



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Accredian, S. de R.L. de C.V.
Calle 24 No. 600, Col. Residencial Las Puentes 3er Sector
San Nicolas de los Garza, Nuevo León, México. C.P 66460

(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, Mass, Force and Weighing Devices, Mechanical, Thermodynamic, Time and Frequency, Electrical, Chemical, Optical 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

Initial Accreditation Date:

February 06, 2020

Issue Date:

April 21, 2022

Expiration Date:

May 31, 2024

Revision Date:

February 2, 2023

Accreditation No.:

107088

Certificate No.:

L22-299-R2

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

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



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Calle 24 No. 600, Col. Residencial Las Puentes 3er Sector
 San Nicolas de los Garza, Nuevo León, México. C.P 66460
 Contact Name: Erick Ramirez Phone: 81-3186-4994

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

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
Micrometer Head ^F	Up to 50 mm	$(0.8 + 1 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 NMX-CH-093
Outside Micrometer ^F	Up to 2 000 mm	$(0.9 + 0.006L) \mu\text{m}$	
Inside Micrometer ^F	Up to 1 200 mm	$(0.8 + 0.005L) \mu\text{m}$	
Depth Micrometers ^F	Up to 300 mm	$(0.8 + 0.004L) \mu\text{m}$	
Calipers, Vernier Dial and Digital ^F	Up to 2 000 mm	$(8.5 + 0.003L) \mu\text{m}$	Gauge Blocks Set NMX-CH-093
Dial and Digital Indicators ^F	Up to 100 mm	$(0.6 + 0.003L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 NMX-CH-463 NMX-CH-149
Dial Test Indicator ^F	Up to 2 mm	$0.8 \mu\text{m}$	
Dial and Digital Bore Gage ^F	0.95 to 50 mm	$(0.8 + 0.001L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 NMX-CH-141
Height Gages Vernier, Dial and Digital ^F	Up to 1 200 mm	$(2.9 + 0.004L) \mu\text{m}$	
Pin Gages ^F	0.05 mm to 534 mm	$(0.5 + 0.005L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 Euramet cg-6
Standard Wire Gage ^F	0.018 mm to 5 mm	$(0.5 + 2 \times 10^{-4}L) \mu\text{m}$	
Setting Micrometer Standard ^F	25 mm to 1 200 mm	$(0.4 + 0.006L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 JIS B 7545
Steel Thickness Gages ^F	0.04 mm to 1 mm	$0.5 \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 JIS B 7524
Thread Plug Gages and Spline Gages Pitch Diameter ^F	0.6 mm to 500 mm	$(8 + 5 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 ANSI B92.1 / DIN 5480 ANSI/ASME B1.2
Plastic Standard Coating Thickness Gages ^F	0.023 mm to 5.2 mm	$(0.5 + 4 \times 10^{-4}L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 ASTM-D-1005



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Threaded Ring Gages ^F	1.2 mm to 300 mm	$(0.5 + 5 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 ANSI/ASME B1.2
Cylindrical Ring Gages ^F	5 mm to 300 mm	$(0.5 + 5 \times 10^{-3}L) \mu\text{m}$	
Coating Thickness Gages ^F	0.023 mm to 1.5 mm	$(0.02 + 1.3L) \mu\text{m}$	Foil Thickness Standard DEFLESCO CSS ASTM D7091
	0.377 mm to 5.2 mm	$(0.03 + 1.3L) \mu\text{m}$	Foil Thickness Standard DEFLESCO STDP1 ASTM D7091
Steel Blocks Gages Grade 1 and 2 ^F	1 mm to 10 mm	$(0.2 + 8 \times 10^{-4}L) \mu\text{m}$	Blocks Standard Grade 0 Nano Digital Indicator NMX-CH-3650
	10 mm to 25 mm	$(0.1 + 4 \times 10^{-3}L) \mu\text{m}$	
	25 mm to 50 mm	$(0.2 + 3 \times 10^{-3}L) \mu\text{m}$	
	50 mm to 75 mm	$(0.03 + 5 \times 10^{-3}L) \mu\text{m}$	
	75 mm to 100 mm	$(0.1 + 4 \times 10^{-3}L) \mu\text{m}$	
Ceramic Blocks Gages Grade 1 and 2 ^F	1 mm to 10 mm	$(0.2 + 7 \times 10^{-4}L) \mu\text{m}$	
	10 mm to 25 mm	$(0.1 + 4 \times 10^{-3}L) \mu\text{m}$	
	25 mm to 50 mm	$(0.2 + 3 \times 10^{-3}L) \mu\text{m}$	
	50 mm to 75 mm	$(0.03 + 5 \times 10^{-3}L) \mu\text{m}$	
	75 mm to 100 mm	$(0.2 + 4 \times 10^{-3}L) \mu\text{m}$	
MeasureTape ^F	Up to 50 m	$(0.21 + 9 \times 10^{-6}L) \text{mm}$	Rule Standard and Reticule JIS B 7512
Surface Roughness Gage (Ra) ^F	0.4 μm	0.058 μm	Precision Roughness Specimen NMX-CH-12179
	2.93 μm	0.063 μm	
	2.97 μm	0.061 μm	
Protractor ^F	0.25° to 90°	0.058°	Angle Blocks Standard NMX-CH-151
Profile Projectors X Axis error Y Axis error ^O	Up to 200 mm	$(0.03 + 4 \times 10^{-5}L) \text{mm}$	Standard Glass Scales Angle Blocks Set JIS B 7184
Radius Gages ^F	0.5 mm to 26 mm	$(5.8 + 0.02L) \mu\text{m}$	Profile Projector QM-DATA ASME Y14.5 CENAM Technical Guide
Pitch Gages ^F	0.25 mm to 7 mm	$(5.8 + 4 \times 10^{-3}L) \mu\text{m}$	
Squares ^F	90°	0.005 1°	



