



TESTEX RUNDTEST

FUNCTION

No. 1

AUSWERTUNG / EVALUATION

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Luftdurchlässigkeit - ISO 9237	7	Permeability to air - ISO 9237
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RUNDTEST FUNCTION No. 1

Allgemeines

Ganz zu Beginn soll vorweggenommen werden, dass für alle untersuchten Proben kein wirklich wahrer Wert (true value) bekannt ist. Die erhaltenen Werte können also nicht mit einem Referenzwert verglichen werden.

Anmerkung

Verschiedentlich zeigen einzelne Resultate eines Labors eine unerwartet hohe Abweichung zu den Resultaten anderer Labors. Werte mit einer Abweichung von $> \pm 1.5s$ zum Mittelwert werden in der Auswertung mit einem "o" gekennzeichnet.

Resultate, die sich statistisch nicht sinnvoll auswerten lassen, da sie ausserhalb der Grenze von $\pm 2s$ zum Mittelwert liegen, werden in der Auswertung mit einem "x" gekennzeichnet. Diese Werte werden nicht in den definitiven Mittelwert miteinbezogen und, mit Ausnahme von EN 471, in den Grafiken nicht mehr dargestellt.

In der Auswertung sind sowohl der Mittelwert und die Standardabweichung und der CV% angegeben.

Es werden diverse Graphiken dargestellt, welche sich den Werten entsprechend im Typ unterscheiden können. Grundsätzlich ist aber die Gegenüberstellung der ermittelten Werte des einzelnen (Labor) angestrebt, als Vergleich zum Mittelwert aller Labors und der jeweiligen Abweichung & Streuung.

In den vorliegenden Graphiken auf Seite 4 bis 8 & 12 ist die Kontrollgrenze $1s$ mittels durchgehender Linie, der Bereich $1.5s$ mit gestrichelter Linie und bei der Graphik auf Seite 14 der Mittelwert (\emptyset) mittels durchgehender Linie gekennzeichnet.

Bei den Werten aus EN 1149-1/ resp. /-3 wurde auf eine graphische Darstellung verzichtet, das sich diese durch die Charakteristika der Werte schlecht in einer aussagekräftigen Grafik darstellen lassen.

Spezielle Anmerkung

Elektrostatistische Eigenschaften:

Die Unterscheidung zwischen dem gemessenen Oberflächenwiderstand 'R' und dem spezifischen Widerstand 'p' hat etwas verwirrt. Eine präzisere Angabe durch Anpassung des Resultatformulars wird für das nächstes Mal berücksichtigt. Ausgewertet wurde hier der spezifische Oberflächenwiderstand, also der gerechnete Wert nach der Messung 'p'. Die Spalte "Erfüllt nach EN 1149-5" ist rein informativ angebracht.

Flammenausbreitungsgeschwindigkeit:

Das eingesetzte Material ist tendenziell etwas zu leicht und ist daher sehr schnell abgebrannt. Ein detaillierter Vergleich der Resultate mit etwaigem Rückschluss auf Messunsicherheiten ist daher nicht möglich, allerdings lassen sich auch so Tendenzen erkennen, welchen Einfluss die Anwendung der Norm oder des Prüfgerätes haben können. Konkretere Aussagen werden erst nach mehreren Rundtests möglich sein.

General

At first is to be mentioned that for all analysed samples the true value is not known. The determined values and results can therefore not be compared with a reference value.

Remark

Sometimes single results of a lab show an unusual high deviation compared to the results of other laboratories. Values with a deviation $> \pm 1.5s$ of the mean value are being marked with an "o" in the evaluation.

Results that cannot be used for statistical calculations since they are out of the range of $\pm 2s$ to the mean value will be marked in the evaluation with an "x". Those values are not integrated into the final mean value either and except on the trapeze from EN 471, are not shown in any of the graphs.

Generally, besides the mean value and standard deviation, also the CV% is indicated.

Different types of graphics are shown sometimes, which depend on the type of the single values given. In general the main goal of the graphs shall be to compare the single values of each Lab with the mean value of all labs, as well as it's variation & deviation.

In the existing graphics on page 4 to 8 & 12, the control limit value $1s$ is characterized with a continuous line, the range $1.5s$ with a broken line and in the graphic on page 14 the average value (\emptyset) with a continuous line.

For the values from the tests of EN 1149-1/-3 respectively, we have decided to go without a graph of the single values, as their characteristics would have been very hard to put into to meaningful graph.

Special Note:

Electrostatic properties:

The precise meaning of the word "resistivity" in the result form was a bit confusing, as some Lab's mentioned the value 'R', which is the measured surface resistance, and some others sent the value 'p', which is the surface resistivity as a result of it. The indication in the result form will be adjusted for the next time. For the report, only the specific surface resistivity 'p' was taken in to the evaluation. The column "Fulfills requirement of 1149-5" is for information only.

Flame spread properties:

The chosen material wa a bit too light in weight and burned quite quickly therefore. Any detailed comparison of the single values and eventual conclusion about a measurement intolerance factor are not advisable, although a tendency of the importance of the testing method & equipment can be noticed. A more specific conclusion will probably possible after more Round Robin Tests.



RUNDTEST FUNCTION No. 1

Muster: Gewebe, 100% PA , Farbe orange

Sample: Woven fabric, 100% PA, col. orange

Resistance to water penetration ISO 811

Lab Code	Testing equipment	test size [cm ²]	pressure speed [cm /min]	water temp [°C]	No. of tests				CV (%)
						ø [mbar]	ø [cm]	s	
1	Textest FX 3000 Hydrotester	100	10	20	5	10.46	10.66	0.56	5.35
44	Textest FX 3000 Hydrotester	100	10	20	5	12.00	12.00	0.80	6.60
59	Öti Gerätebau	100	10	20	5	12.50	12.15	0.00	o 0.00
71	Textest FX 3100 Hydrotester	100	60	20	5	13.60	13.90	0.89	6.58
79	Textest FX 3000 Hydrotester	100	10	20	5	o 9.20	9.40	0.57	6.20
84	Shirley SDLOE	100	10	20	4	10.30	10.50	2.10	x 20.00
85	?	100	60	19	5	13.70	14.00	0.50	3.60
89	Textest FX 3000 Hydrotester	100	60	22	10	12.70	12.95	1.64	12.91
107	Karl Schröder	100	10	25	8	12.50	12.80	1.00	7.80
116	FF 13	100	10	19	5	x 20.20	20.20	1.10	5.40
128	Branca	314	60	25	5	o 17.10	17.10	15.97	9.34
142	Textest FX 3000 Hydrotester	100	60	20	5	o 17.20	17.20	1.37	7.90
180	Textest FX 3000 Hydrotester	100	60	20	6	o 17.00	17.00	1.10	6.40
181	Textest FX 3000 Hydrotester	100	10	20	5	11.40	11.60	1.39	12.20
203	Textest FX 3000 Hydrotester	100	10	21	5	10.10	10.10	0.90	9.30
212	Textest FX 3000 Hydrotester	100	60	?	5	12.72	12.72	0.41	3.22
233	Textest FX 3000 Hydrotester	100	10	20	5	11.40	11.40	0.82	7.21
241	?	100	60	20	5	11.00	11.00	1.10	x 20.90
242	Textest FX 3000 Hydrotester	100	10	20	5	11.28	11.50	21.32	o 18.60
244	TEXTTEST	100	10	20	5	12.00			13.60
258	Textest FX 3000 Hydrotester	100	60	20	7	12.31	12.55	1.65	o 1.20
261	Textest FX 3000 Hydrotester	100	60	25	10	12.25		1.27	10.35
265	Textest FX 3000 Hydrotester	100	10	19	5	10.90	11.10	0.56	5.00
272	Textest FX 3000 Hydrotester	100	60	22	5	15.60	15.60	1.82	11.60
333	Textest FX 3000 Hydrotester	100	10	18	10	11.50	11.50	68.40	
n						24	22		22
ø						12.53	12.67		7.74
s						2.20	2.27		4.32
CV %						17.60	17.93		55.77

SEVERAL COMMENTS:

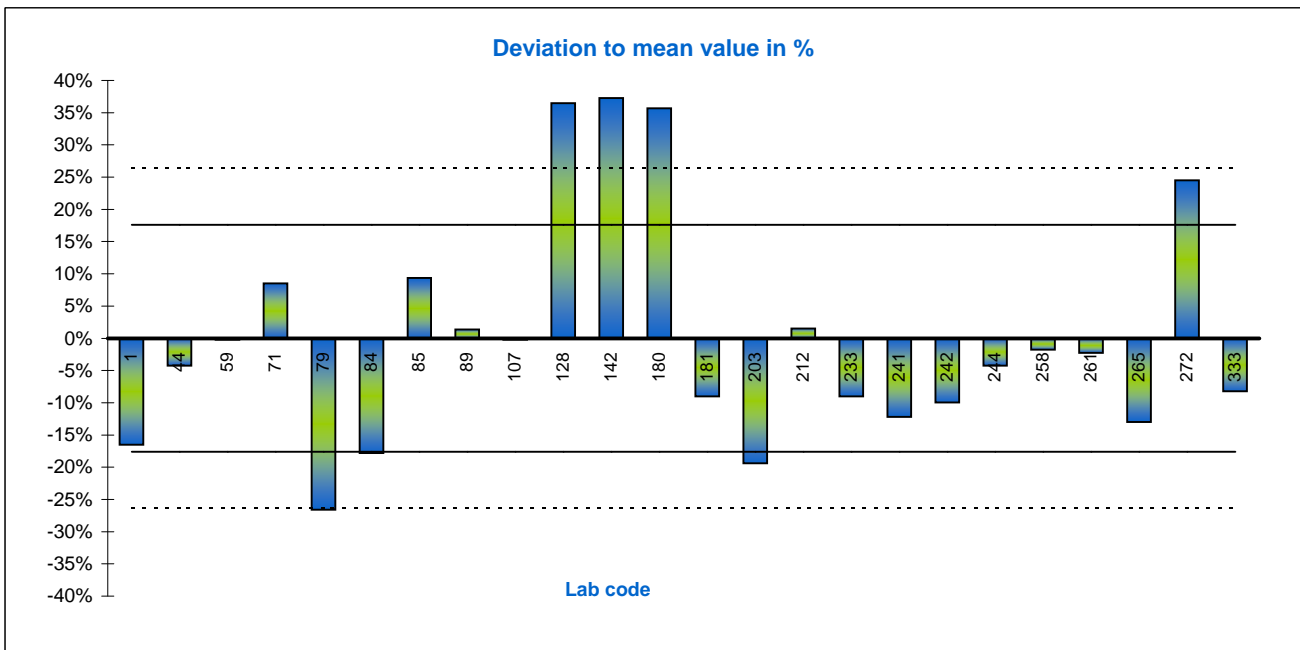
Lab 258: Material had folding marks, that might have affected the test results



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RUNDTTEST FUNCTION No. 1

Resistance to water penetration
ISO 811



RUNDTEST FUNCTION No. 1

Muster: Gewebe, laminiert, dunkelblau

Sample: Woven fabric with clear coating, col. Darkblue

**Water-vapour resistance / Thermal resistance
ISO 11092**

Lab Code	Testing equipment	testing temp. [°C] R _{et} / R _{ct}	humidity rel. [%] R _{et} / R _{ct}	No. of tests	Results R _{et}			Results R _{ct}		
					Ø R _{et} [m ² Pa/W]	s	CV (%)	Ø R _{ct} [m ² K/W]	s	CV (%)
1	Hautmodel Hohenstein	35 / 20	40 / 65	3	10.18	0.20	1.96	0.012	0.0006	5.01
44	Skinmodel SDL Atlas	35 / 20	40 / 65	3	7.60	0.90	11.50	0.009	0.0010	8.30
59	Hautmodel Hohenstein	35 / 20	40 / 65	3	6.82	0.00	0.00	0.005	0.0000	0.00
85	Skinmodel	36 / 20	41 / 65	3	8.00	0.30		0.008	0.0010	
89	Hautmodel Hohenstein	35 / 20	40 / 65	3	6.58	0.13	1.91	0.005	0.0004	11.90
116	Sweating Guard hot plate M259	36 / 20	41 / 65	3	o 12.74	1.07	0.08	0.010	0.0100	0.58
128	SGH P10.2 MTN	35 / 20	40 / 65	5	x 16.42	0.12	0.75	x 0.090	0.1900	2.00
142	SDL Sweating Guard hot plate	35 / 20	40 / 65	3	9.45	1.05	11.10	o 0.018	0.0020	10.00
203	SDL Atlas M 259 B	35 / 20	40 / 65	3	8.41	0.35	4.10	0.006	0.0024	38.10
212	SDL Atlas	35	37	3	o 12.30	0.86	6.99			
233	Hautmodel Hohenstein	35 / 20	40 / 65	6	6.72	0.41	6.06	0.0055	1.7810	32.18
258	SDL Atlas M 259 B	35 / 20	40 / 65	3	5.07	0.80	15.69	0.0100	0.0100	43.30
261	SDL Sweating Guard hot plate	35 / 20	40 / 65	3	5.22	0.25	4.81	0.0150	0.0054	36.28
272	Permetester	22	50	5	6.40	0.28	4.30			
333	Hohensteiner Hautmodel	35	40	1	6.76					
n					14			11		
Ø					8.02			0.0094		
s					2.38			0.0042		
CV %					29.68			45.09		

SEVERAL COMMENTS:

Lab 233: Material did soak a lot of liquid and got bulky. Therefore it was hard to fix on the measuring head without causing air-bubbles.

Lab 258: Material had folding marks, that might have affected the test results

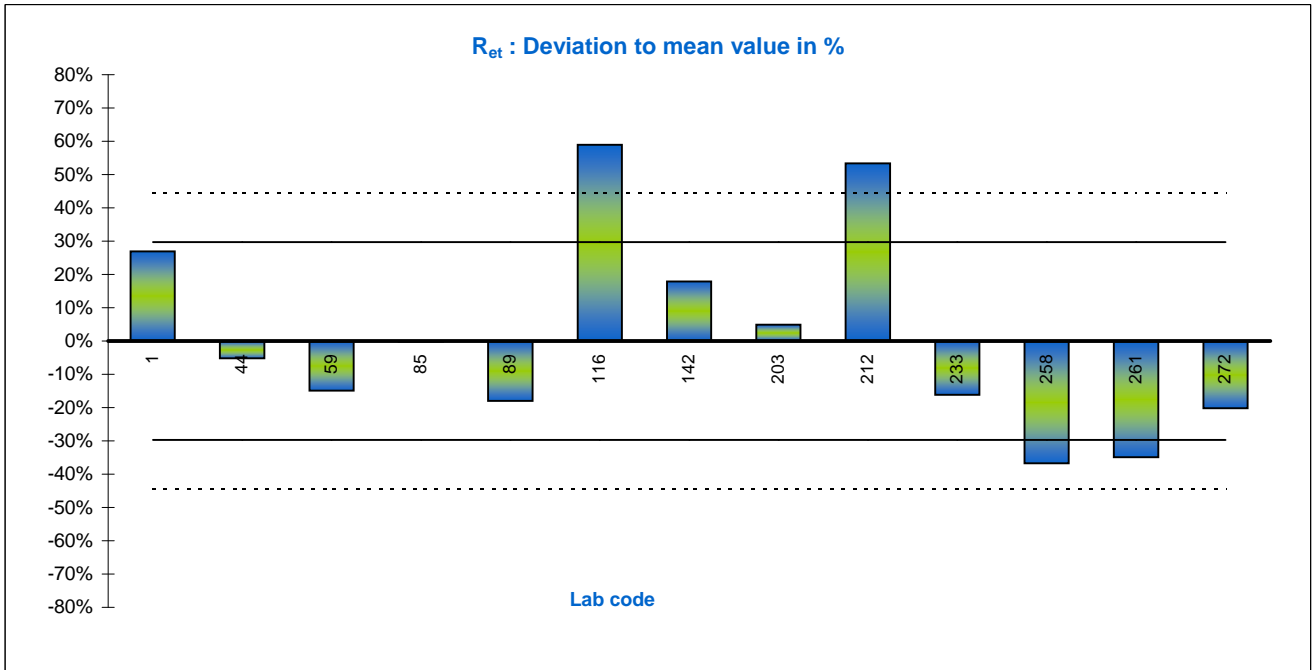
Lab 272: Tests were carried out on PERMETESTER, therefore the following differences to ISO 11092 are caused:

- smaller sample patches
- Temperature in lab 22oC instead of 35oC
- humidity 50% instead of 40%

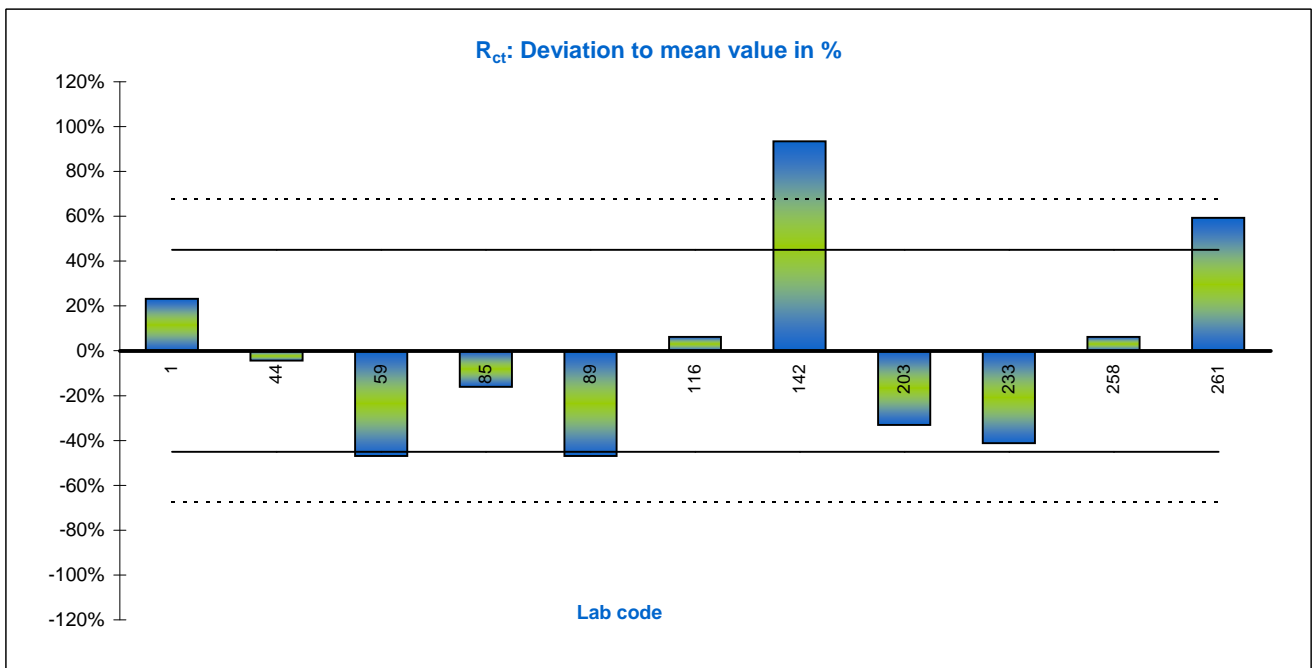
For a measurement of the R_{ct}, the material is not corresponding with the method based on ISO 11092 to be tested on the Permetester. Therefore it was not tested.

RUNDTTEST FUNCTION No. 1

**Water-vapour resistance
ISO 11092**



**Thermal resistance
ISO 11092**





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RUNDTEST FUNCTION No. 1

Muster: Gewebe, 100% Microfibre, Farbe weiss

Sample: Woven fabric, 100% Microfibre in col. White

**Permeability to air
ISO 9237**

Lab Code	Testing equipment	test size [cm ²]	under-inflation [mbar]	No. of tests			
					∅ [l/m ² s]	s	CV (%)
1	FRANK 21443	20	1	10	56.20	7.35	13.07
44	TEXTTEST FX 3300	20	1	10	28.80	3.80	13.30
59	Öti Gerätebau	20	1	10	x <10		
71	TEXTTEST FX 3300	20	1	10	31.96	4.34	13.56
71	TEXTTEST FX 3300	20	2	10	o 59.48	7.20	17.11
79	TEXTTEST FX 3300	20	1	10	50.70	8.90	17.60
84	Metefem	20	1	10	30.70	2.30	7.50
85	FRANK	20	?	10	51.18	7.37	14.40
89	TEXTTEST FX 3300	20	1	3	36.00	2.57	7.14
107	TEXTTEST	20	1	12	x 112.80	3.20	o 2.80
116	FAP - 1034- LP	20	1	10	31.00	6.00	18.00
128	TEXTTEST FX 3300	20	1	10	29.70	3.36	11.30
142	Air permeability tester	20	1	10	31.47	4.48	14.20
180	Karl Schröder	20	1	10	56.70	5.94	10.80
181	TEXTTEST FX 3020	20	1	10	46.00	6.90	15.00
181	TEXTTEST FX 3020	20	2	10	x 88.00	12.60	14.30
203	TEXTTEST FX 3300	20	1	10	31.80	2.40	7.50
212	Karl Schröder	20	1	5	25.00	1.41	5.64
233	TEXTTEST FX 3300	20	1	10	31.30	1.44	o 4.60
241	?	20	2	10	52.30	1.50	9.10
242	TEXTTEST FX 3300	20	1	5	50.50	13.07	x 25.90
258	TEXTTEST FX 3300	20	1	10	30.85	4.81	15.58
261	TEXTTEST FX 3300 AIR	20	1	18	46.14	7.37	16.00
265	?	20	1	10	45.90	6.82	14.90
272	TEXTTEST FX 3300	20	2	5	o 59.80	6.70	11.20
333	TEXTTEST FX 3300	20	1	5	47.04		
n					23		23
∅					41.76		11.94
s					11.49		4.35
CV %					27.51		36.41

SEVERAL COMMENTS:

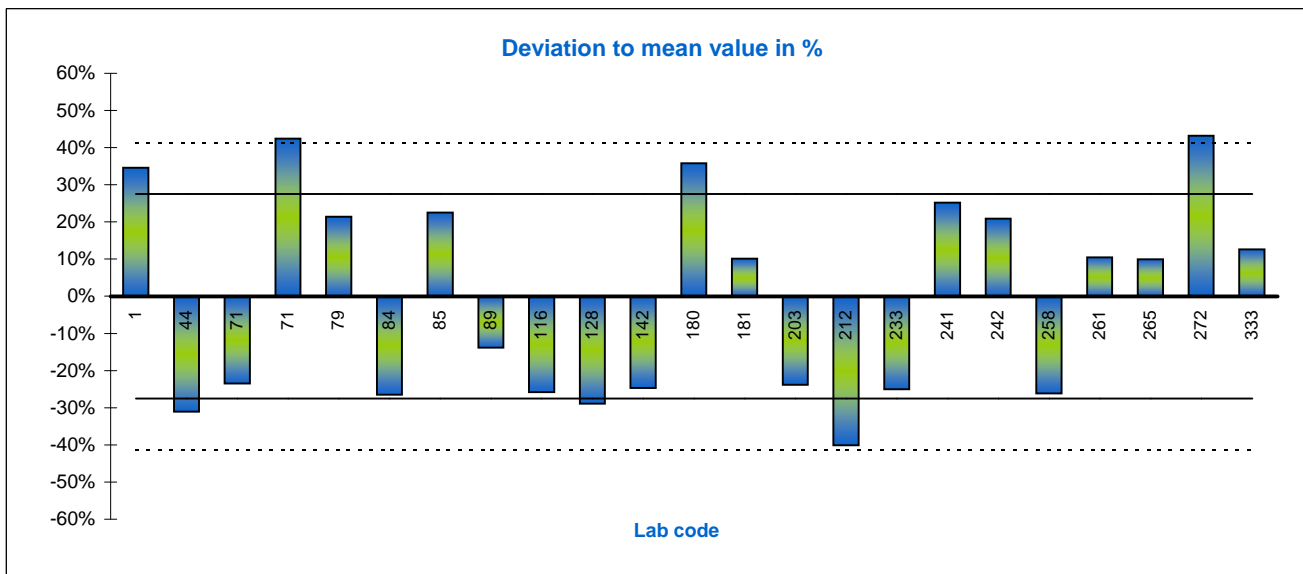
Lab 258: Material had folding marks, that might have affected the test results



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RUNDTTEST FUNCTION No. 1

Permeability to air
ISO 9237



RUNDTEST FUNCTION No. 1

Muster: Gewebe, laminiert, Farbe HI-Vis Gelb mit Gitterraster

Sample: Woven fabric, coated, col. Hi-Vis yellow with grids in black

**Color measurement of background material
EN 471:2003+A1**

Lab Code	Testing equipment	No. of tests New / Exp.	Results NEW			Results EXPOSED TO LIGHT		
			∅ Chromaticity [x]	∅ Chromaticity [y]	∅ luminance factor [β min]	∅ Chromaticity [X]	∅ Chromaticity [Y]	∅ luminance factor [β min]
1	Konica Minolta CM2500 C	4 / 4	0.3894	0.532	0.942	0.388	0.526	0.916
44	?	3	0.3760	0.5350	0.9700	0.375	0.530	0.940
59	Minolta CM 2500C	3	0.3700	0.3700	o 0.8800	0.369	0.523	o 0.860
71	CE 2145 (Mode 3)	12 / 4	0.3702	0.5367	1.0418	0.369	0.531	o 1.027
79	?	1	0.3714	0.5301	o 1.0514	0.367	0.519	o 1.036
89	Datacolor 245	3	0.3648	0.5404	x 1.1200	0.361	0.524	x 1.110
116	?	3	0.3700	0.5320	1.0000	0.368	0.525	0.995
241	Spectrophotometer	4	0.3820	0.5270	0.9500	0.382	0.520	0.940
242	Minolta CM 2500C	3	0.3880	0.5338	0.9500	0.386	0.526	0.930
258	Minolta CM 2500C	4	0.3721	0.5373	0.9700	0.366	0.517	0.920
261	Konica Minolta / Specrophotome	6	0.3723	0.5338	0.9395	0.372	0.531	0.946
333	Datacolor	1	0.3914	0.5295	0.8998	0.389	0.523	0.894
n					11			12
∅					0.96			0.95
s					0.05			0.05
CV %					5.47			5.69

SEVERAL COMMENTS:
Lab 258: Variation of results is higher if fabric with a black grid is tested. Solid color would be better, especially hi-vis orange.

Lab 44: the black yarns are included in the measurement due to the area of the aperture of the spectrophotometer

Lab 71:No# of samples tested NEW: 12 pcs / No.# of samples testes exposed to light: 4 pcs.

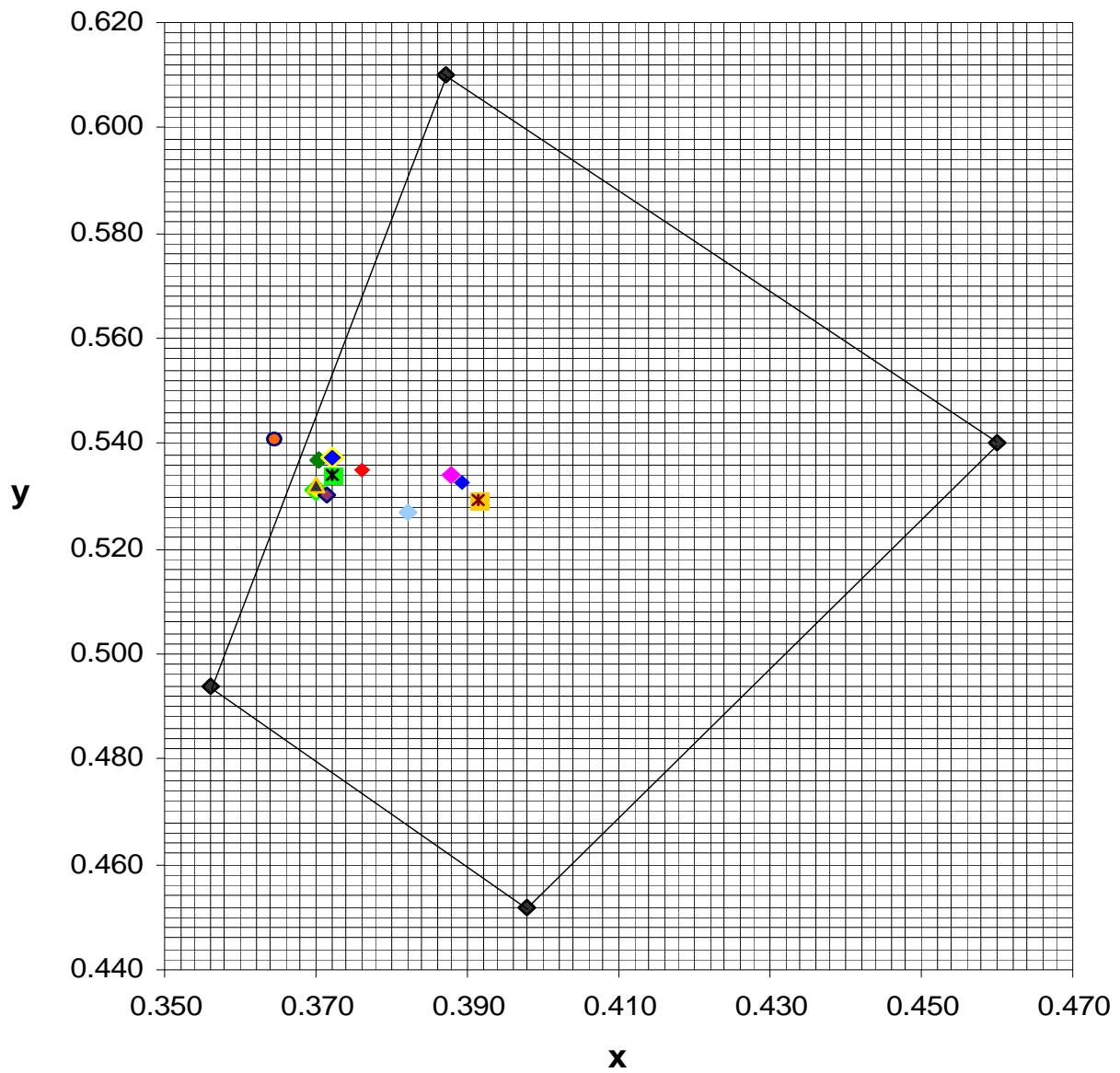


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RUNDTTEST FUNCTION No. 1

Color measurement of background material
EN 471:2003+A1

MEASUREMENTS NEW



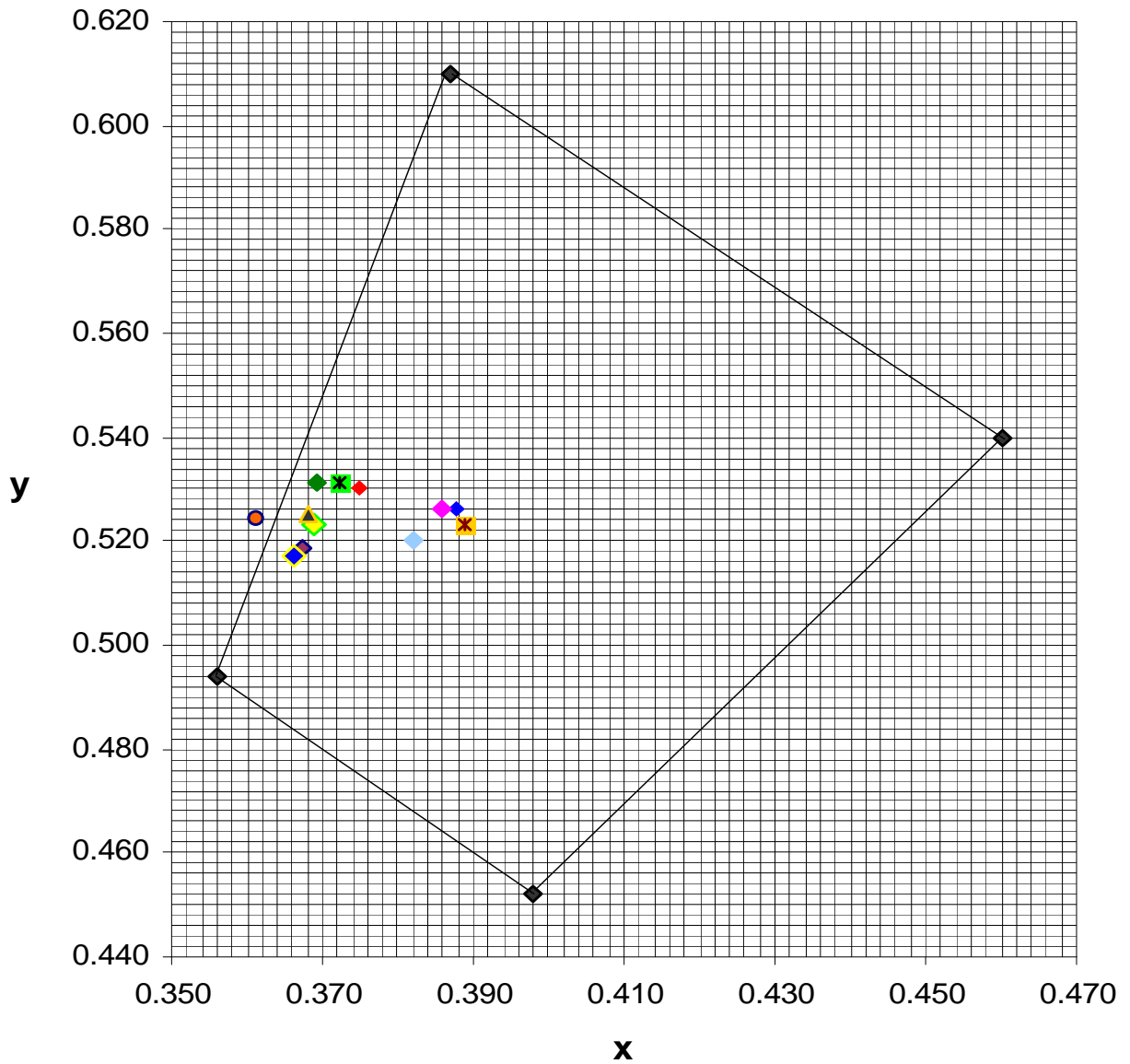


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RUNDTEST FUNCTION No. 1

Color measurement of background material
EN 471:2003+A1

MEASUREMENTS EXPOSED TO LIGHT



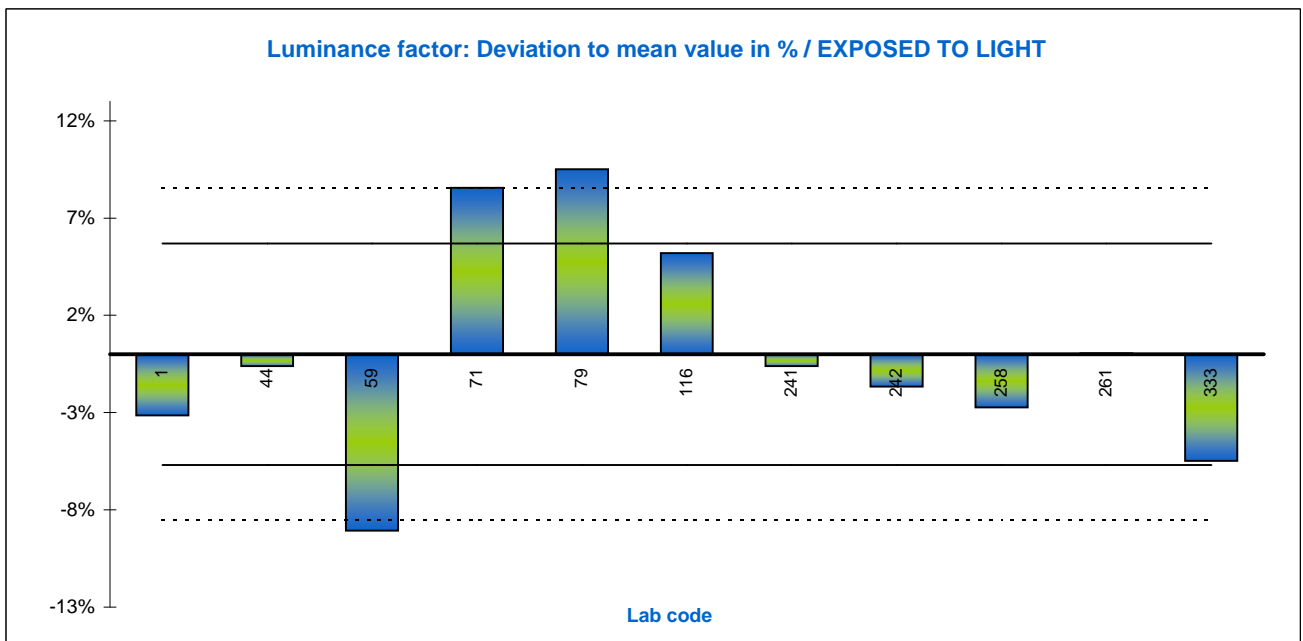
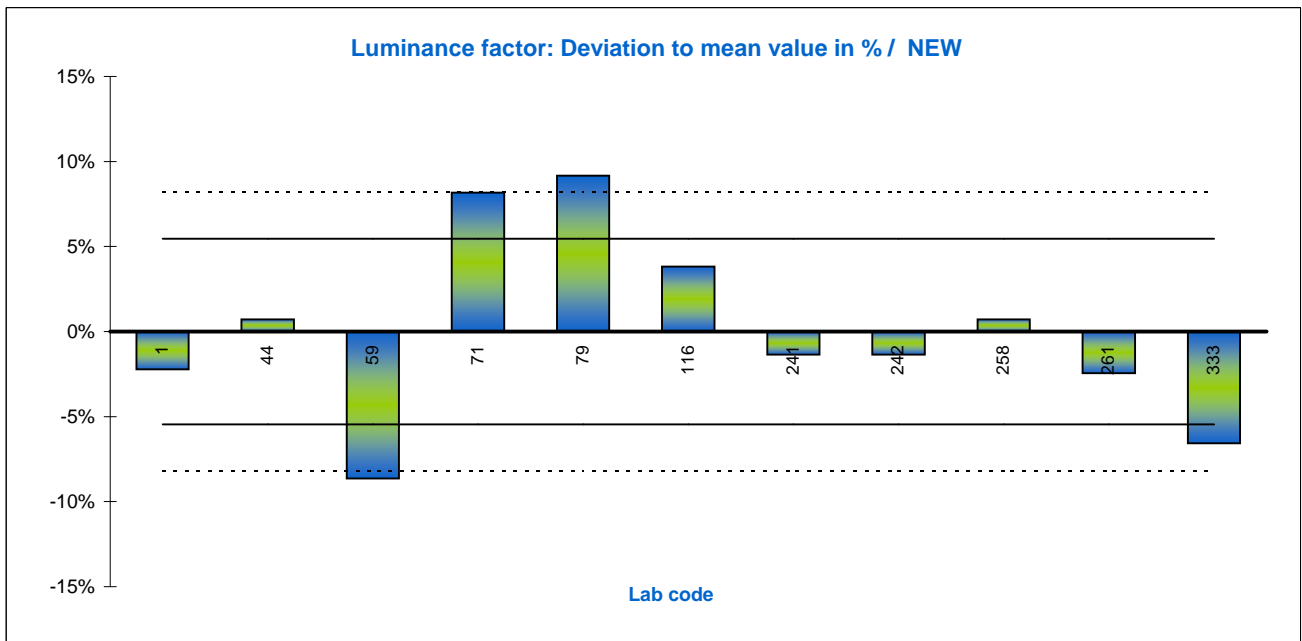
◆ Lab Code ◆ 1 ◆ 44 ◆ 59 ◆ 71 ◆ 79 ● 89 ▲ 116 ◆ 241 ◆ 242 ◆ 258 ✖ 261 ✖ 333



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RUNDTTEST FUNCTION No. 1

Color measurement of background material
EN 471:2003+A1





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RUNDTEST FUNCTION No. 1

Muster: Gewebe PES/CO/CF, Farbe royal blau

Sample: Woven fabric, PES/CO/CF, color royal

**Electrostatic properties
surface resistivity / charge decay
EN 1149-1 / EN 1149-3**

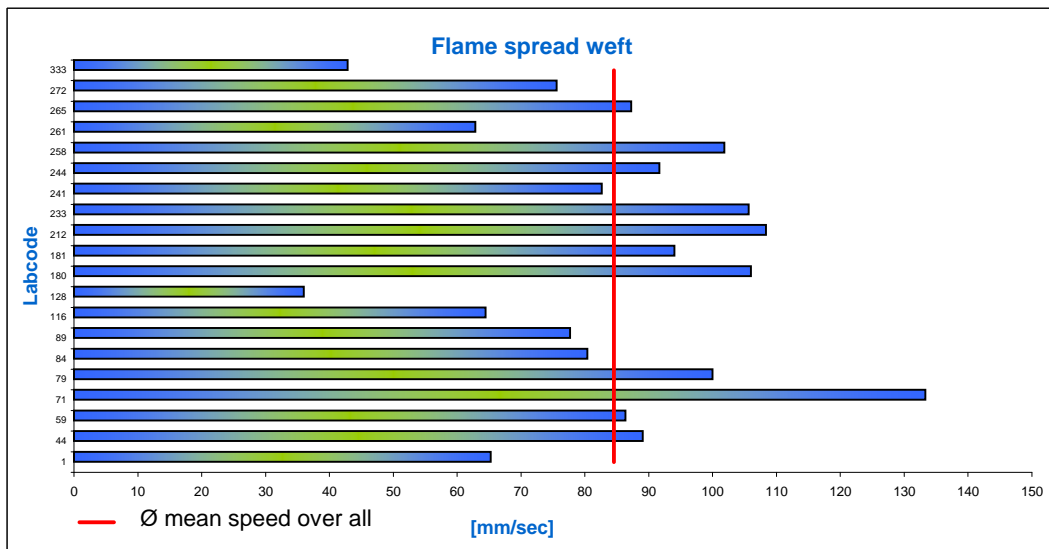
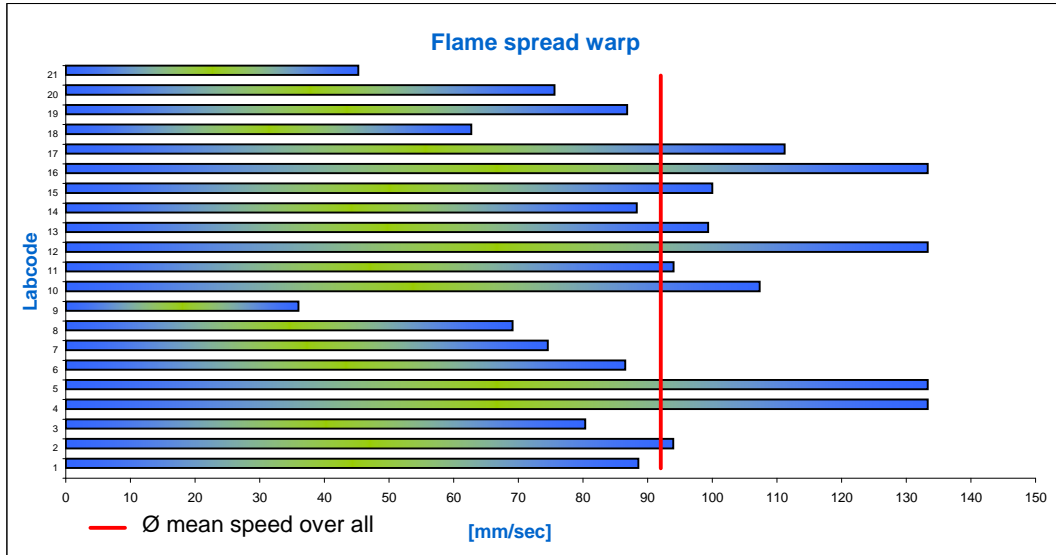
Lab Code	conditioning time [h]	testing temp. [°C]	humidity rel. [%]	No. of tests per sample	EN 1149-1			EN 1149-3		
					∅ Resistivity [Ω]	∅ Resistivity, value in millions [Ω] =>10 ⁶	Fulfills requirement of 1149-5 [YES/ NO]	∅ Shield factor S	∅ Half-life T ₅₀ [s]	Fulfills requirement of 1149-5 [YES/ NO]
44	24	23	25	5	4.02 x 10 ¹⁰	40'200	NO	0.94	<0.001	YES
71	48	23.1	25	5	9.0 x 10 ⁸	900	YES	0.94	<0.001	YES
79	>24	23	25	5 / 3	2.79 x 10 ¹¹	279'000	NO	0.93	<0.001	YES
85	>24	25	23	5	o 10.3 x 10 ¹²	10'300'000	NO			YES
89	24	23	25	10	9.48x 10 ¹¹	948'000	NO	0.95	<0.001	YES
116	24	23.4	25	5	4.93x 10 ¹¹	493'000	NO	0.93	<0.001	YES
128	24	25	65	6	39.789x 10 ¹⁰	397'890	NO			YES
181	48	20	24	5	4.2x 10 ¹¹	420'000	NO			YES
203	24	23	25	5	4.9x 10 ⁹	4'900	NO			YES
212	24	20	65	5	x 4.0x 10 ¹³	40'000'000	NO			YES
233	24	23	25	5 / 5	1.4x 10 ¹¹	140'000	NO	0.93	<0.001	YES
241	140	23	22	8	5.5 x 10 ¹¹	550'000	NO			YES
272	24	22	26	5	45.56 x 10 ¹⁰	455'600	NO			YES
333	48	21	64	10	1.0 x 10 ⁶	1	YES			YES
n						13		6.00		
∅						1'079'192		1.78		
s						2'784'408		2.07		
CV %						258		116.15		



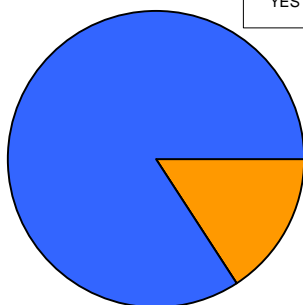
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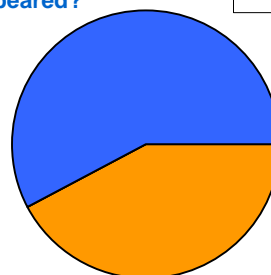
Flame spread properties
ISO 6941



Dropping Parts?



Flaming top/sides appeared?





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RUNDTEST FUNCTION No. 1

Dictionary / Lexikon

Abkürzungen Abbreviations	English	Deutsch
n	Number of values	Anzahl Werte
Ø	Mean value	Mittelwert
s	Standard deviation	Standardabweichung
CV%	Coefficient of variation (%)	Variationskoeffizient (%)
R _{e,t} [m ² Pa/W]	squaremeter Pascal per Watt	Quadratmeter Pascal je Watt
R _{c,t} [m ² K/W]	squaremeter Kelvin per Watt	Quadratmeter Kelvin je Watt
[β min]	Minmum luminance factor	Mindestleuchtdichtefaktor
Resistance R [Ω]	Surface resistance measured	Oberflächenwiderstand gemessen
Resistivity ρ [Ω]	Surface resistivity calculated	spezifischer Oberflächenwiderstand
[Ω] =>10 ⁶	Resistivity values in millions	Oberflächenwiderstand in Millionen
Hi-Vis	High visibility	Sehr hohe Sichtbarkeit
	chromaticity	Farbwert
	flaming top/aside	Oberkante/Seite gebrannt
	droping parts	brennende Teilchen
	humidity rel. %	Feuchtigkeit in %
	Increase pressure	Steigdruck
	pressure speed	Druckgeschwindigkeit
	sample patched	Musterabschnitte
	shield factor	Abschirmfaktor
	testing equipment	Prüfgerät
	underinflation	Unterdruck
	water temperature	Wassertemperatur