CERTIFICATE OF ACCREDITATION

ANSI National Accreditation Board

11617 Coldwater Road, Fort Wayne, IN 46845 USA

This is to certify that

Techmaster de Mexico SA de CV

Calle Seminario No. 8610 Int. 11, Col. Niños Heroes, Deleg. La Presa. C.P. 22120
Tijuana, B.C., Mexico
(and satellite locations as listed on the scope)

has been assessed by ANAB and meets the requirements of international standard

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

while demonstrating technical competence in the field of

CALIBRATION, DIMENSIONAL MEASUREMENT AND TESTING

Refer to the accompanying Scope of Accreditation for information regarding the types of activities to which this accreditation applies

AC-1342
Certificate Number

ANAB Approval

Certificate Valid Through: 10/29/2020
Version No. 009 Issued: 11/04/2019

This laboratory 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 (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

ANSI National Accreditation Board

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017 AND ANSI/NCSL Z540-1-1994 (R2002)

Techmaster de Mexico SA de CV

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CALIBRATION, DIMENSIONAL MEASUREMENT AND TESTING

Valid to: **October 29, 2020** Certificate Number: **AC-1342**

CALIBRATION

Acoustics and Vibration

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Sound - Source	(94 to 114) dB @ 1 kHz	0.62 dB	Sound Calibrator Tijuana Mexicali Juarez Monterrey Queretaro

Acoustics and Vibration

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Sound - Measure	(30 to 140) dB	0.43 dB	Sound Level Meter Tijuana Mexicali Juarez Monterrey Queretaro
Vibration - Source	(0.2 to 20) gpk (7 to 100) Hz 100 Hz to 5 kHz (5 to 10) kHz	 3.5 % of reading + 0.03 g 3.1 % of reading + 0.03 g 3.6 % of reading + 0.03 g	Portable Vibration Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
Vibration - Measure	Up to 500 g (1 to 10 Hz) (10 Hz to 2kHz) (2 kHz to 10 kHz)	 3.5 % of reading + 0.06 g 2.3 % of reading + 0.06 g 4.4 % of reading + 0.06 g	Portable Vibration Meter Tijuana Mexicali Juárez Monterrey Queretaro

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
pH	1.681 pH 4.011 pH 6.987 pH 10.03 pH	0.03 pH 0.04 pH 0.04 pH 0.03 pH	pH Solutions Tijuana Mexicali Juarez Monterrey Queretaro
Viscosity Dynamic @ 25 °C	7.239 cP 100.9 cP 498.1 cP 717.7 cP 4 595 cP 7 686 cP 200 050 cP	0.26 cP 1.1 cP 5.1 cP 7.4 cP 48 cP 80 cp 210 cP	Standard Solutions: S6, S60, D500, N350, S2000, D7500, S8000 Tijuana Mexicali Juarez Monterrey Queretaro

