CERTIFICATE OF ACCREDITATION

This is to attest that

MEASUREMENT CONTROL CENTER (MCC)

269 ZONE INDUSTRIELLE SUD OUEST MOHAMMEDIA MAROC
MOHAMMEDIA, 28810, MOROCCO
(SATELLITE FACILITY: 187 BD ACCRA ETD RD LOTIS LA COLLINE MOHAMMEDIA,
28810, MOROCCO)

Calibration Laboratory CL-284

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories.* This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date April 30, 2024

Expiration Date May 1, 2026

IAS ACCREDITED

President

Visit www.iasonline.org for current accreditation information.

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

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MEASUREMENT CONTROL CENTER (MCC)

www.mccmaroc.com

Accredited to ISO/IEC 17025:2017 *Effective Date April 30, 2024*

Location	Address	Contact Name	Contact Phone	Scope Pages
Main	269 Zone Industrielle Sud Ouest Mohammedia Maroc, Mohammedia, 28810, Morocco	Mohamed Hafid	+212-0661081224	2-5
Satellite	187 Bd Accra Etd Rd Lotis La Colline Mohammedia, CP-28810, Morocco, 28810	Mohamed Hafid	+212-0661081224	6-8

Main Location

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Mechanical			
Pressure Pneumatic[5] Metal Pressure Gauge, Pressure Measurement system (indicator, sensor), Pressure transmitter, Pressure sensor, Air inflator gauge, Pressure Data Record	-0.95 bar to 0 bar	5 mbar	Using Digital pressure gauge + Pneumatic Generator by Comparison Method
	0 bar to 10 bar 10 bar to 20 bar	0.015 bar 0.025 bar	
Pressure Hydraulic[5] Metal Pressure Gauge, Pressure Measurement system (indicator, sensor), Pressure transmitter, Pressure sensor, Air inflator gauge, Pressure Data Record	0 bar to 10 bar 10 bar to 20 bar 20 bar to 100 bar 100 bar to 350 bar 350 bar to 600 bar 600 bar to 700 bar	0.016 bar 0.03 bar 0.07 bar 0.3 bar 0.7 bar 1.0 bar	Using Digital pressure gauge + Pneumatic Generator by Comparison Method
Pressure Hydraulic Metal Pressure Gauge, Pressure Measurement system (indicator, sensor), Pressure transmitter, Pressure sensor, Air inflator gauge, Pressure Data Record	10 bar to 50 bar 50 bar to100 bar 100 bar to 200 bar 200 bar to 400 bar 400 bar to 500 bar 500 bar to 600 bar	0.005 bar 0.01 bar 0.021 bar 0.031 bar 0.041 bar 0.052 bar	Using Dead Weight Tester (Pressure Balance) by Direct method

** If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Thermal			
Temperature Measurement system[5] (Liquid Expansion Glass Thermometer/ Digital Thermometer / Dial thermometer/ Temperature sensor indicator-RTD/TC, Analog thermometer	-90 °C to 400 °C 400 °C to 600 °C 600 °C to 1200 °C	0.06 °C 1.1 °C 1.9 °C	Using Reference Sensor (PRT and S Type with indicator) by Comparison Method
Thermostatic enclosures Muffle Furnace[5]	-90 °C to 250 °C 250 °C to 450 °C 450 °C to 650 °C 650 °C to 800 °C	0.2 °C 1.2 °C 2.1 °C 2.4 °C	By using Temp Sensor with Indicator (PT-100/ S Type/ K Type) by Mapping Method (The number of sensors depends on the volume of the enclosure)
Climate chambers[5]	Temperature 15 °C to 50 °C Relative humidity 15 %RH to 90 %RH	 0.36 °C 3.0 % + 0.061 %RH	By using Temp Sensor with Indicator (PT-100) and Reference Hygrometer by Mapping Method The number of sensors depends on the volume of the enclosure)
Water Bath[5]	-30 °C to 100 °C	0.20 °C	By using Temp Sensor with Indicator (PT-100) by Direct method (Single Sensor Method)
Thermo-button Thermograph Temperature recorder[5]	-60 °C to 140 °C	0.20 °C	Using Climatic chamber by Comparison Method
Impedance hygrometer Mechanical hygrometer Psychrometer Humidity logger Thermo-hygrograph Thermo-hygrometer	15 °C to 50 °C 10 %RH to 90 %RH	0.3 °C 1.3 % + 0.21 %RH	Using Reference Sensor (PRT and Humidity Meter & Climate Chamber) by Comparison Method
Dew point hygrometer	5 °C to 50 °C	0.2 °C	Using Reference Dew Point Meter and Climate Chamber by Comparison Method
Infrared thermometer Optical pyrometer Thermal camera[5]	-15 °C to 35 °C 35 °C to 120 °C 120 °C to 350 °C 350 °C to 500 °C	1.2 °C 2.5 °C 6 °C 8 °C	Using radiant standard plane source (Infrared Calibrator) by direct method ε=0,95 ʎ= (8 to 14) µm

