



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

Metrolab, S.A. de C.V.

***Av. San Nicolás #118, Col. Arboledas de San Jorge
San Nicolás de los Garza, Nuevo León, México. C.P 66465***

*(Hereinafter called the Organization) and hereby declares that Organization is accredited
in accordance with the recognized International Standard:*

ISO/IEC 17025:2017

This accreditation demonstrates technical competence for a defined scope and the
operation of a laboratory quality management system
(as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

***Mechanical, Electrical, Thermodynamic, Dimensional, Mass, Force and
Weighing Devices Calibration
(As detailed in the supplement)***

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen
President

Perry Johnson Laboratory
Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

Initial Accreditation Date:

October 09, 2005

Issue Date:

October 08, 2020

Expiration Date:

October 31, 2022

Revision Date:

October 04, 2021

Accreditation No.:

48521

Certificate No.:

L20-605-R1

*The validity of this certificate is maintained through ongoing assessments based
on a continuous accreditation cycle. The validity of this certificate should be
confirmed through the PJLA website: www.pjllabs.com*



Certificate of Accreditation: Supplement

Metrolab, S.A. de C.V.

Av. San Nicolás #118, Col. Arboledas de San Jorge
San Nicolás de los Garza, Nuevo León, México. C.P 66465
Contact Name: Tomás Antonio Vanegas Phone: 818-383-6930

Accreditation is granted to the facility to perform the following calibrations:

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Indirect Verification of Rockwell Hardness Tester HRA ⁰	20 HRA to 40 HRA	0.3 HRA	ISO 6508-2/ ASTM E18 Hardness Test Block
	41 HRA to 75 HRA	0.32 HRA	
	76 HRA to 95 HRA	0.39 HRA	
Indirect Verification of Rockwell Hardness Tester HRBW ⁰	10 HRBW to 50 HRBW	0.5 HRBW	
	51 HRBW to 80 HRBW	0.34 HRBW	
	81 HRBW to 100 HRBW	0.33 HRBW	
Indirect Verification of Rockwell Hardness Tester HRC ⁰	10 HRC to 30 HRC	0.48 HRC	
	31 HRC to 55 HRC	0.35 HRC	
	56 HRC to 70 HRC	0.41 HRC	
Indirect Verification of Rockwell Hardness Tester HREW ⁰	70 HREW to 77 HREW	0.18 HREW	
	78 HREW to 90 HREW	0.31 HREW	
	91 HREW to 100 HREW	0.17 HREW	
Indirect Verification of Rockwell Hardness Tester HR15N ⁰	70 HR15N to 77 HR15N	0.22 HR15N	
	78 HR15N to 88 HR15N	0.25 HR15N	
	89 HR15N to 94 HR15N	0.32 HR15N	
Indirect Verification of Rockwell Hardness Tester HR30N ⁰	42 HR30N to 54 HR30N	0.25 HR30N	
	55 HR30N to 73 HR30N	0.32 HR30N	
	74 HR30N to 86 HR30N	0.36 HR30N	
Indirect Verification of Rockwell Hardness Tester HR45N ⁰	20 HR45N to 31 HR45N	0.34 HR45N	
	32 HR45N to 61 HR45N	0.28 HR45N	
	63 HR45N to 77 HR45N	0.36 HR45N	
Indirect Verification of Rockwell Hardness Tester HR15TW ⁰	67 HR15TW to 80 HR15TW	0.23 HR15TW	
	81 HR15TW to 87 HR15TW	0.27 HR15TW	
	88 HR15TW to 93 HR15TW	0.11 HR15TW	
Indirect Verification of Rockwell Hardness Tester HR30TW ⁰	29 HR30TW to 56 HR30TW	0.27 HR30TW	
	57 HR30TW to 69 HR30TW	0.3 HR30TW	
	70 HR30TW to 82 HR30TW	0.21 HR30TW	
Indirect Verification of Rockwell Hardness Tester HR45TW ⁰	10 HR45TW to 33 HR45TW	0.34 HR45TW	
	34 HR45TW to 54 HR45TW	0.4 HR45TW	
	55 HR45TW to 72 HR45TW	0.2 HR45TW	
Indirect Verification of Brinell Hardness Tester HBW 10/3 000 ⁰	95.5 HBW to 250 HBW	1.3 HBW	ISO 6506-02 / ASTM E10 Hardness Test Block



