



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Nicol Scales & Measurement

***7239 Envoy Court, Dallas, TX 75247
15800 West Hardy Road, Suite 500, Houston TX 77060***

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2005

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):

Chemical, Dimensional, Viscosity, Electrical, Force, Mass, Mechanical, Thermodynamic, Weighing Devices, Air Velocity, and Time and Frequency
(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/Operations Manager

<i>Initial Accreditation Date:</i>	<i>Issue Date:</i>	<i>Expiration Date:</i>
February 15, 2002	October 24, 2018	December 31, 2020

<i>Accreditation No.:</i>	<i>Certificate No.:</i>
59154	L18-497

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.pjilabs.com



Certificate of Accreditation: Supplement

Nicol Scales & Measurement

7239 Envoy Court, Dallas, TX 75247
 15800 Hardy Road, Suite 500, Houston, TX 77060
 Contact Name: Gary Ames Phone: 214-428-8181

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

Chemical

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
pH Meter ^{FO}	4 pH	0.12 pH	Buffer Solutions
	7 pH	0.12 pH	
	10 pH	0.12 pH	

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
Calipers ^{FO}	Up to 72 in	(582 + 1.64L) μ in	Gage blocks Starrett TS510-100ME Fowler 53-670-038-0
Micrometer Outside ^{FO}	Up to 12 in	(59.4 + 3.8L) μ in	
			Rod standards Mitutoyo 167 SPI 3031-45 SPI 12-493-3
Length Standards ^{FO}	Up to 60 in	0.000 58 in	Gage Blocks, TesaHite Height Gage Rod Standards Mahr Helios Supra 500
Dial Indicators ^{FO}	Up to 2 in	(87 + 3.7L) μ in	Gage blocks
Test Indicators ^{FO}	Up to 0.13 in	95 μ in	
Height Gages ^{FO}	Up to 24 in	(193 + 3.3L) μ in	
End Standards ^{FO}	Up to 12 in	(625 + 3.9L) μ in	Gage blocks Starrett TS510-100ME Fowler 53-670-038-0
Micrometers Inside Rod & Tube Type ^{FO}	Up to 12 in	(70 + 4.4L) μ in	
Micrometers Inside Caliper Type ^{FO}	Up to 4 in	(62 + 3.6L) μ in	
Micrometers Depth ^{FO}	Up to 12 in	(64 + 4.7L) μ in	
Pin Gages ^{FO}	0.000 05 in to 100 000 in	(0.13 + 2.0L) μ in	Z-Mike 162-500 Techmet 500-00
Ring Gages ^{FO}	0.5 in to 10 in	0.000 058 in	Mahr Helios Supra 500
Thread Plugs Pitch Diameter ^{FO}	0-80 to 4-12	60 μ in	
Thread Plugs Major Diameter ^{FO}	0-80 to 4-12	120 μ in	



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Viscosity

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Brookfield 500 VF ^{FO}	1 kPa*s to 104 kPa*s	1 % of reading	Brookfield Standards
Brookfield 5 000 VF ^{FO}			
Brookfield B 200 ^{FO}			
Brookfield B 2 000 ^{FO}			

