PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Calmet Industrial, S.A. de C.V.

1^{era} Privada 4831, Col. Niño Artillero
Monterrey, Nuevo León, México. C.P. 64280

(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):

Dimensional, Mechanical, Thermodynamic, Time & Frequency, Optical, Electrical, Chemical, Mass, Force and Weighing Devices and Acoustic 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:	*Issue Date:*	*Expiration Date:*
February 11, 2011	October 17, 2023	November 30, 2025
Revision Date:	*Accreditation No.:*	*Certificate No.:*
August 07, 2024,	45294	L23-760-R1

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

Certificate of Accreditation: Supplement

Calmet Industrial, S.A. de C.V.
1era Privada No. 4831, Col. Niño Artillero
Monterrey, Nuevo León, México. C.P. 64280
Contact Name: Eliud Elizondo Phone: 818-351-0368

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

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Outside Micrometers[FO]	Up to 1 000 mm	1.8 µm	Gage Block Sets	NMX-CH-099-IMNC
Laser Micrometer[FO]	0.1 mm to 50 mm	$(0.13 + 6 \times 10^{-3} L)$ µm	Pin Gage Set	
Caliper[FO]	Up to 1 000 mm	9.6 µm	Gage Block Sets	NMX-CH-002-IMNC
Indicator[FO]	0.01 mm to 50.8 mm	0.76 µm	Dial Gauge Calibration Tester	NMX-CH-36, JIS B 7503
Rules[FO]	1 mm to 2 000 mm	0.35 mm	Standard Steel Ruler, Microscope	JIS B 7516
Surface Plates Repeat Measurement[O]	300 mm to 4 000 mm	1.9 µm	Indicator Mitutoyo 543-554-1	JIS B 7513
Optical Comparator, Vision System and Microscope Length X Axis Linearity	0.5 mm to 508 mm	3.3 µm	Standard Glass Scale Gage Block Sets Angle Block	JIS B 7184
Y Axis Linearity	0.5 mm to 508 mm	3.3 µm		
Z Axis Linearity Error of Indication[O]	0.5 mm to 508 mm	5.8 µm		
Optical Comparator, Vision System and Microscope Angularity[O]	0° to 90°	0.38º		
Height Gage[FO]	Up to 1 000 mm	11 µm	Gage Block Sets	JIS B 7517
Pin Gages[F]	0.254 mm to 76.2 mm	1.4 µm	Micrometer	ASME B 89 1.5
Thread Plug Gage Major Diameter[F]	0-80 to 4-12	2.8 µm	Conventional Micrometer	ANSI/ASME B1.2
Ultrasonic Thickness[FO]	0.022 mm to 50.8 mm	2 µm	Gage Block Sets	ASTM E 797
Thread Plug Gage Pitch Diameter[F]	0-80 to 4-12	2.8 µm	Wires and Digital Micrometer	ANSI/ASME B1.2
Measuring Tape[F]	0.001 m to 10 m	0.48 mm	Standard Steel Ruler	JIS B 7512
Thickness Gages[FO]	0.022 mm to 1.5 mm	(2.37 + 0.8L) µm	Micrometer	JIS B 7524
Depth Micrometer[FO]	Up to 150 mm	$(2.23 + 6.78 \times 10^{-4} L)$ µm	Block Gages	JIS B 7544
Protector Angle Meter[FO]	0º to 90º	0.38º	Angle Blocks	NMX-CH-151
Angle Gage Block[FO]	1° to 30°	0.02°	Coordinate Measuring Machines (CMM)	CEM Procedure DI-017
Inside Micrometers[FO]	25 mm to 600 mm	1.8 µm	Caliper Checks	NMX-CH-093-IMNC

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Gages Blocks[F]	0.5 mm to 100 mm	$(2.6 \times 10^{-2} + 7.1 \times 10^{-5}L)$ µm	Set Master Block Grade K Edmunds Twin Head Comparator	NMX-CH-3650
	0.05 in to 20 in	(3.1 + 1.9L) µin		
Roughness Meter Ra[F]	0.21 µm to 3 µm	0.07 µm	Ra Roughness Master	ISO 4287 NMX-CH-4287
CMM Calibration and Volumetric Inspection[O]	10 mm to 10 000 mm	(0.6 + 1.2L) µm	Gage Block, Laser Interferometer Sphere	ISO 10360-2
Coordinate Measuring Machines (CMM) Linear Displacement	Up to 18 000 mm	(0.3 + 1L) µm	Laser Interferometer Gage Blocks	ISO 10360-2
Length Measuring Error	Up to 1 500 mm	(0.41 + 1.3L) µm	Gage Blocks	ISO 10360-2
Single Stylus and Multi-Stylus Probing error[O]	30 mm (diameter)	0.73 µm	Test Sphere	ISO 10360-5
Bore Gage[F]	6 mm to 100 mm	2.6 µm	Ring Gage Sets,	JIS B7515
Radius Gage[FO]	0.4 mm to 25.4 mm	5 µm	Vision System Machine	ISO-2769-2, ISO-22081
Ring Gages[F]	1 mm to 205 mm	6.3 µm	Trimos Tels Coordinate Measuring Machines (CMM)	ASME B89.1.6
Sieve[F]	0.01 mm to 16 mm	4.3 µm	Vision System Machine	ASTM E11
	18 mm to 100 mm	4.8 µm	Coordinate Measuring Machines (CMM)	
Numerically Controlled Machine Tool (CNC) – X, Y, Z Axial Positional Deviation (Linear Displacement Accuracy)[O]	Up to 18 000 mm	(1.6 + 0.2L) µm	Laser Interferometer	ISO 230-2
Standard and Measuring Rods to Micrometer zero Setting[FO]	25 mm to 1 000 mm (1 in to 40 in)	2.6 µm	Coordinate Measuring Machines (CMM)	JIS B 7420, BS 5317, NMX-CH-099-IMNC 6.10, IS0-3611

