

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-K-15127-01-01 according to DIN EN ISO/IEC 17025:2018

Valid from: 08.02.2024

Date of issue: 08.02.2024

This annex is a part of the accreditation certificate D-K-15127-01-00.

Holder of partial accreditation certificate:

**Kistler Instrumente Gesellschaft mit beschränkter Haftung
Umberto-Nobile-Str. 14, 71063 Sindelfingen**

with the locations

**Kistler Instrumente Gesellschaft mit beschränkter Haftung
Umberto-Nobile-Str. 14, 71063 Sindelfingen**

**Kistler Instrumente Gesellschaft mit beschränkter Haftung
Maierhofstraße 35, 73547 Lorch**

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 certificate annex 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 given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de>.

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 Partial Accreditation Certificate D-K-15127-01-01

Calibration in the fields:

Mechanical quantities

- Force
- Pressure
- Acceleration
- Torque

Material testing machines (MTM)

- Force (MTM) ^{a)}

^{a)} only on-site calibrations

Within the measurands/calibration items marked 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.

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Permanent laboratory, Sindelfingen location

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Acceleration * Acceleration sensors, Acceleration measuring chains (reference frequency)	1 m/s ² to 80 m/s ²	DKD-R 3-1:2018 Sinusoidal excitation 40 Hz, 80 Hz (APS)	0.8 %	Calibration result: amount of charge transfer coefficient or voltage transfer coefficient, Acceleration
	10 m/s ² to 200 m/s ²	DKD-R 3-1:2018 Sinusoidal excitation 159.2 Hz, 160 Hz (TIRA)	0.8 %	
Acceleration sensors, Acceleration measuring chains (intermediate frequency range)	5 m/s ² to 200 m/s ²	DKD-R 3-1:2018 Sinusoidal excitation 20 Hz to 1.25 kHz	1 %	
		DKD-R 3-1:2018 Sinusoidal excitation > 1.25 kHz to 5 kHz	2 %	
		DKD-R 3-1:2018 Sinusoidal excitation > 5 kHz to 10 kHz	5 %	
Acceleration sensors, Acceleration measuring chains (low frequency range)	0.1 m/s ² to 80 m/s ²	DKD-R 3-1:2018 Sinusoidal excitation 0.5 Hz to 20 Hz	0.5 % / 0.9°	Calibration result: complex transfer coefficient or voltage transfer coefficient (amplitude / phase), Acceleration
		DKD-R 3-1:2018 Sinusoidal excitation > 20 Hz to 100 Hz	0.8 % / 1.2°	
Vibration calibrator Amount of acceleration	1 m/s ² to 20 m/s ²	DIN ISO 16063-44:2019 10 Hz to 10 kHz	2 %	
Frequency	10 Hz to 160 Hz		0.02 Hz	
	> 160 Hz to < 1 kHz		0.10 Hz	
	1 kHz to < 5 kHz		0.50 Hz	
	5 kHz to < 9 kHz		1.00 Hz	
	9 kHz to 10 kHz		1.50 Hz	
Distortion	10 Hz to 10 kHz	0.05 %		

