OFI – PTS RRT 2016

Florence October 27th 2016

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Reported test methods

- 109 Vertical Ball Behaviour EN 12235
- 110 Vertical Deformation EN 14809
- 111 Shock Absorption EN 14808
- 119 Slip Resistance EN 13036-4
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- 125 Abrasion Resistance EN ISO 5470 – 1
- 165 Mass ISO 8543
- HIC not finished yet!

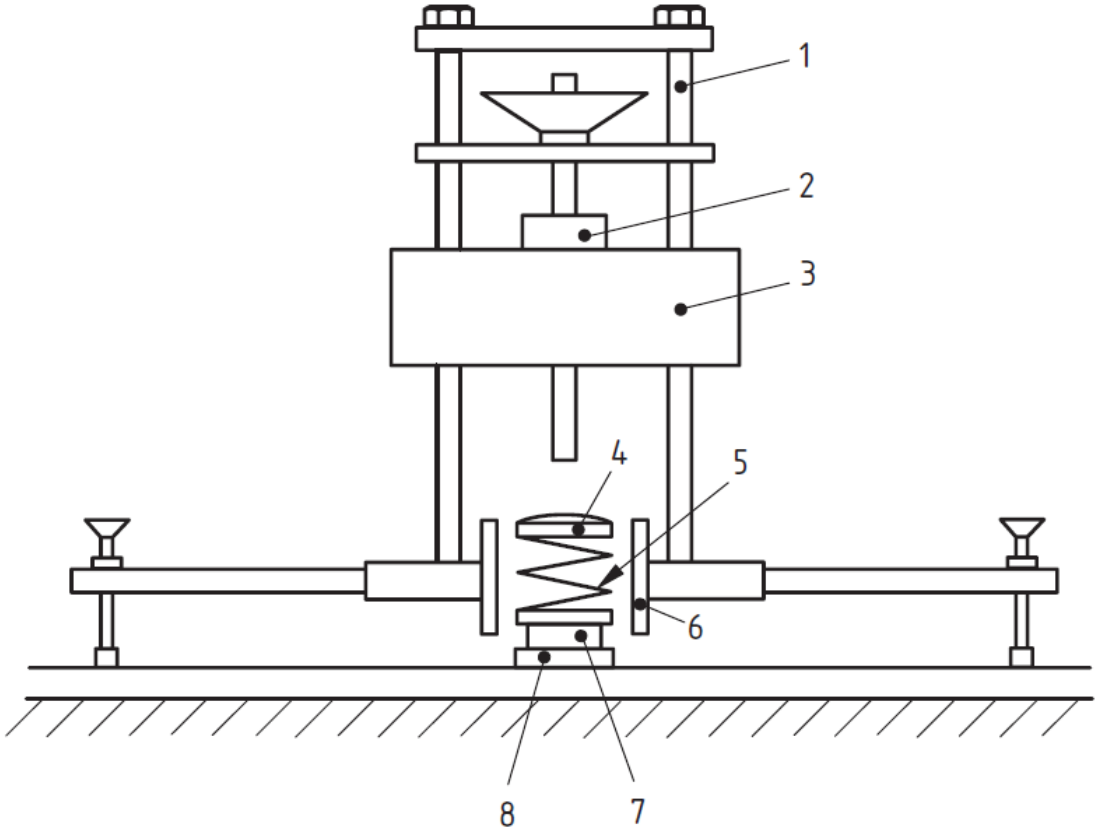
Parameters

- Standard Deviation
- Repeatability: is the variation in measurements taken by a single person or instrument on the same item, under the same conditions, and in a short period of time. (inter – lab)
- Reproducibility is the ability of an entire experiment or study to be duplicated, either by the same researcher or by someone else working independently (intra –lab)

Parameters

- The “z-score” and “z%” give information about the bias of the laboratory result and can be used as a documentation of the lab performance for third parties and supervisory bodies
- The participants can utilize this evaluation for the calculation of the measurement uncertainty of the particular test method.

Shock Absorption (EN 14808)



Key

1 guide for the falling weight
2 electromagnet
3 falling weight
4 upper plate
5 spring
6 guiding tube
7 force sensing device
8 base plate

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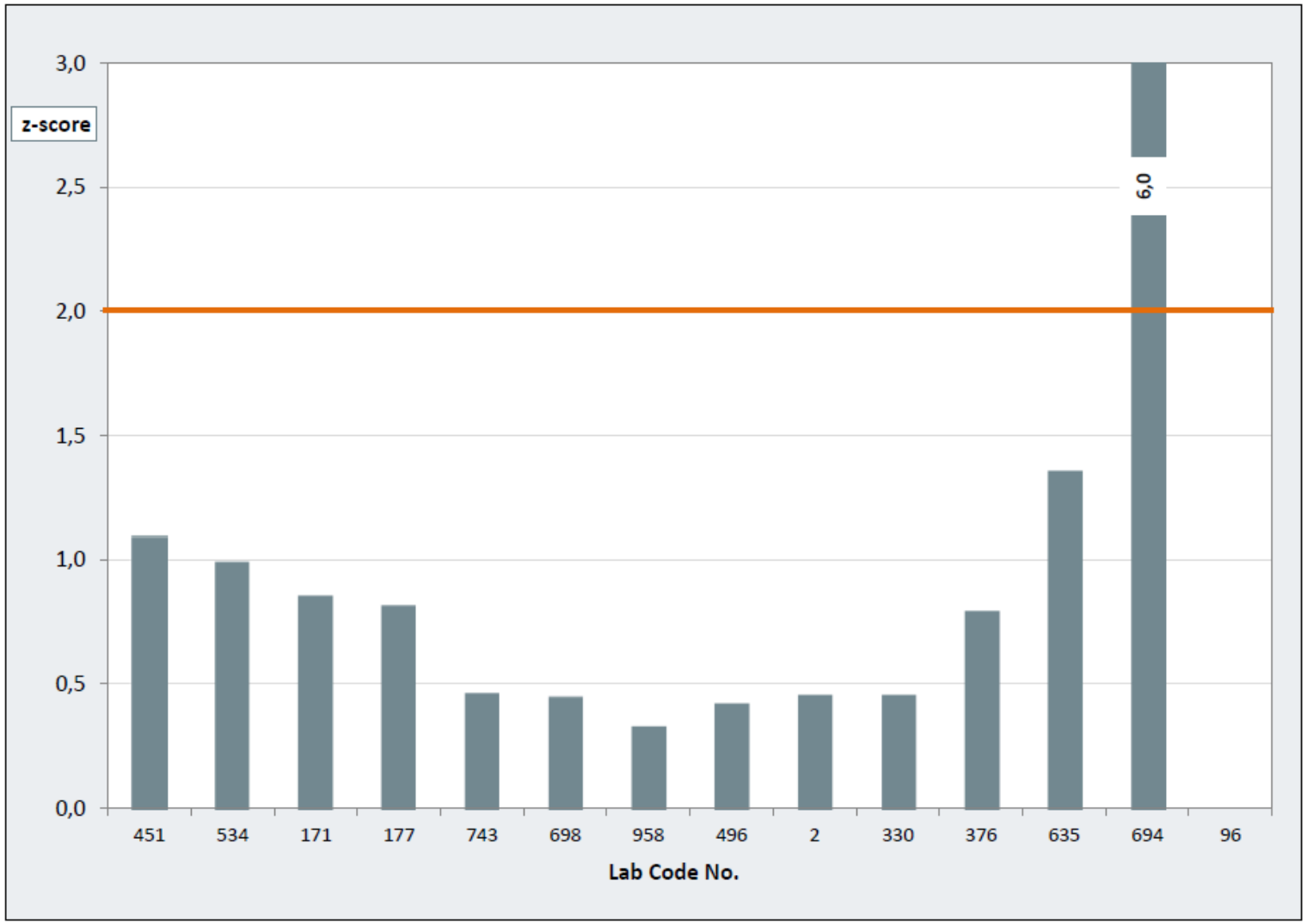
Shock Absorption