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Profile Projector Angle error ^O	0.25° to 90°	$(0.046 + 2 \times 10^{-5}L)^\circ$	Standard Glass Scales Angle Blocks Set JIS B 7184
Vision System & Microscope ^F X Axis Linearity Y Axis Linearity	0.01 mm to 300 mm 0.01 mm to 300 mm	$(5.8 + 0.9L) \mu\text{m}$ $(5.8 + 0.9L) \mu\text{m}$	Standard Glass Scales JIS B 7184
Surface Plates: Local Area Flatness ^O	250 x 250 mm to 2 500 x 1 600 mm	0.48 μm	Repeat Reading Gage JIS B 7513
Internal Micrometers with Three Point (Holtest) ^F	8 mm to 100.5 mm	$(0.79 + 7 \times 10^{-3}L) \mu\text{m}$	Steel Setting Rings NMX CH-92
Angle Gages ^F	1° to 45°	$(4.6 \times 10^{-3} + 2 \times 10^{-5}L)^\circ$	Profile Projector QM-DATA ASME Y14.5 CENAM Technical Guide
Reticles ^F	Up to 20 mm	$(0.029 + 0.005 \times 10^{-3}L) \text{mm}$	Profile Projector QM-DATA CENAM Technical Guide
Drill & Wire Gages ^F	0.5 mm to 20 mm	$(5.8 + 0.01L) \mu\text{m}$	Profile Projector QM-DATA ASME Y14.5 CENAM Technical Guide
Standards for Screw Thread Micrometers ^F	25 mm to 275 mm	$(0.028 + 1 \times 10^{-4}L) \text{mm}$	Profile Projector QM-DATA ASME Y14.5 CENAM Technical Guide
Weld Fillet Gauge ^F	Up to 50 mm	0.03 mm	Profile Projector QM-DATA ASME Y14.5
Angle Blocks ^F	Up to 90°	$(0.046 + 2 \times 10^{-5}L)^\circ$	
Taper Gages ^F	Up to 200 mm	$(0.065 + 3 \times 10^{-5}L) \text{mm}$	
Diameter Tape ^F	Up to 8 m	$(0.76 + 7.4 \times 10^{-3}L) \mu\text{m}$	Profile Projector QM-DATA and Master Tape ASME Y14.5
Scantling Gages ^F	Up to 1 000 mm	$(0.5 + 6 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 ASME Y14.5
Sieve ^F (Opening Length)	0.02 mm to 127 mm	$(0.03 + 2 \times 10^{-5}L) \text{mm}$	Profile Projector QM-DATA ASTM E11
Laser Distance Meter ^F	Up to 1 200 mm	$(5.8 + 3 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 ISO 16331-1
Telescope Gages ^F (Only max and min values)	Up to 150 mm	$(0.55 + 8.4 \times 10^{-3}L) \mu\text{m}$	
Chamfer Gages ^F	Up to 100 mm	$(0.6 + 3 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, MicTrac 4000 ASME Y14.5



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Tubular Inside Micrometer Micrometer Head ^F	Up to 25 mm	$(0.8 + 4 \times 10^{-4}L) \mu\text{m}$	Precision Gage Calibration System, Mic Trac 4000 JIS B 7508
Tubular Inside Micrometer Extensions Rods ^F	25 mm to 400 mm	$(0.7 + 5 \times 10^{-3}L) \mu\text{m}$	
Height Master ^F	5 mm to 1 010 mm	$(0.7 + 5 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, Mic Trac 4000 NMX-CH-7863
Caliper Checker ^F	Up to 600 mm	$(0.5 + 5 \times 10^{-3}L) \mu\text{m}$	Precision Gage Calibration System, Mic Trac 4000 CENAM Technical Guide
Rules ^F	Up to 1 000 mm	$(0.12 + 3 \times 10^{-4}L) \text{mm}$	Profile Projector QM-DATA NMX-CH-148
Linear Scales (Digital Rulers) ^{FO}	Up to 2 000 mm	$(8.5 + 3 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks Set NMX-CH-093
Ultrasonic Thickness Gage ^F	Up to 12.5 mm	$(0.015 + 1 \times 10^{-4}L) \text{mm}$	Step Block ASTM E797
Levels ^F	Up to 300 mm Sensitivity 0.02 mm/m	0.012 mm	Reference flat surface DIN 877
Dial Gage Testers ^F	Up to 25 mm	$(0.8 + 4 \times 10^{-5}L) \mu\text{m}$	Precision Gage Calibration System, Mic Trac 4000 JIS B 7502

