

## Deutsche Akkreditierungsstelle GmbH

**Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV**

Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

# Accreditation



The Deutsche Akkreditierungsstelle GmbH attests that the calibration laboratory

**Bareiss Prüfgerätebau GmbH**  
**Breiteweg 1, 89610 Oberdischingen**

is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out calibrations in the following fields:

### Mechanical quantities

- **Hardness** <sup>a)</sup>
- **Weighing instruments** <sup>b)</sup>
- Material testing machines (MTM)**
- **Hardness (MTM)** <sup>a)</sup>
- **Extension (MTM)** <sup>b)</sup>
- **Mechanical work (MTM)** <sup>b)</sup>

<sup>a)</sup> also on-site calibrations

<sup>b)</sup> only on-site calibrations

The accreditation certificate shall only apply in connection with the notice of accreditation of 12.08.2022 with the accreditation number D-K-15206-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 12 pages.

Registration number of the certificate: **D-K-15206-01-00**

*in Vertretung Klaus Ullrich*

Berlin,  
12.08.2022

Dipl.-Wirtsch.-Ing. (BA) Tim Harnisch  
Head of Technical Unit

Translation issued:  
29.09.2022

Head of Technical Unit

*The certificate together with the annex reflects the status as indicated by the date of issue.*

*The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de/en/accredited-bodies-search.html>.*

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

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The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkKS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council setting out the requirements for accreditation and market surveillance relating to the marketing of products. DAkKS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Co-operation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:

EA: [www.european-accreditation.org](http://www.european-accreditation.org)

ILAC: [www.ilac.org](http://www.ilac.org)

IAF: [www.iaf.nu](http://www.iaf.nu)

# Deutsche Akkreditierungsstelle GmbH

## Annex to the Accreditation Certificate D-K-15206-01-00 according to DIN EN ISO/IEC 17025:2018

**Valid from:** 12.08.2022

**Date of issue:** 29.09.2022

Holder of certificate:

**Bareiss Prüfgerätebau GmbH**  
**Breiteweg 1, 89610 Oberdischingen**

Calibration in the fields:

### **Mechanical quantities**

- **Hardness** <sup>a)</sup>
- **Weighing instruments** <sup>b)</sup>

### **Material testing machines (MTM)**

- **Hardness (MTM)** <sup>a)</sup>
- **Extension (MTM)** <sup>b)</sup>
- **Mechanical work (MTM)** <sup>b)</sup>

<sup>a)</sup> also on-site calibrations

<sup>b)</sup> only on-site calibrations

Within the measurands/calibration items marked with with \*, the calibration laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use calibration standards or equivalent calibration procedures listed here with different issue dates. The calibration laboratory maintains a current list of all calibration standards / equivalent calibration procedures within the flexible scope of accreditation.

*The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories. Laboratories that conform to the requirements of this standard, operate generally in accordance with the principles of DIN EN ISO 9001.*

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Abbreviations used: see last page

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**This document is a translation. The definitive version is the original German annex to the accreditation certificate.**