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 Measure DC Voltage ^{FO}	1 mV to 110 mV	0.025 % of reading + 16.5 μ V	Multiproduct – Calibrator Fluke 743B Fluke 5100B Fluke 8142 Transmille 3041A Transmille 8081 Transmille EA002
	110 mV to 1.1 V	0.025 % of reading + 55 μ V	
	1.1 V to 11 V	0.025 % of reading + 550 μ V	
	11 V to 300 V	0.05 % of reading + 15 mV	
	301 V to 1 000 V	1.2 % of reading + 5.8 μ V	
Equipment to Measure AC Voltage Frequency Measurement at range: 1.1 Vrms ^{FO}	20 Hz to 40 Hz	2 % of reading + 0.1 mV	
	40 Hz to 500 Hz	0.5 % of reading + 0.05 mV	
	500 Hz to 1 kHz	2 % of reading + 0.1 mV	
	1 kHz to 5 kHz	10 % of reading + 0.2 mV	
Equipment to Measure AC Voltage Frequency Measurement at range: 11 Vrms ^{FO}	20 Hz to 40 Hz	2 % of reading + 0.01 V	
	40 Hz to 500 Hz	0.5 % of reading + 0.05 V	
	500 Hz to 1 kHz	2 % of reading + 0.01 V	
	1 kHz to 5 kHz	10 % of reading + 0.02 V	
Equipment to Measure AC Voltage Frequency Measurement at range: 110 Vrms ^{FO}	20 Hz to 40 Hz	2 % of reading + 0.1 V	
	40 Hz to 500 Hz	0.5 % of reading + 0.5 V	
	500 Hz to 1 kHz	2 % of reading + 0.1 V	
	1 kHz to 5 kHz	10 % of reading + 0.2 V	
Equipment to Measure AC Voltage Frequency Measurement at range: 300 Vrms ^{FO}	20 Hz to 40 Hz	2 % of reading + 1 V	
	40 Hz to 500 Hz	0.5 % of reading + 0.5 V	
	500 Hz to 1 kHz	2 % of reading + 1 V	
	1 kHz to 5 kHz	10 % of reading + 2 V	



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Equipment to Measure AC Voltage Frequency Measurement at range 1 000.0 ms ^{FO}	10 Hz to 40 Hz	0.05 % of reading + 0.09 V	Multiproduct – Calibrator Fluke 743B Fluke 5100B Fluke 8142 Transmille 3041A Transmille 8081 Transmille EA002
	40 Hz to 200 Hz	0.02 % of reading + 0.07 V	
	200 Hz to 1 KHz	0.018 % of reading + 0.07 V	
	1 KHz to 20 KHz	0.03 % of reading + 0.11 V	
	20 KHz to 50 KHz	0.08 % of reading + 0.53 V	
Equipment to Measure DC Current ^{FO}	30 mA	0.01 % of reading + 0.015 % full scale	
	110 mA	0.01 % of reading + 0.015 % full scale	
	1A	0.012 % full scale + 150 μ V	
	10 A	0.029 % full scale + 360 μ V	
	30 A	0.016 % full scale + 490 μ V	
Equipment to Measure Resistance ^{FO}	1 Ω to 11 Ω	0.05 % of reading + 50 M Ω	
	11 Ω to 110 Ω	0.05 % of reading + 50 M Ω	
	110 Ω to 1.1 k Ω	0.05 % of reading + 500 M Ω	
	1.1 k Ω to 11 k Ω	0.1 % of reading + 10 Ω	
	100 k Ω to 0.999 M Ω	0.1 % of reading + 11 Ω	
	1 M Ω to 10 M Ω	0.12 % of reading + 15 Ω	
Equipment to Measure Frequency ^{FO}	1 Hz to 110 Hz	0.05 Hz	
	110 Hz to 1 100 Hz	0.5 Hz	
	1.1 kHz to 11 kHz	5 Hz	
	11 kHz to 50 kHz	50 Hz	
Equipment to Output DC Voltage ^{FO}	1 mV to 110 mV	0.01 % of reading + 0.55 μ V	
	110 mV to 1.1 V	0.01 % of reading + 5.5 μ V	
	1.1 V to 15 V	0.01 % of reading + 75 μ V	
Equipment to Output DC Current ^{FO}	1 mA to 22 mA	0.01 % of reading + 3.3 μ A	
	22 mA to 220 mA	0.02 % of reading + 0.03 % of full scale	
Equipment to Output Resistance ^{FO}	1 Ω to 11 Ω	0.01 % of reading + 20 m Ω	
	11 Ω to 110 Ω	0.01 % of reading + 40 m Ω	
	110 Ω to 1.1 k Ω	0.02 % of reading + 500 m Ω	
	1.1 k Ω to 11 k Ω	0.03 % of reading + 5 Ω	