Mass, Force and Weighing Devices

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Scales and Balances ^O	Up to 50 g (Res.= 0.05 mg)	0.064 mg	Weight Set OIML E2 NOM-010-SCFI
	Up to 100 g (Res.= 0.05 mg)	0.089 mg	
	Up to 200 g (Res.= 0.1 mg)	0.17 mg	
	Up to 500 g (Res.= 0.2 mg)	0.39 mg	
	Up to 1 kg (Res.= 2 mg)	3. mg	Weight Set OIML F1 NOM-010-SCFI
	Up to 2 kg (Res.= 5 mg)	6.4 mg	
	Up to 5 kg (Res.= 10 mg)	15 mg	



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Scales and Balances ^O	Up to 10 kg (Res.= 2 g)	1.6 g	Weight Set OIML M1 NOM-010-SCFI
	Up to 20 kg (Res.= 5 g)	4 g	
	Up to 50 kg (Res.= 10 g)	8.1 g	
	Up to 100 kg (Res.= 20 g)	16 g	
	Up to 200 kg (Res.= 50 g)	40 g	
	Up to 500 kg (Res.= 100 g)	80 g	
	Up to 1 000 kg (Res.= 500 g)	0.4 kg	
Floor, Hopper & Scales ^O	Up to 2 000 kg (Res.= 100 g)	0.18 kg	Weight Set OIML M1 and Material Substitution CENAM Technical Guide
	Up to 6 000 kg (Res.= 1 kg)	0.82 kg	
	Up to 10 000 kg (Res.= 1 kg)	1 kg	
Weighth ^F OIML Class F1, M1, M2 and M3 ASTM Class 5, 6 and 7	1 mg	0.067 mg	Weight Set OIML E2 Double Substitution CENAM Technical Guide
	2 mg	0.067 mg	
	5 mg	0.067 mg	
	10 mg	0.083 mg	
	20 mg	0.1 mg	
	50 mg	0.13 mg	
	100 mg	0.17 mg	
	200 mg	0.2 mg	
	500 mg	0.26 mg	
	1 g	0.33 mg	
	2 g	0.4 mg	
	5 g	0.82 mg	Weight Set OIML E2 and F1 Double Substitution CENAM Technical Guide
	10 g	0.83 mg	
	20 g	0.83 mg	
	50 g	0.84 mg	
100 g	0.88 mg		



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Weight ^F OIML Class M1, M2 and M3 ASTM Class 5, 6 and 7	200 g	0.99 mg	Weight Set OIML E2 and F1 Double Substitution CENAM Technical Guide
	500 g	1.6 mg	
	1 kg	2.9 mg	
	2 kg	9.8 mg	
	5 kg	83 mg	
	10 kg	86 mg	
	20 kg	98 mg	
Weight ^F OIML Class F1 and F2 ASTM Class 3 and 4	1 mg	0.007 mg	Weight Set OIML E2 Double Substitution CENAM Technical Guide
	2 mg	0.007 mg	
	5 mg	0.007 mg	
	10 mg	0.008 mg	
	20 mg	0.01 mg	
	50 mg	0.013 mg	
	100 mg	0.017 mg	
	200 mg	0.02 mg	
	500 mg	0.027 mg	
	1 g	0.033 mg	
	2 g	0.04 mg	
	5 g	0.05 mg	
	10 g	0.067 mg	
	20 g	0.083 mg	
	50 g	0.1 mg	
	100 g	0.17 mg	
	200 g	0.33 mg	
500 g	0.83 mg		
1 000 g	1.7 mg		

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
Pressure / Vacuum Gages Air Medium ^{F0}	-1 psi to 1 psi	0.000 34 psi	Pressure Gauge Fluke 700G02 CENAM Technical Guide