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Indirect Verification of Brinell Hardness Tester HBW10/3 000 ^o	250 HBW to 450 HBW	3.1 HBW	ISO 6506-02, ASTM E10 Hardness Test Block
	450 HBW to 650 HBW	8.3 HBW	
Indirect Verification of Brinell Hardness Tester HBW10/500 ^o	30 HBW to 70 HBW	1.2 HBW	
	70 HBW to 100 HBW	1.1 HBW	
	100 HBW to 148 HBW	2 HBW	
Indirect Verification of Brinell Hardness Tester HBW5/750 ^o	95.5 HBW to 250 HBW	1.5 HBW	
	250 HBW to 450 HBW	2.9 HBW	
	450 HBW to 650 HBW	7.6 HBW	
Indirect Verification of Brinell Hardness Tester HBW5/250 ^o	95.5 HBW to 200 HBW	1.6 HBW	
	200 HBW to 400 HBW	3.4 HBW	
	400 HBW to 650 HBW	7.3 HBW	
Brinell Hardness Tester HBW 2.5/ 62.5 ^o	40 HBW to 100 HBW	3.4 HBW	ISO 6507-2, ASTM E92 ASTM E384 Hardness Test Block
	100 HBW to 200 HBW	5.6 HBW	
	200 HBW to 250 HBW	9.8 HBW	
Verification of Knoop Hardness Tester Knoop 200 g ^o	100 HK to 250 HK	7 HK	
	250 HK to 650 HK	6.9 HK	
	650 HK to 999 HK	22 HK	
Verification of Knoop Hardness Tester 500 g ^o	100 HK to 250 HK	3.6 HK	
	250 HK to 650 HK	2.9 HK	
	650 HK to 999 HK	13 HK	
Indirect Verification of Vickers Hardness Tester HV 100 g ^o	100 HV to 240 HV	5.6 HV	
	240 HV to 600 HV	10 HV	
	600 HV to 999 HV	20 HV	
Indirect Verification of Vickers Hardness Tester HV 300 g ^o	100 HV to 240 HV	5.4 HV	
	240 HV to 600 HV	8.3 HV	
	600 HV to 999 HV	11 HV	
Indirect Verification of Vickers Hardness Tester HV 200 g ^o	100 HV to 240 HV	3.9 HV	
	240 HV to 600 HV	6.9 HV	
	600 HV to 999 HV	16 HV	
Indirect Verification of Vickers Hardness Tester HV 500 g ^o	100 HV to 240 HV	6.5 HV	
	240 HV to 600 HV	5 HV	
	600 HV to 999 HV	9.6 HV	



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Indirect Verification of Vickers Hardness Tester HV 5 kg ^O	100 HV to 240 HV	9.4 HV	ISO 6507-2, ASTM E92 ASTM E384 Hardness Test Block
	240 HV to 600 HV	2.7 HV	
	600 HV to 999 HV	1.2 HV	
Indirect Verification of Vickers Hardness Tester HV 10 kg ^O	100 HV to 240 HV	7.3 HV	
	240 HV to 600 HV	5.3 HV	
	600 HV to 999 HV	14 HV	
Indirect Verification of Vickers Hardness Tester HV 30 kg ^O	100 HV to 240 HV	14 HV	
	240 HV to 600 HV	8.8 HV	
	600 HV to 999 HV	17 HV	
Torque Meters ^{FO}	1.1 N·m to 5.6 N·m	0.5 % of reading	Standard Torque Transducer CDI / 2000-6-02, 2000-7-02 2000-8-02 and 2000-11-02 Sturtevant Richmond 10052 ISO 6789
	5.6 N·m to 45 N·m	0.43 % of reading	
	45 N·m to 112 N·m	0.33 % of reading	
	112 N·m to 339 N·m	0.17 % of reading	
	339 N·m to 2 712 N·m	0.68 % of reading	
Pressure Gauges Transducers and Transmitters ^{FO}	10.3 kPa to 103 kPa	0.27 kPa	Pressure Transducers Fluke 700 PA4 ASME B40.100
	20.7 kPa to 207 kPa	0.27 kPa	Pressure Transducers Fluke 700 P05 ASME B40.100
	207 kPa to 689 kPa	0.52 kPa	Pressure Transducers Fluke 700 P06 ASME B40.100
	689 kPa to 3.44 MPa	2.2 kPa	Pressure Transducers Fluke 700 P07 ASME B40.100
	3.44 MPa to 6.89 MPa	7 kPa	Pressure Manometer Fluke 2700 G ASME B40.100
	6.89 MPa to 69.8 MPa	82 kPa	Pressure Transducer Fluke 700 P31 ASME B40.100
Vacuum Gauges Transducers and Transmitters ^{FO}	-72.91 kPa to -7.2 kPa	0.17 kPa	Pressure Transducer Fluke 700PV4 ASME B40.1



