

Proficiency testing for in-house and external measuring stations - results and evaluation

Proficiency testing scheme

Volatile organic compounds (VOC) with thermal desorption

September 2023

Summary of laboratory means

Sample 1

Laboratory	1,2,3-Trimethylbenzene	Z score	4-Methyl-2-pentanone	Z score	alpha-Pinene	Z score	Benzene	Z score	Cumene	Z score
Unit	µg/m³		µg/m³		µg/m³		µg/m³		µg/m³	
17	26.00	-4.10 FE	93.50	-3.33 E	29.50	-3.49 E	25.50	-3.79 FE	43.00	-3.53 FE
21	41.00	-0.70	145.50	0.38	49.00	0.82	45.00	0.96	60.50	-0.89
30	46.00	0.43	157.50	1.23	53.50	1.81	48.00	1.69	69.00	0.39
40	33.00	-2.52 E	102.55	-2.68 E			32.25	-2.15 E	53.20	-1.99
52	37.55	-1.49	134.60	-0.40	46.90	0.35	48.05	1.70	60.20	-0.94
55	42.50	-0.36	137.50	-0.19	45.00	-0.06	45.50	1.08	64.50	-0.29
60	50.14	1.37	149.19	0.64	155.04	24.23 BE	47.60	1.59	155.04	13.34 BE
62					49.95	1.03	46.95	1.43		
68	29.30	-3.36 E	147.35	0.51	56.30	2.43 E	45.75	1.14	73.65	1.09
93	48.58	1.02	149.75	0.68	39.41	-1.30	43.83	0.67	73.71	1.10 C
96	45.50	0.32	61.00	-5.65 FE	44.25	-0.23	30.70	-2.53 E	66.70	0.04
99	55.30	2.54 CE	125.12	-1.08	81.96	8.10 CE	35.11	-1.45	103.75	5.62 CE
107	38.75	-1.21	134.85	-0.38	45.15	-0.03	45.15	0.99	65.35	-0.16
117	52.50	1.90	161.50	1.52	50.00	1.04	36.50	-1.11	77.50	1.67
125	53.81	2.20 E			35.38	-2.19 E	39.88	-0.29	78.64	1.84
132	54.50	2.36 E	167.50	1.95	58.50	2.92 E	54.00	3.15 E	82.50	2.42 E
135	53.45	2.12 E	116.50	-1.69	39.80	-1.21	39.25	-0.44	79.60	1.98
138	50.50	1.45	150.00	0.70	41.00	-0.95	35.50	-1.36	69.00	0.39
143	40.70	-0.77	135.00	-0.37	42.95	-0.52	44.00	0.71	53.25	-1.98
144	61.50	3.94 FE	81.00	-4.22 FE	60.50	3.36 E	39.00	-0.51	97.00	4.60 FE
145			140.00	-0.01			40.00	-0.26		
148	42.05	-0.47	141.50	0.09	39.10	-1.37	35.40	-1.38	62.35	-0.61
160	44.66	0.13	144.88	0.33	47.59	0.51	41.92	0.20	64.72	-0.26
167	50.50	1.45	145.50	0.38	51.50	1.37	45.50	1.08	67.00	0.09
186	38.80	-1.20	151.20	0.79	40.95	-0.96	32.55	-2.08 E	57.35	-1.37
192	43.37	-0.17	146.75	0.47	46.63	0.29	42.91	0.45		
199	45.75	0.37	165.65	1.82	42.25	-0.67	37.25	-0.93	75.75	1.40
207	37.50	-1.50	120.50	-1.40	40.00	-1.17	42.50	0.35	57.00	-1.42
215	38.50	-1.27	131.00	-0.66	35.50	-2.16 CE	31.50	-2.33 E	59.50	-1.04

Laboratory	1,2,3-Trimethylbenzene	Z score	4-Methyl-2-pentanone	Z score	alpha-Pinene	Z score	Benzene	Z score	Cumene	Z score
218	43.85	-0.06	135.75	-0.32	41.15	-0.91	39.00	-0.51	70.70	0.64
237	39.25	-1.10	149.30	0.65	39.90	-1.19	33.65	-1.81	62.65	-0.57
238	52.10	1.81					53.60	3.05 E	76.45	1.51
256	41.60	-0.57	150.69	0.75	51.31	1.33	40.56	-0.12	60.31	-0.92
258	44.09	0.00	133.10	-0.51	35.66	-2.13 E	32.10	-2.19 E	57.70	-1.31
261	47.03	0.66	147.11	0.49	45.36	0.01	40.42	-0.16	66.57	0.02
267	46.55	0.55			50.30	1.11	47.70	1.61	73.10	1.01
503					15.76	-6.52 BE	50.50	2.29 E	70.50	0.61
510			135.00	-0.37			35.00	-1.48		
518	37.90	-1.41	82.70	-4.10 FE			36.80	-1.04	57.40	-1.36
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Method	ISO 5725-2		ISO 5725-2		ISO 5725-2		ISO 5725-2		ISO 5725-2	
Assessment	Z <=2.00		Z <=2.00		Z <=2.00		Z <=2.00		Z <=2.00	
No. of laboratories that submitted results	35		34		34		39		35	
No. of single values	70		68		68		78		70	
Mean	44.10		140.19		45.29		41.08		66.42	
Reproducibility s.d.	6.32		17.60		7.24		6.71		8.18	
Rel. reproducibility s.d.	14.33 %		12.55 %		15.98 %		16.34 %		12.32 %	
Reference value	43.40		142.50		43.90		37.00		61.60	
Target s.d.	4.41		14.02		4.53		4.11		6.64	
Rel. target s.d.	10.00 %		10.00 %		10.00 %		10.00 %		10.00 %	
Lower limit of tolerance	35.28		112.15		36.23		32.86		53.14	
Upper limit of tolerance	52.92		168.23		54.35		49.29		79.70	
Type B outliers					2				1	
Type C outliers	1				2				2	
Type F outliers	2		3				1		2	
No. of laboratories after elimination of outliers type A-D and F (without laboratories that only gave states but no measured values)	32		31		30		38		30	
Explanation of outlier types										
A: Single outlier	Grubbs									
B: Differing laboratory mean	Grubbs									
C: Excessive laboratory s.d.	Cochran									
D: Excluded manually										

Laboratory	1,2,3-Trimethylbenzene Z score	4-Methyl-2-pentanone Z score	alpha-Pinene Z score	Benzene Z score	Cumene Z score
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E: mean outside tolerance limits

F: |Z-Score|>3.50

Laboratory	n-Decane	Z score	n-Heptane	Z score	p-Xylene	Z score	Toluene	Z score
Unit	µg/m³		µg/m³		µg/m³		µg/m³	
17	110.00	-1.41	30.00	-2.07 E	22.50	-3.40 E	18.00	-3.88 FE
21	132.50	0.35	97.50	15.78 BE	36.50	0.71	33.00	1.21
30	147.50	1.52	42.50	1.24	37.50	1.01	32.50	1.05
40			30.70	-1.88	25.80	-2.43 E	22.40	-2.39 E
52	122.15	-0.46	43.35	1.46	31.60	-0.72	29.15	-0.09
55	135.00	0.55	39.00	0.31	34.00	-0.02	29.00	-0.14
60	136.31	0.65	53.67	4.19 FE	37.20	0.92	32.75	1.13
62	135.10	0.56			35.95	0.55	30.75	0.45
68	95.45	-2.54 E	41.40	0.95	42.80	2.56 E	31.85	0.82 C
93	142.75	1.15	44.80	1.85	41.31	2.13 E	50.80	7.26 CE
96	98.00	-2.34 E	25.75	-3.19 E	34.30	0.07	27.10	-0.79
99	141.57	1.06 C	35.67	-0.57	31.80	-0.67 C	27.30	-0.72
107	115.55	-0.97	51.85	3.71 E	27.40	-1.96	27.50	-0.65
117	149.50	1.68	46.50	2.30 E	35.00	0.27	26.50	-0.99
125	95.19	-2.56 E	26.65	-2.95 E	33.93	-0.04	26.39	-1.03
132	157.00	2.27 E	61.50	6.26 FE	43.50	2.77 E	43.00	4.61 FE
135	151.00	1.80	39.10	0.34	38.25	1.23	29.30	-0.04
138	140.00	0.94	39.00	0.31	37.00	0.86	32.50	1.05
143	115.00	-1.01	39.15	0.35	31.70	-0.70	35.70	2.13 E
144	138.00	0.78	27.50	-2.73 E	42.00	2.33 E	34.50	1.72
145					30.00	-1.19	30.00	0.20
148	127.00	-0.08	36.00	-0.48	32.85	-0.36	27.25	-0.74
160	127.77	-0.02	38.25	0.11	35.50	0.42	29.55	0.04
167	132.00	0.31	39.00	0.31	34.00	-0.02	30.00	0.20
186	125.05	-0.23	34.40	-0.90	31.40	-0.78	29.35	-0.03
192	134.47	0.51	44.49	1.77	34.17	0.03	30.23	0.27
199	132.05	0.32	37.00	-0.22	32.30	-0.52	29.95	0.18
207	100.00	-2.19 E	25.50	-3.26 E	30.00	-1.19	25.50	-1.33
215	120.00	-0.62	34.00	-1.01	31.50	-0.75	27.00	-0.82
218	126.45	-0.12	43.00	1.37	31.50	-0.75	29.15	-0.09
237	139.55	0.90	35.45	-0.63	33.35	-0.21	26.95	-0.84
238	151.10	1.81	51.70	3.67 E	21.25	-3.76 FE	34.00	1.55
256	123.25	-0.37	42.08	1.13	33.27	-0.23	29.68	0.09
258	130.62	0.21	35.36	-0.65	31.14	-0.86	30.59	0.40

Laboratory	n-Decane	Z score	n-Heptane	Z score	p-Xylene	Z score	Toluene	Z score
261	135.61	0.60	37.41	-0.11	32.91	-0.34	27.49	-0.66
267	127.20	-0.06	41.55	0.99	35.10	0.30	29.20	-0.08
503	223.84	7.49 BE	83.09	11.97 CE	40.00	1.74	34.00	1.55
510					30.00	-1.19 C	27.50	-0.65
518	103.50	-1.91	31.95	-1.55	29.25	-1.41	26.15	-1.11
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Method	ISO 5725-2		ISO 5725-2		ISO 5725-2		ISO 5725-2	
Assessment	Z <=2.00		Z <=2.00		Z <=2.00		Z <=2.00	
No. of laboratories that submitted results	36		36		39		39	
No. of single values	72		72		78		78	
Mean	127.99		37.81		34.07		29.42	
Reproducibility s.d.	16.96		6.89		4.65		3.13	
Rel. reproducibility s.d.	13.25 %		18.23 %		13.65 %		10.63 %	
Reference value	132.70		35.70		30.70		25.00	
Target s.d.	12.80		3.78		3.41		2.94	
Rel. target s.d.	10.00 %		10.00 %		10.00 %		10.00 %	
Lower limit of tolerance	102.39		30.25		27.25		23.54	
Upper limit of tolerance	153.59		45.38		40.88		35.31	
Type B outliers	1		1					
Type C outliers	1		1		2		2	
Type F outliers			2		1		2	
No. of laboratories after elimination of outliers type A-D and F (without laboratories that only gave states but no measured values)	34		32		36		35	

Summary of laboratory means

Sample 2

Laboratory	1,2,3-Trimethylbenzene	Z score	4-Methyl-2-pentanone	Z score	alpha-Pinene	Z score	Benzene	Z score	Cumene	Z score
Unit	µg/m³		µg/m³		µg/m³		µg/m³		µg/m³	
17	47.00	-4.22 FE	37.50	-0.21	49.00	-4.01 FE	60.50	-2.97 E	32.50	-3.64 FE
21	78.50	-0.35	41.50	0.83	95.00	1.61	99.50	1.56	47.50	-0.71
30	84.50	0.39	42.00	0.96	94.00	1.49	100.50	1.68	53.50	0.47
40	67.35	-1.72	26.75	-3.02 E			69.70	-1.90	40.85	-2.01 E
52	70.55	-1.33	37.00	-0.34	82.30	0.06	102.30	1.89	47.20	-0.77
55	79.50	-0.23	39.00	0.18	76.00	-0.71	82.00	-0.47	51.50	0.08
60	89.31	0.98	39.90	0.42	268.91	22.87 BE	92.75	0.78	268.91	42.61 CE
62					96.95	1.85	101.15	1.75		
68	80.10	-0.15	45.60	1.90	96.05	1.74	96.00	1.15	61.45	2.02 E
93	84.58	0.40	41.56	0.85 C	72.44	-1.14	95.89	1.14	56.02	0.96
96	83.70	0.29	21.15	-4.48 FE	77.95	-0.47	58.70	-3.18 E	55.75	0.91
99	134.00	6.47 CE	32.73	-1.46 C	159.13	9.45 CE	79.73	-0.74 C	88.31	7.28 CE
107	70.85	-1.29	34.25	-1.06	86.55	0.58	101.90	1.84	50.40	-0.14
117	105.50	2.97 E	45.50	1.88	96.50	1.80	102.00	1.85	61.00	1.93
125	107.53	3.22 E			58.78	-2.81 E	84.43	-0.19	65.71	2.85 E
132	95.00	1.68	53.50	3.97 FE	101.50	2.41 E	119.00	3.83 FE	57.00	1.15
135	95.90	1.79	32.20	-1.59	73.30	-1.04	83.05	-0.35	63.05	2.33 E
138	92.50	1.37	43.00	1.22	74.50	-0.89	75.00	-1.29 C	54.00	0.56
143	76.90	-0.55	39.45	0.30	75.90	-0.72	88.75	0.31	42.70	-1.65
144	117.00	4.38 FE	20.00	-4.78 FE	105.00	2.84 E	74.00	-1.40	73.00	4.28 FE
145			40.00	0.44			85.00	-0.12		
148	79.65	-0.21	39.80	0.39	70.65	-1.36	79.50	-0.76	50.35	-0.15
160	84.05	0.33	40.10	0.47	89.27	0.91	90.97	0.57	51.69	0.11
167	93.50	1.49	38.50	0.05	91.50	1.19	96.50	1.21	52.00	0.17
186	58.80	-2.77 E	39.65	0.35	69.50	-1.50	68.00	-2.10 E	35.30	-3.09 E
192	87.23	0.72	43.31	1.31	94.02	1.49	100.84	1.72		
199	83.05	0.21	42.55	1.11	78.50	-0.40	84.60	-0.17	57.25	1.20
207	66.00	-1.89	29.50	-2.30 E	72.00	-1.20	73.50	-1.46	43.00	-1.59
215	73.50	-0.96	35.50	-0.73	57.50	-2.97 E	64.00	-2.56 E	47.50	-0.71