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Conductivity	2 µmhos/cm 10 µmhos/cm 100 µmhos/cm 1 000 µmhos/cm 1 400 µmhos/cm 10 000 µmhos/cm 100 000 µmhos/cm	0.25 µmhos/cm 1.2 µmhos/cm 15 µmhos/cm 120 µmhos/cm 180 µmhos/cm 2 200 µmhos/cm 8 000 µmhos/cm	Conductivity Solutions Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage - Source	(2.2 to 220) mV 200 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V 220 V to 1.1 kV	11 µV/V + 0.48 µV 6.2 µV/V + 0.87 µV 4.2 µV/V + 3 µV 4.2 µV/V + 5.2 µV 6.1 µV/V + 99 µV 8 µV/V + 0.53 mV	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
DC Voltage - Measure	(2 to 200) mV 200 mV to 2 V (2 to 20) V (20 to 200) V 200 V to 1 kV	6.7 µV/V + 0.2 µV 4.3 µV/V + 0.5 µV 4.3 µV/V + 4.8 µV 6.7 µV/V + 98 µV 6.7 µV + 0.63 mV	Reference Multimeter Tijuana Mexicali Juarez Monterrey Queretaro
DC Voltage - Measure	Up to 2 kV (1 to 20) kV (20 to 70) kV	0.5 mV/V + 11 V 0.5 mV/V + 6.9 V 0.56 mV/V + 51 V	High Voltage Meter Tijuana Mexicali Juarez Monterrey Queretaro
Charge Analyzer	Up to 1 kV (1 to 5) kV	24 mV/V + 0.5 V 24 mV/V + 12 V	Charge Plate Analyzer Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current - Source	(2 to 220) µA 220 µA to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A	50 µA/A + 7.2 nA 43 µA/A + 8.4 nA 43 µA/A + 48 nA 55 µA/A + 0.84 µA 97 µA/A + 21 µA	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
DC Current - Source	(2.2 to 10) A (10 to 10.9) A (10.9 to 20.5) A	0.6 mA/A + 0.77 mA 0.6 mA/A + 1 mA 1.2 mA/A + 1.4 mA	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
DC Current - Source	(10 to 550) A (550 to 1 025) A	2.5 mA/A + 0.55 A 2.6 mA/A + 0.55 A	Multiproduct Calibrator with 50 Turn Coil Tijuana Mexicali Juarez Monterrey Queretaro
DC Current - Measure	(2 to 200) µA (200 µA to 2) mA (2 to 20) mA (20 to 200) mA 200 mA to 2 A (2 to 20) A	15 µA/A + 0.49 nA 15 µA/A + 4.8 nA 17 µA/A + 48 nA 59 µA/A + 0.96 µA 0.23 mA/A + 25 µA 0.49 mA/A + 0.36 mA	Reference Multimeter Tijuana Mexicali Juarez Monterrey Queretaro
DC Current – Measure	(20 to 100) A (100 to 300) A	0.5 mA/A + 0.004 A 1 mA/A + 0.004 A	Current Shunt Tijuana Mexicali Juarez Monterrey Queretaro
DC Current - Measure	Up to 1 000 A	2.6 mA/A + 20 mA	Current Shunt Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance - Source (Fixed Values)	0.001 Ω 0.01 Ω 0.1 Ω 0.333 Ω	0.23 mΩ 0.22 mΩ 0.2 mΩ 0.9 mΩ	Reference Resistor Tijuana Mexicali Juarez Monterrey Queretaro
Resistance - Source (Fixed Values)	1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω	0.12 mΩ 0.22 mΩ 0.28 mΩ 0.53 mΩ 1.3 mΩ 2.3 mΩ	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
Resistance - Source (Fixed Values)	1 kΩ 1.9 kΩ 10 kΩ 19 kΩ 100 kΩ 190 kΩ 1 MΩ 1.9 MΩ 10 MΩ 19 MΩ 100 MΩ	11 mΩ 20 mΩ 0.11 Ω 0.2 Ω 1.4 Ω 2.6 Ω 25 Ω 51 Ω 0.50 kΩ 1.2 kΩ 14 kΩ	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
Resistance - Source	100 MΩ to 1 GΩ (1 to 10) GΩ 10 GΩ to 1 TΩ	10 mV/V + 1 kΩ 11 mV/V + 0.19 MΩ 21 mV/V + 2.1 MΩ	Decade Resistor Tijuana Mexicali Juarez Monterrey Queretaro
Resistance - Measure	Up to 2Ω (2 to 20) Ω (20 to 200) Ω 200 Ω to 2 kΩ (2 to 20) kΩ (20 to 200) kΩ 200 kΩ to 2 MΩ (2 to 20) MΩ (20 to 200) MΩ 200 MΩ to 2 GΩ	23 μΩ/Ω + 5.9 μΩ 12 μΩ/Ω + 18 μΩ 9.8 μΩ/Ω + 80 μΩ 12 μΩ/Ω + 0.94 mΩ 11 μΩ/Ω + 47 mΩ 11 μΩ/Ω + 60 mΩ 13 μΩ/Ω + 1.2 Ω 28 μΩ/Ω + 0.12 kΩ 0.15 mΩ/Ω + 1.2 kΩ 1.9 mΩ/Ω + 12 kΩ	Reference Multimeter Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance – Measure			
at 500 V	200 kΩ to 10 GΩ	61 mΩ/Ω + 0.6 MΩ	Insulation ResistanceTester Tijuana Mexicali Juarez Monterrey Queretaro
at 500 V	(10 to 100) GΩ	0.24 Ω/Ω + 0.6 MΩ	
at 1 kV	200 kΩ to 20 GΩ	60 mΩ/Ω + 0.6 MΩ	
at 1 kV	(20 to 200) GΩ	0.24 Ω/Ω + 0.6 MΩ	
at 2.5 kV	200 kΩ to 50 GΩ	60 mΩ/Ω + 0.6 MΩ	
at 5 kV	200 kΩ to 100 GΩ	60 mΩ/Ω + 0.6 MΩ	
at 5 kV	100 GΩ to 1 TΩ	0.24 Ω/Ω + 0.6 MΩ	
at 10 kV	200 kΩ to 200 GΩ	62 mΩ/Ω + 0.6 MΩ	
at 10 kV	200 GΩ to 2 TΩ	0.24 Ω/Ω + 0.6 MΩ	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage - Source	Up to 2.2 mV		Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
	(10 to 20) Hz	0.29 mV/V + 4.8 µV	
	(20 to 40) Hz	0.11 mV/V + 4.8 µV	
	40 Hz to 20 kHz	96 µV/V + 9.6 µV	
	(20 to 50) kHz	0.24 mV/V + 4.8 µV	
	(50 to 100) kHz	0.6 mV/V + 6 µV	
	(100 to 300) kHz	1.3 mV/V + 12 µV	
	(300 to 500) kHz	1.7 mV/V + 24 µV	
	500 kHz to 1 MHz	3.3 mV/V + 24 µV	
	(2.2 to 22) mV		
	(10 to 20) Hz	0.3 mV/V + 4.8 µV	
	(20 to 40) Hz	0.13 mV/V + 4.8 µV	
	40 Hz to 20 kHz	0.12 mV/V + 4.8 µV	
	(20 to 50) kHz	0.24 mV/V + 4.8 µV	
	(50 to 100) kHz	0.62 mV/V + 6 µV	
	(100 to 300) kHz	1.3 mV/V + 12 µV	
	(300 to 500) kHz	1.7 mV/V + 24 µV	
	500 kHz to 1 MHz	3.3 mV/V + 24 µV	
	(22 to 220) mV		
	(10 to 20) Hz	0.29 mV/V + 20 µV	
	(20 to 40) Hz	0.11 mV/V + 8.9 µV	
	40 Hz to 20 kHz	98 µV/V + 8.5 µV	
	(20 to 50) kHz	0.24 mV/V + 8.5 µV	
	(50 to 100) kHz	0.55 mV/V + 21 µV	
	(100 to 300) kHz	1.1 mV/V + 24 µV	
	(300 to 500) kHz	1.7 mV/V + 32 µV	
	500 kHz to 1 MHz	3.3 mV/V + 54 µV	
	220 mV to 2.2 V		
	(10 to 20) Hz	0.29 mV/V + 48 µV	
	(20 to 40) Hz	0.11 mV/V + 18 µV	
	40Hz to 20 kHz	57 µV/V + 9.6 µV	
	(20 to 50) kHz	91 µV/V + 12 µV	
	(50 to 100) kHz	0.13 mV/V + 36 µV	
	(100 to 300) kHz	0.5 mV/V + 96 µV	
	(300 to 500) kHz	1.2 mV/V + 0.24 mV	
	500 kHz to 1 MHz	2.1 mV/V + 0.36 mV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage - Source	(2.2 to 22) V (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz (22 to 220) V (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 kHz to 1 MHz 220 V to 1.1 kV (15 to 50) Hz 50 Hz to 1 kHz	 0.29 mV/V + 0.14 mV 0.11 mV/V + 41 µV 57 µV/V + 23 µV 91 µV/V + 21 µV 0.13 mV/V + 43 µV 1.2 mV/V + 0.25 mV 2.1 mV/V + 0.4 mV 0.29 mV/V + 0.12 V 0.12 mV/V + 1.9 mV 75 µV/V + 0.72 mV 0.10 mV/V + 1.2 mV 0.19 mV/V + 3 mV 1.1 mV/V + 19 mV 5.3 mV/V + 48 mV 9.7 mV/V + 96 mV 0.29 mV/V + 48 mV 0.11 mV/V + 18 mV	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
