

PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Calidad MX, S.A. de C.V.

Av. López Mateos # 1001, Local 203 Altos, Col. 21 de Enero Guadalupe, Nuevo León, México C.P. 67160

(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, Optical, Chemical, Thermodynamic, Acoustic, Mechanical, Time & Frequency, Mass, Force and Weighing Devices and Electrical 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: July 14, 2011

Issue Date:

Expiration Date: February 21, 2024

February 28, 2026

Accreditation No. 70242

Certificate No.: L24-156

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.pjlabs.com

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Calidad MX, S.A. de C.V. Av. López Mateos # 1001, Local 203 Altos, Col. 21 de Enero Guadalupe, Nuevo León, México C.P. 67160 Contact: Alejandro Lujan Phone: (52) 818-379-2710

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

Dimensional				
MEASURED	RANGE	CALIBRATION	CALIBRATION	CALIBRATION
INSTRUMENT, OUANTITY OR	(AND SPECIFICATION WHERE APPROPRIATE)	OR MEASUREMENT CAPABILITY EXPRESSED	EQUIPMENT AND REFERENCE	MEASUREMENT METHOD OR
GAUGE	WHERE ATTROTRATE)	AS AN UNCERTAINTY (±)	STANDARDS USED	PROCEDURES USED
Caliper ^{FO}	0.105 in to 24 in	(7.7 + 1.1 x 10 ⁻² L) μin	Mitutoyo Gage	CENAM Technical
Micrometer ^{FO}	0.105 in to 24 in	$(5.82 \text{ x } 10^{-1} + 6 \text{ x } 10^{-6} \text{L}) \mu\text{in}$	Block, Grade 0	Guide
Micrometer Heads ^F	2.6 mm to 25.4 mm	(5.76 x 10 ⁻⁴ + 6.1 x 10 ⁻⁶ L) mm	Gage Block Grade 0	DIN-030 CEM
Coating Thickness Gauge ^{FO}	20 µm to 2 600 µm	$(5.78 \text{ x } 10^{-2} + 1.84 \text{ x } 10^{-1} \text{ L}) \mu\text{m}$	Defelsco Certified Thickness Standards	ASTM-D7091-13
Tape ^{FO}	50 m maximum	0.1 cm	Standard Tape	NOM-046-SCFI-1999
Rule ^{FO}	100 cm maximum	0.006 cm	Standard Rule Glass Microrule	NOM-040-SCFI-1994
Sieves ^F	45 μm to 13 200 μm	0.38 μm	Microscope Glass Microrule	ASTM E11-17
	16 mm to 125 mm	0.012 mm	Interior Caliper	ASTM E11-17
CMM ^O	Up to 1 000 mm	(1.16 + 1 x 10 ⁻⁶ L) μm	Gage Blocks	ISO-10360-2
Height Gauges ^{FO}	Up to 609.6 mm	$(5.51 \text{ x } 10^{-3} + 3 \text{ x } 10^{-6} \text{L}) \text{ mm}$	Mitutoyo Gage	DI-008 CEM
Height Master ^{FO}	Up to 304.8 mm	$(6.21 \text{ x } 10^{-4} + 1 \text{ x } 10^{-6} \text{L}) \text{ mm}$	Block Grade 0	
Angle Meter ^{FO}	Up to 90°	0.007°	Angle Block	DI-003 CEM
Granite Surface	0.05 mm	1.2 μm	Repeat-O-Meter with	DI-015 CEM
Plates Repeat			Micro Indicator	
Roughness Tester ^{FO}			Roughness Specimen	DI-025 CEM
Ra (Fixed point)	2.94 μm	0.08 μm		
Ry (Fixed point)	9.3 μm	0.12 μm		
Dial Indicator ^{FO}	Up to 25.4 mm	$(4.7 + 4 \text{ x } 10^{-3} \text{L}) \mu \text{m}$	Head Micrometer	JIS B 7503
Optical Comparator			Glass Reticules	DI-001 CEM
Length ^O				
X Axis Linerity	1 mm to 200 mm	(9.87 x 10 ⁻⁴ + 1 x 10 ⁻⁶ L) mm		
Y Axis linearity	1 mm to 200 mm	$(9.87 \text{ x } 10^{-4} + 1 \text{ x } 10^{-6}\text{L}) \text{ mm}$		
Optical Comparator	Up to 90°	0.05°	Angular Block	DI-001 CEM
Angularity ^O				
Microscopes ^{FO}	Up to 100 mm	$(1.51 \text{ x } 10^{-3} + 4.9 \text{ x } 10^{-5} \text{L}) \text{ mm}$	Glass Scale, Reticule	DI-006 CEM
Vision System ^o	Up to 200 mm	(1.51 x 10 ⁻³ + 4.9 x 10 ⁻⁵ L) mm	Glass Reticules	
Pin Gauge ^F	0.152 mm to 25.4 mm	1.2 μm	Master Micrometer	DI-016 CEM
Tread Plugs Pitch	0-40 to 4-12	1.4 μm	Wire with	ASME B1.2
		1.2	Micrometer	110 D 5504
Feeler Gauge ^r	0.03 mm to 0.9 mm	1.3 μm	Micrometer Digital	JIS B 7524
Bore Gauges ^F	10 mm to 60 mm	$(6.84 \text{ x } 10^{-4} + 8.1 \text{ x } 10^{-6} \text{L}) \text{ mm}$	Ring Gauge Master	ASME B89.1.1.6

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

Optical

MEASUDED	DANCE	CALIDDATION	CALIDDATION	CALIDDATION
INEASURED	KANGE (AND SPECIFICATION	CALIBRATION OD MEASUDEMENT	CALIBRATION FOURPMENT AND	CALIBRA HON MEASUDEMENT METHOD
OUANTITY OR GAUGE	WHERE APPROPRIATE)	CAPABILITY	REFERENCE	OR PROCEDURES USED
Quality of one of the off	() IIII III IIII IIII IIII IIII IIIII IIII	EXPRESSED	STANDARDS USED	OKTROCLUCIALS USED
		AS AN UNCERTAINTY (±)		
ρ(λ) Spectral	Color Values:	· · · ·	White Standard Tile	CENAM Technical Guide
Reflectance ^{FO}	0 to 100	0.36 Units		
CIE L CIE a	*28 to 36	0.26 Units		
CIE b	*: -26 to 63	0.24 Units		
Spectrophotometers	τ: 1 % to 95 %	0.27 % of reading	Neutral density	
Transmittance ^{FO}	λ : 230 nm to 700 nm	0.5 nm	Filters, Holmium	
			Oxide Glass	
Gloss/Specular			Ceram Research	ASTM D-523-14
Reflectance Meter			Gloss and Semi-	
Angle of Incline FO	20° to 92.1°	0.5 Gloss Units	Gloss Standards	
_	60° to 94.9°	0.5 Gloss Units		
	85° to 99.8°	0.5 Gloss Units	0	
Ev Illuminance ^O	100 lux to 6 000 lux	1 % of reading	Luxmeter Minolta	NIST SP 250-37
Light Booth			CL-200	
Ev Light Color ⁰	2856 K	20 K		
Light Booth				
Ev Light Meters ^F	100 lux to 6 000 lux	2 % of reading	Luxometer Minolta	CENAM Technical Guide
			CL-200	