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Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Voltage Voltage measuring amplifier with grounded incoming, with difference incoming, ICP- measuring amplifier with constant current supply	70 mV to 30 V	DKD-R 3-2:2019 Sinusoidal excitation 0.1 Hz to < 1 Hz	0.4 % / 0.6°	Calibration result: transfer coefficient amount / phase shift
		DKD-R 3-2:2019 Sinusoidal excitation 1 Hz to 650 Hz	0.2 % / 0.6°	
		DKD-R 3-2:2019 Sinusoidal excitation > 650 Hz to 6.5 kHz	0.3 % / 0.7°	
		DKD-R 3-2:2019 Sinusoidal excitation > 6.5 kHz to 15 kHz	0.4 % / 1.0°	
		DKD-R 3-2:2019 Sinusoidal excitation > 15 kHz to 50 kHz	0.6 % / 5°	
Charge Charge amplifier with grounded incoming, with difference incoming	7 pC to 10 nC	DKD-R 3-2:2019 Sinusoidal excitation 0.1 Hz to < 1 Hz	0.4 % / 0.6°	Calibration result: transfer coefficient amount / phase shift
		DKD-R 3-2:2019 Sinusoidal excitation 1 Hz to 650 Hz	0.2 % / 0.6°	
		DKD-R 3-2:2019 Sinusoidal excitation > 650 Hz to 6.5 kHz	0.3 % / 0.7°	
		DKD-R 3-2:2019 Sinusoidal excitation > 6.5 kHz to 15 kHz	0.4 % / 1.0°	
		DKD-R 3-2:2019 Sinusoidal excitation > 15 kHz to 50 kHz	0.6 % / 5°	
Pressure * Absolute pressure p_{abs}	1 bar	DKD-R 6-1:2014	$7 \cdot 10^{-5} \cdot p_{abs}$; but not < 2.2 mbar	pressure medium: oil uncertainty of measurement of barometer must be considered
	3 bar to 401 bar			
	> 401 bar to 1401 bar		$8 \cdot 10^{-5} \cdot p_{abs}$	
	0 bar to 20 bar		$1 \cdot 10^{-4} \cdot p_{abs}$; but not < 0.8 mbar	
Positive pressure p_e	0 bar	DKD-R 6-1:2014	$7 \cdot 10^{-5} \cdot p_e$; but not < 2.2 mbar	pressure medium: oil
	2 bar to 400 bar			
	> 400 bar to 1400 bar		$8 \cdot 10^{-5} \cdot p_e$	
	0 bar to 20 bar		$1 \cdot 10^{-4} \cdot p_e$; but not < 0.8 mbar	

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Permanent laboratory, Sindelfingen location

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Force Force sensors *	2 kN to 20 kN	DKD-R 3-3:2018	0.2 %	force-reference measurement device with reference force transducer in compressive force
Multi-component force and moment	2 kN to 50 kN	CD30036-DE:2022	0.25 %; but not < 12.0 N	hexapods- calibration device
Multi-component transducer	0.1 kN·m to 10 kN·m		0.35 %; but not < 1.0 N·m	
	2 kN to 50 kN	CD30036-DE:2022	0.40 %; but not < 12.0 N	measuring wheels and multi-component sensors
	0.1 kN·m to 10 kN·m		0.50 %; but not < 1.2 N·m	

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Permanent laboratory, Lorch location

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement	Remarks
Torque * Torque transducer and Torque measuring chains	0.004 N·m to 0.01 N·m	DIN 51309:2022	$2 \cdot 10^{-3}$	20 N·m DM-BNME
	> 0.01 N·m to < 0.1 N·m		$4 \cdot 10^{-4}$	
	0.1 N·m to 20 N·m		$2 \cdot 10^{-4}$	
	0.1 N·m to < 0.2 N·m		$6 \cdot 10^{-4}$	200 N·m DM-BNME
	0.2 N·m to < 0.4 N·m		$4 \cdot 10^{-4}$	
	0.4 N·m to < 1 N·m		$2 \cdot 10^{-4}$	
	1 N·m to 200 N·m		$1 \cdot 10^{-4}$	
	1 N·m to 10 N·m		$1 \cdot 10^{-3}$	
	> 10 N·m to 3 kN·m		$2 \cdot 10^{-4}$	3 kN·m DM-BNME
	1 N·m to 5 N·m		$1 \cdot 10^{-3}$	
	> 5 N·m to 10 N·m		$5 \cdot 10^{-4}$	5 kN·m DM-BNME
	> 10 N·m to 20 N·m		$2 \cdot 10^{-4}$	
	> 20 N·m to 5 kN·m		$1 \cdot 10^{-4}$	
	1 kN·m to 20 kN·m		$5 \cdot 10^{-4}$	
	> 20 kN·m to 100 kN·m		$1 \cdot 10^{-3}$	100 kN·m DM-BNME

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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
Force (MTM) Force measuring device for devices not compliant with DIN 51220	0.5 kN to 15 kN	CD30038-DE:2023 continuous loading	0.40 %	Devices such as joining systems.
	> 15 kN to 300 kN		0.35 %	In compression direction

Abbreviations used:

CD300xxx In house method of the Kistler Instrumente GmbH
 CMC Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)
 DKD-R Richtlinie des Deutschen Kalibrierdienstes (DKD), herausgegeben von der Physikalisch-Technischen Bundesanstalt