Laboratory	1,2,3-Trimethylbenzene	Z score	4-Methyl-2-pentanone	Z score	alpha-Pinene	Z score	Benzene	Z score	Cumene	Z score
218	75.50	-0.72	34.30	-1.05	70.65	-1.36	79.55	-0.76	51.40	0.06
237	74.35	-0.86	32.05	-1.63	66.35	-1.89	73.85	-1.42	45.30	-1.14
238	81.05	-0.04 C					94.25	0.95	54.00	0.56
256	70.52	-1.33	40.84	0.66	86.47	0.57	81.23	-0.56	47.55	-0.70
258	80.36	-0.12	35.49	-0.74	74.95	-0.84	74.68	-1.32	42.55	-1.68
261	82.34	0.12	37.38	-0.24	79.86	-0.24	81.86	-0.49	48.46	-0.52
267	79.55	-0.22			90.10	1.01	94.75	1.01	53.20	0.41
503					45.35	-4.46 FE	105.00	2.20 E	52.00	0.17
510			40.00	0.44			95.00	1.04		
518	70.95	-1.28	23.40	-3.89 FE			82.40	-0.43	45.45	-1.11
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Method	ISO 5725-2		ISO 5725-2		ISO 5725-2		ISO 5725-2		ISO 5725-2	
Assessment	Z <=2.00		Z <=2.00		Z <=2.00		Z <=2.00		Z <=2.00	
No. of laboratories that submitted results	35		34		34		39		35	
No. of single values	70		68		68		78		70	
Mean	81.34		38.31		81.80		86.07		51.12	
Reproducibility s.d.	11.09		4.56		12.83		12.98		6.87	
Rel. reproducibility s.d.	13.64 %		11.90 %		15.69 %		15.08 %		13.45 %	
Reference value	84.90		36.00		80.00		84.60		47.20	
Target s.d.	8.13		3.83		8.18		8.61		5.11	
Rel. target s.d.	10.00 %		10.00 %		10.00 %		10.00 %		10.00 %	
Lower limit of tolerance	65.07		30.65		65.44		68.86		40.89	
Upper limit of tolerance	97.61		45.97		98.16		103.29		61.34	
Type B outliers					1					
Type C outliers	2		2		1		2		2	
Type F outliers	2		4		2		1		2	
No. of laboratories after elimination of outliers type A-D and F (without laboratories that only gave states but no measured values)	31		28		30		36		31	
Explanation of outlier types										
A: Single outlier	Grubbs									
B: Differing laboratory mean	Grubbs									
C: Excessive laboratory s.d.	Cochran									
D: Excluded manually										

Laboratory	1,2,3-Trimethylbenzene Z score	4-Methyl-2-pentanone Z score	alpha-Pinene Z score	Benzene Z score	Cumene Z score
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E: mean outside tolerance limits

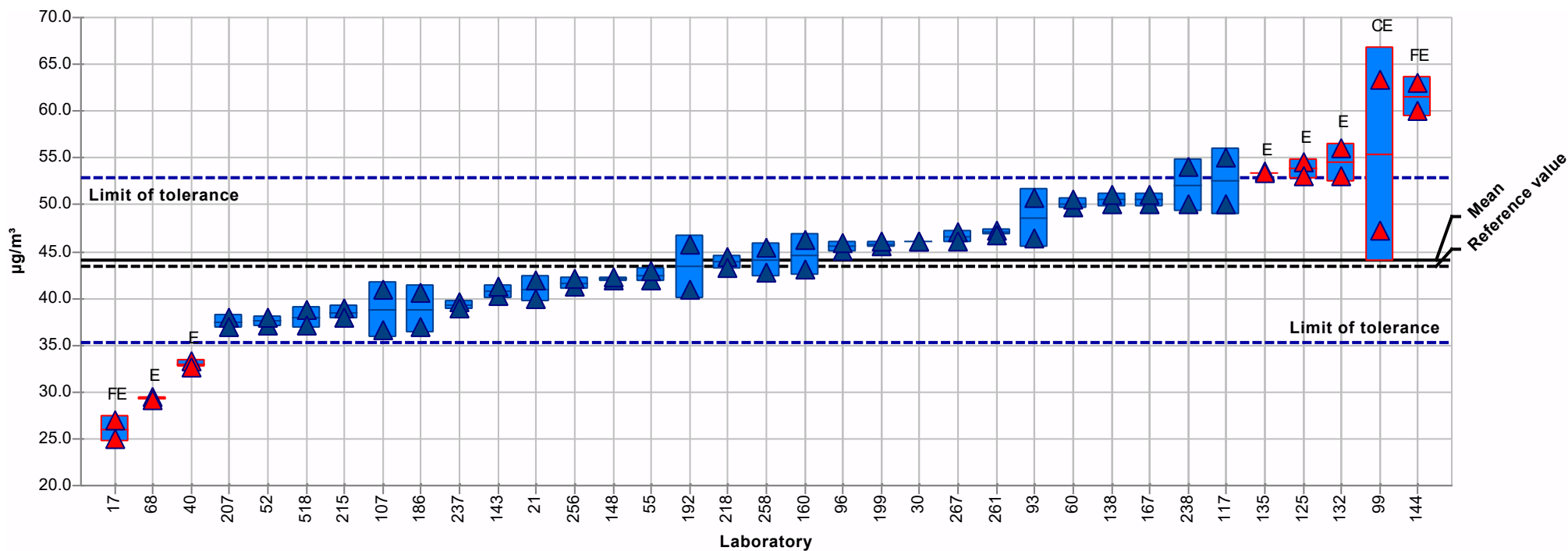
F: |Z-Score|>3.50

Laboratory	n-Decane	Z score	n-Heptane	Z score	p-Xylene	Z score	Toluene	Z score
Unit	µg/m³		µg/m³		µg/m³		µg/m³	
17	60.00	-1.98	62.00	-1.72	51.00	-1.78	31.50	-3.83 FE
21	80.00	0.69	186.00	14.83 BE	65.50	0.55	55.00	0.78
30	86.00	1.49	79.50	0.61	67.00	0.80	56.00	0.98
40			61.65	-1.77	49.10	-2.09 E	39.30	-2.30 E
52	73.00	-0.24	83.30	1.12	58.40	-0.59	51.50	0.09
55	84.50	1.29	74.00	-0.12	63.00	0.15	50.50	-0.10
60	78.69	0.52	92.00	2.28 E	65.85	0.61	56.40	1.05
62	85.20	1.39			69.65	1.22	57.15	1.20
68	64.10	-1.43	80.00	0.68	74.45	2.00	53.30	0.45 C
93	81.16	0.85	81.56	0.89	67.12	0.81	80.81	5.84 BE
96	68.20	-0.88	44.90	-4.01 FE	61.55	-0.08	46.55	-0.88
99	91.31	2.20 CE	77.61	0.36 C	66.68	0.74 C	49.46	-0.31 C
107	67.60	-0.96	99.05	3.22 E	56.55	-0.89	49.55	-0.29
117	89.00	1.90	95.50	2.75 E	72.50	1.68	58.00	1.37
125	56.28	-2.48 E	66.97	-1.06	67.70	0.91	48.87	-0.42
132	103.50	3.83 FE	113.50	5.15 FE	74.00	1.92	79.50	5.58 CE
135	95.00	2.70 E	72.95	-0.26	67.85	0.93	50.90	-0.02
138	82.50	1.03	74.00	-0.12	65.00	0.47	52.50	0.29
143	72.05	-0.37	71.25	-0.49	57.55	-0.73	62.40	2.23 E
144	82.50	1.03	52.00	-3.06 E	80.50	2.97 E	64.50	2.64 E
145					52.50	-1.54	47.50	-0.69
148	79.95	0.69	71.30	-0.48	61.80	-0.04	49.85	-0.23
160	78.45	0.49	75.41	0.07	66.06	0.64	53.14	0.42
167	78.50	0.49	78.00	0.41	63.00	0.15	53.00	0.39
186	56.80	-2.41 E	69.10	-0.77	45.90	-2.60 E	52.40	0.27
192	88.01	1.76	93.40	2.47 E	68.63	1.06	56.58	1.09
199	71.05	-0.50	72.70	-0.29	56.95	-0.82	50.65	-0.07
207	60.50	-1.91	45.00	-3.99 FE	50.50	-1.86	40.00	-2.16 E
215	72.50	-0.31	64.50	-1.39	60.00	-0.33	48.50	-0.49
218	70.40	-0.59	76.55	0.22	53.85	-1.32	46.85	-0.82
237	75.40	0.08	71.75	-0.42	63.50	0.23	43.40	-1.49
238	75.90	0.14	73.50	-0.19 C	32.55	-4.75 FE	52.30	0.25
256	73.53	-0.17	76.71	0.24	56.70	-0.86	49.40	-0.32
258	70.50	-0.58	68.89	-0.80	53.99	-1.30	44.50	-1.28

Laboratory	n-Decane	Z score	n-Heptane	Z score	p-Xylene	Z score	Toluene	Z score
261	77.75	0.39	69.58	-0.71	58.97	-0.50	47.05	-0.78
267	71.50	-0.44	76.65	0.23	61.15	-0.15	50.55	-0.09
503	131.85	7.62 BE	160.63	11.45 BE	72.00	1.60	75.50	4.80 CE
510					62.50	0.07	52.50	0.29
518	62.40	-1.66	61.80	-1.75	53.90	-1.31	46.45	-0.90
-	-	--	-	--	-	--	-	--
Method	ISO 5725-2		ISO 5725-2		ISO 5725-2		ISO 5725-2	
Assessment	Z <=2.00		Z <=2.00		Z <=2.00		Z <=2.00	
No. of laboratories that submitted results	36		36		39		39	
No. of single values	72		72		78		78	
Mean	74.82		74.90		62.06		51.02	
Reproducibility s.d.	9.69		10.69		7.96		5.62	
Rel. reproducibility s.d.	12.96 %		14.27 %		12.82 %		11.02 %	
Reference value	77.90		70.90		58.80		47.30	
Target s.d.	7.48		7.49		6.21		5.10	
Rel. target s.d.	10.00 %		10.00 %		10.00 %		10.00 %	
Lower limit of tolerance	59.85		59.92		49.65		40.82	
Upper limit of tolerance	89.78		89.88		74.47		61.23	
Type B outliers	1		2				1	
Type C outliers	1		2		1		4	
Type F outliers	1		3		1		1	
No. of laboratories after elimination of outliers type A-D and F (without laboratories that only gave states but no measured values)	33		29		37		33	

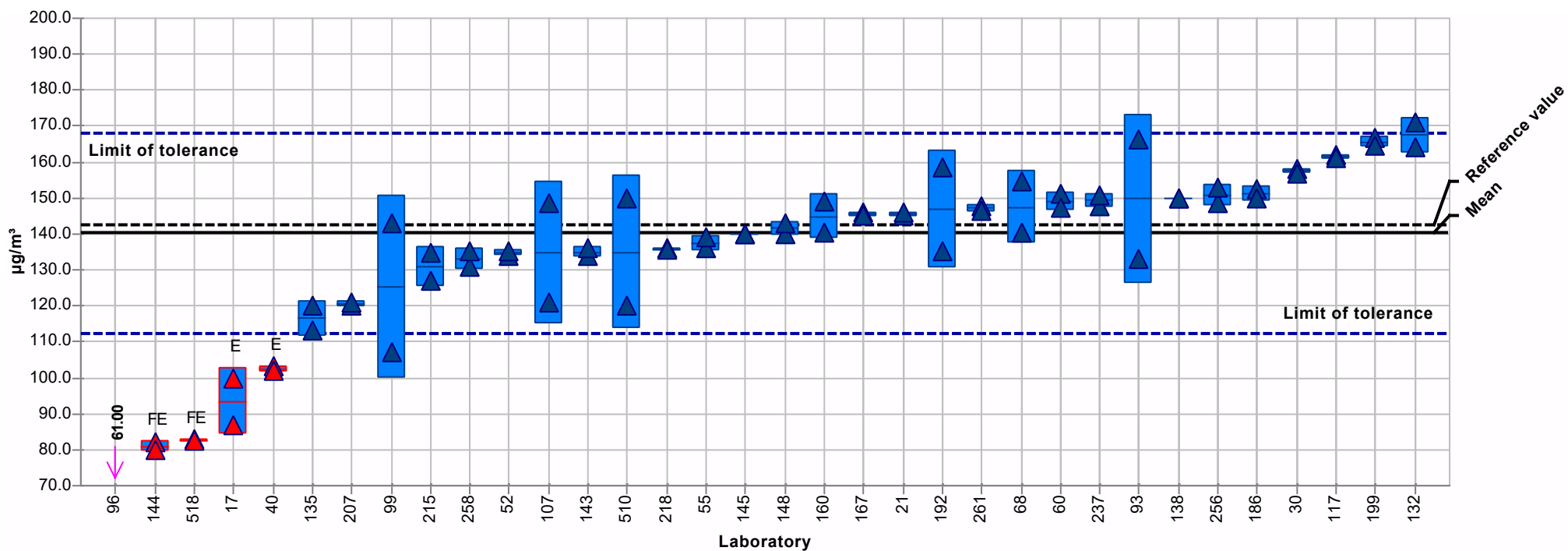
Summary results

Sample:	1	Mean:	44.10 µg/m³
Measurand:	1,2,3-Trimethylbenzene	Reproducibility s.d.:	6.32 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	14.33%
Rel. target s.d.:	10.00% (Limited)	Reference value:	43.40 µg/m³
		Range of tolerance:	35.28 - 52.92 µg/m³ (Z-Score ≤ 2.00)



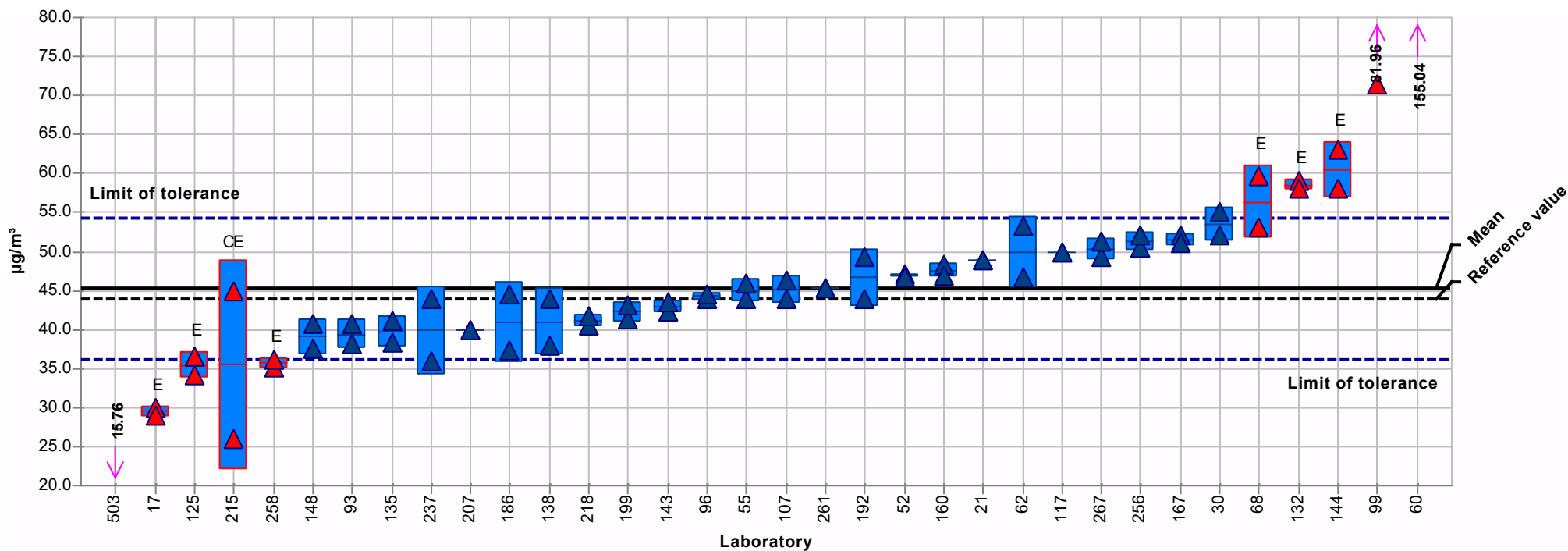
Summary results

Sample:	1	Mean:	140.19 µg/m³
Measurand:	4-Methyl-2-pentanone	Reproducibility s.d.:	17.60 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	12.55%
Rel. target s.d.:	10.00% (Limited)	Reference value:	142.50 µg/m³
		Range of tolerance:	112.15 - 168.23 µg/m³ (Z-Score ≤ 2.00)