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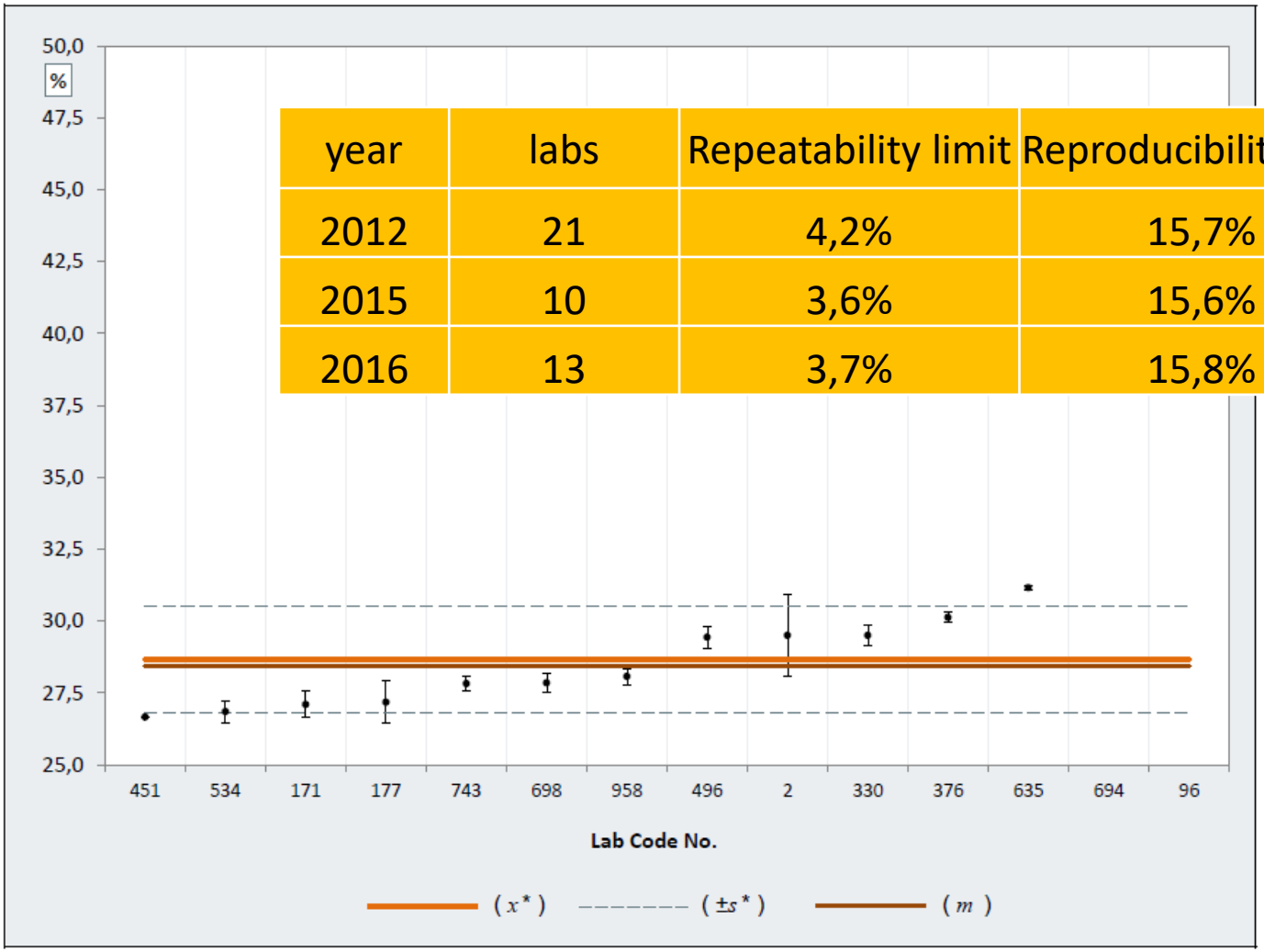
Shock Absorption

year	labs	Repeatability limit	Reproducibility limit
2012	21	4,2%	15,7%
2015	10	3,6%	15,6%
2016	13	3,7%	15,8%



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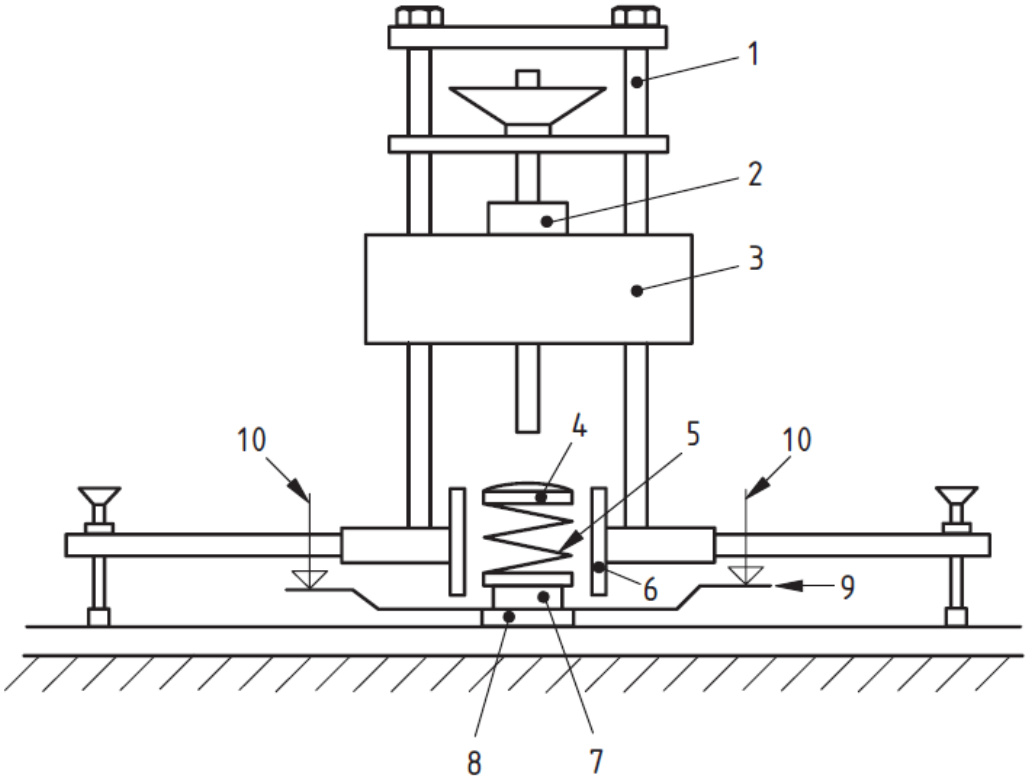
Reference Force!

