Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-K-17723-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from:	**17.11.2022**
Date of issue:	17.11.2022

Holder of accreditation certificate:

WENZEL Metrology GmbH
Werner-Wenzel-Straße, 97859 Wiesthal

The calibration laboratory meets the minimal requirements of DIN EN ISO/IEC 17025:2018 and, if applicable, additional legal and normative requirements, including those in relevant sectoral schemes, in order to carry out the conformity assessment activities listed below.
The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of calibration laboratories and confirm generally with the principles of DIN EN ISO 9001.

Calibration in the fields:

Dimensional quantities
   Coordinate measuring technology
   −   **Coordinate measuring machines** [a]

[a] On-Site Calibration

Abbreviations used: see last page

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Coordinate measuring technology				
Coordinate measuring machines with control software Metrosoft CM and WM I QUARTIS, Software from WENZEL Metromec Software AG, Chur, CH	Coordinate measuring machines featuring a measuring volume with a space diagonal of ≤ 7000mm	Calibration of metrological characteristics according to guideline: DKD-R 4-3 part 18.1:2018, and the following standards DIN EN ISO 10360		
Modus Metrology, Software from Renishaw plc., Wottonunder-Edge, UK INCA3D, Software from Inspect 3D, Cholet, F PolyWorks, Software from Duwe-3d AG, Lindau, GER Metrologic, Software from Metrologic Group SA, Meylan, F		Determination of the error of indication for size measurement E_L (E_0 and E_{150}) by using step gauges according to DIN EN ISO 10360-2:2010 (up to two conjunction measurement by displacement of the measuring standard.)	without temperature compensation: $0,08\ \mu m + 0,33 \cdot 10^{-6} \cdot L$ without temperature compensation and with one conjunction measurement: $0,16\ \mu m + 0,33 \cdot 10^{-6} \cdot L$ with temperature compensation: $0,08\ \mu m + 0,35 \cdot 10^{-6} \cdot L$ with $\Delta T = 1$ K with temperature compensation and with one conjunction measurement: $0,16\ \mu m + 0,35 \cdot 10^{-6} \cdot L$ with $\Delta T = 1$ K with temperature compensation and with two conjunction measurement: $0,24\ \mu m + 0,35 \cdot 10^{-6} \cdot L$ with $\Delta T = 1$ K	L = measured length
		Determination of repeatability range R_0 according to DIN EN ISO 10360-2:2010	$0,07\ \mu m$	
		Determination of individual switch-form deviation $P_{Form.Sph.1x25:SS:Tact}$ by reference sphere according to DIN EN ISO 10360-5:2020	$0,13\ \mu m$	

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On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
		Determination of individual switch-dimensional deviation $P_{Size.Sph.1x25:SS:Tact}$ by reference sphere according to DIN EN ISO 10360-5:2020	0,17 µm	
		Determination of form deviation $P_{Form.Sph.Scan:PP:Tact}$ at scanning mode by reference sphere according to DIN EN ISO 10360-5:2020	0,13 µm	
		Determination of dimensional deviation $P_{Size.Sph.Scan:PP:Tact}$ at scanning mode by reference sphere according to DIN EN ISO 10360-5:2020	0,17 µm	
		Determination of time span in scanning mode $\tau_{Sph.Scan:PP:Tact}$ according to DIN EN ISO 10360-5:2020	0,28 s	
		Bestimmung der Mehrfachtaster-Formabweichung $P_{Form.Sph.5x25:j:Tact}$ an einem Kugelnormal gemäß DIN EN ISO 10360-5:2020	0,13 µm	

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
		Bestimmung der Mehrfachtaster-Größenabweichung $P_{Size.Sph.5x25:j:Tact}$ an einem Kugelnormal gemäß DIN EN ISO 10360-5:2020	0,17 µm	
		Bestimmung der Mehrfachtaster-Ortsabweichung $L_{Dia.5x25:j:Tact}$ an einem Kugelnormal gemäß DIN EN ISO 10360-5:2020	0,15 µm	
Coordinate measuring machines with control software Metrosoft CM and WM I QUARTIS, Software from WENZEL Metromec Software AG, Chur, CH Modus Metrology, Software from Renishaw plc., Wottonunder-Edge, UK INCA3D, Software from Inspect 3D, Cholet, F PolyWorks, Software from Duwe-3d AG, Lindau, GER Metrologic, Software from Metrologic Group SA, Meylan, F	Coordinate measuring machines featuring a measuring volume with a space diagonal of ≤ 9090 mm	Determination of the error of indication for size measurement E_L (E_0 and E_{150}) by using demountable ball bar according to DIN EN ISO 10360-2:2010	without temperature compensation: $2 \cdot \sqrt{i} \cdot (0,4 \, \mu m + 0,55 \cdot 10^{-6} \cdot L)$ with temperature compensation: $2 \cdot \sqrt{i} \cdot (0,4 \, \mu m + 0,61 \cdot 10^{-6} \cdot L)$ with $\Delta T = 2$ K	L = measured length
		Determination of repeatability range R_0 according to DIN EN ISO 10360-2:2010	0,19 µm	
		Determination of individual switch-form deviation $P_{Form.Sph.1x25:SS:Tact}$ by reference sphere according to DIN EN ISO 10360-5:2020	0,13 µm	
		Determination of individual switch-dimensional deviation $P_{Size.Sph.1x25:SS:Tact}$ by reference sphere according to DIN EN ISO 10360-5:2020	0,17 µm	
Coordinate measuring machines with CT-sensor and control software Control according to evaluation software	Coordinate measuring machines featuring a measuring volume with a space diagonal of ≤ 410 mm	Calibration of metrological characteristics according to guideline: DKD-R 4-3 part 18.1:2018 and the following standards VDI/VDE 2630		L = measured length

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On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Metrosoft WM I QUARTIS of WENZEL Metromec Software AG, Chur, CH		Determination of error of indication for size measurement $E_{(TS)}$ by CT-artefact according to VDI/VDE 2630 part 1.3:2011	for length up to 60 mm: 0,9 µm for length up to 271 mm: 1,1 µm	
		Determination of probing error $P_{F(TS)}$ on a reference sphere according to VDI/VDE 2630 part 1.3:2011	0,26 µm	
		Determination of probing error $P_{S(TS)}$ on a reference sphere according to VDI/VDE 2630 part 1.3:2011	0,28 µm	

Abbreviations used:

CMC	Calibration and measurement capabilities
DIN	Deutsches Institut für Normung e.V.
DKD-R	guideline of Deutscher Kalibrierdienst (DKD), published by Physikalisch-Technische Bundesanstalt
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik e.V.
VDI	Verein Deutscher Ingenieure e.V.