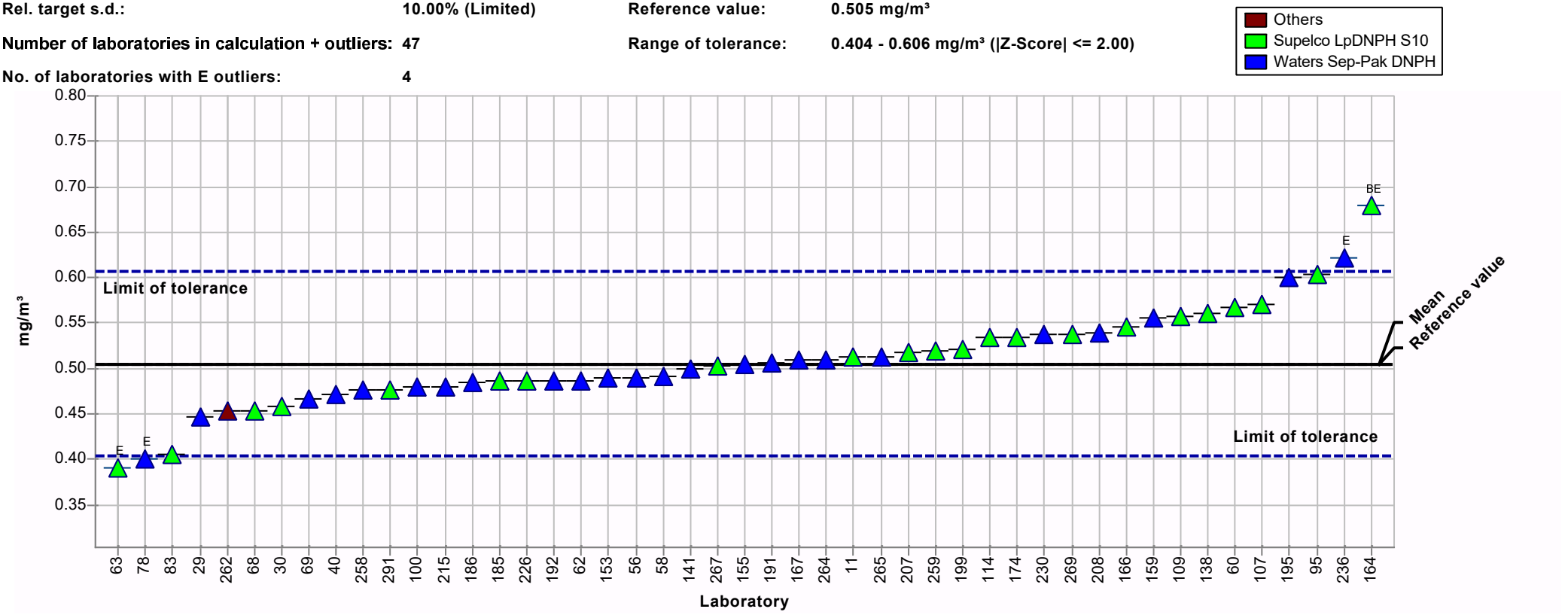
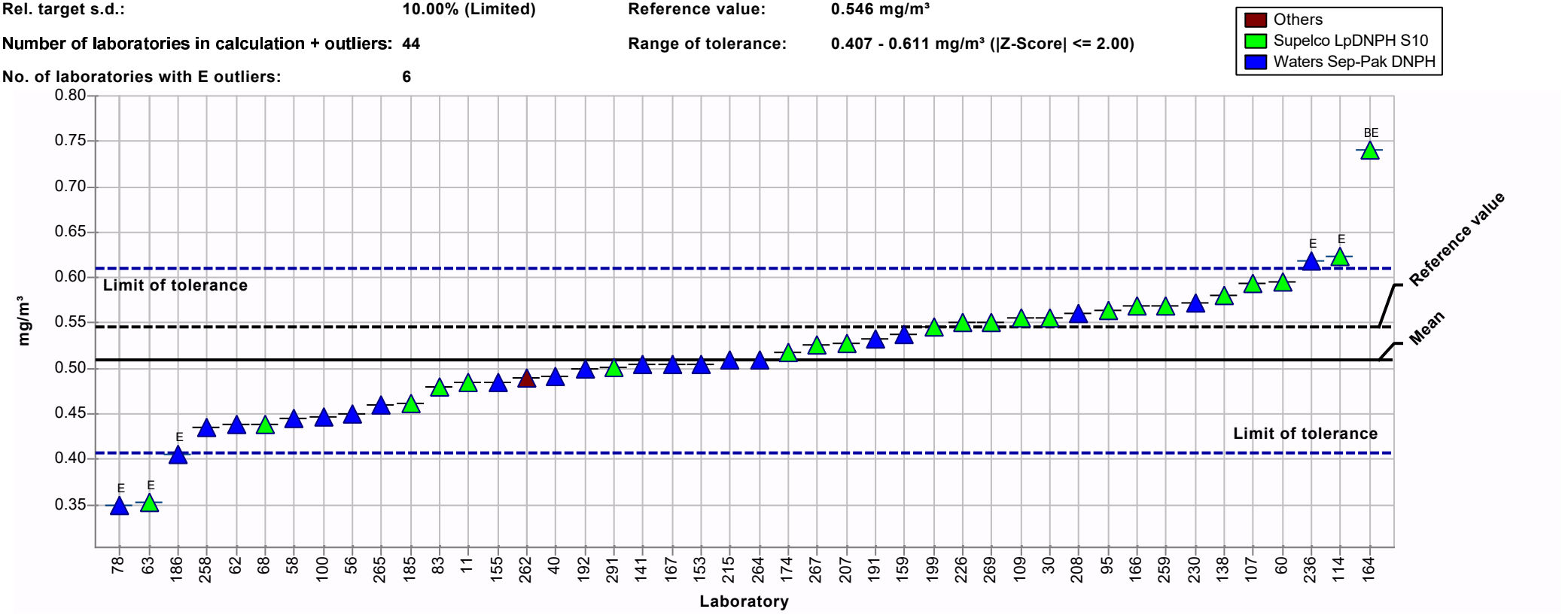
Summary results

Sample:	**2**	**Mean:**	**0.505 mg/m³**
Measurand:	**Acetaldehyde**	**Reproducibility s.d.:**	**0.049 mg/m³**
Method:	**ISO 5725-2**	**Rel. reproducibility s.d.:**	**9.75%**
Rel. target s.d.:	**10.00% (Limited)**	**Reference value:**	**0.505 mg/m³**
Number of laboratories in calculation + outliers:	**47**	**Range of tolerance:**	**0.404 - 0.606 mg/m³ (|Z-Score| <= 2.00)**
No. of laboratories with E outliers:	**4**		