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Equipment to Output Frequency ^{FO}	1 Hz to 11 Hz	0.01 Hz	Multiproduct – Calibrator Fluke 743B Fluke 5100B Fluke 8142 Transmille 3041A Transmille 8081 Transmille EA002
	11 Hz to 110 Hz	0.1 Hz	
	110 Hz to 1 100 Hz	0.1 Hz	
	1 100 Hz to 22 000 Hz	3 Hz	
	22 kHz to 50 kHz	5 Hz	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B ^{FO}	600 °C to 800 °C	1.3 °C	Electrical Simulation of Thermocouple Output Multiproduct – Calibrator Fluke 743B Fluke 5100B Fluke 8142 Transmille 3041A Transmille 8081 Transmille EA002
	800 °C to 1 000 °C	1 °C	
	1 000 °C to 1 820 °C	0.9 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C ^{FO}	0 °C to 800 °C	0.6 °C	
	800 °C to 1 200 °C	0.8 °C	
	1 200 °C to 1 800 °C	1.1 °C	
	1 800 °C to 2 316 °C	2 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type L ^{FO}	-200 °C to -100 °C	0.6 °C	
	-100 °C to 800 °C	0.3 °C	
	800 °C to 900 °C	0.5 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E ^{FO}	-250 °C to -200 °C	1.3 °C	Electrical Simulation of Thermocouple Output Multiproduct – Calibrator Fluke 743B
	-200 °C to -100 °C	0.5 °C	
	-100 °C to 600 °C	0.3 °C	
	600 °C to 1 000 °C	0.4 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N ^{FO}	-200 °C to -100 °C	1 °C	
	-100 °C to 900	0.5 °C	
	900 °C to 1 300 °C	0.6 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J ^{FO}	-210 °C to -100 °C	0.6 °C	
	-100 °C to 800 °C	0.3 °C	
	800 °C to 1 200 °C	0.5 °C	



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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K ^{FO}	-200 °C to -100 °C	0.7 °C	Electrical Simulation of Thermocouple Output Multiproduct – Calibrator Fluke 743B
	-100 °C to 400 °C	0.3 °C	
	400 °C to 1 200 °C	0.5 °C	
	1 200 °C to 1 372 °C	0.7 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R ^{FO}	-20 °C to 0 °C	2.3 °C	
	0 °C to 100 °C	1.5 °C	
	100 °C to 1 767 °C	1 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S ^{FO}	-20 °C to 0 °C	2.3 °C	
	0 °C to 200 °C	1.5 °C	
	200 °C to 1 400 °C	0.9 °C	
	1 400 °C to 1 767 °C	1.1 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T ^{FO}	-250 °C to -200 °C	1.7 °C	
	-200 °C to 0 °C	0.6 °C	
	0 °C to 400 °C	0.3 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type U ^{FO}	-200 °C to 0 °C	0.6 °C	
	0 °C to 600 °C	0.3 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 3926 100 Ω ^{FO}	-200 °C to 0 °C	0.3 °C	
	0 °C to 630 °C	0.5 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385 100 Ω ^{FO}	-200 °C to 0 °C	0.3 °C	
	0 °C to 400 °C	0.5 °C	
	400 °C to 800 °C	0.8 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Ni 672 120 Ω ^{FO}	-200 °C to 260 °C	0.3 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385 200 Ω ^{FO}	-200 °C to 0 °C	0.3 °C	
	0 °C to 400 °C	0.5 °C	
	400 °C to 630 °C	0.8 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 385 500 Ω ^{FO}	-200 °C to 0 °C	0.3 °C	
	0 °C to 400 °C	0.5 °C	
	400 °C to 630 °C	0.8 °C	