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90° Steel Squares Perpendicularity[FO] 50.8 to 457.2 mm	Up to 800 mm	6.1 µm	Coordinate Measuring Machines (CMM)	C.E.M. DI-009 Procedure NMX-CH-062-IMNC JIS B 7526, DIN 875-1
	90°	0.000 3°		
Contour Measuring Machines[FO] X Axis Y Axis	Up to 200 mm	0.042 mm	Set Master Block	JIS B 7450 CEM procedure DI-010
Contour Measuring Machines Angle[FO]	0° to 90°	0.003 6°		
Contour Measuring Machines Rougness Meter Ra[FO]	0.21 µm to 3 µm	0.07 µm	Ra Roughness Master	ISO 4287
Contour Measuring Machines Diameter[FO]	Up to to 30 mm	0.042 µm	Standard Sphere	ISO 10360-5
Roundness Measuring Machines Roundness Error	24.7 mm to 400 mm	0.029 µm	Reference Hemisphere standard Ring Gages	JIS B 7451 ISO 4291
Extensometer to Measuring Length Installed on Uniaxial Testing of Material Machine[FO]	0.001 mm to 25.4 mm	$(8.5 \times 10^{-1} + 1.2 \times 10^{-3}L)$ µm	Micrometric Head Standard Instron, Arizona Tool & Die Co.	CEM ME-022
Length Measuring Wheel with Odometer and Measuring System with Odometer or Length Meter Counter[FO]	Up to 9 999.9 m	$(5.91 \times 10^{-3} + 1.9 \times 10^{-3}L)$ m	Tachometer Extech Measuring Tape Geometry	NMX-CH-74
Optical Portable 3D Scanner -Probing Size Error[FO]	Up to 30 mm (Diameter)	4.9 µm	Ball Bar Standards whit Reference Spheres	VDI/VDE 2634 Part 3
Optical Portable 3D Scanner -Sphere Spacing Error[FO]	Up to 2 m	7.6 µm		
Articulated Arm (ACMM) Verification[FO]	Up to 2 000 mm	$(1.88 \times 10^{-3} + 6 \times 10^{-6}L)$ mm	Ball Bar Standards whit Reference Spheres, Set Master Block Gage Grade K	ISO 10360-12

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Torque Meter Clockwise and Counterclockwise[FO]	0.23 N·m to 1.13 N·m	0.001 5 N·m	Torque Tester	ISO 6789 NMX-CH-6789-IMNC
	0.5 N·m to 5.65 N·m	0.006 4 N·m		
	5.6 N·m to 56 N·m	0.066 N·m		
	81.3 N·m to 813 N·m	1.1 N·m		
	8.4 N·m to 84 N·m	0.58 N·m		
	203.33 N·m to 2 033.62 N·m	1.4 N·m		
Pressure Gauge and Pressure Transducer[FO]	20.68 kPa to 206.84 kPa	5.2×10^{-2} kPa	Fluke 717 30G	NOM-013-SCFI
	206.8 kPa to 2 068 kPa	0.52 kPa		
Pressure Gauge and Transducer[FO]	689.47 kPa to 6 894.75 kPa	3.4 kPa	Fluke 700P27EX BETA BGPIR-PRO-01K	NOM-013-SCFI
	6 894.75 kPa to 68 947.57 kPa	35 kPa		
	-85 kPa to -8.5 kPa	2 Pa	Fluke 700 P31 Fluke 718 1G, 717 30G	
	Up to 6.8 kPa	0.8 Pa	Fluke 717 30G	
Pressure Drop Meter of QTM[O] 17.5 ml/s	0.490 33 kPa to 8.825 985 kPa	1.5 % of Reading	Multi-Capillary Pressure Drop Standard QTM Manufacturer Guide	ISO 6565
	50 mm/H_2O to 900 mm/H_2O	1.5 % of Reading		
Indirect Verifications Hardness tester HRC[FO]	20 HRC to 30 HRC	0.43 HRC	Test Blocks	ISO-6508-2
	31 HRC to 59 HRC	0.41 HRC		
	60 HRC to 70 HRC	0.41 HRC		
Indirect Verifications Hardness tester HRB[FO]	40 HRB to 59 HRB	0.84 HRB		
	60 HRB to 79 HRB	0.84 HRB		
	80 HRB to 100 HRB	0.66 HRB		
Indirect Verification of Brinell Hardness Testers HBW[FO]	95 HBW to 514 HBW	0.95 HBW	Brinell Hardness Blocks	ISO 6506 –2
Micro-Indentation Hardness Testers HV[FO]	200 HV to 700 HV	7.7 HV	Vickers Hardness Blocks	ISO 6507
Indirect Verification of Lebb Hardness Tester HLD[FO]	449 HLD to 800 HLD	5 HLD	Lebb Hardness Blocks	ASTM A956, ISO 16859-2
Leak Test[FO]	0.015 L/min to 0.2 L/min	0.005 L/min	Furness Controls (Res.= 0.001 L/min)	NIST-SP250-38

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Leak Test[FO]	14 L/min to 113 L/min	1 L/min	F and J Specialty Products	NIST-SP250-38
Accelerometer[F]	10.2 m/s^2 to 30 m/s^2	0.34 m/s^2	Agilent 34401, Fluke 289 Fluke 45, Accelerometer Endevco 2256A-100 + Endevco 4416B Data Acquisition	ISO 16063-21
Test Tube[F]	5 mL	6.4 % of Reading	Analitycal Balance	ISO 8655, ASTM E 542– 01
	10 mL	3.2 % of Reading		
	25 mL	1.3 % of Reading		
	50 mL	0.64 % of Reading		
	100 mL	0.32 % of Reading		
	250 mL	0.13 % of Reading		
	500 mL	0.064 % of Reading		
	1 000 mL	0.032 % of Reading		
	2 000 mL	0.017 % of Reading		
Pipette[F]	0.01 mL to 0.1 mL	0.62 % of Reading		
	0.02 mL to 0.2 mL	0.62 % of Reading		
	0.1 mL to 0.2 mL	0.58 % of Reading		
	0.1 mL to 1 mL	0.58 % of Reading		
	0.5 mL to 5 mL	0.58 % of Reading		
	1 mL to 5 mL	0.58 % of Reading		
	1 mL to 10 mL	0.29 % of Reading		
	10 mL to 50 mL	0.24 % of Reading		
Volumetric Flask[F]	5 mL to 2 000 mL	0.33 mL		
Picnometer[F]	10 mL to 500 mL	0.33 mL		
Burette[F]	5 mL	0.33 mL		
	10 mL	0.33 mL		
	25 mL	0.33 mL		
	50 mL	0.33 mL		
	100 mL	0.33 mL		
	250 mL	0.33 mL		
	500 mL	0.33 mL		
	1 000 mL	0.33 mL		