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Electrical – DC/LF			
DC Voltage – Measure[5]	10 mV to 330 m V 330 mV to 1000 V	0.03 % +3 µV 0.02 % + 4.8 mV	Using 8.5 Digit Multimeter by Direct method
AC Voltage – Measure @ 50 Hz, @1 kHz, @10 kHz[5]	10 mV to 33 mV 33 mV to 330 mV 0.33 V to 3.3 V 3.3 V to 33 V 33 V to 330 V 330 V to 1000 V	1.7 % +100 µV 0.48 % + 0.11 mV 0.39 % + 0.1 mV 0.37 % + 0.6 mV 0.63 % + 5.3 mV 0.18 % + 30 mV	
DC Resistance – Measure[5]	1 Ω to 11 Ω 11 Ω to 33 Ω 33 Ω to 33 kΩ 33 kΩ to 110 kΩ 110 kΩ to 330 kΩ 0.33 MΩ to 3.3 MΩ 3.3 MΩ to 11 MΩ 11 MΩ to 33 MΩ 33 MΩ to 100 MΩ	0.06 % + 0.4 mΩ 0.03 % + 0.4 mΩ 0,02 % 0.02 % + 1.1 Ω 0.02 % + 1.2 Ω 0.03 % + 0.06 KΩ 0.12 % + 0.26 KΩ 0.20 % + 0.12 KΩ 1 % + 5 KΩ	Using 8.5 Digit Multimeter by Direct method
DC Current Measure[5]	100 µA to 330 µA 0.33 mA to 1 mA 1 mA to 3.3 mA 3.3 mA to 10 mA 10 mA to 33 mA 33 mA to 100 mA 100 mA to 330 mA 330 mA to 3.3 A 3.3 A to 10 A	0.07 % + 11 nA 0.09 % + 13 nA 0.03 % + 68 nA 0.03 % + 0.23 µA 0.03 % + 0.24 µA 0.04 % + 2.9 µA 0.03 % + 4.6 µA 0.11 % + 44 µA 0.21 % + 0.69 mA	
AV Current Measure[5] @ 50 Hz, @1kHz, @10 kHz	5 mA to 33 mA 33 mA to 330 mA 0.33 A to 3.3 A 3.3 A to 10 A	0.33 % + 0.9 µA 0.47 % + 0.023 mA 0.57 % + 0.13 mA 0.37 % + 0.63 mA	
DC Voltage Generate[5]	10 mV to 50 mV 50 mV to 200 mV 0.2 V to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V	0.007 % + 0.034 µV 0.002 % + 0.07 µV 0.001 % + 0.2 µV 0.001 % + 4.6 µV 0.002 % + 0.048 mV 0.002 % + 0.12 mV	
AC Voltage Generate[5] @ 50 Hz, @1 kHz, @10 kHz	10 mV to 200 mV 0.2 V to 200 V 200 V to 1000 V	0.19 % + 0.8 µV 0.02 % reading 0.06 % + 0.12 mV	Using Electrical Calibrator by Direct method
DC Current Generate[5]	100 µA to 200 µA 0.2 mA to 2 mA 2 mA to 20 mA 20 mA to 200 mA	0,01 % + 0.6 nA 0.007 % + 3 nA 0.007 % + 1.8 nA 0.05 % + 0.086 µA	

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
DC Current Generate[5] (continued)	0.2 A to 2 A 2 A to 10 A	0.06 % + 0. 007 mA 0.11 % + 0. 023 mA	Using Electrical Calibrator by Direct method (continued)
AC Current Generate[5] @ 50 Hz, @1 kHz, @10 kHz	5 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 10 A	0.05 % + 0.35 µA 0.05 % + 3.6 µA 0.10 % + 31 µA 0.22 % + 2.2 mA	
DC Resistance – Generate[5]	1 Ω to 10 Ω 10 Ω to 100 Ω 0.1 kΩ to 1 kΩ 1 kΩ to 10 kΩ 10 kΩ to 100 kΩ 0.1 MΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ	0.02 % + 0.007 mΩ 0.007 % + 0.14mΩ 0.007 % + 1.3 mΩ 0.008 % + 15 mΩ 0.007 % + 0.17 Ω 0.008 % + 4.4 Ω 0.03 % + 17 Ω 0.33 % + 5.4 KΩ	

