Deutsche Akkreditierungsstelle GmbH

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

Valid from: **08.07.2021**

Date of issue 08.07.2021

Holder of certificate:

WENZEL Metrology GmbH
Werner-Wenzel-Straße, 97859 Wiesthal

Calibration in the fields:

Dimensional quantities

Coordinate measuring technology

– **Coordinate measuring machines** [a)]

[a)] On-Site Calibration

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.

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 may be found respectively in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH https://www.dakks.de/en/content/accredited-bodies-dakks.

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 control software Metrosoft CM and QUARTIS, Software from WENZEL Metromec Software AG, Chur, CH Modus Metrology, Software from Renishaw plc., Wottonunder-Edge, UK INCA3D, Software from Mora Metrology GmbH, Aschaffenburg, GER 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 ≤ 4666 mm	Calibration of metrological characteristics according to guideline: DKD-R 4-3 part 18.1:2018, and the following standards DIN EN ISO 10360		
		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 (One conjunction measurement by displacement of the measuring standard.)	without temperature compensation: 0,1 µm + 0,35 · 10^{-6} · l without temperature compensation and with one conjunction measurement: 0,2 µm + 0,35 · 10^{-6} · l with temperature compensation: 0,1 µm + 0,40 · 10^{-6} · l with ΔT = 2 K with temperature compensation and with one conjunction measurement: 0,2 µm + 0,40 · 10^{-6} · l with ΔT = 2 K	l = measured length
		Determination of repeatability range R_0 according to DIN EN ISO 10360-2:2010	0,07 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	0,14 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.

On-site Calibration

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement [1)]	Remarks
		Determination of form deviation $P_{\text{Form.Sph.Scan:PP:Tact}}$ at scanning mode by reference sphere according to DIN EN ISO 10360-5:2020	0,13 µm	
		Determination of dimensional deviation $P_{\text{Size.Sph.Scan:PP:Tact}}$ at scanning mode by reference sphere according to DIN EN ISO 10360-5:2020	0,14 µm	
		Determination of time span in scanning mode $\tau_{\text{Sph.Scan:PP:Tact}}$ according to DIN EN ISO 10360-5:2020	0,28 s	
Coordinate measuring machines with control software Metrosoft CM and QUARTIS, Software from WENZEL Metromec Software AG, Chur, CH Modus Metrology, Software from Renishaw plc., Wottonunder-Edge, UK INCA3D, Software from Mora Metrology GmbH, Aschaffenburg, GER 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: $2 \cdot \sqrt{l} \cdot (0{,}4\ \mu m + 0{,}55 \cdot 10^{-6} \cdot l)$ with temperature compensation: $2 \cdot \sqrt{l} \cdot (0{,}4\ \mu m + 0{,}61 \cdot 10^{-6} \cdot l)$ 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 $P_{\text{Form.Sph.1x25:SS:Tact}}$ by reference sphere according to DIN EN ISO 10360-5:2020	0,13 µm	
		Determination of individual switch-dimensional deviation $P_{\text{Size.Sph.1x25:SS:Tact}}$ by reference sphere according to DIN EN ISO 10360-5:2020	0,14 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.

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 CT-sensor and control software Control according to evaluation software Metrosoft QUARTIS of WENZEL Metromec Software AG, Chur, CH	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		
		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 on a reference sphere according to VDI/VDE 2630 part 1.3:2011	0,26 µm	
		Determination of probing error P_S 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.

[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.

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