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Thermodynamic

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Temperature Probes RTD ^{FO}	-24 °C to 155 °C	0.09 °C	PRT with Indicator ASTM E77
	150 °C to 600 °C	0.24 °C	
Temperature Probes Thermocouple Type K ^{FO}	-24 °C to 150 °C	0.09 °C	PRT with Indicator Euramet cg-8
	150 °C to 600 °C	0.24 °C	
	600 °C to 1 200 °C	1.9 °C	Thermocouple Type S with Indicator Eurametcg-8
Temperature Probes Thermistor ^{FO}	-24 °C to 150 °C	0.09 °C	PRT with Indicator ASTM E77
Thermometer Direct Reading ^{FO}	-24 °C to 150 °C	0.09 °C	PRT with Indicator Euramet_cg-8
	150 °C to 600 °C	0.24 °C	
	600 °C to 1 200 °C	1.9 °C	Thermocouple Type S with Indicator Euramet cg-8
Infrared Thermometers ^{FO}	0 °C to 50 °C	0.75 °C	Infrared Thermometer Euramet cg-8
	50 °C to 500 °C	1.2 °C	
HDT (Heat Deflection Temperature) Bath Temperature ^{FO}	20 °C to 350 °C	0.036 °C	Digital Thermometer Pt 100 ASTM D 648-1525
Melt Flow Index (Plastometer) Temperature Bore Temperature ^O	90 °C to 400 °C	0.036 °C	Digital Thermometer Pt 100 A ASTM D 1238
Thermal Chamber Thermal Oven Furnaces, Muffle ^{FO}	90 °C to 1 200 °C	0.88 °C	Thermocouple Type K and Digital Indicator Fluke 1523 CENAM Technical Guide
Liquid Baths & Incubators ^{FO}	-80 °C to 300 °C	0.058 °C	Resistance Sensor Pt100 and Digital Indicator Fluke 1523 CENAM Technical Guide

Electrical

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Equipment to Measure DC Voltage ^F	0.01 mV to 329.99 mV	0.006 % of reading + 3 μ V	Euramet cg-15 Fluke 5500A
	0 V to 3.299 V	0.005 % of reading + 5 μ V	



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Equipment to Measure DC Voltage ^F	0 V to 32.999 V	0.005 % of reading + 50 μ V	Euramet cg-15 Fluke 5500A
	30 V to 329.99 V	0.005 5 % of reading + 500 μ V	
	100 V to 1 020 V	0.005 5 % of reading + 1 500 μ V	
Equipment to Measure DC Current ^F	4.3 μ A to 3.299 mA	0.013 % of reading + 0.05 μ A	
	3.3 mA to 32.999 mA	0.01 % of reading + 0.25 μ A	
	33 mA to 329.999 mA	0.01 % of reading + 3.3 μ A	
	330 mA to 2.199 A	0.03 % of reading + 44 μ A	
	0.1 A to 11 A	0.06 % of reading + 330 μ A	
Equipment to Measure Resistant ^F	28 m Ω to 10.99 Ω	0.012 % of reading + 0.008 Ω	
	11 Ω to 32.99 Ω	0.012 % of reading + 0.015 Ω	
	33 Ω to 109.99 Ω	0.009 % of reading + 0.015 Ω	
	110 Ω to 329 Ω	0.009 % of reading + 0.015 Ω	
	330 Ω to 1.099 k Ω	0.009 % of reading + 0.06 Ω	
	1.1 k Ω to 3.299 k Ω	0.009 % of reading + 0.06 Ω	
	3.3 k Ω to 10.999 k Ω	0.009 % of reading + 0.6 Ω	
	11 k Ω to 32.999 k Ω	0.009 % of reading + 0.6 Ω	
	33 k Ω to 109.99 k Ω	0.011 % of reading + 6 Ω	
	110 k Ω to 329.99 k Ω	0.012 % of reading + 6 Ω	
	330 k Ω to 1.099 M Ω	0.015 % of reading + 55 Ω	
	1.1 M Ω to 3.299 M Ω	0.015 % of reading + 55 Ω	
	3.3 M Ω to 10.999 M Ω	0.06 % of reading + 550 Ω	
	11 M Ω to 32.999 M Ω	0.1 % of reading + 550 Ω	
	33 M Ω to 109.999 M Ω	0.5 % of reading + 5 500 Ω	
	110 M Ω to 330 M Ω	0.5 % of reading + 16 500 Ω	
Equipment to Measure AC Voltage At the listed frequencies ^F			
10 Hz to 45 Hz	1 mV to 32.999 mV	0.35 % of reading + 20 μ V	
45 kHz to 10 kHz	1 mV to 32.999 mV	0.15 % of reading + 20 μ V	
10 kHz to 20 kHz	1 mV to 32.999 mV	0.2 % of reading + 20 μ V	
20 kHz to 50 kHz	1 mV to 32.999 mV	0.25 % of reading + 20 μ V	
50 kHz to 100 kHz	1 mV to 32.999 mV	0.35 % of reading + 33 μ V	
100 kHz to 500 kHz	1 mV to 32.999 mV	1 % of reading + 60 μ V	



