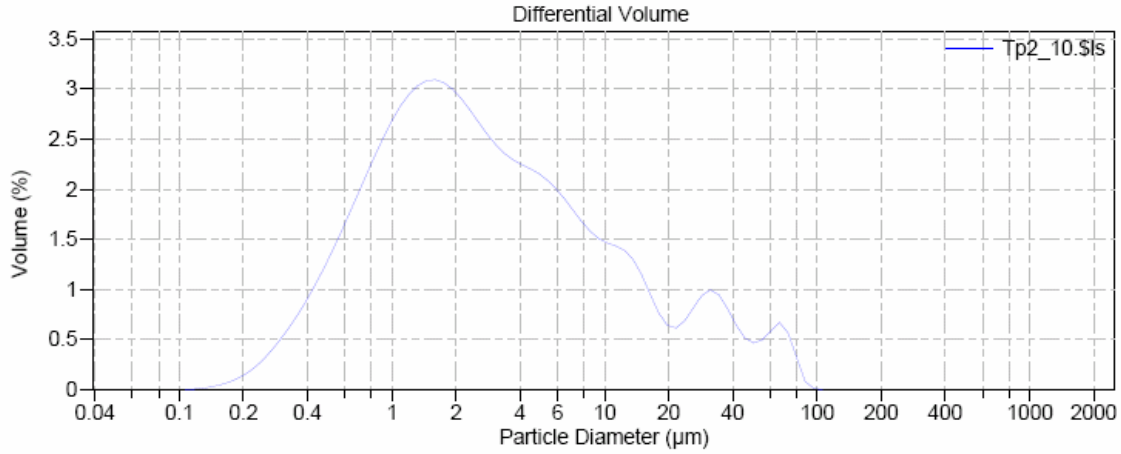
18 Jan 2006

SCT U.B. Informe 0094/2006

File name:	C:\LS13320\Resultados\P25\Tp2_10.$ls Tp2_10.$ls		
File ID:	tp2		
Operator:	Ricard		
Reg SCT:	0094/2006		
Run number:	10		
Comment 2:	5 minuts ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.67%		
LS 13 320	Universal Liquid Module		
Start time:	16:47 17 Jan 2006	Run length:	63 seconds
Pump speed:	70%		
Obscuration:	9%	PIDS Obscur:	61%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) Tp2_10.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	7.671 µm	S.D.:	13.37 µm
Median:	2.489 µm	C.V.:	174%
D(3,2):	1.508 µm	Skewness:	3.140 Right skewed
Mode:	1.592 µm	Kurtosis:	10.56 Leptokurtic

d_{10}: 0.626 µm d_{50}: 2.489 µm d_{90}: 21.12 µm

<10%	<25%	<50%	<75%	<95%
0.626 µm	1.137 µm	2.489 µm	7.047 µm	36.86 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.000020%	21.2%	81.1%	99.999%	100%

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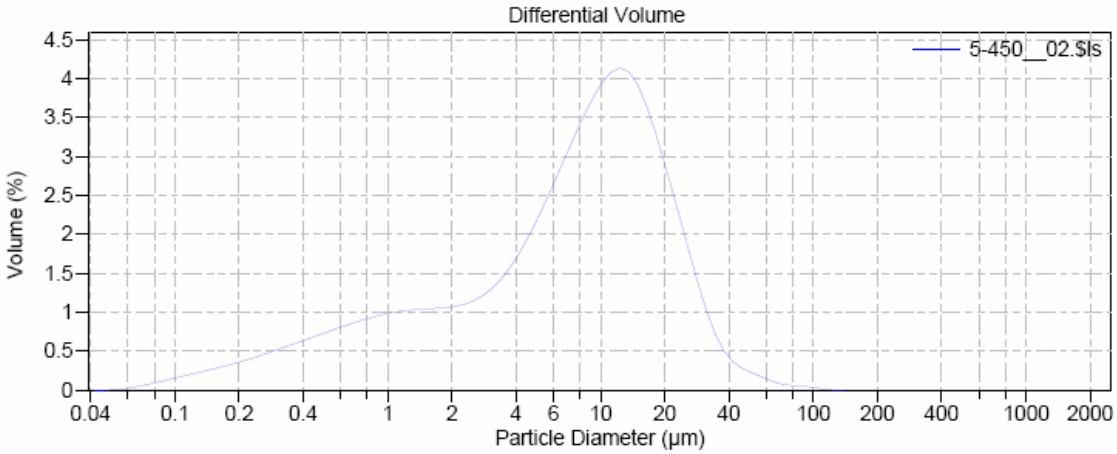
SCT U.B. Informe 3759/2005