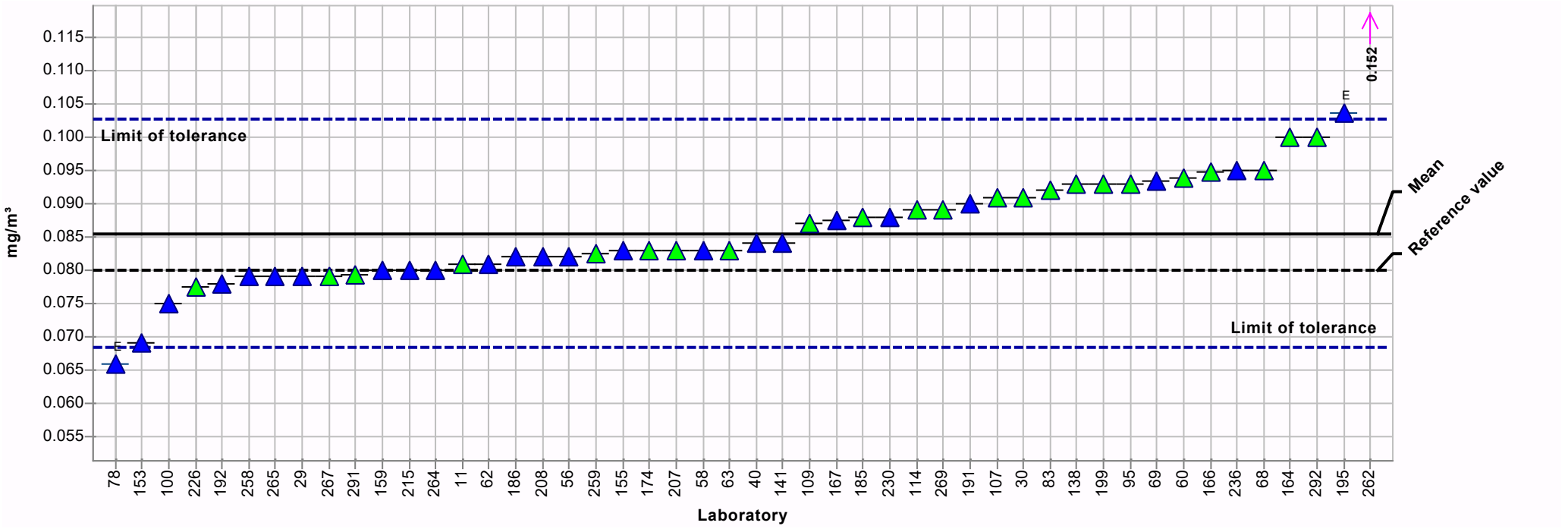
Summary results

Sample:	**2**	**Mean:**	**0.509 mg/m³**
Measurand:	**Butyraldehyde**	**Reproducibility s.d.:**	**0.063 mg/m³**
Method:	**ISO 5725-2**	**Rel. reproducibility s.d.:**	**12.41%**
Rel. target s.d.:	**10.00% (Limited)**	**Reference value:**	**0.546 mg/m³**
Number of laboratories in calculation + outliers:	**44**	**Range of tolerance:**	**0.407 - 0.611 mg/m³ (|Z-Score| <= 2.00)**
No. of laboratories with E outliers:	**6**		



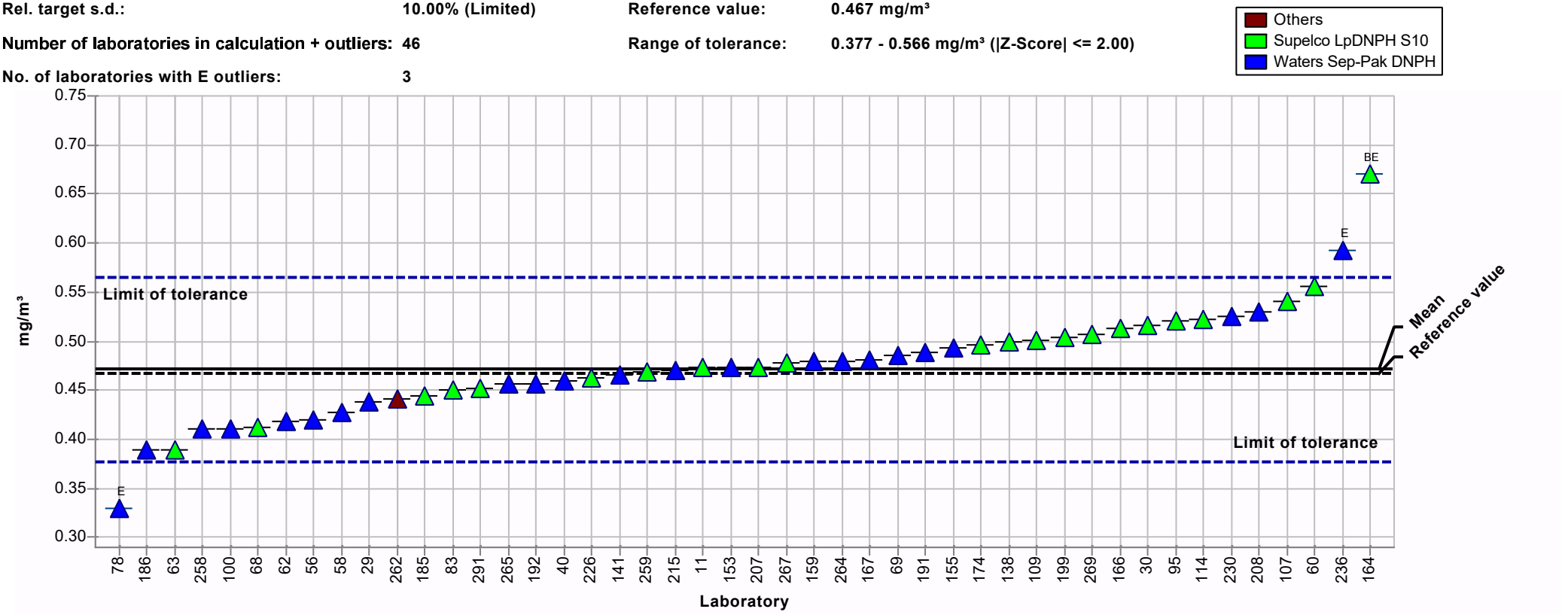
Summary results

Sample:	**2**	**Mean:**	**0.086 mg/m³**
Measurand:	**Formaldehyde**	**Reproducibility s.d.:**	**0.008 mg/m³**
Method:	**ISO 5725-2**	**Rel. reproducibility s.d.:**	**9.09%**
Rel. target s.d.:	**10.00% (Limited)**	**Reference value:**	**0.080 mg/m³**
Number of laboratories in calculation + outliers:	**48**	**Range of tolerance:**	**0.068 - 0.103 mg/m³ (|Z-Score| <= 2.00)**
No. of laboratories with E outliers:	**3**		