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Equipment to Measure AC Voltage At the listed frequencies ^F			Euramet_cg-15 Fluke 5500A
10 Hz to 45 Hz	33 mV to 329.999 mV	0.25 % of reading + 50 μV	
45 kHz to 10 kHz	33 mV to 329.999 mV	0.05 % of reading + 20 μV	
10 kHz to 20 kHz	33 mV to 329.999 mV	0.1 % of reading + 20 μV	
20 kHz to 50 kHz	33 mV to 329.999 mV	0.16 % of reading + 40 μV	
50 kHz to 100 kHz	33 mV to 329.999 mV	0.24 % of reading + 170 μV	
100 kHz to 500 kHz	33 mV to 329.999 mV	0.7 % of reading + 330 μV	
Equipment to Measure AC Voltage At the listed frequencies ^F			
10 Hz to 45 Hz	0.33 V to 3.299 V	0.15 % of reading + 250 μV	
45 kHz to 10 kHz	0.33 V to 3.299 V	0.03 % of reading + 60 μV	
10 kHz to 20 kHz	0.33 V to 3.299 V	0.08 % of reading + 60 μV	
20 kHz to 50 kHz	0.33 V to 3.299 V	0.14 % of reading + 300 μV	
50 kHz to 100 kHz	0.33 V to 3.299 V	0.24 % of reading + 1 700 μV	
100 kHz to 500 kHz	0.33 V to 3.299 V	0.5 % of reading + 3 300 μV	
Equipment to Measure AC Voltage At the listed frequencies ^F			
10 Hz to 45 Hz	3.3 V to 32.999 V	0.15 % of reading + 2.5 mV	
45 Hz to 10 kHz	3.3 V to 32.999 V	0.04 % of reading + 0.6 mV	
10 Hz to 20 kHz	3.3 V to 32.999 V	0.08 % of reading + 2.6 mV	
20 Hz to 50 kHz	3.3 V to 32.999 V	0.19 % of reading + 5 mV	
50 Hz to 100 kHz	3.3 V to 32.999 V	0.24 % of reading + 17 mV	
Equipment to Measure AC Voltage At the listed frequencies ^F			
45 kHz to 1 kHz	33 V to 329.999 V	0.05 % of reading + 6.6 mV	
1 kHz to 10 kHz	33 V to 329.999 V	0.08 % of reading + 15 μV	
10 kHz to 20 kHz	33 V to 329.999 V	0.09 % of reading + 33 μV	



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Equipment to Measure AC Voltage At the listed frequencies ^F			Euramet_cg-15 Fluke 5500A
45 Hz to 1 kHz	330 V to 1 020 V	0.05 % of reading + 80 mV	
1 kHz to 5 kHz	330 V to 1 020 V	0.2 % of reading + 100 µV	
5 kHz to 10 kHz	330 V to 1 020 V	0.2 % of reading + 500 µV	
Equipment to Measure AC Voltage At the listed frequencies ^F			
10 Hz to 20 Hz	0.029 mA to 0.329 9 mA	0.25 % of reading + 0.15 µA	
20 Hz to 45 Hz	0.029 mA to 0.329 9 mA	0.13 % of reading + 0.15 µA	
45 Hz to 1 kHz	0.029 mA to 0.329 9 mA	0.13 % of reading + 0.25 µA	
1 kHz to 5 kHz	0.029 mA to 0.329 9 mA	0.4 % of reading + 0.3 µA	
5 kHz to 10 kHz	0.029 mA to 0.329 9 mA	1.3 % of reading + 0.15 µA	
Equipment to Measure AC Current At the listed frequencies ^F			
10 Hz to 20 Hz	0.33 mA to 3.299 mA	0.2 % of reading + 0.3 µA	
20 Hz to 45 Hz	0.33 mA to 3.299 mA	0.1 % of reading + 0.3 µA	
45 Hz to 1 kHz	0.33 mA to 3.299 mA	0.1 % of reading + 0.3 µA	
1 kHz to 5 kHz	0.33 mA to 3.299 mA	0.2 % of reading + 0.3 µA	
5 kHz to 10 kHz	0.33 mA to 3.299 mA	0.6 % of reading + 0.3 µA	
Equipment to Measure AC Current At the listed frequencies ^F			
10 Hz to 20 Hz	3.3 mA to 32.999 mA	0.2 % of reading + 3 µA	
20 Hz to 45 Hz	3.3 mA to 32.999 mA	0.1 % of reading + 3 µA	
45 Hz to 1 kHz	3.3 mA to 32.999 mA	0.09 % of reading + 3 µA	
1 kHz to 5 kHz	3.3 mA to 32.999 mA	0.2 % of reading + 3 µA	
5 kHz to 10 kHz	3.3 mA to 32.999 mA	0.6 % of reading + 3 µA	
Equipment to Measure AC Current At the listed frequencies ^F			
10 Hz to 20 Hz	33 mA to 329.999 mA	0.2 % of reading + 30 µA	
20 Hz to 45 Hz	33 mA to 329.999 mA	0.1 % of reading + 30 µA	
45 Hz to 1 kHz	33 mA to 329.999 mA	0.09 % of reading + 30 µA	