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Densimeter[F]	0.6 kg/m^3 to 1.3 kg/m^3	0.06 kg/m^3	Analytical Balance	CENAM Technical Guide
Liquid Flow Meter[FO]	0.1 L/min to 30 L/min	0.65 L/min	ZJ-LCD-M & YF-S201 Measuring Flow System	
	0.1 L/min to 45 L/min	0.23 % of Reading	Coriolis Type Flow Meter	
	0.1 L/min to 200 L/min	0.29 % of Reading	Stopwatch and Weighing Device,	OIML R 117 ISO-4604-3 CENAM Technical Guide
	0.1 L/min to 37 854.12 L/min (0.026 GPM to 10 000 GPM) DN 6 to DN 700	0.38 % of Reading	Ultrasonic Flow Meter	CENAM Technical Guide
Air Velocity Measuring System and Anemometers[F]	1.3 m/s to 25 m/s	0.43 m/s	Fluke 925 Vane Anemometer	IEC 61400-12-1 ASTM 5096
Air Velocity of Sources and Fume Hood[O]	1.1 m/s to 25 m/s	0.79 m/s	Fluke 925 Vane Anemometer	ANSI/ASHRAE 110
Vaccum Gauge and Transducer[F]	0.000 1 kPaA to 2.666 kPaA (1 micron to 20 000 micron)	5.8 PaA	TESTO 525 Vacuum Gauge, Fluke 71730G Fluke 7171G	NOM-013-SCFI
Barometer[F]	0.001 kPa to 101.592 kPa (0.013 mBar to 1 015.92 mBar)	9.9 PaA	TESTO 525 Vacuum Gauge, Fluke 71730G, Fluke 7171G, Vacuum Chamber	OIML R 97
Direct Verification of Durometer Hardness Tester Type A, C, D[FO] Grometry of the Indentor[FO]	2.46 mm to 2.54 mm	8 µm	System Vision	ASTMD-2240
Durometer Indentor Spring Type A[FO] Durometer Indentor Spring Type C and D[FO]	0.55 N to 8.05 N 4.45 N to 44.45 N	0.32 N	Load Cell	

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Gas Flow Ventilation Meter of QTM 17.5 ml/s[O]	20 % to 100 % ventilation	1 % of Reading	Gas Flow Ventilation Devices Standards	QTM Manufacture Guide ISO 6565
Gas Flow Ventilation Device 17.5 ml/s[O]	100 % of ventilation	0.91 % of Reading	Flow Meter, Digitron Pressure Gauge	
Gas Flow Meter[FO]	0.02 L/min to 0.2 L/min (20 SCCM to 186 SCCM)	0.91 % of Reading	Furness Controls FC0210-3 Flow Meter	CENAM Technical Guide
	0.057 71 L/min to 2 L/min (56.26 SCCM to 1958.25 SCCM)	0.06 % of Reading	Furness Controls FC0210 Flow Meter	
	15 L/min to 116 L/min (14.432 SLPM to 111.352 9 SLPM)	1.7 % of Reading	F&J Specialty Products D-812B, Flow Meter	
	1.026 L/min to 204.26 L/min (20 SLPM to 200 SLPM)	0.58 % of Reading	MF5712 Flow Meter	

Thermodynamic

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Bimetallic Thermometers[FO]	-70 °C to 500 °C	0.75 °C	Indicator RTD pt 100 Standard, Dry Ice, Dry Block Calibrator	NOM-CH-070
Glass Thermometers[F]	-70 °C to 300 °C	0.76 °C		
Thermal Chamber[O]	-70 °C to 300 °C	0.23 °C	Indicator RTD 100 TC Standards Dry Ice, Dry Block Calibrator Fluke, Hart Scientific	
Thermal Oven[O]	50 °C to 500 °C	0.23 °C		
Digital Thermometer[F]	-70 °C to 400 °C	0.48 °C		
Digital Infrared Thermometer[FO]	50 ºC to 500 ºC	0.51 ºC	Black Body Source	CENAM Technical Guide
Direct Reading Thermometer used Termistor, RTD, Thermocouple[FO]	-20 °C to 600 °C	0.25 °C	Reference Temperature Calibrator RTD 100 Ω Dry Block Calibrator	NOM-011-SCFI
Temperature Measurement Thermocouple Type J[FO]	0 °C to 300 °C	0.53 °C	Fluke 743 with Sensor K Dry Well, Fluke 9141	CENAM Technical Guide

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Temperature Measurement Thermocouple Type J[FO]	300 °C to 500 °C	0.91 °C	Fluke 743 with Sensor K Dry Well, Fluke 9141	CENAM Technical Guide
Temperature Measurement Thermocouple Type K[FO]	0 °C to 300 °C	0.53 °C	Fluke 743 with Sensor RTD Dry Well, Fluke 9141	
	300 °C to 500 °C	0.91 °C	Fluke 743 with sensor K Dry Well, Fluke 9141	
Temperature Measurement Thermocouple Type T[FO]	0 °C to 300 °C	0.53 °C	Fluke 743 with Sensor RTD Dry Well Fluke 9141	
	300 °C to 500 °C	0.91 °C	Fluke 743 with Sensor K Dry Well Fluke 9141	
Temperature Measurement RTD Pt 100 Ω[FO]	0 °C to 300 °C	0.53 °C	Fluke 743 with sensor RTD Dry Well Fluke 9141	
	300 °C to 500 °C	0.91 °C	Fluke 743 with Sensor K Dry Well, Fluke 9141	
Hygro-thermometer Humidity Sensors[F]	20 % RH to 95 % RH	1.3 % RH	Hygrometer Vaisala, Humidity Chamber	
Humidity Generators, Humidity Chamber, Climatic Chamber[F]	20 % RH to 95 % RH	1.4 % RH	Hygrometer Vaisala with Humidity Sensor Dataloggers	EURATHERM Technical Guide CENAM Technical Guide
Equipment to Output Generators, Chambers, Enclosure Sources[F]	11 % RH to 95 % RH	0.8 % RH	Hygrometer Vaisala	
Temperature System Accuracy Test (SAT) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types K[F]	100 °C to 30°C	0.78 °C	Beta PTC-8001, Fluke 702 Fluke 51 series TC Temperature Indicators with Reference Thermocouple wire	SAE/AMS 2750
	30 °C to 1 000 °C	0.75 °C		
Temperature System Accuracy Test (SAT) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types J[F]	100 °C to 30 °C	0.66 °C		

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Temperature System Accuracy Test (SAT) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types N[F]	30 °C to 1 000 °C	0.63 °C	Beta PTC-8001, Fluke 702, Fluke 51 series TC Temperature Indicators with Reference Thermocouple wire	SAE/AMS 2750
Temperature System Accuracy Test (SAT) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types T[F]	-100 °C to 30 °C	0.75 °C		
	30 °C to 400 °C	0.44 °C		
Temperature Uniformity Surveys (TUS) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types T[F]	-100 °C to 30 °C	0.82 °C	HP 34970A Data Acquisition, Datapaq TC Temperature Indicator with Reference Thermocouples wire set	SAE/AMS 2750E NT-04 ENAC Guide
	30 °C to 400 °C	0.64 °C		
Temperature Uniformity Surveys (TUS) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types K[F]	30 °C to 1 000 °C	0.77 °C		
Temperature Uniformity Surveys (TUS) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types J[F]	-100 °C to 30 °C	0.71 °C		
	30 °C to 1 000 °C	0.68 °C		
Temperature Uniformity Surveys (TUS) Furnace, Autoclave, Freezer, and Isothermal Sources with Thermocouple Types N[F]	30 °C to 1 000 °C	1.3 °C		