File name:	C:\LS13320\Resultados\P25\P25_3759\5-450__02.$ls 5-450__02.$ls		
File ID:	5-450		
Operator:	Ricard		
Reg SCT:	3759/2005		
Run number:	2		
Comment 1:	5 min. ultrsounds (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.19%		
LS 13 320	Universal Liquid Module		
Start time:	15:32 18 Oct 2005	Run length:	92 seconds
Pump speed:	60%		
Obscuration:	9%	PIDS Obscur:	51%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 5-450__02.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	10.20 µm	S.D.:	10.15 µm
Median:	7.995 µm	C.V.:	99.4%
D(3,2):	1.643 µm	Skewness:	2.482 Right skewed
Mode:	12.40 µm	Kurtosis:	12.19 Leptokurtic

d_{10}: 0.654 µm d_{50}: 7.995 µm d_{90}: 22.09 µm

<10%	<25%	<50%	<75%	<95%
0.654 µm	2.599 µm	7.995 µm	14.49 µm	27.84 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.51%	14.2%	58.8%	99.96%	100%

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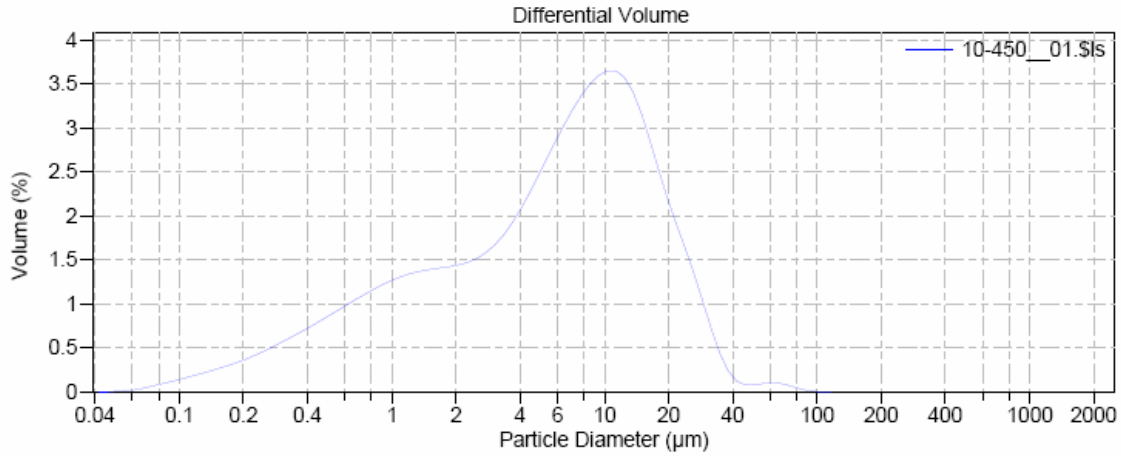
File name:	C:\LS13320\Resultados\P25\P25_3759\10-450__01.$ls 10-450__01.$ls		
File ID:	10-450		
Operator:	Ricard		
Reg SCT:	3759/2005		
Run number:	1		
Comment 1:	5 min. ultrsounds (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.19%		
LS 13 320	Universal Liquid Module		
Start time:	15:45 18 Oct 2005	Run length:	92 seconds
Pump speed:	60%		
Obscuration:	10%	PIDS Obscur:	56%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 10-450__01.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	8.408 µm	S.D.:	8.682 µm
Median:	6.143 µm	C.V.:	103%
D(3,2):	1.528 µm	Skewness:	2.408 Right skewed
Mode:	10.29 µm	Kurtosis:	11.17 Leptokurtic

d_{10}: 0.606 µm d_{50}: 6.143 µm d_{90}: 19.19 µm

<10%	<25%	<50%	<75%	<95%
0.606 µm	1.842 µm	6.143 µm	12.12 µm	24.44 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.44%	16.1%	67.5%	99.998%	100%