LabCode No.	reference force Fr [N]	Temperature [°C]	rel. humidity [%]
2	4699,25	18,7	42
171	6400	23,6	52
177	6390	23,2	55
330	6780	23,0	50
376	6477	28,0	72
451	6375	23,5	49
496	6350	24,0	48
534	6392	23,1	53
635	6800	24,5	38
694	22798	22,5	60
698	6380		
743	6609	24,0	50
958	6714	22,0	49

Vertical Deformation (EN 14809)



Key

1 guide for the falling weight
2 electromagnet
3 falling weight
4 upper plate
5 spring
6 guiding tube
7 force sensing device
8 base plate
9 horizontal projections
10 sensors (pick up)

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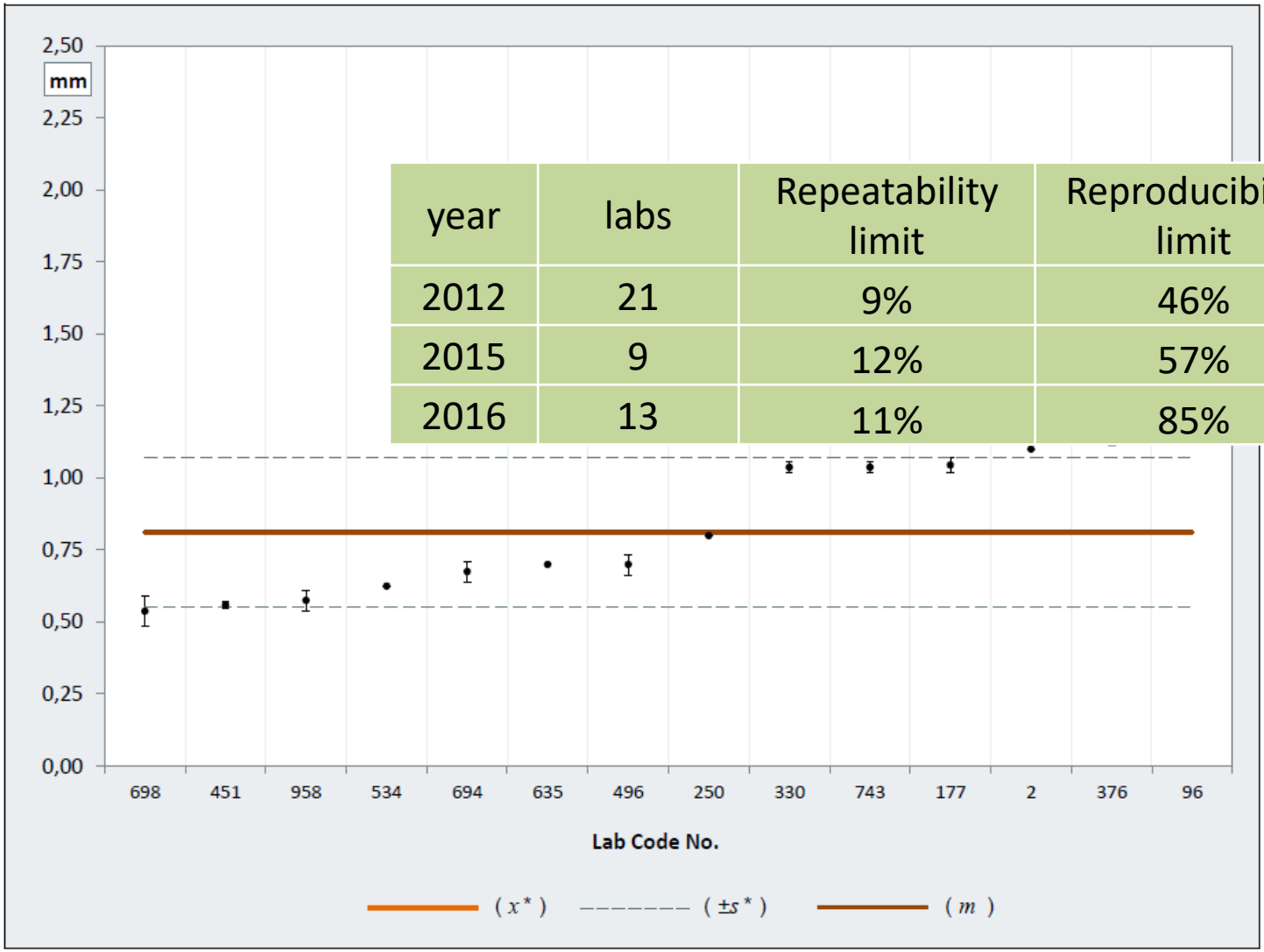
Vertical Deformation



year	labs	Repeatability limit	Reproducibility limit
2012	21	9%	46%
2015	9	12%	57%
2016	13	11%	85%

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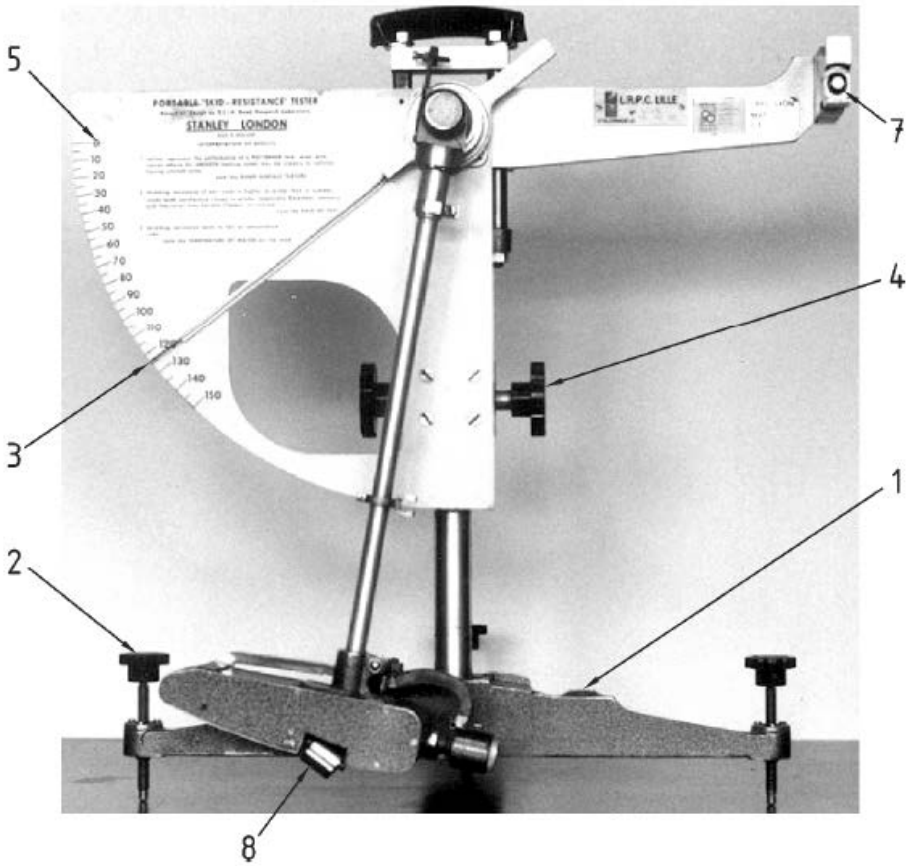
Slip Resistance (EN 13036-4)