AC Voltage - Measure	Up to 200 mV (1 to 10) Hz (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz 200 mV to 2 V (1 to 10) Hz (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	 0.2 mV/V + 29 µV 0.17 mV/V + 5 µV 0.14 mV/V + 5 µV 0.17 mV/V + 2 µV 0.17 mV/V + 5 µV 0.42 mV/V + 10 µV 0.93 mV/V + 24 µV 0.19 mV/V + 0.33 mV 0.15 mV/V + 3 µV 0.12 mV/V + 24 µV 0.17 mV/V + 24 µV 0.14 mV/V + 24 µV 0.27 mV/V + 48 µV 0.7 mV/V + 0.24 mV	Reference Multimeter Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage - Measure	(2 to 20) V		Reference Multimeter Tijuana Mexicali Juarez Monterrey Queretaro
	(1 to 10) Hz	0.18 mV/V + 3.3 mV	
	(10 to 40) Hz	0.14 mV/V + 0.3 mV	
	(40 to 100) Hz	0.11 mV/V + 0.24 mV	
	100 Hz to 2 kHz	0.15 mV/V+ 0.24 mV	
	(2 to 10) kHz	0.14 mV/V + 0.24 mV	
	(10 to 30) kHz	0.27 mV/V + 0.48 mV	
	(30 to 100) kHz	0.69 mV/V + 2.4 mV	
	(100 to 300) kHz	3.6 mV/V + 24 mV	
	300 kHz to 1 MHz	12 mV/V + 0.24 mV	
	(20 to 200) V		
	1 to 10 Hz	0.19 mV/V + 58 mV	
	(10 to 40) Hz	0.15 mV/V + 2.7 mV	
	(40 to 100) Hz	0.12 mV/V + 2.4 mV	
	100 Hz to 2 kHz	0.15 mV/V + 2.4 mV	
	(2 to 10) kHz	0.14 mV/V + 2.4 mV	
	(10 to 30) kHz	0.27 mV/V + 4.8 mV	
	(30 to 100) kHz	0.69 mV/V + 24 mV	
	(100 to 300) kHz	3.6 mV/V + 0.24 mV	
	300 kHz to 1 MHz	12 mV/V + 2.4 V	
	200 V to 1 kV		
	(1 to 10) Hz	0.19 mV/V + 84 mV	
	(10 to 40) Hz	0.16 mV/V + 24 mV	
	40 Hz to 10 kHz	0.29 mV/V + 24 mV	
	(10 to 30) kHz	0.28 mV/V + 48 mV	
	(30 to 100) kHz	0.72 mV/V + 0.24 V	
AC Voltage - Measure	(1 to 2) kV		High Voltage Meter Tijuana Mexicali Juarez Monterrey Queretaro
	(20 to 400) Hz	0.86 mV/V + 11 V	
	(2 to 20) kV		
	(20 to 100) Hz	0.52 mV/V + 49 V	
	(20 to 70) kV		
	(50 to 60) Hz	0.49 mV/V + 0.21 kV	
AC Current - Source	Up to 220 µA		Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
	(10 to 20) Hz	0.38 mA/A + 21 nA	
	(20 to 40) Hz	0.3 mA/A + 12 nA	
	40 Hz to 1 kHz	0.27 mA/A + 9.9 nA	
	(1 to 5) kHz	0.41 mA/A + 15 nA	
	(5 to 10) kHz	1.4 mA/A + 78 nA	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source	220 µA to 2.2 mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (2.2 to 22) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (22 to 220) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 220 mA to 2.2 A 20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	 0.3 mA/A + 68 nA 0.19 mA/A + 48 nA 0.15 mA/A + 48 nA 0.27 mA/A + 0.13 µA 1.3 mA/A + 0.78 µA 0.3 mA/A + 0.49 µA 0.2 mA/A + 0.43 µA 0.15 mA/A + 0.43 µA 0.39 mA/A + 0.66 µA 1.4 mA/A + 6 µA 0.43 mA/A + 7.9 µA 0.37 mA/A + 4.7 µA 0.36 mA/A + 3.9 µA 0.41 mA/A + 4.3 µA 3.3 mA/A + 12 µA 0.5 mA/A + 55 µA 4 µA/A + 96 µA 9.3 mA/A + 0.19 mA	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
AC Current – Source	(3 to 20) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz (11 to 20.5) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	 0.5 mA/A + 1.4 mA 0.7 mA/A + 1.4 mA 20 mA/A + 1.4 mA 0.8 mA/A + 3.4 mA 1 mA/A + 3.4 mA 20 mA/A + 3.4 mA	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
AC Current – Source	(16.5 to 55) A 65 Hz 440 Hz (55 to 150) A 65 Hz 440 Hz (150 to 550) A 65 Hz 440 Hz	 2.8 mA/A + 0.17 A 7.9 mA/A + 0.19 A 2.8 mA/A + 0.31 A 7.9 mA/A + 0.16 A 2.8 mA/A + 1.3 A 7.9 mA/A + 0.41 A	Multiproduct Calibrator with 50 Turn Coil Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source	(550 to 1 025) A 65 Hz 440 Hz	 2.9 mA/A + 0.71 A 8 mA/A + 1.2 A	Multiproduct Calibrator with 50 Turn Coil Tijuana Mexicali Juarez Monterrey Queretaro
AC Current - Measure	Up to 200 µA 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz 200 µA to 2 mA 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz 2 to 20 mA 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz 20 to 200 mA 10 Hz to 10 kHz (10 to 30) kHz 200 mA to 2 A 10 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz 2 to 20 A 10 Hz to 2 kHz (2 to 10) kHz	 0.42 mA/A + 24 nA 0.88 mA/A + 24 nA 4.8 mA/A + 24 nA 0.36 mA/A + 0.24 µA 0.86 mA/A + 0.24 µA 4.8 mA/A + 0.24 µA 0.37 mA/A + 2.4 µA 0.86 mA/A + 2.4 µA 4.8 mA/A + 2.4 µA 0.35 mA/A + 24 µA 0.75 mA/A + 24 µA 0.75 mA/A + 0.25 mA 0.87 mA/A + 0.27 mA 3.6 mA/A + 0.26 mA 0.99 mA/A + 2.4 mA 3.1 mA/A + 2.4 mA	Reference Multimeter Tijuana Mexicali Juarez Monterrey Queretaro
AC Current - Measure	(20 to 1 000) A (60 to 100) Hz	 2.6 mA/A + 0.28 A	Current Shunt Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicators	Type B		Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
	(600 to 800) °C	0.53 °C	
	(800 to 1 000) °C	0.43 °C	
	(1 000 to 1 550) °C	0.37 °C	
	(1 550 to 1 820) °C	0.41 °C	
	Type C		
	(0 to 150) °C	0.36 °C	
	(150 to 650) °C	0.30 °C	
	(650 to 1 000) °C	0.37 °C	
	(1 000 to 1 800) °C	0.61 °C	
	(1 800 to 2 316) °C	1 °C	
	Type E		
	(-250 to -100) °C	0.6 °C	
	(-100 to -25) °C	0.19 °C	
	(-25 to 350) °C	0.17 °C	
	(350 to 650) °C	0.19 °C	
	(650 to 1 000) °C	0.26 °C	
	Type J		
	(-200 to -100) °C	0.32 °C	
	(-100 to -30) °C	0.19 °C	
	(-30 to 150) °C	0.17 °C	
	(150 to 760) °C	0.21 °C	
	(760 to 1 200) °C	0.28 °C	
	Type K		
	(-200 to -100) °C	0.57 °C	
	(-100 to -25) °C	0.22 °C	
	(-25 to 120) °C	0.19 °C	
	(120 to 1 000) °C	0.31 °C	
	(1 000 to 1 372) °C	0.48 °C	
	Type L		
	(-200 to -100) °C	0.45 °C	
	(-100 to 800) °C	0.32 °C	
	(800 to 900) °C	0.21 °C	
	Type N		
	(-200 to -100) °C	0.48 °C	
	(-100 to -25) °C	0.26 °C	
	(-25 to 120) °C	0.23 °C	
	(120 to 410) °C	0.22 °C	
	(410 to 1 300) °C	0.33 °C	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicators	Type R (0 to 250) °C (250 to 400) °C Type S (400 to 1 000) °C (1 000 to 1 767) °C Type T (-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C Type U (0 to 250) °C (250 to 1 000) °C (1 000 to 1 400) °C (1 400 to 1 767) °C	 0.69 °C 0.42 °C 0.48 °C 0.6 °C 0.76 °C 0.29 °C 0.19 °C 0.48 °C 0.57 °C 0.43 °C 0.44 °C 0.57 °C	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
