



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## Certificate of Accreditation

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

***Alteq de México, S.A. de C.V.***  
*Av. Las Puentes # 224, Colonia Las Puentes 2 Sector*  
*San Nicolás 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, Chemical, Mass, Force and Weighing Devices, Mechanical, Thermodynamic, Time and Frequency and Electrical 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:*

November 12, 2020

*Issue Date:*

November 09, 2022

*Expiration Date:*

February 28, 2025

*Accreditation No.:*

112359

*Certificate No.:*

L22-747

*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.pjlab.com](http://www.pjlab.com)*



## Certificate of Accreditation: Supplement

### Alteq De México, S.A. de C.V.

Av. Las Puentes # 224, Colonia Las Puentes 2 Sector  
 San Nicolás de los Garza, Nuevo León, México. C.P. 66460  
 Contact Name: David A. Treviño Morales Phone: 818-350-1053

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
Pin Gauges <sup>FO</sup>	0.01 mm to 25.4 mm	$(0.84 + x 2.9 \times 10^{-3}L) \mu\text{m}$	Digital Outside Micrometer
Feeler Gauges <sup>FO</sup>	0.001 mm to 25.4 mm	$(0.84 + x 2.9 \times 10^{-3}L) \mu\text{m}$	Euramet-cg-6 JIS B 7524
Gauge Blocks <sup>FO</sup>	1 to 1 016) mm	$(0.17 + 3.7 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks and digital Indicators NMX-CH-3650-IMNC
Ring Gauges <sup>FO</sup>	5 mm to 300 mm	$(0.039 + 3.9 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks and Micrometer Heads and (accessories) Internal Procedure ATE-063
Micrometer Standards <sup>FO</sup>	Up to 1 01) mm	$(0.17 + 3.7 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks and Indicators Digital NMX-CH-3650-IMNC
Squares <sup>FO</sup>	5° to 90°	0.065°	Digital Protractor and Angle Blocks NMX-CH-151-IMNC
Surface Plates (overall flatness only) <sup>FO</sup>	100 mm to 1 830 mm (Diagonal Length)	$(3.7 + 4.5 \times 10^{-3}L) \mu\text{m}$	Digital Indicator. Parallel Set and Gauge Blocks JIS B 7513
Radius Gauges <sup>FO</sup>	Up to 50.8 mm	$(0.91 + 1.1 \times 10^{-3}L) \mu\text{m}$	Microscope Internal Procedure ATE-069
Sieve <sup>FO</sup>	Up to 50.8 mm	$(0.91 + 1.1 \times 10^{-3}L) \mu\text{m}$	Microscope ASTM E-11
Thread Ring Gauges Pitch Diameter Minor Diameter <sup>FO</sup>	1 mm to 68 mm	$(0.91 + 1.1 \times 10^{-3}L) \mu\text{m}$	Digital Micrometer and Thread Pitch Master Inserts
Thread Plug Gauges Pitch Diameter Major Diameter <sup>FO</sup>	1 mm to 68 mm	$(1.5 + 4.8 \times 10^{-3}L) \mu\text{m}$	JIS B 0251
Inside Micrometers <sup>FO</sup>	Up to 508 mm	$(0.58 + 3 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks
Micrometer Heads <sup>FO</sup>	Up to 76 mm	$(0.58 + 8.3 \times 10^{-4}L) \mu\text{m}$	JIS B 7502
Digital and Dial Calipers <sup>FO</sup>	Up to 1 524 mm	$(5.8 + 1.6 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7507
Hole Gauges <sup>FO</sup>	1 mm to 300 mm	$(0.58 + 2.4 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7515



