

# Deutsche Akkreditierungsstelle GmbH

## Annex to the Accreditation Certificate D-K-15035-01-00 according to ISO/IEC 17025:2017

Period of validity: 13.10.2020 to 12.10.2025

Date of issue: 13.10.2020

Holder of certificate:

**National Metrology Laboratory of the Philippines  
General Santos Avenue, Bicutan, 1631 Taguig City, Philippines**

Calibration in the fields:

### **Thermodynamic quantities**

#### **Temperature quantities**

- Resistance thermometers
- Liquid-in-glass thermometers
- Direct reading thermometers

### **Mechanical quantities**

- Mass standards
- Weighing instruments <sup>a)</sup>
- Pressure

### **Chemical and Medical Quantities**

#### **Chemical analysis, reference material**

- Volume of liquids

<sup>a)</sup> only on-site calibration

*The management system requirements in DIN EN ISO/IEC 17025 are written in language relevant to operations of calibration laboratories and operate generally in accordance with the principles of DIN EN ISO 9001.*

*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>*

**Annex to the accreditation certificate D-K-15035-01-00**
**Permanent Laboratory**
**Calibration and Measurement Capabilities (CMC)**

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks
<b>Temperature quantities</b> Platinum Resistance Thermometers	-30 °C to 0 °C	Cryostatic bath DKD-R 5-1:2018	25 mK	Comparison with standard platinum resistance thermometer. Determination of the polynomial coefficients according to IEC 60751
	> 0 °C to 90 °C	Water bath DKD-R 5-1:2018	25 mK	
	> 90 °C to 250 °C	Oil bath DKD-R 5-1:2018	30 mK	
	0 °C (Ice Point)	Ice bath DKD-R 5-1:2018	10 mK	
Liquid-in-Glass Thermometers	-30 °C to 0 °C	Cryostatic bath PTB-Prüfregeln, Volume 2: Liquid-in-glass Thermometers	45 mK	Comparison with standard platinum resistance thermometer
	> 0 °C to 90 °C	Water bath PTB-Prüfregeln, Volume 2: Liquid-in-glass Thermometers	45 mK	
	> 90 °C to 250 °C	Oil bath PTB-Prüfregeln, Volume 2: Liquid-in-glass Thermometers	45 mK	
Digital Thermometers	-30 °C to 0 °C	Cryostatic bath DKD-R 5-1:2018	30 mK	
	> 0 °C to 90 °C	Water bath DKD-R 5-1:2018	30 mK	
	> 90 °C to 250 °C	Oil bath DKD-R 5-1:2018	30 mK	

<sup>1)</sup> 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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<b>Mass standard</b> Conventional mass	1 mg    2mg    5 mg	OIML R 111-1:2004 (E)  without density determination	0.002 mg	For weight pieces according to OIML R 111-1:2004, up to Class E2
	10 mg		0.002 mg	
	20 mg		0.003 mg	
	50 mg		0.004 mg	
	100 mg		0.005 mg	
	200 mg		0.006 mg	
	500 mg		0.008 mg	
	1 g		0.010 mg	
	2 g		0.012 mg	
	5 g		0.016 mg	
	10 g		0.020 mg	
	20 g		0.025 mg	
	50 g		0.03 mg	
	100 g		0.05 mg	
	200 g		0.10 mg	
	500 g		0.25 mg	
	1 kg		0.50 mg	
	2 kg		1.0 mg	
	5 kg		2.5 mg	
	10 kg		5.0 mg	
	20 kg		10 mg	
	50 kg		25 mg	
	100 kg		160 mg	For weight pieces according to OIML R 111-1:2004, up to Class F1
200 kg	300 mg			
500 kg	8.0 g	For weight pieces according to OIML R 111-1:2004, up to Class M1		

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Conventional mass	1 mg to 10 mg	OIML R 111-1:2004 (E) without density determination	0.0080 mg	For free nominal values  $m_c$ = conventional mass
	> 10 mg to 20 mg		0.010 mg	
	> 20 mg to 50 mg		0.012 mg	
	> 50 mg to 100 mg		0.016 mg	
	> 100 mg to 200 mg		0.020 mg	
	> 200 mg to 500 mg		0.025 mg	
	> 500 mg to 1 g		0.030 mg	
	> 1 g to 2 g		0.040 mg	
	> 2 g to 5 g		0.050 mg	
	> 5 g to 10 g		0.060 mg	
	> 10 g to 20 g		0.080 mg	
	> 20 g to 50 g		0.10 mg	
	> 50 g to 100 g		0.16 mg	
	> 100 g to 50 kg		$1.7 \cdot 10^{-6} m_c$	
	> 50 kg to 500 kg		$5 \cdot 10^{-5} m_c$	
Pressure Gauge Pressure $p_e$	0.2 MPa to 4 MPa	DKD-R-6-1: 2014 EURAMET cg-17 Version 4.0	$7.1 \cdot 10^{-5} \cdot p_e$ , but not less than 25 Pa	Pressure Medium: Gas $p_e$ : measured gauge pressure in MPa
	> 4 MPa to 20 MPa		$7.1 \cdot 10^{-5} \cdot p_e$	
	1.25 MPa to 6.8 MPa		$1.1 \cdot 10^{-4} \cdot p_e$ , but not less than 410 Pa	Pressure Medium: Liquid $p_e$ : measured gauge pressure in MPa
	> 6.8 MPa to 100 MPa		$8.3 \cdot 10^{-5} \cdot p_e$ , but not less than 630 Pa	
Absolute Pressure $p_{abs}$	0.3 MPa to 4.1 MPa	DKD-R-6-1: 2014 EURAMET cg-17 Version 4.0 Principle of measurement: $p_{abs} = p_e + p_{amb}$	$7.1 \cdot 10^{-5} \cdot p_{abs}$ , but not less than 25 Pa	Pressure Medium: Gas $p_{abs}$ : measured pressure in MPa The uncertainty of the atmospheric pressure $p_{amb}$ (barometer) has to be added.
	> 4.1 MPa to 20.1 MPa		$7.1 \cdot 10^{-5} \cdot p_{abs}$	
	1.35 MPa to 6.9 MPa		$1.1 \cdot 10^{-4} \cdot p_{abs}$ , but not less than 410 Pa	Pressure Medium: Liquid $p_{abs}$ : measured absolute pressure in MPa The uncertainty of the atmospheric pressure $p_{amb}$ (barometer) has to be added.
	> 6.9 MPa to 100.1 MPa		$8.3 \cdot 10^{-5} \cdot p_{abs}$ , but not less than 630 Pa	