Electrical Simulation of RTD Indicators	Pt 385, 100 Ω (-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C Pt 385, 200 Ω (-200 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C Pt 385, 500 Ω (-200 to -80) °C (-80 to 100) °C (100 to 260) °C (260 to 400) °C (400 to 600) °C (600 to 630) °C	 0.06 °C 0.08 °C 0.11 °C 0.12 °C 0.14 °C 0.28 °C 0.05 °C 0.06 °C 0.14 °C 0.16 °C 0.17 °C 0.19 °C 0.07 °C 0.07 °C 0.08 °C 0.11 °C 0.12 °C 0.14 °C	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of RTD Indicators	Pt 385, 1 000Ω (-200 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 600) °C (600 to 630) °C Pt 3926, 100 Ω (-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	 0.06 °C 0.07 °C 0.07 °C 0.08 °C 0.1 °C 0.28 °C 0.06 °C 0.08 °C 0.11 °C 0.12 °C 0.14 °C	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
Capacitance - Source 10 Hz to 10 kHz 10 Hz to 10 kHz 10 Hz to 3 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz (10 to 600) Hz (10 to 300) Hz (10 to 150) Hz (10 to 120) Hz (10 to 80) Hz	 (200 to 400) pF 400 pF to 1.1 nF (1.1 to 3.3) nF (3.3 to 11) nF (11 to 33) nF (33 to 110) nF (110 to 330) nF 330 nF to 1.1 µF (1.1 to 3.3) µF (3.3 to 11) µF (11 to 33) µF (33 to 110) µF	 6 mF/F + 12 pF 6 mF/F + 12 pF 6 mF/F + 12 pF 3 mF/F + 13 pF 3 mF/F + 0.12 nF 3 mF/F + 0.14 nF 3 mF/F + 0.43 nF 3 mF/F + 1.5 nF 3 mF/F + 4.1 nF 3 mF/F + 14 nF 4.8 mF/F + 41 nF 5.4 mF/F + 0.16 µF	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
Capacitance - Measure (1 to 100) kHz 300 Hz to 100 kHz (50 to 100) kHz (50 to 200) kHz 50 Hz to 10 kHz 50 Hz to 1 kHz	 100 pF to 1 nF (1 to 10) nF (10 to 100) nF (0.1 to 1) µF (1 to 10) µF (10 to 100) µF	 1.3 mF/F + 0.013 pF 1.3 mF/F + 0.17 pF 1.2 mF/F + 2.7 pF 1.2 mF/F + 0.14 nF 1.2 mF/F + 1.1 nF 1.2 mF/F + 1.7 nF	Impedance Meter Tijuana Mexicali Juarez Monterrey Queretaro
Capacitance - Source (Fixed Values @ 1 kHz)	1 nF 10 nF 100 nF 1 µF	0.8 pF 14 pF 0.14 nF 0.65 nF	Reference Capacitors Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Inductance - Source 100 Hz to 10 kHz	100 µH 1 mH 20 mH 100 mH @ (0.1 to 1) kHz 101.88 mH @ 10 kHz	0.85 µH 18 µH 27 µH 0.13 mH 0.15 mH	Reference Inductor Tijuana Mexicali Juarez Monterrey Queretaro
Inductance - Measure (2 to 100) kHz 300 Hz to 100k Hz 100 Hz to 100 kHz (50 to 100) kHz 50 Hz to 10 kHz 50 Hz to 2 kHz	 100 µH to 1 mH (1 to 10) mH (10 to 100) mH 100 mH to 1 H (1 to 10) H (10 to 100) H	 1.2 mH/H + 23 nH 1.2 mH/H + 0.27 µH 1.2 mH/H + 3.3 µH 1.3 mH/H + 27 µH 1.3 mH/H + 1.1 µH 1.3 mH/H + 3.5 mH	Impedance Meter Tijuana Mexicali Juarez Monterrey Queretaro
Oscilloscopes Amplitude Square Wave 50 Ω Load 1 MΩ Load Leveled Sine Wave Time Marker into 50 Ω	 1 mV to 6.6 V p-p 10 Hz to 10 kHz 1 mV to 130 V p-p 10 Hz to 10 kHz 5 mV to 5.5 V 50 kHz to 100 MHz (100 to 300) MHz (300 to 500) MHz (500 to 600) MHz 1 ns to 50 ms 20 ms to 5 s	 3 mV/V + 0.96 mV 3 mV/V + 1.8 mV 42 mV/V + 1.4 mV 48 mV/V + 1.4 mV 66 mV/V + 1.4 mV 72 mV/V + 1.4 mV 1 µs/s + 60 ns 3 µs/s + 9 µs	Oscilloscope Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
DC Power - Source	Up to 3.06 kW (3.06 to 20.91) kW	20 µW/W + 0.39 W 50 µW/W + 3.1W	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
AC Power - Source (45 to 65 Hz)	Up to 336.6 W 336.6 W to 2.244 kW (2.244 to 4.59) kW (4.59 to 20.91) kW	50 µW/W + 0.39 W 60 µW/W + 2.8 W 90 µW/W + 2.8 W 50 µW/W + 2.8 W	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Phase	Up to 90 ° (10 to 500) Hz 500 Hz to 1 kHz (1to 5) kHz (5 to 10) kHz (10 to 30) kHz	1. 4 ° 1.5 ° 2.2 ° 3.7 ° 6.9 °	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power/Gain – Measure[1]	(-30 to 20) dB (10 to 20) MHz (20 to 50) MHz (50 to 100) MHz 100 MHz to 1 GHz (1 to 4) GHz (4 to 8) GHz (8 to 18) GHz	2.1 % of reading + 0.09 dB 1.8 % of reading + 0.09 dB 1.4 % of reading + 0.09 dB 1.2 % of reading + 0.09 dB 1.2 % of reading + 0.09 dB 1.4 % of reading + 0.09 dB 2.5 % of reading + 0.09 dB	Feed thru Power Standard, Control Unit Tijuana Mexicali Juarez Monterrey Queretaro
Frequency Modulation - Measure	Rate: 20 Hz to 10 kHz Deviation: ≤ 40 kHz peak 250 kHz to 10 MHz Rate: 20 Hz to 10 kHz Deviation: ≤ 400 kHz peak 10 MHz to 1.3 GHz	2.4 % of reading + 210 Hz 1.2 % of reading + 210 Hz	Measuring Receiver w/ Power Sensor Tijuana Mexicali Juarez Monterrey Queretaro
Amplitude Modulation - Measure	Rate: 50 Hz to 10 kHz Depths;(5 to 99) % 150 kHz to 10 MHz Rate 10 MHz to 1.3 GHz Depths (5 to 99) % 50 Hz to 50 kHz	2.4 % of reading + 0.19 % depth 1.2 % of reading + 0.19 % depth	Measuring Receiver w/ Power Sensor Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Phase Modulation - Measure	Rate: 200 Hz to 10 kHz 150 kHz to 10 MHz Rate: 200 Hz to 20 kHz 10 MHz to 1.3 GHz	4.8 % of reading + 0.32 rad 3.6 % of reading + 0.32 rad	Measuring Receiver w/ Power Sensor Tijuana Mexicali Juarez Monterrey Queretaro
RF Power - Measure	(-20 to 30) dBm 100 kHz to 2.6 GHz	0.1 dB	Measuring Receiver w/ Power Sensor Tijuana Mexicali Juarez Monterrey Queretaro
RF Power - Measure	(-30 to 20) dBm 100 kHz to 4.2 GHz 50 MHz to 26.5 GHz	4.9 % of reading + 0.21 dB 3.1 % of reading + 0.13 dB	Power Sensors w/Power Meter Tijuana Mexicali Juarez Monterrey Queretaro
Tuned RF Power Relative - Measure	2.5 MHz to 1.3 GHz (0 to -10) dB (-10 to -40) dB (-40 to -50) dB (-50 to -80) dB (-80 to -90) dB (-90 to -110) dB (-110 to -127) dB	 0.03 dB 0.06 dB 0.13 dB 0.18 dB 0.16 dB 0.43 dB 0.44 dB	Measuring Receiver w/ Power Sensor Tijuana Mexicali Juarez Monterrey Queretaro