Satellite Location

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Mechanical			
Conventional mass	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 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg	0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg 0.05 mg 0.06 mg 0.08 mg 0.1 mg 0.16 mg 0.3 mg 2.5 mg 5 mg 30 mg 80 mg 160 mg 300 mg	By ABBA Method as per OIML
Non-automatic, non-regulatory weighing instruments with analog or digital indication and automatic balance. (M is mass) [5]	1 mg to 220 g 100 g to 10 kg 1 kg to 1000 kg	$2x10^{-6}$ x M $5x10^{-6}$ x M $5x10^{-5}$ x M	Using reference weight of E2, F1, F2, M1 and M2 by direct method
	1000 kg to 9000 kg	$2x10^{-4}$ x M + Resolution	Using reference weight of M1 and M2 by substitution method
Single-stroke pipettes (Fixed volume)	200 mL 100 mL 50 mL 25 mL 20 mL 10 mL 5 mL 2 mL 1 mL 0.5 mL	28 µL 10 µL 8 µL 7 µL 6 µL 2 µL 1.5 µL 1 µL 0.8 µL 0.6 µL	By Gravimetric method Using Weighing balance + Distilled water
Graduated pipettes (Variable volume) V is Volume	10 mL to 25 mL 5 mL to 10 mL 2 mL to 5 mL	2.5 µL+ $1.5x10^{-5}$ x V 1.5 µL + $1x10^{-5}$ x V 1 µL + $5x10^{-4}$ x V	By Gravimetric method Using Weighing balance + Distilled water

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Graduated pipettes (Variable volume) V is Volume (continued)	1 mL to 2 mL 0.5 mL to 1 mL 10 µL to 0.5 mL	0.8 µL + $4x10^{-4}$ x V 0.5 µL + $3x10^{-4}$ x V 0.4 µL + $1x10^{-4}$ x V	By Gravimetric method Using Weighing balance + Distilled water
Variable and fixed volume liquid dispensers V is Volume	5 mL to 100 mL 0.5 mL to 5 mL 100 µL to 500 µL 20 µL to 100 µL	10 µL + $6x10^{-4}$ V 0.5 µL + $3x10^{-4}$ V 0.4 µL + $3x10^{-4}$ V 0.3 µL + $3x10^{-4}$ V	By Gravimetric method Using Weighing balance + Distilled water
Syringe V is Volume	20 mL to 50 mL 5 mL to 20 mL 0.5 mL to 5 mL 20 µL to 500 µL	3 µL + $8x10^{-6}$ x V 0.6 µL+ $8x10^{-6}$ x V 0.5 µL+ $5x10^{-6}$ x V 0.45 µL+ $3x10^{-6}$ x V	By Gravimetric method Using Weighing balance + Distilled water
Piston pipettes (Fixed and variable volume)	10 mL to 25 mL 5 mL to 10 mL 2 mL to 5 mL 500 µL to 2 mL 200 µL to 500 µL 50 µL to 200 µL 10 µL to 50 µL	1.5 µL 0.8 µL 0.7 µL 0.6 µL 0.5 µL 0.3 µL 0.3 µL	By Gravimetric method Using Weighing balance + Distilled water
Test Tubes graduated	1 L to 2 L 500 mL to 1 L 250 mL to 500 mL 100 mL to 250 mL 50 mL to 100 mL 25 mL to 50 mL 10 mL to 25 mL 5 mL to 10 mL 10 µL to 5 mL	350 µL 280 µL 250 µL 200 µL 80 µL 70 µL 30 µL 20 µL 15 µL	By Gravimetric method Using Weighing balance + Distilled water
Single line flasks (Fixed volume)	2 L 1 L 500 mL 200 mL 100 mL 50 mL 20 mL 10 mL 5 mL	130 µL 70 µL 45 µL 31 µL 30 µL 12 µL 9 µL 7 µL 6 µL	By Gravimetric method Using Weighing balance + Distilled water
Graduated burettes (Variable volume) V is Volume	50 mL to 100 mL 25 mL to 50 mL 10 mL to 25 mL 5 mL to 10 mL 2 mL to 5 mL 1 mL to 2 mL 0.1 mL to 1 mL	3.5 µL + 3.5 $x10^{-5}$ x V 3 µL + $2.5x10^{-5}$ x V 3 µL + $1.5x10^{-5}$ x V 2 µL + $1x10^{-5}$ x V 1.5 µL + 3.5 $x10^{-5}$ x V 1.2 µL + $4x10^{-6}$ x V 0.9 µL+ $4x10^{-6}$ x V	By Gravimetric method Using Weighing balance + Distilled water

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Pycnometer	200 mL to 1000 mL 5 mL to 100 mL	0.03 mL 0.01 mL	By Gravimetric method Using Weighing balance + Distilled water
Density Hydrometers	700 kg/m^3 to 1400 kg/m^3	0.5 kg/m^3	Density standard solutions and balances by Direct method.

[1]The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

[2]When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

[3]Capability is suitable for the calibration of measuring devices in the stated ranges.

[4]Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

[5]Also available as site calibration. Note that actual measurement uncertainties achievable at a customer's site can normally be expected to be larger than the uncertainties listed on this Scope of Accreditation.