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Pressure / Vacuum Gages Air Medium ^{FO}	-12 psi to 0 psi	0.14 psi	Automatic Pressure Calibrator, Fluke 729 CENAM Technical Guide
	Up to 300 psi	0.15 psi	
Pressure Gages Air and Water Medium ^{FO}	Up to 1 000 psi	1.2 psi	Automatic Pressure Calibrator, Fluke 729 w/ Pressure Module CENAM Technical Guide
Pressure Gages Oil Medium ^{FO}	3 000 psi to 30 000 psi	$(1.7 + 5 \times 10^{-5}P)$ psi	Electronic Dead Weight Tester, Fluke 6532-200M CENAM Technical Guide
Torque Tools ^F	0.028 2 N·m to 0.282 N·m	0.4 % of reading	Torque Analyzer PTT 2000 NMX-CH-6789 ISO 6789
	0.28 N·m to 2.82 N·m	0.13 % of reading	
	2.82 N·m to 28.25 N·m	0.14 % of reading	
	13.56 N·m to 135.58 N·m	$(0.15 + 2 \times 10^{-4}Tr)$ % of reading	
	135.6 N·m to 1 355.82 N·m	$(0.11 + 7 \times 10^{-4}Tr)$ % of reading	
Dynamic Viscosity Meters ^{FO}	98.23 cP	0.82 cP	Cannon Standard Oil @ 25°C ASTM D7042
	472.9 cP	3.6 cP	
	6 021 cP	62 cP	
	16 680 cP	2 100 cP	
Kinematic Viscosity Cups: Zahn, Ford, ISO, ASTM, DIN, Gradco, Shell, Frikmar Saybolt ^{FO}	113.9 cSt	0.84 cSt	Cannon Standard Oil ASTM D1200 ASTM D4212
	563.7 cSt	3.7 cSt	
	6 972 cSt	63 cSt	
	Note: All ranges are at 25°C	18 920 cSt	
Rockwell Hardness Tester HRB ^{FO}	20 HRB to 50 HRB	0.4 HRB	Test Block ISO 6508-2 ASTM E18
	50 HRB to 80 HRB	0.26 HRB	
	80 HRB to 100 HRB	0.39 HRB	
Rockwell Hardness Tester HRC ^{FO}	20 HRC to 30 HRC	0.39 HRC	
	30 HRC to 55 HRC	0.34 HRC	
	55 HRC to 70 HRC	0.33 HRC	
Indirect Verification of Leeb Hardness Tester LDF	365 HLD	2.1 HLD	Test Block ASTM A956
Anemometer (Air Flow) ^F	5 m/s to 9 m/s	0.15 m/s	Anemometer Comparison ASTM D 5096



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Force Machines, Gages and Instruments Tension ^{FO}	0.5 kN to 5 kN	0.13 % of reading	Load Cells ISO-7500-1 NMX-CH-7500-1-IMNC ASTM E4
	5 kN to 50 kN	0.18 % of reading	
	30 kN to 300 kN	0.17 % of reading	
Force Machines, Gages and Instruments Compression ^{FO}	0.5 kN to 5 kN	0.13 % of reading	
	5 kN to 50 kN	0.14 % of reading	
	30 kN to 300 kN	0.23 % of reading	
	100 kN to 1 000 kN	0.22 % of reading	
Direct Verification of Durometer Shore Tester Types A, B, E & O ^F	0.55 N to 8.05 N	0.058 N	
Indenter Shore Diameter (Not all Parameters Apply to all of Durometer Types) Durometer Indentor Radius Durometer Indentor Angle Durometer Force Spring ^F Type M Durometer Force Spring ^F Type OO, OOO Durometer Force Spring ^F Type OOO-S Durometer Force Spring ^F Type C, D & DO	0.088 mm to 13 mm Up to 90°	0.03 mm ($4.6 \times 10^{-3} + 2 \times 10^{-5}L$)°	Profile Projector (Res.= 0.1 μ m) ASTM D2240 ISO 21509 Load Cell
	4.445 N to 44.45 N	0.058 N	
	0.324 N to 0.765 N	0.058 N	
	0.203 N to 1.111 N	0.058 N	
	0.167 N to 1.932 N	0.058 N	
	Pipettes ^F	10 mL to 200 mL	
Burettes ^F	10 mL to 100 mL	0.001 9 mL	
Cylinders and Cubic Cups ^F	10 mL to 2 000 mL	0.001 9 mL	
Volumetric Flasks ^F	10 mL to 100 mL	0.001 9 mL	
	100 mL to 1 000 mL	0.018 mL	
Flasks ^F	1 000 mL to 2 000 mL	0.18 mL	
Beakers ^F	50 mL to 2 000 mL	0.09 mL	
Pycnometers ^F	10 mL to 250 mL	0.001 9 mL	
Containers ^F	5 000 mL to 20 000 mL	0.91 mL	



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Micropipettes and Pipettes ^F	1 μ L	0.025 μ L	Gravimetric Method Micro Analytical Balance AND AD-4212B-PT Analytical Balance Ohaus Explorer EX1103 CENAM Technical Guide
	2 μ L	0.025 μ L	
	5 μ L	0.05 μ L	
	10 μ L	0.05 μ L	
	20 μ L	0.04 μ L	
	50 μ L	0.02 μ L	
	100 μ L	0.02 μ L	
	200 μ L	0.06 μ L	
	500 μ L	0.3 μ L	
	1 000 μ L	0.3 μ L	
	2 000 μ L	0.3 μ L	
Density Measuring Device - Liquid Immersion Densimeter ^F	0.6 g/cm ³ to 1.6 g/cm ³	0.3 kg/m ³	Analytical Balance CENAM Technical Guide