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Height Gauges <sup>FO</sup>	Up to 1 016 mm	$(0.58 + 3.4 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7517
Thickness Gauges (steel) <sup>FO</sup>	1 mm to 508 mm	$(0.58 + 3 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7517
Thickness Gauges (plastic) <sup>FO</sup>	0.024 mm to 5 mm	$(0.63 + 0.29L) \mu\text{m}$	Plastic Shims (Standards) Internal Procedure ATE-016
Measuring Tapes <sup>FO</sup>	0.1 m to 20 m	$(0.089 + 2 \times 10^{-6}L) \text{mm}$	Steel Rule and Optical Mini Comparator JIS B 7512
Measuring Pi Tape <sup>FO</sup>	100 mm to 20 000 mm	$(0.089 + 2 \times 10^{-6}L) \text{mm}$	Steel Rule and Optical Mini Comparator NOM-CH-046-SCFI
Precision Rules (Plastic, Steel, Glass, Aluminum) <sup>FO</sup>	28 mm to 2 000 mm	$(0.092 + 3 \times 10^{-6}L) \text{mm}$	Steel Rule and Optical Mini Comparator JIS B 7516
Digital and Dial Test Indicators <sup>FO</sup>	Up to 179 mm	$(0.12 + 2.9 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7503
Digital Indicators <sup>FO</sup>	Up to 51 mm	$(0.9 + 1.2 \times 10^{-3}L) \mu\text{m}$	Micrometer Head JIS B 7503
Outside Micrometers Digital / Analog <sup>FO</sup>	1 mm to 1 016 mm	$(0.58 + 3.4 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7502
Depth Micrometers <sup>FO</sup>	1 mm to 300 mm	$(0.58 + 2.4 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7518
Profile Projectors <sup>FO</sup> X Axis Linearity	1 mm to 508 mm	$(0.58 + 3 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7184
Y Axis Linearity	1 mm to 508 mm	$(0.58 + 3 \times 10^{-3}L) \mu\text{m}$	
Profile Projectors <sup>FO</sup> Angularity	1° to 360°	0.005 8°	Angle Blocks JIS B 7184
Microscopes <sup>FO</sup> X Axis Linearity	1 mm to 300 mm	$(0.58 + 2.4 \times 10^{-3}L) \mu\text{m}$	Gauge Blocks JIS B 7153
Y Axis Linearity <sup>FO</sup>	1 mm to 300 mm	$(0.58 + 2.4 \times 10^{-3}L) \mu\text{m}$	
Microscope <sup>FO</sup> Angularity	1° to 360°	0.005 8°	Angle Blocks JIS B 7153
Protractors <sup>FO</sup>	1° to 180°	0.005 8°	Angle Blocks NMX-CH-151-IMNC
Precision Levels <sup>FO</sup>	0.01 mm/m to 1.57 mm/m	0.94 $\mu\text{m}/\text{m}$	Micrometer Head JIS B 7510



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### 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 Meters, Controllers Recorders <sup>FO</sup> @25 °C	4 pH to 10 pH	0.014 pH	Certified Buffer Solutions Thermometer Fluke 51 Internal Procedure ATE-030
Conductivity Meters Controllers and Recorders <sup>FO</sup>	100 $\mu$ S/cm @25°C	0.7 $\mu$ S/cm	Certified Conductivity Standards Thermometer Fluke 51 Internal Procedure ATE-015
	147 $\mu$ S/cm @25°C	0.5 $\mu$ S/cm	
	500 $\mu$ S/cm @25°C	2 $\mu$ S/cm	
	1 000 $\mu$ S/cm @25°C	3 $\mu$ S/cm	
	1 413 $\mu$ S/cm @25°C	4 $\mu$ S/cm	
	10 000 $\mu$ S/cm @25°C	30 $\mu$ S/cm	

### Mass, Force and Weighing Devices

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Density Measuring Device - Liquid <sup>FO</sup>	Up to 0.6 g/cm <sup>3</sup>	0.000 61 g/cm <sup>3</sup>	Balance, Thermometer Internal Procedure ATE-018
	Up to 2 g/cm <sup>3</sup>	0.000 79 g/cm <sup>3</sup>	
Dynamometers, Tensile Testing Machine and Load Cell (Tension and/or Compression) <sup>FO</sup>	UP to 98.06 N	0.005 7 N	Standard Weights Set Internal Procedure ATE-013
	Up to 245.16 N	0.057 N	
	Up to 490.33 N	0.057 N	
	Up to 980.66 N	0.059 N	
	Up to 2 451.66 N	0.069 N	
	Up to 24 516.63 N	8.8 N	Load Cell Internal Procedure ATE-014
Mass Weights Class F1, F2, M1, M2 and M3 <sup>FO</sup>	1 mg	0.003 8 mg	Standard Weight Class OIML E2 and OIML R 111-1
	2 mg	0.003 8 mg	
	5 mg	0.003 8 mg	
	10 mg	0.004 7 mg	
	20 mg	0.005 6 mg	
	50 mg	0.006 6 mg	
	100 mg	0.008 1 mg	
	200 mg	0.011 mg	