Time and Frequency

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Stopwatch Timer[FO]	Up to 86 400 s	1.3 s/day	Stop Watch	CENAM Technical Guide

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Time and Frequency

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Equipment to Output Electrical Welding Equipment Power Sources or Generators wire Feed Speed 1.3 m/min to 36.6 m/min (50 rpm to 1 440 rpm)^{O}	1.06 rad/s to 29.76 rad/s (10 rpm to 285 rpm)	0.085 rad/s (0.82 rpm)	Photo-Tachometer Ono Sokki Welding Equipment Manufacturer 275053 Guide	ANSI/IEC 60974−1 ISO 17662
Equipment to Output Angular Velocity Sources, Stroboscope, Vortex Mixers, Centrifuges, Rotarex^{FO}	10.471 98 rad/s to 5 235.987 76 rad/s (100 rpm to 50 000 rpm)	0.061 rad/s (0.58 rpm)	Photo- tachometer Ono Sokki	CENAM Technical Guide
Equipment to Output Frequency 100 mV to 750 V^{FO}	3 Hz to 9.999 999 Hz	0.008 2 Hz	Agilent 34401A Multimeter	CENAM Technical Guide ANSI C39.6
	10 Hz to 99.999 99 Hz	0.012 Hz		
	100 Hz to 999.999 9 Hz	0.59 Hz		
	1 kHz to 9.999 999 kHz	0.005 9 kHz		
	10 kHz to 99.999 99 kHz	0.058 kHz		
	100 kHz to 300 kHz	0.067 kHz		
Equipment to Output Frequency 0.005 V to 30 V^{FO}	10 Hz to 60 MHz	0.014 Hz	Oscilloscope Tektronix TDS 1002B	CENAM Technical Guide
Equipment to Measure Frequency 1 mV to 3.3 V^{FO}	0.002 Hz to 11.999 kHz	0.002 Hz	Fluke 5500A	
	12 kHz to 2 MHz	50 Hz		
Equipment to Measure Angular Velocity Systems, Photo and Contact Tachometer^{FO}	0.125 7 rad/s to 10 471.98 rad/s (1.2 rpm to 100 000 rpm)	0.000 048 rad/s (0.000 46 rpm)	Fluke 5500A with Infrared Led	
Equipment to Measure Frequency 0.1 V to 10 V p-p^{FO}	2 Hz to 109.9 Hz	0.059 Hz	Fluke 702 Process Calibrator	
	110 Hz to 1 000 Hz	0.59 Hz		
	1.01 kHz to 11 kHz	0.014 Hz		
	11.1 kHz to 50 kHz	0.059 kHz		

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Contact Name: Eliud Elizondo Phone: 818-351-0368

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Optical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Light Meters[F]	120 lux to 6 000 lux	1 % of Reading	Light Meter Master	CENAM Technical Guide
Refractometers[F]	0.1 °Brix to 20 °Brix	0.13 °Brix	R °Bx Standards Traceable NIST and PTB, Merck Millipore	OIML R108
Refractometers[FO]	20 °Brix to 90 °Brix	0.15 °Brix	Standard Solutions	
Spectral Reflectance 400nm to 700nm Geometry d/8° Specular Component Included SCI (CEI)[FO]			White Standard Tile	CENAM Technical Guide ASTM D2244, ASTM E-1164 ASTM E-1331, ASTM E-1347
CIE L*:	0 to 100 CIE L*	0.2 CIE L*		
CIE a*	-100 to 100 CIE a*	0.2 CIE a*		
CIE b*	-100 to 100 CIE b*	0.15 CIE b*		
Spectral Reflectance 400nm to 700nm Geometry d/8° Specular Component Excluded SCE (CEE)[FO]			White Standard Tile	
CIE L:	0 to 100 CIE L*	0.2 CIE L*		
CIE a*	-100 to 100 CIE a*	0.2 CIE a*		
CIE b*	-100 to 100 CIE b*	0.15 CIE b*		
Gloss/Specular Reflectance Meter[FO]			BS	ISO 2813 ASTM D-523-14
Angle of Incline: 20°	92.6 Gloss Units	0.23 Gloss Units		
Angle of Incline: 60°	92.6 Gloss Units	0.19 Gloss Units		
Angle of Incline: 85°	92.6 Gloss Units	0.25 Gloss Units		

Electrical

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Equipment to Output DC Voltage[FO]	1 mV to 99.99 mV	0.005 % of Reading + 0.003 5 mV	Agilent 34401A Multimeter	CENAM Technical Guide
	100 mV to 0.99 V	0.004 % of Reading + 7 µV		
	1 V to 9.99 V	0.003 5 % of Reading + 50 µV		
	10 V to 99.99 V	0.004 5 % of Reading + 0.6 mV		
	100 V to 1 000 V	0.004 5 % of Reading + 10 mV		

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Equipment to Output AC Voltage At the listed frequencies[FO]			Agilent 34401A Multimeter	CENAM Technical Guide
3 Hz to 5 Hz	10 mV to 100 mV	1.1 mV		
5 Hz to 10 Hz	10 mV to 100 mV	0.39 mV		
10 Hz to 20 kHz	10 mV to 100 mV	0.1 mV		
20 kHz to 50 kHz	10 mV to 100 mV	0.16 mV		
50 kHz to 100 kHz	10 mV to 100 mV	0.68 mV		
100 kHz to 300 kHz	10 mV to 100 mV	4.5 mV		
Equipment to Output AC Voltage At the listed frequencies[FO]				
3 Hz to 5 Hz	100 mV to 1 V	0.011 V		
5 Hz to 10 Hz	100 mV to 1 V	0.003 8 V		
10 Hz to 20 kHz	100 mV to 1 V	0.000 9 V		
20 kHz to 50 kHz	100 mV to 1 V	0.001 6 V		
50 kHz to 100 kHz	100 mV to 1 V	0.006 8 V		
100 kHz to 300 kHz	100 mV to 1 V	0.045 V		
Equipment to Output AC Voltage At the listed frequencies[FO]				
3 Hz to 5 Hz	1 V to 750 V	7.8 V		
5 Hz to 10 Hz	1 V to 750 V	2.9 V		
10 Hz to 20 kHz	1 V to 750 V	0.68 V		
20 kHz to 50 kHz	1 V to 750 V	1.2 V		
50 kHz to 100 kHz	1 V to 750 V	5.1 V		
100 kHz to 300 kHz	1 V to 750 V	34 V		
Equipment to Output AC Current At the listed frequencies[FO]				
3 Hz to 5 Hz	1 mA to 0.999 99 A	0.011 A		
5 Hz to 10 Hz	1 m A to 0.999 99 A	0.003 4 A		
10 Hz to 5 kHz	1 m A to 0.999 99 A	0.001 4 A		