Thermodynamic

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Infrared Guns and Cameras ^F	35 °C to 500 °C	(0.18 + 2 x 10 ⁻³ T) °C	Precision Infrared Calibrator Fluke 4181-156 CENAM Technical Guide
Bi-Metallic Thermometers ^{FO}	0 °C (Fusion Point Ice)	0.58 °C	Dry-Well Field Calibrator Fluke 9144 w/PRT Fluke 5609-12-A Euramet cg-20
	8 °C to 50 °C	0.63 °C	Vaisala MI70 & HMP75B Euramet cg-20
	50 °C to 660 °C	(0.65 + 5 x 10 ⁻⁴ T) °C	Dry-Well Field Calibrator Fluke 9144 Euramet cg-20
RTDs, Rods and Probes with Thermocouple J, K, T, E, R, S, B, L U and N ^{FO}	0 °C (Fusion Point Ice)	0.081 °C	Dry-Well Field Calibrator Fluke 9144 w/PRT Fluke 5609-12-A Euramet cg-8
	50 °C to 660 °C	(0.33 + 8 x 10 ⁻⁴ T) °C	Dry-Well Field Calibrator Fluke 9144 Euramet cg-8



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Accredian, S. de R.L. de C.V.

Calle 24 No. 600, Col. Residencial Las Puentes 3er Sector
 San Nicolas de los Garza, Nuevo León, México. C.P 66460
 Contact Name: Erick Ramirez Phone: 81-3186-4994

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

Thermodynamic

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
RTDs, Rods and Probes with Thermocouple J, K, T, E, R, S, B, L U and N ^{FO}	8 °C to 50 °C	0.26 °C	Vaisala MI70 & HMP75B Euramet cg-8
	50 °C to 200 °C	0.12 °C	Liquid Bath Calibrator Fluke 6102 Euramet cg-8
	25 °C to 1 350 °C	$(1.3 + 7 \times 10^{-4}T)$ °C	Process Calibrator Fluke 725 w/ Probe Type R Euramet cg-8
Liquid in Glass Thermometers ^{FO}	0 °C (Fusion Point Ice)	0.06 °C	Dry-Well Field Calibrator Fluke 9144 w/PRT Fluke 5609-12-A OIML R 133
	35 °C to 200 °C	$(0.12 + 6 \times 10^{-5}T)$ °C	Liquid Bath Calibrator Fluke 6102-156 OIML R 133
Climatic Chambers: Ovens, Furnaces, Mufflers, Incubators, Refrigerators, Freezers, Cold Rooms ^{FO} Error of Indication	25 °C to 1 350 °C	$(1.3 + 7 \times 10^{-4}L)$ °C	Process Calibrator Fluke 725 w/ Probe Type R Euramet cg-20
Climatic Chambers: Ovens, Furnaces, Mufflers, Incubators, Refrigerators, Freezers, Cold Rooms ^{FO} Error of Indication	-20 °C to 60 °C	0.58 °C	Vaisala MI70 & HMP75B Euramet cg-20
	-40 °C to 816 °C	$(1.1 + 2 \times 10^{-3}T)$ °C	Process Calibrator Fluke 725 w/Type K Thermocouple Probe Euramet cg-20
	-80 °C to 600 °C	0.58 °C	Dry-Well Field Calibrator Fluke 9144 w/PRT Fluke 5609-12-A Euramet cg-20
Thermo Hygrometer (Humidity) ^F	35 % RH to 95 % RH	$(1.3 + 8.3 \times 10^{-3}RH)$ % RH	Vaisala MI70 & HMP75B Humidity Chamber Euramet cg-20
Climatic Chambers (Humidity) Sensors and Recorders ^O	Up to 97.5 % HR	$(1.3 + 5.1 \times 10^{-3}RH)$ % RH	
Thermo Hygrometer (Temperature) ^F	8 °C to 50 °C	0.26 °C	Vaisala MI70 and HMP75B Temperature Chamber Euramet cg-20



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Thermodynamic

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
Heating Plates ^{FO}	0 °C to 260 °C	1 °C	Process Calibrator Fluke 725 w/Type K Thermocouple Surface Probe Euramet cg-20
Dry Block ^{FO}	-80 °C to 660 °C	0.58 °C	Dry-Well Field Calibrator Fluke 9144 w/PRT Fluke 5609-12-A Euramet cg-13
Baths Circulators ^{FO}	-40 °C to 1 090 °C	$(1.1 + 2 \times 10^{-3}T)$ °C	Process Calibrator Fluke 725 w/Type K Thermocouple Immersion Probe Euramet cg-20
	-80 °C to 660 °C	0.58 °C	Dry-Well Field Calibrator Fluke 9144 w/PRT Fluke 609-12-A Euramet cg-20

Time and Frequency

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
Equipment to Output Frequency ^{FO}	112.5 rpm to 28 801 rpm	$(0.54 + 0.000 3Fr)$ rpm	LUTRON DT-2259 Digital Tachometer / Stroboscope AS432B CENAM Technical Guide
Equipment to Output Time ^{FO}	1 s to 86 400 s	$(0.49 + 2 \times 10^{-6}t)$ s	Traceable Stopwatch ITTC-7.6-02-07 CENAM Technical Guide