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Mass Weights Class F1, F2, M1, M2 and M3 <sup>FO</sup>	500 mg	0.013 mg	Standard Weight Class OIML E2 and OIML R 111-1
	1 g	0.000 021 g	
	2 g	0.000 025 g	
	5 g	0.000 029 g	
	10 g	0.000 034 g	
	20 g	0.000 044 g	
	50 g	0.000 053 g	
	100 g	0.000 079 g	
	200 g	0.000 16 g	
Weights Class F2, M1, M2 and M3 <sup>FO</sup>	500 g	0.001 3 g	Standard Weight Class OIML F1 and and OIML R 111-1
	1 000 g	0.002 6 g	
	2 000 g	0.005 2 g	
	5 000 g	0.013 g	
	10 000 g	0.09 g	
	20 000 g	0.095 g	
Balances <sup>FO</sup>	0.001 g to 1 g (Res.= 0.000 1 mg)	$(9 \times 10^{-3} + 1.21 \times 10^{-3}Wt)$ mg	Standard Weights Class OIML E2 and Euramet_cg-18
	1 g to 2 g (Res.= 0.000 1 mg)	$(7 \times 10^{-3} + 1.21 \times 10^{-2}Wt)$ mg	
	2 g to 5 g (Res.= 0.000 1 mg)	$(3.9 \times 10^{-3} + 1.21 \times 10^{-2}Wt)$ mg	
	0.001 g to 10 g (Res.= 0.001 mg)	$(2.5 \times 10^{-3} + 1.21 \times 10^{-2}Wt)$ mg	
	10 g to 20 g (Res.= 0.001 mg)	$(1.5 \times 10^{-3} + 1.21 \times 10^{-2}Wt)$ mg	
	20 g to 50 g (Res.= 0.001 mg)	$(1.1 \times 10^{-3} + 1.21 \times 10^{-2}Wt)$ mg	
	50 g to 100 g (Res.= 0.001 mg)	$(1 \times 10^{-3} + 1.21 \times 10^{-2}Wt)$ mg	
	100 g to 200 g (Res.= 0.001 mg)	$(9 \times 10^{-4} + 1.21 \times 10^{-2}Wt)$ mg	
	0.01 g to 500 g (Res.= 1 mg)	$(1.7 \times 10^{-3} + 0.817Wt)$ mg	
	0.01 g to 1 000 g (Res.= 0.002 g)	$(2 \times 10^{-6} + 1.6 \times 10^{-3}Wt)$ g	
	0.01 g to 2 000 g (Res.= 0.005 g)	$(2 \times 10^{-6} + 4.1 \times 10^{-3}Wt)$ g	