Chemical

Chemieal				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
pH Meters ^{FO}	4 pH to 10 pH	0.02 pH	SRM NIST Traceable, (Buffer, 4.01, 7.01, 10.01)	CENAM Technical Guide
Conductivity Meters	84 µS/cm	1 μS/cm	SRM NIST	
Fixed Points ^{FO}	1 413 µS/cm	7 μS/cm	Traceable	
Turbidimeter ^{FO}	0.1 NTU to 100 NTU	0.5 NTU	HACH Standard	EPA Method 180.1
	100 NTU to 800 NTU	5 NTU		
Refractive Index ^{FO}	1 °Brix to 80 °Brix	0.55 % of reading	Sucrose Standards	OIML R-108



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

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Mec	hanica	I

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Burette ^F	10 mL	14 µL	Analytical Balance	CENAM Technical
	25 mL	35 µL	AND HR200	Guide
	50 mL	50 μL		
Volumetric Pipettes and	1 mL	3.3 µL		
Pipettes ^F	5 mL	3.3 µL		
	10 mL	3.3 µL		
	25 mL	5.3 μL		
Micropipettes and	1 µL	0.023 μL	Micro Analytical	
Pipettes ^F	2 µL	0.023 μL	Balance	
	5 μL	0.059 μL	AND AD-4212B-P1 Analytical Balance	
	10 μL	0.051 μL	AND HR200	
	20 μL	0.042 μL		
	50 μL	0.015 μL		
	100 μL	0.015 μL		
	200 μL	0.083 μL		
	500 μL	0.32 μL		
	1 000 μL	0.32 μL		
	2 000 μL	0.32 μL		
Graduated Cylinder ^F	25 mL	1.2 mL	Analytical Balance	CENAM Technical
	50 mL	1.2 mL	AND HR200	Guide
	100 mL	1.2 mL	OHAUS SPA2202	
	250 mL	1.2 mL		
	500 mL	1.2 mL		
	1 000 mL	1.2 mL		
	2 000 mL	1.2 mL		
Volumetric Flask ^F	10 mL	0.02 μL		
	25 mL	0.02 μL		
	50 mL	0.02 μL		
	100 mL	0.03 mL		
	250 mL	0.07 mL		
	500 mL	0.08 mL]	
	1 000 mL	0.15 mL]	
	2 000 mL	0.33 mL]	



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

Mechanical				
MEASURED	RANGE	CALIBRATION OD MEASUDEMENT	CALIBRATION FOLIDMENT AND	CALIBRATION
OUANTITY OR	WHERE APPROPRIATE)	CAPABILITY EXPRESSED	REFERENCE	MEASUREMENT METHOD OR
GAUGE	,	AS AN UNCERTAINTY (±)	STANDARDS USED	PROCEDURES USED
Containers ^F	10 L	0.34 mL	Analytical Balance	CENAM Technical
	20 L	0.34 mL	AND HR200	Guide
	200 L	1.7 mL	OHAUS SPA2202	
Pressure Gauge	1 psi to 1 000 psi	0.6 % of reading	Digital Manometer	
Pressure	· ·		Ametek EPC2000	
Transducer ^{FO}				
	1 000 psi to 10 000 psi	0.2 % of reading	Digital Manometer	
			Adittel GP10K	
	$0.02 H_20$ to 280 in H ₂ 0	0.02 % of reading	AMETEC EPC 2000	
Vacuum ^{FO}	-14 psi to 0 psi	0.02 % of reading		
(Pressure Gauge				
Pressure				
Transducer)				
Dynamic Viscosity	0.1 Pa·s to 30 Pa·s	0.58 % of reading	Cannon Standard	NMX-U-038-SCFI
Meters ^{FO}			OIL	
Kinematic	121.6 mm ² /s	1.4 % of reading		ASTM D4212 - 16
Viscosity Ford Cup				
No.4 ^{FO}				
Kinematic	48.75 mm ² /s	1.1 % of reading		
Viscosity				
Zahn Cups No. 2 ^{FO}				
Kinematic	42.37 mm ² /s	1.1 % of reading		
Viscosity				
Zahn Cups No. 3 ^{FO}			J	
Kinematic	32.57 mm ² /s	1.1 % of reading		
Viscosity				
Zahn Cups No. 4 ^{FO}				
Torque Wrench	$2 \text{ N} \cdot \text{m}$ to $500 \text{ N} \cdot \text{m}$	1 % of reading	Torque Transducer	CENAM Technical
Torque Transducer ^r			CEDAR Mod.	Guide
			DIS-IP500 500 N·m	
Torque Wrench	$2 \text{ N} \cdot \text{m}$ to $500 \text{ N} \cdot \text{m}$	1 % of reading	Torque Transducer	CENAM Technical
Torque Transducer ^r			CEDAR Mod.	Guide
T W 1			DIS-IP500 500 N·m	D (CD 150) (
Torque Wrench	$0.1 \text{ N} \cdot \text{m}$ to $15 \text{ N} \cdot \text{m}$	0.5 % of reading	Torque Transducer	IM-CD150M
Torque			CEDAK Mod.	
I ransaucer ····································		0.42 UDC		
Indirect	20 HKC to 30 HKC	0.42 HKC		
Verifications	30 HRC to 60 HRC	0.39 HRC		
HRC ⁰	60 HRC to 70 HRC	0.38 HRC		

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

Mec	hanical
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MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Indirect Verifications	40 HRB to 60 HRB	0.38 HRB	E18-16 Test	CENAM
Hardness Tester	60 HRB to 80 HRB	0.36 HRB	Blocks	Technical Guide
пкр	80 HRB to 100 HRB	0.42 HRB		
Indirect Verifications Hardness Tester	120 HB to 300 HB at 10/1 500 kgf	1.8 HB		
HB ^o	300 HB to 600 HB at 10/3 000 kgf	6 HB		
Direct Verification of Durometer Hardness Tester ^F Types A, B, C, D, E, O, & DO Extension at zero reading	2.46 mm to 2.54 mm	3.7 µm	Head Micrometer	ASTM D-2240
Durometer Indentor Spring Types A, B, E & O Types C, D & DO	0.55 N to 9.05 N 0.445 N to 44.45 N	1.4 N 1.4 N	Electronic Balance	

Time & Frequency

MEASURED	RANGE OR NOMINAL DEVICE	CALIBRATION	CALIBRATION	
INSTRUMENT,	SIZE AS APPROPRIATE	AND MEASUREMENT	EQUIPMENT AND	
QUANTITY OR GAUGE		CAPABILITY EXPRESSED	REFERENCE	
		AS AN UNCERTAINTY (±)	STANDARDS USED	
Stopwatch ^F	60 s to 86 400 s	16 s/day	Direct	CENAM
			Comparison	Technical Guide
			Stopwatch, UTC	
Tachometer ^F	1 rev/min to 10 000 rev/min	0.2 % of reading	Tachometer	ASTM-F2046-00

Mass, Force and Weighting Devices

MEASURED	RANGE	CALIBRATION	CALIBRATION	CALIBRATION
INSTRUMENT,	(AND SPECIFICATION WHERE	OR MEASUREMENT	EQUIPMENT AND	MEASUREMENT
QUANTITY OR GAUGE	APPROPRIATE)	CAPABILITY EXPRESSED	REFERENCE	METHOD OR
		AS AN UNCERTAINTY (±)	STANDARDS USED	PROCEDURES USED
Force Compression	1 N to 4 906 N	0.3 % of reading	Transducer Load	CENAM
and Tension (Force	4 906 N to 44 444 N	0.3 % of reading	Cell	Technical Guide
Gages, Load Cell and				
Universal	44 444 N to 222 222 N	0.1 % of reading		
Machines)FO				
Analytical Balance ^{FO}	1 mg to 200 g	$(2 \text{ x } 10^{-4} + 5.21 \text{ x } 10^{-6} \text{Wt}) \text{ g}$	OIML E2 Weights	
	(Res. = 0.1 mg)			