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
Equipment to Output DC Voltage ^{FO}	10 mV to 100 mV	0.009 8 mV	Fluke 8845A Precision Multimeter CENAM Technical Guide
	0.1 V to 1 V	0.000 055 V	



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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
Equipment to Output DC Voltage ^{FO}	1 V to 10 V	0.0004 7 V	Fluke 8845A Precision Multimeter CENAM Technical Guide
	10 V to 100 V	0.005 9 V	
	100 V to 1000 V	0.064 V	
Equipment to Output AC Voltage ^{FO} At the listed frequencies			
10 Hz to 20 kHz	10 mV to 100 mV	0.12 mV	
10 Hz to 20 kHz	0.1 V to 1 V	0.001 V	
10 Hz to 20 kHz	1 V to 10 V	0.01 V	
10 Hz to 20 kHz	10 V to 100 V	0.1 V	
10 Hz to 20kHz	1 V to 750 V	0.78 V	
Equipment to Output DC Current ^{FO}	10 μ A to 100 μ A	0.087 μ A	
	0.1 mA to 1 mA	0.005 8 mA	
	1 mA to 10 mA	0.009 9 mA	
	10 mA to 100 mA	0.064 mA	
	40 mA to 400 mA	0.25 mA	
	0.1 A to 1 A	0.001 A	
	0.3 A to 3 A	0.004 2 A	
1 A to 10 A	0.019 A		
Equipment to Output DC Current At the listed frequencies ^{FO}			Fluke 8845A Precision Multimeter CENAM Technical Guide
10 Hz to 5 kHz	1 μ A to 10 μ A	0.024 μ A	
10 Hz to 5 kHz	10 mA to 100 mA	0.16 mA	
10 Hz to 5 kHz	40 mA to 400 mA	0.92 mA	
10 Hz to 5 kHz	0.1 mA to 1 mA	0.001 7 mA	
10 Hz to 5 kHz	0.3 mA to 3 mA	0.007 3 mA	
10 Hz to 5 kHz	1 A to 10 A	0.024 A	
Equipment to Output Frequency ^{FO}	3 Hz to 5 Hz	0.012 Hz	
	5 Hz to 10 Hz	0.01 Hz	
	10 Hz to 40 Hz	0.024 Hz	
	40 kHz to 300 kHz	0.06 kHz	



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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
Equipment to Output Resistance ^{FO}	10 Ω to 100 Ω	0.017 Ω	Fluke 8845A Precision Multimeter CENAM Technical Guide
	0.1 k Ω to 1 k Ω	0.000 14 k Ω	
	1 k Ω to 10 k Ω	0.001 4 k Ω	
	10 k Ω to 100 k Ω	0.014 k Ω	
	0.1 M Ω to 1 M Ω	0.000 14 M Ω	
	1 M Ω to 10 M Ω	0.004 8 M Ω	
	10 M Ω to 100 M Ω	0.94 M Ω	
Equipment to Measure DC Voltage ^{FO}	33 mV to 330 mV	0.018 mV	Fluke 5502A Euramet-cg-15 CENAM Technical Guide
	0.33 V to 3.3 V	0.13 mV	
	3.3 V to 33 V	0.0013 V	
	33 V to 330 V	0.014 V	
	100 V to 1 000 V	0.045 V	
Equipment to Measure AC Voltage ^{FO} At the listed frequencies			
45 Hz to 10 kHz	1 mV to 33 mV	0.041 mV	
45 Hz to 10 kHz	33 mV to 330 mV	0.092 mV	
45 Hz to 10 kHz	0.33 V to 3.3 V	0.82 mV	
45 Hz to 10 kHz	3.3 V to 33 V	0.008 2 V	
45 Hz to 1 kHz	33 V to 330 V	0.13 V	
45 Hz to 1 kHz	330 V to 1 000 V	0.41 V	
Equipment to Output High Voltage DC ^{FO}	1 kV to 25 kV	0.3 kV	Fluke 80K-40 CENAM Technical Guide
	25 kV to 35 kV	0.91 kV	
Equipment to Output High Voltage AC (60 Hz) ^{FO}	1 kV to 25 kV	0.3 kV	Fluke 80K-40 CENAM Technical Guide
DC Clamp Meters DC Current ^{FO}	11 A to 550 A	2.9 A	Fluke 5502A with Current Coil Euramet-cg-15 CENAM Technical Guide
	550 A to 1 025 A	17 A	
Equipment to Measure DC Current ^{FO}	33 μ A to 330 μ A	0.038 mA	Fluke 5502A Euramet-cg-15 CENAM Technical Guide
	0.33 mA to 3.3 mA	0.000 3 mA	
	3.3 mA to 33 mA	0.002 8 mA	
	33 mA to 330 mA	0.028 A	