**Annex to the accreditation certificate D-K-15206-01-00**
**Permanent Laboratory and On-site Calibration**
**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Hardness (MTM)</b>				
Measuring devices for the hardness scale Shore A*	0 Shore to 100 Shore	DIN ISO 48-4:2021 DIN EN ISO 868:2003 DIN ISO 48-9:2021 ASTM D 2240:2015	1.0 Shore	direct measurement with reference standards for distance and force
Analog Display				
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 mN to 8050 mN		6 mN	
Digital Display				
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 mN to 8050 mN		3 mN	
Indenter				
Shaft diameter	1.10 mm to 1.40 mm		1.2 µm	
Diameter of truncated cone	0.78 mm to 0.80 mm		1.5 µm	
Taper angle	34.75° to 35.25°		0.035°	
Pressure plate				
Outer diameter	17.50 mm to 18.50 mm		0.02 mm	
Bore diameter	2.90 mm to 3.10 mm		0.01 mm	
Load weight	1.000 kg to 1.100 kg		10 g	
Measuring devices for the hardness scale Shore D*	10 Shore to 100 Shore		1.0 Shore	
Analog Display				
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 mN to 44500 mN		5 mN	
Digital Display				
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 mN to 44500 mN		3 mN	
Indenter				
Shaft diameter	1.10 mm to 1.40 mm		1.2 µm	
Tip radius	0.09 mm to 0.11 mm		1.2 µm	
Taper angle	29.75° to 30.25°		0.035°	
Pressure plate				
Outer diameter	17.50 mm to 18.50 mm		0.02 mm	
Bore diameter	2.90 mm to 3.10 mm		0.01 mm	
Load weight	5.000 kg to 5.500 kg		20 g	
Measuring devices for the hardness scale Micro Shore A (M Shore A)	0 Shore to 100 Shore	QMV7.2-1.1 Edition 06/2021	1.0 Shore	
Measuring distance	0.05 mm to 0.90 mm		2 µm	
Pre-load	7.8 mN to 8.8 mN		0.2 mN	
Test force	107 mN to 110 mN		0.2 mN	
Contact pressure	205 mN to 265 mN		2 mN	
Indenter				
Shaft diameter	1.10 mm to 1.40 mm		1.2 µm	
Tip radius	0.09 mm to 0.11 mm		1.2 µm	
Taper angle	29.75° to 30.25°		0.035°	
Pressure plate				
Outer diameter	5.50 mm to 6.50 mm		0.02 mm	
Bore diameter	2.90 mm to 3.10 mm		0.01 mm	

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Permanent Laboratory and On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Hardness (MTM)</b>				
Measuring devices for the hardness scale Micro Shore D (M Shore D)	30 Shore to 100 Shore	QMV7.2-1.1 Edition 06/2021	1.0 Shore	direct measurement with reference standards for distance and force
Measuring distance	0 mm to 0.50 mm		2 µm	
Spring force	0 mN to 9420 mN		3.5 mN	
Indenter				
Shaft diameter	1.10 mm to 1.40 mm		1.2 µm	
Tip radius	0.09 mm to 0.11 mm		1.2 µm	
Taper angle	29.75° to 30.25°		0.035°	
Pressure plate				
Circle segment diameter	6.00 mm to 7.00 mm		0.02 mm	
Circle segment width	3.90 mm to 4.90 mm		0.01 mm	
Bore diameter	2.90 mm to 3.10 mm		0.01 mm	
Measuring devices for the hardness scale 0 – 2 N	0 N to 2.0 N	QMV7.2-1.1 Edition 06/2021	0.02 N	
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 N to 2.03 N		4 mN	
Indenter				
Cylinder diameter	3.55 mm to 3.59 mm		2 µm	
Measuring devices for the hardness scale 0 – 20 N	0 N to 20.1 N	QMV7.2-1.1 Edition 06/2021	0.2 N	
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 N to 20.0 N		6 mN	
Indenter				
Cylinder diameter	9.98 mm to 10.02 mm		2 µm	
Measuring devices for the hardness scale IRHD N (normal)*	30 IRHD to 100 IRHD	DIN ISO 48-2:2021 DIN ISO 48-9:2021 ASTM D 1415:2018	1.0 IRHD	
Measuring distance	0 mm to 1.81 mm		2 µm	
Pre-load	0.28 N to 0.32 N		1 mN	
Main force	5.39 N to 5.41 N		2 mN	
Total force	5.67 N to 5.73 N		2 mN	
Contact pressure	6.80 N to 9.80 N		5 mN	
Indenter				
Ball diameter	2.49 mm to 2.51 mm		2 µm	
Pressure plate				
Outer diameter	19.00 mm to 21.00 mm		0.02 mm	
Bore diameter	5.00 mm to 7.00 mm		0.01 mm	
Measuring devices for the hardness scale IRHD L (low)*	9.9 IRHD to 34.9 IRHD	DIN ISO 48-2:2021 DIN ISO 48-9:2021 ASTM D 1415:2018	1.0 IRHD	
Measuring distance	1.09 mm to 3.19 mm		2 µm	
Pre-load	0.28 N to 0.32 N		1 mN	
Main force	5.39 N to 5.41 N		2 mN	
Total force	5.67 N to 5.73 N		2 mN	
Contact pressure	6.80 N to 9.80 N		5 mN	
Indenter				
Ball diameter	4.99 mm to 5.01 mm		2 µm	
Pressure plate				
Outer diameter	21.00 mm to 23.00 mm		0.02 mm	
Bore diameter	9.00 mm to 11.00 mm		0.01 mm	