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

Mass, Force and Weight	ing Devices			
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Precision Balance ^{FO}	$0.1 \text{ g to } 10\ 000 \text{ g}$ (Res = 0.01 g)	(1.16 x 10 ⁻² + 3.35 x 10 ⁻⁶ Wt) g	OIML F1 and M1 Weights	CENAM Technical Guide
Scale ^{FO}	5 kg to 200 kg (Res.= 1 g)	(1.142 9 + 2.45 x 10 ⁻⁶ Wt) g	OIML M1 Weights	
Weighing Devices ^O	200 kg to 10 000 kg (Res.= 0.5 kg)	$(5.85 \text{ x } 10^{-1} + 3.1 \text{ x } 10^{-5} \text{Wt}) \text{ kg}$	OIML M2 Weights	
Mass Class F1, M1	0.1 g	0.05 mg	Class E2 and	OIML R-111
Weights ^{r0}	0.5 g	0.05 mg	F1Mass Micro and	
	1 g	0.13 mg	Analytical Balance	
	2 g	0.16 mg	Precision Balance	
	5 g	0.18 mg	(Res.=0.01 g)	
	10 g	0.22 mg	7	
Mass Class F1, M1	20 g	0.28 mg	Class E2 and F1	
Weights ^{r0} (Res = 0.01 g)	100 g	0.18 mg	Mass Analytical	
(Res 0.01 g)	200 g	0.34 mg	Precision Balance	
	500 g	0.13 mg		
Mass Class M1, M2	1 kg	19 mg	Class F1 Mass	
Weights ^{FO} (Pes = 0.01 g)	2 kg	35 mg	Precision Balance	
(Res 0.01 g)	5 kg	150 mg		
Mass Class M2, M3	10 kg	580 mg	Class M1 Mass	
Weights ^{r0}	20 kg	580 mg	Balance	

Thermodynamic

Thermou j numme				
MEASURED	RANGE	CALIBRATION	CALIBRATION	CALIBRATION
INSTRUMENT,	(AND SPECIFICATION	OR MEASUREMENT	EQUIPMENT AND	MEASUREMENT
QUANTITY OR GAUGE	WHERE	CAPABILITY EXPRESSED	REFERENCE	METHOD OR
	APPROPRIATE)	AS AN UNCERTAINTY (±)	STANDARDS USED	PROCEDURES
				USED
Temperature	0 °C to 500 °C	0.24 °C	Fluke 724, Dry	NIST 250-35
Measurement	501 °C to 1 100 °C	0.24 °C	Well	
Thermocouple Type K ^{FO}	201 0 10 100 0	0.21 0		
Temperature	0 °C to 500 °C	0.24 °C		
Measurement	501 °C to 1 100 °C	0.24 °C		
Thermocouple Type J ^{FO}	201 2 10 1 100 2			

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

Thermodynamic				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Measurement RTD Pt 100 ^{FO}	-80 °C to 420 °C	0.11 °C	Fluke 724 with Dry Well, Freezer, Dry Ice Bath Comparison	CENAM Technical Guide
Bimetallic Thermometer ^{FO}	-20 °C to 500 °C	1.2 °C	Fluke 724, Dry	NIST 250-35
Temperature Controllers ^{FO}	0 °C to 1 100 °C	0.5 ℃	Well	
IR Thermometer ^{FO}	50 °C to 500 °C	0.64 °C	Fluke 724 Dry Block Black Body (Temperature Generator)	CENAM Technical Guide
Temperature Generation:	-20 °C to 0 °C	1.4 °C	Fluke 724	NIST 250-35
Ovens, Furnaces, Muffles, Freezers and Incubators ^{FO}	0 °C to 25 °C	1.4 °C		
Treezers and mediators	25 °C to 100 °C	1.5 °C		
	100 °C to 450 °C	1.7 °C		
	450 °C to 900 °C	1.9 °C		
Relative Humidity	11.3 % RH	1.5 % RH	Saturated Salt	OIML R-121
Meter ^{r0}	35 % RH	1.5 % RH	Solution	
	95 % RH	1.5 % RH	1	

Acoustic

110040410				
MEASURED	RANGE	CALIBRATION	CALIBRATION	CALIBRATION
INSTRUMENT,	(AND SPECIFICATION	OR MEASUREMENT	EQUIPMENT AND	MEASUREMENT
QUANTITY OR GAUGE	WHERE APPROPRIATE)	CAPABILITY	REFERENCE	METHOD OR
		EXPRESSED	STANDARDS USED	PROCEDURES USED
		AS AN UNCERTAINTY		
		(±)		
Sonometer ^{FO}	94 dB	0.7 dB	Acoustical	ANSI S1.4
	114 dB	0.88 dB	Calibrator 1 kHZ	

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure Resistance ^{FO}	0.1 Ω to 1 Ω	0.002 6 Ω	Process Calibrator Fluke 743 B	CENAM Technical Guide

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Electrical				
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Equipment to Measure	1 Ω to 2 Ω	0.002 4 Ω	Process	CENAM
Resistance ^{FO}	2Ω to 5Ω	0.002 5 Ω	Calibrator Fluke 743 B	Technical Guide
Equipment to Measure	5 Ω to 10 Ω	0.002 4 Ω	Process	CENAM
Resistance	10Ω to 20Ω	0.004 9 Ω	Calibrator	Technical Guide
	20 Ω to 50 Ω	0.007 Ω	TIUKE/45 D	
	50 Ω to 100 Ω	0.039 Ω		
	100 Ω to 200 Ω	0.017 Ω		
	200 Ω to 500 Ω	0.018 Ω		
	500 Ω to 1 000 Ω	0.9 Ω		
Equipment to Output	100 mV to 1 V	0.001 8 V	Fluke 5500A	
DC Voltage ^{FO}	1 V to 10 V	0.002 V	Multimeter	
	10 V to 100 V	0.003 V		
	100 V to 1 000 V	0.048 V		
Equipment to Output AC Voltage At the listed frequencies 50 Hz to 1 kHz ^{FO}	0.001 V to 750 V	0.13 V	\mathbf{P}	
Equipment to Output	0.01 A to 3 A	0.001 3 A		
AC Current At the listed frequencies 10 Hz to 900 Hz ^{FO}	3 A to 10 A	0.024 A		
Equipment to output	0.000 01 mA to 9.999 9 mA	0.001 9 mA		
DC Current ^{FO}	10 mA to 99.999 mA	0.006 8 mA		
	100 mA to 1 A	0.006 9 mA		
	1 A to 3 A	0.000 7 A		
	3 A to 10 A	0.006 8 A		
Equipment to Output	Up to 100 Ω	0.01 % of reading + 0.004 range	Agilent	Procedure
Resistance ^{FO}	100 Ω to 1 k Ω	0.01 % of reading + 0.001 range	Multimeter	EL-024
	1 k Ω to 10 k Ω	0.01 % of reading + 0.001 range	34401A	FL-025
	$10 \text{ k}\Omega$ to $100 \text{ k}\Omega$	0.01 % of reading + 0.001 range		
	100 k Ω to 1 M Ω	0.01 % of reading + 0.001 range	1	
	$1 \text{ M}\Omega$ to $10 \text{ M}\Omega$	0.04 % of reading + 0.001 range	1	
	$10 \text{ M}\Omega$ to $100 \text{ M}\Omega$	0.8 % of reading + 0.01 range	1	