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Equipment to Measure DC Current ^{FO}	0.11 A to 1.1 A	0.000 36 A	Fluke 5502A Euramet-cg-15 CENAM Technical Guide
	1.1 A to 3 A	0.000 92 A	
	0.11 A to 11 A	0.005 5 A	
	11 A to 20.5 A	0.016 A	
Equipment to Measure AC Current ^{FO} At the listed frequencies			Fluke 5502A with Current Coil Euramet-cg-15 CENAM Technical Guide
45 Hz to 1 kHz	0.03 mA to 0.33 mA	0.000 4 mA	
45 Hz to 1 kHz	0.33 mA to 3.3 mA	0.002 7 mA	
45 Hz to 1 kHz	3.3 mA to 33 mA	0.013 mA	
45 Hz to 1 kHz	33 mA to 330 mA	0.12 mA	
45 Hz to 1 kHz	0.33 A to 1.1 A	0.000 77 A	
45 Hz to 1 kHz	1.1 A to 3 A	0.006 A	
45 Hz to 100 kHz	3 A to 11 A	0.012 A	
100 Hz to 1 kHz	11 A to 20.5 A	0.008 5 A	
AC Clamp Meters AC Current ^{FO} At the listed frequencies			
45 Hz to 65 Hz	11 A to 550 A	3.3 A	
30 Hz to 60 Hz	550 A to 1025 A	11 A	
Equipment to Measure DC Power ^{FO}	1.089 mW to 108.9 mW	0.066 mW	
	0.0363 W to 3.63 W	0.000 76 W	
	3.63 W to 99 W	0.003 2 W	
	3.3 W to 3 630 W	0.031 W	
	1.1 kW to 20.91 kW	0.095 kW	
Equipment to Measure Resistance ^{FO}	2 Ω to 11 Ω	0.001 2 Ω	
	11 Ω to 33 Ω	0.003 1 Ω	
	33 Ω to 110 Ω	0.007 7 Ω	
	110 Ω to 330 Ω	0.023 Ω	
	0.33 k Ω to 1.1 k Ω	0.000 077 k Ω	
	1.1 k Ω to 3.3 k Ω	0.000 23 k Ω	
	3.3 k Ω to 11 k Ω	0.000 77 k Ω	
	11 k Ω to 33 k Ω	0.002 3 k Ω	



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Equipment to Measure Resistance ^{FO}	33 k Ω to 110 k Ω	0.009 4 k Ω	Fluke 5502A Euramet-cg-15 CENAM Technical Guide
	110 k Ω to 330 k Ω	0.031 k Ω	
	0.33 M Ω to 1.1 M Ω	0.000 13 M Ω	
	1.1 M Ω to 3.3 M Ω	0.000 38 M Ω	
	3.3 M Ω to 11 M Ω	0.005 1 M Ω	
	11 M Ω to 33 M Ω	0.026 M Ω	
	33 M Ω to 110 M Ω	0.43 M Ω	
	110 M Ω to 330 M Ω	1.3 M Ω	
	330 M Ω to 1100 M Ω	13 M Ω	
Equipment to Measure Capacitance ^{FO}	220 pF to 400 pF	1.6 pF	
	0.4 nF to 1.1 nF	0.004 3 nF	
	1.1 nF to 3.3 nF	0.013 nF	
	3.3 nF to 11 nF	0.021 nF	
	11 nF to 33 nF	0.064 nF	
	33 nF to 110 nF	0.21 nF	
	110 nF to 330 nF	0.64 nF	
	0.33 μ F to 1.1 μ F	0.002 1 μ F	
	1.1 μ F to 3.3 μ F	0.006 4 μ F	
	3.3 μ F to 11 μ F	0.021 μ F	
	11 μ F to 33 μ F	0.1 μ F	
	33 μ F to 110 μ F	0.38 μ F	
	110 μ F to 330 μ F	1.2 μ F	
	0.33 mF to 1.1 mF	0.003 8 mF	
	1.1 mF to 3.3 mF	0.012 mF	
	3.3 mF to 11 mF	0.038 mF	
	11 mF to 33 mF	0.19 mF	
33 mF to 110 mF	0.94 mF		
Equipment to Measure DC Power ^{FO}	1.089 mW to 108.9 mW	0.066 mW	
	0.0363 W to 3.63 W	0.000 76 W	
	3.63 W to 99 W	0.003 2 W	
	3.3 W to 3 630 W	0.031 W	
	1.1 kW to 20.91 kW	0.095 kW	



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Equipment to Measure AC Power ^{FO} At the listed frequencies			Fluke 5502A Euramet-cg-15 CENAM Technical Guide
45 Hz to 1 kHz	1.089 mW to 108.9 mW	0.3 mW	
45 Hz to 1 kHz	0.1089 W to 3.63 W	0.002 2 W	
45 Hz to 1 kHz	3.63 W to 99 W	0.02 W	
45 Hz to 100 Hz	99 W to 3 630 W	0.26 W	
100 Hz to 1 kHz	3.63 kW to 20.91 kW	0.82 kW	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type B ^{FO}	600 °C to 1 820 °C	0.25 °C	Fluke 5502A Electrical Simulation of Thermocouple Output Euramet Calibration Guide No. 11
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type C ^{FO}	0 °C to 2 316 °C	0.22 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type E ^{FO}	-250 °C to 1 000 °C	0.15 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type J ^{FO}	-210 °C to 1 200 °C	0.15 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K ^{FO}	-200 °C to 1 372 °C	0.16 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type L ^{FO}	-200 °C to 900 °C	0.16 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type N ^{FO}	-200 °C to 1 300 °C	0.17 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type R ^{FO}	0 °C to 1 767 °C	0.27 °C	



