PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Grupo Comsurlab, S.A. de C.V.

Ave. José Pagés Llergo # 345, Col. Nueva Villahermosa
Villahermosa, Tabasco, México. CP. 86070

(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):

Thermodynamic, Mass, Force and Weighing Devices, Mechanical, Chemical, Time & Frequency, Optical, Electrical and Dimensional 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:*
September 11, 2011	January 26, 2024	March 30, 2026

Accreditation No.:	*Certificate No.:*
69078	L24-86

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

Certificate of Accreditation: Supplement

Grupo Comsurlab, S.A. de C.V.

Ave. Jose Pagés Llergo # 345, Col. Nueva Villahermosa
Villahermosa, Tabasco, México. C.P. 86070
Contact Name: Claudia de la Fuente Phone: 993-354-8521

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
Bimetallic Thermometers[FO]	-25 °C to 150 °C	0.3 °C	Sensor RTD Pt-100 Brand: Hart Scientific Model: 5615 and Sensor RTD Pt-10 Hart Scientific Model 5624	GC-PR-L007 Internal Procedure
	150 °C to 600 °C	0.3 °C		
Thermocouple Type J[FO]	-25 °C to 150 °C	0.3 °C		
	150 °C to 895 °C	0.3 °C		
Thermocouple Type K[FO]	-25 °C to 150 °C	0.3 °C		
	150 °C to 895 °C	0.3 °C		
Thermocouple Type T[FO]	-25 °C to 150 °C	0.3 °C		
	150 °C to 400 °C	0.3 °C		
Glass Thermometers[FO]	-25 °C to 150 °C	3 °C	Sensor RTD Pt-100 Brand Hart Scientific Model 5615 and Sensor RTD Pt-10 Hart Scientific Model: 5624	CENAM Technical Guide
	150 °C to 250 °C	3 °C		
Temperature Controller used with RTD Pt 385, 100 Ω[FO]	0 °C to 1 000 °C	0.33 °C	Sensor RTD Pt-100 Brand: Hart Scientific Model 5615 and Sensor RTD Pt-10 Hart Scientific Model: 5624	GC-PR-L007 (Internal Procedure)
Temperature Controller used with RTD Pt 385, 200 Ω[FO]	0 °C to 1 000 °C	0.2 °C		
Temperature Controller used with RTD Pt 385, 500 Ω[FO]	0 °C to 1 000 °C	0.33 °C		
Temperature Controller used with RTD Pt 385, 1 000 Ω[FO]	0 °C to 1 000 °C	0.2 °C		
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385, 100 Ω[FO]	25 °C to 750 °C	1.5 °C		
Temperature Calibration, Indication and Control Equipment used with RTD Pt 3926, 100 Ω, JIS 100 Ω[FO]	-25 °C to 750 °C	1.5 °C		
Dry Well[FO]	0 °C to 800 °C	0.1 °C	Sensor RTD Pt-100 Brand: Hart Scientific Model 5615 and Sensor RTD Pt-10 Hart Scientific Model: 5624	CENAM Technical Guide
Oven[FO]	30 °C to 500 °C	1.7 °C		

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Thermometers of Radiation[F]	50 °C to 450 °C	1 °C	Sensor RTD Pt-100 Brand Hart Scientific Model 5615 and Sensor RTD Pt-10 Hart Scientific Model 5624	CENAM Technical Guide
Thermo Balance[O]	40 °C to 200 °C	2 °C	Thermometer bimetallic 40 °C to 400 °C Brand Ohaus	GC-PR-L021 (Internal Procedure)
Thermal Bath[FO]	0 °C to 100 °C	1.7 °C	Sensor RTD Pt-100 Brand Hart Scientific Model 5615	CENAM Technical Guide
Hygrometer[F]	30 % to 90 %	1.2 %	Humidity and Temperature Meter, Vaisala HM40	