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

MAXNURPS INSTRUMENT, QLAVITIV OR CAUGERANGE (AND SPECIFICATION WHERE APPROPRIATE)CALBRATION CAUBLAVE CAURANTION CAMBILITY EXPRESSION CAUBRATION CAUBR	Electrical				
Electrical Current Derivator (Shunt) ^{FO} I0 A to 150 A0.07 9 AFluke S500A Multimeter GuideCENAM Technical GuideDerivator (Shunt) ^{FO} 1 kV to 6 kV0.38 kVFluke 177 MultimeterGuideGuideEquipment to Output DC High Voltage (Hy-Por) ^O 1 kV to 6 kV0.1 kVMultimeter Fluke 80X-40Fluke 177 Multimeter Fluke 80X-40Equipment to Measurement Resistance ^{FO} 100 Ω0.03 ΩMegabox ResistanceMegabox ResistanceTemperature Calibration Indication and Control Equipment to Measurement Nead Vith 20.99 PM to 32.999 PM0.014 MQFluke 5500ATemperature Calibration Indication and Control Equipment to Measurement DC Voltage ^{FO} 0.70 °C1.2 °C 0.005 % of reading + 3 µV 30 V to 329.99 mV0.006 % of reading + 50 µV 30 V to 32.999 PM A0.013 % of reading + 0.50 µAEquipment to Measurement DC Voltage ^{FO} Up to 3.299 99 mA 32.999 PM A0.013 % of reading + 0.50 µAMulticalibrator MulticalibratorEquipment to Measurement DC Current ^{FO} Up to 3.299 99 mA 32.999 PM A0.013 % of reading + 30 µAMulticalibratorEquipment to Measurement DC Current ^{FO} Up to 3.299 99 mA 32.999 90 mA0.013 % of reading + 0.05 µAMulticalibratorEquipment to Measurement DC Current ^{FO} Up to 3.299 99 mA 32.999 90 mA0.013 % of reading + 0.05 µAMulticalibratorEquipment to Measurement DC Current ^{FO} Up to 3.299 99 mA 32.999 90 mA0.012 % of reading + 0.001 5 ΩFluke 5500AEquipment to Measure	MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
$ \begin{array}{ c $	Electrical Current	10 A to 150 A	0.007 9 A	Fluke 5500A	CENAM
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Equipment to Output AC High Voltage (Hv-Pot) ^o	1 kV to 6 kV	0.38 kV	Fluke 177 Multimeter	Guide
Equipment to Measurement Resistance ^{FO} 100 Ω 0.03 Ω Megabox Resistance $500 Ω$ 0.18 Ω Resistance Resistance $1 kΩ$ 0.014 kΩ Resistance Resistance $100 kΩ$ 0.022 kΩ Int Int Resistance $100 kΩ$ 0.023 MΩ Int Int Resistance $100 MΩ$ 0.022 MΩ Int Int Int Resistance $-130 °C to 800 °C$ 0.89 °C Electrical Simulation of Themocouple $-60 °C to 1000 °C$ 0.26 °C Simulation of Themocouple Intermocouple $-40 °C to 1000 °C$ 0.26 °C Simulation of Themocouple Intermocouple $-40 °C to 130 °C$ 1.2 °C Output Output Intermocouple Intermocouple Equipment to 0 mV to 329.99 mV 0.005 % of reading + 5 µV Multicalibrator DC Voltage ^{FO} 3299 90 mA to 32.999 PM 0.013 % of reading + 0.05 µA Multicalibrator Measurement DC to 1020 V 0.005 5 % of reading + 1500 µV Multicalibrator <td>Equipment to Output DC High Voltage (Hy-Pot)⁰</td> <td>1 kV to 6 kV</td> <td>0.1 kV</td> <td>Fluke 177 Multimeter Fluke 80K-40</td> <td></td>	Equipment to Output DC High Voltage (Hy-Pot) ⁰	1 kV to 6 kV	0.1 kV	Fluke 177 Multimeter Fluke 80K-40	
Measurement Resistance ^{F0} 500 Ω 0.18 Ω Resistance $I kΩ$ 0.014 kΩ 0.022 kΩ 0.022 kΩ $I00 kΩ$ 0.022 kΩ 0.023 MΩ 0.015 MΩ $I0MΩ$ 0.022 MΩ 0.015 MΩ 0.021 MΩ $I0MΩ$ 0.022 MΩ 0.014 MΩ 0.021 MΩ $I0MΩ$ 0.022 MΩ 0.014 MΩ 0.014 MΩ Temperature -130 °C to 800 °C 0.89 °C Electrical ad Control Equipment -60 °C to 1000 °C 0.26 °C Simulation of -40 °C to 1200 °C 0.77 °C Thermocouple Simulation of Tequipment to 0 mV to 329.99 mV 0.006 % of reading + 3 µV Simulation of 3.299 V to 32.999 V 0.005 % of reading + 50 µV Multicalibrator DC Voltage ^{FO} 3.299 V to 32.999 V 0.005 % of reading + 0.05 µA Multicalibrator Bequipment to Up to 3.299 9 mA to 32.999 9 mA 0.01 % of reading + 0.05 µA Multicalibrator DC Current ^{FO} 3.299 9 mA to 32.999 9 mA 0.01 % of reading + 0.05 µA Supp 9 mA to 32.999 9 mA 0.010 % of reading + 0.05 µA	Equipment to	100 Ω	0.03 Ω	Megabox	
Resistance I kΩ 0.014 kΩ I0 kΩ 0.022 kΩ I00 kΩ 0.02 kΩ IMΩ 0.015 MΩ I0 MΩ 0.022 MΩ I0 MΩ 0.022 MΩ I0 MΩ 0.022 MΩ IGΩ 0.014 MΩ IGΩ 0.026 °C -60 °C to 1000 °C 0.26 °C -60 °C to 1000 °C 0.26 °C -40 °C to 1200 °C 0.77 °C Thermocouple Type E -140 °C to 130 °C I0 mV to 329.99 mV 0.0005 % of reading + 3 μV 329.99 mV to 32.999 V 0.005 % of reading + 50 μV 329 V to 32.999 V 0.005 % of reading + 500 μV I00 V to 120 V 0.005 5 % of reading + 0.05 μA Measurement 0.01 % of reading + 0.05 μA 329.999 mA to 32.999 9 mA 0.01 % of reading + 0.05 μA 329.999 mA to 32.999 9 mA 0.01 % of reading + 0.	Measurement Registered ^{FO}	500 Ω	0.18 Ω	Resistance	
$ \begin{array}{ c c c c c c } \hline I0 \ k\Omega & 0.022 \ k\Omega & 0.02 \ k\Omega & 0.02 \ k\Omega & 0.02 \ k\Omega & 0.015 \ M\Omega & 0.023 \ M\Omega & 0.0015 \ M\Omega & 0.023 \ M\Omega & 0.002 \ M\Omega & 0.022 \ M\Omega & 0.000 \ M\Omega & 0.022 \ M\Omega & 0.022 \ M\Omega & 0.0014 \ M\Omega & 0.022 \ M\Omega & 0.014 \ M\Omega & 0.022 \ M\Omega & 0.014 \ M\Omega & 0.022 \ M\Omega & 0.014 \ M\Omega & 0.023 \ M\Omega & 0.014 \ M\Omega & 0.022 \ M\Omega & 0.014 \ M\Omega & 0.023 \ M\Omega & 0.014 \ M\Omega & 0.023 \ M\Omega & 0.014 \ M\Omega & 0.023 \ M\Omega & 0.014 \ M\Omega & 0.014 \ M\Omega & 0.024 \ M\Omega & 0.016 \ \% \ O^{-1} \ O^{$	Resistance	1 kΩ	0.014 kΩ		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		10 kΩ	0.022 kΩ		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		100 kΩ	0.02 kΩ		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		1 MΩ	0.015 ΜΩ		