Summary results

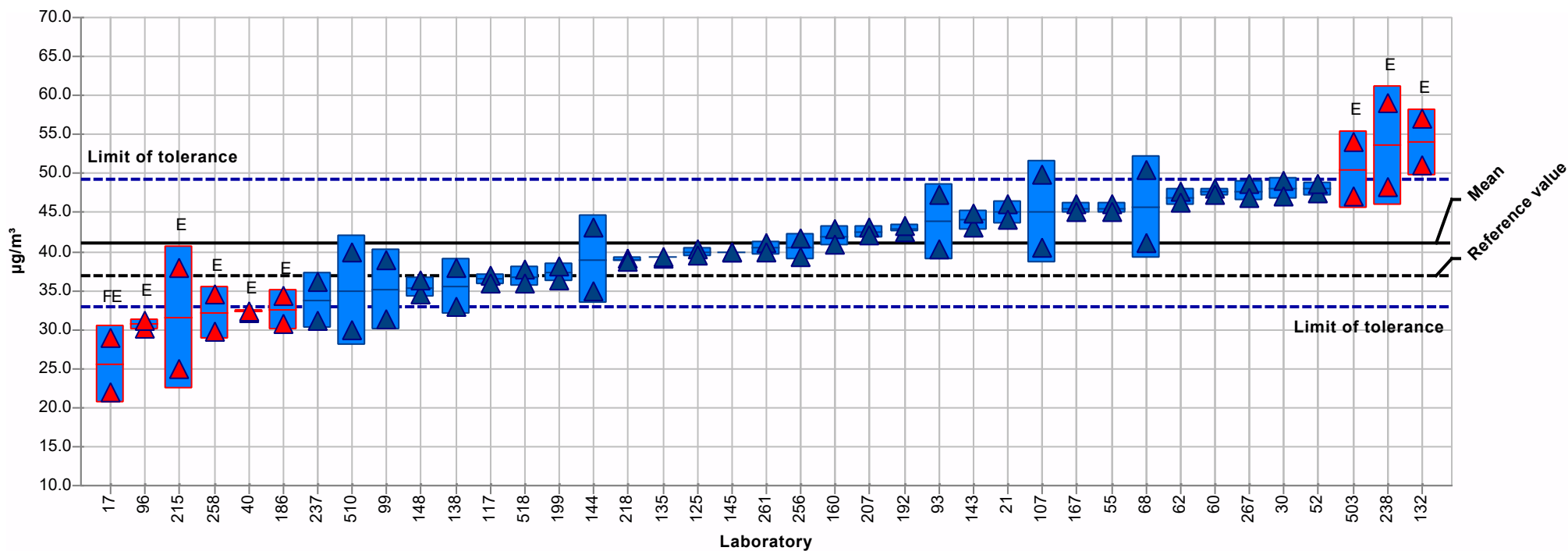
Sample:	1	Mean:	45.29 µg/m³
Measurand:	alpha-Pinene	Reproducibility s.d.:	7.24 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	15.98%
Rel. target s.d.:	10.00% (Limited)	Reference value:	43.90 µg/m³
		Range of tolerance:	36.23 - 54.35 µg/m³ (Z-Score <= 2.00)



Summary results

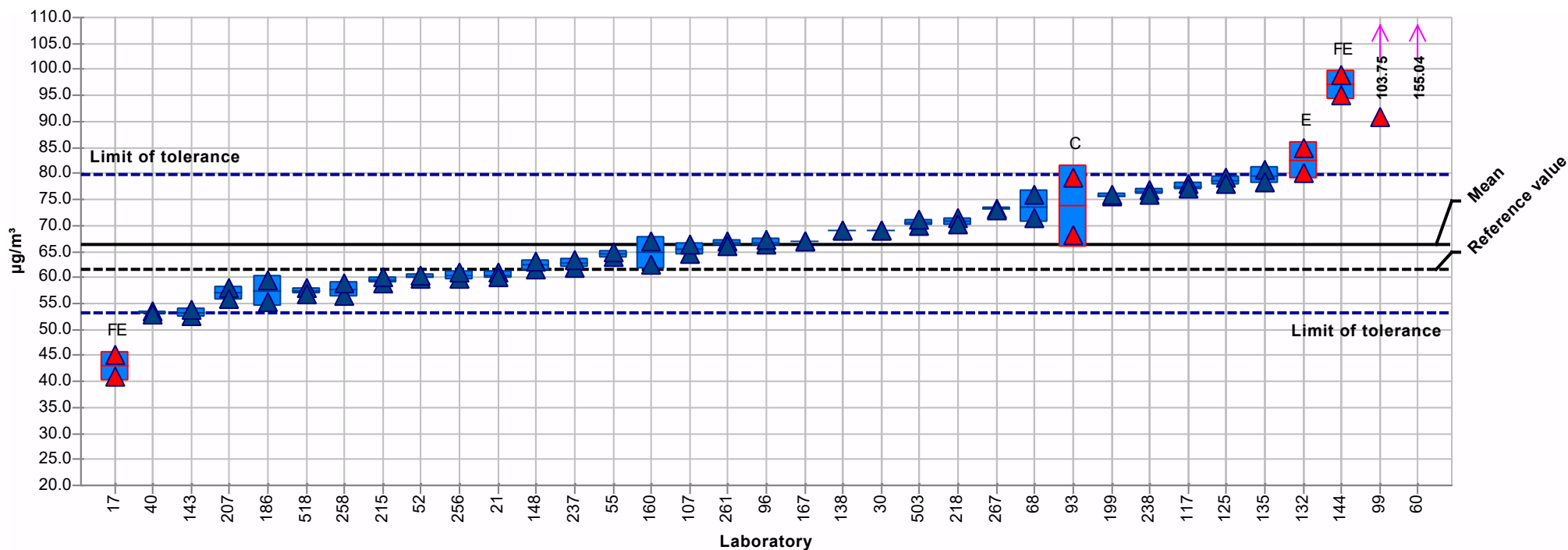
Sample: 1
 Measurand: Benzene
 Method: ISO 5725-2
 Rel. target s.d.: 10.00% (Limited)

Mean: 41.08 $\mu\text{g}/\text{m}^3$
 Reproducibility s.d.: 6.71 $\mu\text{g}/\text{m}^3$
 Rel. reproducibility s.d.: 16.34%
 Reference value: 37.00 $\mu\text{g}/\text{m}^3$
 Range of tolerance: 32.86 - 49.29 $\mu\text{g}/\text{m}^3$ ($|Z\text{-Score}| \leq 2.00$)



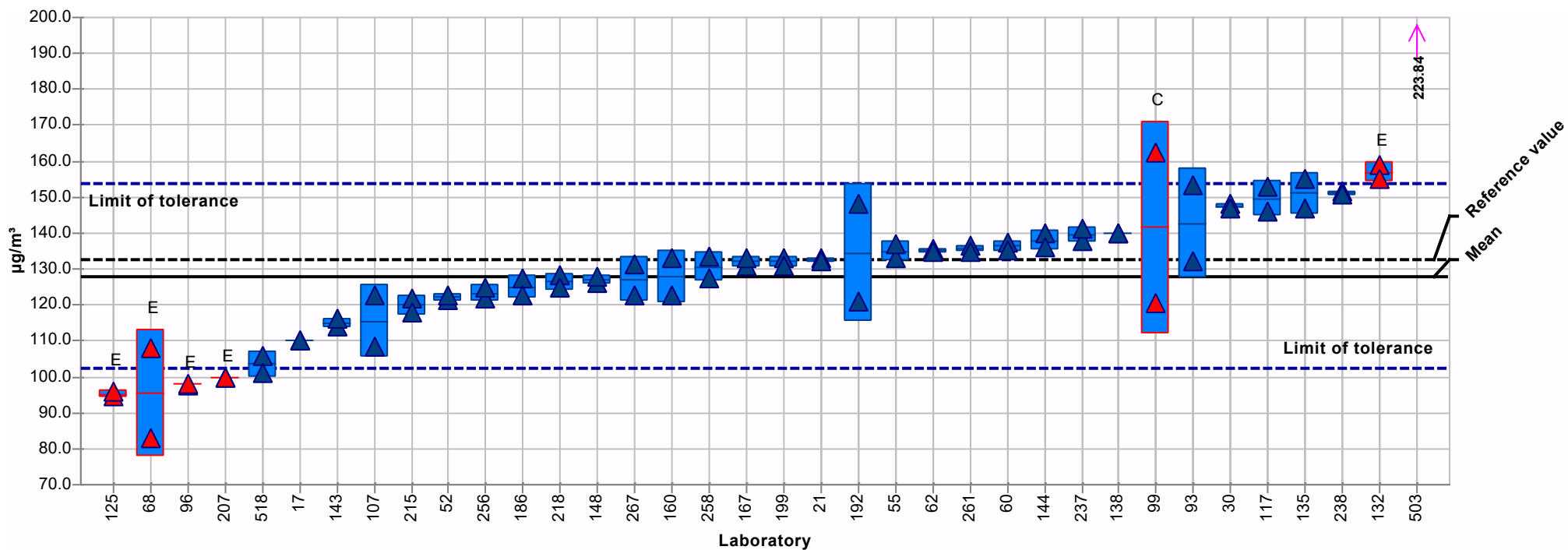
Summary results

Sample:	1	Mean:	66.42 µg/m³
Measurand:	Cumene	Reproducibility s.d.:	8.18 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	12.32%
Rel. target s.d.:	10.00% (Limited)	Reference value:	61.60 µg/m³
		Range of tolerance:	53.14 - 79.70 µg/m³ (Z-Score ≤ 2.00)



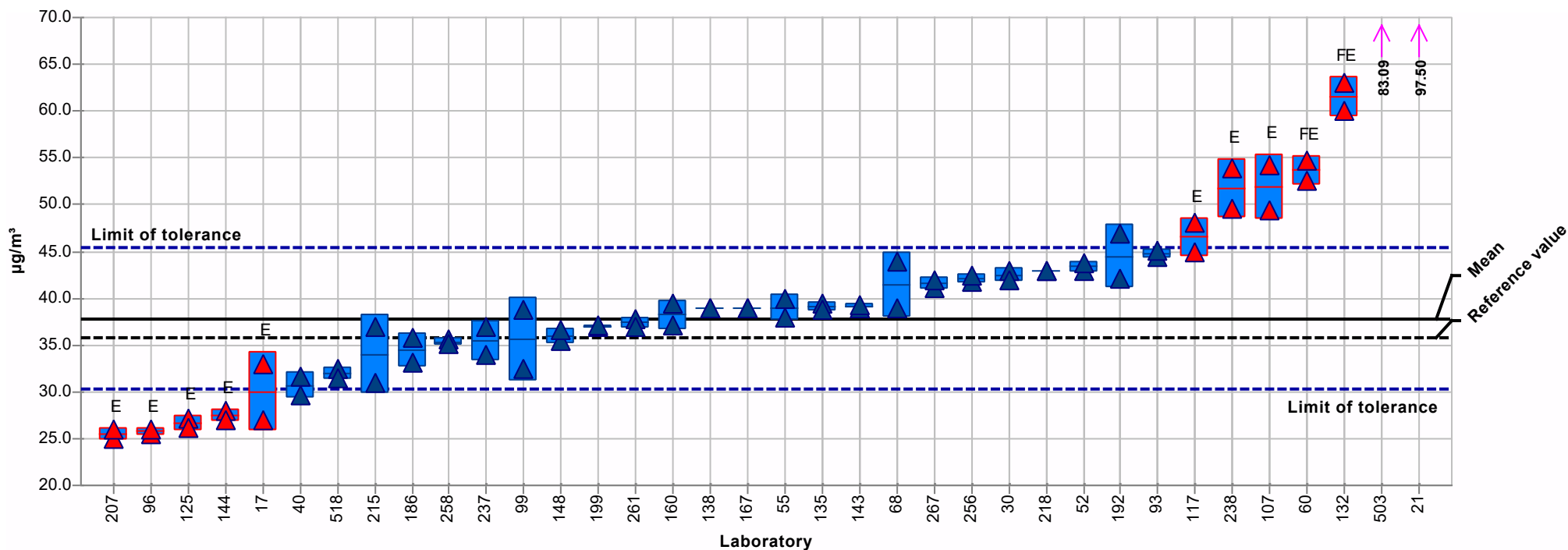
Summary results

Sample:	1	Mean:	127.99 $\mu\text{g}/\text{m}^3$
Measurand:	n-Decane	Reproducibility s.d.:	16.96 $\mu\text{g}/\text{m}^3$
Method:	ISO 5725-2	Rel. reproducibility s.d.:	13.25%
Rel. target s.d.:	10.00% (Limited)	Reference value:	132.70 $\mu\text{g}/\text{m}^3$
		Range of tolerance:	102.39 - 153.59 $\mu\text{g}/\text{m}^3$ ($ Z\text{-Score} \leq 2.00$)



Summary results

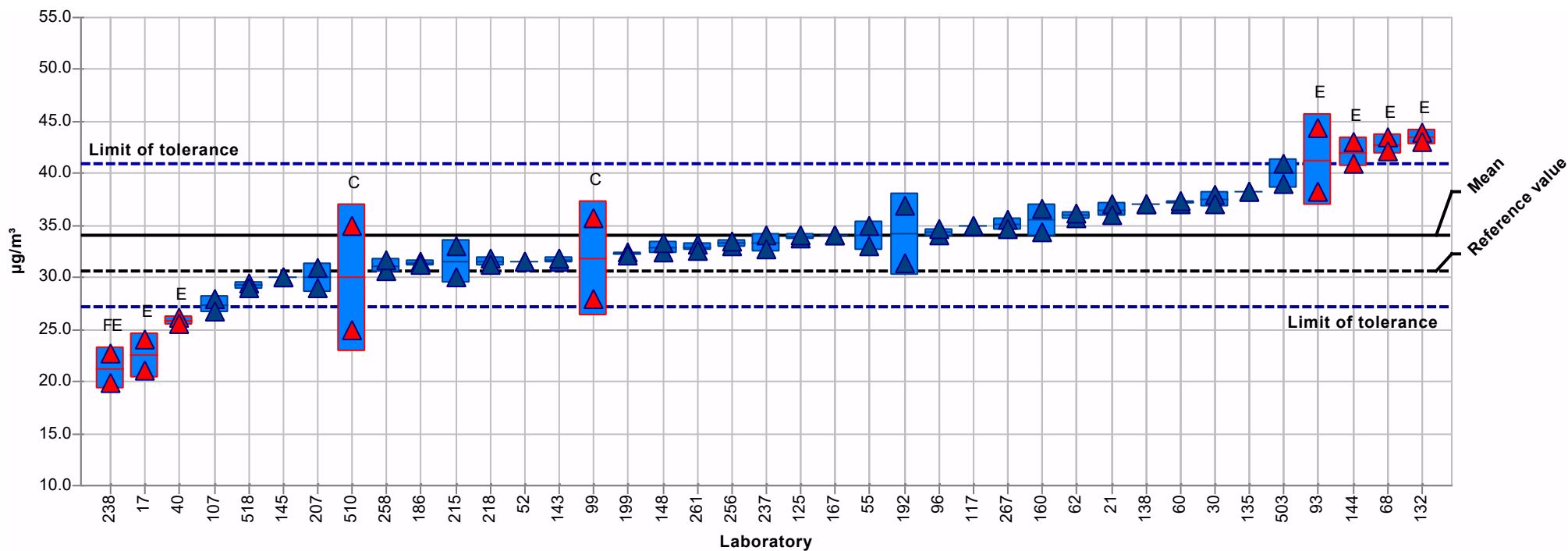
Sample:	1	Mean:	37.81 µg/m³
Measurand:	n-Heptane	Reproducibility s.d.:	6.89 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	18.23%
Rel. target s.d.:	10.00% (Limited)	Reference value:	35.70 µg/m³
		Range of tolerance:	30.25 - 45.38 µg/m³ (Z-Score ≤ 2.00)