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Equipment to Output AC Current At the listed frequencies[FO]			Fluke 45 Multimeter Agilent 34401A Multimeter	CENAM Technical Guide
3 Hz to 5 Hz	1 A to 3 A	0.035 A		
5 Hz to 10 Hz	1 A to 3 A	0.013 A		
10 Hz to 5 kHz	1 A to 3 A	0.006 3 A		
10 Hz to 3 kHz	2.2 A to 11 A	0.12 A		
Equipment to Output Resistance[FO]	Up to 100 Ω	16 mΩ		
	100 Ω to 1 000 Ω	130 mΩ		
	1 kΩ to 10 kΩ	1.3 Ω		
	10 kΩ to 100 kΩ	13 Ω		
	100 kΩ to 1 MΩ	130 Ω		
	1 MΩ to 10 MΩ	4.8 Ω/kΩ		
	10 MΩ to 100 MΩ	0.93 kΩ/MΩ		
Electrical Current Derivator (Shunt)[F]	20 A to 600 A	1 % of Reading	Agilent 34401A, Fluke 289, Current Clamp Amp Meter	CEM Guide EL-006
Equipment to Measure Low Resistance At the listed frequencies 0.01 A to 10 A[FO]	1 mΩ to 5 mΩ	58 µΩ/Ω + 5.8 µΩ	Fluke 5500A, Multimeter Agilent 34401A, Fluke 289, Fluke 87 V,	CENAM Technical Guide
	5.001 mΩ to 50mΩ	580 µΩ/Ω + 58 µΩ		
	50.01 mΩ to 500 mΩ	580 µΩ /Ω + 577 µΩ		
	0.500 1 Ω to 9.999 9 Ω	15 mΩ/Ω + 14.9 mΩ		
Equipment to Measure High resistance At the listed frequencies 20 V to 100 V[FO]	0.6 MΩ to 1 MΩ	0.96 % of Reading	GenRad 1433-F High Resistance Standard Decade Box	
Equipment to Output Resistance At the listed frequenciess 100 mV to 750 V[FO]	3 Hz to 5 Hz	0.56 % of Reading	Agilent 34401A Multimeter	
	5 Hz to 10 Hz	0.67 % of Reading		
	10 Hz to 40 Hz	0.9 % of Reading		
	40 Hz to 300 kHz	0.9 % of Reading		
Equipment to Measure DC Voltage[FO]	33 mV to 330 mV	0.002 % of Reading + 57 µV	Fluke 5500A	
	0.33 V to 3.3 V	0.001 % of Reading + 600 µV		

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Equipment to Measure DC Voltage[FO]	3.3 V to 33 V	0.001 % of reading + 5.7 mV	Fluke 5500A	CENAM Technical Guide
	33 V to 330 V	0.001 % of reading + 56 mV		
	330 V to 1 000 V	0.003 % of reading + 608 mV		
Equipment to Measure DC Current[FO]	0.33 mA to 3.3 mA	0.47 µA	Fluke 5500A Current Coil 9100-200	
	3.3 mA to 33 mA	4.1 µA		
	33 mA to 330 mA	42 µA		
	330 mA to 2.2 A	820 µA		
	2.2 A to 11 A	8 100 µA		
	11 A to 550 A	0.11 % of Reading + 0.03 A		
Equipment to Measure DC Power[FO]	0.1 mW to 11 220 W	0.11 % of Reading + 30 µW		
Equipment to Measure AC Voltage At the listed frequencies[FO]				
10 Hz to 45 Hz	1 mV to 32.999 mV	200 µV		
45 Hz to 10 kHz	1 mV to 32.999 mV	160 µV		
10 kHz to 20 kHz	1 mV to 32.999 mV	170 µV		
20 kHz to 50 kHz	1 mV to 32.999 mV	200 µV		
50 kHz to 100 kHz	1 mV to 32.999 mV	230 µV		
100 kHz to 500 kHz	1 mV to 32.999 mV	460 µV		
Equipment to Measure AC Voltage At the listed frequencies[FO]			Fluke 5500A	
10 Hz to 45 Hz	33 mV to 329.999 mV	960 µV		
45 Hz to 10 kHz	33 mV to 329.999 mV	260 µV		
10 kHz to 20 kHz	33 mV to 329.999 mV	350 µV		
20 kHz to 50 kHz	33 mV to 329.999 mV	680 µV		
50 kHz to 100 kHz	33 mV to 329.999 mV	1 100 µV		
100 kHz to 500 kHz	33 mV to 329.999 mV	2 700 µV		
Equipment to Measure AC Voltage At the listed frequencies[FO]				
10 Hz to 45 Hz	0.33 V to 3.299 99 V	10 mV		
45 Hz to 10 kHz	0.33 V to 3.299 99 V	19 mV		
10 kHz to 20 kHz	0.33 V to 3.299 99 V	3 mV		
20 kHz to 50 kHz	0.33 V to 3.299 99 V	10 mV		

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Equipment to Measure AC Voltage At the listed frequencies[FO]			Fluke 5500A	CENAM Technical Guide
50 kHz to 100 kHz	0.33 V to 3.299 99 V	10 mV		
100 kHz to 500 kHz	0.33 V to 3.299 99 V	23 mV		
Equipment to Measure AC Voltage At the listed frequencies[FO]				
10 Hz to 45 Hz	3.3 V to 32.999 9 V	60 mV		
45 Hz to 10 kHz	3.3 V to 32.999 9 V	20 mV		
10 kHz to 20 kHz	3.3 V to 32.999 9 V	30 mV		
20 kHz to 50 kHz	3.3 V to 32.999 9 V	80 mV		
50 kHz to 100 kHz	3.3 V to 32.999 9 V	190 mV		
Equipment to Measure AC Voltage At the listed frequencies[FO]				
45 Hz to 1 kHz	33 V to 329.999 V	580 mV		
1 kHz to 10 kHz	33 V to 329.999 V	300 mV		
10 kHz to 20 kHz	33 V to 329.999 V	2 300 mV		
Equipment to Measure AC Voltage At the listed frequencies[FO]				
45 Hz to 1 kHz	330 V to 1 000 V	2 200 mV		
1 kHz to 10 kHz	330 V to 1 000 V	2 600 mV		
Equipment to Measure AC Current At the listed frequencies[FO]				
10 Hz to 20 Hz	0.029 mA to 0.329 99 mA	1.5 µA		
20 Hz to 45 Hz	0.029 mA to 0.329 99 mA	1.3 µA		
45 Hz to 1 kHz	0.029 mA to 0.329 99 mA	1.3 µA		
1 kHz to 5 kHz	0.029 mA to 0.329 99 mA	1.9 µA		
5 kHz to 10 kHz	0.029 mA to 0.329 99 mA	4.4 µA		
Equipment to Measure AC Current At the listed frequencies[FO]				
10 Hz to 20 Hz	0.33 mA to 3.299 9 mA	14 µA		
20 Hz to 45 Hz	0.33 mA to 3.299 9 mA	12 µA		