$ \begin{array}{ c c c c c c c } \hline 100 \ M\Omega & 0.022 \ M\Omega \\\hline 1 \ G\Omega & 0.014 \ M\Omega \\\hline 1 \ G\Omega & 0.014 \ M\Omega \\\hline \hline 1 \ G\Omega & 0.014 \ M\Omega \\\hline \hline 1 \ G\Omega & 0.014 \ M\Omega \\\hline \hline 1 \ G\Omega & 0.014 \ M\Omega \\\hline \hline 1 \ G\Omega & 0.014 \ M\Omega \\\hline \hline 1 \ G\Omega & 0.014 \ M\Omega \\\hline \hline 1 \ G\Omega & 0.016 \ M\Omega & 0.014 \ M\Omega \\\hline \hline 1 \ G\Omega & 0.010 \ ^{\circ}C & 0.89 \ ^{\circ}C \\\hline \hline 0 \ ^{\circ}C \ to \ 1 \ 000 \ ^{\circ}C & 0.26 \ ^{\circ}C \\\hline \hline 0 \ ^{\circ}C \ to \ 1 \ 000 \ ^{\circ}C & 0.26 \ ^{\circ}C \\\hline \hline 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.77 \ ^{\circ}C \\\hline \hline 1 \ 40 \ ^{\circ}C \ to \ 1 \ 200 \ ^{\circ}C & 0.005 \ ^{\circ}S \ of \ reading \ + 3 \ \muV \\\hline \hline 3 \ 29.99 \ MV \ to \ 3.299 \ V \\\hline \hline 3 \ 0 \ V \ to \ 32.999 \ V \\\hline 0 \ V \ to \ 32.999 \ V \\\hline 0.005 \ 5 \ ^{\circ}S \ of \ reading \ + \ 500 \ \muV \\\hline \hline 100 \ V \ to \ 32.999 \ 9 \ MA \ 0.01 \ ^{\circ}S \ of \ reading \ + \ 0.05 \ \muA \\\hline \hline 3 \ 2.999 \ 9 \ MA \ to \ 32.999 \ 9 \ MA \ 0.01 \ ^{\circ}S \ of \ reading \ + \ 3.2 \ \muA \\\hline \hline 10 \ V \ to \ 32.999 \ 9 \ MA \ 0.01 \ ^{\circ}S \ of \ reading \ + \ 3.2 \ \muA \\\hline \hline 10 \ V \ to \ 32.999 \ 9 \ MA \ 0.01 \ ^{\circ}S \ of \ reading \ + \ 3.2 \ \muA \\\hline \hline 10 \ V \ to \ 32.999 \ 9 \ A \ 0.01 \ ^{\circ}S \ of \ reading \ + \ 3.2 \ \muA \\\hline \hline 10 \ V \ to \ 12.99 \ 9 \ A \ 0.01 \ ^{\circ}S \ of \ reading \ + \ 3.2 \ \muA \ \ 1 \ A \ A \ A \ A \ A \ A \ A \ A $		10 ΜΩ	0.023 ΜΩ		
		100 MΩ	0.022 ΜΩ		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		1 GΩ	0.014 ΜΩ		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Temperature	-130 °C to 800 °C	0.89 °C	Fluke 5500A	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Calibration Indication	-60 °C to 1 000 °C	0.26 °C	Electrical	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	and Control Equipment	-40 °C to 1 200 °C	0.77 °C	Simulation of Thermocouple	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Thermocouple Type E	-140 °C to 130 °C	1.2 °C	Output	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Equipment to	0 mV to 329.99 mV	0.006 % of reading + 3 µV	Fluke 5500A	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Measurement	329.99 mV to 3.299 V	0.005 % of reading + 5 µV	Multicalibrator	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	DC Voltage ¹⁰	3.299 V to 32.999 V	0.005 % of reading + 50 µV	•	
$ \begin{array}{ c c c c c c c } \hline 100 \ V \ to \ 1 \ 020 \ V \\ \hline 100 \ V \ to \ 100 \ 020 \ V \\ \hline 100 \ V \ 0 \ V \ 0 \ 020 \ V \\ \hline 100 \ V \ 0 \ V \ 0 \ 020 \ V \\ \hline 100 \ V \ 0 \ V \ 0 \ 020 \ V \\ \hline 100 \ V \ 020 \ V \\ \hline 100 \ V \ 020 \ V \\ \hline 100 \ V \ 020 \ V \\ \hline 100 \ V \ 020 \ V \\ \hline 100 \ V \ 020 \ V \ 0 \ 020 \ V \\ \hline 100 \ V \ 020 \ V \ 020 \ V \\ \hline 100 \ V \ 020 \ V \ 020 \ V \\ \hline 100 \ V \ 020 \ 020 \ V \ 020$		30 V to 329.99 V	0.005 5 % of reading + 500 µV	•	
$ \begin{array}{c c} \mbox{Equipment to} & \mbox{Up to } 3.299 \ 99 \ mA & 0.013 \ \% \ of \ reading + 0.05 \ \muA \\ \hline 3.299 \ 99 \ mA \ to \ 32.999 \ 9 \ mA & 0.01 \ \% \ of \ reading + 0.25 \ \muA \\ \hline 32.999 \ 9 \ mA \ to \ 329.999 \ mA & 0.01 \ \% \ of \ reading + 3.3 \ \muA \\ \hline 329.999 \ mA \ to \ 329.999 \ mA & 0.03 \ \% \ of \ reading + 44 \ \muA \\ \hline 2.199 \ 99 \ A \ to \ 11 \ A & 0.06 \ \% \ of \ reading + 330 \ \muA \\ \hline \ Equipment \ to \ Measure Resistance^{FO} & 0 \ \Omega \ to \ 10.999 \ \Omega & 0.012 \ \% \ of \ reading + 0.001 \ 5 \ \Omega \\ \hline \ \ Huke \ 5500A \\ Multicalibrator \\ \hline \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$		100 V to 1 020 V	0.005 5 % of reading + 1 500 μV		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Equipment to	Up to 3.299 99 mA	0.013 % of reading + 0.05 µA		
$ \begin{array}{c c} \hline DC \ Current^{10} & \hline 32.999 \ 9 \ mA \ to \ 329.999 \ mA \\ \hline 329.999 \ mA \ to \ 329.999 \ mA \\ \hline 329.999 \ mA \ to \ 2.199 \ 99 \ A \\ \hline 2.199 \ 99 \ A \ to \ 11 \ A \\ \hline 2.199 \ 99 \ A \ to \ 11 \ A \\ \hline 0.06 \ \% \ of \ reading + 330 \ \muA \\ \hline 11 \ \Omega \ to \ 32.999 \ \Omega \\ \hline 0.012 \ \% \ of \ reading + 0.001 \ S \ \Omega \\ \hline Multicalibrator \\ \hline Multicalibrator \\ \hline 33 \ \Omega \ to \ 109.999 \ \Omega \\ \hline 0.009 \ \% \ of \ reading + 0.001 \ S \ \Omega \\ \hline \end{array} $	Measurement	3.299 99 mA to 32.999 9 mA	0.01 % of reading + 0.25 µA	•	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	DC Current ^{ro}	32.999 9 mA to 329.999 mA	0.01 % of reading + 3.3 μA	•	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		329.999 mA to 2.199 99 A	0.03 % of reading + 44 µA	•	
$ \begin{array}{c} \mbox{Equipment to Measure} \\ \mbox{Resistance}^{FO} \end{array} & \begin{array}{c} 0 \ \Omega \ \mbox{to } 10.999 \ \Omega \\ \hline 11 \ \Omega \ \mbox{to } 32.999 \ \Omega \\ \hline 33 \ \Omega \ \mbox{to } 109.999 \ \Omega \end{array} & \begin{array}{c} 0.012 \ \% \ \mbox{of reading } + \ 0.001 \ \mbox{5} \ \Omega \\ \hline 0.009 \ \% \ \mbox{of reading } + \ 0.001 \ \mbox{5} \ \Omega \\ \hline \end{array} & \begin{array}{c} \mbox{Fluke } 5500 \ \mbox{A} \\ \mbox{Multicalibrator} \\ \hline \end{array} \\ \end{array} $		2.199 99 A to 11 A	0.06 % of reading+ 330 μA		
ResistanceFO 11Ω to 32.999Ω 0.012% of reading + $0.001 5 \Omega$ Multicalibrator 33Ω to 109.999Ω 0.009% of reading + $0.001 5 \Omega$	Equipment to Measure	0 Ω to 10.999 Ω	0.012 % of reading + 0.008 Ω	Fluke 5500A	1
33 Ω to 109.999 Ω 0.009 % of reading + 0.001 5 Ω	Resistance ^{FO}	11 Ω to 32.999 Ω	0.012 % of reading + 0.001 5 Ω	Multicalibrator	
		33 Ω to 109.999 Ω	0.009 % of reading + 0.001 5 Ω		

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Calidad Mx, S.A. de C.V. Av. López Mateos # 1001, Local 203 Altos, Col. 21 de Enero Guadalupe, Nuevo León, México C.P. 67160 Contact: Alejandro Lujan Phone: (52) 818-379-2710

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

Electrical				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to	110 Ω to 329.999 Ω	0.009 % of reading + 0.001 5 Ω	Fluke 5500A	CENAM Technical
Measure Resistance ^{FO}	330 Ω to 1.099 99 k Ω	0.009 % of reading + 0.06 Ω	Multicalibrator	Guide
	$1.1 \text{ k}\Omega$ to $3.299 99 \text{ k}\Omega$	0.009 % of reading + 0.06 Ω		
	$3.3~k\Omega$ to $10.999~9~k\Omega$	0.009 % of reading + 0.6 Ω		
	11 kΩ to 32.999 9 kΩ	0.009 % of reading + 0.6 Ω		
	33 k Ω to 109.999 k Ω	0.011 % of reading + 6 Ω		
	110 kΩ to 329.999 kΩ	0.012 % of reading + 6 Ω		
	330 k Ω to 1.099 99 M Ω	0.015 % of reading + 55 Ω		
	1.1 MΩ to 3.299 99 MΩ	0.015 % of reading + 55 Ω		
	3.3 M\Omega to 10.999 9 MΩ	0.06 % of reading + 550 Ω		
	11 MΩ to 32.999 9 MΩ	0.1 % of reading + 550 Ω		
	33 MΩ to 109.999 MΩ	0.5 % of reading + 5 500 Ω		
	110 MΩ to 330 MΩ	0.5 % of reading + 16 500 Ω		
Equipment to Measure				
AC Voltage	-FO			
10 Hz to 45 Hz	1 mV to 32 999 mV	0.35% of reading ± 20 µV		
45 kHz to 10 kHz	1 mV to 32.999 mV	0.15% of reading $\pm 20 \mu$ V		
10 kHz to 20 kHz	1 mV to 32.999 mV	0.2% of reading $\pm 20 \mu V$		
20 kHz to 50 kHz	1 mV to 32.999 mV	0.25% of reading $\pm 20~\mu$ V		
50 kHz to 100 kHz	1 mV to 32.999 mV	0.35% of reading $\pm 33\mu$ V		
100 kHz to 500 kHz	1 mV to 32.999 mV	1% of reading + 60 µV		
Fauinment to Massure	1 111 (0 52.999 111)			
AC Voltage				
At the listed frequencies	s ^{FO}			
10 Hz to 45 Hz	33 mV to 329.999 mV	0.25 % of reading + 50 μ V		
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 μ V		
20 kHz to 50 kHz	33 mV to 329.999 mV	0.16 % of reading + 40 μ V		
50 kHz to 100 kHz	33 mV to 329.999 mV	0.24 % of reading + 170 μ V		
100 kHz to 500 kHz	33 mV to 329.999 mV	0.7 % of reading + 330 μ V		
Equipment to Measure AC Voltage	sFO			
10 Hz to 45 Hz	0.33 V to 3.299 99 V	0.15 % of reading + 250 µV		
	1		1	1

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Calidad Mx, S.A. de C.V. Av. López Mateos # 1001, Local 203 Altos, Col. 21 de Enero Guadalupe, Nuevo León, México C.P. 67160 Contact: Alejandro Lujan Phone: (52) 818-379-2710

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

1 1		
	еспола	
	couroar	

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (+)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure AC Voltage	es ^{FO}		Fluke 5500A Multicalibrator	CENAM Technical Guide
45 kHz to 10 kHz	0.33 V to 3.299 99 V	0.03 % of reading + 60 μ V		
10 kHz to 20 kHz	0.33 V to 3.299 99 V	0.08 % of reading + 60 μ V		
20 kHz to 50 kHz	0.33 V to 3.299 99 V	0.14 % of reading + 300 μV		
50 kHz to 100 kHz	0.33 V to 3.299 99 V	0.24 % of reading + 1 700 μV		
100 kHz to 500 kHz	0.33 V to 3.299 99 V	0.5 % of reading + 3 300 μV		
Equipment to Measure AC Voltage At the listed frequenci	e es ^{FO}			
10 Hz to 45 Hz	3.3 V to 32.999 9 V	0.15 % of reading + 2 500 μV		
45 kHz to 10 kHz	3.3 V to 32.999 9 V	0.04 % of reading + 600 µV		
10 kHz to 20 kHz	3.3 V to 32.999 9 V	0.08 % of reading + 2 600 µV		
20 kHz to 50 kHz	3.3 V to 32.999 9 V	0.19 % of reading + 5 000 μV		
50 kHz to 100 kHz	3.3 V to 32.999 9 V	0.24 % of reading + 17 000 μ V		
Equipment to Measure AC Voltage At the listed frequenci	es ^{FO}		•••	
45 Hz to 1 kHz	33 V to 329.999 9 V	0.05 % of reading + 6 600 μV		
1 kHz to 10 kHz	33 V to 329.999 9 V	0.08 % of reading + 15 000 μ V		
10 kHz to 20 kHz	33 V to 329.999 9 V	0.09 % of reading + 33 000 μ V		
Equipment to Measure AC Voltage At the listed frequenci	e es ^{FO}			
45 Hz to 1 kHz	330 V to 1 020 V	0.05 % of reading + 80 000 μV		
1 kHz to 5 kHz	330 V to 1 020 V	0.2 % of reading + 100 000 μV		
5 kHz to 10 kHz	330 V to 1 020 V	0.2 % of reading + 500 000 μ V		
Equipment to Measure AC Current At the listed frequence	es ^{FO}			
10 Hz to 20 Hz	0.029 mA to 0.329 99 mA	0.25 % of reading + 0.15 μ A]	
20 Hz to 45 Hz	0.029 mA to 0.329 99 mA	0.13 % of reading + 0.15 μA		
45 Hz to 1 kHz	0.029 mA to 0.329 99 mA	0.13 % of reading + 0.25 µA]	
1 kHz to 5 kHz	0.029 mA to 0.329 99 mA	0.4% of reading + 0.15 μ A]	
5 kHz to 10 kHz	0.029 mA to 0.329 99 mA	1.3 % of reading + 0.15 μa		

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Calidad Mx, S.A. de C.V. Av. López Mateos # 1001, Local 203 Altos, Col. 21 de Enero Guadalupe, Nuevo León, México C.P. 67160 Contact: Alejandro Lujan Phone: (52) 818-379-2710

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

Electrical				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure			Fluke 5500A	CENAM Technical
AC Current			Multicalibrator	Guide
At the listed frequencies ^{FO}				
10 Hz to 20 Hz	0.33 mA to 3.299 9 mA	0.2 % of reading + 0.3 µA		
20 Hz to 45 Hz	0.33 mA to 3.299 9 mA	0.1 % of reading + 0.3 μ A		
45Hz to 1 kHz	0.33 mA to 3.299 9 mA	0.1 % of reading + 0.3 μ A		
1 kHz to 5 kHz	0.33 mA to 3.299 9 mA	0.2 % of reading + 0.3 μ A		
5 kHz to 10 kHz	0.33 mA to 3.299 9 mA	0.6 % of reading + 0.3 μa		
Equipment to Measure AC Current At the listed frequencies ^{FO}				
10 Hz to 20 Hz	3.3 mA to 32.999 9 mA	0.2 % of reading + 3 μ A	2	
20 Hz to 45 Hz	3.3 mA to 32.999 9 mA	0.1 % of reading + 3 μ A		
45Hz to 1 kHz	3.3 mA to 32.999 9 mA	0.09 % of reading + 3 μA		
1 kHz to 5 kHz	3.3 mA to 32.999 9 mA	0.2 % of reading + 3 μ A		
5 kHz to 10 kHz	3.3 mA to 32.999 9 mA	0.6 % of reading + 3 μa		
Equipment to Measure AC Current At the listed frequencies ^{FO}				
10 Hz to 20 Hz	33 mA to 329.999 mA	0.2 % of reading + 30 μ A		
20 Hz to 45 Hz	33 mA to 329.999 mA	0.1 % of reading + 30 μ A		
45Hz to 1 kHz	33 mA to 329.999 mA	0.09 % of reading + 30 μA		
1 kHz to 5 kHz	33 mA to 329.999 mA	0.2 % of reading + 30 µA		
5 kHz to 10 kHz	33 mA to 329.999 mA	0.6 % of reading + 30 μa		
Equipment to Measure AC Current At the listed frequencies ^{FO}				
10 Hz to 45 Hz	0.33 A to 2.199 99 A	0.2 % of reading + 300 μA		
45 Hz to 1 kHz	0.33 A to 2.199 99 A	0.1 % of reading + 300 µA		
1 kHz to 5 kHz	0.33 A to 2.199 99 A	0.75 % of reading + 300 μA		
Equipment to Measure AC Current At the listed frequencies ^{FO}				
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 µA		
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Calidad Mx, S.A. de C.V. Av. López Mateos # 1001, Local 203 Altos, Col. 21 de Enero Guadalupe, Nuevo León, México C.P. 67160

Contact: Alejandro Lujan Phone: (52) 818-379-2710

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

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure	0.33 nF to 0.4999 nF	0.5 % of reading + 0.01 pF	Fluke 5500A	Eurament_cg-11
Capacitance ^{FO}	0.5 nF to 1.0999nF	0.5 % of reading + 0.01 pF	Multicalibrator	CENAM Technical
	1.1 nF to 3.2999 nF	0.5 % of reading + 0.01 pF	Eurament_cg-11	Guide
	3.3 nF to 10.999nF	0.5 % of reading + 0.01 pF		
	11 nF to 32.999 nF	0.25 % of reading + 0.1 pF		
	33 nF to 109.99 nF	0.25 % of reading + 0.1 pF		
	110 nF to 329.99 nF	0.25 % of reading + 0.3 pF		
	0.33 µF to 1.0999 µF	0.25 % of reading + 1 pF		
	1.1 μF to 3.2999 μF	0.35 % of reading + 3 pF		
	3.3 μF to 10.999 μF	0.35 % of reading + 10 nF		
	11 μF to 32.999 μF	0.4 % of reading + 30 nF	0	
	33 µF to 109.99 µF	0.5 % of reading + 100 nF		
	110 μF to 329.99 μF	0.7 % of reading + 300 nF		
	0.33 mF to 1.1 mF	1 % of reading + 300 nF	K.	
Equipment to Measure	0.01 Hz to 119.99 Hz	0.000 025 Hz		
Frequency ^{FO}	120 Hz to 1199.9 Hz	0.000 025 Hz		
	1.2 kHz to 11.999 kHz	0.016 Hz		
	12 kHz to 119.99 kHz	0.016 Hz		
	120 kHz to 1199.9 kHz	0.016 Hz		
	1.2 MHz to 2 MHz	0.016 Hz		
Temperature Calibration	600 °C to 800 °C	0.44 °C	Fluke 5500A	
Indication and Control	800 °C to 1 000 °C	0.34 °C	Multicalibrator	
Thermocouple Type B ^{FO}	1 000 °C to 1 550 °C	0.3 °C	Simulation of	
	1 550 °C to 1 820 °C	0.33 °C	Thermocouple	
Temperature Calibration	0 °C to 150 °C	0.3 °C	Output	
Indication and Control	150 °C to 650 °C	0.26 °C		
Thermocouple Type C ^{FO}	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	-250 °C to -100 °C	0.5 °C		
Indication and Control	-100 °C to -25 °C	0.16 °C		
Thermocouple Type E ^{FO}	-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		
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Guadalupe, Nuevo León, México C.P. 67160 Contact: Alejandro Lujan Phone: (52) 818-379-2710

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Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration	-210 °C to -100 °C	0.27 °C	Fluke 5500A	Eurament_cg-11
Indication and Control Equipment used with Thermocouple Type J ^{FO}	-100 °C to -30 °C	0.16 °C	Multicalibrator	CENAM Technical
	-30 °C to 150 °C	0.14 °C	Thermocouple Output	Guide
inennocoupie Type t	150 °C to 760 °C	0.17 °C		
	760 °C to 1 200 °C	0.23 °C		
Temperature Calibration	-200 °C to -100 °C	0.33 °C		
Indication and Control	-100 °C to -25 °C	0.18 °C		
Thermocouple Type K ^{FO}	-25 °C to 120 °C	0.16 °C		
inennocoupie Type II	120 °C to 1 000 °C	0.26 °C		
	1 000 °C to 1 372 °C	0.4 °C		
Temperature Calibration	-200 °C to -100 °C	0.37 °C	\square	
Indication and Control	-100 °C to 800 °C	0.26 °C		
Equipment used with Thermocouple Type L ^{FO}	800 °C to 900 °C	0.17 °C		
Temperature Calibration	-200 °C to -100 °C	0.4 °C		
Indication and Control	-100 °C to -25 °C	0.22 °C		
Equipment used with Thermocouple Type N ^{FO}	-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	0 °C to 250 °C	0.57 °C		
Indication and Control	250 °C to 400 °C	0.35 °C		
Equipment used with Thermocouple Type R ^{FO}	400 °C to 1 000 °C	0.33 °C		
Thermoeouple Type R	1 000 °C to 1 767 °C	0.4 °C		
Temperature Calibration	0 °C to 250 °C	0.47 °C		
Indication and Control	250 °C to 1 000 °C	0.36 °C		
Equipment used with Thermocouple Type S ^{FO}	1 000 °C to 1 400 °C	0.37 °C		
Thermocoupie Type 5	1 400 °C to 1 767 °C	0.46 °C		
Temperature Calibration	-250 °C to -150 °C	0.63 °C		
Indication and Control Equipment used with	-150 °C to 0 °C	0.24 °C		
	0 °C to 120 °C	0.16 °C		
Thermocoupie Type T	120 °C to 400 °C	0.14 °C		
Temperature Calibration	-200 °C to 0 °C	0.56 °C	1	
Indication and Control Equipment used with Thermocouple Type U ^{FO}	0 °C to 600 °C	0.27 °C		
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MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION OR MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration	-200 °C to -80 °C	0.05 °C	Fluke 5500A	Eurament_cg-11
Indication and Control	-80 °C to 0 °C	0.05 °C	Multicalibrator	CENAM Technical
RTD Pt 385, 100 Ω^{FO}	0 °C to 100 °C	0.07 °C	of	Uuide
,	100 °C to 300 °C	0.09 °C	RTD Output	
	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	-200 °C to -80 °C	0.05 °C		
Indication and Control	-80 °C to 0 °C	0.05 °C		
RTD Pt 3926, 100 Ω^{FO}	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	-200 °C to -190 °C	0.25 °C		
Indication and Control	-190 °C to -80 °C	0.04 °C		
RTD Pt 3916, 100 Ω^{FO}	-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	J	
	400 °C to 600 °C	0.1 °C		
2	600 °C to 630 °C	0.23 °C		
Temperature Calibration	-200 °C to -80 °C	0.04 °C		
Indication and Control	-80 °C to 0 °C	0.04 °C		
RTD Pt 385, 200 Ω^{FO}	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		
Temperature Calibration	-200 °C to -80 °C	0.04 °C		
Indication and Control	-80 °C to 0 °C	0.05 °C		
RTD Pt 385, 500 Ω^{FO}	0 °C to 100 °C	0.05 °C		

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Electrical				
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Temperature Calibration	100 °C to 260 °C	0.06 °C	Fluke 5500A	Eurament_cg-11
Indication and Control	260 °C to 300 °C	0.08 °C	Multicalibrator	CENAM Technical
RTD Pt 385 500 O ^{FO}	300 °C to 400 °C	0.08 °C	of RTD Output	Guide
R1D 11 505, 500 22	400 °C to 600 °C	0.09 °C	of RTD Output	
	600 °C to 630 °C	0.11 °C		
Temperature Calibration	-200 °C to -80 °C	0.03 °C		
Indication and Control Equipment used with RTD Pt 385, 1,000 O ^{FO}	-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	0	
	400 °C to 600 °C	0.07 °C		
Temperature Calibration	600 °C to 630 °C	0.23 °C		
Indication and Control	-80 °C to 0 °C	0.08 °C		
RTD Pt Ni 385, 120 Ω^{FO}	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 Pt Cu 427, 10 Ω^{FO}	-100 °C to 260 °C	0.3 °C		
Equipment to Output	Up to 100 mV	0.005 % of reading + 0.003 5	Agilent Multimeter	EL-024, EL-025
AC Voltage	100 mV to 1 V	0.004% of reading $\pm 0.000.7$	34401A	
		% range		
	1 V to 10 V	0.0035% of reading $+0.000$		
		5 % range		
	10 V to 100 V	0.004 5 % of reading + 0.000		
	100 14 1 000 14	6 % range		
	100 V to 1 000 V	0.004 5 % of reading + 0.001 % range		
Equipment to Output AC Voltage At the listed frequencies ^{FO}	L	70 Tange		
3 Hz to 5 Hz	Up to 100 mV	1 % of reading + 0.04 range		
5 Hz to 10 Hz	Up to 100 mV	0.35 % of reading + 0.04		
		range		
10 Hz to 20 kHz	Up to 100 mV	0.06 % of reading $+$ 0.04		
	<u>I</u>	range	L	1

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Equipment to Output			Agilent Multimeter	EL-024, EL-025
AC Voltage			34401A	
At the listed frequencie	s ^{FO}			
20 kHz to 50 kHz	Up to 100 mV	0.12 % of reading + 0.04 range		
50 kHz to 100 kHz	Up to 100 mV	0.6 % of reading + 0.08 range		
100 kHz to 300 kHz	Up to 100 mV	4 % of reading + 0.5 range		
Equipment to Output			Agilent Multimeter	EL-024, EL-025
AC Voltage	50		34401A	
At the listed frequencies ^{FO}				
3 Hz to 5 Hz	1 V to 750 V	1% of reading $+0.03$ range		
5 Hz to 10 Hz	1 V to 750 V	0.35 % of reading + 0.03 range		
10 Hz to 20 kHz	1 V to 750 V	0.06 % of reading + 0.03 range		
20 kHz to 50 kHz	1 V to 750 V	0.12 % of reading + 0.04 range	1	
50 kHz to 100 kHz	1 V to 750 V	0.6 % of reading + 0.08 range		
100 kHz to 300 kHz	1 V to 750 V	4 % of reading + 0.5 range		
Equipment to Voltage Direct Current ^{FO}	Up to 10 mA	0.05 % of reading + 0.02 range		
	10 mA to 100 mA	0.05 % of reading + 0.005 range		
	100 mA to 1 A	0.1 % of reading + 0.01 range		
	1 A to 3 A	0.12 % of reading + 0.02 range		
Equipment to Output AC Current At the listed frequencie	s ^{FO}			
3 Hz to 5 Hz	Up to 1 A	1 % of reading + 0.04 range		
5 Hz to 10 Hz	Up to 1 A	0.3 % of reading + 0.04 range		
10 Hz to 5 kHz	Up to 1 A	0.1 % of reading + 0.04 range		
Equipment to Output AC Current At the listed frequencie	s ^{FO}			
3 Hz to 5 Hz	Up to 3 A	1.1 % of reading + 0.06 range		
5 Hz to 10 Hz	Up to 3 A	0.35 % of reading + 0.06 range		
10 Hz to 5 kHz	Up to 3 A	0.15 % of reading + 0.06 range		
Equipment to Output	3 Hz to 5 Hz	0.1 % of reading		
Frequency ^{FO}	5 Hz to 10 Hz	0.05 % of reading		
	10 Hz to 40 Hz	0.03 % of reading		
	40 Hz to 300 KHz	0.01 % of reading		

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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.