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Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type S ^{FO}	0 °C to 1 767 °C	0.3 °C	Fluke 5502A Electrical Simulation of Thermocouple Output Euramet cg-11
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T ^{FO}	-250 °C to 400 °C	0.15 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type U ^{FO}	-200 °C to 600 °C	0.23 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 100 Ω ^{FO}	-200 °C to 800 °C	0.1 °C	Fluke 5502A Electrical Simulation of RTD Output Euramet cg-11
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 3 926, 100 Ω ^{FO}	-200 °C to 630 °C	0.1 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 3 916, 100 Ω ^{FO}	-200 °C to 630 °C	0.1 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 200 Ω ^{FO}	-200 °C to 630 °C	0.1 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 500 Ω ^{FO}	-200 °C to 630 °C	0.1 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 1 000 Ω ^{FO}	-200 °C to 630 °C	0.1 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Pt Ni 385, 120 Ω (Ni 120) ^{FO}	-80 °C to 260 °C	0.11 °C	



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Temperature Calibration, Indication, and Control Equipment used with RTD Cu 427, 10 Ω^{FO}	-100 °C to 260 °C	0.25 °C	Fluke 5502A Electrical Simulation of RTD Output Euramet cg-11
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 100 Ω^{FO}	-200 °C to 800 °C	0.27 °C	Fluke 725 Electrical Simulation of RTD Output Euramet cg-11
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 3 926, 100 Ω^{FO}	-200 °C to 630 °C	0.25 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 3 916, 100 Ω^{FO}	-200 °C to 630 °C	0.25 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 200 Ω^{FO}	-200 °C to 630 °C	0.18 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 500 Ω^{FO}	-200 °C to 630 °C	0.25 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Type Pt 385, 1 000 Ω^{FO}	-200 °C to 630 °C	0.18 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Pt Ni 385, 120 Ω (Ni 120) FO	-80 °C to 260 °C	0.18 °C	
Temperature Calibration, Indication, and Control Equipment used with RTD Cu 427, 10 Ω^{FO}	-100 °C to 260 °C	0.25 °C	



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Chemical

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pH Meter ^{FO}	4 pH	0.059 pH	Buffer Solutions NMX-CH-166 CEM QU-003
	7 pH	0.059 pH	
	10 pH	0.059 pH	
Conductivity Meter ^{FO}	99.2 μ S/cm	2.1 μ S/cm	Buffer Solutions OIML R 68
	1 408 μ S/cm	4.6 μ S/cm	
	100 005 μ S/cm	360 μ S/cm	
Karl Fisher Titration Equipment ^{FO}	0.998 mg/g	0.17 mg/g	Standard Solutions ASTM E 203
	10.03 mg/g	0.18 mg/g	

Optical

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
Gloss/Specular Reflectance Angle of Incline ^{FO}	20° / 92.4°	0.5 Gloss Units	Ceram Research Gloss Standard ASTM D-523-14
	60° / 97.6°	0.5 Gloss Units	
	85° / 99.8°	0.5 Gloss Units	
Spectrophotometers Transmittance ^{FO}	τ : 1 % to 95 %	0.27 % of reading	Neutral density Filters, Holmium Oxide Glass CENAM Technical Guide
	λ : 230 nm to 700 nm	0.5 nm	
ρ (λ) Spectral Reflectance ^{FO}	CIE L:	0 to 100 Units	Ceramic Research Tiles CENAM Technical Guide ASTM E-1164
	CIE a*:	-28 to 36 Units	
	CIE b*:	-26 to 63 Units	
Ev Light Meters ^{FO}	120 lux to 3 000 lux	2 % of reading	Luxometer Accupro XP2000 CENAM Technical Guide
Ev Illuminance ^{FO}	120 lux to 3 000 lux	1 % of reading	
Refractive Index ^{FO}	1 °Brix to 80 °Brix	0.5 % of reading	Sucrose Standards OIML R-108

Acoustic

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
Sonometer (Acoustic Level) (F=1 kHz)	94 dB	0.14 dB	Acoustic Calibrator Sountek ST-120 NMX-AA-059
	114 dB	0.14 dB	



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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. 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. The term P represents pressure in units appropriate to the uncertainty statement.
9. The term T represents temperature in °C or °F as appropriate to the uncertainty statement.
10. The term Fr represents frequency in rpm as appropriate to the uncertainty statement.
11. The term t represents time in second (s) or minute (min) as appropriate to the uncertainty statement.
12. The term Tr represents torque in N•m (including SI multiple and submultiple units) for the international system of units (the SI) or ozf•in, lbf•in and lbf•ft for the USC system of units.