

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV

Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation



The Deutsche Akkreditierungsstelle GmbH attests that the calibration laboratory

Ludwig Schneider Messtechnik GmbH
Am Eichamt 4, 97877 Wertheim

is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out calibrations in the following fields:

Thermodynamic quantities

Temperature quantities

- Resistance thermometers
- Thermocouples
- Temperature block calibrators
- Fixed-point cells
- Direct reading thermometers
- Liquid-in-glass thermometers
- Mechanical thermometers
- Temperature indicators and simulators
- Temperature transmitters, data loggers

Chemical analysis, reference materials

- Density of liquids

The accreditation certificate shall only apply in connection with the notice of accreditation of 19.07.2021 with the accreditation number D-K-15223-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 4 pages.

Registration number of the certificate: **D-K-15223-01-00**

Berlin,
19.07.2021

Dr Heike Manke
Head of Division

Translation issued:
19.07.2021


Head of Division

The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.
<https://www.dakks.de/en/content/accredited-bodies-dakks>

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

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The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:

EA: www.european-accreditation.org

ILAC: www.ilac.org

IAF: www.iaf.nu

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-15223-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 19.07.2021

Date of issue 19.07.2021

Holder of certificate:

Ludwig Schneider Messtechnik GmbH
Am Eichamt 4, 97877 Wertheim

Calibration in the fields:

Thermodynamic quantities

Temperature quantities

- Resistance thermometers
- Thermocouples
- Temperature block calibrators
- Fixed-point cells
- Direct reading thermometers
- Liquid-in-glass thermometers
- Mechanical thermometers
- Temperature indicators and simulators
- Temperature transmitters, data loggers

Chemical analysis, reference materials

- Density of liquids

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.

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>.

Annex to the accreditation certificate D-K-15223-01-00

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Temperature				
Fixed-point cells	0,01 °C	triple point of water	1 mK	Comparison with reference fixed-point cell
Standard platinum resistance thermometers	0,00 °C	ice point	5 mK	Calibration at fixed point temperatures
	0,010 °C	triple point of water	2 mK	
	29,7646 °C	melting point of gallium	2,5 mK	
Resistance thermometers, Direct reading thermometers and measuring chains with resistance sensor *)	-196 °C	in liquid nitrogen DKD-R 5-1:2018	50 mK	Comparison with standard resistance thermometers
	-90 °C to 0 °C	in calibration baths DKD-R 5-1:2018	20 mK	
	> 0 °C to 300 °C		10 mK	
	> 300 °C to 500 °C		50 mK	
	> 500 °C to 660 °C		0,1 K	
Base metal thermocouples, Direct reading thermometers and measuring chains with base metal thermocouples *)	-196 °C	in liquid nitrogen DKD-R 5-3:2018	1 K	Comparison with standard resistance thermometers
	-90 °C to 300 °C	in calibration baths DKD-R 5-3:2018	0,5 K	
	> 300 °C to 660 °C		1 K	
	> 660 °C to 1000 °C	in tube furnaces DKD-R 5-3:2018	1,5 K	Comparison with standard thermocouples
	> 1000 °C to 1200 °C		2 K	
	> 1200 °C to 1300 °C		3 K	
Noble metal thermocouples, Direct reading thermometers and measuring chains with noble metal thermocouples *)	0 °C to 200 °C	in calibration baths DKD-R 5-3:2018	0,3 K	Comparison with standard resistance thermometers
	> 200 °C to 660 °C		0,5 K	
	> 660 °C to 1000 °C	in tube furnaces DKD-R 5-3:2018	1 K	Comparison with standard thermocouples
	> 1000 °C to 1200 °C		1,5 K	
	> 1200 °C to 1300 °C		2 K	
Measuring transducers with resistance thermometer *)	-196 °C	in liquid nitrogen DKD-R 5-1:2018	$U_{PRT} + 0,1 \text{ K}$	Comparison with standard resistance thermometers U_{PRT} is the expanded measurement uncertainty from the calibration of the resistance thermometer only
	-90 °C to 660 °C	in calibration baths DKD-R 5-1:2018		
Measuring transducers with thermocouple *)	-196 °C	in liquid nitrogen DKD-R 5-3:2018	$U_{TC} + 0,5 \text{ K}$	Comparison with standard resistance thermometers or standard thermocouples U_{TC} is the expanded measurement uncertainty from the calibration of the thermocouple only
	-90 °C to 660 °C	in calibration baths DKD-R 5-3:2018		
	> 660 °C to 1300 °C	in tube furnaces DKD-R 5-3:2018		

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-15223-01-00
Permanent Laboratory
Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Temperature block calibrators *)	-30 °C to < 0 °C	DKD-R 5-4:2018	0,20 K	Comparison with standard resistance thermometers
	0 °C to 150 °C		0,07 K	
	> 150 °C to 350 °C		0,13 K	
	> 350 °C to 550 °C		0,17 K	
	> 550 °C to 660 °C		0,22 K	Comparison with standard thermocouples
	0 °C to 660 °C		1,5 K	
	> 660 °C to 1000 °C		4 K	
	> 1000 °C to 1300 °C		6 K	
Mechanical thermometers	-196 °C	in liquid nitrogen QMP 10.8.1, Rev. 1	0,1 K (min. ½ of the scale interval)	Comparison with standard resistance thermometers
	-90 °C to 660 °C	in calibration baths QMP 10.8.1, Rev. 1		
Liquid-in glass thermometers	-196 °C	in liquid nitrogen QMP 10.3.1, Rev. 1	50 mK	Comparison with standard resistance thermometers
	-90 °C to 0 °C	in calibration baths QMP 10.3.1, Rev. 1	20 mK	
	> 0 °C to 300 °C		10 mK	
	> 300 °C to 500 °C		50 mK	
	> 500 °C to 660 °C		0,1 K	
Micro baths, precision baths and calibration baths, thermostats	-60 °C to 60 °C	QMP 10.7.1, Rev. 1	10 mK	Comparison with precision or standard resistance thermometers
	> 60 °C to 250 °C		15 mK	
Temperature indicators and simulators for resistance thermometers *)	-200 °C to 850 °C	DKD-R 5-5:2018	2 mK	Characteristic curve according to DIN EN 60751:2009
Temperature indicators and simulators for base metal thermocouples *)	-270 °C to 1370 °C	DKD-R 5-5:2018	0,1 K	Characteristic curve according to DIN EN 60584-01:2014 without reference junction compensation
Temperature indicators and simulators for noble metal thermocouples *)	-50 °C to 1820 °C	DKD-R 5-5:2018	0,2 K	Characteristic curve according to DIN EN 60584-01:2014 without reference junction compensation

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.

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Density of liquids				
Hydrometers and derived instruments	450 kg/m ³ to 2000 kg/m ³	QMP 10.11.1, Rev. 2	0,04 kg/m ³	
Alcoholometers	0 % to 100 %	QMP 10.11.1, Rev. 2	0,016 %	no relative uncertainty of measurement
Saccharimeters	0 % to 70 %	QMP 10.11.1, Rev. 2	0,012 %	

Abbreviations used:

CMC	Calibration and measurement capabilities
DKD-R	Guideline of Deutscher Kalibrierdienst (DKD), published by Physikalisch-Technische Bundesanstalt
QMP	Procedure of Ludwig Schneider Messtechnik GmbH

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.