

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-17723-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 15.05.2019 to 16.09.2023

Date of issue: 15.05.2019

Holder of certificate:

WENZEL Metrology GmbH
Werner-Wenzel-Straße, 97859 Wiesthal

Head: Bernd Kirchner
Deputy head: Marcus Büttner

Accredited as calibration laboratory since: 11.05.2004

Calibration in the fields:

Dimensional quantities
Coordinate measuring technology
– **Coordinate measuring machines**

Abbreviations used: see last page

Annex to the accreditation certificate D-K-17723-01-00

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Coordinate measuring technology Coordinate measuring machines with the following software: Metrosoft CM and QUARTIS of WENZEL Metromec Software AG Modus metrology, Software of Renishaw INCA3D, Software of Mora Metrology PollyWorks, Software of Duwe 3d AG Metrologic, Software of Metrologic	Coordinate measuring machines featuring a measuring volume with a space diagonal ≤ 4666 mm	Calibration of metrological characteristics according to guideline DAKKS-DKD-R 4-3 part 18.1:2010, and the following standards and guidelines DIN EN ISO 10360 VDI/VDE 2617	without temperature compensation: $0,1 \mu\text{m} + 0,46 \cdot 10^{-6} \cdot l$ without temperature compensation: $0,2 \mu\text{m} + 0,46 \cdot 10^{-6} \cdot l$ (with one conjunction measurement)	Main field of application for this method are coordinate measuring machines in fixed and moving bridge structure $l =$ measured length
		Determination of the error of indication for size measurement E_0, E_{150} by using step gauges according to DIN EN ISO 10360-2:2010 (one conjunction measurement with displacement of the measuring standard).	with temperature compensation: $0,1 \mu\text{m} + 0,5 \cdot 10^{-6} \cdot l$ with $\Delta T = 2 \text{ K}$ with temperature compensation: $0,2 \mu\text{m} + 0,5 \cdot 10^{-6} \cdot l$ with $\Delta T = 2 \text{ K}$ (with one conjunction measurement)	
		Determination of repeatability range R_0 according to DIN EN ISO 10360-2:2010	0,07 μm	
		Determination of probing error P_{FTU} on a reference sphere according to DIN EN ISO 10360-5:2011	0,13 μm	
		Determination of scanning probing error THP and scanning-test time τ on a reference sphere according to DIN EN ISO 10360-4:2003	0,13 μm 0,2 s	

¹⁾ The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of $k = 2$ unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.

Annex to the accreditation certificate D-K-17723-01-00

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Coordinate measuring machines with the following software: Metrosoft CM and QUARTIS of WENZEL Metromec Software AG Modus metrology, Software of Renishaw INCA3D, Software of Mora Metrology PollyWorks, Software of Duwe 3d AG Metrologic, Software of Metrologic	Coordinate measuring machines featuring a measuring volume with a space diagonal ≤ 9090 mm	The error of indication for size measurement E_L (E_0 und E_{150}) is determined by using demountable ball bar according to DIN EN ISO 10360-2:2010	without temperature compensation: $2 \cdot \sqrt{l} \cdot (0,4 \mu\text{m} + 0,51 \cdot 10^{-6} \cdot l)$ with temperature compensation: $2 \cdot \sqrt{l} \cdot (0,4 \mu\text{m} + 0,62 \cdot 10^{-6} \cdot l)$ mit $\Delta T = 2 \text{ K}$	Main field of application for this method are coordinate measuring machines in cantilever design $l =$ measured length
		Determination of repeatability range R_0 according to DIN EN ISO 10360-2:2010	0,19 μm	
		Determination of probing error P_{FTU} on a reference sphere according to DIN EN ISO 10360-5:2011	0,13 μm	
Coordinate measuring machines with CT-sensor and control software according to evaluation software: Metrosoft QUARTIS of WENZEL Metromec Software AG	Coordinate measuring machines featuring a measuring volume with a space diagonal ≤ 410 mm	Calibration of metrological characteristics according to guideline DAKKS-DKD-R 4-3 part 18.1:2010 The error of indication for size measurement $E_{(TS)}$ with a CT-artefact according to VDI/VDE 2630 Blatt 1.3:2011		Main field of application for this method are coordinate measuring machines $l =$ measured length
		for length to 60 mm	0,9 μm	
		for length to 271 mm	1,1 μm	
		Determination of probing error of form error P_F on a reference sphere according to VDI/VDE 2630 Blatt 1.3:2011	0,27 μm	
Determination of probing error of size error P_S on a reference sphere according to VDI/VDE 2630 Blatt 1.3:2011	0,28 μm			

¹⁾ The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of $k = 2$ unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.

Annex to the accreditation certificate D-K-17723-01-00

Abbreviations used:

CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
DIN	Deutsches Institut für Normung e.V.
DAkkS-DKD-R	Guideline on Deutsche Akkreditierungsstelle GmbH
VDI/VDE 2617	Guideline: Accuracy of coordinate measuring machines
VDI/VDE 2630	Guideline: Computed tomography in dimensional measurement

¹⁾ The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of $k = 2$ unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.