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**Permanent Laboratory and On-site Calibration**

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Hardness (MTM)</b> Measuring devices for the hardness scale IRHD M (micro)*	30 IRHD to 100 IRHD	DIN ISO 48-2:2021 DIN ISO 48-9:2021 ASTM D 1415:2018	1.0 IRHD	direct measurement with reference standards for distance and force
Measuring distance	0 mm to 0.302 mm		1 µm	
Pre-load	7.8 mN to 8.8 mN		0.2 mN	
Main force	144.5 mN to 145.5 mN		0.2 mN	
Total force	152.3 mN to 154.3 mN		0.2 mN	
Contact pressure	205 mN to 265 mN		2 mN	
Indenter				
Ball diameter	0.390 mm to 0.400 mm		1 µm	
Pressure plate				
Outer diameter	3.20 mm to 3.50 mm		0.02 mm	
Bore diameter	0.85 mm to 1.15 mm		0.01 mm	
Measuring devices for the hardness scale IRHD H (hard)*	30 IRHD to 100 IRHD		1.0 IRHD	
Measuring distance	0 mm to 0.45 mm		2 µm	
Pre-load	0.28 N to 0.32 N		1 mN	
Main force	5.39 N to 5.41 N		2 mN	
Total force	5.67 N to 5.73 N		2 mN	
Contact pressure	6.8 N to 9.8 N		5 mN	
Indenter				
Ball diameter	0.99 mm to 1.01 mm		2 µm	
Pressure plate				
Outer diameter	19.0 mm to 21.0 mm		0.02 mm	
Bore diameter	5.0 mm to 7.0 mm		0.01 mm	
Measuring device for the Hardness scale VLRH*	0 VLRH to 100 VLRH	DIN ISO 48-3:2021	1.0 VLRH	
Measuring distance	0 mm to 1.01 mm		2 µm	
Pre-load	7.8 mN to 8.8 mN		0.2 mN	
Main force	91.2 mN to 92.2 mN		0.2 mN	
Total force	99.0 mN to 101.0 mN		0.2 mN	
Contact pressure	205 mN to 265 mN		2 mN	
Indenter				
Ball diameter	2.49 mm to 2.51 mm		2 µm	
Pressure plate				
Outer diameter	5.50 mm to 6.50 mm		0.02 mm	
Bore diameter	2.90 mm to 3.10 mm		0.01 mm	
Spring force-check device with sliding weights	0 Shore to 100 Shore	QMV7.2-1.1 Edition 06/2021	0.2 Shore	direct measurement with reference standards for force
Shore A test force	0 mN to 8050 mN		1 mN	
Shore D test force	0 mN to 44500 mN		2 mN	
<b>Extension (MTM)</b> Measuring distance-control rings		QMV7.2-1.1 Edition 06/2021	0.2 Shore 1.3 µm	direct measurement with reference standards for distance
„20 Shore“	1.995 mm to 2.005 mm			
„40 Shore“	1.495 mm to 1.505 mm			
„60 Shore“	0.995 mm to 1.005 mm			
„80 Shore“	0.495 mm to 0.505 mm			

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**Permanent Laboratory and On-site Calibration**

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Hardness (MTM)</b>				
Measuring devices for the hardness scale Shore AM/M*	0 Shore to 100 Shore	DIN ISO 48-4:2021 ASTM D 2240:2015 DIN ISO 48-9:2021	1.0 Shore	direct measurement with reference standards for distance and force
Measuring distance	0 mm to 1.25 mm		2 µm	
Spring force	755.2 mN to 772.8 mN		2 mN	
Indenter				
Shaft diameter	0.765 mm to 0.815 mm		1.2 µm	
Tip radius	0.09 mm to 0.11 mm		1.2 µm	
Taper angle	29.75° to 30.25°		0.035°	
Pressure plate Shore AM				
Outer diameter	8.70 mm to 9.30 mm		0.05 mm	
Bore diameter	1.16 mm to 1.22 mm		0.01 mm	
Pressure plate Shore M				
Outer diameter	3.2 mm to 3.80 mm		0.02 mm	
Bore diameter	1.16 mm to 1.22 mm		0.01 mm	
Load weight	0.250 kg to 0.300 kg	5 g		
<b>Hardness (MTM)</b>				
Measuring devices for the hardness scale Shore A0*	0 Shore to 100 Shore	DIN ISO 48-4:2021 DIN ISO 48-9:2021	1.0 Shore	direct measurement with reference standards for distance and force
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 mN to 8050 mN		2 mN	
Indenter				
Ball diameter	4.96 mm to 5.04 mm		2 µm	
Pressure plate				
Pressure plate surface	≥ 500 mm <sup>2</sup>		5 mm <sup>2</sup>	
Bore diameter	5.20 mm to 5.60 mm		0.01 mm	
Load weight	1.000 kg to 1.100 kg		10 g	

