

Accreditation



The Deutsche Akkreditierungsstelle attests with this **Accreditation Certificate** that

JENOPTIK Industrial Metrology Germany GmbH
Drachenloch 5, 78052 Villingen-Schwenningen

operates a calibration laboratory that fulfills the requirements according to DIN EN ISO/IEC 17025:2018 for those conformity assessment activities specified in detail in the annex listed below. This includes additional existing legal and normative requirements for the calibration laboratory including those in relevant sectoral schemes, provided that these are explicitly confirmed in the annex listed below.

D-K-15030-01-01 Valid from: 18.09.2026

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

This accreditation was issued in accordance with Art. 5 Para. 1 Sentence 2 of Regulation (EC) 765/2008, after an accreditation procedure was carried out in compliance with the minimum requirements of DIN EN ISO/IEC 17011 and on the basis of a review and decision of the appointed accreditation committees.

This accreditation certificate only applies in connection with the notice of 18.09.2026. It consists of this cover sheet, the reverse side of the cover sheet and the corresponding annex .

Registration number of the accreditation certificate: **D-K-15030-01-00**

Berlin, 18.09.2026 Dr. Florian Witt | Head of Technical Unit

Translation issued: 18.09.2026

This accreditation certificate was issued by the Deutsche Akkreditierungsstelle GmbH (DAkkS). It is digitally sealed and valid without signature. It reflects the status as indicated by the date of issue. The current status of any valid and surveyed accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH (www.dakks.de).

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

See notes overleaf

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

The Deutsche Akkreditierungsstelle GmbH (DAkkS) is the entrusted national accreditation body of the Federal Republic of Germany according to § 8 section 1 AkkStelleG in conjunction with § 1 section 1 AkkStelleGBV. DAkkS is designated as the national accreditation authority by Germany according to Art. 4 Para. 4 of Regulation (EC) 765/2008 and clause 4.7 of DIN EN ISO/IEC 17000.

Pursuant to Art. 11 section 2 of Regulation (EC) 765/2008, the accreditation certificate shall be recognised as equivalent by the national authorities within the scope of this Regulation as well as by the WTO member states that have committed themselves in bilateral or multilateral mutual agreements to recognise the certificates of participating accreditation bodies as equivalent.

DAkkS is a signatory to the multilateral agreement for mutual recognition of the European co-operation for Accreditation (EA).

The up-to-date state of membership can be retrieved from the following website:
EA: www.european-accreditation.org

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-15030-01-01 according to DIN EN ISO/IEC 17025:2018

Valid from: 18.09.2026

Date of issue: 18.09.2026

This annex is part of the Accreditation Certificate D-K-15030-01-00.

Holder of the Accreditation Certificate:

JENOPTIK Industrial Metrology Germany GmbH
Drachenloch 5, 78052 Villingen-Schwenningen

with the location

JENOPTIK Industrial Metrology Germany GmbH
Drachenloch 5, 78052 Villingen-Schwenningen

The calibration laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The calibration laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and they conform to the principles of DIN EN ISO 9001.

*This annex to the certificate was issued by the Deutsche Akkreditierungsstelle GmbH (DAkkS) and is digitally sealed.
This annex to the certificate is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of any valid and surveyed accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH (www.dakks.de).*

Annex to the Accreditation Certificate D-K-15030-01-01

Calibration in the fields:

Dimensional quantities

Length

- Roughness
- Form Error
- Contours
- Stylus instruments ^{a)}
- Length measuring instruments ^{a)}

^{a)} also on-site calibrations

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Annex to the Accreditation Certificate D-K-15030-01-01