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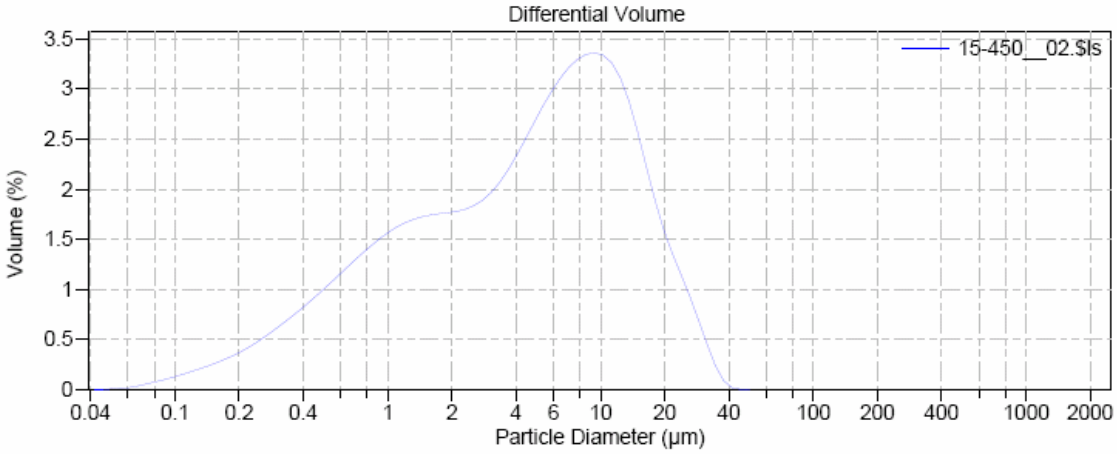
File name:	C:\LS13320\Resultados\P25\P25_3759\15-450__02.$ls 15-450__02.$ls		
File ID:	15-450		
Operator:	Ricard		
Reg SCT:	3759/2005		
Run number:	2		
Comment 1:	5 min. ultrsounds (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.21%		
LS 13 320	Universal Liquid Module		
Start time:	16:05 18 Oct 2005	Run length:	93 seconds
Pump speed:	60%		
Obscuration:	9%	PIDS Obscur:	52%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 15-450__02.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	6.805 µm	S.D.:	6.712 µm
Median:	4.767 µm	C.V.:	98.6%
D(3,2):	1.416 µm	Skewness:	1.453 Right skewed
Mode:	9.370 µm	Kurtosis:	2.128 Leptokurtic

d_{10}: 0.565 µm d_{50}: 4.767 µm d_{90}: 16.14 µm

<10%	<25%	<50%	<75%	<95%
0.565 µm	1.464 µm	4.767 µm	10.07 µm	20.68 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.39%	18.2%	74.8%	100%	100%

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Beckman Coulter LS Particle Size Analyzer

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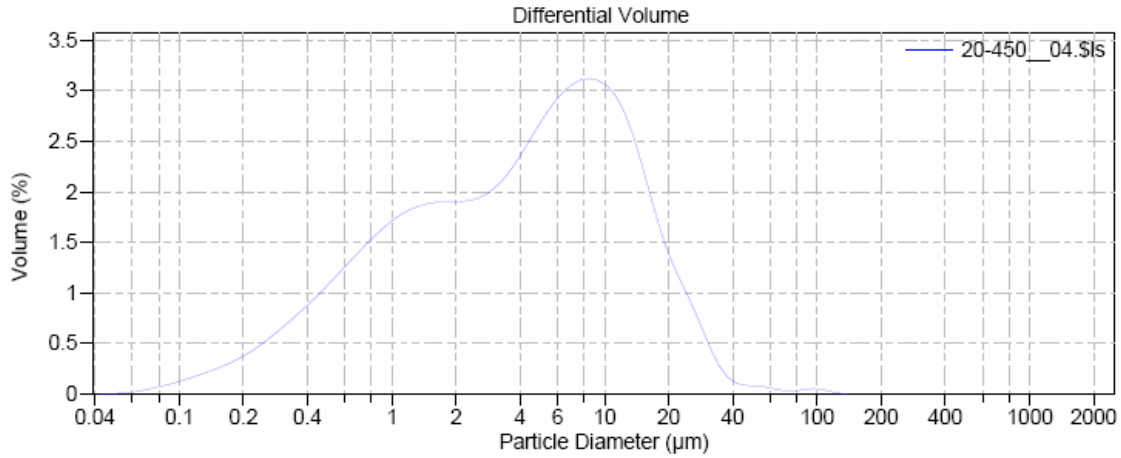
SCT U.B. Informe 3759/2005