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**Permanent Laboratory and On-site Calibration**
**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks	
Measuring devices for the hardness scale Shore 0*	0 Shore to 100 Shore	ASTM D 2240:2015	1.0 Shore		
Analog display					
Measuring distance	0 mm to 2.50 mm		2 µm		
Spring force	0 mN to 8050 mN		5 mN		
Digital display					
Measuring distance	0 mm to 2.50 mm		2 µm		
Spring force	0 mN to 8050 mN		3 mN		
Indenter					
Ball diameter	2.30 mm to 2.46 mm		2 µm		
Pressure plate					
Pressure plate surface	≥ 500 mm <sup>2</sup>		5 mm <sup>2</sup>		
Bore diameter	3.50 mm to 3.70 mm		0.01 mm		
Load weight	1.000 kg to 1.100 kg		10 g		
Measuring devices for the hardness scale Shore 00*	0 Shore to 100 Shore			1.0 Shore	
Measuring distance	0 mm to 2.50 mm			2 µm	
Spring force	0 N to 1.111 N			2 mN	
Indenter					
Ball diameter	2.30 mm to 2.46 mm		2 µm		
Pressure plate					
Pressure plate surface	≥ 500 mm <sup>2</sup>		5 mm <sup>2</sup>		
Bore diameter	3.40 mm to 3.80 mm		0.01 mm		
Load weight	0.400 kg to 0.440 kg		6 g		

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**Permanent Laboratory and On-site Calibration**
**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks	
Measuring devices for the Hardness scale Shore 000*	0 Shore to 100 Shore	ASTM D 2240:2015	1.0 Shore		
Analog/digital display					
Measuring distance	0 mm to 2.50 mm		2 µm		
Spring force	0 N to 1.111 N		2 mN		
Indenter					
Ball radius	6.32 mm to 6.38 mm		2 µm		
Cylinder diameter	10.57 mm to 10.83 mm		2 µm		
Pressure plate					
Pressure plate surface	≥ 500 mm <sup>2</sup>		5 mm <sup>2</sup>		
Bore diameter	11.67 mm to 11.93 mm		0.01 mm		
Load weight	0.400 kg to 0.440 kg		6 g		
Measuring devices for the Hardness scale Shore 000-S*	0 Shore to 100 Shore				1.0 Shore
Analog/digital display					
Measuring distance	0 mm to 5.0 mm		2 µm		
Spring force	0 N to 1.932 N	1 mN			
Indenter					
Ball radius	10.57 mm to 10.83 mm	2 µm			
Cylinder diameter	11.82 mm to 11.98 mm	2 µm			
Pressure plate					
Pressure plate surface	≥ 500 mm <sup>2</sup>	5 mm <sup>2</sup>			
Bore diameter	12.40 mm to 13.00 mm	0.01 mm			
Load weight	0.400 kg to 0.440 kg	6 g			
Measuring devices for the Hardness scale Shore B*	0 Shore to 100 Shore		1.0 Shore		
Analog display					
Measuring distance	0 mm to 2.50 mm	2 µm			
Spring force	0 mN to 8050 mN	5 mN			
Digital display					
Measuring distance	0 mm to 2.50 mm	2 µm			
Spring force	0 mN to 8050 mN	3 mN			
Indenter					
Shaft diameter	1.10 mm to 1.40 mm	1.2 µm			
Tip diameter	0.09 mm to 0.11 mm	1.2 µm			
Cone angle	29.75° to 30.25°	0.035°			
Pressure plate					
Outer diameter	17.50 mm to 18.50 mm	0.02 mm			
Bore diameter	2.90 mm to 3.10 mm	0.01 mm			
Load weight	1.000 kg to 1.100 kg	10 g			