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Equipment to Measure AC Current At the listed frequencies[FO]			Fluke 5500A	CENAM Technical Guide
45 Hz to 1 kHz	0.33 mA to 3.299 9 mA	12 µA		
1kHz to 5 kHz	0.33 mA to 3.299 9 mA	14 µA		
5 kHz to 10 kHz	0.33 mA to 3.299 9 mA	23 µA		
Equipment to Measure AC Current At the listed frequencies[FO]				
10 Hz to 20 Hz	3.3 mA to 32.999 mA	87 µA		
20 Hz to 45 Hz	3.3 mA to 32.999 mA	37 µA		
45 Hz to 1 kHz	3.3 mA to 32.999 mA	35 µA		
1 kHz to 5 kHz	3.3 mA to 32.999 mA	71 µA		
5 kHz to 10 kHz	3.3 mA to 32.999 mA	210 µA		
Equipment to Measure AC Current At the listed frequencies[FO]				
10 Hz to 20 Hz	33 mA to 329.99 mA	700 µA		
20 Hz to 45 Hz	33 mA to 329.99 mA	380 µA		
45 Hz to 1 kHz	33 mA to 329.99 mA	350 µA		
1 kHz to 5 kHz	33 mA to 329.99 mA	700 µA		
5 kHz to 10 kHz	33 mA to 329.99 mA	2 100 µA		
Equipment to Measure AC Current At the listed frequencies[FO]				
10 Hz to 45 Hz	0.33 A to 2.199 99 A	4.8 mA		
45 Hz to 1 kHz	0.33 A to 2.199 99 A	2.6 mA		
Equipment to Measure AC Current At the listed frequencies[FO]				
45 Hz to 65 Hz	2.2 A to 11 A	14 mA		
65 Hz to 500 Hz	2.2 A to 11 A	17 mA		
500 Hz to 1 kHz	2.2 A to 11 A	40 mA		
Equipment to Measure AC Current At the listed frequencies[FO]				
45 Hz to 65 Hz	11 A to 550 A	0.34 % of Reading + 0.03 A		

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Equipment to Measure AC Power At the listed frequencie: (Up to 1 000 V @ 60 Hz)	0.1 mW to 11 220 W	0.18 % of reading + 0.3 mW	Fluke 5500A	CENAM Technical Guide
Equipment to Measure Resistance[FO]	1.1 Ω to 11 Ω	0.011 Ω		
	11 Ω to 33 Ω	0.025 Ω		
	33 Ω to 110 Ω	0.031 Ω		
Equipment to Measure Resistance[FO]	110 Ω to 330 Ω	0.13 Ω		
	0.33 kΩ to 1.1 kΩ	0.18 Ω		
	1.1 kΩ to 3.3 kΩ	0.42 Ω		
	3.3 kΩ to 11 kΩ	1.9 Ω		
	11 kΩ to 33 kΩ	4.2 Ω		
	33 kΩ to 110 kΩ	21 Ω		
	110 kΩ to 330 kΩ	53 Ω		
	330 kΩ to 1.1 MΩ	260 Ω		
	1.1 MΩ to 3.3 MΩ	640 Ω		
	3.3 MΩ to 11MΩ	8.3 kΩ		
	11 MΩ to 33 MΩ	39 kΩ		
	33 kΩ to 110 kΩ	21 Ω		
	110 kΩ to 330 kΩ	53 Ω		
Equipment to Measure Capacitance[FO]	0.33 nF to 0.499 9 nF	0.019 nF		
	0.5 nF to 1.099 9 nF	0.022 nF		
	1.1 nF to 3.299 9 nF	0.032 nF		
	3.3 nF to 10.999 nF	0.075 nF		
	11 nF to 32.999 nF	0.22 nF		
	33 nF to 109.99 nF	0.44 nF		
	110 nF to 329.99 nF	1.5 nF		
	0.33 µF to 1.099 9 µF	4.4 nF		
	1.1 µF to 3.299 9 µF	17 nF		
	3.3 µF to 10.999 µF	56 nF		
	11 µF to 32.999 µF	190 nF		
	33 µF to 109.99 µF	760 nF		
	110 µF to 329.99 µF	3.1 µF		
	330 µF to 1.1 mF	14 µF		

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Equipment to Output AC Voltage (Hipot)^{FO}	1 kV to 6 Kv	0.6 kV	Multimeter High Voltage Probe	CENAM Technical Guide
	6 kV to 10 Kv	1 kV		
	10 kV to 25 kV	2.5 kV		
Equipment to Output DC Voltage (Hipot)^{FO}	1 kV to 6 kV	0.24 kV		
	6 kV to 10 kV	0.4 kV		
	10 kV to 35 kV	1.4 kV		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type B^{FO}	600 ºC to 800 ºC	0.46 ºC	Electrical Simulation of Thermocouple Output Fluke 5500A	
	800 ºC to 1 000 ºC	0.46 ºC		
	1 000 ºC to 1 550 ºC	0.33 ºC		
	1 550 ºC to 1 820 ºC	0.35 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type C^{FO}	0 ºC to 150 ºC	0.33 ºC		
	150 ºC to 650 ºC	0.29 ºC		
	650 ºC to 1 000 ºC	0.33 ºC		
	1 000 ºC to 1 800 ºC	0.52 ºC		
	1 800 ºC to 2 316 ºC	0.85 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type E^{FO}	-250 ºC to -100 ºC	0.52 ºC		
	-100 ºC to -25 ºC	0.19 ºC		
	-25 ºC to 350 ºC	0.19 ºC		
	350 ºC to 650 ºC	0.2 ºC		
	650 ºC to 1000 ºC	0.25 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type J^{FO}	-210 ºC to -100 ºC	0.3 ºC		
	-100 ºC to -30 ºC	0.3 ºC		
	-30 ºC to 150 ºC	0.19 ºC		
	150 ºC to 760 ºC	0.21 ºC		
	760 ºC to 1 200 ºC	0.26 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K^{FO}	-200 ºC to -100 ºC	0.36 ºC		
	-100 ºC to -25 ºC	0.22 ºC		
	-25 ºC to 120 ºC	0.23 ºC		
	120 ºC to 1 000 ºC	0.29 ºC		
	1 000 ºC to 1 372 ºC	0.42 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type L^{FO}	-200 ºC to -100 ºC	0.39 ºC		
	-100 ºC to 800 ºC	0.29 ºC		
	800 ºC to 900 ºC	0.21 ºC		