File name:	C:\LS13320\Resultados\P25\P25_3759\20-450__04.$ls 20-450__04.$ls		
File ID:	20-450		
Operator:	Ricard		
Reg SCT:	3759/2005		
Run number:	4		
Comment 1:	5 min. ultrsounds (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.22%		
LS 13 320	Universal Liquid Module		
Start time:	16:29 18 Oct 2005	Run length:	92 seconds
Pump speed:	60%		
Obscuration:	9%	PIDS Obscur:	52%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 20-450__04.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	6.806 µm	S.D.:	8.343 µm
Median:	4.278 µm	C.V.:	123%
D(3,2):	1.368 µm	Skewness:	4.106 Right skewed
Mode:	8.536 µm	Kurtosis:	33.40 Leptokurtic

d_{10}: 0.546 µm d_{50}: 4.278 µm d_{90}: 15.92 µm

<10%	<25%	<50%	<75%	<95%
0.546 µm	1.338 µm	4.278 µm	9.531 µm	21.19 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.37%	19.4%	76.6%	99.9%	100%

5:500 (5)

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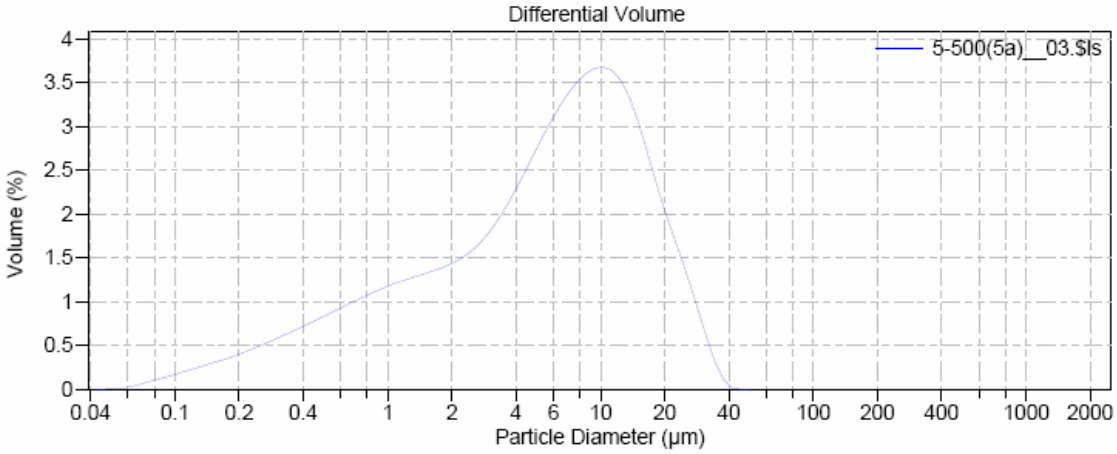
File name:	C:\LS13320\Resultados\P25\P25_4474\5-500(5a)__03.$ls 5-500(5a)__03.$ls		
File ID:	5-500(5a)		
Operator:	Ricard		
Reg SCT:	4474/2005		
Run number:	3		
Comment 2:	5 min Ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.19%		
LS 13 320	Universal Liquid Module		
Start time:	14:30 23 Dec 2005	Run length:	62 seconds
Pump speed:	40%		
Obscuration:	9%	PIDS Obscur:	51%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 5-500(5a)__03.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	7.735 µm	S.D.:	7.119 µm
Median:	5.874 µm	C.V.:	92.0%
D(3,2):	1.448 µm	Skewness:	1.247 Right skewed
Mode:	10.29 µm	Kurtosis:	1.363 Leptokurtic

d_{10}: 0.579 µm d_{50}: 5.874 µm d_{90}: 17.86 µm

<10%	<25%	<50%	<75%	<95%
0.579 µm	1.893 µm	5.874 µm	11.45 µm	22.37 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.56%	16.1%	69.7%	100%	100%

15:500 (5)