Mass, Force and Weighing Devices

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Weight Set Class F1[F]	1 mg	0.005 mg	Weight Set 1 mg to 2 kg Mass Class E2 Troemner ABBA Method	CENAM Technical Guide
	2 mg	0.005 mg		
	5 mg	0.005 mg		
	10 mg	0.007 mg		
	20 mg	0.009 mg		
	50 mg	0.009 mg		
	100 mg	0.009 mg		
	200 mg	0.009 9 mg		
	500 mg	0.002 5 mg		
	1 g	0.003 2 mg		
	2 g	0.052 mg		
	5 g	0.065 mg		
	10 g	0.082 mg		
	20 g	0.039 mg		
	50 g	0.99 mg		
	100 g	0.2 mg		

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Weight Set Class F1[F]	200 g	0.4 mg	Weight Set 1 mg to 2 kg Mass Class E2 Troemner ABBA Method	CENAM Technical Guide
	500 g	0.8 mg		
	1 kg	1.7 mg		
	2 kg	3 mg		
Weight Set Class F2[F]	1 mg	0.019 mg		
	2 mg	0.019 mg		
	5 mg	0.019 mg		
	10 mg	0.025 mg		
	20 mg	0.032 mg		
	50 mg	0.039 mg		
	100 mg	0.052 mg		
	200 mg	0.065 mg		
	500 mg	0.082 mg		
	1 g	0.99 mg		
	2 g	0.13 mg		
	5 g	0.16 mg		
	10 g	0.19 mg		
	20 g	0.26 mg		
	50 g	0.33 mg		
	100 g	0.53 mg		
	200 g	1 mg		
	500 g	2.6 mg		
	1 kg	5.3 mg		
	2 kg	10 mg		
Weight Set Class M1[F]	1 mg	0.06 mg		
	2 mg	0.06 mg		
	5 mg	0.06 mg		
	10 mg	0.08 mg		
	20 mg	0.032 mg		
	50 mg	0.052 mg		
	100 mg	0.15 mg		
	200 mg	0.19 mg		
	500 mg	0.25 mg		

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Weight Set Class M1[F]	1 g	0.32 mg	Weight Set 1 mg to 2 kg Mass Class E2 Troemner ABBA Method	CENAM Technical Guide
	2 g	0.39 mg		
	5 g	0.49 mg		
	10 g	0.65 mg		
	20 g	0.82 mg		
	50 g	0.99 mg		
	100 g	1.6 mg		
	200 g	3.3 mg		
	500 g	8.3 mg		
	1 kg	17 mg		
	2 kg	33 mg		
	10 kg	0.12 g	Weight Class F1 10 kg, 20 kg	
	20 kg	0.77 g		
Weight Set Class M2[F]	100 mg	0.52 mg	Weight Set 1 mg to 2 kg Mass Class E2 Troemner ABBA Method	CENAM Technical Guide
	200 mg	0.65 mg		
	500 mg	0.82 mg		
	1 g	0.99 mg		
	2 g	1.3 mg		
	5 g	1.7 mg		
	10 g	2 mg		
	20 g	2.6 mg		
	50 g	3.3 mg		
	100 g	5.3 mg		
	200 g	10 mg		
	500 g	27 mg		
	1 kg	53 mg		
	2 kg	100 mg		
Weight Set Class M3[F]	1 g	3.3 mg		
	2 g	4 mg		
	5 g	5 mg		
	10 g	6.6 mg		
	20 g	8 mg		
	50 g	10 mg		

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Weight Set Class M3[F]	100 g	17 mg	Weight Set 1 mg to 2 kg Mass Class E2 Troemner ABBA Method	CENAM Technical Guide
	200 g	33 mg		
	500 g	83 mg		
	1 kg	170 mg		
	2 kg	340 mg		
Density (Hydrometer)[F]	0.4 g/cm^3 to 4 g/cm^3	0.031 g/cm^3	Analytic Balance 210 g Brand: Ohaus Model: Discovery Cuckow Method	
Torsion Viscometer Rotatority[FO]	10 g to 100 g (25 °Deflexion to 254 °Deflexion)	4.5 Dina/°Deflexion	Mass 10 g to 200 g Brand Ohaus	GC-PR-L019 Internal Procedure
Balances[F]	0.001 g to 81 g (Res.= 0.1 mg)	(1.25 x 10^{-4} + 3.64 x 10^{-6}Wt) g	OIML E2 Analytical Weight Set 1 mg to 2 000 g w/27 pieces Brand: Troemner	CENAM Technical Guide
	81.001 g to 310 g (Res.= 0.1 mg)	(3 x 10^{-4} + 1.1 x 10^{-6}Wt) g		
	310.001 g to 610 g (Res.= 1 mg)	(1.5 x 10^{-3} + 7.85 x 10^{-7}Wt) g		
	610.01 g to 6 100 g (Res.= 10 mg)	(1.61 x 10^{-2} + 5.81 x 10^{-7}Wt) g		
	5 kg to 200 kg (Res.= 10 g)	0.016 kg	Weight Set Class M1	
	200 kg to 500 kg (Res.= 0.1 kg)	0.039 kg		