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power - Source	10 MHz to 2 GHz (13 to 10) dBm (10 to -10) dBm (-10 to -60) dBm (-60 to -110) dBm 2 to 20 GHz (13 to 10) dBm (10 to -10) dBm (-10 to -60) dBm (-60 to -110) dBm 20 GHz to 26.5 GHz (13 to- 10) dBm (-10 to -60) dBm (-60 to -1) dBm	 1.5 dB 0.73 dB 1.1 dB 1.7 dB 1.6 dB 0.84 dB 1.2 dB 1.8 dB 1.1 dB 1.5 dB 1.8 dB	Signal Generator Tijuana Mexicali Juarez Monterrey Queretaro

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Plug Gages[1,2]	Up to 0.5 in (0.5 to 1) in (1 to 2.5) in (2.5 to 4) in (4 to 12) in	(6.5 + 2.6*L*) µin (7.8 + 2.3*L*) µin (11 + 4.6*L*) µin (18 + 3*L*) µin (13 + 7.7*L*) µin	LabMaster System Tijuana Juarez Monterrey
Ring Gages[1,2]	Up to 1 in (1 to 4) in (4 to 10) in (10 to 40) in	(9 + 20*L*) µin (8.1 + 8.4*L*) µin (11 + 11*L*) µin [26 + 13 (*L*-10)] µin	LabMaster System Tijuana Juarez Monterrey
Gage Blocks[1,2]	Up to 1 in (1 to 4) in 6 in 10 in (10 to 40) in	(4 + 0.8*L*) µin (3.1 + 1.7*L*) µin 14 µin 23 µin [9.7 + 13 (*L*-10)] µin	LabMaster System Tijuana Juarez Monterrey
Thread Plug Gages[1,2]	(0.05 to 1) in (1 to 2) in (2 to 12) in (10 to 40) in	100 µin 100 µin 130 µin [68 + 13 (*L*-10)] µin	LabMaster System Tijuana Juarez Monterrey

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thread Ring Gages[1,2]	(0.19 to 1) in (1 to 2) in (2 to 10) in (10 to 40) in	38 µin 40 µin 77 µin [60 + 13 (*L*-10)] µin	LabMaster System Tijuana Juarez Monterrey
OD Micrometers[2]	Up to 12 in	(66 + 9.6*L*) µin	Gage Blocks Tijuana Mexicali Juarez Monterrey Queretaro
ID Micrometers[2]	Up to 12 in (12 to 40) in	(66 + 9.5*L*) µin (150 + 10*L*) µin	Gage Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Calipers[2]	Up to 12 in (12 to 40) in (40 to 80) in (80 to 120) in	(610 + 1.1*L*) µin (630 + 4.3*L*) µin (940 + 0.25*L*) µin (1 000 + 7.5*L*) µin	Gage Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Dial Indicators[2]	Up to 4 in	(62 + 5.6*L*) µin	Gage Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Test Indicators[2]	Up to 0.06 in	(6.2 + 4.4*L*) µin	Gage Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Pin Gages	Up to 60 mm	3 µm	Laser Micrometer Tijuana Mexicali Juarez Monterrey Queretaro

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Laser Micrometer	Up to 60 mm	0.64 um	Master Plug Gages Tijuana Mexicali Juarez Monterrey Queretaro
Height Gages[2]	Up to 12 in (12 to 40) in	(130 + 7*L*) µin (130 + 13*L*) µin	Gage Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Optical Length[2]	(0 to 50) mm (50 to 100) mm	(2.1 + 0.005*L*) µm (2.6 + 0.005*L*) µm	Reference Glass Scale Tijuana Mexicali Juarez Monterrey Queretaro
Optical Flat - Flatness	Up to 4 in	9.6 µin	Optical Parallels Tijuana Mexicali Juarez Monterrey Queretaro
Distance Measurement[2]	Up to 972 mm Up to 1 200 in	(2.4+0.7*L* / 600) µm 0.06 in	Height Gage, Distance Meter Tijuana Mexicali Juarez Monterrey Queretaro
Protractor/Angle	(Up to 90) °	2 arc min	Angle Block Set Tijuana Mexicali Juarez Monterrey Queretaro

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Square/Block Parallelism	(-0.1 to 0.10) in	21 µin	Federal Head/Amplifier Tijuana Mexicali Juarez Monterrey Queretaro
Surface Plates Local Area Flatness (Repeat Reading)	Up to 1 in	34 µin/step	Repeat-o-Meter Tijuana Mexicali Juarez Monterrey Queretaro
Surface Plates Overall Flatness	Up to 1 000 arc sec	12 arc sec	Federal Level System Tijuana Mexicali Juarez Monterrey Queretaro
Surface Finish - Source	118 µin	2.6 µin	Roughness Standard Tijuana Mexicali Juarez Monterrey Queretaro
Surface Finish - Measure	(0 to 300) µin	5.6 µin	Surface Roughness Meter Tijuana Mexicali Juarez Monterrey Queretaro
Coating Thickness Gauge[3]	Up to 19.84 mils (19.84 to 58.35) mils (58.35 to 202.70) mils	0.02 mils 0.09 mils 0.2 mils	Coating Thickness Standard Tijuana Mexicali Juarez Monterrey Queretaro

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Force - Tension/Compression	Up to 50 lbf (50 to 500) lbf Up to 1 000 lbf (1 000 to 5 000) lbf (5 000 to 10 000) lbf (10 000 to 50 000) lbf	0.06 lbf 0.26 lbf 0.68 lbf 6.3 lbf 24 lbf 60 lbf	Reference Load Cells Tijuana Mexicali Juarez Monterrey Queretaro
Scales/Balances[2]	Up to 5 g	0.021 mg + 0.6*R*	Class 0 Weights Tijuana Mexicali Juarez Monterrey Queretaro
	Up to 50 g (50 to 200) g 200 g to 10 kg (10 to 500) kg (500 to 1 000) kg	0.046 mg + 0.6*R* 0.1 mg + 0.6*R* 88 mg + 0.6*R* 4.5 g + 0.6*R* 110 g + 0.6*R*	Class F Weights Tijuana Mexicali Juarez Monterrey Queretaro
Torque - Measure	Up to 20 ozf·in (15 to 200) ozf·in (12.5 to 50) lbf·in (50 to 250) lbf·in (250 to 1 000) lbf·in (83.3 to 250) lbf·ft	0.5 % of reading + 0.38 ozf·in 0.25 % of reading + 0.33 ozf·in 0.33 % of reading + 0.006 lbf·in 0.31 % of reading + 0.04 lbf·in 0.31 % of reading + 0.12 lbf·in 0.31 % of reading + 1.9 lbf·ft	Torque Cell/ Torque Tester Tijuana Mexicali Juarez Monterrey Queretaro
Torque - Measure	(250 to 1 000) lbf·ft	0.31 % of reading + 0.88 lbf·ft	Torque Tester Tijuana Mexicali Juarez Monterrey Queretaro
Torque - Source	(0.07 to 0.28) Nm (0.28 to 8.47) Nm (8.47 to 16.93) Nm (16.93 to 56.44) Nm (56.44 to 67.71) Nm (67.71 to 225.7) Nm (225.7 to 1 221.05) Nm	0.054 % of reading + 0.000 18 Nm 0.053 % of reading + 0.001 5 Nm 0.015 % of reading + 0.002 1 Nm 0.007 5 % of reading + 0.022 Nm 0.002 9 % of reading + 0.021 Nm 0.007 4 % of reading + 0.025 Nm 0.002 5 % of reading + 0.02 Nm	Calibration Arms and Weights Tijuana Mexicali Juarez Monterrey Queretaro

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Pressure - Measure	Up to 1 inH2O (1 to 10) inH2O (-14.7 to 300) psig (15 to 1 000) psig (1 000 to 10 000) psig (0.25 to 2.5) psig	0.006 inH2O 0.05 inH2O 0.09 psi 0.32 psi 3.8 psi 0.000 8 psi	Pressure Calibrator, Tijuana Mexicali Juarez Monterrey Queretaro
Pressure Source	(-14 to -0.43) psig (0 to 1 000) psig	0.016 % of reading + 0.000 5 psi 0.016 % of reading + 0.001 2 psi	Pneumatic Deadweight Tester Tijuana
Pressure Source	(90 to 10 000) psig	0.006 % of reading + 0.008 psi	Hydraulic Deadweight Tester Tijuana
Barometric Pressure Measurement	(0 to 15) psia	0.011 psi	Absolute pressure module Tijuana Mexicali Juarez Monterrey Queretaro
Volumetric Calibration	Up to 5 ml (5 to 100) ml (100 ml to 250) ml 250 ml to 1.2 l (1.2 to 25) l	0.018 ml 0.071 ml 0.355 ml 0.63 ml 0.81 ml	Analytical Balance and DI Water Tijuana Mexicali Juarez Monterrey Queretaro
Air Flow	Up to 10 sccm (10 to 500) sccm (0.5 to 20) slpm (20 to 250) slpm (250 to 1 000) slpm (0 to 30) sccm (30 to 300) sccm (1 to 10) slm (10 to 100) slm (100 to 1 000) slm	0.52 % of reading + 0.03 sccm 0.52 % of reading + 1.2 sccm 0.52 % of reading + 0.05 slpm 0.87 % of reading + 0.51 slpm 0.87 % of reading + 5.4 slpm 1.4 % of reading + 0.01 sccm 1.4 % of reading + 0.1 sccm 1.4 % of reading + 0.001 slm 1.4 % of reading + 0.01 slm 1.4 % of reading + 0.91 slm	Flowmeter Calibration System Tijuana Mexicali Juarez Monterrey Queretaro
	(0 to 200) sccm	1 % of reading + 2 sccm	Leak Tester Tijuana Mexicali Juarez Monterrey