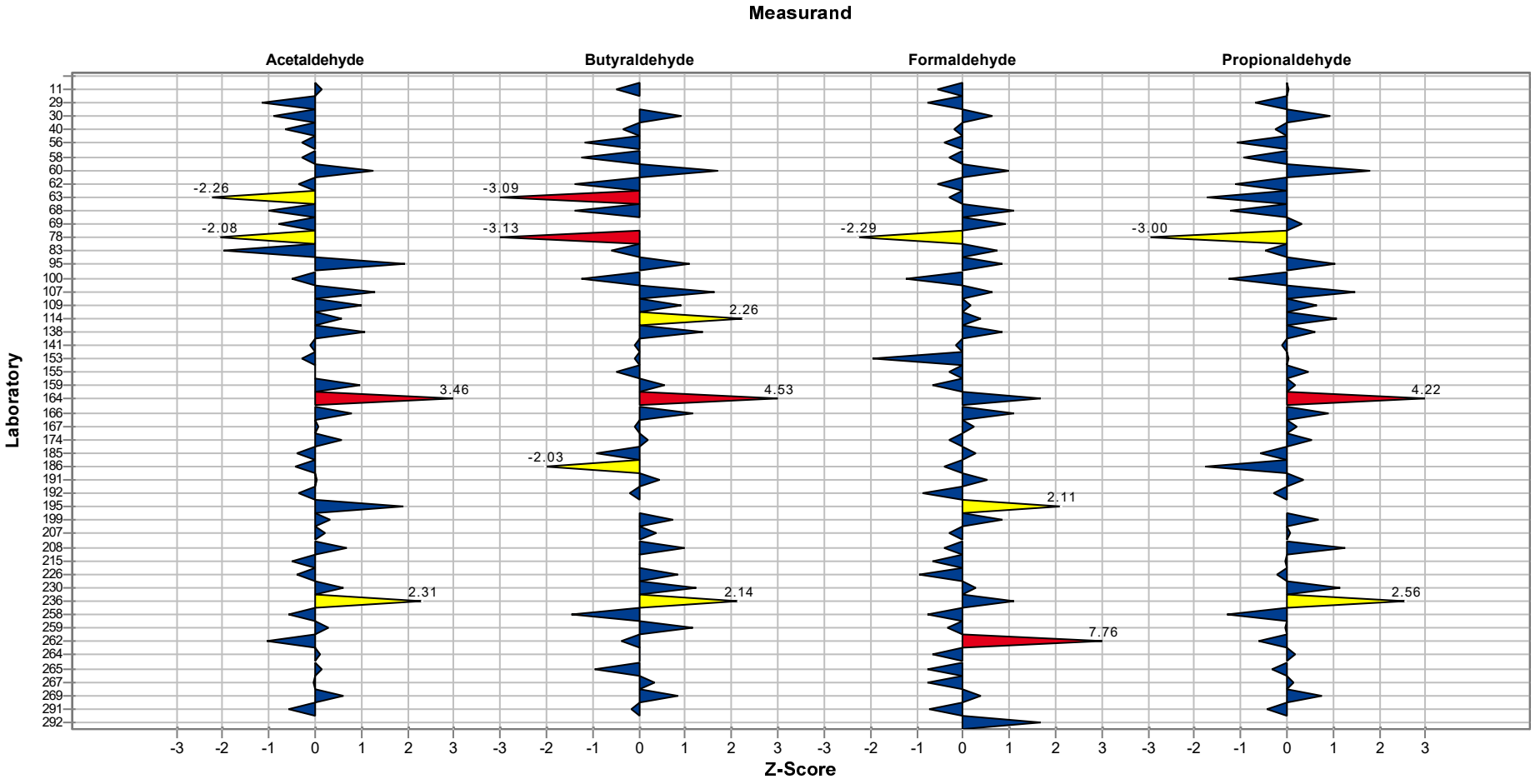
Summary results

Sample:	**2**	**Mean:**	**0.471 mg/m³**
Measurand:	**Propionaldehyde**	**Reproducibility s.d.:**	**0.048 mg/m³**
Method:	**ISO 5725-2**	**Rel. reproducibility s.d.:**	**10.27%**
Rel. target s.d.:	**10.00% (Limited)**	**Reference value:**	**0.467 mg/m³**
Number of laboratories in calculation + outliers:	**46**	**Range of tolerance:**	**0.377 - 0.566 mg/m³ (|Z-Score| <= 2.00)**
No. of laboratories with E outliers:	**3**		



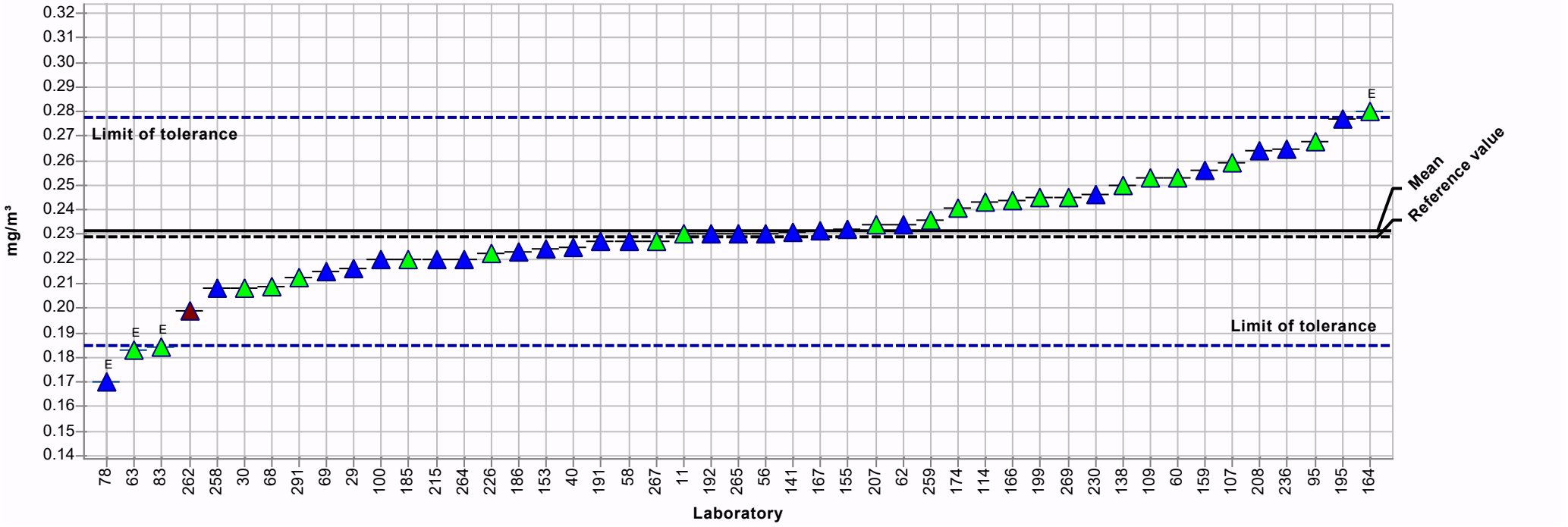
Sample chart of *Z-Scores*

Sample: 2



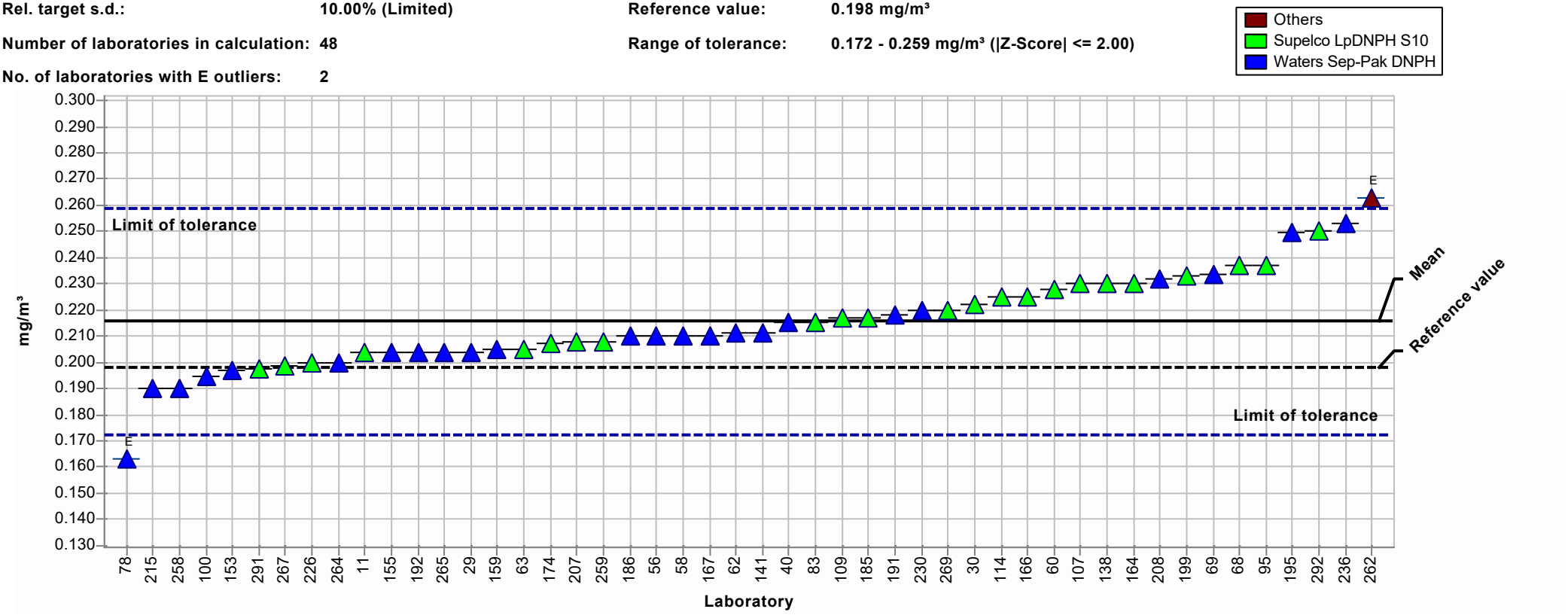
Summary results

Sample:	**3**	**Mean:**	**0.231 mg/m³**
Measurand:	**Acetaldehyde**	**Reproducibility s.d.:**	**0.023 mg/m³**
Method:	**ISO 5725-2**	**Rel. reproducibility s.d.:**	**9.95%**
Rel. target s.d.:	**10.00% (Limited)**	**Reference value:**	**0.229 mg/m³**
Number of laboratories in calculation:	**47**	**Range of tolerance:**	**0.185 - 0.277 mg/m³ (|Z-Score| <= 2.00)**
No. of laboratories with E outliers:	**4**		



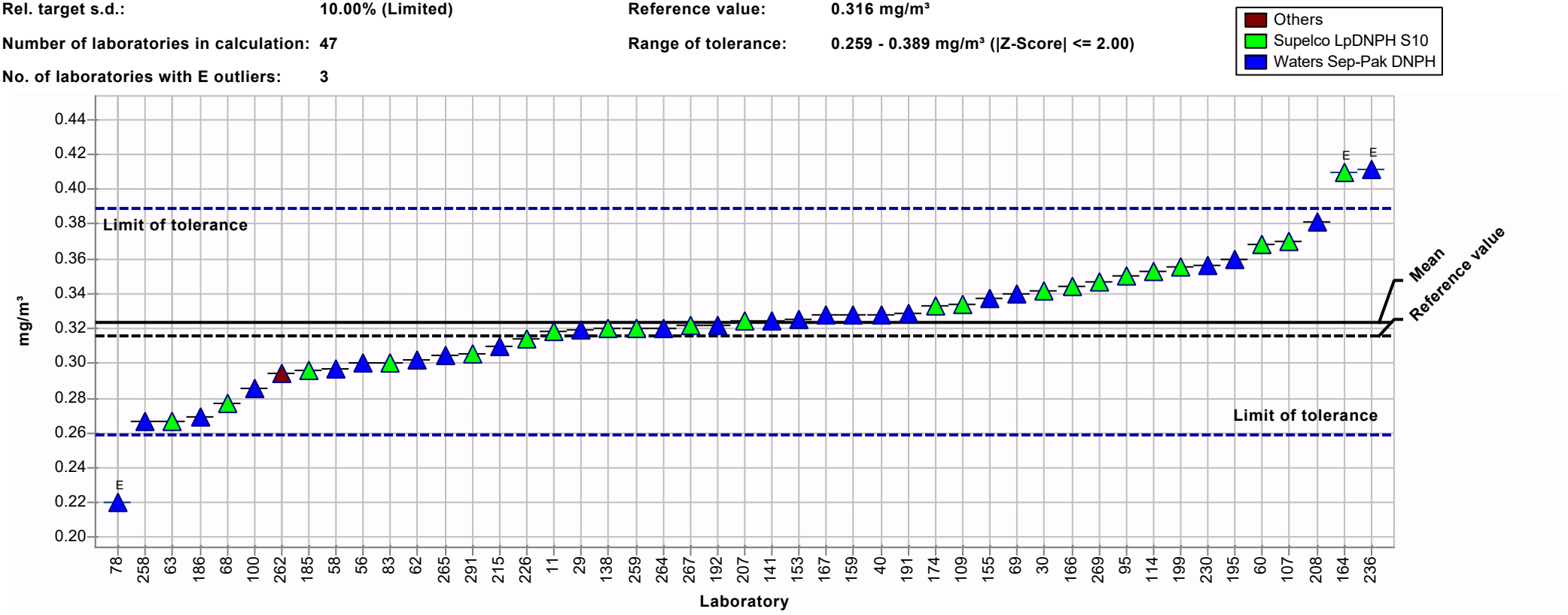
Summary results

Sample:	**3**	**Mean:**	**0.216 mg/m³**
Measurand:	**Formaldehyde**	**Reproducibility s.d.:**	**0.018 mg/m³**
Method:	**ISO 5725-2**	**Rel. reproducibility s.d.:**	**8.57%**
Rel. target s.d.:	**10.00% (Limited)**	**Reference value:**	**0.198 mg/m³**
Number of laboratories in calculation:	**48**	**Range of tolerance:**	**0.172 - 0.259 mg/m³ (|Z-Score| <= 2.00)**
No. of laboratories with E outliers:	**2**		



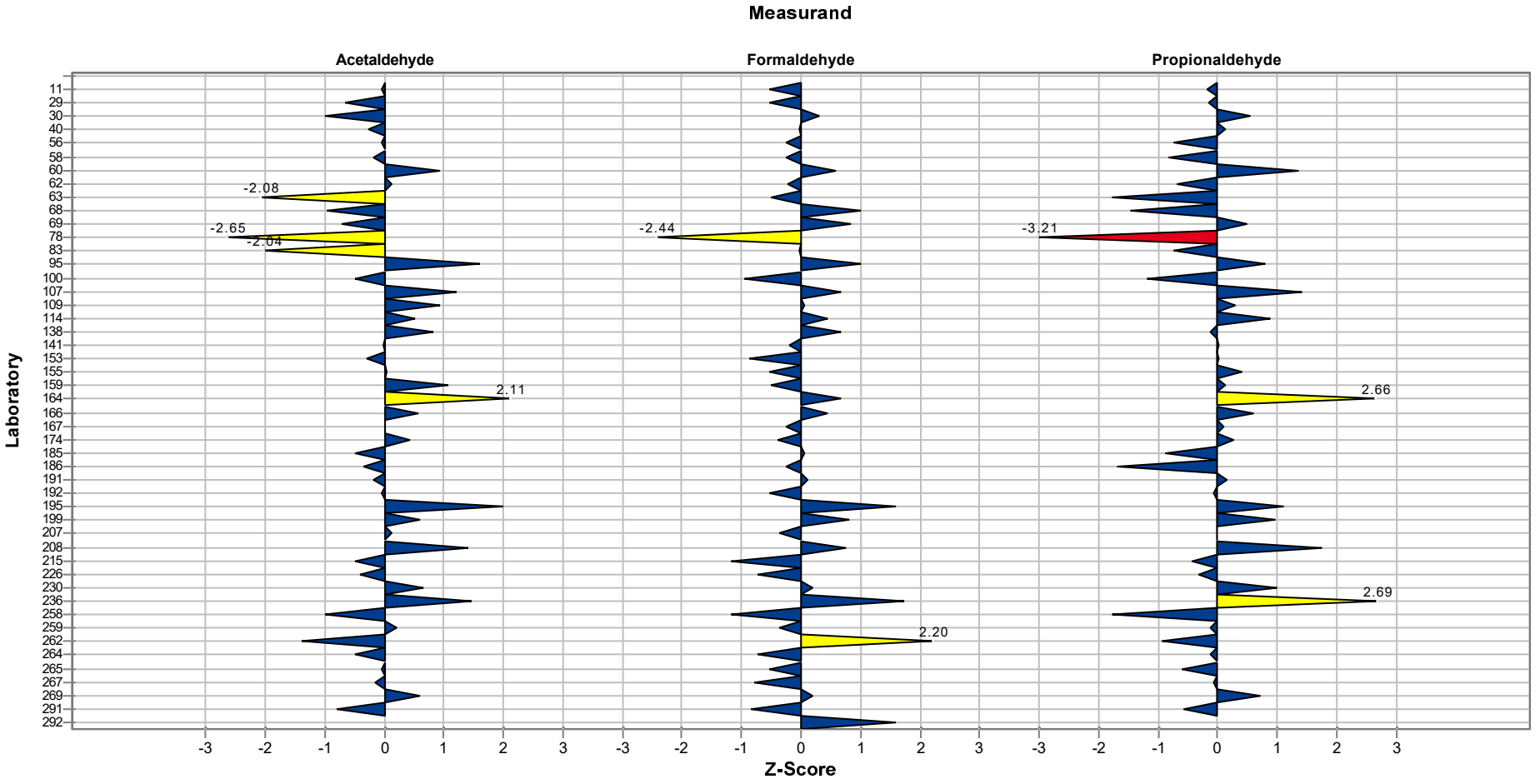
Summary results

Sample:	**3**	**Mean:**	**0.324 mg/m³**
Measurand:	**Propionaldehyde**	**Reproducibility s.d.:**	**0.036 mg/m³**
Method:	**ISO 5725-2**	**Rel. reproducibility s.d.:**	**10.97%**
Rel. target s.d.:	**10.00% (Limited)**	**Reference value:**	**0.316 mg/m³**
Number of laboratories in calculation:	**47**	**Range of tolerance:**	**0.259 - 0.389 mg/m³ (|Z-Score| <= 2.00)**
No. of laboratories with E outliers:	**3**		



Sample chart of *Z-Scores*

Sample: 3



Questions and Answers

Participant	Analytical method	Start sample preparation
11	ISO 16000-3	27/11/2020
29	IFA Arbeitsmappe 6045	7.12.2020
30	ISO 16000-3	30/11/2020
40	HPLC	26.11.2020
56	UHPLC w ith UV detection	23/11/2020
58	HPLC UV	30-11-2020
60	16000-4	26/11/2020
62	HPLC-UV	23/11/2020
63	DIN ISO 16000-3	03.12.2020
68	interne Arbeitsanw eisung	24.11.2020
69	HPLC	25/11/20
78	IFA-Arbeitsmappe 6045	20.11.2020
83	HPLC/DAD	26/11/20
95	Bestimmung von DNPH-Derivaten von Aldehyden und Ketonen mittels LC-DAD	23.11.2020
100	NF X43-264	11/27/2020
107	Hausmethode in Anlehnung an IFA Methode 6045	20.11.2020
109	Hausmethode in Anlehnung an IFA -Arbeitsmappe 6045	23.11.2020
114	HPLC UV	25/11/20
138	BGIA 6045	30.11.2020
141	HPLC / NEN-ISO 16000-3	24-11-2020
153	ISO 16000-3	23.11.2020
155	EN 16516, DIN ISO 16000-3	23.11.2020
159	BGN-Methode AA 7.2-1-1 Nr. 2P (Stand 12/2019)	23.11.2020
164	EPA TO/11	02/12/2020
166	/	25/11/2020
167	UPLC	09.Dec.2020
174	HPLC/UV	25/11/20
185	DIN ISO 16000-3	27.11.2020
186	NF ISO 16000-3	24/11/2020

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Participant	Analytical method	Start sample preparation
191	MET-001 based on ISO 16000-3	24-11-2020
192	ISO16000-3	November 24, 2020
195	NIOSH 2016	14/01/2021
199	in Anlehnung an DIN 16000-3:2013-01	02.12.2020
207		01.12.2020
208	ISO 16000-3:2011	24.11.2020
215	DIN ISO 16000-3 & EN 16516	26.11.20
226	EN ISO 16000-3	26.11.2020
230	DIN EN IS0 16000-3	23.11.2020
236	interne SOP 81.40, angelehnt n NIOSH-Methode Nr. 2016	24.11.2020
258	ISO 16000-3	8 December 2020
259	DIN ISO 16000-3	20.11.2020
264	HPLC/UV	23/11/2020
265	DIN ISO 16000-3	23.11.2020
267	interne Methode	27/11/2020
269	IFA 7520 von 2007	01.12.2020
291	Hausmethode in Anlehnung an VDI 3862 Blatt 3:2000-12 und EPA MEthode 8315A:1996-12	25.11.2020
292	NIOSH 2016	12/7/20

Participant	Storage time after desorption
11	no storage after desorption
29	nein
30	3 days (4°C)
40	Nein
56	0 day
58	hours roomtemp
60	1h
62	11 days at 4 °C.
63	nein
68	1 Tag im Kühlschrank

Participant	Storage time after desorption
69	0 days
78	Nach Desorption direkter Start am HPLC, anschließende Lagerung im Kühlschrank, um einen zw eiten Lauf nach dem Wochenende starten zu können
83	1H
95	2 Tage im Kühlschrank
100	1 hour at room temperature
107	Gefrierschrank, -20 C
109	1 Tag im Kühlschrank, 5 °C
114	one hour, room temperature
138	3 Tage im Kühlschrank
141	None
153	1 day, refrigerator
155	Analyse direkt im Anschluss der Desorption, Rückstellproben im Kühlschrank
159	3 Tage / Kühlschrank
164	One hour at room temperature
166	0.5 Hour at room temperature
167	30 min, rt for the first samples
174	no storage after desorption
185	nein
186	No storage after desorption
191	none
192	No storage after desorption.
195	0 days, samples w ere analyzed immediatelly
199	TK
208	2 h in roomtemperature
215	nein
226	nein
230	Kühlschrank
236	nein
258	Samples w ere received on 23 November 2020 and w ere stored in a refrigerator prior to analysis
259	Nein, Proben w urden am gleich analysiert
264	<1 day in refrigerator
265	3 Tage im Kühlschrank

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Participant	Storage time after desorption
267	0 Tage
269	Ja. Ca. 2 Tage im Kühlschrank
291	2 w eitere Tage (Kühlschrank)
292	ran immediately after dersorption

Participant	Date of analysis	Desorption solution	Volume of desorption solution
11	27/11/2020	acetonitrile	5 mL
29	7.12.2020	Acetonitril	5
30	03/12/2020	acetonitrile	5 ml
40	26.11.2020	Acetonitril	2 ml
56	23/11/2020	acetonitrile	5
58	30-112020	Acetonitrile	ca 10 ml
60	27/11/2020	Acétonitrile	3 mL
62	04/12/2020	Acetonitrile	5 mL
63	03.12.2020	ACN	5
68	25.11.2020	Acetonitril	2mL
69	25/11/20	Acetonitrile	5 ml
78	20.11.2020	Acetonitril	10
83	26/11/20	ACN	2
95	25.11.2020	Acetonitril	5 mL
100	11/27/2020	acetonitrile	4 ml
107	24.11.20 bis 03.12.20	Acetonitril	5
109	24.11.2020	Acetonitril	10
114	25/11/20	acetonitrile	2 mL
138	03.12.2020	Acetonitril	10
141	24-11-2020	acetonitril	10 ml
153	24.11.2020	Acetonitrile	10 ml
155	23.11.2020	Acetonitril	5 ml
159	25.11.2020	Acetonitril mit DNPH u. H3PO4 (in 200 ml ACN : 250mg DNPH)	5 ml
164	02/12/2020	Acetonitrile	4 ml

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Participant	Date of analysis	Desorption solution	Volume of desorption solution
166	25/11/2020	Acetonitrile (ACN) 100%	10
167	09.Dec.2020-10.Dec.2020	Acetonitrile	6 ml filled to 10 ml w ith distilled w ater
174	25/11/20	Acétonitrile	5
185	27.11.2020	DNPH-Lsg	
186	24/11/2020	Acetonitrile	10 mL
191	24-11-2020	Acetonitrile	5
192	November 24,2020	Acetonitrile	5 ml
195	14/01/2021	Acetonitrile	5 ml
199	02.12.2020	Acetonitril	3mL
207	01.12.2020	ACN/H2O Ammoniumbicarbonat	5
208	24.11.2020	Acetonitrile	3 ml
215	26.11.20	Acetonitril	5
226	26.11.2020	Acetonitril	2 ml
230	24.11.2020	Acetonitril	10 ml
236	24.11.2020	Acetonitril	3 ml
258	8 December 2020	Acetonitrile	5
259	20.11.2020	Acetonitril	2 ml
264	23/11/2020	Acetonitrile	5 mL
265	23.11.2020	Acetonitril	10
267	27/11/2020	Acetonitril	5 mL
269	03.12.2020	Acetonitril	5
291	25.11. - 27.11.	Acetonitril	5 ml
292	12/7/20	MeCN	5

Participant	Chromatography system
11	HPLC-UV
29	DAD
30	Waters Alliance 2695 / PDA 2996
40	Agilent HP 1200
56	HPLC/UV (RS Pump, RS Diode Array, RS Autosampler Ultimate 3000 ThermoFisher Scientific)

Participant	Chromatography system
58	Agilent 1100 series
60	Agilent , 1260 infinity
62	Quaternary pump + UV/Visible detector
63	Shimadzu LC-2030C Plus
68	Agilent HPLC 1260 Infinity
69	Elite LabChrom Merck Hitachi, Pump L-2130, Autosampler L-2200
78	S1132 Pumpe, Celeno II DAD, S5300 Autosampler alle Goebel Analytik
83	La chrom elite
95	Waters Acquity Ultra Performance mit PDA Detektor
100	quaternary pump, UV detector
107	Ultimate 3000 Thermo/Dionex
109	Pumpe: Shimadzu LC20-AD, Detektor: SPD-M20A
114	Thermo electron U3000
138	Thermofisher Ultimate 3000
141	Agilent Technologies 1260 Infinity Quaternary pump (HPLC pomp); Agilent Technologies 1260 Infinity TCC Diode Array Detector; Agilent Technologies 1260 Infinity ALS (autosampler)
153	Dionex Ultimate 3000
155	Agilent 1200 LC System DAD-Detektor
159	Tern. Gradientenpumpe, DAD (HP 1100/1200 Serie Agilent)
164	Quaternary pump; VWD Detector
166	Jasco
167	Agilent 1290 Infinity System
186	HHPLC-PAD, quaternary pump
191	Agilent Infinty II system w ith G1311B pump and VWD detector
192	Agilent 1260 , Agilent 1260 II
195	Infinity 1260 series II
199	Agilent
207	1260 Infinity HPLC DAD (Agilent)
208	Waters ACQUITY UPLC H-class, PDA detector
215	HPLC-DAD System Agilent 1290 Infinity
226	Hersteller Thermo: Pumpe: WPS 3000 TRS; Detektor: VWD 3400 RS; Autosampler: WPS 3000 TRS
230	Fa. Agilent

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Participant	Chromatography system
236	HPLC Agilent Technologies Infinity 1260 mit DAD Detektor
258	Waters Acquity UPLC H-Class
259	Agilent HPLC 1090 mit DAD
264	Shimadzu Nexera i-series
265	Shimadzu LC20, DAD
267	Agilent (Quat Pump) 1260, DAD
269	quaternäre Niederdruck-Gradientenpumpe; DAD; Autosampler von Thermo
291	Agilent 1200er DAD G1315D; ALS G1329A und Pumpe G1311A
292	Waters 2707, Waters 1515, Waters 2489

Participant	Refrigerated autosampler	Analytical column
11	Shimadzu : 4 °C	Shimadzu : 1 column C18
29	nein	Waters XBridge Phenyl
30	no	Allure AK 200 x 4.6 mm 5 µm
40	Nein	Superspher 100 RP 18e, 125 mm * 4mm, 5 µm, Fa. Merck
56	yes, at 15°C	column Acclaim RSCL Carbonyl 2.1*100 mm (Thermo)
58	no, room temp	Zorbax C18
60	no	C18, 5µm, 150*4.6mm
62	No, ambiant temperature	Ascentis RP-Amide HLPC Column
63	ja, 15 °C	Ascentis RP-Amide, 15cm x 4,6mm 5µm
68	Nein	Poroshell 120 EC-C18 4.6x50mm, 2.7um
69	No	Ascentis RP-Amide 25 cm x 4,6 mm
78	nein	ProntoSIL 120-5 C18 ace-EPS, Vertex Plus Column
83	15°C	kinetex
95	nein	Accucore C18 100x2.1 (Thermo Scientific)
100	no	RAPTOR C18
107	ja, 8 °C	Supelcosil LC 18, 25 x 4,6 mmm
109	ohne Kühlung	Kinetex RP18 5 µm 100 Ä 250*4,6 mm
114	no	Acclaim C18
138	nein	Nucleosil 100-5 C18 [250 * 4 mm]

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Participant	Refrigerated autosampler	Analytical column
141	No	Agilent Poroshell 120 EC-C18 50x4.6 mm, 2.7im cat. no. 6999975-902
153	No	Acclaim Carbonyl C18. Dionex
155	gekühlter Autosampler, 20°C	Agilent ZORBAX Eclipse XDB-C18; 4,6 mm x 150 mm x 5-Micron
159	nein	ODS Hypersil 250x4.0mm; 5µm von Agilent mit Vorsäule
164	No	Luna C18, 5µm, (250 x 4.6) mm, 100Å
166	no	Agilent Eclipse Plus C18
167	Agilent 1290 Infinity	Waters Symmetry C18, 3,5µm
174	yes, 4°C	C8 25 cm
186	Yes, 4°C	WATERS Nova-Pak C18/150nm*3.9nm*4µm
191	yes 4°C	Zorbax SB-C18
192	No	Formaldehyde,Acetaldehyde:InertSustain C18 / Propionaldehyde,Butyraldehyde:Inertsil ODS-HL
195	no	Zorbax Eclipse Plus C 18 4.6 mm x 100 mm x 1.8 um
199	nein	C18
207		Phenomenex Kinetex C18, 100*4,6 mm, 2,6µ, 100 A
208	15°C	HSS C18 1,8 µm
215	nein	C18-Silica
226	nein	HPLC-Säule Accucore XL 4 µm, C18, 250 x 4,6 mm, Thermo Scientific 74104-254630
230	nein	MZ PAH C 18, 5 µm
236	nein	Pursuit C18 100x2,0 mm 3µm
258	No	Waters Acquity BEH C18
259	Nein	Nucleosil C 18 AB
264	no	
265	ja, 15°C	Agilent Zorbax RRHD Eclipse Plus C18
267	nein, bei 25 °C	Symmetry C18, 250 mm x 4.6 mm x 5 µm (Waters)
269	Nein	LiChrospher 100, RP-18 von Merck
291	Nein	Macherey und Nagel Nucleodur C18 Pyramid
292	No	C18

Participant	Mobile phase	Flow rate HPLC	Wavelength
11	acetonitrile / Methanol and Water	0,80 ml/min	360 nm

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Participant	Mobile phase	Flow rate HPLC	Wavelength
29	ACN/H2O Gradient	1,5	365
30	acetonitrile / w ater	1.2	360 nm
40	Acetonitril/Reinstw asser (Eluent)	1,0 ml/min	365 nm
56	Solvant A : w ater - Solvant B : Acetonitrile _ gradient de 48% de A à 0% de A	0.4	360 nm
58	35% Water 65% ACN	1 ml/min	360 nm
60	AcN / H2O	gradient	360
62	Acetonitrile/Water 40/60 -> 75/25 -> 100/0	1 mL/min	360 nm
63	40% ACN, 60% Wasser	1	360 nm
68	Gradient: Acetonitril, Methanol, reinst Wasser	1mL/min	365nm
69	Acetonitrile - Water	1,5 ml/min	UV-visible
78	30% Acetonitril 30% Methanol 40% Reinstw asser // Acetonitril	1	365 nm
83	ACN/THF/H2O	1.2	
95	Gradient aus Laufmittel A: Acetonitril/Wasser/THFund B: Acetonitril/Wasser	0,6 mL/min	360 nm
100	w ater/MeOH/ACN	0.8ml/min	360 nm
107	Wasser / Acetonitril	0,6 mi/min	365 nm
109	Acetonitril / Wasser (50:50)	1,0	365 nm
114	Acetonitrile/w ater	1.0 mL/min	360nm
138	Acetonitril / Wasser / Ameisensäure	1,4	360 nm
141	Water:Acetonitril = 45:55	1 ml/min	360 nm
153	Acetonitrile/w ater	0,6 ml/min	360 nm
155	Gradient: Start: ACN 30% / THF 10% / H2O 60%	1 ml/min	360 nm, 365nm, 380 nm
159	Methanol/Wasser/Acetonitril	0,8 ml/min	365 nm; 4 nm BW
164	Acetonitrile/Water	1.5 ml/min	360nm
166	60-40 ACN-H2O	0.7	360 nm
167	ACN w ith 0,1% phosphoric acid	0,25 ml/min	360 nm
174	60% ACN/40% H2O	1	360 nm
186	Acetonitrile/Water/THF	1,5 mL/min	360 nm
191	ACN-H2O-THF	0.6ml/min	360
192	Water/Acetonitrile	1.2 ml/min	360 nm
195	ACN:H2O 40:60	1.8	365
199	Wasser/Acetonitril	0,8mL/min	370nm
207	ACN/THF 80/20 H2O	1,5	360

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Participant	Mobile phase	Flow rate HPLC	Wavelength
208	Acetonitrile/THF/w ater	0,42 ml/min	360 nm
215	Wasser / ACN / THF	1,0	360 nm
226	Acetonitril - Wasser	1 ml/min	365 nm
230	dest. Wasser/Acetonitril - Gradientenprogramm	0,5 ml/min	362
236	Wasser/Acetonitril 40:60	0,2 ml/min	360 nm
258	Water / acetonitrile	0.8	367 nm
259	Eluent A: ACN; Eluent B 15% THF isokratisch	0,9 ml/min	365 nm
265	Acetonitril/ Wasser 45:55	0,25 ml/min	356 nm
267	Acetonitrile/Wasser	1,5 ml/min	365 nm
269	Gradient aus Wasser und ACN	1,0 ml/min	365 nm
291	A=H2O + 10% ACN; B=Acetonitrol	0,6 ml/min	360 nm
292	60 MeOH/ 40 DI	1.5	385

Participant	Column temperature
11	Shimadzu : 30 °C
29	27°C
30	30°C
40	40°C
56	28°C +/- 1°C
58	35 C
60	30°C
62	30°C
63	25 °C
68	25°C
69	40°C
78	30
83	40°C
95	40°C
100	30°C
107	30 °C

Participant	Column temperature
109	40 °C
114	22°C
138	40 °C
141	30 degreesC
153	30 oC
155	35°C
159	27°C
164	40°C
166	Ambient
167	30°C
186	35°C
191	40°C
192	40 degC.
195	30°C
199	30°C
207	30
208	40 °V
215	40 °C
226	40 °C
230	40°C
236	33 °C
258	40°C
259	42° C
265	45 °C
267	25°C
269	20,0 °C
291	30 °C
292	38 degreesC

Participant	Calibration standard

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Participant	Calibration standard
11	Ready to use mix / RESTEK
29	Supelco Mix
30	Carbonyl DNPH Mix-1 Sigma Aldrich
40	Einzelstandards Fa. Sopelco
56	read to use mix supelco Custom Mix Ald_DNPH 100µg/mL
58	Ready to use, sigma
60	Accu standard
62	Purchased at Restek
63	Aldehyde/Ketone-DNPH-StockStandard 13
68	für Formaldehyd: Standart von Sigma-Aldrich, alle andern: Fertiger Mix von Sigma-Aldrich
69	Ready to use mix, Isostandards Material S.L.
78	fertiger Mix von supelco
83	individuals standards
95	Sigma-Aldrich CARB-Carbonyl DNPH-Mix 1
100	ready to use mix RESTEK
107	Supelco DNPH Mix 1
109	Einzelstandards von SIGMA-ALDRICH
114	a ready to use mix
138	Einzelstandards (LGC)
141	Induvidual standards - Formaldehyde 37%, Sigma-Aldrich no. 252549
153	Ready-to-use mix. Supelco
155	gekaufter MIX-Standard, Firma CPAchem
159	fertiger DNPH-Mix
164	We use a Derivatized Carbonyl Compounds Standard.The manufacturer is Ultra Scientific Italia; Product Number: ALD-554DA-1; Lot. Number: 0006469075
166	Mix readt ti use : Supelco carbonyl-DNPH MIX1
167	Produced from individual standards
174	purchased at Sigma-Aldrich
186	From a ready-to-use mix (Supelco)
191	CRM47672 Carbonyl DNPH mix 1 - Sigma Aldrich
192	Ready-to-use mix manufactured by FUJIFILM Wako Pure Chemical Corporation.
195	from individual standards
199	Einzelstandards

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Participant	Calibration standard
207	Einzelstandards Supelco
208	Sigma-Aldrich / CRM47651
215	aus Einzelstandards
226	Mix, Sigma
230	Herstellung aus Einzelstandards F. Supelco
236	w urden hergestellt, Supelco
258	Ready to use mix, Supelco Part number CRM47285
259	Ein Multikomponentenstandard w urde aus DNPH-Derivaten diverser Einzelstoffe selbst hergestellt. c = 5 ng/µl je Einzelstoff
265	zugekaufter Standard von Restek
267	Einzelstandard-Mix
269	Der Standard w urde als Mix von Supelco gekauft.
291	Fertiger Mix von Neochema
292	Individual, supelco

Participant	Recovery rate
11	No
29	nein
30	no
40	nein
56	no
58	no
60	no
62	No
63	nein
68	Ja, Formaldehyd 94%
69	No
78	nein
83	no
95	nein
100	no

Participant	Recovery rate
107	nein
109	nein
114	no
138	nein
141	No
153	No
155	nein
159	ja
164	No
166	/
167	Yes
186	No
191	no
192	No
195	no
199	Nein
208	No
215	ja
226	nein
230	nein
236	nein
258	No
259	Nein, nach der Elution ist die Kartusche (LpDNPH S10) farblos, die WFR ist somit 100%
264	Yes
265	nein
267	nein
269	ja
291	Ja, ein ZRM
292	No