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Länge Groove depth P_t and d on depth setting standards and step height standards	0.15 μm to 12 μm > 12 μm to 5500 μm	DIN EN ISO 5436-1:2000 DIN EN ISO 25178-601:2025 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 Withdrawn: DIN EN ISO 3274:1998 DIN EN ISO 4287:2010	0.012 μm + 0.8 · 10 ⁻³ · P_t 0.012 μm + 0.8 · 10 ⁻³ · d 0.022 μm + 0.036 · 10 ⁻³ · P_t 0.022 μm + 0.036 · 10 ⁻³ · d	
Roughness on geometric standards R_a R_z R_{max} $R_z I_{max}$ $R_{zx}(l)$ R_{Sm}, R_{sm}	 0.1 μm to 3.5 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 40 μm to 400 μm	DIN EN ISO 16610-21:2025 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 DIN EN ISO 25178-601:2025 Withdrawn: DIN 4768:1990 DIN EN ISO 3274:1998 DIN EN ISO 4287:2010 DIN EN ISO 4288:1998	 1.5 % · R_a 1.5 % · R_z 2.0 % · R_{max} 2.0 % · $R_z I_{max}$ 2.0 % · $R_{zx}(l)$ 1.5 μm	If necessary, the cutoff length λ_c can be selected one step shorter or up to two steps longer than specified in the standard, but not more than $\lambda_c = 2.5 \text{ mm}$
R_a R_z R_{max} $R_z I_{max}$ $R_{zx}(l)$ RP_c Rpc	0.1 μm to 3.5 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 25 ≤ RP_c ≤ 150 25 ≤ Rpc ≤ 150	DIN EN 10049:2014 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 Withdrawn: Steel test specification (SEP) 1940:2002	5.0 % · R_a 5.0 % · R_z 5.0 % · R_{max} 5.0 % · $R_z I_{max}$ 5.0 % · $R_{zx}(l)$ 2.0 cm ⁻¹ 2.0 cm ⁻¹	Depending on the profile height other intersection line distances can be chosen (as specified) With dual-skid probe system according to DIN EN 10049:2014
R_a R_z R_{max} $R_z I_{max}$ $R_{zx}(l)$ RP_c Rpc	0.1 μm to 3.5 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 25 ≤ RP_c ≤ 150 25 ≤ Rpc ≤ 150	QMV- Simulation Zweikufentastsysteme: 2026-03 (engl.: QMV- Simulation dual-skid probe systems) DIN EN 10049:2014 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 Withdrawn: Steel test specification (SEP) 1940:2002	4.0 % · R_a 4.0 % · R_z 4.0 % · R_{max} 4.0 % · $R_z I_{max}$ 4.0 % · $R_{zx}(l)$ 2.0 cm ⁻¹ 2.0 cm ⁻¹	Depending on the profile height other intersection line distances can be chosen (as specified) Simulation of probing with a dual-skid probe system according to DEN EN 10049:2014 based on measurements with a reference plane probing system

