



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

THERMO FISHER SCIENTIFIC operating as UNITY LAB SERVICES⁴
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CALIBRATION

Valid to: April 30, 2019

Certificate Number: 4946.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of pH Meters ³			
pH			
14	-414.12 mV dc	0.17 mV dc	Using the Nerst equation giving 59.16 mV/pH at 25 °C with the isopotential point at 7.00 pH
13	-354.96 mV dc	0.17 mV dc	
12	-295.80 mV dc	0.17 mV dc	
11	-236.64 mV dc	0.17 mV dc	
10	-177.48 mV dc	0.17 mV dc	
9	-118.32 mV dc	0.17 mV dc	
8	-59.16 mV dc	0.17 mV dc	
7	0.00 mV dc	0.17 mV dc	
6	59.16 mV dc	0.17 mV dc	
5	118.32 mV dc	0.17 mV dc	
4	177.48 mV dc	0.17 mV dc	
3	236.64 mV dc	0.17 mV dc	
2	295.80 mV dc	0.17 mV dc	
1	354.96 mV dc	0.17 mV dc	
0	414.12 mV dc	0.17 mV dc	

II. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
<p>Mass –</p> <p>Fixed Points</p>	<p>1 mg</p> <p>2 mg</p> <p>3 mg</p> <p>5 mg</p> <p>10 mg</p> <p>20 mg</p> <p>30 mg</p> <p>50 mg</p> <p>100 mg</p> <p>200 mg</p> <p>300 mg</p> <p>500 mg</p> <p>1 g</p> <p>2 g</p> <p>3 g</p> <p>5 g</p> <p>10 g</p> <p>20 g</p> <p>30 g</p> <p>50 g</p> <p>100 g</p> <p>200 g</p> <p>300 g</p> <p>500 g</p> <p>1 kg</p> <p>2 kg</p> <p>3 kg</p> <p>5 kg</p> <p>10 kg</p> <p>20 kg</p> <p>25 kg</p> <p>585 g</p>	<p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0020 mg</p> <p>0.0030 mg</p> <p>0.0040 mg</p> <p>0.0068 mg</p> <p>0.0068 mg</p> <p>0.008 mg</p> <p>0.010 mg</p> <p>0.017 mg</p> <p>0.033 mg</p> <p>0.050 mg</p> <p>0.040 mg</p> <p>0.080 mg</p> <p>0.10 mg</p> <p>0.15 mg</p> <p>0.24 mg</p> <p>0.5 mg</p> <p>1.0 mg</p> <p>1.5 mg</p> <p>2.4 mg</p> <p>9.6 mg</p> <p>20 mg</p> <p>30 mg</p> <p>0.050 mg</p>	<p>CMC relates to calibration of integral conventional standard weights</p> <p>Calibrations per lab's procedure M4</p>



Parameter/Equipment	Range	CMC ² (±)	Comments
Mass – (cont)	(1 to 200) mg (> 200 to 300) mg (> 300 to 500) mg > 500 mg to 2 g (> 2 to 3) g (> 3 to 5) g (> 5 to 10) g (> 10 to 20) g (> 20 to 30) g (> 30 to 50) g (> 50 to 100) g (> 100 to 200) g (> 200 to 300) g (> 300 to 500) g > 500 g to 1 kg (> 1 to 2) kg (> 2 to 3) kg (> 3 to 5) kg (> 5 to 10) kg (> 10 to 20) kg (> 20 to 25) kg	0.0020 mg 0.0030 mg 0.0040 mg 0.0068 mg 0.0080 mg 0.010 mg 0.017 mg 0.033 mg 0.050 mg 0.040 mg 0.080 mg 0.10 mg 0.15 mg 0.24 mg 0.50 mg 1.0 mg 1.5 mg 2.4 mg 9.6 mg 20 mg 30 mg	CMC relates to calibration of integral conventional standard weights, Calibrations per lab's procedure M4
Balances (Electronic, Non-automatic) ³	Up to 200 mg (> 200 to 500) mg > 500 mg to 2 g (> 2 to 5) g (> 5 to 10) g (> 10 to 20) g (> 20 to 50) g (> 50 to 100) g (> 100 to 200) g (> 200 to 500) g > 500 g to 1 kg (> 1 to 2) kg (> 2 to 5) kg (> 5 to 10) kg (> 10 to 30) kg	0.0025 mg 0.0045 mg 0.0070 mg 0.015 mg 0.020 mg 0.035 mg 0.075 mg 0.15 mg 0.20 mg 0.60 mg 3.0 mg 5.0 mg 10 mg 30 mg 270 mg	Class 1 weights