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Electrical

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Temperature Calibration, Indication and Control Equipment used with RTD Pt 385 1 000 Ω ^{FO}	-200 °C to 0 °C	0.3 °C	Electrical Simulation of Thermocouple Output Multiproduct – Calibrator Fluke 743B
	0 °C to 400 °C	0.5 °C	
	400 °C to 630 °C	0.8 °C	
Temperature Calibration, Indication and Control Equipment used with RTD CU 427 10 Ω ^{FO}	-100 °C to 0 °C	2 °C	
	0 °C to 260 °C	2 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Pt 3916 100 Ω ^{FO}	-200 °C to -190 °C	0.3 °C	
	-190 °C to 0 °C	0.3 °C	
	0 °C to 360 °C	0.5 °C	

Mass, Force, and Weighing Devices

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
Analytical Balances ^{FO}	Up to 220 g (Resolution 0.01 mg)	$(3.8 \times 10^{-5} + 3 \times 10^{-6} \text{Wt})$ g	ASTM Class I weights Calibration method based on Handbook 44
	Up to 520 g (Resolution 0.1 mg)	$(1.19 \times 10^{-4} + 3 \times 10^{-6} \text{Wt})$ g	
	Up to 3 200 g (Resolution 1 mg)	$(1.15 \times 10^{-3} + 3 \times 10^{-6} \text{Wt})$ g	
	Up to 8 200 g (Resolution 0.1 g)	$(1.15 \times 10^{-1} + 1 \times 10^{-6} \text{Wt})$ g	
	Up to 12 200 g (Resolution 0.1 g)	$(1.15 \times 10^{-1} + 1 \times 10^{-6} \text{Wt})$ g	
Electronic Balances Top Loader ^{FO}	Up to 220 g	$(2.90 \times 10^{-5} + 3.00 \times 10^{-6} \text{Wt})$ g	Handbook 44 Class II Device H44 Test Method Class 1
	221 g to 520 g	$(1.00 \times 10^{-4} + 3.00 \times 10^{-6} \text{Wt})$ g	
	521 g to 3 200 g	$(3.0 \times 10^{-4} + 3.00 \times 10^{-6} \text{Wt})$ g	
	3 201 g to 8 200 g	$(1.15 \times 10^{-1} + 1.00 \times 10^{-6} \text{Wt})$ g	
	8 201 g to 12 200 g	$(1.15 \times 10^{-1} + 1.00 \times 10^{-6} \text{Wt})$ g	
	12 201 g to 20 200 g	$(1.15 \times 10^{-1} + 1.00 \times 10^{-6} \text{Wt})$ g	
	20 201 g to 36 200 g	$(1.14 \times 10^{-1} + 2.00 \times 10^{-6} \text{Wt})$ g	
	36 201 g to 70 200 g	$(1.15 \times 10^{-1} + 2.00 \times 10^{-6} \text{Wt})$ g	
Up to 65 000 g	$(1.15 \times 10^{-1} + 1 \times 10^{-5} \text{Wt})$ g	Handbook 44 Class II Device. H44 Test Method Class F	
Electronic Balance ^{FO}	Up to 150 000 g	$(1.16 + 2.00 \times 10^{-6} \text{Wt})$ g	Class 1 Weights



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Mass, Force, and Weighing Devices