Key

1 spirit level
2 levelling screw
3 pointer
4 vertical adjustment screw
5 C unit scale (126 mm sliding length)
6 F unit scale (76 mm sliding length)
7 starting bottom
8 rubber slider

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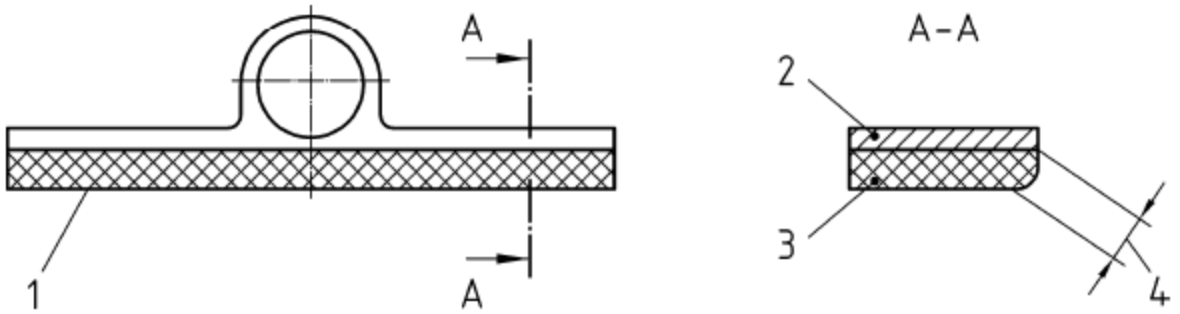
Slider



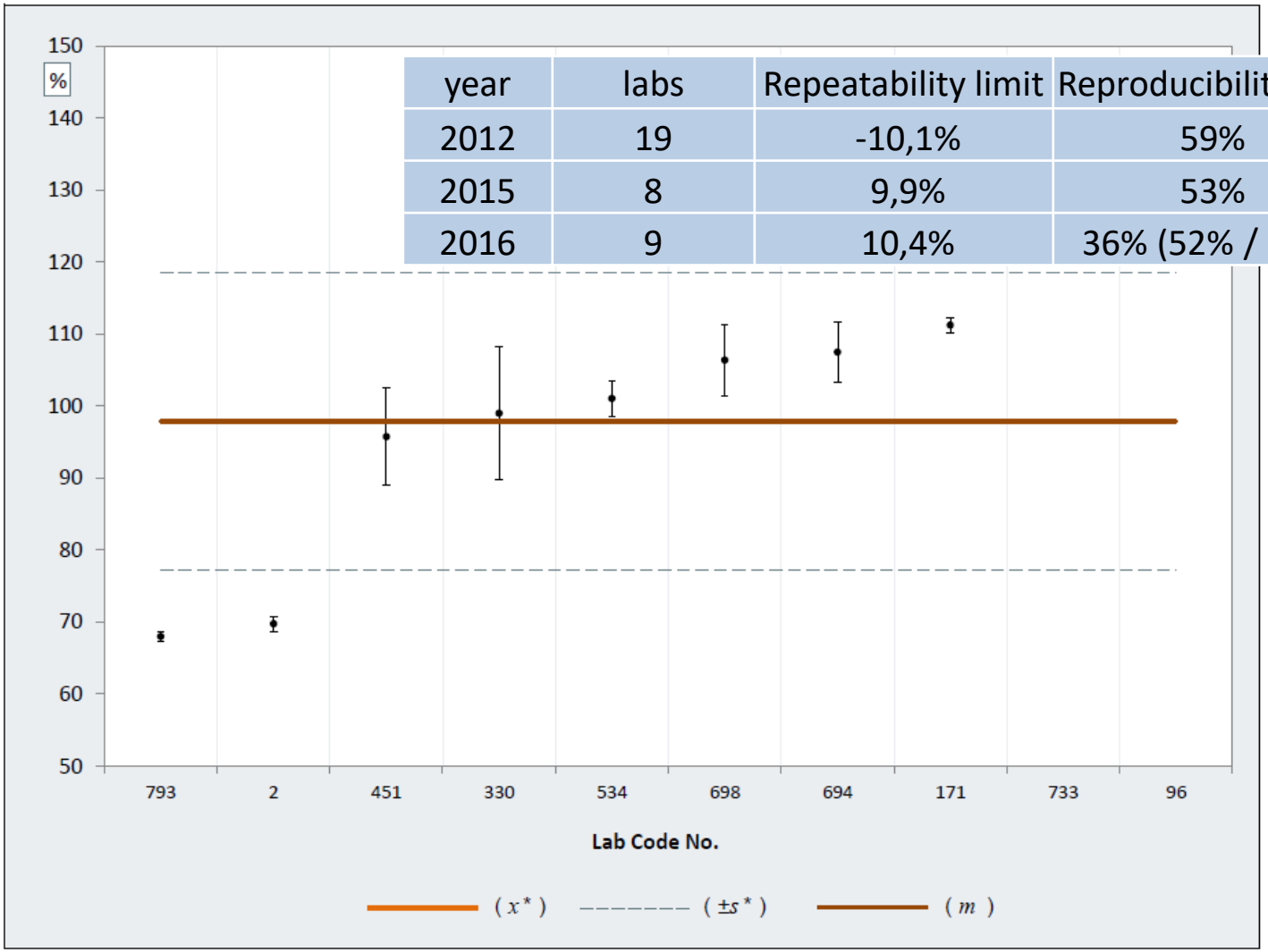
Key

1 striking edge
2 aluminium backing
3 rubber slider
4 worn between 1 mm and 3 mm

Figure 3 — Slider assembly illustrating the maximum wear on striking edge

Slip Resistance (dry)

year	labs	Repeatability limit	Reproducibility limit
2012	19	-10,1%	59%
2015	8	9,9%	53%
2016	9	10,4%	36% (52% / 19%)