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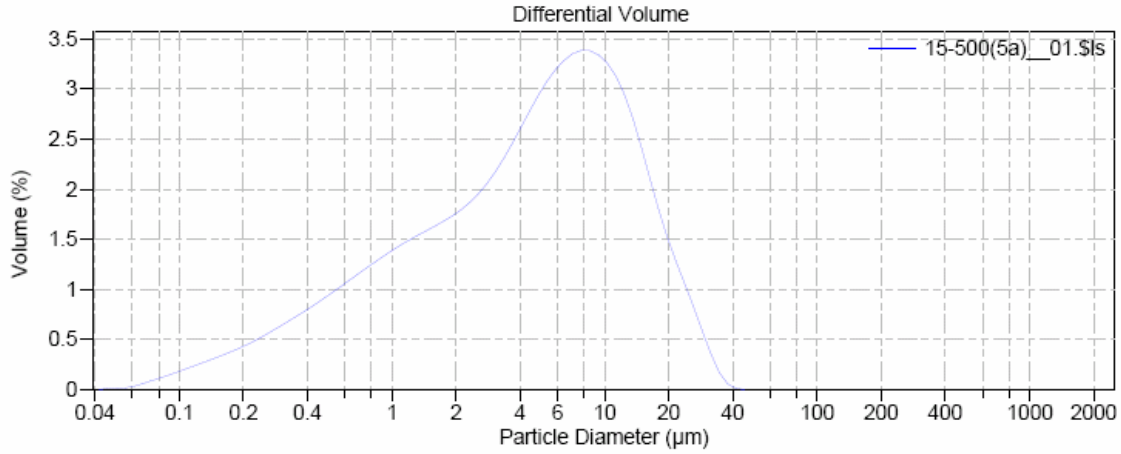
File name:	C:\LS13320\Resultados\P25\P25_4474\15-500(5a)__01.$ls 15-500(5a)__01.$ls		
File ID:	15-500(5a)		
Operator:	Ricard		
Reg SCT:	4474/2005		
Run number:	1		
Comment 2:	5 min Ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.21%		
LS 13 320	Universal Liquid Module		
Start time:	14:12 23 Dec 2005	Run length:	63 seconds
Pump speed:	40%		
Obscuration:	7%	PIDS Obscur:	42%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 15-500(5a)__01.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	6.590 µm	S.D.:	6.424 µm
Median:	4.682 µm	C.V.:	97.5%
D(3,2):	1.320 µm	Skewness:	1.471 Right skewed
Mode:	7.775 µm	Kurtosis:	2.243 Leptokurtic

d_{10}: 0.530 µm d_{50}: 4.682 µm d_{90}: 15.52 µm

<10%	<25%	<50%	<75%	<95%
0.530 µm	1.539 µm	4.682 µm	9.614 µm	19.93 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.59%	18.0%	76.4%	100%	100%

5:500 (10)

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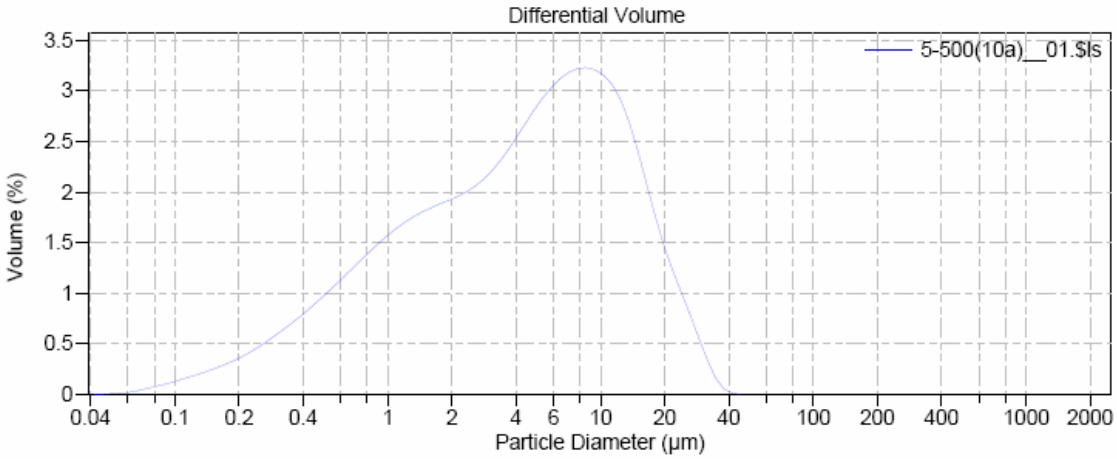
File name:	C:\LS13320\Resultados\P25\P25_4474\5-500(10a)__01.$ls 5-500(10a)__01.$ls		
File ID:	5-500(10a)		
Operator:	Ricard		
Reg SCT:	4474/2005		
Run number:	1		
Comment 2:	5 min Ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.21%		
LS 13 320	Universal Liquid Module		
Start time:	14:39 23 Dec 2005	Run length:	62 seconds
Pump speed:	40%		
Obscuration:	8%	PIDS Obscur:	47%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 5-500(10a)__01.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	6.471 µm	S.D.:	6.400 µm
Median:	4.437 µm	C.V.:	98.9%
D(3,2):	1.420 µm	Skewness:	1.496 Right skewed
Mode:	8.536 µm	Kurtosis:	2.296 Leptokurtic

d_{10}: 0.579 µm d_{50}: 4.437 µm d_{90}: 15.41 µm

<10%	<25%	<50%	<75%	<95%
0.579 µm	1.481 µm	4.437 µm	9.504 µm	19.75 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.39%	17.8%	76.8%	100%	100%

15:500 (10)

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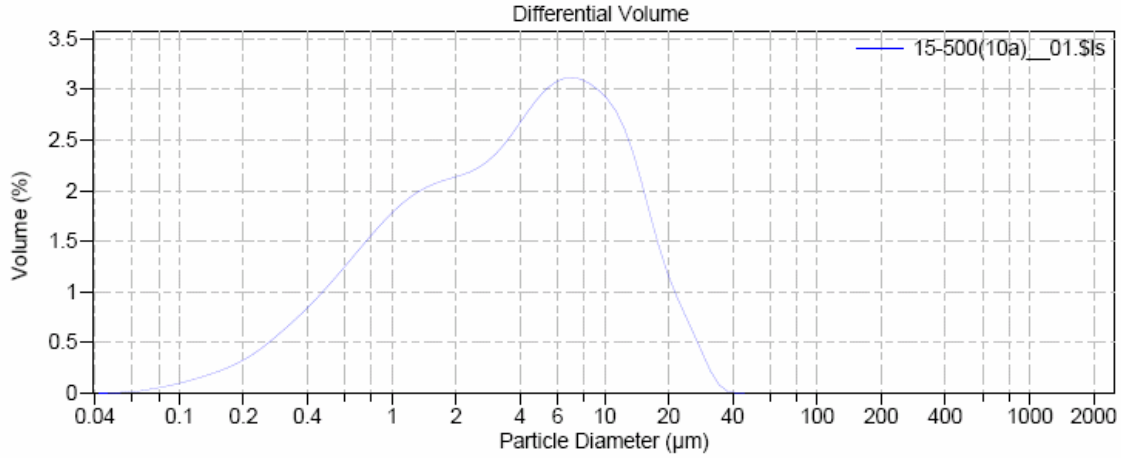
File name:	C:\LS13320\Resultados\P25\P25_4474\15-500(10a)__01.$ls 15-500(10a)__01.$ls		
File ID:	15-500(10a)		
Operator:	Ricard		
Reg SCT:	4474/2005		
Run number:	1		
Comment 2:	5 min Ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.21%		
LS 13 320	Universal Liquid Module		
Start time:	13:01 23 Dec 2005	Run length:	63 seconds
Pump speed:	40%		
Obscuration:	13%	PIDS Obscur:	65%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 15-500(10a)__01.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	5.835 µm	S.D.:	5.867 µm
Median:	3.875 µm	C.V.:	101%
D(3,2):	1.425 µm	Skewness:	1.587 Right skewed
Mode:	7.083 µm	Kurtosis:	2.683 Leptokurtic

d_{10}: 0.582 µm d_{50}: 3.875 µm d_{90}: 14.01 µm

<10%	<25%	<50%	<75%	<95%
0.582 µm	1.361 µm	3.875 µm	8.480 µm	17.99 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.27%	18.7%	80.3%	100%	100%