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Dial & Beam Scales Bench Scales Floor Scales ^{FO}	Up to 40 000 lb	(1.1 + 5.4 x 10 ⁻⁵ Wt) lb	Handbook 44 Class III Devices Handbook 44 Test Method Class 1,F
Vehicle Scales Axle Load Scales Livestock Scales Crane Scales Hopper Scales ^{FO}	Up to 200 000 lb	(22.71 + 3.6 x 10 ⁻⁵ Wt) lb	
Wheel Load Weighers Portable Axle Load Weighers ^{FO}	Up to 40 000 lb	(5.77 + 2.30 x 10 ⁻⁵ Wt) lb	
Force ^{FO}	Up to 200 lb	(1.16 x 10 ⁻² + 7.2 x 10 ⁻⁵ Wt) lb	Moorehouse Precision-300 – Class A SS1009-1 500 lb – Class F SS1009-5 000 – Class F SS1288F-100 000 – Class F
	201 lb to 1 000 lb	(1.16 x 10 ⁻² + 7.2 x 10 ⁻⁵ Wt) lb	
	1 001 lb to 5 000 lb	(1.03 x 10 ⁻⁵ + 1.16 x 10 ⁻⁴ Wt) lb	
	5 001 lb to 100 000 lb	(1.14 + 1.05 x 10 ⁻⁴ Wt) lb	
Mass Class F Weights ^{FO}	0.5 lb to 10 lb	16 mg	Class 1 Weights Mass Comparator
	10 lb to 50 lb	100 mg	
	450 g to 10 kg	16 mg	
	10 kg to 30 kg	100 mg	

Mechanical

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Pipettes ^{FO}	60 μ L to 10 mL	20 μ L	A&D AD4212B Pipette Balance ASTM Class 1 Weights ISO 8655-2 ISO 8655-6 ASTM E1154-89
Pressure Gauges ^{FO}	40 psi to 10 000 psi	10 psi	Fluke 700RG08 Fluke 700RG31 Omega PX409-5K
	2 psi to 200 psi	0.13 psi	Fluke 700RG08 Crystal Engineering 30PSIXP21
	25 psi to 3 000 psi	0.3 psi	65360 Deadweight Tester
	100 psi to 20 000 psi	12 psi	9867 Deadweight Tester



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Torque ^{FO}	60 lbf•ft to 600 lbf•ft	0.18 in•lb	CDI Suretest 5000-T CDI 2000-400-02 TED 50FS TED 100IS TED-600FS TED-250FS AMETEK DFS-2
	25 lbf•ft to 250 lbf•ft	1.81 in•lb	
	5 lbf•ft to 50 lbf•ft	3.74 in•lb	
	0.8 lbf•ft to 8 lbf•ft	0.89 ft•lb	
Vacuum Pressure ^{FO}	-28 inHg to 0.1 inHg	1.7×10^{-1} inHg	Cecomp DPG1000
Tachometer ^{FO}	6 rpm to 99 999 rpm	$1.21 \text{ rpm} + 5.48 \times 10^{-5}$ reading	Shimpo DT207L
Hardness Tester ^{FO}	20 HRC to 40 HRC	0.55 HRC	ASTM E18 Hardness Blocks
	40 HRC to 50 HRC	0.55 HRC	
	50 HRC to 63 HRC	0.75 HRC	
	40 HRBW to 60 HRBW	0.75 HRB	
	60 HRBW to 80 HRBW	0.55 HRB	
	80 HRBW to 100 HRBW	0.55 HRB	
	REX Shore Hardness A, B and O	1.15 Duros	Setra Super II Fowler 54-175-012
REX Shore Hardness C, D and DO	1.15 Duros		

Thermodynamic

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Thermometers – LIG ^{FO}	-20 °C to 200 °C	0.054 °C	Fluke 743B, Martel 1010, Type K Thermocouple Thermalcal Model 28
	-4 °F to 392 °F	0.097 °F	
IR Thermometer ^{FO}	35 °C to 500 °C	0.64 °C	Fluke 4181, Reed BX-500
Humidity ^{FO}	10 % RH to 90 % RH	1.5 % RH	Rotronic HP 23-A Rotronic HygroClip HC2-S Incubator, Saturated Salt Solutions

Air Velocity

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Anemometer ^{FO}	1.7×10^{-2} f/s to 120 f/s	9.6×10^{-3} f/s	Qtest AM 4836



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Time & Frequency

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Timers and Stopwatches ^{FO}	86 400 s	0.51 s	Reference stopwatch Control 1051

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represent the smallest measurement uncertainties attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is 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 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.
4. 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.
5. The term L represents length in inches or millimeters appropriate to the uncertainty statement.
6. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement