



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Metrología y Pruebas, S. A. de C. V.

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CALIBRATION

Valid to: July 7, 2010 Certificate Number: AC - 1337

I. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Relative Humidity	32.8 % RH 75.3 % RH	3.0 % of reading	Reference Materials Humidity Meter Thermometer	PMP-C-028

II. Mechanical

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Dead Weights	0.01 g to 200 g	(0.058 + 0.00011W) mg	Class 1 Stainless weights Class F Cast Iron Weights Digital Scale as Comparison Element	PMP-C-021 NIST Handbook 44 OIML R111 ABBA Method
	(0.2 to 3) kg	(0.33 + 2.04W) mg		
	(3 to 60) kg	(90.2 + 32W) mg		
Scales and Balances	Up to 20 kg	(0.052 + 58W) mg	Class 1 Stainless Weights Class F Cast Iron Weights	PMP-C-012 NOM-010-SCFI-1994, NMX-CH-31- 1982, NMX-CH-047- 1996-IMNC & NMX- CH-059-1996-IMNC
	(20 to 1 000) kg	(10.7 + 0.59W) g		
Volume	(1 to 200) ml	(44.46 + 0.053V) µl	Dead Weights Digital Scale Digital Thermohygrometer Digital Barometer	PMP-C-033 NOM-042-SCFI-1997 & NMX-CH-049-1998- IMNC
	(200 to 3 000) ml	(6.82 + 0.034V) ml		
	(3 000 to 15 000) ml	(63.3 + 0.011V) ml		
Water Flow	Up to 40 l/min	0.013 l/min	Water Flow Meter	PMP-C-034



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Torque Transducers, Tools, and Measuring Equipment	(0.005 to 1) Nm (1 to 20) Nm (20 to 500) Nm (67.8 to 678) Nm	0.42 % of Reading 0.44 % of Reading 0.65 % of Reading 0.42 % of Reading	Dead Weights with Torque Arm Torque Transducer Torque Meter TM-200	PMP-C-015 CNM-MMF-PT-002 & EA-10/14
Air Flow	Up to 20 sl/min Up to 200 sl/min	0.33 % of Reading 0.42 % of Reading	Air Flow Transducers	PMP-C-030
Specific Gravity	(0.62 to 3) SG	0.3 % of Reading	Dead Weights Digital Scale Digital Thermometer	PMP-C-032 NBS Circular 555
Vacuum	Up to 207 kPa (Up to 30 psi)	0.1 % of Full Scale	Vacuum Meter Vacuum Pump	PMP-C-027
Normal Rockwell Hardness	HRA, HRB & HRC	1.1 HR	Indirect Verification using Test Blocks	PMP-C-027
Superficial Rockwell Hardness	15N, 30N, 45N, 15T, 30T & 45T	1.2 HR	Indirect Verification using Test Blocks	PMP-C-027
Micro Rockwell Hardness	Knoop & Vickers	2 % of Reading	Indirect Verification using Test Blocks	PMP-C-027
Shore Hardness	A, B, C, D	0.9 POH	Dead Weights Digital Scale	PMP-C-027
Sound	114 dBm 500 Hz, 1 kHz, 2 kHz	1.0 dB	Sound Generator Sound Level Meter	PMP-C-036
Force Transducers, Tools, and Measuring Equipment	(0.1 to 5.5) N 5.6 N to 2.5 kN (2.5 to 45) kN (45 to 445) kN	0.54 % of Reading 0.26 % of Reading 0.24 % of Reading 0.22 % of Reading	Dead weights Load Cell Fluke 5500A HP 3458A	PMP-C-011 NMX-CH-27-1994- SCFI & NMX-CH-023- 1994-SCFI

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Relative Pressure	Up to 500 Pa (Up to 2 in water)	0.6 % of Full Scale	Water Column	PMP-C-013 NMX-CH-058-1994 & NMX-CH-060-1996- IMNC
	Up to 4.2 MPa (Up to 600 psi)	0.06 % of Reading	Deadweight Gage	
	(4.2 to 21) MPa (600 to 3 000) psi	0.05 % of Reading	Deadweight Gage	
	(21 to 69) MPa (3 000 to 10 000) psi	0.1 % of Reading	Deadweight Gage	
	Up to 35 MPa (Up to 5 000 psi)	0.06 % of Full Scale	Pressure Calibrator (on-site)	

III. Dimensional

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Outside Micrometers	Up to 609.6 mm (Up to 24 in)	(1.4 + 0.016L) μm (54.3 + 15.9L) μin	Gage Blocks Grade 2 Gage blocks Grade 3	PMP-C-014 Reference Standard NMX-CH-99:1993- SCFI
Depth Micrometers	Up to 609.6 mm (Up to 24 in)	(1.4 + 0.016L) μm (54.3 + 15.9L) μin	Gage Blocks Grade 2 Gage Blocks Grade 3	PMP-C-014
Dial and Digital Indicators	Up to 101.6 mm (Up to 4 in)	(0.58 + 0.0033L) μm (28.8 + 3.3L) μin	Calibration Tester Dial Gage Tester	PMP-C-014 NMX-CH-36-1994
Optical Comparators	Up to 203.2 mm (Up to 8 in)	(7.1 + 0.0005L) μm (281 + 0.5L) μin	Glass Scales Gage Blocks Grade 2 Gage Block Grade 3	PMP-C-014
Height Measuring Equipment	Up to 609.6 mm (Up to 24 in)	(7.3 + 0.0033L) μm (289 + 3.3L) μin	Granite Surface Gage Blocks Grade 2 Gage Blocks Grade 3	PMP-C-014
Graduated Rules and Flexometers	Up to 25 m (Up to 984 in)	(70 + 0.07L) μm (2761 + 70L) μin	Digital Indicator Stainless Ruler 5X Amplification Lens	PMP-C-014 NOM-040-SCFI-1994 & NOM-046-SCFI- 1999

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Calipers	Up to 609.6 mm (Up to 24 in)	(20.2 + 0.0014L) μm (796 + 1.4L) μin	Gage blocks grade 2 Gage blocks grade 3	PMP-C-014 Reference standard NMX-CH-2:1993-SCFI
Coordinate Measuring Machines	Up to 609.6 mm (Up to 24 in)	(0.56 + 0.001L) μm (22 + 10L) μin	Gage blocks grade 2 Gage blocks grade 3	PMP-C-014
Coating Thickness	Up to 6.35 mm (Up to 0.25 in)	(0.72 + 1.7L) μm (28.3 + 1.7L) μin	Digital Indicator Gage blocks grade 2	PMP-C-014

Notes:

1. Best Measurement Uncertainties (Expanded Uncertainty) are based on approximately a 95% confidence interval, using a coverage of $k=2$
2. The uncertainty associated when calibrating a balance/scale is dependent on local conditions, such as the resolution of the unit being calibrated and the environment in which the balance/scale is operating. The uncertainty listed in the scope here represents the best uncertainty for a balance/scale which the organization typically calibrates in its lab. Since field (on-site) conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected in the field (on-site) than what is reported on the accredited scope.
3. V is applied volume, W is applied weight, and L is length in either mm or inches.
4. Contact the laboratory for on-site capabilities.
5. This scope is part of and must be included with the Certificate of Accreditation No. AC- 1337



Vice President