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Liquid Flow	1 to 10000 GPM DN 30 to DN 1 000	2 % of reading + 0.l6 GPM	Ultrasonic Flow Meter Tijuana Mexicali Juarez Monterrey Queretaro
Air Velocity	(100 to 6 800) fpm	1.3 % of reading + 41 fpm	Anemometer Tijuana Mexicali Juarez Monterrey Queretaro
Mass DOD Midas, OEM and GIDEP Sourced Procedures NIST 105-1 Handbook Up to Class F only	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 25 kg	0.13 mg 0.15 mg 0.17 mg 0.21 mg 0.24 mg 0.42 mg 0.52 mg 0.65 mg 0.74 mg 1.1 mg 1.3 mg 1.8 mg 2.4 mg 4.8 mg 12 mg 24 mg 48 mg 84 mg 0.14 g 0.25 g 0.61 g 0.6 g	Class F Weights and Balances Tijuana Mexicali Juarez Monterrey Queretaro

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Leak Standards	0.3175 sccm @ 6.22 psi 0.3921 sccm @ 8.68 psi 0.5545 sccm @ 11.12psi 0.6608 sccm @ 13.08 psi 0.7616 sccm @14.56 psi 0.4350 sccm @ 5.38 psi 0.6411 sccm @ 7.49 psi 0.9769 sccm @ 10.54psi 1.3161 sccm @ 13.30psi 1.6584 sccm @ 15.79psi 1.6813 sccm @ 4.30psi 3.0969 sccm @ 7.27psi 4.8716 sccm @ 10.51psi 6.2687 sccm @ 12.80psi 8.2315 sccm @ 15.76psi 3.4512 sccm @ 4.39psi 5.9868 sccm @ 48.81psi 9.4685 sccm @ 10.35psi 12.7553 sccm @ 13.15psi 15.6443 sccm @ 15.46psi (-6.5 to -10.35) psi (0.803 to 1.017) sccm (5.62 to 15.84) psi (31.25 to 102.06) sccm (5.73 to 16.15) psi (35.33 to 113.43) sccm	0.008 sccm 0.008 sccm 0.009 sccm 0.009 sccm 0.01 sccm 0.007 sccm 0.009 sccm 0.012 sccm 0.015 sccm 0.019 sccm 0.018 sccm 0.032 sccm 0.05 sccm 0.063 sccm 0.083 sccm 0.036 sccm 0.061 sccm 0.096 sccm 0.13 sccm 0.16 sccm 1.2 % of reading + 0.17 sccm 1.2 % of reading + 0.16 sccm 1.2 % of reading + 0.16 sccm	American Specialty Gold Restrictor Tijuana Mexicali Juarez Monterrey Queretaro
Leak Tester	Up to 10 sccm	0.17 sccm	Optima VT Leak Tester Tijuana Mexicali Juarez Monterrey Queretaro

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Leak Tester	(10 to 200) sccm	1 % of reading. + 2 sccm	Leak Tester Tijuana Mexicali Juarez Monterrey Queretaro
Rockwell Hardness Testers	82.57 HRBW 62.56 HRBW 45.28 HRBW 49.20 HRC 62.42 HRC 27.11 HRC 76.15 HREW 89.62 HREW 97.23 HREW 56.88 HRKW 72.56 HRKW 91.62 HRKW	1.3 HRBW 1.5 HRBW 2.1 HRBW 1.2 HRC 0.68 HRC 1.2 HRC 1.3 HREW 1.4 HREW 1.3 HREW 1.1 HRKW 1.1 HRKW 1 HRKW	Indirect Verification per ASTM E18 using Hardness Test Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Rockwell Superficial Hardness Testers	29.51 HR45N 47.37 HR45N 70.07 HR45N 82.41 HR30TW 59.90 HR30TW 54.51 HR30TW 91.10 HR15N 81.10 HR15N 74.04 HR15N 92.21 HR15TW 81.07 HR15TW 75.69 HR15TW	1.3 HR45N 1.3 HR45N 0.75 HR45N 1.2 HR30TW 1.2 HR30TW 1.4 HR30TW 0.77 HR15N 1.1 HR15N 1.2 HR15N 1.1 HR15TW 1.1 HR15TW 1.2 HR15TW	Indirect Verification per ASTM E18 using Hardness Test Blocks Tijuana Mexicali Juarez Monterrey Queretaro

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Brinell Hardness Testers	100 HBW 10/500 142 HBW 10/3000 163 HBW 10/500 197 HBW 3000 239 HBW 10/500 248 HBW 10/3000	4.3 HBW 5.7 HBW 7.9 HBW 8.7 HBW 9 HBW 14 HBW	Indirect Verification per ASTM E10 using Hardness Test Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Micro-Indentation Hardness Testers	712 HK 714 HV 117 HV 393 HV	36 HK 35 HV 24 HV 28 HV	Indirect Verification per ASTM E92 using Hardness Test Blocks Tijuana Mexicali Juarez Monterrey Queretaro
Durometers Force Types A, B, O Types C, D, DO Types M, OO Indenter Length	 (20 to 90) Duro (0.096 to 0.104) in	 0.8 grf 4.9 grf 0.31 grf 0.001 in	Partial Direct Verification to T.O 33K6-4-1362-1 Tijuana Mexicali Juarez Monterrey Queretaro

Photometry and Radiometry

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Optical Power Source 850,1300,1310 and 1550 nm	(-7 to 0) dBm	0.35 dB	Laser Source Tijuana Mexicali Juarez Monterrey Queretaro

Photometry and Radiometry

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Optical Power Measure-Linearity Measure –Accuracy 800 nm to 1650 nm	(-80 to 10) dBm Up to 10 mW	0.035 dB 3.5% of reading + 0.073 uW	Optical Power Sensor Tijuana Mexicali Juarez Monterrey Queretaro
Optical Attenuation Source 1 310 nm to 1 550 nm	(-60 to 0) dB	0.13 dB	Optical Attenuator Tijuana Mexicali Juarez Monterrey Queretaro
Optical Power Source (850, 1 300, 1 310, 1 550) nm	(-7 to 0) dBm	0.35 dB	Laser Power Source Tijuana Mexicali Juarez Monterrey Queretaro

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Humidity	(0 to 90) %RH	1.2 %RH	Indicator/Hygrometer Tijuana Mexicali Juarez Monterrey Queretaro
Temperature - Source (Black Body)	(50 to 100) °C (100 to 500) °C	0.63 °C 1 °C	Infrared Calibrator $\varepsilon = 0.95$, $\lambda = (8 \text{ to } 14)$ µm Tijuana Mexicali Juarez Monterrey Queretaro