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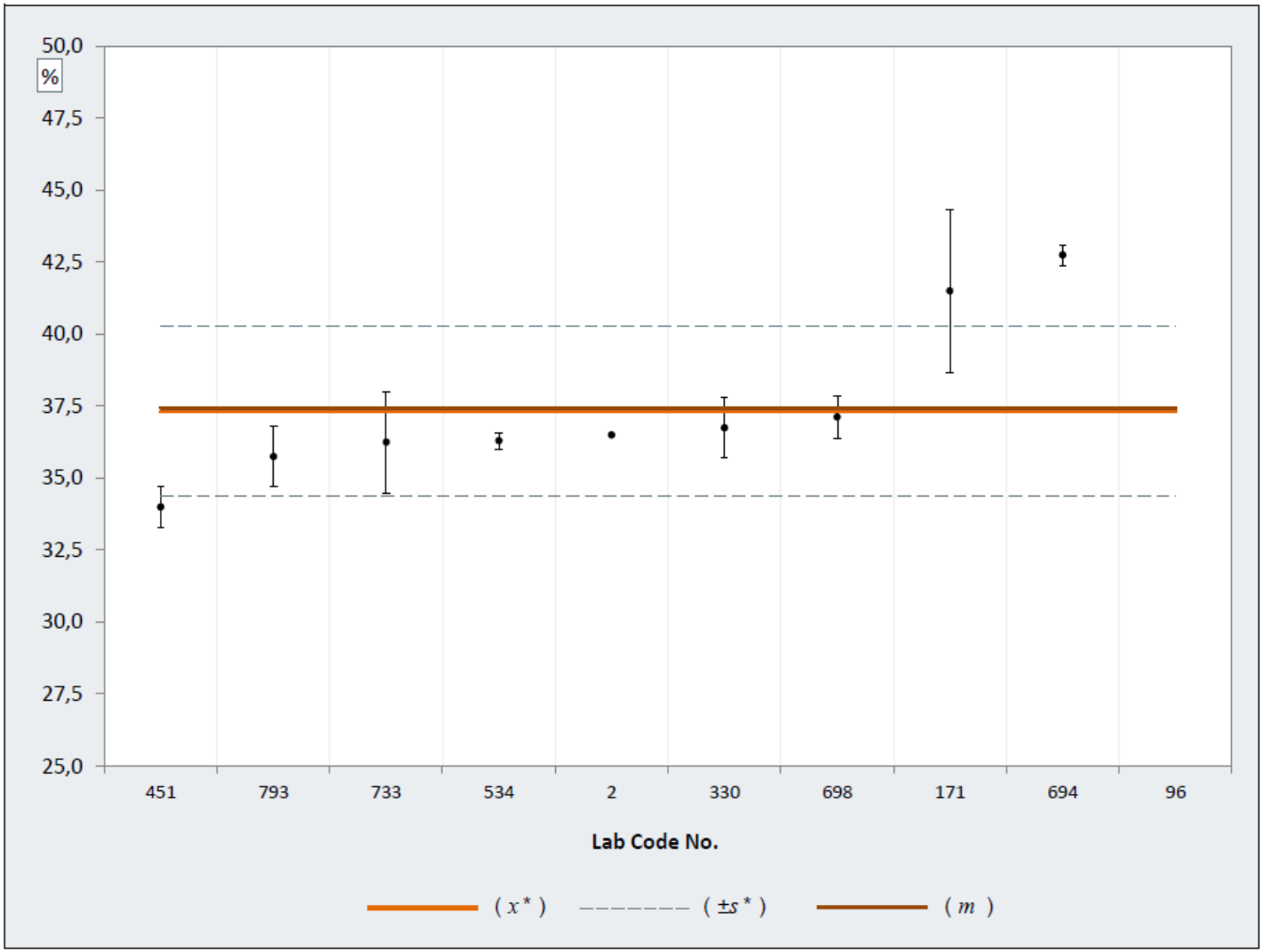
Slip Resistance (wet)



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Thickness (EN 1969)

Sample A

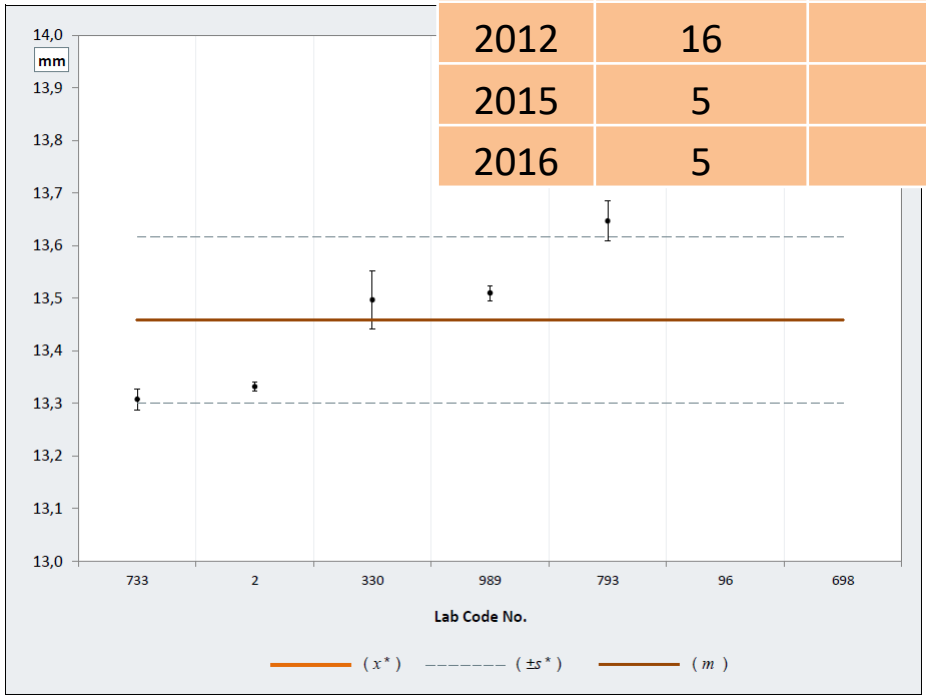
- Do not abrade the surface for the determination of the overall thickness. You just have to abrade one layer to determine the layer thickness.

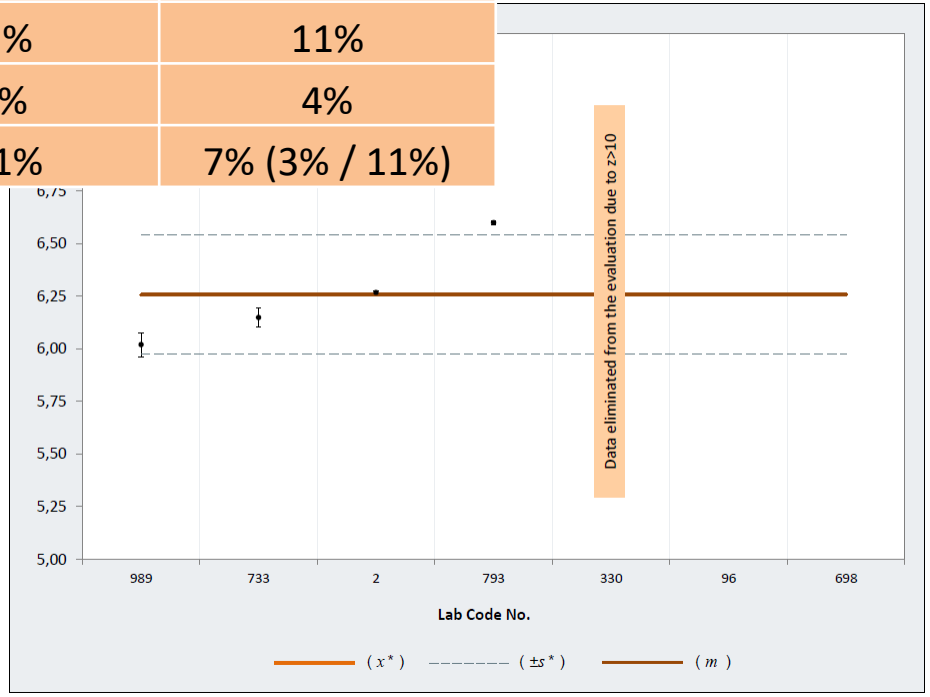
Thickness (EN 1969)

overall

year	labs	Repeatability limit	Reproducibility limit
2012	16	2%	11%
2015	5	2%	4%
2016	5	11%	7% (3% / 11%)

layer





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Vertical ball behavior (EN 12235)

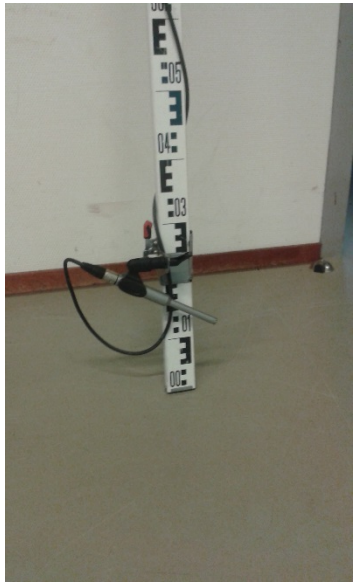

Table 1 — Properties of balls

Type of ball	Drop height (m) [d]	Rebound height from concrete [c, d] (m)	K_1 [a] (s)	Additional requirements
Basketball	1,80 ± 0,01	1,050 ± 0,025	0,025	Use a men's nylon wound basketball. Conform to FIBA requirements
Association football [b]	2,00 ± 0,01	1,350 ± 0,05	0,025	Conform to FIFA requirements
Tennis ball	2,54 ± 0,01	1,400 ± 0,025	0,005	Conform to ITF requirements
Hockey ball	2,00 ± 0,01	0,640 ± 0,025	0,038	Conform to FIH requirements

[a] K_1 is an empirically determined correction factor.

[b] The precision of the test using footballs is ± 10 % absolute.

[c] The rebound height from concrete is measured as described in 7.1 to determine if the ball is suitable for tests on the test piece.

[d] The drop height and rebound height should always be measured from the bottom of the ball.

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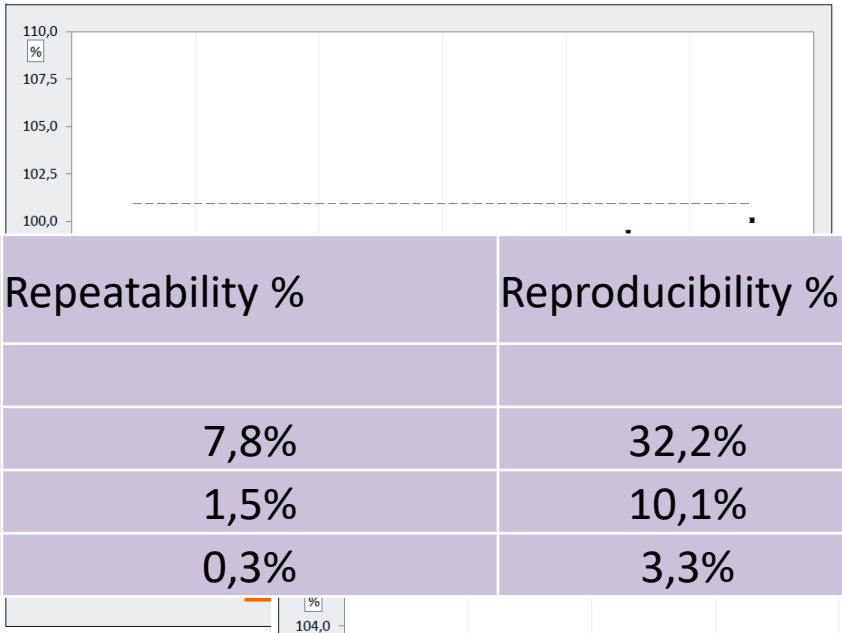
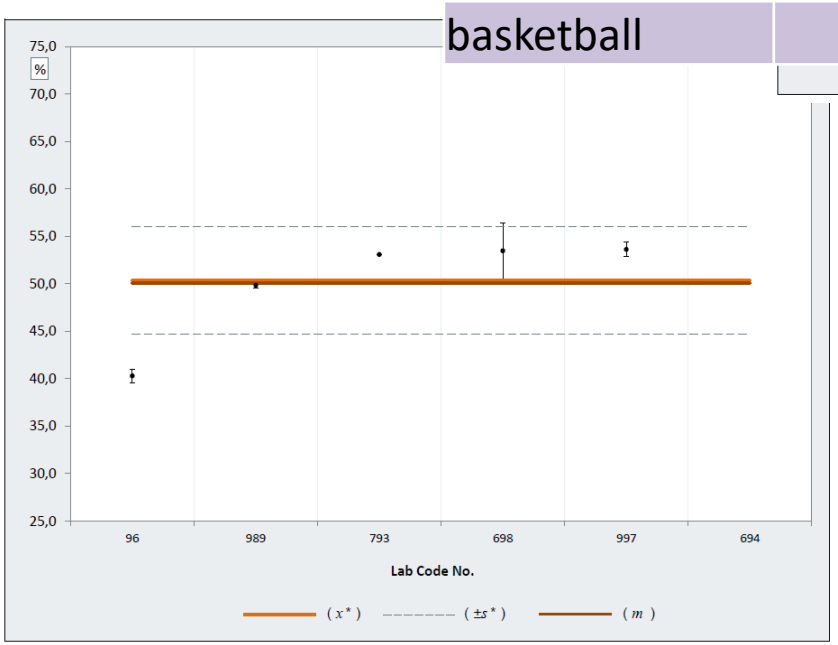
Vertical ball behaviour

football

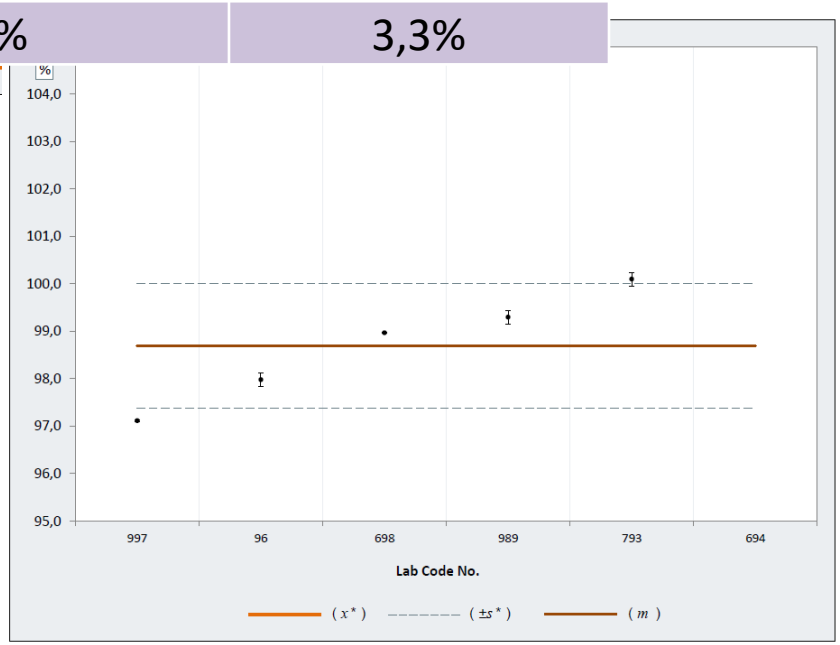


Sample	Repeatability %	Reproducibility %
hockeyball	7,8%	32,2%
football	1,5%	10,1%
basketball	0,3%	3,3%

hockey

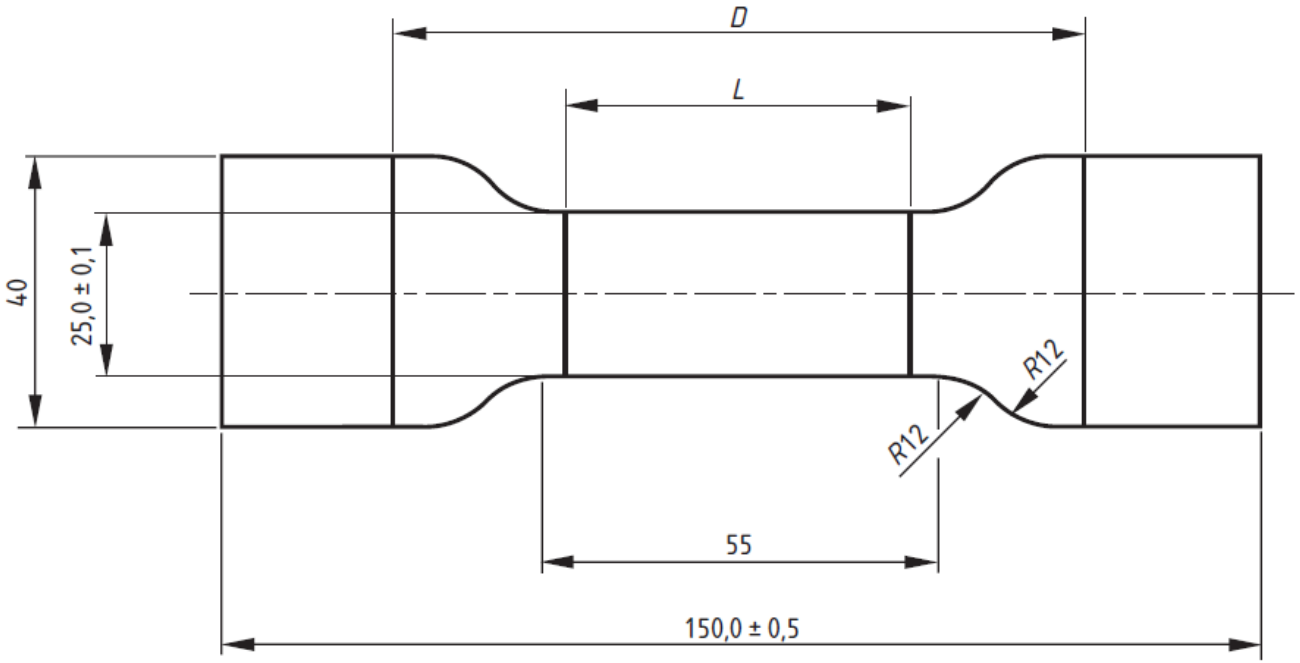


Basket ball



Tensile Properties (EN 12230)

Dimensions in millimetres



Key

D Distance between the grips, 100 mm
L Original gauge length, (50,0 ± 0,1) mm

Figure 1 — Dimensions and shape of a tensile test specimen

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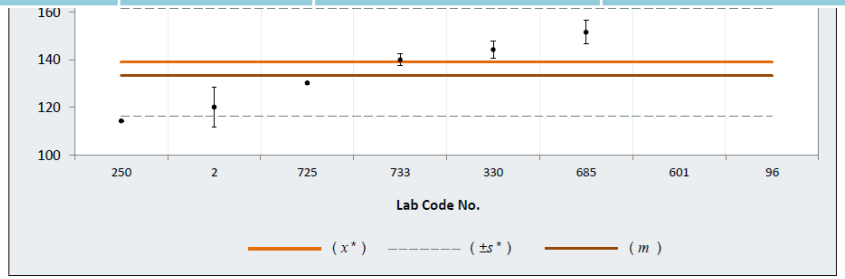
Tensile Properties (EN 12230)

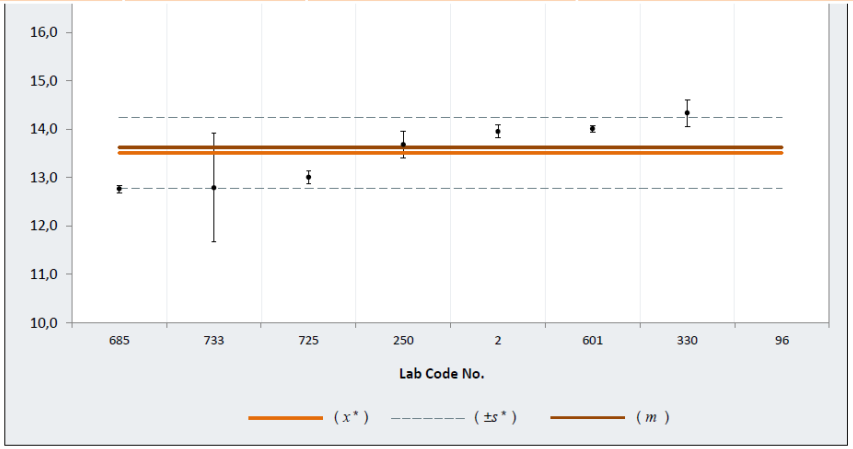
Relative Elongation

year	labs	Repeatability limit	Reproducibility limit
2012	14	10,0%	98,4 %
2015	7	4,3%	97,2%
2016	6	13,4%	29,0%



Maximum Strength

year	labs	Repeatability limit	Reproducibility limit
2012	15	-7,6%	18,5%
2015	7	3,4%	10,5%
2016	7	11,1%	17,8%



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Abrasion Resistance

TEST SPECIMEN		
	Sample A	Sample B
Material	EPDM	PVC
Colour	red	Blue
Specimen size	500 x 500	
Number of specimen delivered	1	
PROCEDURE		
Conditioning prior testing	40 h at 23 °C / 50 % r.H.	
Test conditions	23 °C / 50 % r.H.	
Type of wheels	H 18	
Load	1000 g	
Number of specimens to be tested in each test	1	
Number of tests *)	3	
EXPRESSION OF RESULTS		
	Decimals	Unit
Abrasion resistance	0	mg

Determination of abrasion resistance of the samples provided, following the method described in EN ISO 5470-1:1999 and in accordance with EN 14904:2006 and EN 14877:2006 on two samples.

The result should be reported after 1000 cycles.

Taber Abrader

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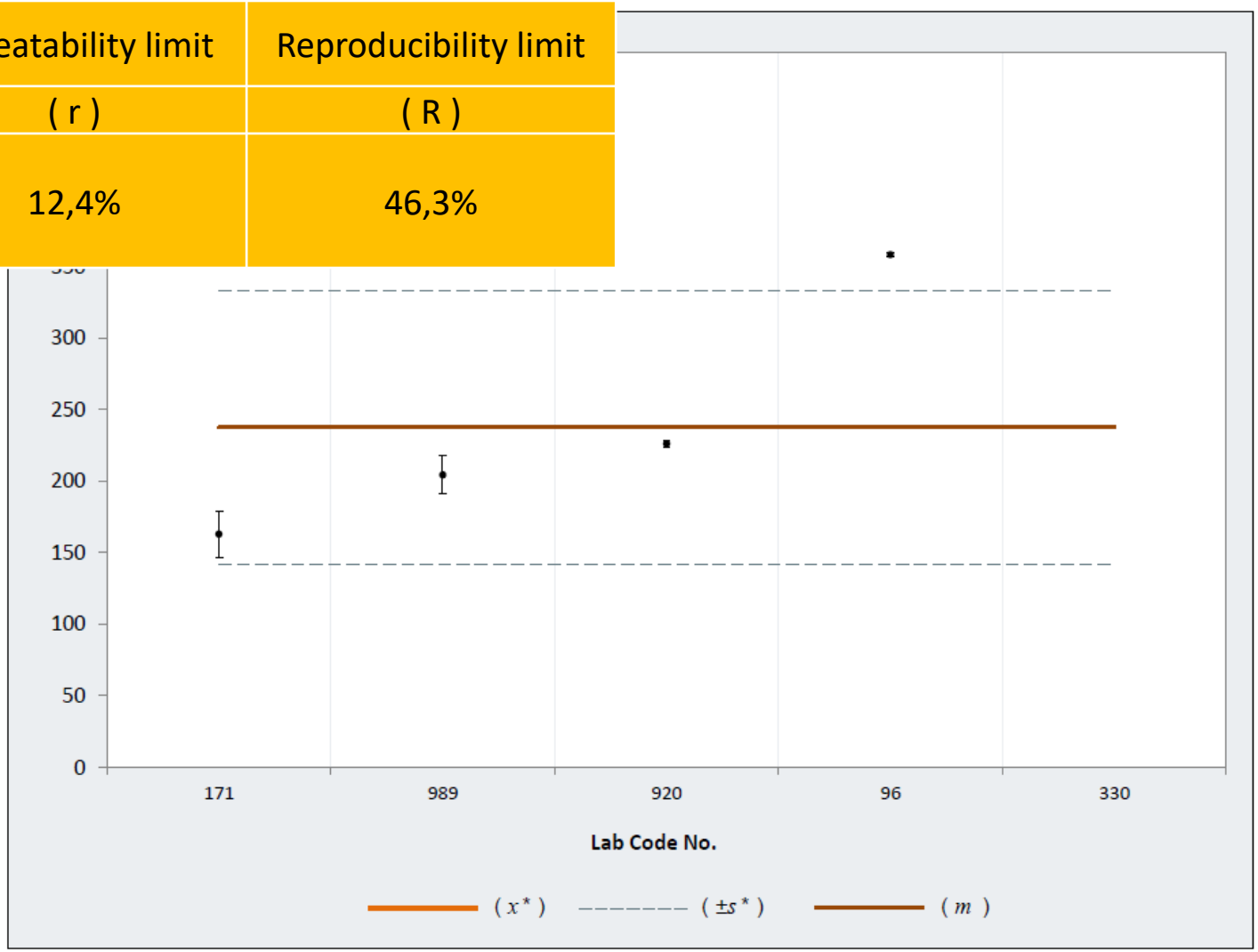
Abrasion Resistance

Repeatability limit	Reproducibility limit
(r)	(R)
12,4%	46,3%



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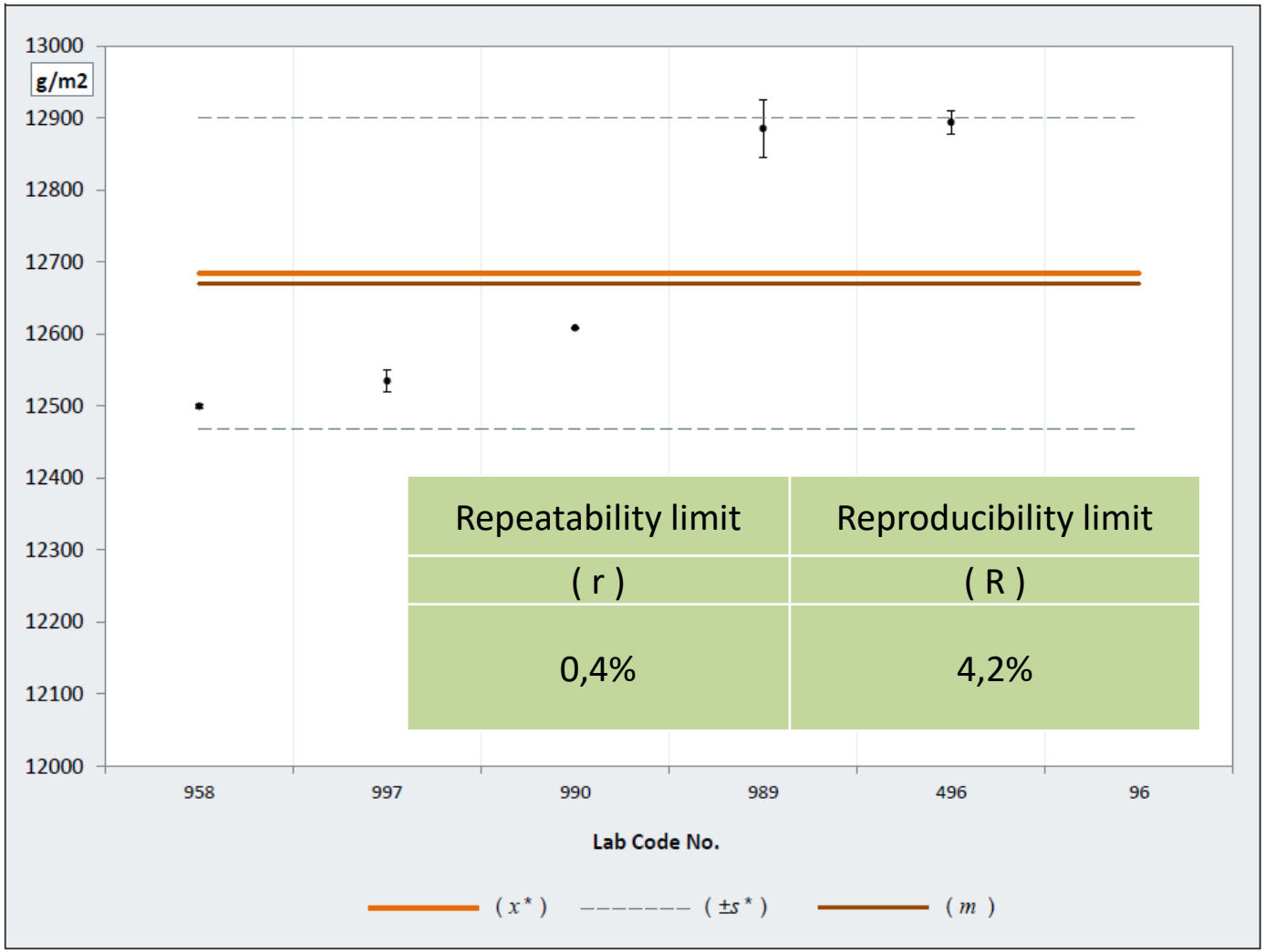
Mass (ISO 8543)



Repeatability limit	Reproducibility limit
(r)	(R)
0,4%	4,2%

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Any Questions?

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