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*Supplement of*

## **ECOC comparison exercise with identical thermal protocols after temperature offset correction – instrument diagnostics by in-depth evaluation of operational parameters**

**P. Panteliadis et al.**

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**Supplement of ECOC comparison exercise with identical thermal protocols after temperature offsets correction. Instrument diagnostics by in-depth evaluation of operational parameters.**

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**Table S1. Overview of tests on filter load homogeneity by replicate analysis on two HVS quartz filters (Pall Tissuquartz and Whatman QMA). OC, EC, TC, and EC/TC concentrations and relative standard deviation reported per filter.**

	<b>OC</b>	<b>EC</b>	<b>TC</b>	<b>EC/TC</b>
<b>Average filter 1 (<math>\mu\text{g}/\text{cm}^2</math>)<sup>a</sup></b>	<b>26.66</b>	<b>12.18</b>	<b>38.83</b>	<b>0.31</b>
<b>RSD % filter 1<sup>a</sup></b>	<b>6</b>	<b>11</b>	<b>5</b>	<b>9</b>
<b>Average filter 2 (<math>\mu\text{g}/\text{cm}^2</math>)<sup>b</sup></b>	<b>19.54</b>	<b>7.01</b>	<b>26.54</b>	<b>0.26</b>
<b>RSD % filter 2<sup>b</sup></b>	<b>9</b>	<b>10</b>	<b>6</b>	<b>11</b>

<sup>a</sup> 150 mm Pall Tissuquartz HVS filter, PM<sub>2.5</sub> DHA80 (Digitel Elektronik AG, Switzerland), 44 replicate analyses.

<sup>b</sup> 20.3x25.4 cm Whatman QMA HVS filter, PM<sub>10</sub>, (ESM Andersen Instruments GmbH, Germany), 146 replicate analyses.

**Table S2. TC results per participant and protocol in  $\mu\text{g}/10\ \mu\text{L}$  for the sucrose solutions (S1, S2) and in  $\mu\text{g}/\text{cm}^2$  for the filter samples.**

Laboratory	TC	S1	S2	A	B	D	G	U
1	EUSAAR2	9.92	32.05	20.75	73.56	8.49	17.32	33.92
		10.17	32.51	20.44	73.65	8.10	16.66	31.97
		9.77	32.08					
	NIOSH870	10.24	33.27	20.51	73.55	9.65	17.45	31.44
		10.01	33.35	20.90	72.49	9.11	17.37	32.28
		9.82	33.52					
2	EUSAAR2	10.09	34.89	20.58	76.61	9.16	17.60	35.57
		10.71	35.28	20.67	80.21	9.07	17.16	33.38
		10.05	35.30					
	NIOSH870	10.16	35.32	21.46	75.04	10.57	18.44	35.93
		10.52	35.24	21.23	72.66	9.44	18.32	32.48
		10.78	34.46					
3	EUSAAR2	10.24	34.65	26.04	78.61	10.20	17.84	33.31
		10.61	32.50	21.11	73.40	9.18	17.95	30.41
		9.86	33.88					
	NIOSH930	10.80	35.44	21.54	73.69	9.91	18.75	30.86
		10.18	33.69	22.51	76.81	9.45	18.50	29.42
		10.84	35.25					
4	EUSAAR2	10.97	34.30	18.72	68.92	9.26	17.66	30.92
		9.19	33.95	18.39	74.05	9.87	17.55	32.59
		9.06	33.54					
	NIOSH870	10.60	32.74	18.71	68.70	9.92	17.33	31.89
		10.85	32.07	18.47	67.26	9.23	17.29	29.80
		10.62	32.83					
5	EUSAAR2	9.90	32.30	19.25	77.48	9.11	16.49	32.13
		9.80	32.10	20.76	73.04		16.76	32.01
		9.70	32.70					
	NIOSH-like	10.00	32.40	20.17	74.98	9.69	17.54	34.48
		10.10	33.10	20.50	72.52	9.83	17.46	33.62
		10.10	33.00					

**Table S2 (continued). TC results per participant and protocol in  $\mu\text{g}/10 \mu\text{L}$  for the sucrose solutions (S1, S2) and in  $\mu\text{g}/\text{cm}^2$  for the filter samples.**

Laboratory	TC	S1	S2	A	B	D	G	U
6	EUSAAR2	9.73	32.85	21.35	86.94	10.05	17.43	37.61
		9.72	33.13	21.67	79.87	9.54	17.55	36.15
		9.68	33.14					
	NIOSH870	10.03	33.33	21.35	72.87	9.27	18.10	34.80
		9.97	33.49	21.16	77.42	9.29	17.75	33.22
		9.97	33.49					
7	EUSAAR2	9.88	33.18	21.25			17.80	
		9.86	33.23	18.96			16.94	
		10.21	33.08	18.65			16.63	
				18.84			17.48	
	NIOSH870	10.30	32.95	20.18	73.15	9.02	16.87	30.85
		10.45	33.45	20.58	74.77	9.27	17.30	32.85
		10.37	33.89	18.91	70.30	9.50	17.20	32.74
				20.38	71.86	9.17	17.33	33.12
8	EUSAAR2	9.94	32.82	20.05	76.30	9.51	17.89	36.12
		10.07	33.05	20.07	78.07	9.24	17.42	34.31
		10.85	33.80					
	NIOSH870	9.94	34.57	20.22	74.62	9.56	17.88	34.48
		10.39	34.25	20.27	78.86	9.50	18.63	33.86
		10.50	34.36					
9	EUSAAR2	10.44	32.75	21.09	75.57	11.79	16.52	38.94
		11.11	34.93	21.06	76.55	9.49	18.60	34.90
		10.78	34.88					
	NIOSH870	10.87	31.69	20.52	68.59	9.04	16.75	30.67
		9.96	33.71	20.14	69.47	9.97	17.59	30.83
		10.29	32.56					
10	EUSAAR2	14.04	43.32	26.41	94.79	9.84	23.77	42.50
		12.64	41.91	26.13	93.23	11.14	24.58	40.48
		12.39	42.92					
	NIOSH-like	12.47	37.61	30.41	93.36	15.48	25.21	47.20
		12.28	44.49	27.26	95.67	12.26	25.13	46.77
		9.71	36.57					
11	EUSAAR2	16.21	52.72	29.75	105.90	12.18	24.89	51.96
		15.83	51.50	29.68	104.92	11.81	23.95	51.98
		17.80	53.93					
	NIOSH870	17.71	54.55	30.75	114.58	13.81	27.99	46.58
		17.65	56.51	30.82	110.04	13.69		47.83
		18.03	53.29					

**Table S2 (continued). TC results per participant and protocol in  $\mu\text{g}/10 \mu\text{L}$  for the sucrose solutions (S1, S2) and in  $\mu\text{g}/\text{cm}^2$  for the filter samples.**

<b>Laboratory</b>	<b>TC</b>	<b>S1</b>	<b>S2</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>12</b>	EUSAAR2	8.09	26.94	18.10	98.62	8.62	16.26	28.54
		9.68	32.99	18.68	68.35	9.05	16.07	29.07
		10.05	29.40					
	NIOSH870	6.75	32.79	25.78	73.93	8.33	16.54	31.04
		7.04	25.79	21.85	68.35	9.00	16.80	40.42
		7.16	32.25					
<b>13</b>	EUSAAR2		37.46	25.41	80.70	9.50	18.22	33.83
			39.51	22.25	74.25	9.91	18.93	36.77
			38.24					
	NIOSH870		39.81	23.19	79.40	10.05	19.97	36.45
			39.16	22.76	78.39	9.56	21.09	34.28
		38.80						
<b>14</b>	EUSAAR2	9.71	32.76	19.63	78.88	9.41	16.70	31.90
		9.66	33.07	19.61	73.74	8.73	16.60	34.84
		9.46	32.94					
	NIOSH870	10.36	33.76	19.86	73.42	8.71	16.64	33.70
		10.31	33.73	19.41	77.30	8.72	17.07	31.94
		10.36	34.61					
<b>15</b>	EUSAAR2	10.01	32.24	20.09	79.30	9.09	16.88	31.94
		10.53	32.88	20.28	74.64	9.14	16.59	34.03
		10.36	33.91					
	NIOSH870	10.93	33.46	21.02	76.45	9.47	17.15	34.11
		11.92	34.12	20.67	77.70	8.93	17.80	
		11.71	33.54					
<b>16</b>	EUSAAR2	13.71	41.98	20.15	53.07	10.13	20.19	27.55
		13.93	37.58	18.37	87.61	11.20	18.75	27.01
		11.94	44.34					
	NIOSH870	13.17	38.97	20.75	51.83	10.11	19.34	36.67
		12.61	42.24	19.57	47.83	16.28	20.24	33.13
		12.77	45.08					
<b>17</b>	EUSAAR2	8.10	31.23	19.70			19.02	
		8.48	31.50	19.72			17.57	
		9.89	31.73					
	NIOSH870	7.95	32.06	20.51			17.52	
		8.67	33.86	21.49			18.24	
		8.52	32.13					

**Table S3. EC (TOT) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>EC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>1</b>	<b>EUSAAR2</b>	3.52	11.00	1.35	5.75	5.26
		3.47	11.10	1.28	5.06	4.49
	<b>NIOSH870</b>	3.10	7.63	1.29	5.22	3.19
		3.13	7.24	1.00	4.82	3.00
<b>2</b>	<b>EUSAAR2</b>	2.92	12.15	1.01	4.41	3.38
		2.92	12.57	0.94	4.28	3.56
	<b>NIOSH870</b>	1.96	7.76	0.74	4.57	2.64
		2.08	8.39	0.67	5.18	2.33
<b>3</b>	<b>EUSAAR2</b>	3.84	5.02	0.97	4.91	3.82
		3.62	4.48	1.35	4.88	3.60
	<b>NIOSH930</b>	2.20	3.78	0.05	4.57	3.68
		2.48	4.41	0.01	4.65	3.58
<b>4</b>	<b>EUSAAR2</b>	2.80	12.22	1.38	5.30	3.56
		2.71	13.81	1.16	5.16	3.73
	<b>NIOSH870</b>	2.45	7.80	1.16	3.11	2.49
		2.47	7.41	1.15	3.06	2.28
<b>5</b>	<b>EUSAAR2</b>	3.07	15.90	1.27	4.19	5.09
		3.32	14.44		4.11	4.67
	<b>NIOSH-like</b>	2.24	12.22	0.95	4.26	3.77
		2.31	10.44	1.00	4.03	3.50
<b>6</b>	<b>EUSAAR2</b>	3.19	11.27	1.32	4.45	4.20
		3.23	11.24	1.06	4.38	3.97
	<b>NIOSH870</b>	1.71	5.73	0.72	4.10	1.96
		1.76	6.47	0.78	4.10	1.93
<b>7</b>	<b>EUSAAR2</b>	4.23			4.41	
		3.61			4.27	
		3.64			4.20	
		3.63			4.37	
	<b>NIOSH870</b>	2.36	10.86	0.94	4.48	2.84
		2.59	11.53	1.01	4.40	3.39
		2.27	10.28	0.94	4.23	3.27
		2.42	10.31	0.80	4.29	3.26
<b>8</b>	<b>EUSAAR2</b>	4.42	13.72	1.64	4.94	4.82
		4.30	13.73	1.55	5.00	4.67
	<b>NIOSH870</b>	3.73	10.14	1.21	5.43	3.61
		3.78	11.48	1.42	5.48	3.11