Summary results

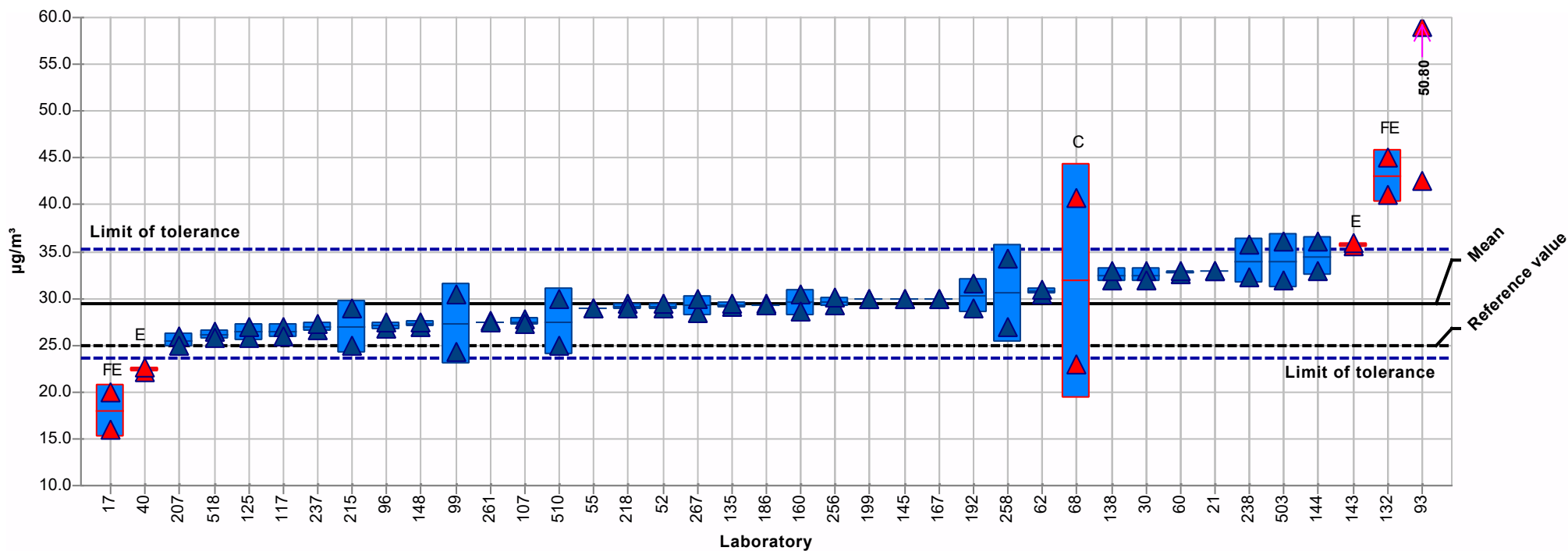
Sample: 1
 Measurand: p-Xylene
 Method: ISO 5725-2
 Rel. target s.d.: 10.00% (Limited)

Mean: 34.07 µg/m³
 Reproducibility s.d.: 4.65 µg/m³
 Rel. reproducibility s.d.: 13.65%
 Reference value: 30.70 µg/m³
 Range of tolerance: 27.25 - 40.88 µg/m³ (|Z-Score| <= 2.00)



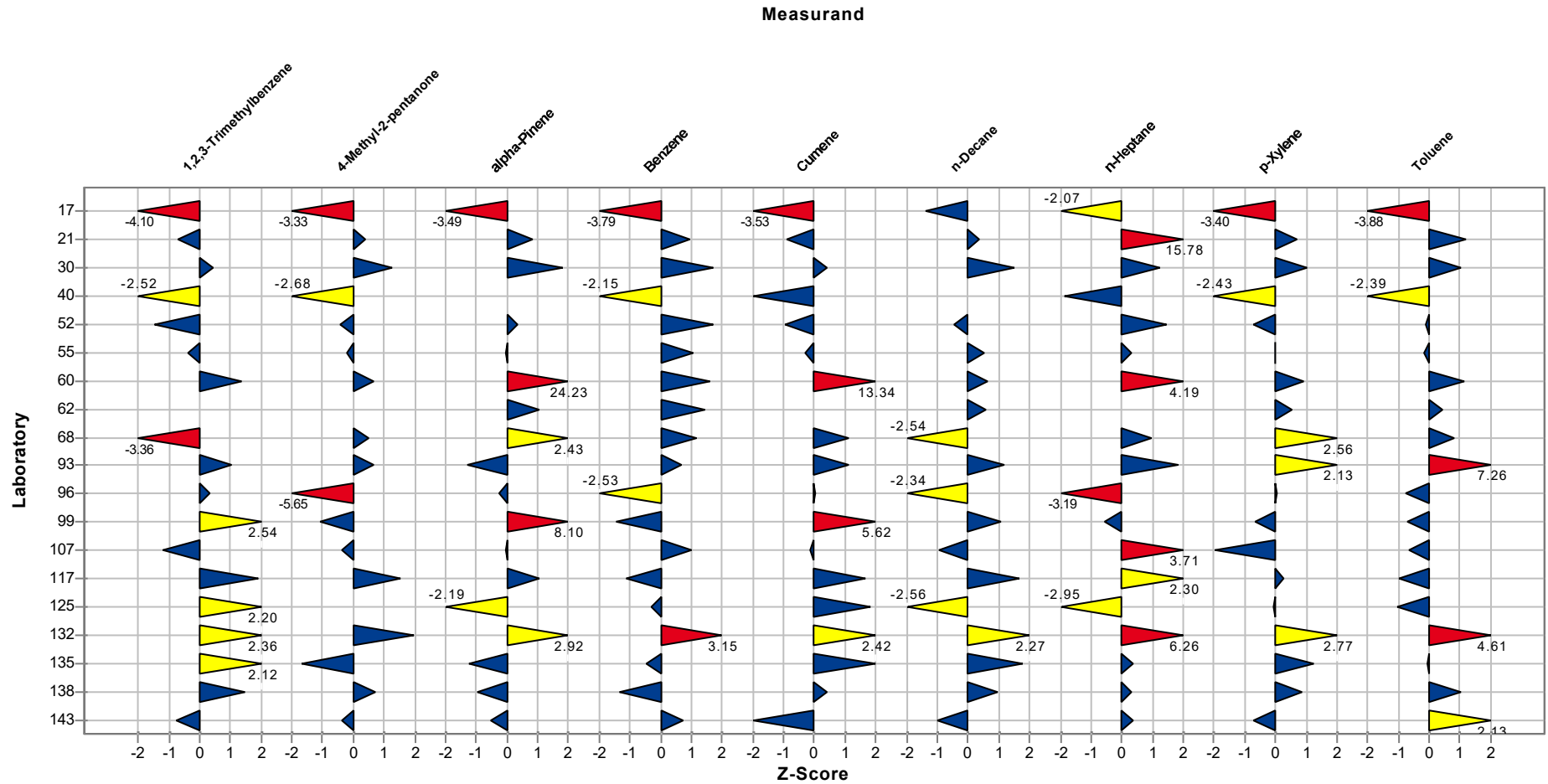
Summary results

Sample:	1	Mean:	29.42 µg/m³
Measurand:	Toluene	Reproducibility s.d.:	3.13 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	10.63%
Rel. target s.d.:	10.00% (Limited)	Reference value:	25.00 µg/m³
		Range of tolerance:	23.54 - 35.31 µg/m³ (Z-Score <= 2.00)