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Balances <sup>FO</sup>	0.1 g to 5 000 g (Res.= 0.01 g)	$(2 \times 10^{-6} + 8.2 \times 10^{-3}Wt) \text{ g}$	Standard Weights Class OIML F1 Euramet_cg-18
	0.000 1 kg to 10 kg (Res.= 0.02 g)	$(1.7 \times 10^{-3} + 1.63 \times 10^{-2}Wt) \text{ g}$	
	0.000 1 kg to 20 kg (Res.= 0.05 g)	$(1.5 \times 10^{-3} + 4.08 \times 10^{-2}Wt) \text{ g}$	
Scale <sup>FO</sup>	0.01 kg to 50 kg (Res.= 1 g)	$(0.012 \text{ 7} + 0.817Wt) \text{ g}$	Standard Weights Class OIML F1 and M1 Euramet_cg-18
	0.01 kg to 100 kg (Res.= 2 g)	$(0.017 \text{ 2} + 1.633Wt) \text{ g}$	
	0.01 kg to 200 kg (Res.= 5 g)	$(0.015 \text{ 3} + 4.083Wt) \text{ g}$	
	0.1 kg to 500 kg (Res.= 10 g)	$(0.017 \text{ 2} + 8.163Wt) \text{ g}$	
	0.1 kg to 1 000 kg (Res.=20 g)	$(0.017 \text{ 2} + 16.328Wt) \text{ g}$	
	0.1 kg to 1 500 kg (Res.= 50 g)	$(0.012 \text{ 8} + 40.824Wt) \text{ g}$	
	1 500 kg to 2 000 kg (Res.= 50 g)	$(0.015 \text{ 3} + 40.823Wt) \text{ g}$	
	2 000 kg to 2 500 kg (Res.= 50 g)	$(0.017 \text{ 2} + 40.823Wt) \text{ g}$	

#### Mechanical

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Indirect Verification of Rockwell Hardness Testers HR15N <sup>FO</sup>	70 HR15N to 77 HR15N	0.43 HR15N	Indirect Verification per using Hardness Test Blocks ASTM E18
	78 HR15N to 88 HR15N	0.13 HR15N	
	90 HR15N to 92 HR15N	0.1 HR15N	
Indirect Verification of Rockwell Hardness Testers HR15TW <sup>FO</sup>	74 HR15TW to 80 HR15TW	0.22 HR15TW	
	81 HR15TW to 86 HR15TW	0.14 HR15TW	
	87 HR15TW to 93 HR15TW	0.4 HR15TW	
Indirect Verification of Rockwell Hardness Testers HRBW <sup>FO</sup>	40 HRBW to 59 HRBW	1 HRBW	
	60 HRBW to 79 HRBW	0.29 HRBW	
	80 HRBW to 100 HRBW	0.43 HRBW	
Indirect Verification of Rockwell Hardness Testers HRC <sup>FO</sup>	20 HRC to 30 HRC	0.37 HRC	
	35 HRC to 55 HRC	0.34 HRC	
	60 HRC to 65 HRC	0.33 HRC	



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### Mechanical

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Pneumatic Positive Pressure: Water Columns <sup>FO</sup>	0.4 inH <sub>2</sub> O to 4 inH <sub>2</sub> O	0.001 7 inH <sub>2</sub> O	Dwyer Digital Manometer Internal Procedure ATE-001
	4 inH <sub>2</sub> O to 10 inH <sub>2</sub> O	0.003 7 inH <sub>2</sub> O	
Pneumatic Positive Pressure: Transducers, Pressure Gages, Safety Valve and Recorders <sup>FO</sup>	0.35 psig to 5 psig	0.000 32 psi	Fluke Pressure Module and Display unit Internal Procedure ATE-001
	5 psig to 30 psig	0.005 4 psi	
	30 psig to 300 psig	0.015 psi	
	300 psig to 1 500 psig	0.15 psi	
	1 500 psig to 5 000 psig	0.39 psi	
	5 000 psig to 10 000 psig	1.1 psi	Digital Pressure Gauge Internal Procedure ATE-001
Vacuum Gauges <sup>FO</sup>	-20 inHg to 0 inHg	0.007 9 inHg	Fluke Pressure Module and Display unit Internal Procedure ATE-001
Direct verification of Durometer Hardness Tester Types A, B, C, D, O, & DO <sup>FO</sup> Extension at zero reading	4.445 N to 44.45 N	0.29 N	ASTM D2240
Indenter Shape (Not all parameters apply to all of Indenter Extension Indenter Diameter Indenter Tip Radius Indenter Tip Angle	0 mm to 5 mm 0 mm to 12 mm 25° to 40 °	0.94 $\mu$ m 0.94 $\mu$ m 0.94 $\mu$ m 0.065 °	Digital Microscope
Durometer Indenter Spring: Types A, B and O Types C, D and DO	0.55 N to 8.05 N	0.29 N	Electronic Balance
Digital, Dial, Click and Preset Torque Meters (Clockwise and Counter Clockwise) <sup>FO</sup>	0.56 N·m to 5.65 N·m (5 lb.in to 50 lb.in)	0.007 2 N·m	Torque Analyzer ASME B107.300
	2.83 N·m to 28.25 N·m (25 lb.in to 250 lb.in)	0.007 2 N·m	
	33.9 N·m to 339 N·m (25 lb.ft to 250 lb.ft)	0.079 N·m	



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Torque Analyzer and Calibrators (Clockwise and Counter Clockwise) <sup>FO</sup>	1.13 N·m to 43.8 N·m (0.83 lbf·ft to 32.3) lbf·ft	0.008 3 N·m	Standard Weights and Torque Arm ASME B107.300
	43.8 N·m to 201.5 N·m (32.3 to 148.6) lbf·ft	0.008 8 N·m	
	201.5 N·m to 344.1 N·m (148.6 to 253.8) lbf·ft	0.009 7 N·m	
	344.1 N·m to 543.2 N·m (253.8 to 400.6) lbf·ft	0.012 N·m	
	543.2 N·m to 813.49 N·m (400.6 to 600) lbf·ft	0.016 N·m	
Flow Meter <sup>FO</sup>	1 L/min to 20 L/min	0.003 L/min	Jug Master Internal Procedure ATE-090
Viscosity Cups <sup>FO</sup> (ISO, Zahn, Ford, Shell) @ (20 to 25) °C	110 cSt to 128 cSt	0.16 cSt	Viscosity Solutions Thermometer Internal Procedure ATE-031
	230 cSt to 258 cSt	0.33 cSt	
	397.6 cSt to 533.1 cSt	0.58 cSt	
Viscometers <sup>FO</sup> @ (15°C to 45) °C	Up to 10 mm <sup>2</sup> /s	0.17 % of reading	Analytical Balance and Digital Balance Thermometer Internal Procedure ATE-012
	10 mm <sup>2</sup> /s to 100 mm <sup>2</sup> /s	0.22 % of reading	
	100 mm <sup>2</sup> /s to 1 000 mm <sup>2</sup> /s	0.29 % of reading	
	1 000 mm <sup>2</sup> /s to 10 000 mm <sup>2</sup> /s	0.38 % of reading	
Micropipettes <sup>FO</sup>	1 µl to 10 µl	0.13 µl	Analytical Balance and Digital Balance Thermometer Internal Procedure ATE-012
	11 µl to 100 µl	0.14 µl	
	101 µl to 1 000 µl	0.47 µl	
Pycnometers <sup>FO</sup>	10 ml to 1 000 ml	0.094 ml	Analytical Balance and Digital Balance Thermometer Internal Procedure ATE-012
Pipettes <sup>FO</sup>	20 ml to 200 ml	0.092 ml	
Test Tubes and Burettes <sup>FO</sup>	0 ml to 5 ml	0.003 5 ml	
	5 ml to 2 000 ml	0.013 ml	
Test Tubes and Jars <sup>FO</sup>	5 ml to 5 000 ml	1.3 ml	
	5 001 ml to 20 000 ml	1.7 ml	

### Thermodynamic

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Humidity Meters and Recorders <sup>FO</sup>	10 % RH to 33 % RH	0.7 % RH	Thermo-hyrometer Internal Procedure ATE-010
	34 % RH to 75 % RH	0.9 % RH	
	76 % RH to 95 % RH	1.3 % RH	





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#### Thermodynamic

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IR Thermometers <sup>FO</sup>	25 °C to 300 °C	1.1 °C	Blackbody and Digital Thermometer $\epsilon = 0.95$ $\lambda = (8 \text{ to } 14) \mu\text{m}$ Internal Procedure ATE-085
	300 °C to 600 °C	1.4 °C	
	600 °C to 800 °C	1.5 °C	
	800 °C to 1 000 °C	2 °C	
	1 000 °C to 1 200 °C	2.3 °C	
Thermocouple, RTD, Bimetal, Recorder Temperature and Thermometer Digital	-40 °C to 300 °C	0.07 °C	Thermometer RTD Fluke 1552A Thermometer RTD Omega and Dry Block Ametek, ThermaCal Type K Thermocouple and Muffle Internal Procedure ATE-009
	300 to 500 °C	0.24 °C	
	500 °C to 600 °C	0.24 °C	
	600 °C to 800 °C	0.93 °C	
	800 °C to 1 000 °C	1.4 °C	
Liquid in Glass Thermometer <sup>FO</sup>	-40 °C to 300 °C	0.07 °C	RTD and Thermometer and Dry Block, Ametek, ThermaCal Internal Procedure ATE-0080
Ovens, Furnaces, Dry Block, Baths, Muffles, and Incubators <sup>FO</sup>	-80 °C to 300 °C	0.07 °C	Thermometer RTD Fluke 1552A Thermometer RTD Omega Internal Procedure ATE-009
	300 °C to 500 °C	0.24 °C	
	500 °C to 600 °C	0.24 °C	
	600 °C to 800 °C	0.93 °C	Type K Thermocouple and Amprobe TMB-52 Indicator Internal Procedure ATE-009
	800 °C to 1 000 °C	1.4 °C	
	1 000 °C to 1 200 °C	2 °C	

#### 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
Tachometers <sup>FO</sup>	60 rpm to 18 000 rpm	0.93 rpm	Standard Digital Tachometer Shimpo Internal Procedure ATE-050
	18 001 rpm to 36 000 rpm	1.3 rpm	
	36 001 rpm to 96 000 rpm	2.5 rpm	
Stopwatches, Timers <sup>FO</sup>	15 s to 36 000 s	0.14 s	Standard Digital Chronometer Citizen NIST 960-12
	36 001 s to 72 000 s	0.18 s	
	72 001 s to 86 400 s	0.2 s	
Revolutions Counter <sup>FO</sup>	150 rpm to 2 000 rpm	1.5 rpm	Direct Comparisons and Optical Counter Internal Procedure ATE-050



# Certificate of Accreditation: Supplement

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 Contact Name: David A. Treviño Morales Phone: 818-350-1053

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

### 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
Frequency Source <sup>FO</sup>	45 Hz to 120 Hz	0.002 5 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-075
	120 Hz to 1 000 Hz	0.002 5 % of reading	
	1 kHz to 10 kHz	0.002 5 % of reading	
	10 kHz to 100 kHz	0.002 5 % of reading	
Frequency Measure <sup>FO</sup>	45 Hz to 1 000 Hz	0.031 % of reading	6 ½ DMM Keithley Internal Procedure ATE-025
	1 kHz to 10 kHz	0.042 % of reading	
	10 kHz to 100 kHz	0.071 % of reading	

### 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 Source Capacitance <sup>FO</sup>	3.3 nF to 10 nF	0.56 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-082
	10 nF to 30 nF	0.56 % of reading	
	30 nF to 100 nF	0.34 % of reading	
	100 nF to 300 nF	0.34 % of reading	
	0.3 $\mu$ F to 1 $\mu$ F	0.34 % of reading	
	1 $\mu$ F to 3 $\mu$ F	0.35 % of reading	
	3 $\mu$ F to 10 $\mu$ F	0.46 % of reading	
	10 $\mu$ F to 30 $\mu$ F	0.46 % of reading	
Equipment to Measure Capacitance <sup>FO</sup>	4 nF to 40 nF	2.2 % of reading	Extech 380282 DMM Internal Procedure ATE-089
	40 nF to 400 nF	2.2 % of reading	
	400 nF to 1 000 nF	2.2 % of reading	
	1 000 nF to 4 000 nF	2.1 % of reading	
	4 $\mu$ F to 40 $\mu$ F	2.1 % of reading	
	40 $\mu$ F to 400 $\mu$ F	2.1 % of reading	
Equipment to Measure DC Current <sup>FO</sup>	0.2 $\mu$ A to 200 $\mu$ A	0.056 % of reading	6 ½ DMM Keithley Internal Procedure ATE-054
	0.2 mA to 2 mA	0.044 % of reading	
	2 mA to 20 mA	0.044 % of reading	
	20 mA to 200 mA	0.044 % of reading	
	0.21 A to 2 A	0.1 % of reading	



