Hellenic Accreditation System S.A.

Annex F2/18 to the Certificate No. **388**-5

SCOPE of ACCREDITATION

of the

Laboratory

of

CHIMIKI TECHNIKI MINESCHOS L.P.

for the performance of calibrations

Calibration item / Parameters	Range of measurement	Expanded measurement uncertainty (k=2) *	Remarks
Mass measurements			
Non-automatic electronic weighing instruments			EURAMET cg-18 v.04:2015 Calibration is performed on site. Available standard weights OIML Class:
	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g	$3{,}8 \times 10^{-3}$ $1{,}9 \times 10^{-3}$ $7{,}5 \times 10^{-4}$ $3{,}8 \times 10^{-4}$ $1{,}9 \times 10^{-4}$ $1{,}0 \times 10^{-4}$ $6{,}3 \times 10^{-5}$ $3{,}8 \times 10^{-5}$ $2{,}0 \times 10^{-5}$ $1{,}3 \times 10^{-5}$ $7{,}5 \times 10^{-6}$ $4{,}0 \times 10^{-6}$ $2{,}5 \times 10^{-6}$ $1{,}6 \times 10^{-6}$ $0{,}8 \times 10^{-6}$ $0{,}6 \times 10^{-6}$	E1
	(100 g to 500 g]	$2{,}0 \times 10^{-6}$	E2
	(500 g to 4 kg]	$6{,}3 \times 10^{-5}$	M1
	(4 kg to 230 kg]	$2{,}0 \times 10^{-4}$	M2

Calibration item / Parameters	Range of measurement	Expanded measurement uncertainty (k=2) *	Remarks
Standard weights			OIML R111-1:2004 Capability to calibrate standard weights up to OIML Class:
	[1 mg to 10 mg] 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g	2 µg 3 µg 3 µg 3 µg 4 µg 5 µg 5 µg 7 µg 8 µg 10 µg 13 µg 26 µg 31 µg 50 µg	E2
	500 g	1,5 mg	F2
	1 kg 2 kg	1,6 mg 2,1 mg	F1
	5 kg 10 kg 20 kg	0,22 g 0,26 g 0,34 g	M2
Spectrophotometric measurements			
Spectrophotometers / Absorption of visible and UV radiation in the range 200 nm to 900 nm	[0 to 0,5 AU]	7,4 mAU**	ASTM E 275: 2008 (R2022) (baseline stability, photometric accuracy and precision) Calibration is also performed on site.
	(0,5 AU to 1,0 AU]	7,7 mAU	
	(1,0 AU to 2,2 AU]	8,0 mAU	
High-performance liquid chromatographs (HPLC) / Absorption of visible and UV radiation	[0 to 0,3 AU]	10 mAU	ASTM E 1657: 1998 (2019) (noise & drift, photometric accuracy and precision) Calibration is also performed on site.
	(0,3 AU to 1,0 AU]	11 mAU	
Plate readers / Absorption of visible radiation	[0 to 0,5 AU]	10 mAU	ASTM E 275-08 (R2022) (photometric accuracy and
	(0,5 AU to 1,0 AU]	11 mAU	
	(1,0 AU 2,8 AU]	14 mAU	
Conductivity measurements			
Conductivity detectors of ion chromatographs (IC) and high-performance liquid chromatographs (HPLC)	[0 to 15 µS/cm]	0,2 µS/cm	ASTM E 1511: 1993 (2017) (noise & drift, conductivity accuracy and precision) Calibration is also performed on site.
	(15 µS/cm to 150 µS/cm]	1,0 µS/cm	
	(150 µS/cm to 1500 µS/cm]	12 µS/cm	

Calibration item / Parameters	Range of measurement	Expanded measurement uncertainty (k=2) *	Remarks
Electrical measurements			
pH meters / DC voltage	-420 mV to +420 mV	0,033 mV	Internal method ΜΔ-19.Γ using voltage simulator, based on guideline EURAMET cg-15:2015 The range of measurements corresponds to pH values 0 to 14.
Flow measurements			
Liquid chromatography systems / Liquid volume flow	0,5 mL/min to 5 mL/min	0,06 mL/min	ISO 8316:1987
Volume measurements			
Piston volumetric apparatuses (pipettes, burettes, dilutors, dispensers)	(1 µL to 2 µL]	2,0 % to 1,3 %	EN ISO 8655.06:2022
	(2µL to 10 µL]	1,3 % to 0,56 %	
	(10 µL to 100 µL]	0,56 % to 0,20 %	
	(100 µL to 1000 µL]	0,20 % to 0,14 %	
	(1 mL to 5 mL]	0,14 %	
	(5 mL to 10 mL]	0,13 %	
	(10 mL to 150 mL]	0,12 %	
Temperature measurements			
Climatic and isothermal chambers, Incubators & laboratory ovens, Refrigerators, Cooling chambers with internal volume up to 2000 l, with or without air circulation	[-80 °C to -60 °C]	0,3 °C	DKD-R 5-7:2018 ELOT EN 60068-3-5:2018 using Pt100 thermometers and type K thermocouples (for temperature > 250 °C). Calibration is performed on site.
	(-60 °C to 120 °C]	0,2 °C	
	(120 °C to 250 °C]	1,2 °C	
	(250 °C to 350 °C]	3,0 °C	
Climatic and isothermal chambers, Incubators & laboratory ovens, Refrigerators, Cooling chambers with internal volume up to 2000 l, with air circulation	[350 °C to 500 °C]	3,0 °C	DKD-R 5-7:2018 ELOT EN 60068-3-5:2018 using type K thermocouples. Calibration is performed on site.
	(500 °C to 1000 °C]	3,0 °C to 3,5 °C	Internal method ΜΔ.06.Θ based on: DKD-R 5-7:2018 ΕΛΟΤ EN 60068-3-5:2018 EURAMET cg-20 v.5.0:2017 using type K thermocouples. Calibration is performed on site.

Calibration item / Parameters	Range of measurement	Expanded measurement uncertainty (k=2) *	Remarks
GC ovens	[-20 ºC to 120 ºC]	0,2 ºC	DKD-R 5-7: 2018 using Pt100 thermometers. Calibration is performed on site.
	(120 ºC to 250 ºC]	1,2 ºC	
HPLC ovens	0 ºC to 80 ºC	0,2 ºC	DKD-R 5-7: 2018 using Pt100 thermometers. Calibration is performed on site.
Autoclaves	100 ºC to 140 ºC	0,3 ºC	BS 2646-5: 1993 DKD-R 5-7: 2018 using data loggers. Calibration is performed on site.
Liquid baths	-40 ºC to +140 ºC	0,4 ºC	ASTM E 715: 80 (R2022) DKD-R 5-7: 2018 using data loggers. Calibration is performed on site.
Dissolution testers and disintegration testers	30 ºC to 50 ºC	0,3 ºC	ASTM E 715: 80 (R2022) using data loggers. Calibration is performed on site.
Analog, digital thermometers of direct reading, temperature data loggers	[-80 ºC to -40 ºC]	0,8 ºC	COFRAC LAB GTA 08: 2017
	(-40 ºC to 75 ºC]	0,09 ºC	
	(75 ºC to 125 ºC]	0,11 ºC	
	(125 ºC to 600 ºC]	1,1 ºC	
Air temperature thermometers	-20 ºC to +60 ºC	0,6 ºC	COFRAC LAB GTA 08: 2017
Liquid-in-glass thermometer (total / partial immersion)	[-40 ºC to 25 ºC]	0,09 ºC	COFRAC LAB GTA 08: 2017
	(25 ºC to 125 ºC]	0,11 ºC	
Temperature dry block calibrators	[-50 ºC to 240 ºC]	0,2 ºC	EURAMET cg-13 v.4.0:2017 using Pt100 thermometers.
	(240 ºC to 600 ºC]	1,3 ºC	
Relative humidity measurements			
Relative humidity/ Controlled relative humidity chambers, with volume up to 2000 l (Climatic chambers)	65 %rh (at 30 ºC)	2,5 %rh	DKD-R 5-7:2018 Calibration is performed on site.
	60 %rh (at 25 ºC)	2,3 %rh	

Calibration item / Parameters	Range of measurement	Expanded measurement uncertainty (k=2) *	Remarks
	75 %rh (at 40 °C)	2,7 %rh	
Relative humidity / Analog and digital hygrometers	[20 %rh to 40 %rh] (40 %rh to 60 %rh) [60 %rh to 90 %rh] at 25°C	1,7 %rh 1,6 %rh 2,2 %rh	Internal method ΜΔ-16.Ε based on NPL guideline, "A guide to the measurement of humidity":1996 using standard hygrometer and climatic chamber.
	[20 %rh to 40 %rh] (40 %rh to 60 %rh) [60 %rh to 90 %rh] At 30°C	1,9 %rh 1,7 %rh 2,0 %rh	
	[20 %rh to 40 %rh] (40 %rh to 60 %rh) [60 %rh to 90 %rh] at 40°C	1,8 %rh 1,7 %rh 2,0 %rh	
Pressure measurements			
Analog and digital gas medium gauge pressure measuring instruments of direct reading	[10 mbar to 70 mbar)	0,02 mbar	DKD-R 6-1 v.3:2014
	[70 mbar to 20 bar]	5,2 mbar	
	[-730 mbar to -70 mbar]	4,5 mbar	
	(-70 mbar to -10 mbar]	0,021 mbar	

* *Where the expanded uncertainty (with coverage probability 95 %) is accompanied by the corresponding unit, it is absolute, while where it is not accompanied by a unit, it is relative.*

*** Uncertainty values were estimated assuming a spectrophotometer having a resolution of 0,1 mAU.*

The Calibration & Measurement Capability (CMC) includes the measurand, the measurement range and the measurement uncertainty and expresses the smallest measurement uncertainty that can be achieved in a calibration.

Site of assessment: **Permanent laboratory premises, 197, Spaton Avenue, GR-153 51 Pallini, Attiki, Greece.**
Approved signatories: **Gerasimos Mineschos.**

This Scope of Accreditation replaces the previous one dated October 4th, 2023.
The Accreditation Certificate No. **388**-5, to ELOT EN ISO/IEC 17025: 2017, is valid until 09.10.2028.

Athens, March 15th, 2024

Christos Nestoras
CEO of ESYD