**Table S3 (continued). EC (TOT) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>EC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>9</b>	<b>EUSAAR2</b>	3.55	12.01	1.31	4.45	5.40
		3.66	11.50	1.49	5.05	4.24
	<b>NIOSH870</b>	2.91	6.28	0.85	4.40	2.91
		2.95	6.92	0.90	4.62	2.93
<b>10</b>	<b>EUSAAR2</b>	1.18	8.36	-0.36	1.97	2.29
		1.85	6.89	0.20	1.65	1.68
	<b>NIOSH-like</b>	0.85	5.74	0.55	1.16	2.04
		2.66	8.33	0.12	1.65	1.34
<b>11</b>	<b>EUSAAR2</b>	4.13	14.92	1.75	6.86	6.45
		4.03	16.60	1.56	5.65	6.45
	<b>NIOSH870</b>	3.71	17.49	1.36	6.06	4.86
		3.54	17.86	1.46		4.83
<b>12</b>	<b>EUSAAR2</b>	2.69	8.95	1.37	4.06	3.54
		3.31	7.63	1.50	3.63	4.08
	<b>NIOSH870</b>	3.98	7.27	0.90	3.59	2.84
		3.06	8.17	0.87	3.80	4.41
<b>13</b>	<b>EUSAAR2</b>	2.08	8.87	0.97	4.47	2.25
		2.35	7.84	1.07	4.57	2.52
	<b>NIOSH870</b>	2.24	6.34	0.82	5.21	2.44
		2.45	6.67	0.66	5.41	2.11
<b>14</b>	<b>EUSAAR2</b>	3.51	11.24	1.36	4.61	3.93
		3.44	10.26	1.33	4.55	4.66
	<b>NIOSH870</b>	2.99	8.77	1.03	4.38	2.75
		2.84	9.59	1.04	3.89	2.30
<b>15</b>	<b>EUSAAR2</b>	3.56	14.14	1.52	4.75	4.63
		3.49	12.95	0.74	4.56	1.14
	<b>NIOSH870</b>	2.28	7.79	0.89	4.57	2.77
		2.48	7.35	0.93	5.40	
<b>16</b>	<b>EUSAAR2</b>	3.00	11.69	1.35	4.42	4.42
		3.10	19.11	1.41	4.48	3.67
	<b>NIOSH870</b>	1.86	4.73	0.94	5.07	0.68
		1.99	3.76	1.13	5.59	2.43
<b>17</b>	<b>EUSAAR2</b>	3.24			4.57	
		2.97			4.36	
	<b>NIOSH870</b>	2.68			5.78	
		3.40			4.80	

**Table S4. EC/TC (TOT) ratios results per participant and protocol.**

<b>Laboratory</b>	<b>EC/TC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>1</b>	<b>EUSAAR2</b>	0.17	0.15	0.16	0.33	0.16
		0.17	0.15	0.16	0.30	0.14
	<b>NIOSH870</b>	0.15	0.10	0.13	0.30	0.10
		0.15	0.10	0.11	0.28	0.09
<b>2</b>	<b>EUSAAR2</b>	0.14	0.16	0.11	0.25	0.10
		0.14	0.16	0.10	0.25	0.11
	<b>NIOSH870</b>	0.09	0.10	0.07	0.25	0.07
		0.10	0.12	0.07	0.28	0.07
<b>3</b>	<b>EUSAAR2</b>	0.15	0.06	0.10	0.28	0.11
		0.17	0.06	0.15	0.27	0.12
	<b>NIOSH930</b>	0.10	0.05	0.01	0.24	0.12
		0.11	0.06	0.00	0.25	0.12
<b>4</b>	<b>EUSAAR2</b>	0.15	0.18	0.15	0.30	0.12
		0.15	0.19	0.12	0.29	0.11
	<b>NIOSH870</b>	0.13	0.11	0.12	0.18	0.08
		0.13	0.11	0.12	0.18	0.08
<b>5</b>	<b>EUSAAR2</b>	0.16	0.21	0.14	0.25	0.16
		0.16	0.20		0.25	0.15
	<b>NIOSH-like</b>	0.11	0.16	0.10	0.24	0.11
		0.11	0.14	0.10	0.23	0.10
<b>6</b>	<b>EUSAAR2</b>	0.15	0.13	0.13	0.26	0.11
		0.15	0.14	0.11	0.25	0.11
	<b>NIOSH870</b>	0.08	0.08	0.08	0.23	0.06
		0.08	0.08	0.08	0.23	0.06
<b>7</b>	<b>EUSAAR2</b>	0.20			0.25	
		0.19			0.25	
		0.20			0.25	
		0.19			0.25	
	<b>NIOSH870</b>	0.12	0.15	0.10	0.27	0.09
		0.13	0.15	0.11	0.25	0.10
		0.12	0.15	0.10	0.25	0.10
		0.12	0.14	0.09	0.25	0.10
<b>8</b>	<b>EUSAAR2</b>	0.22	0.18	0.17	0.28	0.13
		0.21	0.18	0.17	0.29	0.14
	<b>NIOSH870</b>	0.18	0.14	0.13	0.30	0.10
		0.19	0.15	0.15	0.29	0.09



**Table S4 (Continued). EC/TC (TOT) ratios results per participant and protocol.**

<b>Laboratory</b>	<b>EC/TC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>9</b>	<b>EUSAAR2</b>	0.17	0.16	0.11	0.27	0.14
		0.17	0.15	0.16	0.27	0.12
	<b>NIOSH870</b>	0.14	0.09	0.09	0.26	0.09
		0.15	0.10	0.09	0.26	0.10
<b>10</b>	<b>EUSAAR2</b>	0.04	0.09	-0.04	0.08	0.05
		0.07	0.07	0.02	0.07	0.04
	<b>NIOSH-like</b>	0.03	0.06	0.04	0.05	0.04
		0.10	0.09	0.01	0.07	0.03
<b>11</b>	<b>EUSAAR2</b>	0.14	0.14	0.14	0.28	0.12
		0.14	0.16	0.13	0.24	0.12
	<b>NIOSH870</b>	0.12	0.15	0.10	0.22	0.10
		0.11	0.16	0.11		0.10
<b>12</b>	<b>EUSAAR2</b>	0.15	0.09	0.16	0.25	0.12
		0.18	0.11	0.17	0.23	0.14
	<b>NIOSH870</b>	0.15	0.10	0.11	0.22	0.09
		0.14	0.12	0.10	0.23	0.11
<b>13</b>	<b>EUSAAR2</b>	0.08	0.11	0.10	0.25	0.07
		0.11	0.11	0.11	0.24	0.07
	<b>NIOSH870</b>	0.10	0.08	0.08	0.26	0.07
		0.11	0.09	0.07	0.26	0.06
<b>14</b>	<b>EUSAAR2</b>	0.18	0.14	0.14	0.28	0.12
		0.18	0.14	0.15	0.27	0.13
	<b>NIOSH870</b>	0.15	0.12	0.12	0.26	0.08
		0.15	0.12	0.12	0.23	0.07
<b>15</b>	<b>EUSAAR2</b>	0.18	0.18	0.17	0.28	0.14
		0.17	0.17	0.08	0.27	0.03
	<b>NIOSH870</b>	0.11	0.10	0.09	0.27	0.08
		0.12	0.09	0.10	0.30	
<b>16</b>	<b>EUSAAR2</b>	0.15	0.22	0.13	0.22	0.16
		0.17	0.22	0.13	0.24	0.14
	<b>NIOSH870</b>	0.09	0.09	0.09	0.26	0.02
		0.10	0.08	0.07	0.28	0.07
<b>17</b>	<b>EUSAAR2</b>	0.16			0.24	
		0.15			0.25	
	<b>NIOSH870</b>	0.13			0.33	
		0.16			0.26	

**Table S5. OC (TOT) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>OC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>1</b>	<b>EUSAAR2</b>	17.23	62.56	7.14	11.57	28.66
		16.97	62.55	6.82	11.60	27.48
	<b>NIOSH870</b>	17.41	65.92	8.36	12.23	28.25
		17.77	65.25	8.11	12.55	29.28
<b>2</b>	<b>EUSAAR2</b>	17.66	64.46	8.15	13.19	32.19
		17.75	67.64	8.13	12.88	29.82
	<b>NIOSH870</b>	19.50	67.28	9.83	13.87	33.29
		19.15	64.27	8.77	13.14	30.15
<b>3</b>	<b>EUSAAR2</b>	22.20	73.59	9.23	12.93	29.49
		17.49	68.92	7.83	13.07	26.81
	<b>NIOSH930</b>	19.34	69.91	9.86	14.18	27.18
		20.03	72.40	9.44	13.85	25.84
<b>4</b>	<b>EUSAAR2</b>	15.92	56.70	7.88	12.36	27.36
		15.68	60.24	8.71	12.39	28.86
	<b>NIOSH870</b>	16.26	60.90	8.76	14.22	29.40
		16.00	59.85	8.08	14.23	27.52
<b>5</b>	<b>EUSAAR2</b>	16.18	61.58	7.84	12.30	27.04
		17.44	58.60		12.65	27.34
	<b>NIOSH-like</b>	17.93	62.76	8.74	13.28	30.71
		18.19	62.08	8.83	13.43	30.12
<b>6</b>	<b>EUSAAR2</b>	18.16	75.67	8.73	12.98	33.41
		18.44	68.63	8.48	13.17	32.18
	<b>NIOSH870</b>	19.64	67.14	8.55	14.00	32.84
		19.40	70.95	8.51	13.65	31.29
<b>7</b>	<b>EUSAAR2</b>	17.02			13.39	
		15.35			12.67	
		15.01			12.43	
		15.21			13.11	
	<b>NIOSH870</b>	17.82	62.29	8.08	12.39	28.01
		17.99	63.24	8.26	12.90	29.46
		16.64	60.02	8.56	12.97	29.47
		17.96	61.55	8.37	13.04	29.86
<b>8</b>	<b>EUSAAR2</b>	15.63	62.58	7.87	12.95	31.30
		15.77	64.34	7.69	12.42	29.64
	<b>NIOSH870</b>	16.49	64.48	8.35	12.45	30.87
		16.49	67.38	8.08	13.15	30.75

**Table S5 (continued). OC (TOT) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>OC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>9</b>	<b>EUSAAR2</b>	17.54	63.56	10.48	12.07	33.54
		17.40	65.05	8.00	13.55	30.66
	<b>NIOSH870</b>	17.61	62.31	8.19	12.35	27.76
		17.19	62.55	9.07	12.97	27.90
<b>10</b>	<b>EUSAAR2</b>	25.23	86.43	10.20	21.80	40.21
		24.28	86.34	10.94	22.93	38.80
	<b>NIOSH-like</b>	29.56	87.62	14.93	24.05	45.16
		24.60	87.34	12.14	23.48	45.43
<b>11</b>	<b>EUSAAR2</b>	25.62	90.98	10.43	18.03	45.51
		25.65	88.32	10.25	18.30	45.53
	<b>NIOSH870</b>	27.04	97.09	12.45	21.93	41.72
		27.28	92.18	12.23		43.00
<b>12</b>	<b>EUSAAR2</b>	15.41	89.67	7.25	12.20	25.00
		15.37	60.72	7.55	12.44	24.99
	<b>NIOSH870</b>	21.80	66.66	7.43	12.95	28.20
		18.79	60.18	8.13	13.00	36.01
<b>13</b>	<b>EUSAAR2</b>	23.33	71.83	8.53	13.75	31.58
		19.90	66.41	8.84	14.36	34.25
	<b>NIOSH870</b>	20.95	73.06	9.23	14.76	34.01
		20.31	71.72	8.90	15.68	32.17
<b>14</b>	<b>EUSAAR2</b>	16.12	67.64	8.05	12.09	27.97
		16.17	63.48	7.40	12.05	30.18
	<b>NIOSH870</b>	16.87	64.65	7.68	12.26	30.95
		16.57	67.71	7.68	13.18	29.64
<b>15</b>	<b>EUSAAR2</b>	16.53	65.16	7.57	12.13	27.31
		16.79	61.69	8.40	12.03	32.89
	<b>NIOSH870</b>	18.74	68.66	8.58	12.58	31.34
		18.19	70.35	8.00	12.40	
<b>16</b>	<b>EUSAAR2</b>	17.15	41.38	8.78	15.77	23.13
		15.27	68.50	9.79	14.27	23.34
	<b>NIOSH870</b>	18.89	47.10	9.17	14.27	35.99
		17.58	44.07	15.15	14.65	30.70
<b>17</b>	<b>EUSAAR2</b>	16.46			14.45	
		16.75			13.21	
	<b>NIOSH870</b>	17.83			11.74	
		18.09			13.44	