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Annex to the Accreditation Certificate D-K-15030-01-01
Permanent Laboratory
Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Roughness on aperiodic roughness standards <i>Ra</i> <i>Rz</i> <i>Rmax</i> <i>RzI_{max}</i> <i>Rzx(l)</i>	0.1 µm to 3.5 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 0.5 µm to 20 µm	DIN EN ISO 16610-21:2025 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 DIN EN ISO 25178-601:2025 Withdrawn: DIN 4768:1990 DIN EN ISO 3274:1998 DIN EN ISO 4287:2010 DIN EN ISO 4288:1998	2.5 % · <i>Ra</i> 3.0 % · <i>Rz</i> 3.5 % · <i>Rmax</i> 3.5 % · <i>RzI_{max}</i> 3.5 % · <i>Rzx(l)</i>	
<i>Rpk</i> <i>Rk</i> <i>Rvk</i>	auf Oberflächen im Bereich	DIN EN ISO 13565-1:1998 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022	9.0 % · <i>Rpk</i> 5.0 % · <i>Rk</i> 8.0 % · <i>Rvk</i>	
<i>Mr1</i> , <i>Rmrk1</i> <i>Mr2</i> , <i>Rmrk2</i>	0.1 µm ≤ <i>Ra</i> ≤ 3.5 µm 0.5 µm ≤ <i>Rz</i> ≤ 20 µm	Withdrawn: DIN 4776:1990 DIN EN ISO 13565-2:1998	2.0 % 2.0 %	Relative measuring uncertainty relative to 100 % material ratio
<i>Ra</i> <i>Rz</i> <i>Rmax</i> <i>RzI_{max}</i> <i>Rzx(l)</i> <i>RPc</i> <i>Rpc</i>	0.1 µm to 3.5 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 25 ≤ <i>RPc</i> ≤ 100 25 ≤ <i>Rpc</i> ≤ 100	DIN EN 10049:2014 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 Withdrawn: Steel test specification (SEP) 1940:2002	8.0 % · <i>Ra</i> 8.0 % · <i>Rz</i> 8.0 % · <i>Rmax</i> 8.0 % · <i>RzI_{max}</i> 8.0 % · <i>Rzx(l)</i> 2.0 cm ⁻¹ 2.0 cm ⁻¹	Depending on the profile height other intersection line distances can be chosen (as specified) With dual-skid probe system according to DIN EN 10049:2014
<i>Ra</i> <i>Rz</i> <i>Rmax</i> <i>RzI_{max}</i> <i>Rzx(l)</i> <i>RPc</i> <i>Rpc</i>	0.1 µm to 3.5 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 0.5 µm to 20 µm 25 ≤ <i>RPc</i> ≤ 150 25 ≤ <i>Rpc</i> ≤ 150	QMV- Simulation Zweikufentastsysteme: 2026-03 (engl.: QMV- Simulation dual-skid probe systems) DIN EN 10049:2014 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 Withdrawn: Steel test specification (SEP) 1940:2002	5.0 % · <i>Ra</i> 5.0 % · <i>Rz</i> 5.0 % · <i>Rmax</i> 5.0 % · <i>RzI_{max}</i> 5.0 % · <i>Rzx(l)</i> 2.0 cm ⁻¹ 2.0 cm ⁻¹	Depending on the profile height other intersection line distances can be chosen (as specified) Simulation of probing with a dual-skid probe system according to DEN EN 10049:2014 based on measurements with a reference plane probing system

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Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Roughness on extra fine aperiodic roughness standards <i>Ra</i> <i>Rz</i> <i>Rmax</i> <i>RzI_{max}</i> <i>Rzx(l)</i>	0.015 µm to 0.1 µm 0.1 µm to 0.8 µm 0.1 µm to 0.8 µm 0.1 µm to 0.8 µm 0.1 µm to 0.8 µm	DIN EN ISO 16610-21:2025 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 DIN EN ISO 25178-601:2025 Withdrawn: DIN 4768:1990 DIN EN ISO 3274:1998 DIN EN ISO 4287:2010 DIN EN ISO 4288:1998	6.0 % · <i>Ra</i> 7.0 % · <i>Rz</i> 9.0 % · <i>Rmax</i> 9.0 % · <i>RzI_{max}</i> 9.0 % · <i>Rzx(l)</i>	
<i>Rpk</i> <i>Rk</i> <i>Rvk</i>	On surfaces in the range	DIN EN ISO 13565-1:1998 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022	10.0 % · <i>Rpk</i> 6.0 % · <i>Rk</i> 9.0 % · <i>Rvk</i>	
<i>Mr1, Rmrk1</i> <i>Mr2, Rmrk2</i>	0.015 µm ≤ <i>Ra</i> ≤ 0.1 µm 0.1 µm ≤ <i>Rz</i> ≤ 0.8 µm	DIN EN ISO 16610-31:2017 Withdrawn: DIN 4776:1990 DIN EN ISO 13565-2:1998	2.0 % 2.0 %	Relative measuring uncertainty relative to 100 % material ratio
Stylus instruments according to DIN EN ISO 25178-601:2025 Withdrawn: DIN 4772:1979 DIN EN ISO 3274:1998 Reference plane measuring devices Groove depth <i>Pt</i> and <i>d</i> <i>Ra</i> <i>Rz</i> <i>Rmax</i> <i>RzI_{max}</i> <i>Rzx(l)</i> <i>RSm, Rsm</i>	0.15 µm to 5500 µm 0.015 µm to 3.5 µm 0.1 µm to 20 µm 0.1 µm to 20 µm 0.1 µm to 20 µm 0.1 µm to 20 µm 0.1 µm to 20 µm 40 µm to 400 µm	DKD-R 4-2 Blatt 2:2018 DIN EN ISO 12179:2023 DIN EN ISO 16610-21:2025 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 DIN EN ISO 25178-601:2025 Withdrawn: DIN 4768:1990 DIN EN ISO 3274:1998 DIN EN ISO 4287:2010 DIN EN ISO 4288:1998	$U_{\text{normal}} + 0.01 \mu\text{m}$ $U_{\text{normal}} + 1 \% \cdot Ra$ $U_{\text{normal}} + 1 \% \cdot Rz$ $U_{\text{normal}} + 1 \% \cdot Rmax$ $U_{\text{normal}} + 1 \% \cdot RzI_{\text{max}}$ $U_{\text{normal}} + 1 \% \cdot Rzx(l)$ $U_{\text{normal}} + 1 \mu\text{m}$	U_{normal} is the measurement uncertainty of the standards used. Smaller measuring ranges for which standards are available can also be calibrated.
<i>Rpk</i> <i>Rk</i> <i>Rvk</i>	On surfaces in the range	DIN EN ISO 13565-1:1998 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022	$U_{\text{normal}} + 1 \% \cdot Rpk$ $U_{\text{normal}} + 1 \% \cdot Rk$ $U_{\text{normal}} + 1 \% \cdot Rvk$	
<i>Mr1, Rmrk1</i> <i>Mr2, Rmrk2</i>	0.015 µm ≤ <i>Ra</i> ≤ 3.5 µm 0.1 µm ≤ <i>Rz</i> ≤ 20 µm	Withdrawn: DIN 4776:1990 DIN EN ISO 13565-2:1998	$U_{\text{normal}} + 1 \%$ $U_{\text{normal}} + 1 \%$	Relative measuring uncertainty relative to 100 % material ratio