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**Permanent Laboratory and On-site Calibration**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks	
Measuring devices for the Hardness scale Shore D0*	0 Shore to 100 Shore	ASTM D 2240:2015	1.0 Shore		
Measuring distance	0 mm to 2.50 mm		2 µm		
Spring force	0 mN to 44450 mN		3 mN		
Indenter					
Ball diameter	2.30 mm to 2.46 mm		2 µm		
Pressure plate					
Outer diameter	17.50 mm to 18.50 mm		0.02 mm		
Bore diameter	3.50 mm to 3.70 mm		0.01 mm		
Load weight	5.000 kg to 5.500 kg		20 g		
Measuring devices for the Hardness scale Shore C*	0 Shore to 100 Shore			1.0 Shore	
Analog display					
Measuring distance	0 mm to 2.50 mm			2 µm	
Spring force	0 mN to 44450 mN			5 mN	
Digital display					
Measuring distance	0 mm to 2.50 mm		2 µm		
Spring force	0 mN to 44450 mN		3 mN		
Indenter					
Shaft diameter	1.15 mm to 1.39 mm		1.2 µm		
Cone stump diameter	0.76 mm to 0.82 mm		1.5 µm		
Cone angle	34.75° to 35.25°		0.035°		
Pressure plate					
Outer diameter	17.50 mm to 18.50 mm		0.02 mm		
Bore diameter	2.50 mm to 3.10 mm		0.01 mm		
Load weight	5.000 kg to 5.500 kg		20 g		
Measuring devices for the Hardness scale Shore E*	0 Shore to 100 Shore		1.0 Shore		
Measuring distance	0 mm to 2.50 mm		2 µm		
Spring force	0 mN to 8050 mN		2 mN		
Indenter					
Ball diameter	4.92 mm to 5.08 mm		2 µm		
Pressure plate					
Pressure plate surface	≥ 500 mm <sup>2</sup>		5 mm <sup>2</sup>		
Bore diameter	5.80 mm to 6.20 mm		0.01 mm		
Load weight	1.000 kg to 1.100 kg		10 g		

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Permanent Laboratory and On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Hardness (MTM)</b>	0 Hardness-units to 100 Hardness-units	ASTM D 2240:2015	1.0 hardness-units	direct measurement with reference standards for distance and force
Measuring device for the Hardness scale Hardness L and L/c*				
Measuring distance	0 mm to 2.50 mm		2 µm	
Spring force	0 mN to 8050 mN		2 mN	
Indenter				
Ball diameter	4.92 mm to 5.08 mm		2 µm	
Pressure plate				
Outer diameter	17.50 mm to 18.50 mm		0.02 mm	
Bore diameter	5.80 mm to 6.20 mm	0.01 mm		
Load weight	1.000 kg to 1.100 kg		10 g	
Measuring device for the Hardness scale Pusey & Jones*	0 to 300 PJ	DIN ISO 48-8:2021 ASTM D 531:2015	1.0 Pusey & Jones (PJ)	
Measuring distance	0 mm to 3.00 mm		2 µm	
Total force	9787 mN to 9826 mN		2.9 mN	
Indenter				
Ball diameter	3.16 mm to 3.19 mm		2 µm	
Measuring device for the Hardness scale Barcol*	0 to 100 Barcol	ASTM D 2583a:2013 DIN EN 59:2016	1.0 Barcol	
Measuring distance	0.74 mm to 0.78 mm		2 µm	
Spring force	60.8 N to 71.6 N		0.07 N	
Indenter				
Diameter of the truncated cone	0.137 mm to 0.177 mm		1.5 µm	
Taper angle	25.75° to 26.25°		0.035°	