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Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type N^{FO}	-200 ºC to -100 ºC	0.42 ºC	Fluke 5500A Electrical Simulation of Thermocouple Output	CENAM Technical Guide
	-100 ºC to -25 ºC	0.24 ºC		
	-25 ºC to 120 ºC	0.22 ºC		
	120 ºC to 410 ºC	0.22 ºC		
	410 ºC to 1 300 ºC	0.3 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type R^{FO}	0 ºC to 250 ºC	0.58 ºC		
	250 ºC to 400 ºC	0.58 ºC		
	400 ºC to 1 000 ºC	0.35 ºC		
	1 000 ºC to 1 767 ºC	0.42 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type S^{FO}	0 ºC to 250 ºC	0.49 ºC		
	250 ºC to 1 000 ºC	0.38 ºC		
	1 000 ºC to 1 400 ºC	0.39 ºC		
	1 400 ºC to 1 767 ºC	0.48 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T^{FO}	-250 ºC to -150 ºC	0.64 ºC		
	-150 ºC to 0 ºC	0.27 ºC		
	0 ºC to 120 ºC	0.19 ºC		
	120 ºC to 400 ºC	0.19 ºC		
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type U^{FO}	-200 ºC to 0 ºC	0.57 ºC		
	0 ºC to 600 ºC	0.3 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 385, 100 Ω	-200 ºC to -80 ºC	0.05 ºC	Fluke 5500A Electrical Simulation of RTD Output	CENAM Technical Guide
	-80 ºC to 0 ºC	0.05 ºC		
	0 ºC to 100 ºC	0.07 ºC		
	100 ºC to 300 ºC	0.09 ºC		
	300 ºC to 400 ºC	0.1 ºC		
	400 ºC to 630 ºC	0.12 ºC		
	630 ºC to 800 ºC	0.23 ºC		
	-200 ºC to -80 ºC	0.05 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 3 926, 100 Ω	-200 ºC to -80 ºC	0.05 ºC		
	-80 ºC to 0 ºC	0.05 ºC		
	0 ºC to 100 ºC	0.07 ºC		
	100 ºC to 300 ºC	0.09 ºC		

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Calmet Industrial, S.A. de C.V.
1era Privada No. 4831, Col. Niño Artillero
Monterrey, Nuevo León, México. C.P. 64280
Contact Name: Eliud Elizondo Phone: 818-351-0368

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

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 3 926, 100 Ω	300 ºC to 400 ºC	0.1 ºC	Fluke 5500A Electrical Simulation of RTD Output	CENAM Technical Guide
	400 ºC to 630 ºC	0.12 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 3916, 100 Ω	-200 ºC to -190 ºC	0.25 ºC		
	-190 ºC to -80 ºC	0.04 ºC		
	-80 ºC to 0 ºC	0.05 ºC		
	0 ºC to 100 ºC	0.06 ºC		
	100 ºC to 260 ºC	0.07 ºC		
	260 ºC to 300 ºC	0.08 ºC		
	300 ºC to 400 ºC	0.09 ºC		
	400 ºC to 600 ºC	0.1 ºC		
	600 ºC to 630 ºC	0.23 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 385, 100 Ω^{FO}	-200 ºC to -80 ºC	0.25 ºC		
	-80 ºC to 0 ºC	0.04 ºC		
	0 ºC to 100 ºC	0.06 ºC		
	100 ºC to 260 ºC	0.07 ºC		
	260 ºC to 300 ºC	0.08 ºC		
	300 ºC to 400 ºC	0.09 ºC		
	400 ºC to 600 ºC	0.1 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 3 926, 100 Ω^{FO}	-200 ºC to -80 ºC	0.23 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 385, 500 Ω^{FO}	-200 ºC to -80 ºC	0.04 ºC		
	-80 ºC to 0 ºC	0.05 ºC		
	0 ºC to 100 ºC	0.05 ºC		
	100 ºC to 260 ºC	0.06 ºC		
	260 ºC to 300 ºC	0.08 ºC		
	300 ºC to 400 ºC	0.08 ºC		
	400 ºC to 600 ºC	0.09 ºC		
	600 ºC to 630 ºC	0.11 ºC		

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Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 385, 1 000 Ω[FO]	-200 ºC to -80 ºC	0.03 ºC	Fluke 5500A Electrical Simulation of RTD Output	CENAM Technical Guide
	-80 ºC to 0 ºC	0.03 ºC		
	0 ºC to 100 ºC	0.04 ºC		
	100 ºC to 260 ºC	0.05 ºC		
	260 ºC to 300 ºC	0.06 ºC		
	300 ºC to 400 ºC	0.07 ºC		
	400 ºC to 600 ºC	0.07 ºC		
	600 ºC to 630 ºC	0.23 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD Pt 385, Ni 120, 120 Ω[FO]	-80 ºC to 0 ºC	0.08 ºC		
	0 ºC to 100 ºC	0.08 ºC		
	100 ºC to 260 ºC	0.14 ºC		
Temperature Calibration, Indication, and Control Equipment used with RTD CU 427, 10 Ω[FO]	-100 ºC to 260 ºC	0.3 ºC		
Equipment to Measure High Resistance Fixed Point @ 50 V to 10 kV[FO]	38 MΩ	0.4 % of reading	High Resistance CENAM Technical Guide	
	42 MΩ	0.44 % of reading		
	100 MΩ	1.1 % of reading		
	1 GΩ	0.019 % of reading		
	10 GΩ	0.26 % of reading		
	100 GΩ	2.1 % of reading		
Porosity Detector[F]	1 kV to 28 kV	0.24 kV	Multimeter High Voltage Probe	
Equipment to Measure Capacitance[FO]	10 nF to 1 000 nF	0.088 % of reading	General Radio 1412-BC Decade Box	
Equipment to Measure Inductance At the listed frequencies 100 Hz to 1 kHz[FO]	1 mH to 10 H	0.15 % of reading		
Equipment to Measure High Resistance Tester of ESD (Wristrap & Foot Strap)[FO]	600 kΩ to 1 MΩ 38 MΩ fixed point	1.5 kΩ	GenRad 1433-F Decade Box, High Resistance Standard Set	CENAM Technical Guide ESD Equipment Manufacturing Guide