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Permanent Laboratory
Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Skid probe measuring device				
R_a	0.1 μm to 3.5 μm	DIN EN ISO 16610-21:2025	$U_{\text{normal}} + 2.0 \% \cdot R_a$	stylus instruments with skid probe may be calibrated
R_z	0.5 μm to 20 μm	ISO 21920-2:2022	$U_{\text{normal}} + 2.0 \% \cdot R_z$	
R_{max}	0.5 μm to 20 μm	ISO 21920-3:2022	$U_{\text{normal}} + 2.0 \% \cdot R_{\text{max}}$	
$R_z I_{\text{max}}$	0.5 μm to 20 μm	DIN EN ISO 25178-601:2025	$U_{\text{normal}} + 2.0 \% \cdot R_z I_{\text{max}}$	
$R_{zx}(l)$	0.5 μm to 20 μm	Withdrawn: DIN 4768:1990	$U_{\text{normal}} + 2.0 \% \cdot R_{zx}(l)$	
R_{Sm}, R_{sm}	40 μm to 400 μm	DIN EN ISO 3274:1998 DIN EN ISO 4287:2010 DIN EN ISO 4288:1998	$U_{\text{normal}} + 1 \mu\text{m}$	
R_a	0.1 μm to 3.5 μm	DIN EN 10049:2014	$U_{\text{normal}} + 2.0 \% \cdot R_a$	Depending on the profile height other intersection line distances can be chosen (as specified)
R_z	0.5 μm to 20 μm	ISO 21920-2:2022	$U_{\text{normal}} + 2.0 \% \cdot R_z$	
R_{max}	0.5 μm to 20 μm	ISO 21920-3:2022	$U_{\text{normal}} + 2.0 \% \cdot R_{\text{max}}$	
$R_z I_{\text{max}}$	0.5 μm to 20 μm	Withdrawn: Steel test specification (SEP) 1940:2002	$U_{\text{normal}} + 2.0 \% \cdot R_z I_{\text{max}}$	
$R_{zx}(l)$	0.5 μm to 20 μm		$U_{\text{normal}} + 2.0 \% \cdot R_{zx}(l)$	
RP_c	$25 \leq RP_c \leq 150$		$U_{\text{normal}} + 1.0 \text{ cm}^{-1}$	
R_{pc}	$25 \leq R_{pc} \leq 150$		$U_{\text{normal}} + 1.0 \text{ cm}^{-1}$	
Roundness standards		DIN EN ISO 1101:2017		Diameter: 5 mm to 300 mm
Roundness deviation	to 10 μm	DIN EN ISO 12181-1:2011	0.025 μm	
	> 10 μm to 20 μm	DIN EN ISO 12181-2:2011 DKD-R 4-4:2018	0.1 μm	
Magnification standards (flick standards)				
Roundness deviation	2 μm to 20 μm		0.2 μm	
	> 20 μm to 60 μm		0.3 μm	
	> 60 μm to 500 μm		0.5 % of measured value	