Parameter/Equipment	Range	CMC ² (±)	Comments
Piston Pipettes and Syringes	0.2 µL (> 0.2 to 0.5) µL (> 0.5 to 1) µL (> 1 to 2) µL (> 2 to 5) µL (> 5 to 10) µL (> 10 to 20) µL (> 20 to 50) µL (> 50 to 100) µL (> 100 to 200) µL (> 200 to 500) µL (> 500 to 1000) µL (> 1000 to 5000) µL (> 5000 to 10 000) µL	0.017 µL 0.019 µL 0.017 µL 0.017 µL 0.019 µL 0.019 µL 0.022 µL 0.074 µL 0.20 µL 0.23 µL 0.56 µL 0.68 µL 5.5 µL 6.8 µL	Calibration procedure M31(PIP)
Piston Pipettes and Syringes ³	(10 to 20) µL (> 20 to 50) µL (> 50 to 100) µL (> 100 to 200) µL (> 200 to 500) µL (> 500 to 1000) µL (> 1000 to 5000) µL (> 5000 to 10 000) µL	0.022 µL 0.074 µL 0.20 µL 0.23 µL 0.56 µL 0.68 µL 5.5 µL 6.8 µL	Gravimetric; calibration procedure PIPON-P03

III. Optical Quantities

Parameter/Equipment	Range	CMC ² (±)	Comments
Transmittance Density (Absorbance)			
Calibration at the Following Wavelengths in nm: 440, 465, 546.1, 590, 635	0 to 1	0.006	Neutral density filters
230, 240, 260, 280, 320	0 to 0.75	0.007	
	> 0.75 to 1.5	0.012	
	> 1.5 to 2.5	0.034	

Parameter/Equipment	Range	CMC ² (±)	Comments
Wavelength Peak Position	(279, 287, 360) nm	0.7 nm	Holmium oxide filters
	(445, 453, 460) nm	0.7 nm	
	536 nm	1.0 nm	

IV. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature Controlled Chambers ³	-80 °C to 105 °C > 105 °C to 150 °C > 150 °C to 200 °C > 200 °C to 250 °C > 250 °C to 300 °C > 300 °C to 350 °C > 350 °C to 450 °C > 450 °C to 1000 °C	0.13 °C 1 °C 2 °C 5 °C 7 °C 10 °C 12 °C 17 °C	Calibration procedure P3
Liquid-in-glass Thermometers (Partial Immersion) ³	-45 °C to 145 °C	0.020 °C	Liquid temperature bath
Platinum Resistance Thermometer System ³	-196 °C -80 °C to 125 °C > 126 °C to 400 °C > 401 °C to 600 °C	0.0084 °C 0.013 °C 0.15 °C 0.69 °C	Liquid bath or dry block calibrator
Thermistor Thermometer System ³	-10 °C to 105 °C	0.067 °C	Stirred liquid bath

V. Time & Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Centrifuges ³	(1000 to 15 000) rpm (> 15 000 to 80 000) rpm	10 rpm 43 rpm	Optical tachometer

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Timers ³	(1 to 24) hr	0.85 s	Reference timer

¹ This laboratory offers commercial calibration services and field calibration services.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ Offices for administration of field technicians are located in 145 Renfrew Dr, Markham, Ontario, Canada and 28 Scheneck Parkway, Suite 400, Ashville, NC.



Accredited Laboratory

A2LA has accredited

THERMO FISHER SCIENTIFIC OPERATING AS UNITY LAB SERVICES

Ottawa, Ontario, CANADA

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets R205 – Specific Requirements: Calibration Laboratory Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).



Presented this 19th day of July 2018.

A handwritten signature in black ink, written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 4946.01
Valid to April 30, 2019

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.