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Equipment to Measure AC Current At the listed frequencies ^F			Euramet_cg-15 Fluke 5500A
1 kHz to 5 kHz	33 mA to 329.999 mA	0.2 % of reading + 30 μ A	
5 kHz to 10 kHz	33 mA to 329.999 mA	0.6 % of reading + 30 μ A	
Equipment to Measure AC Current At the listed frequencies ^F			
10 Hz to 45 Hz	0.33 A to 2.199 A	0.2 % of reading + 300 μ A	
45 Hz to 1 kHz	0.33 A to 2.199 A	0.1 % of reading + 300 μ A	
1 kHz to 5 kHz	0.33 A to 2.199 A	0.75 % of reading + 300 μ A	Euramet_cg-15 Fluke 5500A
Equipment to Measure AC Current At the listed frequencies ^F			
45 Hz to 65 Hz	2.2 A to 11 A	0.06 % of reading + 2 000 μ A	
65 Hz to 500 Hz	2.2 A to 11 A	0.1 % of reading + 2 000 μ A	
500 Hz to 1 KHz	2.2 A to 11 A	0.33 % of reading + 2 000 μ A	
Capacitance to Measure ^F	0.33 nF to 0.499 9 nF	0.5 % of reading + 0.01 nF	
	0.5 nF to 1.099 9 nF	0.5 % of reading + 0.01 nF	
	1.1 nF to 3.299 9 nF	0.5 % of reading + 0.01 nF	
	3.3 nF to 10.999 nF	0.5 % of reading + 0.01 nF	
	11 nF to 32.999 nF	0.25 % of reading + 0.1 nF	
	33 nF to 109.99 nF	0.25 % of reading + 0.1 nF	
	110 nF to 329.99 nF	0.25 % of reading + 0.3 nF	
	0.33 μ F to 1.099 μ F	0.25 % of reading + 1 nF	
	1.1 μ F to 3.299 μ F	0.35 % of reading + 3 nF	
	3.3 μ F to 10.999 μ F	0.35 % of reading + 10 nF	
	11 μ F to 32.999 μ F	0.4 % of reading + 30 nF	
	33 μ F to 109.99 μ F	0.5 % of reading + 100 nF	
	110 μ F to 329.99 μ F	0.7 % of reading + 300 nF	
	330 μ F to 1.1 mF	1 % of reading + 300 nF	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B ^F	600 °C to 800 °C	0.44 °C	Fluke 5500A Electrical Simulation of Thermocouple Output Euramet_cg-11
	800 °C to 1 000 °C	0.34 °C	
	1 000 °C to 1 550 °C	0.3 °C	
	1 550 °C to 1 820 °C	0.33 °C	



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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C ^F	0 °C to 150 °C	0.3 °C	Fluke 5500A Electrical Simulation of Thermocouple Output Euramet_cg-11
	150 °C to 650 °C	0.26 °C	
	650 °C to 1 000 °C	0.31 °C	
	1 000 °C to 1 800 °C	0.5 °C	
	1 800 °C to 2 316 °C	0.84 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E ^F	-250 °C to -100 °C	0.5 °C	
	-100 °C to -25 °C	0.16 °C	
	-25 °C to 350 °C	0.14 °C	
	350 °C to 650 °C	0.16 °C	
	650 °C to 1 000 °C	0.21 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J ^F	-210 °C to -100 °C	0.27 °C	
	-100 °C to -30 °C	0.16 °C	
	-30 °C to 150 °C	0.14 °C	
	150 °C to 760 °C	0.17 °C	
	760 °C to 1 200 °C	0.23 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K ^F	-200 °C to -100 °C	0.33 °C	
	-100 °C to -25 °C	0.18 °C	
	-25 °C to 120 °C	0.16 °C	
	120 °C to 1 000 °C	0.26 °C	
	1 000 °C to 1 372 °C	0.4 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type L ^F	-200 °C to -100 °C	0.37 °C	
	-100 °C to 800 °C	0.26 °C	
	800 °C to 900 °C	0.17 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N ^F	-200 °C to -100 °C	0.4 °C	
	-100 °C to -25 °C	0.22 °C	
	-25 °C to 120 °C	0.19 °C	
	120 °C to 410 °C	0.18 °C	
	410 °C to 1 300 °C	0.27 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R ^F	0 °C to 250 °C	0.57 °C	
	250 °C to 400 °C	0.35 °C	
	400 °C to 1 000 °C	0.33 °C	
	1 000 °C to 1 767 °C	0.4 °C	



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Metrolab, S.A. de C.V.