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Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Cylindrical form standards		DIN EN ISO 1101:2017		Diameter:
Roundness deviation	to 20 µm	DIN EN ISO 12181-1:2011	0.1 µm	3 mm to 300 mm
Straightness deviation of the generatrices		DIN EN ISO 12181-2:2011		Length:
Length: 2 mm to 300 mm	to 10 µm	DKD-R 4-4:2018	0.2 µm	5 mm to 300 mm
Length: 2 mm to 100 mm			0.2 µm	
Length: > 100 mm to 300 mm	> 10 µm to 20 µm		0.3 µm	
Parallelism deviation of the generatrices				
Length: 2 mm to 300 mm	to 10 µm		0.3 µm	
Length: 2 mm to 100 mm			0.3 µm	
Length: > 100 mm to 300 mm	> 10 µm to 20 µm		0.4 µm	
Contour standards				
X Length Lateral distances	5 mm to 100 mm	Substitution measurement with reference contour standard according to VDI 2629 part 1:2008	0.6 µm	
Z Length Vertical distances	to 10 mm	Procedure according to DIN EN ISO 15530-3:2018	0.75 µm	
Radii	2 mm to 12 mm		0.75 µm	
Angles	40° to 135°		0.01°	
Optoelectronic length and diameter measuring devices (Shaft measuring systems)		Shadow image method QMV Kalibrierung von Wellenmessgeräten: 2026-03		Smaller measuring ranges for which standards are available can also be calibrated
Diameter	to 320 mm	(english: Calibration of shaft measuring systems: 2026-03)	$0.4 \mu\text{m} + 0.6 \cdot 10^{-6} \cdot d$	d = measured diameter
Length	to 1200 mm		$0.5 \mu\text{m} + 0.6 \cdot 10^{-6} \cdot l$	l = measured length

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Annex to the Accreditation Certificate D-K-15030-01-01