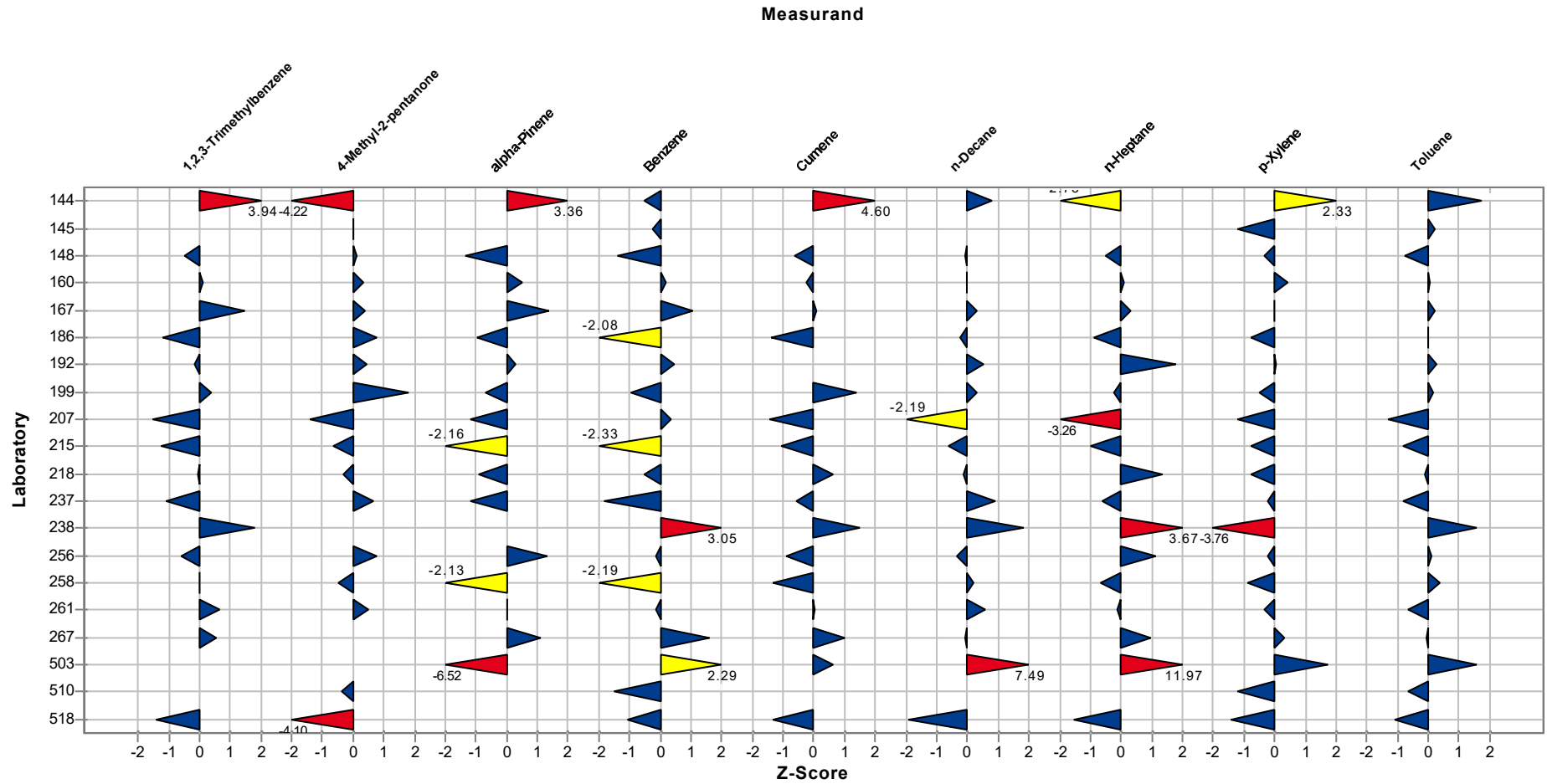
Sample chart of Z-Scores

Sample: 1



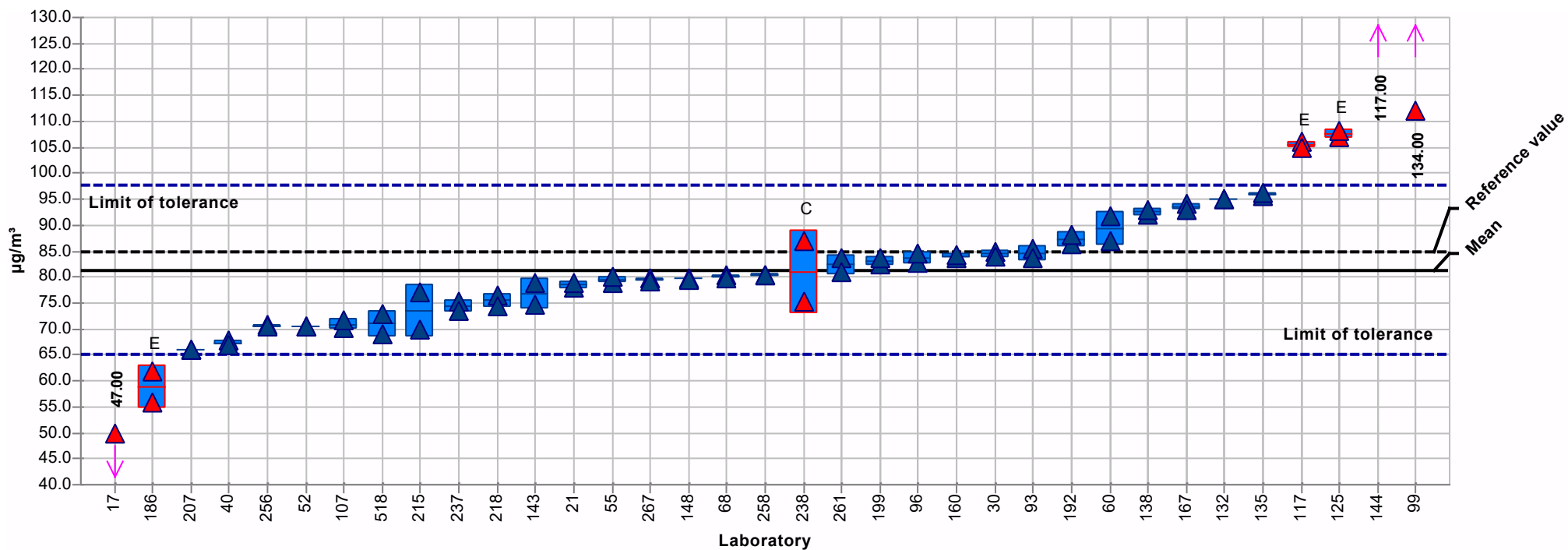
Sample chart of Z-Scores

Sample: 1



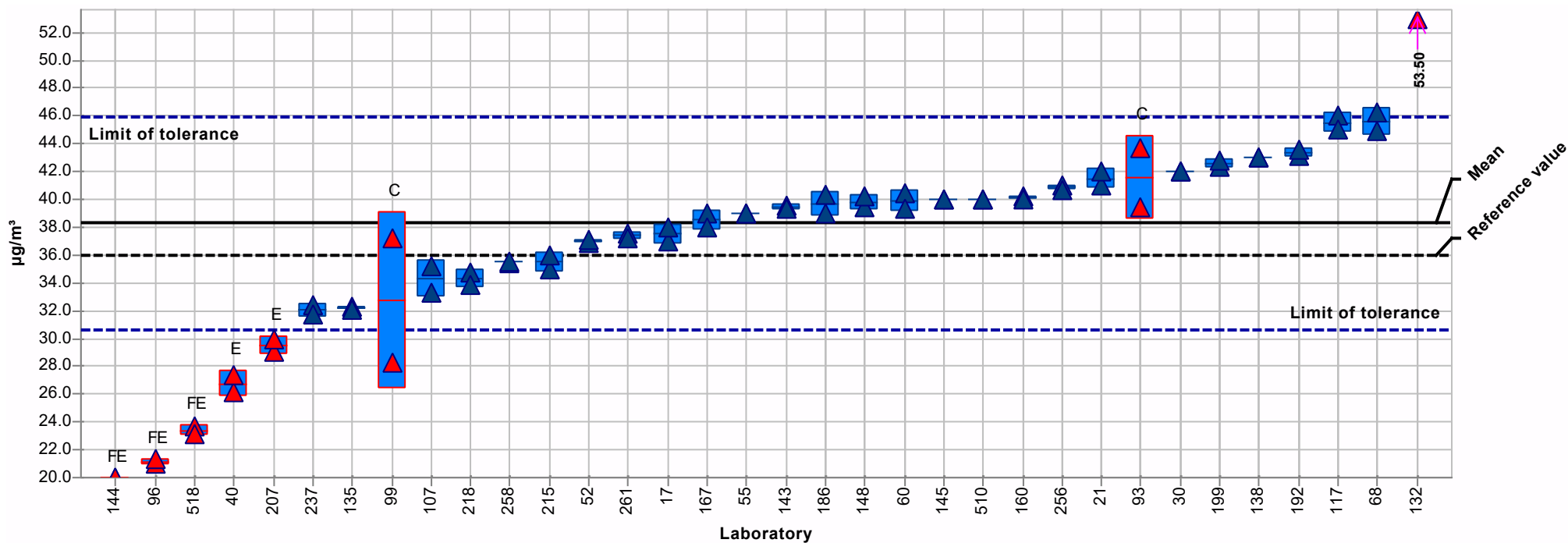
Summary results

Sample:	2	Mean:	81.34 µg/m ³
Measurand:	1,2,3-Trimethylbenzene	Reproducibility s.d.:	11.09 µg/m ³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	13.64%
Rel. target s.d.:	10.00% (Limited)	Reference value:	84.90 µg/m ³
		Range of tolerance:	65.07 - 97.61 µg/m ³ (Z-Score ≤ 2.00)



Summary results

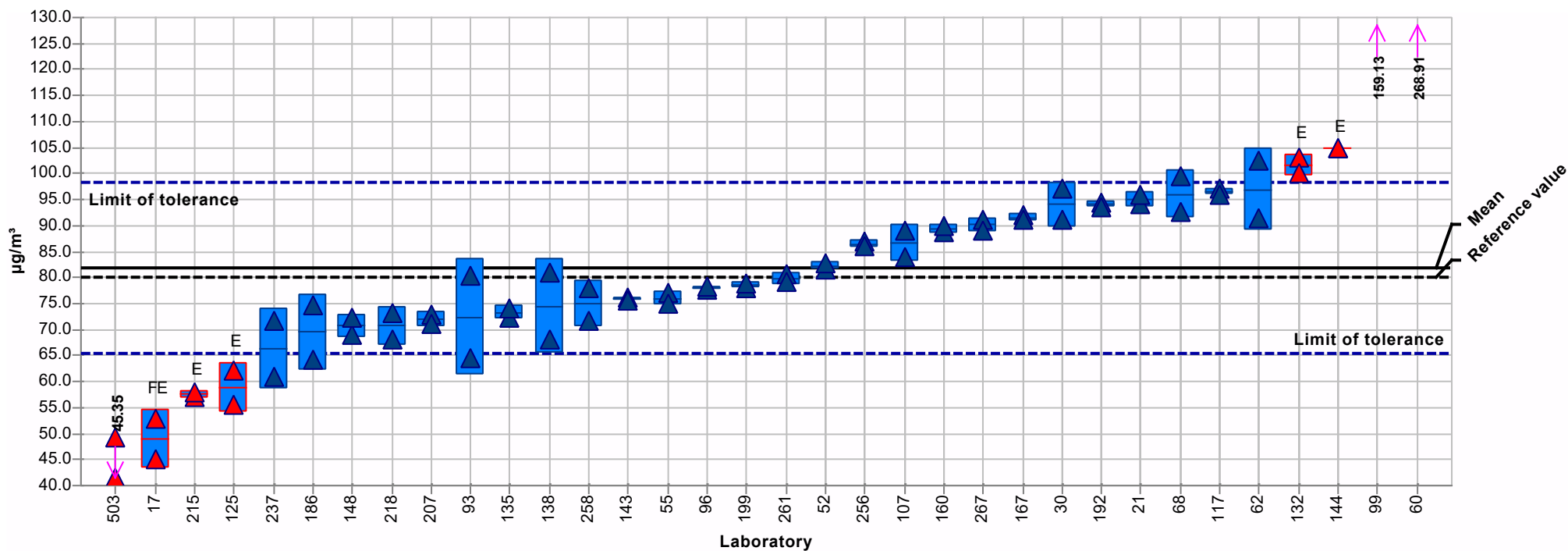
Sample:	2	Mean:	38.31 µg/m³
Measurand:	4-Methyl-2-pentanone	Reproducibility s.d.:	4.56 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	11.90%
Rel. target s.d.:	10.00% (Limited)	Reference value:	36.00 µg/m³
		Range of tolerance:	30.65 - 45.97 µg/m³ (Z-Score ≤ 2.00)



Summary results

Sample: 2
 Measurand: alpha-Pinene
 Method: ISO 5725-2
 Rel. target s.d.: 10.00% (Limited)

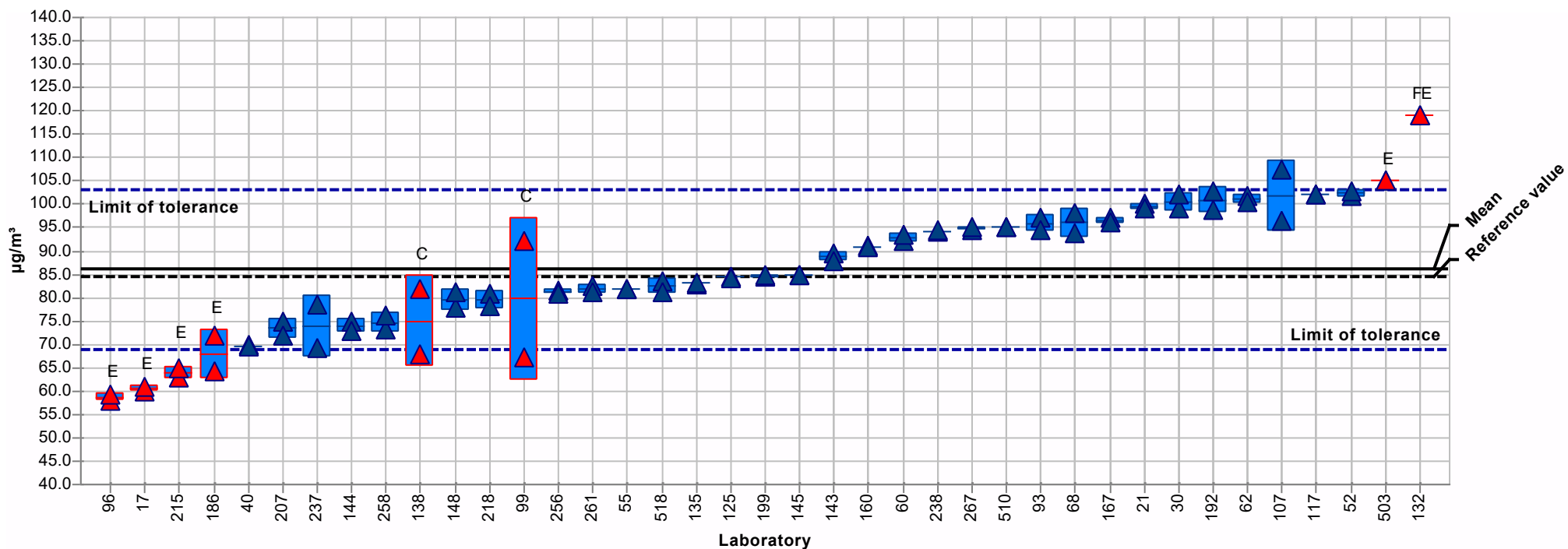
Mean: 81.80 µg/m³
 Reproducibility s.d.: 12.83 µg/m³
 Rel. reproducibility s.d.: 15.69%
 Reference value: 80.00 µg/m³
 Range of tolerance: 65.44 - 98.16 µg/m³ (|Z-Score| <= 2.00)



Summary results

Sample: 2
 Measurand: Benzene
 Method: ISO 5725-2
 Rel. target s.d.: 10.00% (Limited)

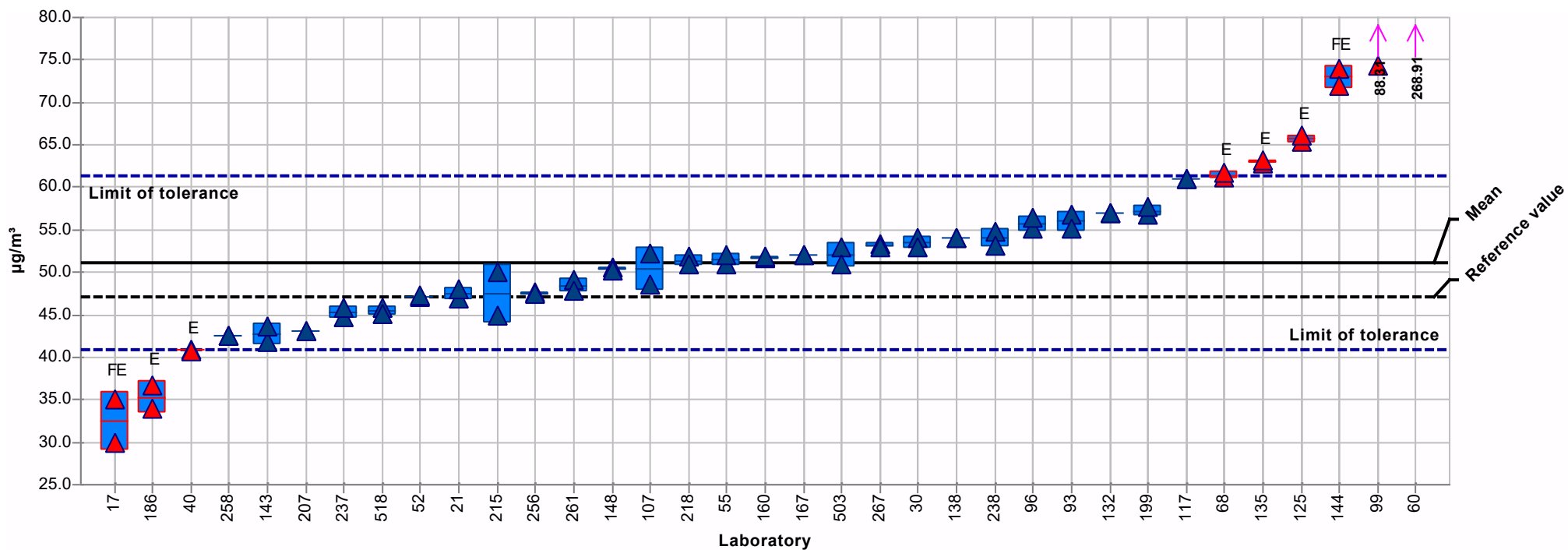
Mean: 86.07 $\mu\text{g}/\text{m}^3$
 Reproducibility s.d.: 12.98 $\mu\text{g}/\text{m}^3$
 Rel. reproducibility s.d.: 15.08%
 Reference value: 84.60 $\mu\text{g}/\text{m}^3$
 Range of tolerance: 68.86 - 103.29 $\mu\text{g}/\text{m}^3$ ($|Z\text{-Score}| \leq 2.00$)



Summary results

Sample: 2
 Measurand: Cumene
 Method: ISO 5725-2
 Rel. target s.d.: 10.00% (Limited)

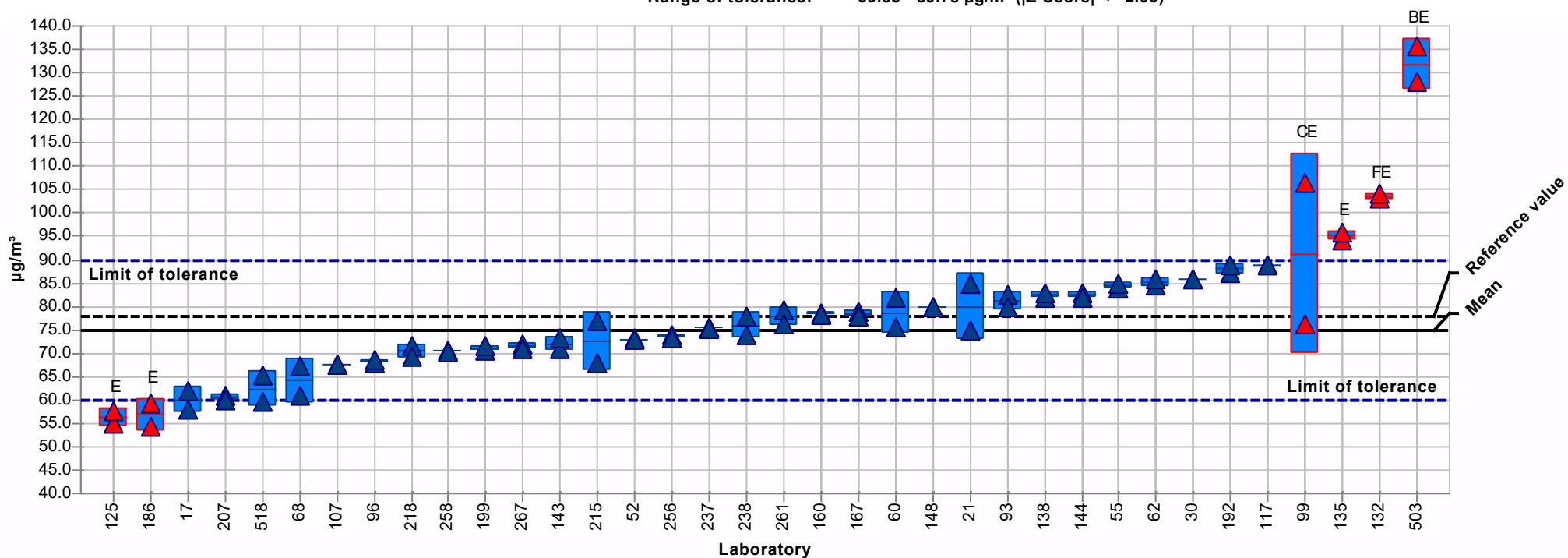
Mean: 51.12 µg/m³
 Reproducibility s.d.: 6.87 µg/m³
 Rel. reproducibility s.d.: 13.45%
 Reference value: 47.20 µg/m³
 Range of tolerance: 40.89 - 61.34 µg/m³ (|Z-Score| <= 2.00)



Summary results

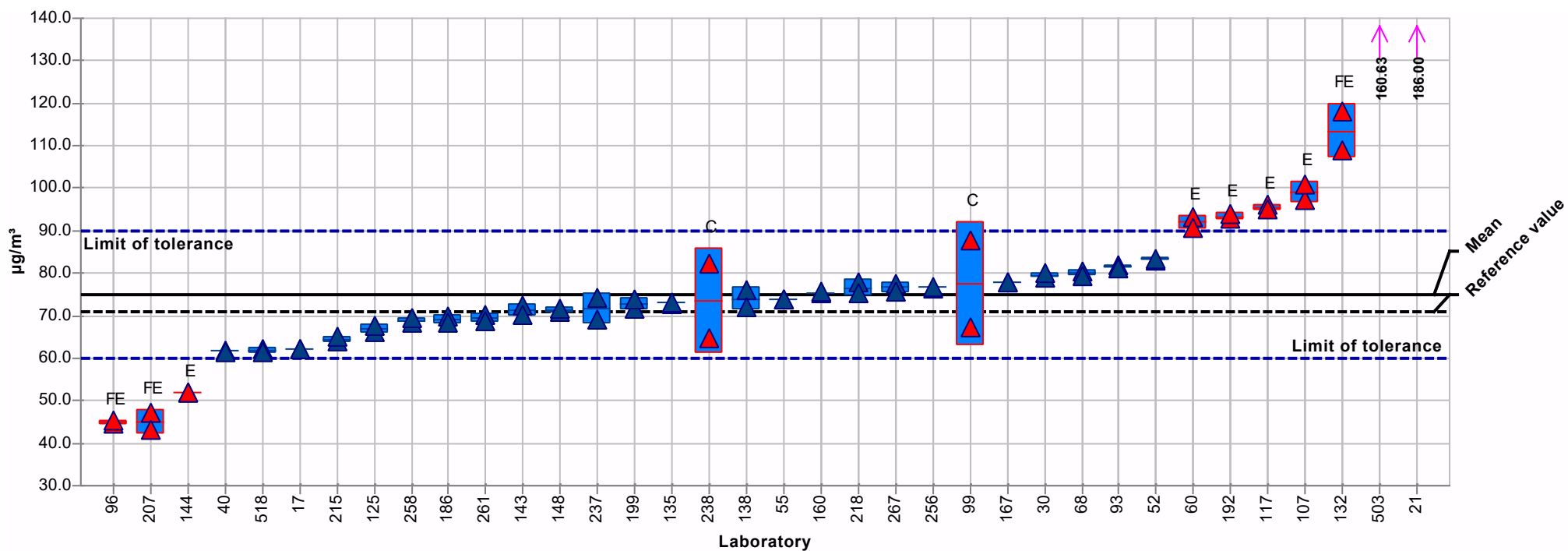
Sample: 2
Measurand: n-Decane
Method: ISO 5725-2
Rel. target s.d.: 10.00% (Limited)

Mean: 74.82 $\mu\text{g}/\text{m}^3$
Reproducibility s.d.: 9.69 $\mu\text{g}/\text{m}^3$
Rel. reproducibility s.d.: 12.96%
Reference value: 77.90 $\mu\text{g}/\text{m}^3$
Range of tolerance: 59.85 - 89.78 $\mu\text{g}/\text{m}^3$ ($|Z\text{-Score}| \leq 2.00$)



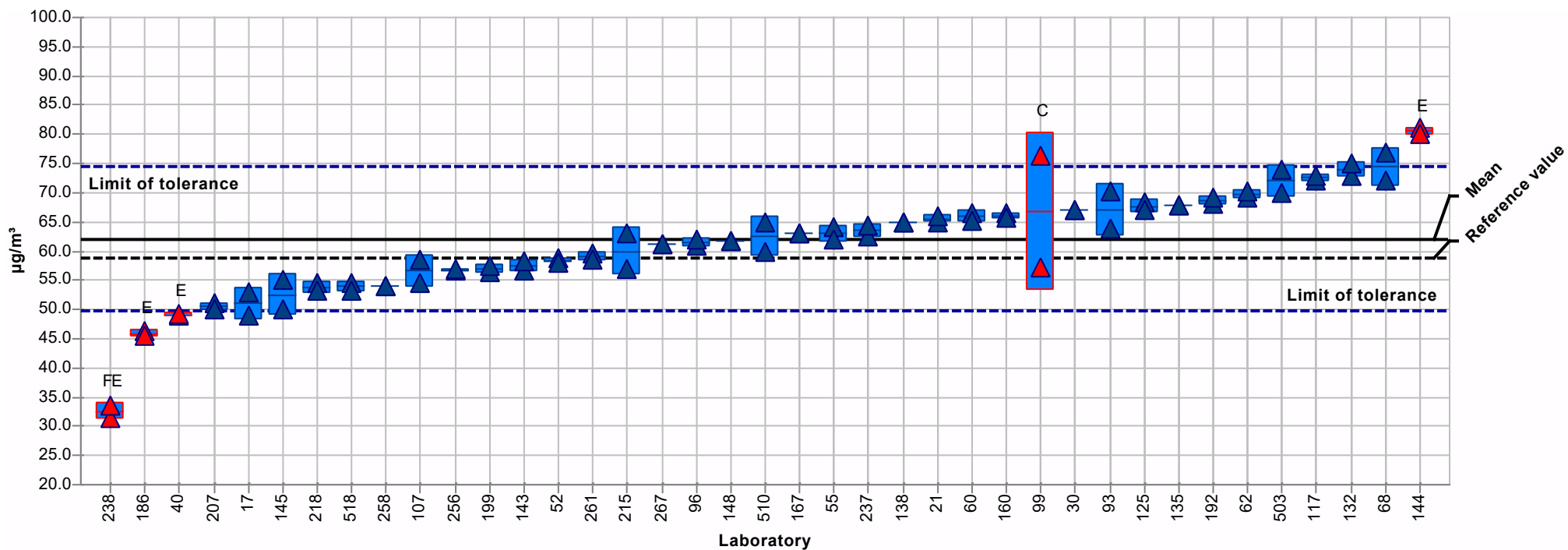
Summary results

Sample:	2	Mean:	74.90 µg/m ³
Measurand:	n-Heptane	Reproducibility s.d.:	10.69 µg/m ³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	14.27%
Rel. target s.d.:	10.00% (Limited)	Reference value:	70.90 µg/m ³
		Range of tolerance:	59.92 - 89.88 µg/m ³ (Z-Score ≤ 2.00)



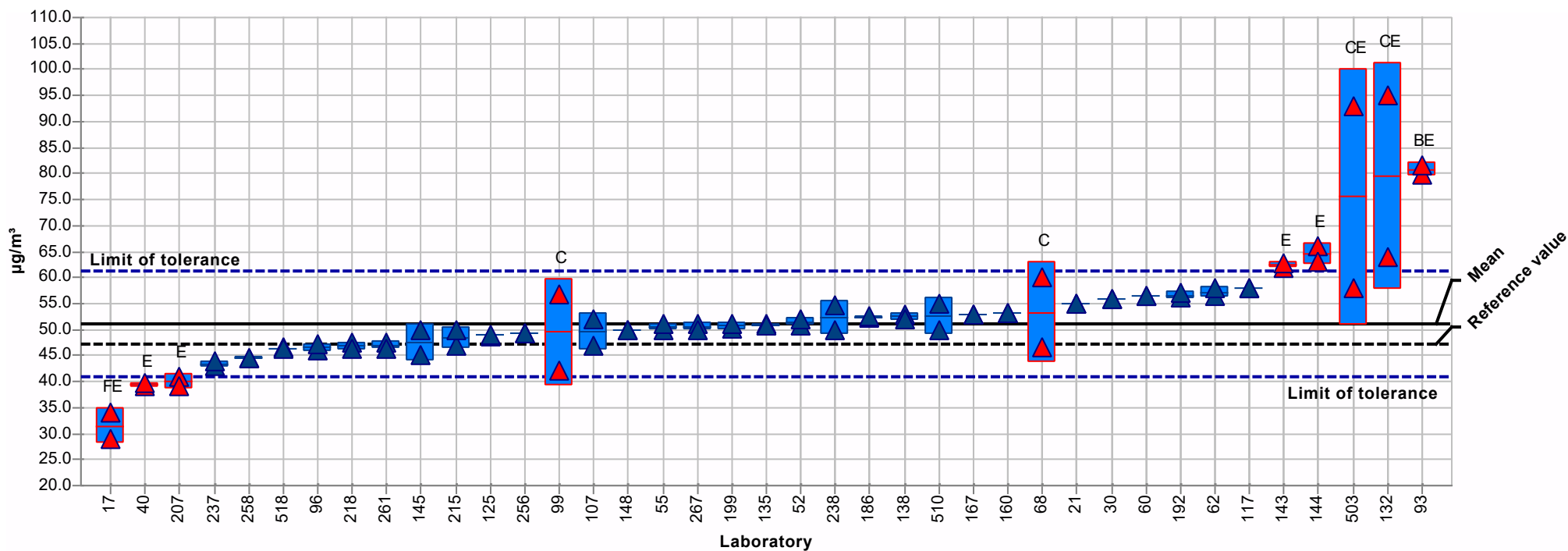
Summary results

Sample:	2	Mean:	62.06 µg/m³
Measurand:	p-Xylene	Reproducibility s.d.:	7.96 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	12.82%
Rel. target s.d.:	10.00% (Limited)	Reference value:	58.80 µg/m³
		Range of tolerance:	49.65 - 74.47 µg/m³ (Z-Score <= 2.00)



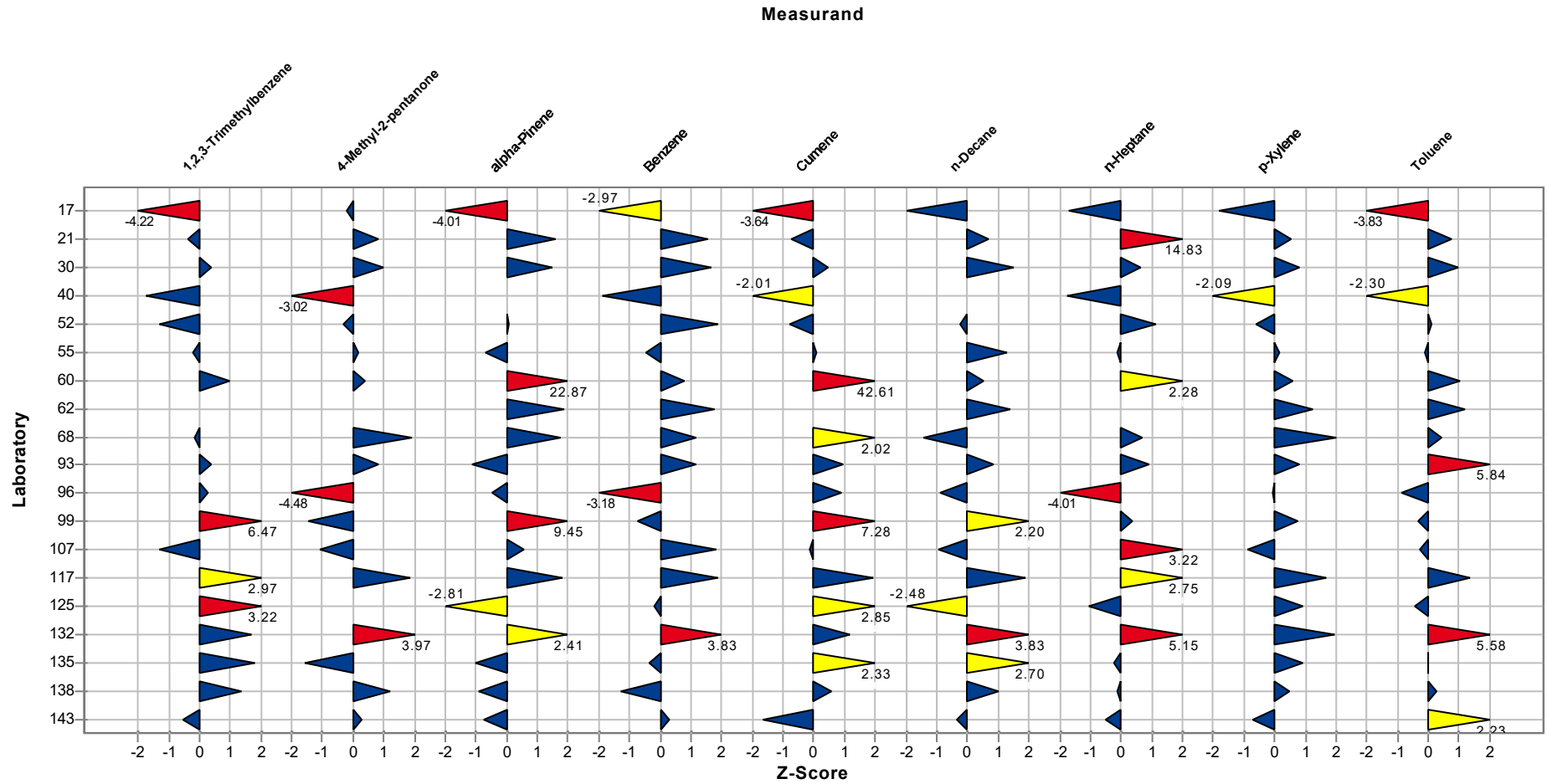
Summary results

Sample:	2	Mean:	51.02 µg/m³
Measurand:	Toluene	Reproducibility s.d.:	5.62 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	11.02%
Rel. target s.d.:	10.00% (Limited)	Reference value:	47.30 µg/m³
		Range of tolerance:	40.82 - 61.23 µg/m³ (Z-Score ≤ 2.00)



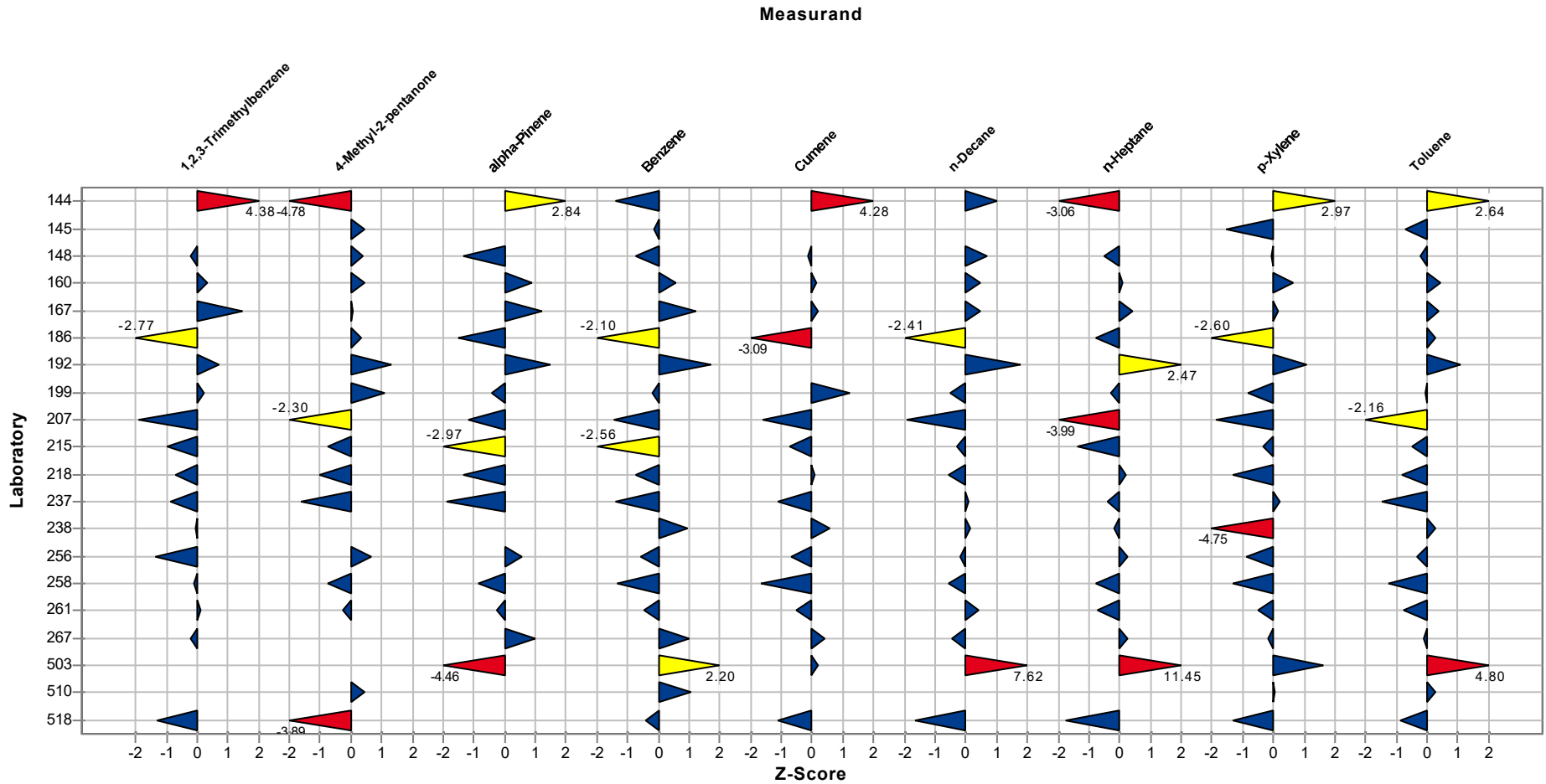
Sample chart of Z-Scores

Sample: 2



Sample chart of Z-Scores

Sample: 2



Summary of laboratory test results

Blank value sample 1

Laboratory	1,2,3-Trimethylbenzene	4-Methyl-2-pentanone	alpha-Pinene	Benzaldehyde	Benzene
Unit	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
17	< 5.00	< 1.00	< 1.00	3.60	< 2.00
21	< 1.00	< 1.00	< 1.00	1.00	2.00
30	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00
40	0.00	0.00			3.68
52					2.40
55	< 5.00	< 5.00	< 5.00	< 5.00	7.50
60	< 2.50	< 2.50	< 5.00		< 2.48
62			< 0.80		< 0.80
68	< 0.10	< 0.10	< 0.10	3.40	< 0.10
93	0.00	0.00	1.42	17.05	1.76
96	0.10	< 0.10	0.10	0.30	0.30
99	0.35	0.10	1.39	3.61	0.76
107				1.20	0.70
117					12.00
125	0.00		0.00		0.00
132	0.00	0.00	0.00	< 16.00	< 14.00
135	< 2.00	< 2.00	< 2.00	7.00	< 2.00
138	< 0.50	< 0.50	< 0.50	< 2.00	< 0.50
143	< 0.50	< 1.00	< 0.50	1.58	< 1.00
144					0.15
145		0.00			0.00
148	0.10	0.10	0.30	2.40	0.60
160	0.10	0.11	0.23	2.49	0.97
167	0.00	0.00	1.00	1.60	1.80
186	0.10	0.20	0.20	11.60	0.80
192	0.13	0.18	0.22		0.63
199	0.40	0.30	0.30	2.50	0.80
215	0.00	0.00	0.00	1.40	0.00
238	< 25.00				< 5.00

VOC 2023, Blank samples

Blank value sample 1

Laboratory	1,2,3-Trimethylbenzene	4-Methyl-2-pentanone	alpha-Pinene	Benzaldehyde	Benzene
256	< 0.50	< 0.50	< 0.50	0.74	3.11
258	< 1.00	< 1.00	< 1.00	3.46	3.61
261				3.93	1.96
267	4.00		28.30		7.00
503			< 5.00		< 5.03
510		0.00			0.00
518	0.40	< 0.20		0.90	< 0.20
-	--	--	--	--	--
No. of laboratories that submitted results	27	26	26	23	36

Laboratory	Cumene	n-Decane	n-Heptane	p-Xylene	Toluene
Unit	µg/m ³	µgt/m ³	µg/m ³	µg/m ³	µg/m ³
17	< 2.00	< 2.00	< 3.00	< 2.00	< 1.00
21	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
30	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00
40	0.00		0.00	2.18	2.15
55	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00
60	< 5.00	< 5.00	< 5.00	< 2.48	< 2.48
62		< 1.00		2.30	4.10
68	< 0.10	13.20	< 0.10	< 0.10	< 0.10
93	0.00	0.59	5.25	0.70	24.71
96	< 0.10	0.20	0.10	0.30	0.50
99	0.51	0.80	0.12	0.59	0.57
125	0.00	0.00	7.49	2.15	5.40
132	0.00	0.00	0.00	0.00	< 17.00
135	< 2.00	< 2.00	< 2.00	< 2.00	2.50
138	< 0.50	< 0.50	< 1.00	< 0.50	0.80
143	< 0.50	< 0.50	< 1.50	< 1.00	< 1.00
144					0.53
145				0.00	0.00
148	0.04	0.20	0.20	0.40	0.90
160	0.06	0.29	0.29	0.47	0.85
167	0.00	0.30	0.00	0.60	0.80
186	0.00	0.20	0.30	0.20	0.70
192		0.28	0.21	0.52	0.75
199	0.20	0.30	0.30	0.70	0.80
215	0.00	0.00	0.00	0.00	0.00
238	< 25.00	< 25.00	< 25.00	< 10.00	< 10.00
256	< 0.50	< 0.50	< 0.50	< 0.50	1.28
258	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
261				0.43	1.40
267	1.20	64.10	13.80	31.00	53.50
503	< 5.03	< 5.00	< 5.00	< 5.03	< 5.03
510				0.00	0.00
518	< 0.20	0.80	0.20	0.30	0.60
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Laboratory	Cumene	n-Decane	n-Heptane	p-Xylene	Toluene
No. of laboratories that submitted results	27	28	28	32	33

Summary of laboratory test results

Blank value sample 2

Laboratory	1,2,3-Trimethylbenzene	4-Methyl-2-pentanone	alpha-Pinene	Benzaldehyde	Benzene
Unit	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
17	< 5.00	< 1.00	1.40	5.40	< 2.00
21	< 1.00	< 1.00	< 1.00	1.00	2.00
30	< 2.00	< 2.00	< 2.00	2.70	< 2.00
40	0.00	0.00			3.18
52					2.50
55	< 5.00	< 5.00	< 5.00	< 5.00	5.00
60	< 2.50	< 2.50	< 5.00		< 2.50
62			< 0.80		< 0.80
68	< 0.10	< 0.10	< 0.10	1.00	< 0.10
93	0.00	0.00	1.45	12.04	1.65
96	0.20	0.10	0.20	0.30	0.40
99	0.41	0.63	2.49	2.13	0.71
107				1.60	
117					12.00
125	0.00		0.00		0.00
132	0.00	0.00	0.00	0.00	< 14.00
135	< 2.00	< 2.00	< 2.00	2.30	< 2.00
138	< 0.50	< 0.50	< 0.50	< 2.00	< 0.50
143	< 0.50	< 1.00	< 0.50	1.29	< 1.00
144					0.11
145		0.00			0.00
148	0.20	0.30	0.30	2.10	0.60
160	0.19	0.15	0.20	2.14	0.74
167	0.00	0.00	0.00	0.70	1.30
186	0.10	0.20	0.20	1.30	0.50
192	0.27	0.43	0.31		0.61
199	0.60	0.40	0.20	2.00	0.50
215	0.00	0.00	0.00	1.80	0.00
238	< 25.00				< 5.00

VOC 2023, Blank samples

Blank value sample 2

Laboratory	1,2,3-Trimethylbenzene	4-Methyl-2-pentanone	alpha-Pinene	Benzaldehyde	Benzene
256	< 0.50	< 0.50	< 0.50	0.62	2.37
258	< 1.00	< 1.00	< 1.00	20.25	4.05
261				2.30	1.04
267	6.10		27.90		7.90
503			< 5.00		< 5.00
510		0.00			0.00
518	0.40	< 0.20		0.60	< 0.20
-	--	--	--	--	--
No. of laboratories that submitted results	27	26	26	23	35

Laboratory	Cumene	n-Decane	n-Heptane	p-Xylene	Toluene
Unit	µg/m ³	µgt/m ³	µg/m ³	µg/m ³	µg/m ³
17	< 2.00	< 2.00	< 3.00	< 2.00	1.50
21	< 1.00	< 1.00	< 1.00	< 1.00	1.00
30	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00
40	1.11		0.00	1.92	2.63
55	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00
60	< 5.00	< 5.00	< 5.00	< 2.50	< 2.50
62		< 1.00		< 1.20	< 2.50
68	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
93	0.00	0.79	6.60	1.39	33.28
96	0.10	0.40	0.20	0.50	1.00
99	0.78	0.86	1.04	0.94	0.82
125	0.00	0.00	0.00	0.00	3.41
132	0.00	0.00	0.00	0.00	0.00
135	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00
138	< 0.50	< 0.50	< 1.00	< 0.50	1.40
143	< 0.50	< 0.50	< 1.50	< 1.00	< 1.00
144					0.75
145				0.00	0.00
148	0.10	0.40	0.40	0.60	1.50
160	0.10	0.45	0.27	0.59	1.18
167	0.00	0.40	0.00	0.00	1.00
186	0.00	0.20	0.30	0.20	1.00
192		0.54	0.51	0.92	1.40
199	0.30	0.70	0.20	0.60	0.90
215	0.00	0.00	0.00	0.00	0.00
238	< 25.00	< 25.00	< 25.00	< 10.00	< 10.00
256	< 0.50	0.67	< 0.50	0.67	1.63
258	< 1.00	< 1.00	1.27	< 1.00	1.21
261				0.49	1.24
267	2.50	63.30	13.20	31.20	50.30
503	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00
510				0.00	0.00
518	< 0.20	0.70	0.20	0.60	1.00
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Laboratory	Cumene	n-Decane	n-Heptane	p-Xylene	Toluene
No. of laboratories that submitted results	27	28	28	32	33

Questions and Answers

Participant	Sample carrier	Analytical method
17	TENAX, Supelco und Perkin Elmer	DIN 16000-6
21	Tenax TA; (Markes 35/60)	EN 16516
30	Tenax TA	ISO 16000-6
40	Thermodesorptionsmetallröhrchen mit Tenaxfüllung (Markes)	Hausmethode
52	TENAX	DIN ISO 16000-6
55	Tenax TA	EN16516
60	manufacturer	DIN ISO 16006
62	helium	DIN EN ISO 16017-1
68	Tenax TA	Auf Basis von EN ISO 16000-5 und ISO 16000-6 wurde eigene Labormethode entwickelt
93	Tenax-TA 60/80 , Merck KGaA	DIN ISO 16017-1
96	Tenax GR	Inhouse method
99	SUPELCO Tenax TA, 35/60 mesh, glass TD tube	ISO 16000-6
107	SS TD Tube, Tenax TA, Supelco	16000-6
117	Tenax TA	DIN ISO 16000-6
125	Tenax TA	in house
132	Gerstel Tenax TA 60/80 glass thermal desorption tubes (009947-000-00)	Internal method based on ISO 16000-6
135	Tenax TA (Merck) in Edelstahl	ISO 16000-6
138		DIN ISO 16000-6 (03-2022)
143	Tenax TA, Markes	DIN ISO 16000-6
144	Glass tubes, Tenax GR, Markes International	Inhouse method
145	Gerstel Tenax TA - Carbosieve S3	Hausmethode
148	Tenax TA (Markes)	DIN ISO 16000-6, DIN EN 16516
160	Stainless Steel, Tenax, RESTEK	DIN ISO 16000-6
167	Markes Material Emission Tubes (Quartz Wool, Tenax TA, Carbograph 5TD)	EN 16516
186		DIN ISO 16000-6
192	TenaxTA	ISO 16000-6
199	Tenax TA; Markes	in Anlehnung an DIN ISO 16000-6: 2022-3
207	Tenax, Markes Röhrchen	DIN ISO 16000-6
215	Markes Tenax TA- glass tubes	DIN ISO 16000-6
218	Edelstahl, Tenax TA	DIN ISO 16000-6:2022-03
237	Tenax TA Markes	Inhouse

Participant	Sample carrier	Analytical method			
238	tubes Markes Carbotrap 349 (CpkY/CpkB/Cbxn1003)	NF EN ISO 16017-1			
256	Tenax TA	DIN ISO 16000-6			
258	Stainless steel tubes, Tenax TA, Markes	ISO 16000-6			
261	Edelstahl Adsorptionsröhrchen gefüllt mit Tenax TA, Firma Camsco	DIN ISO 16000-6			
267	Stainless Steel tubes filled with Tenax TA (ref. C1-AXXX-5003, Markes International)	ISO 16000-6			

Participant	Gas chromatograph (GC)	Thermal desorber	Desorption temperature	Desorption flow	Desorption time
17	Thermo Fisher Trace 1310	Markes TD100-xr-advanced	270°C	40	7
21	Agilent 7820A	Markes TD-100xr	300	25	10
30	GC 7890 Agilent	TD 650 Perkin Elmer	260°C	50	30
40	7890	Markes TD-100xr	250	50	3
52	Perkin Elmer	Perkin Elmer	280 °C	20	20 Minuten
55	Trace GC Ultra (Thermo)	Markes TD-100	300 °C	30	10
60	AGILENT 7890A	MARKES	295	100	5
62	Agilent	Perkin	250°C	23	10
68	Agilent 7890B Series GC Custom	TD100-xr (ATD) von Markes	300°C	50 ml/min	20 min.
93	GCMS-QP2020 , Shimadzu Corporation	JTD-505? , JAPAN Analytical Industry Co.Ltd	250?	1ml/min	15min
96	Agilent 7890B	Gerstel TDSA	225°C	Proprietary	4 min
99	Perkin Elmer Clarus 690 GC	Perkin Elmer TurboMatrix 350 ATD	300?	50 mL/min	10 min
107	Thermo Trace 1310	Markes 100-TD xr	280 °C	40 ml/min	6 min
117	Agilent 7890 A	PerkinElmer TurboMatrix 650	280 °C	20	15
125	Agilent 6890-5973N	Markes Unity/Ultra	300	20	5
132	Agilent GC/MS	Gerstel TDS3	300°C	50	10
135	Agilent 7890B	Perkin Elmer TurboMatrix 650	270°C	29	15
138	Shimadzu QP-2020	Shimadzu TD-30R	220°C		
143	Agilent 7920A	MArkes TD 100	250°C	20	20
144	Agilent 8890 GC	Perkin Elmer Turbomatrix 650, Tenax GR tubes	300°C	50 mL/min	10 min
145	Agilent 6890N	Gerstel TDS3	260°C	50	21
148	Agilent GC 7890B	Markes TD100	280°C	50	10
160	SHIMADZU Nexis GC-2030	SHIMADZU TD-30	280 ?	30 mL/min	10 minutes
167	Agilent 6890N	Markes ATD 100XR	320	40	10
186	Perkin Elmer Clarus 680 GC	Perkin Elmer TurboMatrix 350 ATD	280°C	50	10
192	Agilent technologies	Markes International	270°C	30mL/min	10min

Participant	Gas chromatograph (GC)	Thermal desorber	Desorption temperature	Desorption flow	Desorption time
199	Agilent 7890B	TD-100 Markes	250 °C	50 mL/min	5 min
207	Agilent 7890	Markes Unity TD 100	300	20	8
215	Shimadzu GC 2010 Plus	Shimadzu TD20	300°C	60 ml/min	10 min.
218	Agilent 7890A	Markes TD-100			
237	PE Clarus	PE Turbomatrix	300	30	10
238	GC 8890 / MSD5977B	TD 100 XRMarkes	330°C	100 mL/min	15 min
256	Agilent 8890	Perkin Elmer TurboMatrix 650	300°C	50 ml/min	5 min
258	Agilent 8890	Markes TD-100-xr	280°C	42	15
261	Perkin Elmer Clarus 680	Perkin Elmer ATD 650	275 °C	30	15
267	Agilent 8890	Markes Unity-xr	280°C	50 mL/min	15 min

Participant	Cryo trap	Carrier gas	Carrier gas flow
17	20°C, 280°C	Helium	1,4
21	10°C and 320°C	He	1.6
30	-30°C/280°C	Helium	1.0
40	Kühltemperatur: 10°C / 40°C/s / 280°C	Helium	2,3
52	-30°C und 280°C	Helium	60
55	10-350 °C max heating rate	He	1.5
60	-10°C and 300°C	Helium	2.5
62	-30°C - 340°C	helium	1 (colonne GC)
68	-20°C / 300°C	Helium	15 ml/min
93	cryo- trap temperature is -40? , heating temperature is 250?	Helium gas	1ml/min
96	Proprietary	Helium	Proprietary
99	5? / 300?	Helium	N/A
107	- 5 °C, Max (100 °C/sec)	Helium	1 ml/min
117	-30 °C; +280 °C	Helium	1
125	10 and 300	Helium	
132	-120°C	helium	not sure what this question refers to. Purge flow 52.0ml/min, column flow is 1.3ml/min.
135	-20°C/300°C	Helium	1,5
138	-30°C auf 220°C	Helium	1,2ml/min
143	-10 / 300	He	1,29
144	-25 C (cold trap) and 325 C (heating temperature)	Helium	1.63 mL/min
145	-150°C	Helium	2

Participant	Cryo trap	Carrier gas	Carrier gas flow
148	-20 / 315	Helium	0,5
160	280 ?	Helium	4.00 mL/min
167	5 / 320	Helium	1,5
186	-30°C and 40°C/s	Helium	1,8
192	5°C / 280°C	Helium	1,3mL/min
199	25-300 °C	Helium	0,7 mL/min
207	-25	Helium	1,2
215	Trap Heat Temp 300°C / Cool Temp. 0°C	Helium	4,8 ml/min
218		Helium	
237	-20/ +270	He	0,5
238	T°C cryo = 15°C, T°C heating = 300°C	Helium	1 mL/min
256	2°C / 300°C	Helium	1,2
258	-30°C, 300	Helium	1,3
261	-8 / 278 °C	Helium	1
267	-5°C - 300°C	Helium	1.77 mL/min

Participant	Analytical column	Detector
17	DB 5MS 30m x 0.25mm x 1µm	ISQ 7000
21	Restek Rxi-5Sil MS (60m x 250µm x 1µm)	Agilent 5977E MSD
30	RTX5-MS	FID (except benzene by MS)
40	Restek RXI-1MS	MS
52	Zebtron 1 MS 60X0,32X1µm	MS/FID
55	Rxi-5Sil-MS 60 m x 0.25 mm ID x 1µ film	MS
60	HP-5MS	MS
62	RTx-VMsRestek L=30m, di=0,25 mm, e= 1,4 µm	MS
68	Vocol von Supelco	7000D Quadrupol MS/MS von Agilent
93	HP-1MS , Length 60m , Diam 0,250mm , Film 0,25µm , Agilent Technologies	Mass spectrometer (Shimadzu Corporation GCMS-QP2020 ; EI quadrupole mass analyzer)
96	Agilent J&W DB1MS	Mass spectrometer
99	Elite-1	Perkin Elmer Clarus SQ8
107	OPTIMA 5 MS 60 m x 0,25 mm x 1 µm	Massenspektrometer (Thermo ISQ 7000)
117	5 %-Phenyl- und 95 %-Methylpolysiloxan	MSD
125	DB-5MS 60m x 0.25 x 2um	Agilent 5973N
132	Agilent 19091B-115 Ultra 2 5% Phenyl Methyl Siloxane (50.0 m X 320.00 um X 0.52 um)	Agilent MSD

Participant	Analytical column	Detector
135	RTX-200	MSD
138	Restek RTX-5ms	MS und FID
143	DB24UI 30mx0,25mmx1,4µm	Single Quadrupol Agilent 5977E MSD
144	HP-5MS Column (30m x 0.25 mm x 0.25 µm film)	Agilent 7000D MSD
145	DB-624 60 x 0,25 x 1,4	FID / MSD
148	Restek Rxi-5Sil MS, 20m x 0,18mm id x 0,36µm df	MS
160	DB-1MS	SHIMADZU GCMS-QP2020NX
167	Agilent DB-5MS UI	Agilent 5975 MSD
186	Agilent DB-5ms UI 0.25mm x 60m x 1µm	Perkin Elmer SQ8
192	InertCap1 (60m, 0.25mm id, 1.5µm df)	MSD
199	DB-5.625MS	Massendetektor (5977A MSD)
207	DB 5	MS Agilent 5975
215	Agilent VF-5ms ,60 m	Massenspektrometer Shimadzu QP 2010 Ultra
218	DB5	Agilent 5975C
237	Varian	MS
238	RTX 624	GC/MS
256	60m Rtx / 0.25 ID / 1.4 µm	Agilent MSD 5977B
258	HP-ULTRA 2, 50m x 0.32mm, 0.52µm (Agilent 19091B-115)	Agilent 5977 MSD
261	Rtx-VMS	Massenspektrometer Perkin Elmer Clarus SQ8
267	HP Innowax 60 m x 0.32 mm x 0.5 µm, Agilent Technologies (ref: 19091N-216)	Mass spectrometer (scan mode for acquisition)

Participant	Data evaluation
17	Kalibration je Substanz; Retentionszeit, Datenbank
21	Calibration Curve
30	external
40	Interne Standardmethode, Identifizierung mit MS
52	FID/MS
55	5 point calibration curve with external calibration
60	Scan
62	acquisition SCAN - quantification SIM
68	Identifikation mit MS; Quantifizierung mit entspr. Berechnung in einem Excelfile
93	A calibration curve was created using standard substances with cyclodecane as an internal standard, and quantitative and qualitative measurements were performed.
96	Quantification based on TIC using toluene equivalent sensitivity. Identification, manual comparison to NIST library

Participant	Data evaluation
99	Calibration curve method, NIST Library
107	automatische Identifizierung und Quantifizierung mittels Chromeleon-Software
117	Quantifizierung über Kalbriergeraden; Identifizierung über MS- und Retentionszeiten-Vergleich
125	Scan
132	Match to a library, target ion and qualifying ion for identification, target compound quantification using a target compound with a three-point calibration curve.
135	externer Standard/Check von Retentionszeit und Massenspektrum
138	Identifizierung: Retentionszeit + Massenspektrum; Quantifizierung: MS interne Standardmethode, FID externe Standardmethode
143	Quantifizierung über Kalibrierreihe (Tenax-Röhrchen mit STd dotiert), Identifizierung über Retentionszeit und ausgewählte Massenspuren
144	Quantification based on Toluene equivalence, Identification based on NIST library
145	Quantifizierung: FID Qualifizierung: MSD
148	Identifizierung und Quantifizierung mittels GC-MSD und Toluol d8 als Interner Standard, 12-Punkt Kalibrierung aller Analyten (1-500 ng abs.)
160	SIM mode
167	4 Point calibration curve with internal standard, match against commercial libraries with qualifier ions
186	identification with specifics standards and quantification with internal standards
192	Absolute calibration curve
199	Standards externe Kalibrierung, Korrektur über interne Standards
207	EIC Originalreferenzen, eigene und kommerzielle Bibliotheken
215	Über substanzspezifische Kalibrierung, automatische Auswertung über "compound table" Funktion
218	externe Kalibrierung
237	MS, MS
238	Internal calibration + sim & scan
256	Substanzspezifische 6-Punkt-Kalibrierung, Retentionszeit, Massenspektren
258	External standards of specific substances for quantification, MS spectra and retention times of standards for identification
261	Quantifiziert nach charakteristischer Ionenspur mit internem Standard und 8-Punkt Kalibrierung, Identifikation erfolgt nach Spektrum
267	Acquisition in scan mode, quantification with one m/z quantifier and confirmation of identification with specific qualifiers and their ratio

Participant	Recovery rate
17	ja (Kalibration wurde über dotierte Röhrchen gemacht)
21	No
30	No
40	ja
52	nein
55	yes

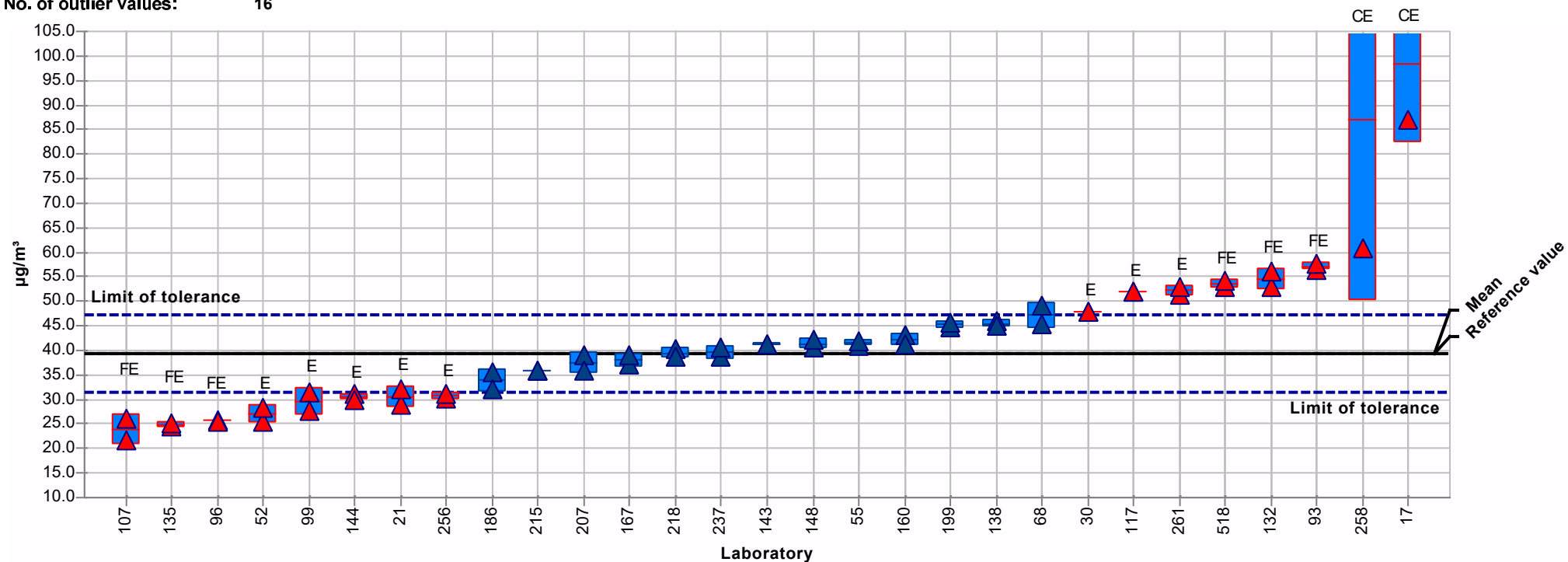
Participant	Recovery rate
60	No
62	NO
68	Nein
93	NO
96	Not possible, concentration on tubes not known
99	No
107	Ausgleich lediglich von Desorptionsschwankungen über automatische IS-Dotierung in diesem Schritt
125	no
132	No
135	ja
138	nein
143	nein
144	N/A
145	nein
148	nein
160	No.
167	No
186	No
192	No
199	nein
207	nein
218	Nein
237	nein
238	no
256	nein
258	No
261	Nein
267	No

Participant	Date of analysis
17	14.09.2023
21	08/09/2023; 15/09/2023
30	23/10/2023

Participant	Date of analysis
40	13.09.2023
52	18.09.2023
55	15/09/2023
60	september 18, 2023
62	20/09/2023
68	05./06.10.2023
93	14/Sep/2023
96	9/11/2023
99	2023/10/25
107	Die ersten Proben jeweils am 14.09, die zweiten Proben eine Woche später am 21.09.
117	19.09.2023
132	10/17/2023
135	14.09.2023
138	12.09.2023
143	19.-20.10.2023
144	9/12/2023
145	02.10.2023
148	13.09.2023
160	2023-09-20
167	13 Sept. 2023
186	18/09/2023
192	26 Sep 2023
199	11.09.2023
207	15.09.2023
215	13.09.2023
218	18.09.2023
237	19.09.2023
238	11/09/2023
256	05.09.2023
258	September 28, 2023
261	29.09.2023
267	21/09/2023

Summary results

Sample:	1	Mean:	39.48 µg/m³
Measurand:	Benzaldehyde	Reproducibility s.d.:	7.42 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	18.79%
Rel. target s.d.:	10.00% (Limited)	Reference value:	39.40 µg/m³
No. of measurement values:	58	Range of tolerance:	31.58 - 47.38 µg/m³ (Z-Score ≤ 2.00)
No. of outlier values:	16		



Summary results

Sample:	2	Mean:	27.11 µg/m³
Measurand:	Benzaldehyde	Reproducibility s.d.:	5.89 µg/m³
Method:	ISO 5725-2	Rel. reproducibility s.d.:	21.73%
Rel. target s.d.:	10.00% (Limited)	Reference value:	26.00 µg/m³
No. of measurement values:	58	Range of tolerance:	21.69 - 32.53 µg/m³ (Z-Score ≤ 2.00)
No. of outlier values:	16		