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San Nicolás de los Garza, Nuevo León, México. C.P 66465
Contact Name: Tomás Antonio Vanegas Phone: 818-383-6930

Accreditation is granted to the facility to perform the following calibrations:

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S ^F	0 °C to 250 °C	0.47 °C	Fluke 5500A Electrical Simulation of Thermocouple Output Euramet_cg-11
	250 °C to 1 000 °C	0.36 °C	
	1 000 °C to 1 400 °C	0.37 °C	
	1 400 °C to 1 767 °C	0.46 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T ^F	-250 °C to -150 °C	0.63 °C	
	-150 °C to 0 °C	0.24 °C	
	0 °C to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type U ^F	-200 °C to 0 °C	0.56 °C	
	0 °C to 600 °C	0.27 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385, 100 Ω^F	-200 °C to -80 °C	0.05 °C	Fluke 5500A Electrical Simulation of RTD Output Euramet_cg-11
	-80 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.07 °C	
	100 °C to 300 °C	0.09 °C	
	300 °C to 400 °C	0.1 °C	
	400 °C to 630 °C	0.12 °C	
	630 °C to 800 °C	0.23 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 3926, 100 Ω^F	-200 °C to -80 °C	0.05 °C	
	-80 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.07 °C	
	100 °C to 300 °C	0.09 °C	
	300 °C to 400 °C	0.1 °C	
	400 °C to 630 °C	0.12 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385 200 Ω^F	-200 °C to -80 °C	0.04 °C	
	-80 °C to 0 °C	0.04 °C	
	0 °C to 100 °C	0.04 °C	
	100 °C to 260 °C	0.05 °C	
	260 °C to 300 °C	0.12 °C	
	300 °C to 400 °C	0.13 °C	
	400 °C to 600 °C	0.14 °C	
	600 °C to 630 °C	0.16 °C	



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Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature Calibration, Indication and Control Equipment used with RTD Pt 3916, 100 Ω^F	-200 °C to -190 °C	0.25 °C	Fluke 5500A Electrical Simulation of RTD Output Euramet_cg-11
	-190 °C to -80 °C	0.04 °C	
	-80 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.06 °C	
	100 °C to 260 °C	0.07 °C	
	260 °C to 300 °C	0.08 °C	
	300 °C to 400 °C	0.09 °C	
	400 °C to 600 °C	0.1 °C	
	600 °C to 630 °C	0.23 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385, 500 Ω^F	-200 °C to -80 °C	0.04 °C	
	-80 °C to 0 °C	0.05 °C	
	0 °C to 100 °C	0.05 °C	
	100 °C to 260 °C	0.06 °C	
	260 °C to 300 °C	0.08 °C	
	300 °C to 400 °C	0.08 °C	
	400 °C to 600 °C	0.09 °C	
	600 °C to 630 °C	0.11 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385, 1 000 Ω^F	-200 °C to -80 °C	0.03 °C	
	-80 °C to 0 °C	0.03 °C	
	0 °C to 100 °C	0.04 °C	
	100 °C to 260 °C	0.05 °C	
	260 °C to 300 °C	0.06 °C	
	300 °C to 400 °C	0.07 °C	
	400 °C to 600 °C	0.07 °C	
	600 °C to 630 °C	0.23 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt Ni 385, 120 Ω^F	-80 °C to 0 °C	0.08 °C	
	0 °C to 100 °C	0.08 °C	
	100 °C to 260 °C	0.14 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Cu 427, 10 Ω^F	-100 °C to 260 °C	0.3 °C	



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Accreditation is granted to the facility to perform the following calibrations:

Mass, Force & Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Mechanical Balances, Electronic and Electromechanical ^O	0.18 mg to 5 g (Res.= 0.001 mg)	0.06 mg	Mass Set Class E2 OIML CENAM Technical Guide for Instrument Non-Automatic
	0.36 mg to 50 g (Res.= 0.001 mg)	0.12 mg	
	0.84 mg to 200 g (Res.= 0.001 mg)	0.28 mg	
	1.92 mg to 500 g (Res.= 0.001 mg)	0.64 mg	
	4.2 mg to 1 000 g (Res.= 0.001 mg)	1.4 mg	
	0.036 g to 2 kg (Res.= 0.005 g)	12 mg	Mass Set Class F1 OIML CENAM Technical Guide for Instrument Non-Automatic
	0.08 g to 5 kg (Res.= 0.01 g)	26 mg	
	0.156 g to 10 kg (Res.= 0.02 g)	52 mg	
	0.36 g to 20 kg (Res.= 0.05 g)	120 mg	
	0.78 g to 50 kg (Res.= 0.1 g)	260 mg	
	10.2 g to 100 kg (Res.= 5 g)	5.2 g	Mass Set Class M1 OIML CENAM Technical Guide for Instrument Non-Automatic
	21.3 g to 200 kg (Res.= 10 g)	13 g	
	51 g to 500 kg (Res.= 20 g)	26 g	
	102 g to 1 000 kg (Res.= 50 g)	52 g	
	213 g to 2 000 kg (Res.= 100 g)	130 g	
	291 g to 3 000 kg (Res.= 200 g)	140 g	
Universal Testing Force Machines Tension ^F	49.03 N to 500 N	0.14 % of reading	Load Cell HBM 123530034 ISO 7500-1 ASTM E74 and ASTM E4
	0.49 kN to 4.9 kN	0.25 % of reading	Load Cell Revere Transducers H593739B ISO 7500-1 ASTM E74 and ASTM E4



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Accreditation is granted to the facility to perform the following calibrations:

Mass, Force & Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Universal Testing Force Machines Tension ^F	4.903 kN to 49.03 kN	0.13 % of reading	Load Cell HBM 013270S ISO 7500-1 ASTM E74 and ASTM E4
	44.13 kN to 441.3 kN	0.17 % of reading	Load Cell Revere Transducers G590267J ISO 7500-1 / ASTM E4 ASTM E74 and ISO 376
Universal Testing Force Machines Compression ^F	49.03 N to 500 N	0.18 % of reading	Load Cell HBM 123530034 ISO 7500-1 / ASTM E4 ASTM E74 and ISO 376
	0.49 kN to 4.9 kN	0.13 % of reading	Load Cell Revere Transducers H593739B ISO 7500-1 / ASTM E4 ASTM E74 and ISO 376
	4.903 kN to 49.03 kN	0.13 % of reading	Load Cell HBM 013270S ISO 7500-1 / ASTM E4 ASTM E74 and ISO 376
	44.13 kN to 441.3 kN	0.16 % of reading	Load Cell Revere Transducers G590267J ISO 7500-1 / ASTM E4 ASTM E74 and ISO 376
	220 kN to 2 200 kN	0.14 % of reading	Load Cell Revere Transducers H593074C, ISO 7500-1 ASTM E74 and ASTM E4
Melt Flow Index (Plastometer) Weight Piston Masses ^F	300 g to 22 000 g	0.19 g	Balance ASTM D 1238
Plastic Impact Pendulum Weight Dynamometer ^F	1 kg to 35 kg	0.19 kg	Dynamometer ASTM D 256 - 6110

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Dial Indicators ^F	0.1 mm to 25 mm	(2+ 0.017L) μ m	Gauge Indicators NMX-CH-463-IMNC
Digital Indicators ^F	0.1 mm to 25 mm	(2 + 0.017L) μ m	
Tape Measures ^F	0.000 1 m to 50 m	(67 + 0.012L) μ m	Steel Rules and Microscope NOM-046-SCFI



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Calipers ^F	0.1 mm to 1 000 mm	$(13 + 7 \times 10^{-3}L) \mu\text{m}$	Blocks Gages Calipers NMX-CH-002-IMNC
Micrometers ^F	0.1 mm to 500 mm	$(1.4 + 0.014L) \mu\text{m}$	Micrometers NMX-CH-099-IMNC
Plastic Impact Height Impact (Flexometer) ^O	612 mm to 608 mm	0.59 mm	Flexometer ASTM D 256 - 6110
Surface Plates Flatness ^O	354 mm to 2 960 mm (in diagonal)	$(5 + 1.46 \times 10^{-3}L) \mu\text{m}$	Electronic Levels NMX-CH-8512-2-IMNC ISO 8512-2
Height Gages ^F	25 mm to 1 000 mm	$(6.8 + 7 \times 10^{-3}L) \mu\text{m}$	Block Gages NMX-CH-141-IMNC
Steel Rules ^F	1 mm to 2 000 mm	$(67 + 0.012L) \mu\text{m}$	Semi-flexible Rules Rule Standard JIS B 7516 NMX-148-IMNC
Coatings Thickness Gage ^F	2.2 μm to 1 500 μm	$(0.26 + 0.4L) \mu\text{m}$	Thickness Liners ISO 2178
Inside Micrometers ^F	2.5 mm to 1 000 mm	$(1.4 + 8 \times 10^{-3}L) \mu\text{m}$	Blocks Standard NMX-CH-093-IMNC
Depth Micrometers ^F	2.5 mm to 300 mm	$(1.4 + 8 \times 10^{-3}L) \mu\text{m}$	Blocks Standard JIS B 7544
Angles Conveyers (Protractor) ^F	0° to 90°	0.048°	Angle Meter NMX-CH-151-IMNC
Extensometers ^O	0.1 mm to 25 mm	0.061 % of reading	Extensometers Gauge ASTM E 83
	0.1 mm to 600 mm	0.061 % of reading	
Microscopes ^O	0.01 mm to 1 mm 1X, 5X, 10X, 20X, 50X 100X, 200X, 500X, 1 000X	0.4 μm	Scale Standard 0 to 1 mm x 0.01 mm JIS B 7153
	0.01 mm to 300 mm 1X, 5X, 10X, 20X, 50X 100X, 200X, 500X, 1 000X	1.4 μm	Scale Standard 0 to 50 mm x 0.5 mm 0 to 300 mm x 0.5 mm JIS B 7153
Surface Roughness Meters – Ra ^F	0.055 μm to 5.79 μm	$(0.012 + 24L) \mu\text{m}$	Precision Roughness Specimen JIS B 0651