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature - Source (Black Body)	(100 to 1 200) °C	2.5 °C	High Temperature Blackbody Source $\varepsilon = 0.995$, $\lambda = (8 \text{ to } 14)$ µm Tijuana Mexicali Juarez Monterrey Queretaro
Temperature Measurement	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 420) °C (420 to 650) °C	0.03 °C 0.05 °C 0.07 °C 0.11 °C 0.14 °C	Reference Thermometer w/ PRT Tijuana Mexicali Juarez Monterrey Queretaro
Temperature Measurement	0 to 1 200 °C	0.6 °C	Type S Reference Thermocouple Tijuana Mexicali Juarez Monterrey Queretaro
Temperature Measurement	(650 to 1 200) °C	0.1 % of reading + 1.4 °C	Type R Reference Thermocouple Tijuana Mexicali Juarez Monterrey Queretaro
Dew Point	(-40 to 60) °C	2.5 °C	Reference Dew Point Indicator Tijuana Mexicali Juarez Monterrey Queretaro

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Chronometers, Stopwatches, Timers	1 ms to 100 000 s	0.12 ms	Frequency Counter Tijuana Mexicali Juarez Monterrey Queretaro
Time - Source	1 ms to 100 000 s	(4.8×10^{-3}) µs	Frequency Counter Tijuana Mexicali Juarez Monterrey Queretaro
Frequency – Measure[2]	150 kHz to 1.3 GHz	(2.4×10^{-8}) Hz + 2*R*	Measuring Receiver Tijuana Mexicali Juarez Monterrey Queretaro
	DC to 3.2 GHz (3.2 to 20) GHz	(9.4×10^{-6}) Hz + 2*R* 2.6 Hz	Frequency Counter Tijuana Mexicali Juarez Monterrey Queretaro
Frequency - Source	(0.01 to 120) Hz 120 Hz to 1.2 kHz (1.2 to 120) kHz 120 kHz to 1.2 MHz (1.2 to 2) MHz	3 µHz/Hz + 61 µHz 3 µHz/Hz + 61 µHz 3 µHz/Hz + 120 µHz 3 µHz/Hz + 10 mHz 3 µHz/Hz + 12 mHz	Multiproduct Calibrator Tijuana Mexicali Juarez Monterrey Queretaro
Frequency – Source[2]	2 MHz to 6 GHz	1.3 µHz/Hz + 0.02 Hz	Signal Generator Tijuana Mexicali Juarez Monterrey Queretaro

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Source[2]	10 MHz to 26.5 GHz	(1.2×10^{-7}) Hz + *R*	Signal Generator Frequency Counter Tijuana Mexicali Juarez Monterrey Queretaro
Tachometer (Stroboscope)	Up to 100 rpm (100 to 1 000) rpm	0.03 % of reading + 0.014 rpm 0.03 % of reading + 0.14 rpm	Tachometer/Stroboscope Tijuana Mexicali Juarez Monterrey Queretaro
Tachometer (Stroboscope)	(1 000 to 99 999) rpm	0.03 % of reading + 1.4 rpm	Tachometer/Stroboscope Tijuana Mexicali Juarez Monterrey Queretaro

DIMENSIONAL MEASUREMENT

Dimensional Measurement, 3D

Specific Tests and / or Properties Measured	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Dimensional[1,2] (CMM)	X axis to 705 mm Y axis to 1 005 mm Z axis to 605 mm	(7.6 + 4.6L/1 000) um	Mitutoyo CRTAS7106 with TP20 Probe per Costumer Print or Report Tijuana
Dimensional[1,2] (Non-Contact)	X axis to 250 mm Y axis to 200 mm Z axis to 200 mm	(2.5+3.5L/1 000) um (2.5+3.5L/1 000) um (3.9+4.6L/1 000) um	Quick Vision QV-E202 per Costumer Print or Report Tijuana Mexicali Juarez

TESTING

Environmental

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Airflow Measurement Air Pressure Difference Test Airflow Smoke Pattern Test HEPA/ULPA filter leak Test Airborne Particle Count Survey Lighting Level Sound Level Test Temperature Test Humidity Test Temperature/Humidity Uniformity Test Recovery Test	WP-004/ IEST-RP-CC006.3 WP-005/ IEST-RP-CC006.3 WP-007/ ISO 14644-4:2015 WP-006/ IEST-RP-CC034.2 WP-002/ ISO 14644-1:2015 WP-014/IEST-RP-CC006.3 WP-012/IEST-RP-CC006.3 WP-008 /IEST-RP-CC006.3 WP-009/IEST-RP-CC006.3 WP-010/IEST-RP-CC006.3 ISO 14644-3:2015	Clean Room Test	Balometer Differential Pressure Meter Digital Aerosol Photometer, Aerosol Generator Particle Counter Light Level meter Sound meter Temperature & humidity meter Thermal anemometer.
Airborne Particle Count Survey Airflow Measurement Airflow Smoke Pattern Test HEPA/ULPA filter leak Test Biological Safety Cabinet Classification	WP-002/ ISO 14644-1:2015 WP-004/ IEST-RP-CC006.3 WP-007/ ISO 14644-4:2015 WP-006/ IEST-RP-CC034.2 WP-016/NSF/ANSI49-2004 Anex F	Biological Safety Gabinet Test	Particle Counter Balometer Aerosol Generator Digital Aerosol Photometer Thermal Anemometer

Environmental

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Airborne Particle Count Survey Airflow Velocity Laminar Hood HEPA/ULPA filter leak Test Induction Leak/Backstreaming Test Airflow Smoke Pattern Test Lighting Level Sound Level Test	WP-002/ ISO 14644-1:2015 WP-015/IEST-RP-CC002.4 WP-006/ IEST-RP-CC034.2 WP-017/IEST-RP-CC02.4 WP-007/ ISO 14644-4:2015 WP-014/IEST-RP-CC006.3 WP-012/IEST-RP-CC006.3	Laminar Air Flow Workstation Test	Particle Counter Thermal Anemometer Aerosol Generator Digital Aerosol Photometer Light Level meter Sound meter
Face Velocity Test Airflow Smoke Pattern Test Leak/Backstreaming Test	WP-017/ANSI/ASHRAE 110 WP-007/ ISO 14644-4:2015 WP-017/IEST-RP-CC02.4	Flow hood Devices Test	Thermal Anemometer Aerosol Generator Digital Aerosol Photometer

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1. This parameter is available at the laboratory facilities only, all other parameters are available for on-site calibration service, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope
2. L = length in inches, N = the diagonal length of the surface place divided by four, R = resolution of the unit under test.
3. 1 mil = 0.001 inch.
4. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1342.

Vice President