Mechanical

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Pressure Gauges[FO]	1 psi to 100 psi	2 % of reading	Digital Pressure Gauge 500 psi, 2 000 psi and 10 000 psi Brand: Crystal, Model: XP2i	CENAM Guide Technical
	100 psi to 10 000 psi	0.3 % of reading		
Pressure Gauges and Transducer[FO]	3 000 psi to 30 000 psi	0.25 % of reading	Digital Pressure Gauge 40 000 psi Brand: Additel, Model: 681	

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Pressure Gauges and Transducer[FO]	30 000 psi to 60 000 psi	0.25 % of reading	Pressure Gages FB-75-1 Brand Astragauge and Generator of Pressure 10 000 psi to 60 000 psi	CENAM Technical Guide
Vacuum Gauges[FO]	-10 psi to -1 psi	0.25 % of reading	Pressure Gage Brand: Crystal Model: 2Pxi 0 psi to14 psi	
Rotational Viscometer Dynamic Viscosity[FO]	100 mPa/s	2 mPa/s	Fluid of Calibration Certificate 100 cP Brand: Ofite	GC-PR-L010 Internal Procedure
	480 mPa.s	0.5 mPa.s	Fluid of Calibration Certificate Brand: Cannon	
	1 100 mPa.s	2.5 mPa.s		
	3 000 mPa.s	5 mPa.s		
Mud Balance Density[F] Fixed Points	1 sp	0.03 sp	Sensor RTD Pt-100 Brand: Hart Scientific Model: 5615 Weight Set 1 mg to 2 kg Mass Class E2 Troemner	GC-PR-L013 Internal Procedure
	2 sp	0.023 sp		
	1.8 sp	0.01 sp	Weight Mass Set Class M1	
	2.3 sp	0.01 sp		
Micropipettes[FO]	1 µL to 99 µL	0.1 µL	Balance 0.000 01 g to 81 g (Res.= 0.01 mg) OHAUS Balance 81 g to 210 g (Res.= 0.1 mg) Brand: OHAUS Model: Discovery DV 215CD	CENAM Technical Guide
Micropipettes[F]	100 µL to 1 000 µL	1.5 µL		
Pipettes[F]	0.5 mL	0.006 mL		
	1 mL	0.002 mL		
	2 mL	0.002 6 mL		
	5 mL	0.055 mL		
	10 mL	0.003 mL		
	20 mL	0.004 mL		
	25 mL	0.005 mL		
	50 mL	0.005 mL		
	100 mL	0.01 mL		

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Burettes[F]	1 mL	0.000 45 mL	Balance 81g to 210 g (Res.= 0.1 mg) Brand: OHAUS Model: Discovery DV 215CD	CENAM Technical Guide
	2 mL	0.000 46 mL		
	5 mL	0.004 6 mL		
	10 mL	0.004 6 mL		
	20 mL	0.006 8 mL		
	25 mL	0.007 mL		
	50 mL	0.01 mL		
	100 mL	0.02 mL		
Cylinders[F]	1 mL	0.006 5 mL		
	2 mL	0.006 6 mL		
	5 mL	0.006 5 mL		
	10 mL	0.015 mL		
	20 mL	0.03 mL		
	25 mL	0.04 mL		
	50 mL	0.06 mL		
	100 mL	0.11 mL		
	200 mL	0.3 mL		
Flask[F]	500 mL	0.38 mL	Balance 210.01 g to 4 100 g (Res.= 0.01 g) Brand: OHAUS CENAM Technical Guide	CENAM Technical Guide
	1 000 mL	1.8 mL		
	2 000 mL	3 mL		
	1 mL	0.007 mL	Balance 210.01 g to 4 100 g (Res.= 0.01 g) Brand: OHAUS Model: Discovery DV 215CD	
	2 mL	0.001 4 mL		
	5 mL	0.003 5 mL		
	10 mL	0.005 mL		
	20 mL	0.004 mL		
	25 mL	0.037 mL		
	50 mL	0.007 5 mL		
	100 mL	0.011 mL	Balance 210.01 g to 4 100 g (Res.= 0.01 g) Brand: OHAUS	
	500 mL	0.05 mL		
	1 000 mL	0.1 mL		
	2 000 mL	0.2 mL		

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Flask Le Chatelier[F]	24 mL	0.1 mL	Balance 4 100 g (Res.= 0.01 g) Brand: OHAUS	CENAM Technical Guide
Tube Centrifuge[F]	0.05 mL	0.015 mL	Balance Analytics 0 g to 220 g OHAUS Explorer EX 224	
	0.2 mL to 0.5 mL	0.029 mL		
	1 mL to 3 mL	0.057 mL		
	5 mL	0.11 mL		
	10 mL	0.29 mL		
	25 mL to 100 mL	0.57 mL		

Chemical

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 Meter[FO]	4.005 pH	0.02 pH	Buffer Solution pH 4, pH 7 and pH 10 Traceable Through NIST Brand: Hatch	GC-PR-L020 (Internal Procedure)
	7 pH	0.02 pH		
	10.012 pH	0.02 pH		

Time & Frequency

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
Tachometer, Centrifuge, Rotational Viscometer, Mixer[F]	0.05 Hz to 1 000 Hz	3.33×10^{-3} Hz	Tektronix AFG1022 Arbitrary/ Function Generator Digital Optical & Contact Brand: Monarch	GC-PR-L012 (Internal Procedure)
Stopwatch[FO]	60 s	0.5 s	Digital Chronometer Brand: Control Company Model: 1 021C	NIST Handbook 105-5
	120 s	0.5 s		
	3 600 s	0.5 s		
	86 400 s	0.72 s		

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Optical

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Spectrophofometer Transmittance Density[F]	0.25 % OD to 4 % OD	3 % of reading	Opacity Filter (KV450/3)	Technical Guide UV-Vis
ά Absorbance[F]	0.297 absorbance to 1.409 absorbance	3 % of reading	Density, Neutral (NG9/1, NG5/2, NG11/2)	
τ Transmittance[F]	1 % to 95 %	0.27 % of reading	Filter of Oxide, Holmium (Ho)	
Wavelenght[F]	359 n·m to 809 n·m	2 n·m	Filter of Oxide Didymium (BG20/2) UV-Vis	CENAM Technical Guide

Electrical

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Standard Emulsion Stability Tester[FO]	10 MΩ	25 Ω	Multimeter Fluke Model: 28II	GC-PR-L016 (Internal Procedure)
	32 MΩ	1.6 MΩ		
Equipment to Measure DC Voltage[F]	Up to 104 mV	11 µV	Multimeter Calibrator Trasmille 1000	CENAM Technical Guide
	0.104 V to 1.04 V	31 µV		
	1.04 V to 10.4 V	1.5 mV		
	10.4 V to 104 V	15 mV		
	104 V to 1 020 V	640 mV		
Equipment to Measure DC Current[F]	Up to 104 µA	0.052 µA		
	0.104 mA to 1.04 mA	0.001 1 mA		
	1.04 mA to 10.4 mA	0.018 A		
	10.4 mA to 104 mA	0.035 mA		
	104 m to 1 040 mA	0.06 mA		
	1.4 A to 10.2 A	1.8 mA		
	10.2 A to 500 A	2 mA		
Equipment to Measure AC voltage At the listed frequencies 10 Hz to 20 kHz	Up to 104 mV	0.001 1 mV		
	0.104 V to 1.04 V	0.011 mV		
	1.04 V to 10.4 V	0.11 mV		

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Equipment to Measure AC voltage At the listed frequencies 40 Hz to 1 kHz[F]	10.4 V to 104 V	1.1 mV	Multimeter Calibrator Trasmille 1000	CENAM Technical Guide
	104 V to 1020 V	11 mV		
Equipment to Measure AC voltage At the listed frequencies 10 Hz to 2 kHz[F]	10.4 µA to 104 µA	0.001 1 µA		
	0.104 mA to 1 mA	0.015 mA		
	1.04 mA to 10.4 mA	0.15 mA		
	10.4 mA to 104 mA	1 mA		
	104 mA to 1 040 mA	10 mA		
	1.04 A to 10.4 A	0.01 A		
Equipment to Measure AC voltage At the listed frequencies 30 Hz to 60 Hz[F]	10 A to 500 A	1 A		
Equipment to Measure Resistance[F]	0 Ω to 10 Ω	0.57 mΩ		
	10.1 Ω to 100 Ω	5.7 mΩ		
	101 Ω to 1 kΩ	57 mΩ		
	1.01 kΩ to 10 kΩ	0.57 Ω		
	10.1 kΩ to 100 kΩ	5.7 Ω		
	101 kΩ to 1 MΩ	57 Ω		
	1.01 MΩ to 10 MΩ	570 Ω		
	10 MΩ to 32 MΩ	570 Ω		
Equipment to Measure Resistance At the listed frequencies[F] Up to 10 kV Fixed Point	1 kΩ	0.000 5 % of reading	Multimeter Calibrator Transmiller 1000 High Resistance Standard VRS-100-1K-BP-10KV	
	10 kΩ	0.000 5 % of reading		
	100 kΩ	0.000 5 % of reading		
	1 MΩ	0.002 % of reading		
	10 MΩ	0.54 % of reading		
	100 MΩ	0.5 % of reading		
	1 GΩ	0.5 % of reading		
	10 GΩ	0.5 % of reading		
	100 GΩ	0.5 % of reading		
	1 TΩ	0.5 % of reading		
Equipment to Output DC Voltage[F]	0.001 mV to 100 mV	0.57 mV	Multimeter Calibrator Trasmille 1000	
	0.1 V to 1 V	5.7 mV		
	1 V to 10 V	57 mV		

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Equipment to Output DC Voltage[F]	10 V to 30 V	0.57 V	Multimeter Calibrator Trasmille 1000	CENAM Technical Guide
Equipment to Output DC Current[F]	0.01 mA to 30 mA	0.005 7 mA		
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B[F]	600 °C to 1 800 °C	0.35 °C	Multimeter Calibrator Trasmille 1000 Electrical Simulation of Thermocouple Output	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E[F]	-200 °C to 1 000 °C	0.34 °C		
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J[F]	-200 °C to 1 000 °C	0.34 °C		
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K[F]	-200 to 1 000 °C	0.34 °C		
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R[F]	-200 °C to 1 000 °C	0.34 °C		
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S[F]	-200 °C to 1 000 °C	0.34 °C		
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N[F]	-200 °C to 1 000 °C	0.34 °C		
Equipment to Measure Frequency[F]	1 Hz to 200 Hz	0.005 7 Hz	Multimeter Calibrator Trasmille 1000	
	200 Hz to 2000 Hz	0.057 Hz		
	2 000 Hz to 20 kHz	0.000 57 kHz		
	20 kHz to 100 kHz	0.005 7 kHz		
Equipment to Measure Capacitance[F]	1 nF to 10 nF	0.000 057 nF		
	10 nF to 100 nF	0.005 7 nF		
	100 nF to 1µF	0.057 nF		

Certificate of Accreditation: Supplement

Grupo Comsurlab, S.A. de C.V.
Ave. Jose Pagés Llergo # 345, Col. Nueva Villahermosa
Villahermosa, Tabasco, México. CP. 86070
Contact Name: Claudia de la Fuente Phone: 993-354-8521

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

Dimensional

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
Vernier[FO]	5 mm to 600 mm (0.19 in to 24 in)	12 µm [(0.000 47 in)]	Gauge Block Set Grade 0, Mitutoyo	CENAM Technical Guide

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 Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.