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Equipment to Output Air Ionizer Charger ESD[F]	0.5 kV to 28 kV	0.33 % of output	Multimeter High Voltage Probe	CENAM Technical Guide ESD Equipment Manufacturing Guide
Equipment to Measure ESD Air Ionizer Meters and Sensors[F]	0.5 kV to 28 kV	0.33 % of output		
Equipment to Output DC Voltage and DC Current of Electrical Welding Equipment Power Sources or Generators[F]	1 V to 100 V	0.058 V	Multimeter, Current Clamp Amp Meter, Load Bank Welding Equipment	Manufacturer 275053 Guide ANSI/IEC 60974−1 ISO 17662
	1 A to 750 A	0.064 A		

Chemical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
pH Meter Fixed point[FO]	4 pH	0.012 pH	pH Buffer Solutions	CENAM Technical Guide
pH Meter Fixed point[FO]	7 pH	0.012 pH	pH Buffer Solutions	
	10 pH	0.012 pH		
Conductivity Meter[FO]	84 µS	0.94 µS	Conductivity Buffer Solutions	
	1 413 µS	6.5 µS		
	12 880 µS	63 µS		
Viscometers - Kinematic Viscosity (Zhan) 2/3/4, Ford 3, 4[FO]	120 mm^2/s (cSt)	0.34 mm^2/s (cSt)	Cannon Certified Viscosity Reference Standard (C60, C100) 25 °C	
	230 mm^2/s (cSt)			
Viscometers - Dynamic Viscosity[FO]	335.3 mPa·s	0.66 mPa·s	Cannon Certified Viscosity Reference Standard (S200, RT500) 25 °C	
	484.7 mPa·s	0.89 mPa·s		
	100 mPa.s	0.95 mPa.s	Cannon, Brookfield STD	
	500 mPa.s	1.8 mPa.s		
	1 000 mPa.s	3 mPa.s		
	5 000 mPa.s	19 mPa.s		
	12 500 mPa.s	55 mPa.s		

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Chemical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Alcohol Meter[F]	Up to 0.4 BAC	0.012 % BAC	Alcohol Meter Master	OIMLR-126
Combustion Analyzer[F]	51 µmol/mol (CO)	1.1 µmol/mol (CO)	PRAXAIR Certified Standard	NOM-034-ECOL
Explosimeter[F] Methane	100 µmol/mol	0.05 µmol/mol		
Explosimeter[F] Hydrogen Sulfide	26 µmol/mol	0.05 µmol/mol		
Explosimeter[F] Butane	109 µmol/mol	0.05 µmol/mol		

Acoustic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Acoustical Meter[FO]	94 dB	0.27 dB	Acoustical Calibrator	UNE-EN 61672-2014
	114 dB	0.27 dB		

Mass, Force, and Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Analytical Balance[FO]	1 mg to 210 g (Res.= 0.01 mg)	$(8 \times 10^{-5} + 6 \times 10^{-7}\text{Wt})$ g	Weight Class E2	CENAM Technical Guide
Scales[O]	5 g to 2 000 g (Res.= 0.01 g)	$(7.8 \times 10^{-3} + 1 \times 10^{-6}\text{Wt})$ g	Weight Class E2, F1	
	200 g to 50 000 g (Res.= 0.1 g)	$(7.73 \times 10^{-2} + 3 \times 10^{-6}\text{Wt})$ g	Weight Class E2, F1, F2	
Scales[O]	4 kg to 200 kg (Res.= 0.02 kg)	$(3.3 \times 10^{-3} + 2 \times 10^{-5}\text{Wt})$ kg	Weight Class M1, F1, F2	
Weighing Scales, Crane Scale, Dynamic Checkweighing Systems[O]	20 kg to 2 000 kg (Res.= 0.2 kg)	$(0.16 + 3 \times 10^{-5}\text{Wt})$ kg	Weight Class M1, M2	
Weights Class M1, M2, M3[F]	1 g	0.33 mg	Mass Set Class E2	NOM-EM-020-SE
	2 g	0.4 mg		
	5 g	0.53 mg		
	10 g	0.66 mg		
	20 g	0.83 mg		

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Mass, Force, and Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Weights Class M1, M2, M3[F]	50 g	1 mg	Mass Set Class E2	NOM-EM-020-SE
	100 g	1.7 mg		
	200 g	3.4 mg		
Weights Class M1, M2, M3[F]	1 000 g	17 mg	Mass Set Class F2	
	20 000 g	340 mg		
	2 000 g	10 mg		
Weights Class M2, M3[F]	5 000 g	270 mg	Mass Set Class M1	
	10 000 g	540 mg		
Weights Class F1[F]	5 mg	0.006 1 mg	Mass Set Class E2	
	10 mg	0.006 4 mg		
	20 mg	0.008 mg		
	50 mg	0.019 mg		
	100 mg	0.01 mg		
	200 mg	0.018 mg		
	500 mg	0.024 mg		
	1 g	0.024 mg		
	2 g	0.022 mg		
	5 g	0.022 mg		
	10 g	0.021 mg		
	20 g	0.05 mg		
	50 g	0.074 mg		
	100 g	0.29 mg		
	200 g	0.28 mg		
Force Machines Compression and Tension[FO]	44 N to 444 N	0.21 % of reading	Load Cells Strainsense SST104ULP, BLH Electronics 82060, 59676 Laumas CLS- 5t, CLS-1t	NMX-CH-7500-1-IMNC
	44 N to 4.44 kN	0.5 % of reading		
	4.44 kN to 44.48 kN	0.6 % of reading		
	44.48 kN to 490.33 kN	0.3 % of reading		
Force Machines Tension[FO]	0.009 8 N to 1.96 N	0.001 N	Class F1, F2 and M1 Weight	ISO-7500-1, ASTM E4 NMX-CH-7500-1-IMNC
	1.97 N to 9.8 N	0.007 N		
	9.81 N to 588 N	0.012 N		
Force Measuring Systems, Gauges and Devices Compression and Tension[FO]	0.8 895 N to 980.665 N	0.006 3 % of reading	F1, F2, M1 Weight Set	ISO 376, ISO-7500-1 ASTM E4 NMX-CH-7500-1-IMNC
Force Load Cells Tension[FO]	22.24 N to 490.33 kN	0.17 % of reading	Standard Load Cells	ISO 376
Force Load Cells Compression [FO]	22.24 N to 98.0665 kN	0.17 % of reading		

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Contact Name: Eliud Elizondo Phone: 818-351-0368

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

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.
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.
4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations.
5. 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.
6. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
7. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.