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Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	0.508 mm to 10.16 mm	0.029 μ m	Comparator and Master Blocks Grade K NMX-CH-3650 ASME B 89.1.9
Steel Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	10.16 mm to 25.4 mm	0.038 μ m	
Steel Gage Block Grade 0, 1 and 2; Variation of Length ^F	0.508 mm to 10.16 mm	0.029 μ m	
Steel Gage Block Grade 0, 1 and 2; Variation of Length ^F	10.16 mm to 25.4 mm	0.029 μ m	
Steel Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	25.4 mm to 50.8 mm	0.052 μ m	Comparator and Master Blocks Grade K NMX-CH-3650 ASME B 89.1.9
Steel Gage Block Grade 0, 1 and 2; Variation of Length ^F	25.4 mm to 50.8 mm	0.029 μ m	
Steel Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	50.8 mm to 76.2 mm	0.073 μ m	
Steel Gage Block Grade 0, 1 and 2; Variation of Length ^F	50.8 mm to 76.2 mm	0.033 μ m	
Steel Gage Block Grade 0, 1 and 2; Variation of Length ^F	76.2 mm to 101.6 mm	0.033 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	0.508 mm to 10.16 mm	0.028 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Variation of Length ^F	0.508 mm to 10.16 mm	0.029 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	10.16 mm to 25.4 mm	0.037 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Variation of Length ^F	10.16 mm to 25.4 mm	0.029 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	25.4 mm to 50.8 mm	0.051 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Variation of Length ^F	25.4 mm to 50.8 mm	0.029 μ m	



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Ceramic Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	50.8 mm to 76.2 mm	0.072 μ m	Comparator and Master Blocks Grade K NMX-CH-3650 ASME B 89.1.9
Ceramic Gage Block Grade 0, 1 and 2; Variation of Length ^F	50.8 mm to 76.2 mm	0.033 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Deviation of Central Length ^F	76.2 mm to 101.6 mm	0.093 μ m	
Ceramic Gage Block Grade 0, 1 and 2; Variation of Length ^F	76.2 mm to 101.6 mm	0.033 μ m	
LVDT (Linear Variable Differential Transformer) Gauge Block ^{FO}	1 mm to 2 mm	5.7 μ m	Gauge Block ASTM D 648- 1525
Melt Flow Index (Plastometer) Length Capilar ^{FO}	8.025 mm to 7.975 mm	0.001 7 mm	Micrometer ASTM D 1238
Melt Flow Index (Plastometer) Piston Foot Diameter ^F	9.481 8 mm to 9.466 6 mm	0.001 7 mm	
Melt Flow Index Piston Foot (Plastometer) Length ^F	6.48 mm to 6.22 mm	0.001 7 mm	
Melt Flow Index (Plastometer) Capillary Diameter ^F	2.090 42 mm to 2.100 58 mm	0.000 8 mm	Gage Go / No Go ASTM D 1238

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor k (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC for the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate from ideal to some degree.



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Accreditation is granted to the facility to perform the following calibrations:

2. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value for which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure for many calibrations but by its definition it does not constitute calibration of zero capacity.
3. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its fixed location. Example: Outside Micrometer^F would mean that the laboratory performs this calibration at its fixed location.
4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations. Example: Outside Micrometer^O would mean that the laboratory performs this calibration onsite at the customer's location.
5. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its fixed location and onsite at customer locations. Example: Outside Micrometer^{FO} would mean that the laboratory performs this calibration at its fixed location and onsite at customer locations.
6. Measurement uncertainties obtained for calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratories fixed location for similar calibrations. This is due to the effects of transportation of the standards and equipment and upon environmental conditions at the customer site which are typically not controlled as closely as at the laboratories fixed location.
7. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
8. This is the parent location.