<sup>1)</sup> 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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Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks
<b>Chemical analysis</b> Volume of liquids/ Piston-operated Pipettes with Variable Volume	1 µL to < 10 µL	Gravimetric Method according to ISO 8655:2002 and DKD R 8-1:2011	a. 2.0 % b. 1.5 % c. 1.0%	Measurement uncertainties refer to nominal volumes.  a) Upper nominal volume: ( $V_T = 1,0 \cdot V_N$ ) for devices with fixed or variable volume  b) Middle nominal volume: ( $V_T = 0,5 \cdot V_N$ ) for devices with variable volume  c) Lower nominal volume: ( $V_T = 0,1 \cdot V_N$ ) for devices with variable volume  $V_T$ : Test volume $V_N$ : Nominal volume
	10 µL to < 100 µL		a. 0.45 % b. 0.34 % c. 0.23 %	
	100 µL to < 1200 µL		a. 0.23 % b. 0.17 % c. 0.12 %	
	1200 µL to 10 ml		a. 0.15 % b. 0.11 % c. 0.075 %	
Volume of liquids/ Piston-operated Pipettes with Fixed Volume	1 µL to < 10 µL		2.0 %	
	10 µL to < 100 µL		0.45 %	
	100 µL to < 1200 µl		0.23 %	
	1200 µL to 10 mL		0.15 %	
Volume of liquids/ Dispenser	1 µL to < 10 µL	Gravimetric Method according to ISO 8655:2002 and DKD R 8-2:2017	a. 2.0 % b. 1.5 % c. 1.0%	Measurement uncertainties refer to nominal volumes.  d) Upper nominal volume: ( $V_T = 1,0 \cdot V_N$ ) for devices with fixed or variable volume  e) Middle nominal volume: ( $V_T = 0,5 \cdot V_N$ ) for devices with variable volume  f) Lower nominal volume: ( $V_T = 0,1 \cdot V_N$ ) for devices with variable volume  $V_T$ : Test volume $V_N$ : Nominal volume
	10 µL to < 100 µL		a. 0.45 % b. 0.34 % c. 0.23 %	
	100 µL to < 1200 µL		a. 0.23 % b. 0.17 % c. 0.12 %	
	1200 µL to < 10 mL		a. 0.15 % b. 0.11 % c. 0.075 %	
	10 mL to 100 mL		a. 0.075 % b. 0.056 % c. 0.038 %	

<sup>1)</sup> 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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Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks
Volume of liquids/ Volumetric Instruments made of glass, "Ex"	0.1 mL to 1 mL	Gravimetric Method according to ISO 4787:2011	0.30 %	
	> 1 mL to 10 mL		0.085 %	
	> 10 mL to 100 mL		0.045 %	
Volume of liquids/ Volumetric Instruments made of glass, "In"	1 mL to 10 mL	Gravimetric Method according to ISO 4787:2011	0.085 %	
	> 10 mL to 100 mL		0.050 %	
	> 100 mL to 1000 mL		0.045 %	
	> 1 L to 5 L		0.042 %	

**On-site Calibration**

Calibration and Measurement Capabilities (CMC)				
Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement <sup>1)</sup>	Remarks
<b>Weighing instruments</b> Non-automatic electronic weighing instruments	up to 2 kg	EURAMET Calibration Guide No.-18 Version 4.0	$1.0 \cdot 10^{-6}$	For weight pieces according to OIML R 111-1:2004 Class E <sub>2</sub> weight pieces
	up to 60 kg		$6.0 \cdot 10^{-6}$	For weight pieces according to OIML R 111-1:2004 Class F <sub>1</sub> weight pieces
	up to 200 kg		$2.0 \cdot 10^{-5}$	For weight pieces according to OIML R 111-1:2004 Class F <sub>2</sub> weight pieces
	up to 300 kg		$6.0 \cdot 10^{-5}$	For weight pieces according to OIML R 111-1:2004 Class M <sub>1</sub> weight pieces

**Abbreviations used:**

DKD-R	Guideline of Deutscher Kalibrierdienst (DKD), published by Physikalisch-Technische Bundesanstalt
PTB	Physikalisch-Technische Bundesanstalt
EURAMET	European Association of National Metrology Institutes
OIML	International Organization of Legal Metrology

<sup>1)</sup> 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.