**Table S6. EC (TOR) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>EC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>1</b>	<b>EUSAAR2</b>	2.90	10.64	0.64	3.52	6.31
		3.19	8.79	0.69	2.88	6.10
	<b>NIOSH870</b>	1.63	9.07	0.80	2.58	5.29
		1.92	7.75	0.78	1.63	4.61
<b>2</b>	<b>EUSAAR2</b>	3.62	24.49	2.06	5.04	10.67
		3.34	25.11	1.97	5.30	10.08
	<b>NIOSH870</b>	3.29	21.58	1.49	4.92	8.92
		2.81	21.61	1.58	4.82	9.32
<b>3</b>	<b>EUSAAR2</b>	4.99	11.06	1.74	3.88	0.17
		5.27	11.81	0.00	2.84	1.89
	<b>NIOSH930</b>	0.00	0.01	1.79	0.00	0.02
		0.00	0.00	1.41	0.00	2.23
<b>5</b>	<b>EUSAAR2</b>	3.12	20.69	1.80	4.08	8.32
		3.12	18.76		3.81	8.50
	<b>NIOSH-like</b>	2.71	16.97	1.38	3.99	7.60
		2.90	15.04	1.80	3.91	7.25
<b>6</b>	<b>EUSAAR2</b>	4.03	29.14	2.99	5.76	11.63
		4.15	28.01	2.56	5.62	11.76
	<b>NIOSH870</b>	2.27	18.94	1.71	5.01	8.17
		2.45	19.61	1.62	4.83	8.00
<b>7</b>	<b>EUSAAR2</b>	4.71			5.62	
		4.23			5.45	
		4.29			5.62	
		4.25			5.63	
	<b>NIOSH870</b>	3.50	24.49	1.72	4.79	8.22
		3.78	23.67	1.82	4.95	9.24
		3.37	23.86	1.57	4.80	10.05
		3.69	22.37	1.66	4.99	10.00
<b>8</b>	<b>EUSAAR2</b>	6.92	14.43	1.99	2.88	13.47
		3.82	7.59	2.22	4.53	8.83
	<b>NIOSH870</b>	3.08	22.47	1.48	3.81	19.22
		3.37	18.07	2.16	4.72	10.71

**Table S6 (continued). EC (TOR) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>OC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>10</b>	<b>EUSAAR2</b>	1.65	9.65	0.23	0.94	4.74
		1.53	9.09	0.46	1.05	4.41
	<b>NIOSH-like</b>	1.42	10.47	1.23	1.11	5.49
		1.55	14.69	0.05	1.58	5.83
<b>13</b>	<b>EUSAAR2</b>	2.08	7.81	1.26	2.57	5.37
		2.21	7.19	1.37	2.71	6.01
	<b>NIOSH870</b>	2.09	8.03	0.73	2.26	7.33
		2.02	10.20	0.97	2.61	5.78
<b>14</b>	<b>EUSAAR2</b>	4.31	16.15	2.61	2.69	6.51
		3.09	12.62	1.48	3.39	9.46
	<b>NIOSH870</b>	3.94	9.42	1.03	4.07	8.57
		2.19	26.91	1.29	0.00	5.04

**Table S7. EC/TC (TOR) ratios per participant and protocol.**

<b>Laboratory</b>	<b>EC/TC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>1</b>	<b>EUSAAR2</b>	0.14	0.14	0.07	0.20	0.19
		0.16	0.12	0.08	0.17	0.19
	<b>NIOSH870</b>	0.08	0.12	0.08	0.15	0.17
		0.09	0.11	0.09	0.09	0.14
<b>2</b>	<b>EUSAAR2</b>	0.18	0.32	0.22	0.29	0.30
		0.16	0.31	0.22	0.31	0.30
	<b>NIOSH870</b>	0.15	0.29	0.14	0.27	0.25
		0.13	0.30	0.17	0.26	0.29
<b>3</b>	<b>EUSAAR2</b>	0.19	0.14	0.17	0.22	0.01
		0.25	0.16	(0.00)	0.16	0.06
	<b>NIOSH930</b>	(0.00)	0.00	0.18	0.00	0.00
		0.00	-	0.15	0.00	0.08
<b>5</b>	<b>EUSAAR2</b>	0.16	0.27	0.20	0.25	0.26
		0.15	0.26		0.23	0.27
	<b>NIOSH-like</b>	0.13	0.23	0.14	0.23	0.22
		0.14	0.21	0.18	0.22	0.22
<b>6</b>	<b>EUSAAR2</b>	0.19	0.34	0.30	0.33	0.31
		0.19	0.35	0.27	0.32	0.33
	<b>NIOSH870</b>	0.11	0.26	0.18	0.28	0.23
		0.12	0.25	0.17	0.27	0.24
<b>7</b>	<b>EUSAAR2</b>	0.22			0.32	
		0.22			0.32	
		0.23			0.34	
		0.23			0.32	
	<b>NIOSH870</b>	0.17	0.33	0.19	0.28	0.27
		0.18	0.32	0.20	0.29	0.28
		0.18	0.34	0.16	0.28	0.31
		0.18	0.31	0.18	0.29	0.30
<b>8</b>	<b>EUSAAR2</b>	0.35	0.19	0.21	0.16	0.37
		0.19	0.10	0.24	0.26	0.26
	<b>NIOSH870</b>	0.15	0.30	0.15	0.21	0.56
		0.17	0.23	0.23	0.25	0.32

**Table S7 (continued). EC/TC (TOR) ratios per participant and protocol.**

<b>Laboratory</b>	<b>OC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>10</b>	<b>EUSAAR2</b>	0.06	0.10	0.02	0.04	0.11
		0.06	0.10	0.04	0.04	0.11
	<b>NIOSH-like</b>	0.05	0.11	0.08	0.04	0.12
		0.06	0.15	0.00	0.06	0.12
<b>13</b>	<b>EUSAAR2</b>	0.08	0.10	0.13	0.14	0.16
		0.10	0.10	0.14	0.14	0.16
	<b>NIOSH870</b>	0.09	0.10	0.07	0.11	0.20
		0.09	0.13	0.10	0.12	0.17
<b>14</b>	<b>EUSAAR2</b>	0.22	0.20	0.28	0.16	0.20
		0.16	0.17	0.17	0.20	0.27
	<b>NIOSH870</b>	0.20	0.13	0.12	0.24	0.25
		0.11	0.35	0.15	(0.00)	0.16

**Table S8. OC (TOR) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>OC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>1</b>	<b>EUSAAR2</b>	17.85	62.92	7.85	13.80	27.61
		17.25	64.86	7.41	13.78	25.87
	<b>NIOSH870</b>	18.88	64.48	8.85	14.87	26.15
		18.98	64.74	8.33	15.74	27.67
<b>2</b>	<b>EUSAAR2</b>	16.96	52.12	7.10	12.56	24.90
		17.33	55.10	7.10	11.86	23.30
	<b>NIOSH870</b>	18.17	53.46	9.08	13.52	27.01
		18.42	51.05	7.86	13.50	23.16
<b>3</b>	<b>EUSAAR2</b>	21.05	67.55	8.46	13.96	33.14
		15.84	61.59	9.18	15.11	28.52
	<b>NIOSH930</b>	21.54	73.68	8.12	18.75	30.84
		22.51	76.81	8.04	18.50	27.19
<b>4</b>	<b>EUSAAR2</b>	16.13	56.79	7.31	12.41	23.81
		17.64	54.28		12.95	23.51
	<b>NIOSH-like</b>	17.46	58.01	8.31	13.55	26.88
		17.60	57.48	8.03	13.55	26.37
<b>6</b>	<b>EUSAAR2</b>	17.32	57.80	7.06	11.67	25.98
		17.52	51.86	6.98	11.93	24.39
	<b>NIOSH870</b>	19.08	53.93	7.56	13.09	26.63
		18.71	57.81	7.67	12.92	25.22
<b>7</b>	<b>EUSAAR2</b>	16.54			12.18	
		14.73			11.49	
		14.36			11.01	
		14.59			11.85	
	<b>NIOSH870</b>	16.68	48.66	7.30	12.08	22.63
		16.80	51.10	7.45	12.35	23.61
		15.54	46.44	7.93	12.40	22.69
		16.69	49.49	7.51	12.34	23.12
<b>8</b>	<b>EUSAAR2</b>	13.13	61.87	7.52	15.01	22.65
		16.25	70.48	7.02	12.89	25.48
	<b>NIOSH870</b>	17.14	52.15	8.08	14.07	15.26
		16.90	60.79	7.34	13.91	23.15



**Table S8 (continued). OC (TOR) results per participant and protocol in  $\mu\text{g}/\text{cm}^2$ .**

<b>Laboratory</b>	<b>OC</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>G</b>	<b>U</b>
<b>10</b>	<b>EUSAAR2</b>	24.76	85.14	9.61	22.83	37.76
		24.60	84.14	10.68	23.53	36.07
	<b>NIOSH-like</b>	28.99	82.89	14.25	24.10	41.71
		25.71	80.98	12.21	23.55	40.94
<b>13</b>	<b>EUSAAR2</b>	23.33	72.89	8.24	15.65	28.46
		20.04	67.06	8.54	16.22	30.76
	<b>NIOSH870</b>	21.10	71.37	9.32	17.71	29.12
		20.74	68.19	8.59	18.48	28.50
<b>14</b>	<b>EUSAAR2</b>	15.32	62.73	6.80	14.01	25.39
		16.52	61.12	7.25	13.21	25.38
	<b>NIOSH870</b>	15.92	64.00	7.68	12.57	25.13
		17.22	50.39	7.43	17.07	26.90

**Table S09. Normalized<sup>a</sup> mean (m), repeatability (s<sub>r</sub>) and reproducibility (s<sub>R</sub>) relative standard deviation, raw and corrected consensus values for TC per protocol.**

Protocol	Consensus values	m	s <sub>r</sub>	s <sub>R</sub>	Participants
EUSAAR2	Raw	1.064	0.166 (16%)	0.212 (20%)	17
	<b>Corrected</b>	<b>1.025</b>	<b>0.117</b> <b>(11%)</b>	<b>0.150</b> <b>(15%)</b>	<b>15</b>
NIOSH870	Raw	1.045	0.134 (13%)	0.171 (16%)	17
	<b>Corrected</b>	<b>1.015</b>	<b>0.094</b> <b>(9%)</b>	<b>0.119</b> <b>(12%)</b>	<b>15</b>

<sup>a</sup>Normalized results calculated by dividing TC concentrations by robust means

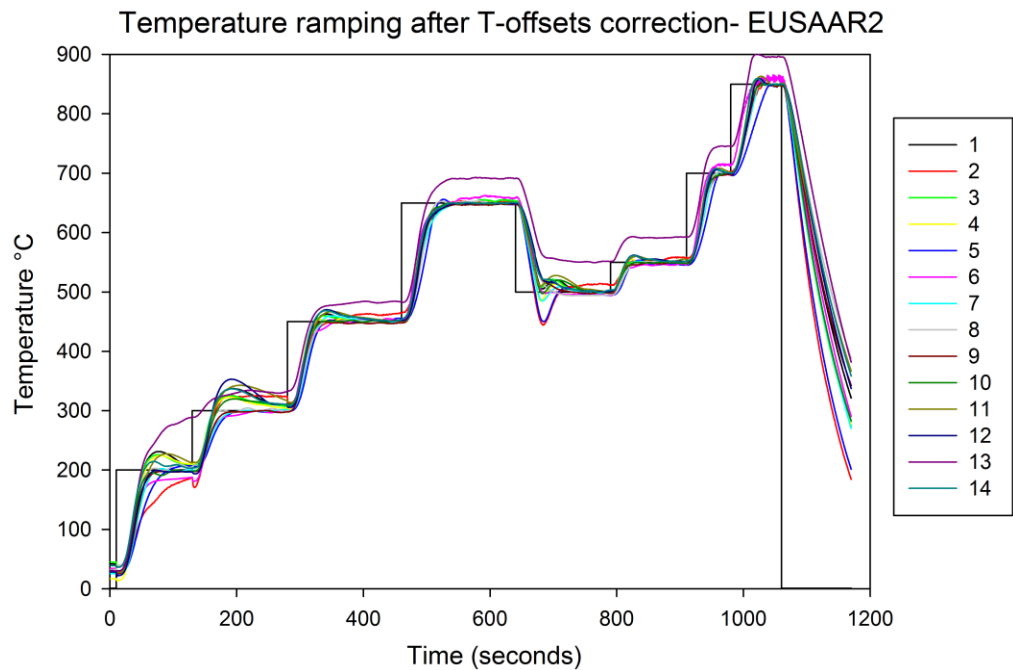
**Table S10. Normalized<sup>a</sup> mean (m), repeatability (s<sub>r</sub>) and reproducibility relative standard deviation (s<sub>R</sub>), raw and corrected consensus values for EC per protocol.**

Protocol	Consensus values	m	s <sub>r</sub>	s <sub>R</sub>	Participants
EUSAAR2	Raw	1.025	0.238 (23%)	0.303 (30%)	17
	<b>Corrected</b>	<b>1.051</b>	<b>0.161</b> <b>(15%)</b>	<b>0.205</b> <b>(20%)</b>	<b>15</b>
NIOSH870	Raw	1.064	0.276 (26%)	0.353 (33%)	17
	<b>Corrected</b>	<b>1.013</b>	<b>0.202</b> <b>(20%)</b>	<b>0.258</b> <b>(26%)</b>	<b>15</b>

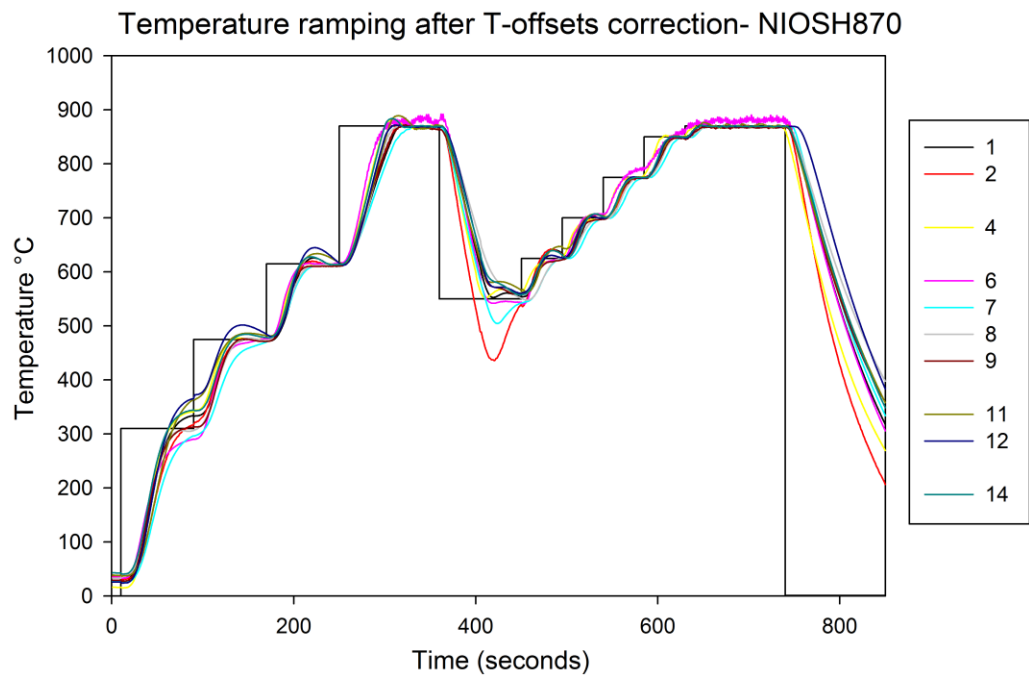
<sup>a</sup>Normalized results calculated by dividing EC concentrations by robust means

**Table S11. Robust mean (X), repeatability (s<sub>r</sub>) and reproducibility (s<sub>L</sub>) relative standard deviation, raw and corrected consensus values for pooled TC results, EUSAAR2 and NIOSH870, per filter.**

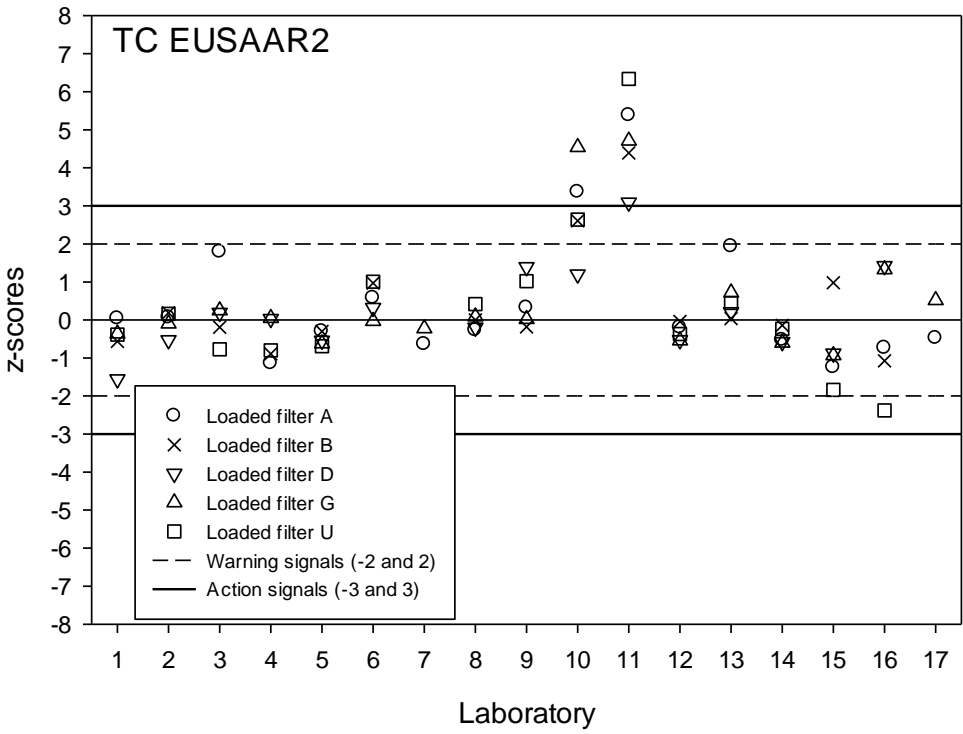
Sample	Consensus values	X (µg/cm <sup>2</sup> )	s <sub>r</sub>	s <sub>L</sub>	Participants
A	Raw	21.90	3.31 (15%)	4.15 (19%)	17
	<b>Corrected</b>	<b>21.20</b>	<b>2.35</b> <b>(11%)</b>	<b>2.96</b> <b>(14%)</b>	<b>15</b>
B	Raw	79.02	12.06 (15%)	15.02 (19%)	16
	<b>Corrected</b>	<b>77.03</b>	<b>6.58</b> <b>(9%)</b>	<b>8.22</b> <b>(11%)</b>	<b>13</b>
D	Raw	10.09	1.42 (14%)	1.76 (18%)	16
	<b>Corrected</b>	<b>9.74</b>	<b>1.14</b> <b>(12%)</b>	<b>1.41</b> <b>(15%)</b>	<b>14</b>
G	Raw	18.71	2.73 (15%)	3.42 (18%)	17
	<b>Corrected</b>	<b>18.28</b>	<b>2.12</b> <b>(12%)</b>	<b>2.67</b> <b>(15%)</b>	<b>16</b>
U	Raw	35.55	5.71 (16%)	7.09 (20%)	16
	<b>Corrected</b>	<b>34.28</b>	<b>3.73</b> <b>(11%)</b>	<b>4.64</b> <b>(14%)</b>	<b>14</b>



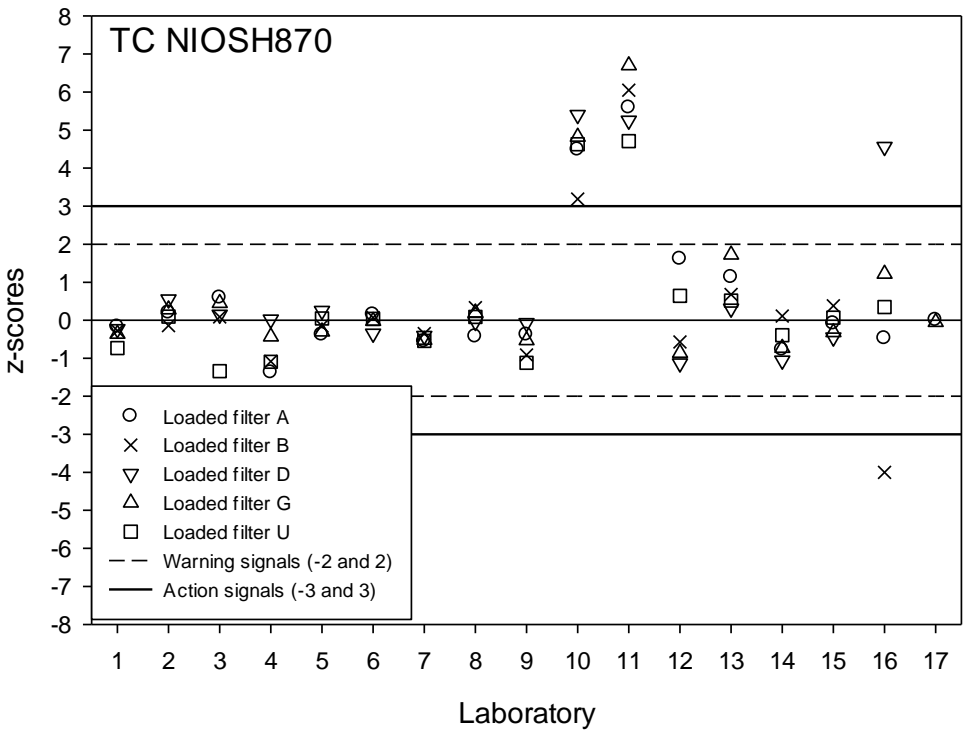
**Figure S1. Heating profile per participant during analysis with EUSAAR2 thermal protocol after temperature offsets correction.**



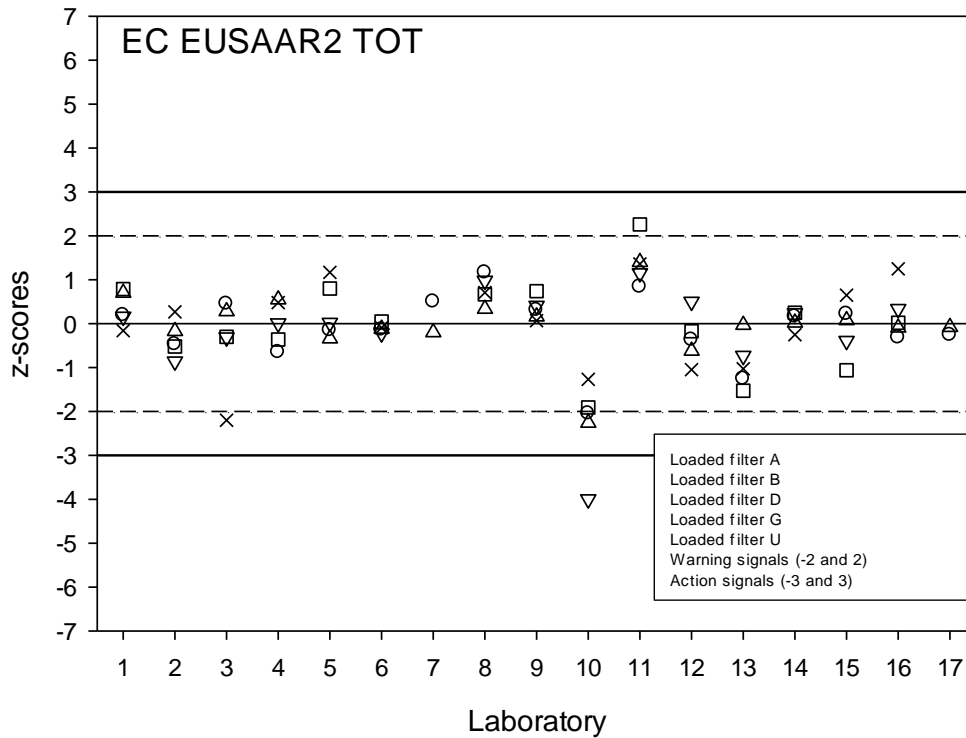
**Figure S2. Heating profile per participant during analysis with NIOSH870 thermal protocol after temperature offsets correction.**



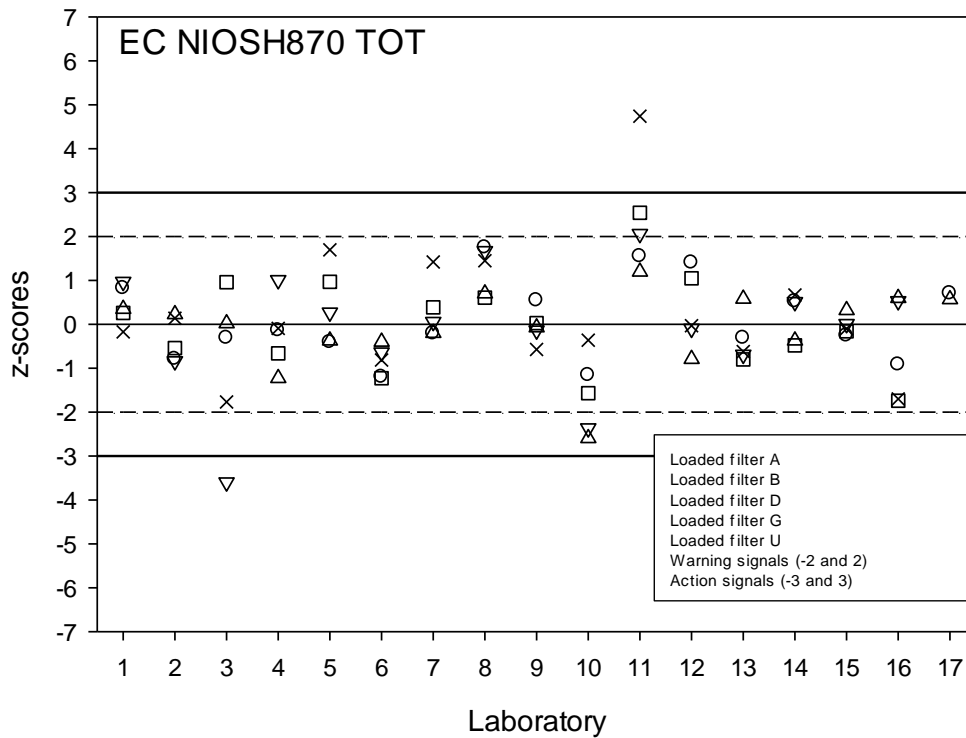
**Figure S3. z-scores for TC by EUSAAR2 protocol per participant and filter, calculated from robust means and fit for purpose relative standard deviation of 8.3%.**



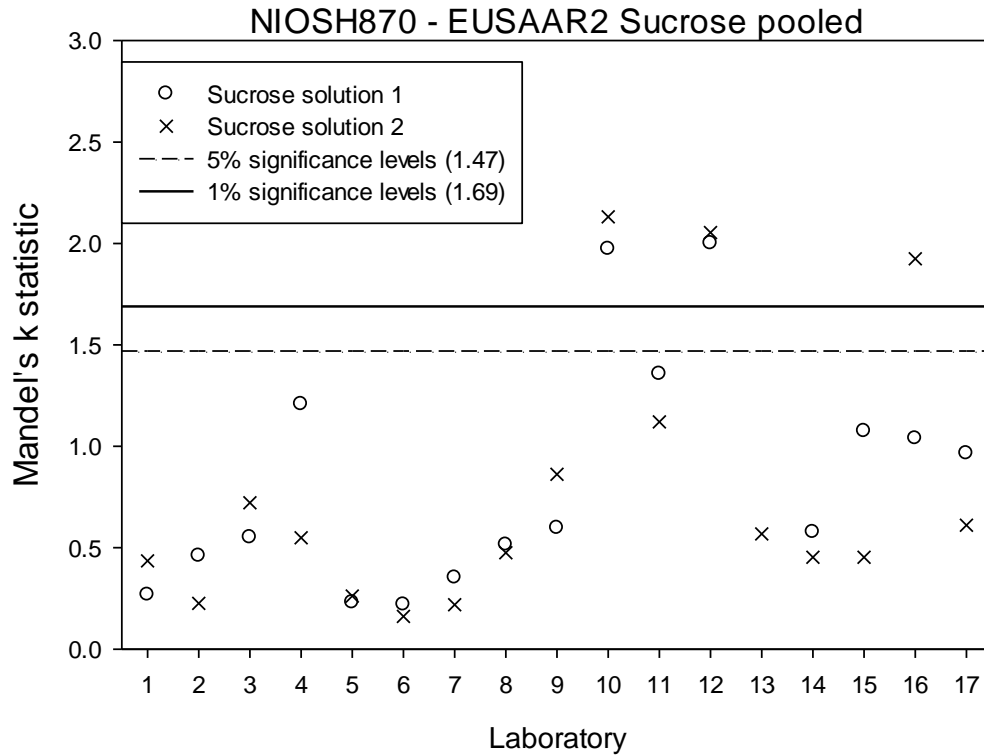
**Figure S4. z-scores for TC by NIOSH870 protocol per participant and filter, calculated from the robust means and fit for purpose relative standard deviation of 8.3%.**



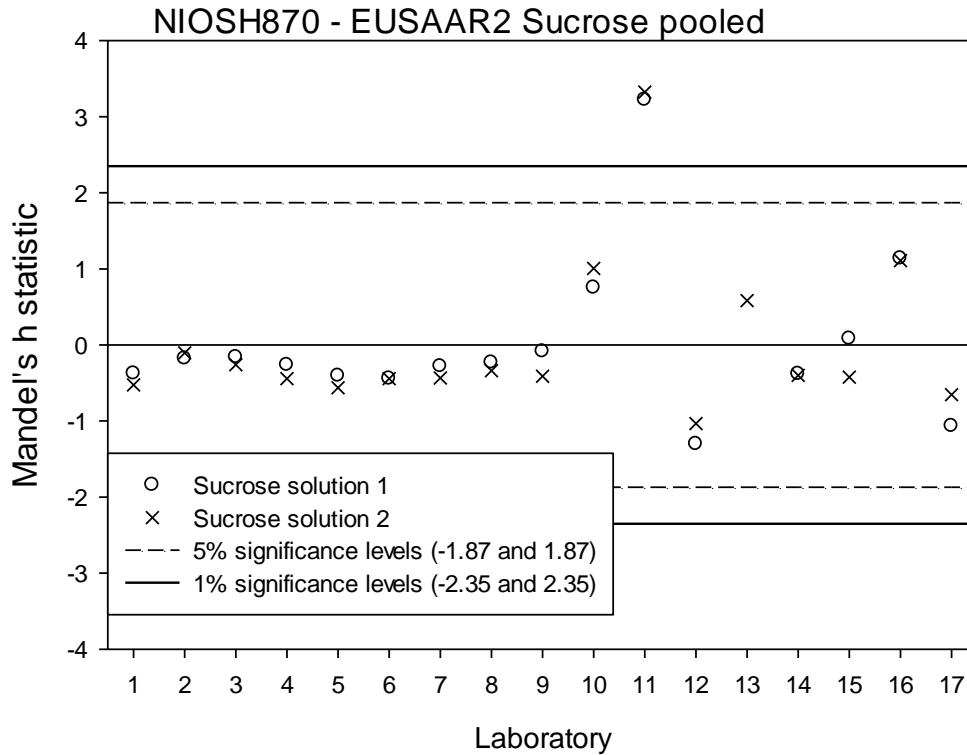
**Figure S5. z-scores for EC for the EUSAAR2 protocol on TOT mode, per participant and filter, calculated from the robust means and fit for purpose relative standard deviation of 25%.**



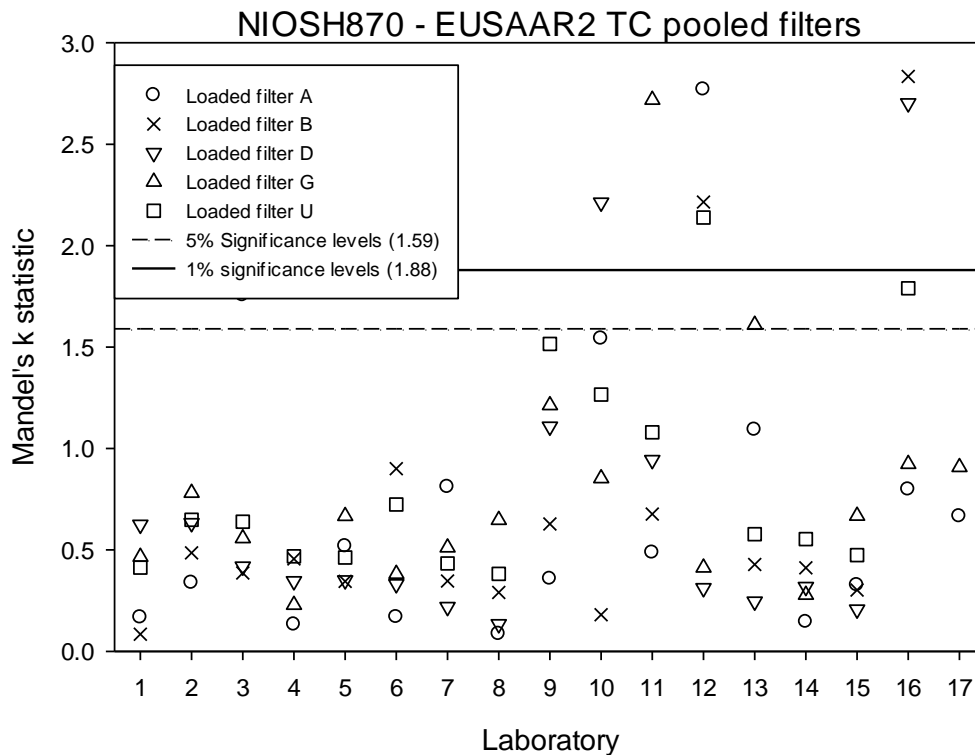
**Figure S6. z-scores for EC for the NIOSH870 protocol on TOT mode, per participant and filter, calculated from the robust means and fit for purpose relative standard deviation of 25%.**



**Figure S7. Mandel's k statistic values (within laboratory consistency) calculated for the pooled TC results, EUSAAR2 and NIOSH870, per participant and sucrose solution.**

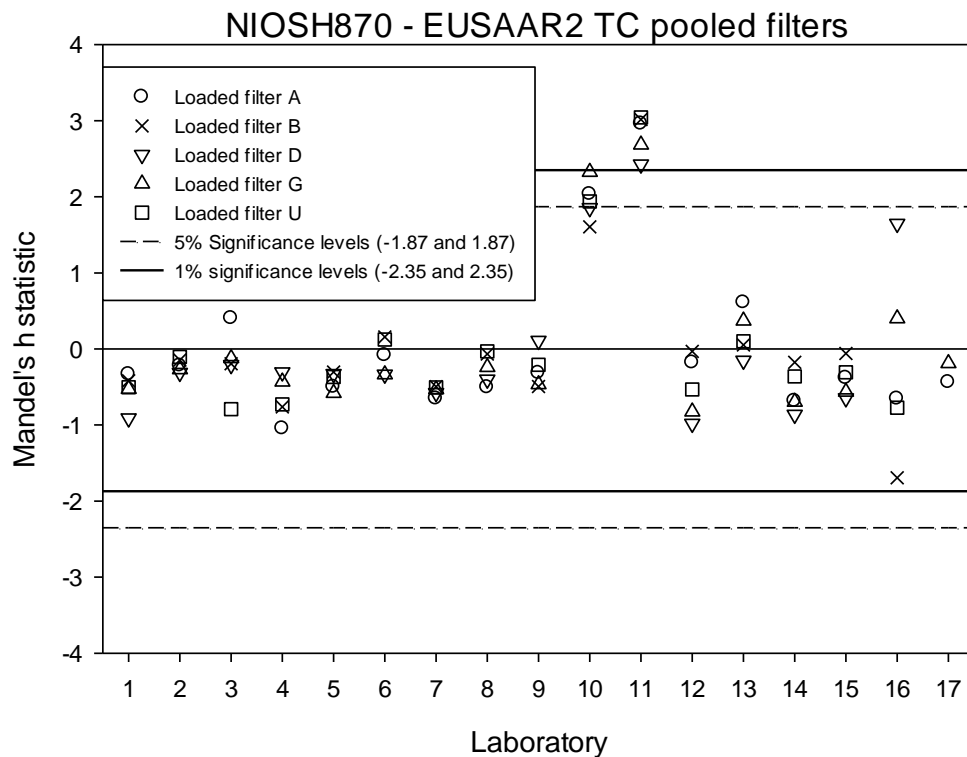


**Figure S8. Mandel's h statistic values (between laboratory consistency) calculated for the pooled TC results, EUSAAR2 and NIOSH870, per participant and sucrose solution.**

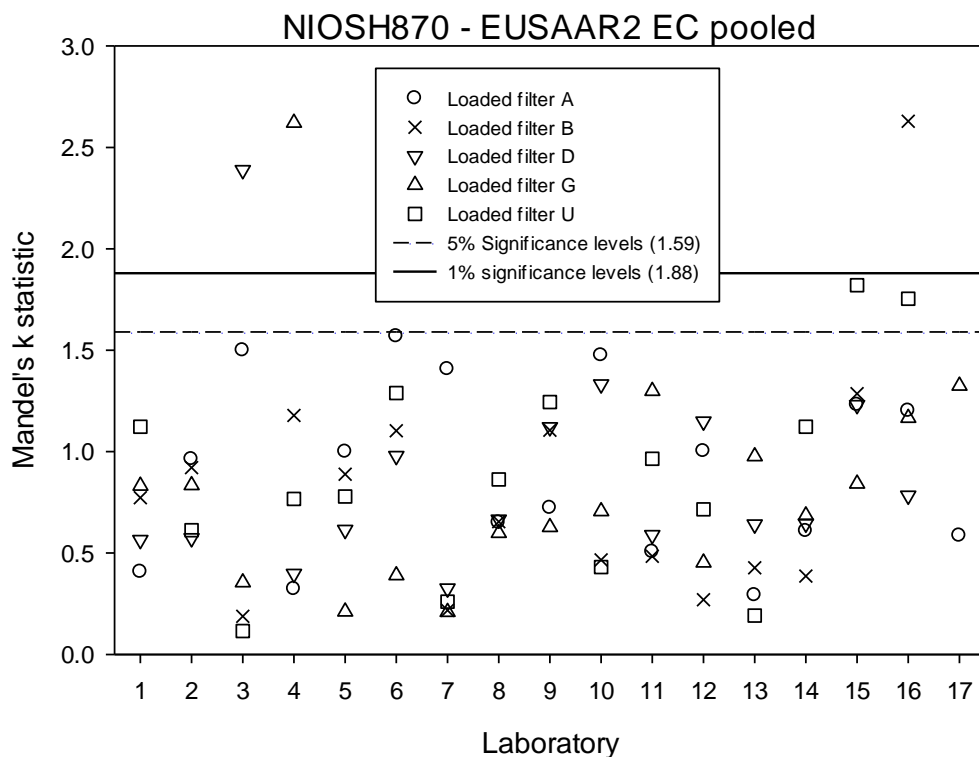


**Figure S9. Mandel's k statistic values (within laboratory consistency) calculated for the pooled TC results, EUSAAR2 and NIOSH870, per participant and filter.**

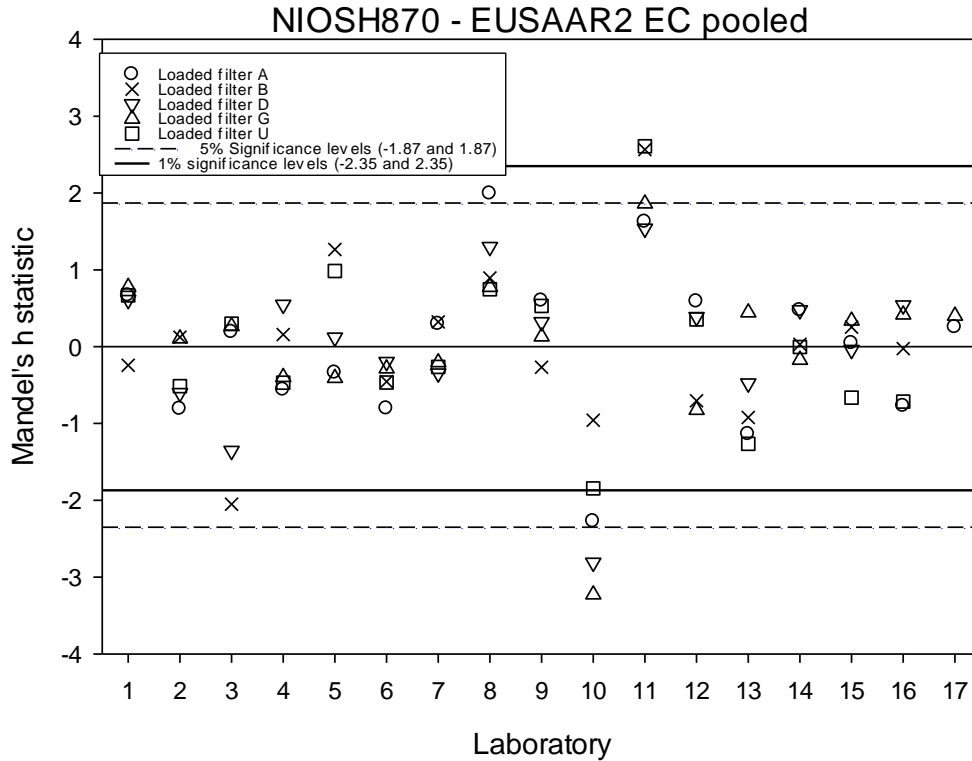




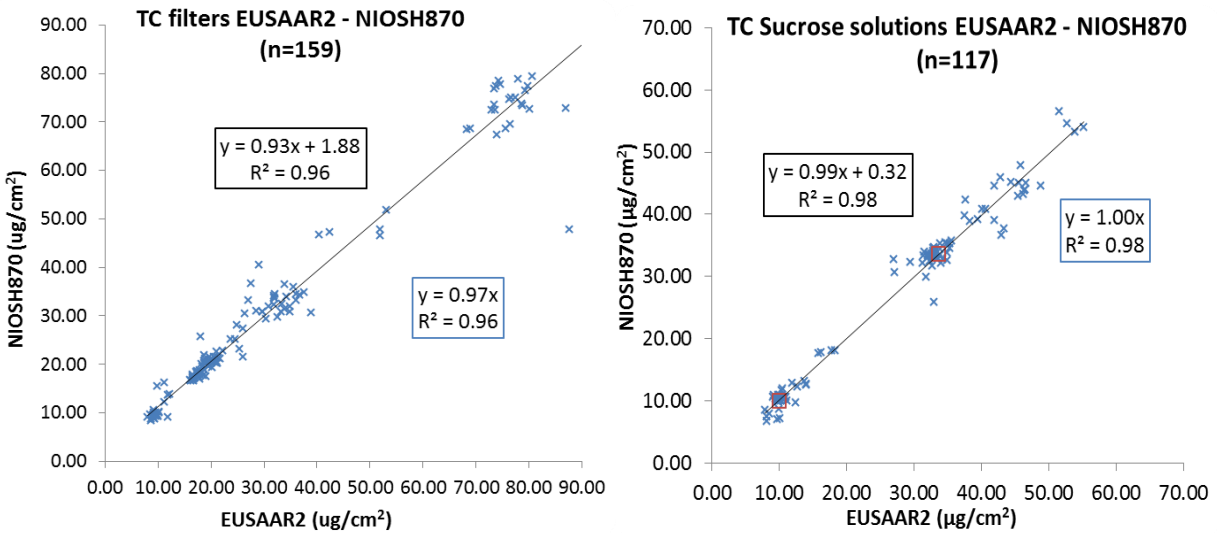
**Figure S10. Mandel's h statistic values (between laboratory consistency) calculated for the pooled TC results, EUSAAR2 and NIOSH870, per participant and filter.**



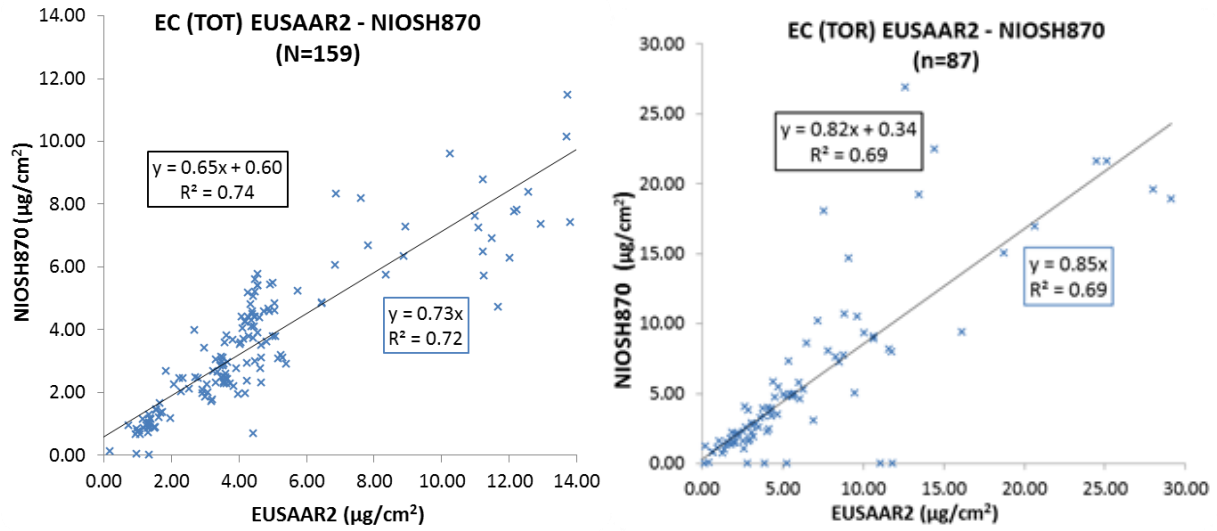
**Figure S11. Mandel's k statistic values (within laboratory consistency) calculated for the pooled EC (TOT) EUSAAR2 and NIOSH870 results per participant and filter.**



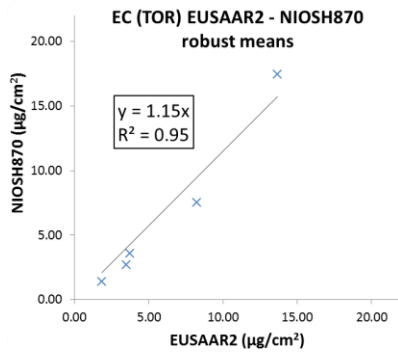
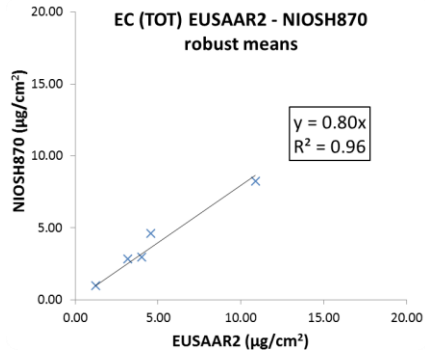
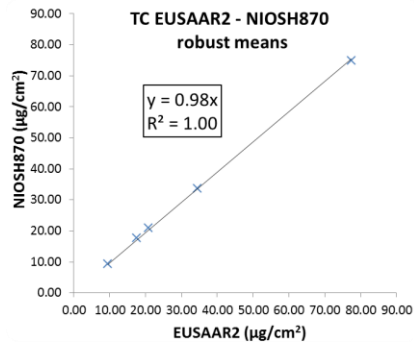
**Figure S12. Mandel's h statistic values (between laboratory consistency) calculated for the pooled EC (TOT) EUSAAR2 and NIOSH870 results per participant and filter.**



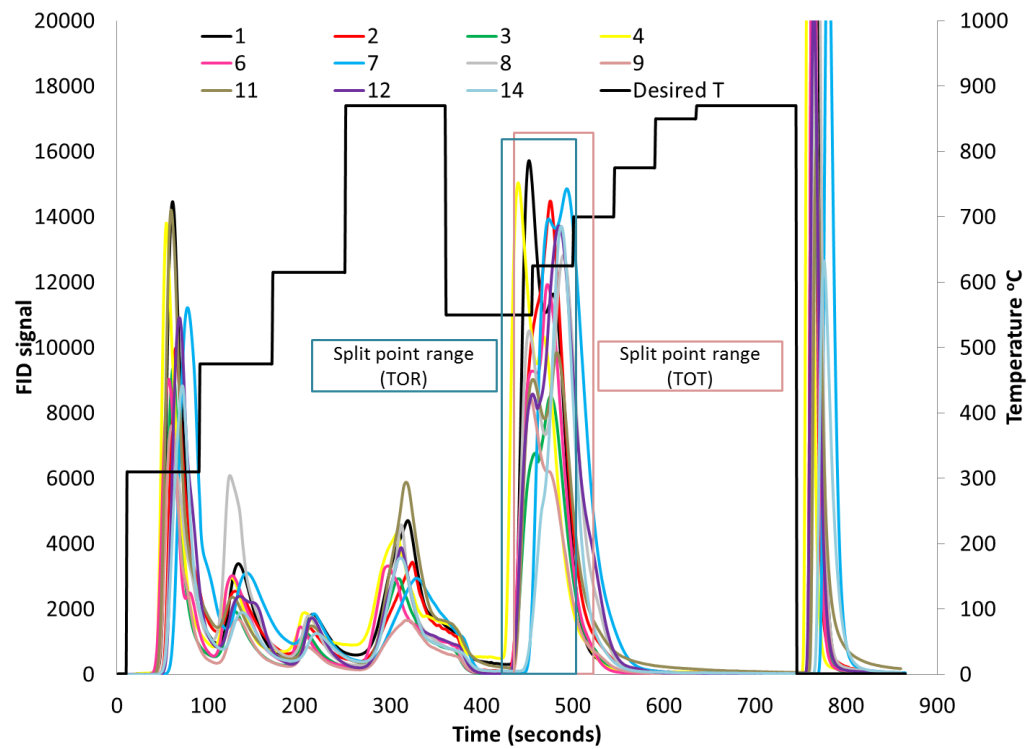
**Figure S13. Comparison of pooled raw TC results between EUSAAR2 and NIOSH870 for filter samples and sucrose solutions. The red squares indicate the actual concentration of the 2 sucrose solutions.**



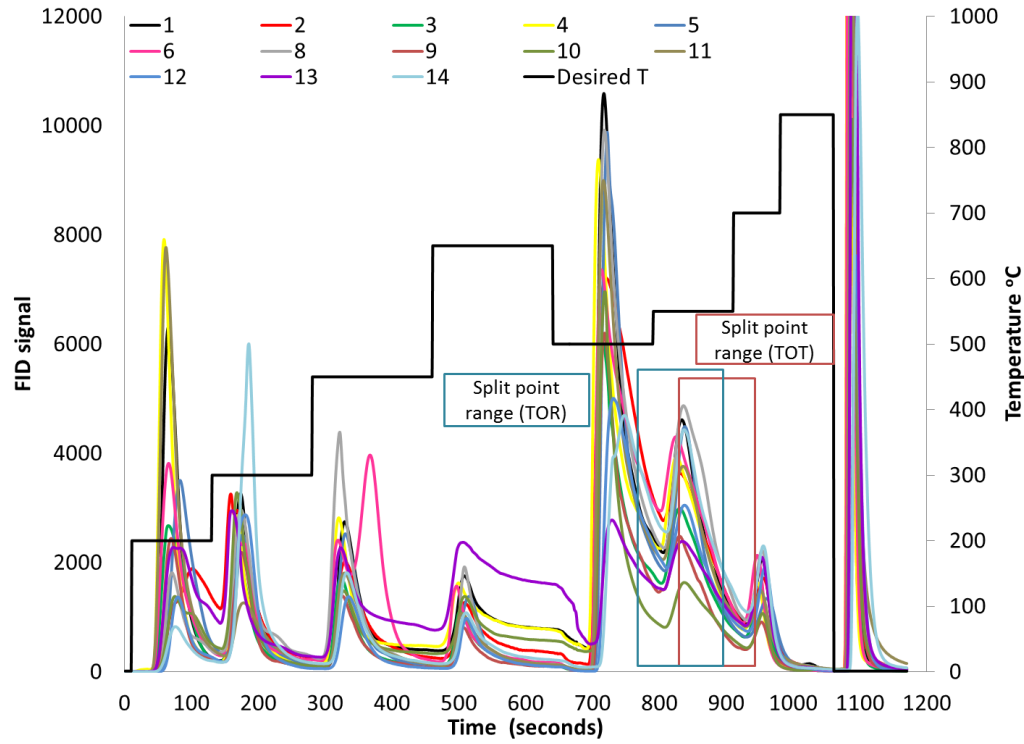
**Figure S14. Comparison of pooled EC raw results between EUSAAR2 and NIOSH870 protocols with the use of transmittance (TOT) or reflectance (TOR).**



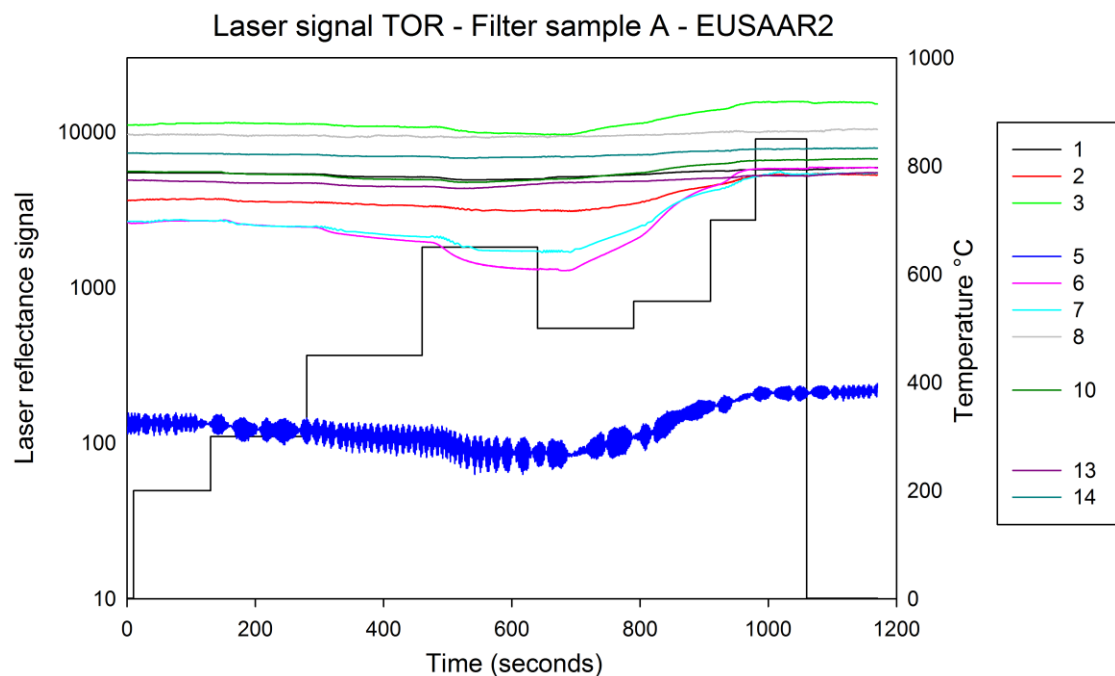
**Figure S15. Comparison of pooled TC (TOT) and EC (TOT and TOR) robust means between EUSAAR2 and NIOSH870 protocols.**



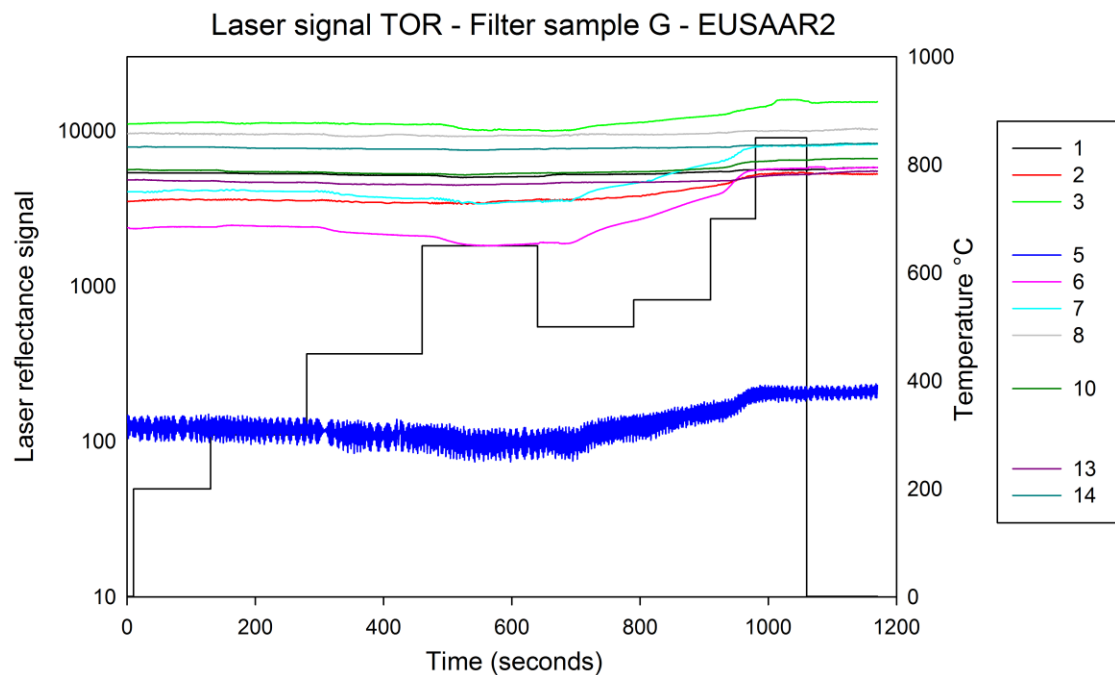
**Figure S16. Thermograms of ECOC analysis on PM loaded quartz fibre filter (B sample), by NIOSH870 for all participants.**



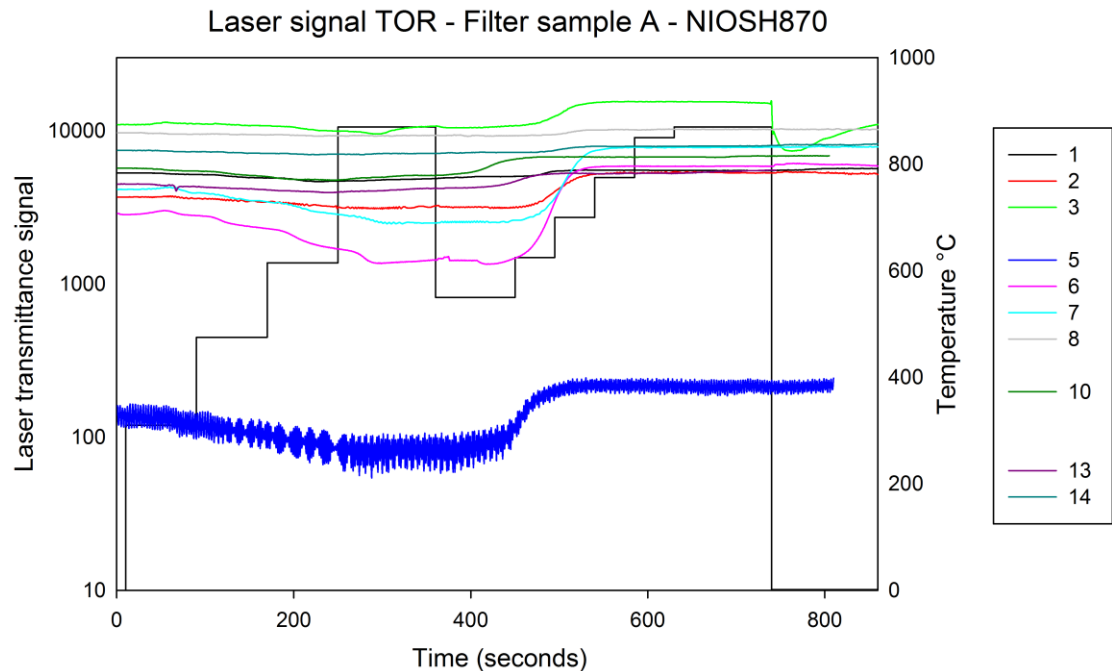
**Figure S17. Thermograms of ECOC analysis on PM loaded quartz fibre filter (B sample), by EUSAAR2 for all participants.**



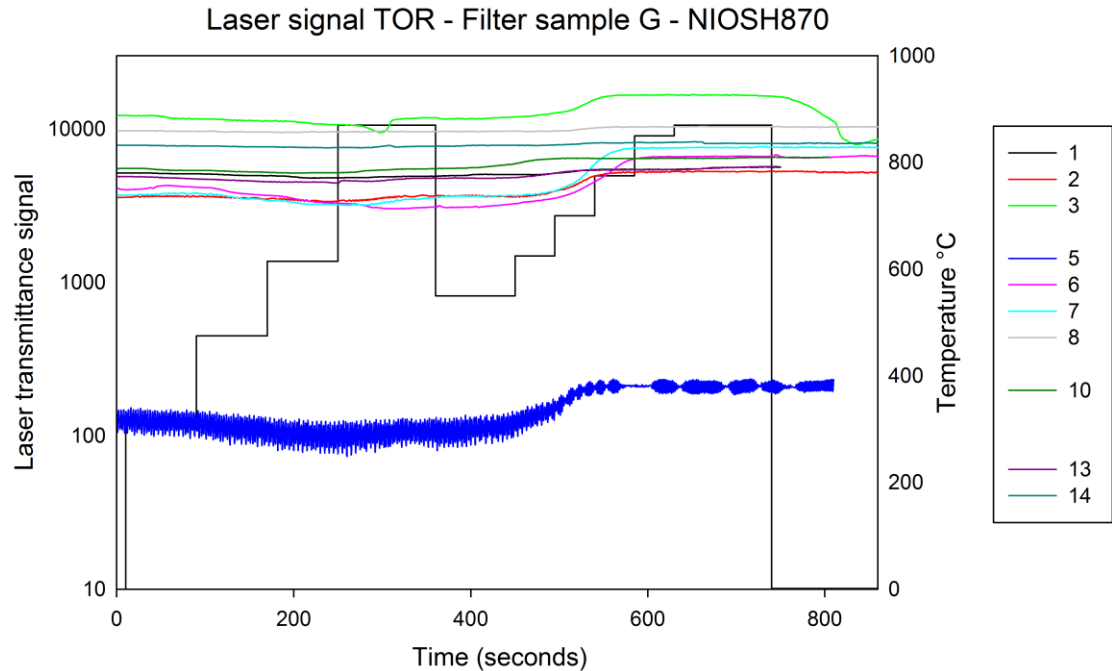
**Figure S18. Laser reflectance signal during filter sample A analysis with the use of the EUSAAR2 thermal protocol.**



**Figure S19. Laser reflectance signal during filter sample G analysis with the use of the EUSAAR2 thermal protocol.**

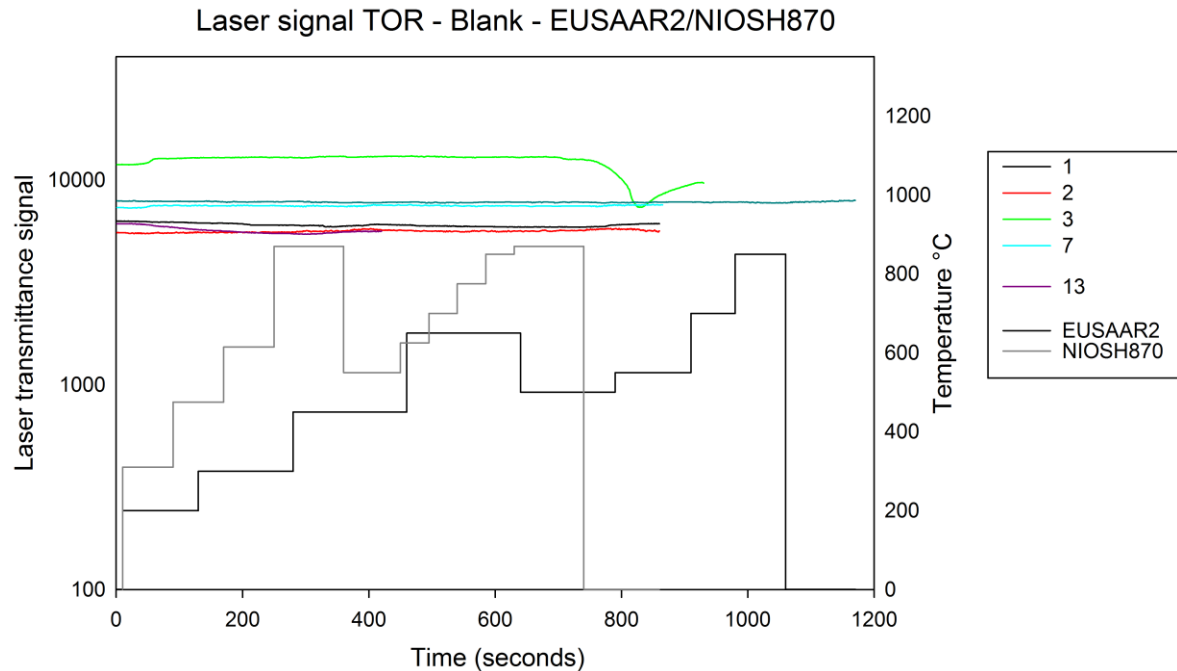


**Figure S20. Laser reflectance signal during filter sample A analysis with the use of the NIOSH870 thermal protocol.**

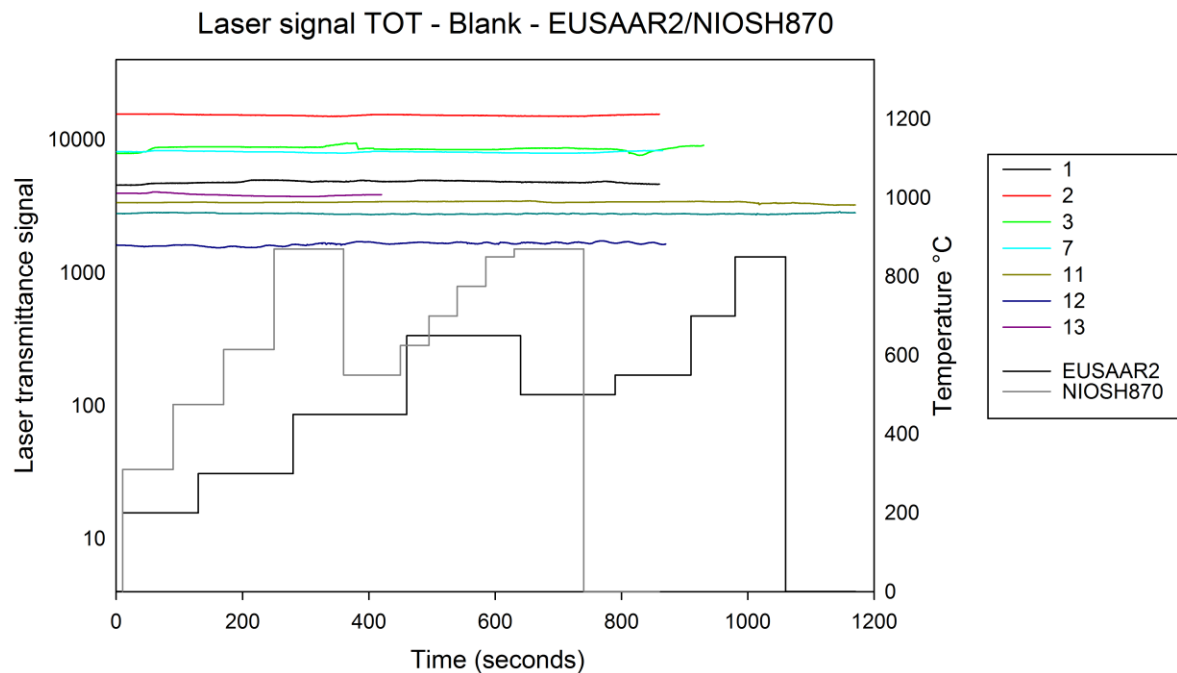


**Figure S21. Laser reflectance signal during filter sample G analysis with the use of the NIOSH870 thermal protocol.**

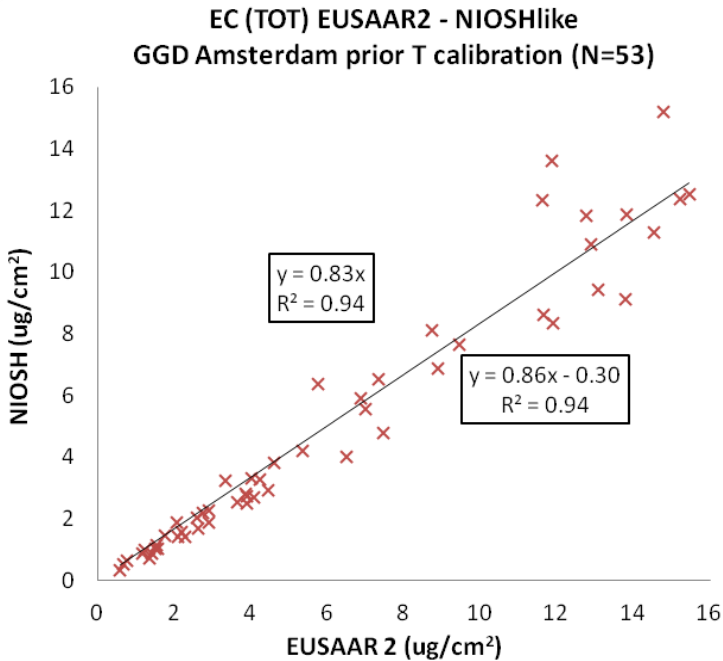




**Figure S22. Laser reflectance signal during instrument blank filter analysis with the use of the EUSAAR2 or NIOSH870 thermal protocol. (Participant 13 used a shorter protocol for the specific analysis).**



**Figure S23. Laser transmittance signal during instrument blank filter analysis with the use of the EUSAAR2 or NIOSH870 thermal protocol. (Participant 13 used a shorter protocol for the specific analysis).**



**Figure S24. Comparison of EC (TOT) results between EUSAAR2 and NIOSH870like protocols. Analysis performed by GGD Amsterdam prior to temperature calibration (Panteliadis, 2011; 2012; Keuken, et al., 2013).**

## References

- Keuken, M. P., Jonkers, S., Moerman, M., Jedynska, A. D., Verbeek, R., Visschedijk, A, van den Elshout, S., Panteliadis P. and Velders, G. J. M. (2013). Modelling elemental carbon at regional, urban and traffic locations in Netherlands Atmos. Environ., 73, 73-80.
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