**Annex to the accreditation certificate D-K-15206-01-00**
**Only Permanent Laboratory**
**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Hardness</b> Calibration of standard rubber blocks		DIN ISO 48-4:2021 DIN EN ISO 868:2003		direct measurement with reference standards for hardness
Shore A/D*	20 Shore to 90 Shore		2.0 Shore	
Shore AM/M*	20 Shore to 90 Shore	DIN ISO 48-4:2021 ASTM D 2240:2015	2.0 Shore	
Shore A0*	20 Shore to 90 Shore	DIN ISO 48-4:2021	2.0 Shore	
Shore 0/00/000/000-S/ B/C/D0/E*	20 Shore to 90 Shore	ASTM D 2240:2015	2.0 Shore	
Hardness L*	20 Hardness <sub>L</sub> to 90 Hardness <sub>L</sub>	ASTM D 2240:2015	2.0 hardness-units	
Hardness L/c*	20 Hardness <sub>L/c</sub> to 90 Hardness <sub>L/c</sub>			
IRHD M (micro)*	30 IRHD to 90 IRHD	DIN ISO 48-2:2021	2.0 IRHD	
IRHD N (normal)*	30 IRHD to 90 IRHD			
IRHD L (low)*	10 IRHD to 34.9 IRHD			
IRHD H (hard)*	85 IRHD to 100 IRHD			
VLRH*	20 VLRH to 90 VLRH	DIN ISO 48-3:2021	2.0 VLRH	
Pusey & Jones*	30 PJ to 300 PJ	DIN ISO 48-8:2021 ASTM D 531:2015	2.0 Pusey & Jones (PJ)	
Barcol*	30 Barcol to 90 Barcol	ASTM D 2583a:2013 DIN EN 59:2016	2.0 Barcol	
Micro Shore A	0 M Shore A to 100 M Shore A	QMV7.2-1.1 Edition 06/2021	2.0 M Shore A	
Micro Shore D	30 M Shore D to 100 M Shore D	QMV7.2-1.1 Edition 06/2021	2.0 M Shore D	
0 – 2 N	0 N to 2.0 N	QMV7.2-1.1 Edition 06/2021	0.02 N	
0 – 20 N	0 N to 20.0 N	QMV7.2-1.1 Edition 06/2021	0.2 N	
<b>Extension (MTM)</b> Device for penetration depth measurement kal-rock for Rockwell-Hardness-Testers	- 250 µm to 250 µm	QMV7.2-1.1 Edition 06/2021	0.15 µm	direct measurement with reference standards for extension

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**Only On-site Calibration**

**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
<b>Hardness (MTM)*</b> Depth measuring device of ball indentation hardness testing machines	0 mm to 0.4 mm	DIN EN ISO 2039-1:2003	0.3 µm	direct calibration with depth calibration device
Force measuring device of hardness testing machines	0.1 N to 2500 N	DIN EN ISO 2039-1:2003 DIN EN ISO 2039-2:2000	0.12 %	direct calibration with load cells (class 0) and precision balances
<b>Mechanical work (MTM)*</b> Abrasion resistance tester	5 N to 20 N	DIN ISO 4649:2017	friction force: 0.12 % cylinder diameter: 0.02 mm friction distance: 0.02 m frequency: 0.05 min <sup>-1</sup>	the measuring uncertainty will be calculated separately for: 1. friction force 2. cylinder diameter 3. friction distance 4. frequency
Resilience elasticity tester (Schob-Pendulum)	0 J to 0.5 J	DIN 53512:2000 ISO 4662:2017	force: 0.12 % pendulum length: 0.1 mm angle: 0.03° time: 0.2 s	the measuring uncertainty will be calculated separately for: 1. position of the oscillation center 2. potential energy 3. deviation of the indicated energy
<b>Weighing instruments*</b> nonautomatic weighing instruments	bis 610 g	EURAMET Calibration Guide No. 18 version 4.0 (11/2015)	2 · 10 <sup>-6</sup>	with weights for OIML R 111-1:2004 according to class E <sub>2</sub>
	bis 20 kg	Richtlinie DKD-R 7-2 (01/2018)	6 · 10 <sup>-6</sup>	with weights for OIML R 111-1:2004 according to class F <sub>1</sub>

**Abbreviations used:**

ASTM	ASTM American Society for Testing and Materials
CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DKD-R	Richtlinie des Deutschen Kalibrierdienstes (DKD), herausgegeben von der Physikalisch-Technischen Bundesanstalt
EURAMET	European Association of National Metrology Institutes
OIML	Organisation Internationale de Métrologie Légale
QMV	internal calibration procedure of Bareiss Prüfgerätebau GmbH

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