On-site Calibration

Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Stylus instruments according to DIN EN ISO 25178-601:2025 Withdrawn: DIN 4772:1979 DIN EN ISO 3274:1998		DKD-R 4-2 Blatt 2:2018 DIN EN ISO 12179:2023		
Reference plane measuring devices Groove depth P_t and d R_a R_z R_{max} $R_{zI_{max}}$ $R_{zx}(l)$ R_{Sm}, R_{sm}	0.15 μm to 5500 μm 0.015 μm to 3.5 μm 0.1 μm to 20 μm 0.1 μm to 20 μm 0.1 μm to 20 μm 0.1 μm to 20 μm 40 μm to 400 μm	DIN EN ISO 16610-21:2025 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022 DIN EN ISO 25178-601:2025 Withdrawn: DIN 4768:1990 DIN EN ISO 3274:1998 DIN EN ISO 4287:2010 DIN EN ISO 4288:1998	$U_{normal} + 0.01 \mu m$ $U_{normal} + 1 \% \cdot R_a$ $U_{normal} + 1 \% \cdot R_z$ $U_{normal} + 1 \% \cdot R_{max}$ $U_{normal} + 1 \% \cdot R_{zI_{max}}$ $U_{normal} + 1 \% \cdot R_{zx}(l)$ $U_{normal} + 1 \mu m$	U_{normal} is the measurement uncertainty of the standards used. Smaller measuring ranges for which standards are available can also be calibrated.
R_{pk} R_k R_{vk}	On surfaces in the range	DIN EN ISO 13565-2:1998 DIN EN ISO 21920-2:2022 DIN EN ISO 21920-3:2022	$U_{normal} + 1 \% \cdot R_{pk}$ $U_{normal} + 1 \% \cdot R_k$ $U_{normal} + 1 \% \cdot R_{vk}$	
M_{r1}, R_{mrk1} M_{r2}, R_{mrk2}	0.015 $\mu m \leq R_a \leq 3.5 \mu m$ 0.1 $\mu m \leq R_z \leq 20 \mu m$	Withdrawn: DIN 4776:1990 DIN EN ISO 13565-2:1998	$U_{normal} + 1 \%$ $U_{normal} + 1 \%$	
Skid probe measuring device R_a R_z R_{max} $R_{zI_{max}}$ $R_{zx}(l)$ R_{Sm}, R_{sm}	0.1 μm to 3.5 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 40 μm to 400 μm	DIN EN ISO 16610-21:2025 ISO 21920-2:2022 ISO 21920-3:2022 DIN EN ISO 25178-601:2025 Withdrawn: DIN 4768:1990 DIN EN ISO 3274:1998 DIN EN ISO 4287:2010 DIN EN ISO 4288:1998	$U_{normal} + 2.0 \% \cdot R_a$ $U_{normal} + 2.0 \% \cdot R_z$ $U_{normal} + 2.0 \% \cdot R_{max}$ $U_{normal} + 2.0 \% \cdot R_{zI_{max}}$ $U_{normal} + 2.0 \% \cdot R_{zx}(l)$ $U_{normal} + 1 \mu m$	stylus instruments with skid probe may be calibrated
R_a R_z R_{max} $R_{zI_{max}}$ $R_{zx}(l)$ RP_c R_{pc}	0.1 μm to 3.5 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm 0.5 μm to 20 μm $25 \leq RP_c \leq 150$ $25 \leq R_{pc} \leq 150$	DIN EN 10049:2014 ISO 21920-2:2022 ISO 21920-3:2022 Withdrawn: Steel test specification (SEP) 1940:2002	$U_{normal} + 2.0 \% \cdot R_a$ $U_{normal} + 2.0 \% \cdot R_z$ $U_{normal} + 2.0 \% \cdot R_{max}$ $U_{normal} + 2.0 \% \cdot R_{zI_{max}}$ $U_{normal} + 2.0 \% \cdot R_{zx}(l)$ $U_{normal} + 1.0 cm^{-1}$ $U_{normal} + 1.0 cm^{-1}$	Depending on the profile height other intersection line distances can be chosen (as specified)

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Annex to the Accreditation Certificate D-K-15030-01-01
On-site Calibration

Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Optoelectronic length and diameter measuring devices (Shaft measuring systems)		Shadow image method QMV Kalibrierung von Wellenmessgeräten: 2026-03		Smaller measuring ranges for which stand-ards are available can also be calibrated.
Diameter	to 320 mm	(english: Calibration of shaft measuring systems: 2026-03)	$0.4 \mu\text{m} + 0.6 \cdot 10^{-6} \cdot d$	d = measured diameter
Length	to 1200 mm		$0.5 \mu\text{m} + 0.6 \cdot 10^{-6} \cdot l$	l = measured length

Abbreviations used:

CMC	Calibration and measurement capabilities
DIN	German Institute for Standardization e.V.
DKD-R	Guidelines of the German Calibration Service (DKD), published by the Physikalisch-Technische Bundesanstalt
EN	Europäische Norm
ISO	Internationale Organisation für Normung
QMA	Internal documentation of JENOPTIK Industrial Metrology Germany GmbH
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik e.V.
VDI	Verein Deutscher Ingenieure e.V.
QMV	Calibration procedure developed by JENOPTIK Industrial Metrology Germany GmbH

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