15:500 (10) – verificación

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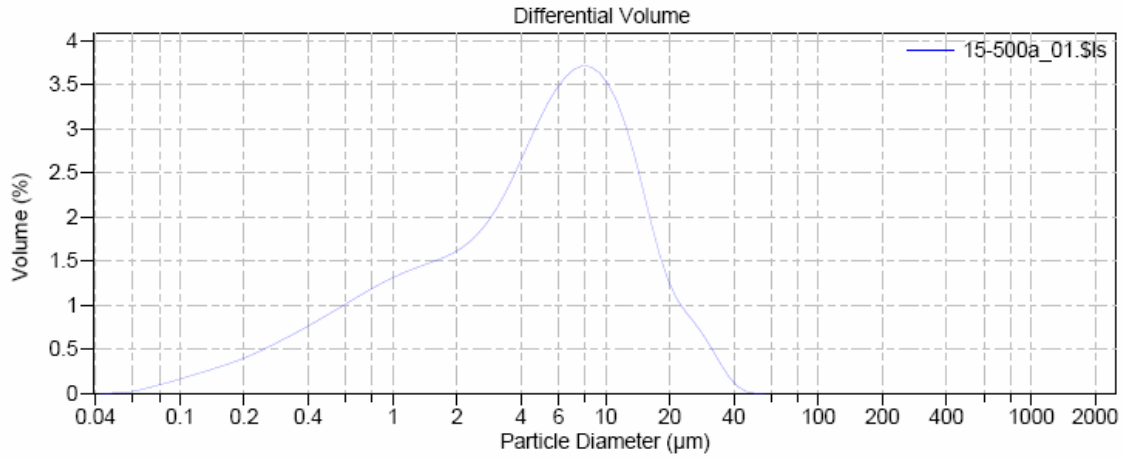
File name:	C:\LS13320\Resultados\P25\15-500a_01.$ls 15-500a_01.$ls		
File ID:	15-500a		
Operator:	Ricard		
Reg SCT:	0094/2006		
Run number:	1		
Comment 2:	5 minuts ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.26%		
LS 13 320	Universal Liquid Module		
Start time:	11:57 18 Jan 2006	Run length:	62 seconds
Pump speed:	70%		
Obscuration:	10%	PIDS Obscur:	50%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 15-500a_01.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	6.788 µm	S.D.:	6.636 µm
Median:	5.017 µm	C.V.:	97.8%
D(3,2):	1.396 µm	Skewness:	1.706 Right skewed
Mode:	7.775 µm	Kurtosis:	3.678 Leptokurtic

d_{10}: 0.562 µm d_{50}: 5.017 µm d_{90}: 15.28 µm

<10%	<25%	<50%	<75%	<95%
0.562 µm	1.679 µm	5.017 µm	9.651 µm	20.15 µm
<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.52%	17.1%	76.4%	100%	100%

30:500 (20)

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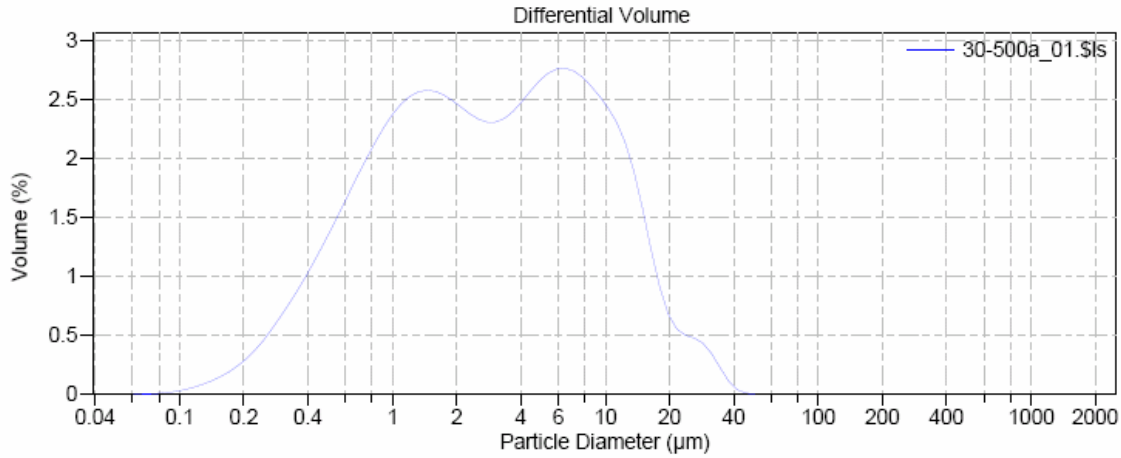
File name:	C:\LS13320\Resultados\P25\30-500a_01.$ls 30-500a_01.$ls		
File ID:	30-500a		
Operator:	Ricard		
Reg SCT:	0094/2006		
Run number:	1		
Comment 2:	5 minuts ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.32%		
LS 13 320	Universal Liquid Module		
Start time:	11:35 18 Jan 2006	Run length:	63 seconds
Pump speed:	70%		
Obscuration:	10%	PIDS Obscur:	59%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 30-500a_01.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	5.054 µm	S.D.:	5.741 µm
Median:	2.845 µm	C.V.:	114%
D(3,2):	1.378 µm	Skewness:	2.185 Right skewed
Mode:	6.452 µm	Kurtosis:	6.149 Leptokurtic

d_{10}: 0.557 µm d_{50}: 2.845 µm d_{90}: 12.40 µm

<10%	<25%	<50%	<75%	<95%
0.557 µm	1.108 µm	2.845 µm	7.088 µm	16.22 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.036%	22.3%	84.7%	100%	100%

60:500 (20)

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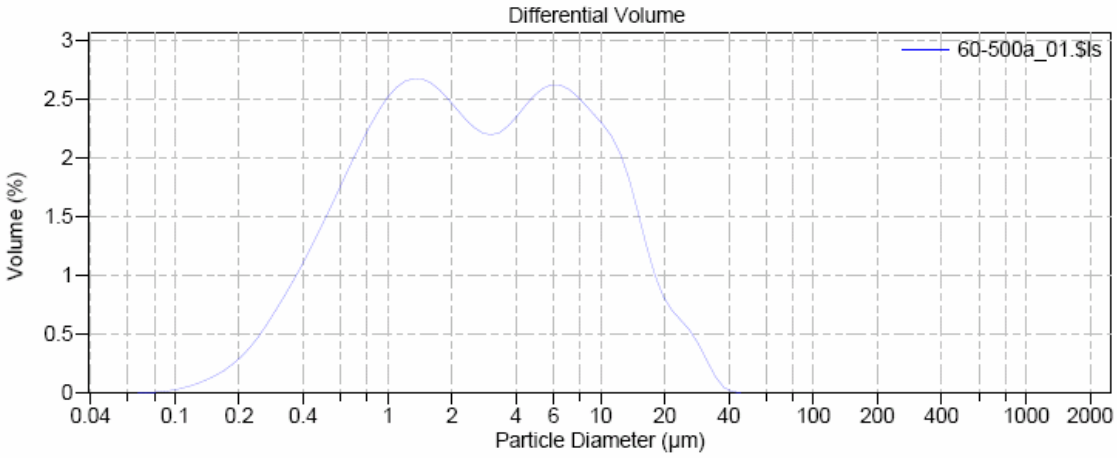
File name:	C:\LS13320\Resultados\P25\60-500a_01.$ls 60-500a_01.$ls		
File ID:	60-500a		
Operator:	Ricard		
Reg SCT:	0094/2006		
Run number:	1		
Comment 2:	5 minuts ultrasons (30KHz;200W)		
Optical model:	Fraunhofer.rfd PIDS included		
Residual:	0.31%		
LS 13 320	Universal Liquid Module		
Start time:	17:08 17 Jan 2006	Run length:	62 seconds
Pump speed:	70%		
Obscuration:	13%	PIDS Obscur:	73%
Fluid:	Ethanol		
Software:	5.01	Firmware:	2.02



Volume Statistics (Arithmetic) 60-500a_01.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	4.942 µm	S.D.:	5.681 µm
Median:	2.619 µm	C.V.:	115%
D(3,2):	1.326 µm	Skewness:	2.045 Right skewed
Mode:	1.321 µm	Kurtosis:	4.918 Leptokurtic

d_{10}: 0.537 µm d_{50}: 2.619 µm d_{90}: 12.52 µm

<10%	<25%	<50%	<75%	<95%
0.537 µm	1.044 µm	2.619 µm	6.907 µm	16.63 µm

<0.1 µm	<1 µm	<10 µm	<100 µm	<1000 µm
0.029%	23.8%	84.8%	100%	100%