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

#### 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 Current <sup>FO</sup>	2 A to 10 A	0.28 % of reading	Fluke 45 4½ DMM Internal Procedure ATE-054
	10 A to 550 A	2.2 % of reading	Clamp Meter Fluke 375 Internal Procedure ATE-054
Equipment to Measure AC Current At the listed frequencies 50 Hz to 1 kHz <sup>FO</sup>	0.2 $\mu$ A to 200 $\mu$ A	12 % of reading	6 ½ DMM Keithley Internal Procedure ATE-056
	0.2 mA to 2 mA	0.2 % of reading	
	2 mA to 20 mA	0.2 % of reading	
	20 mA to 200 mA	0.2 % of reading	
	0.2 A to 2 A	0.2 % of reading	Fluke 45 4½ DMM Internal Procedure ATE-056
	2 A to 10 A	1.2 % of reading	
Equipment to Source DC Current <sup>FO</sup>	10 A to 550 A	2.5 % of reading	Clamp Meter Fluke 375 Internal Procedure ATE-056
	0.3 mA to 3.3 mA	0.011 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-053
	3.3 mA to 33 mA	0.011 % of reading	
	33 mA to 300 mA	0.011 % of reading	
	0.3 A to 2 A	0.011 % of reading	
	2 A to 11 A	0.033 % of reading	
11 A to 550 A	0.61 % of reading	Fluke 5500A/Coil Internal Procedure ATE-053	
Equipment to Source AC Current <sup>FO</sup> At the listed frequencies 50 Hz to 1 kHz	0.3 mA to 3.3 mA	0.1 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-061
	3.3 mA to 33 mA	0.1 % of reading	
	33 mA to 330 mA	0.1 % of reading	
	0.3 A to 1 A	0.1 % of reading	
	1 A to 11 A	0.082 % of reading	
	11 A to 550 A	0.75 % of reading	Fluke 5500A/Coil Internal Procedure ATE-061
Inductance Source <sup>FO</sup> 100 Hz and 1 kHz	1 mH to 10 mH	2 % of reading	Inductance Substitute Internal Procedure ATE-083
	11 mH to 100 mH	2 % of reading	
	0.101 H to 0.9 H	2 % of reading	
	1 H to 10 H	2 % of reading	
Electrical Simulation of Power Level Indicators <sup>FO</sup> @ 1 kHz	-30 dB to 60 dB	0.5 % of reading	Extech DDM 4.5 dig Internal Procedure ATE-041



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

### 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
Electrical Simulation of Sound Pressure Level <sup>FO</sup> Indicators @ 1 kHz	80 dB to 130 dB	0.044 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-041
Equipment to Measure Resistance <sup>FO</sup>	2 $\Omega$ to 20 $\Omega$	0.096 % of reading	6 ½ DMM Keithley Internal Procedure ATE-058
	20 $\Omega$ to 200 $\Omega$	0.016 % of reading	
	200 $\Omega$ to 1 000 $\Omega$	0.016 % of reading	
	1 k $\Omega$ to 20 k $\Omega$	0.016 % of reading	
	20 k $\Omega$ to 200 k $\Omega$	0.016 % of reading	
	200 k $\Omega$ to 1 000 k $\Omega$	0.019 % of reading	
	1 M $\Omega$ to 20 M $\Omega$	0.027 % of reading	
	20 M $\Omega$ to 330 M $\Omega$	0.16 % of reading	
Equipment to Source Resistance <sup>FO</sup>	1 $\Omega$ to 10 $\Omega$	0.097 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-057
	10 $\Omega$ to 30 $\Omega$	0.06 % of reading	
	30 $\Omega$ to 100 $\Omega$	0.024 % of reading	
	100 $\Omega$ to 300 $\Omega$	0.014 % of reading	
	0.3 k $\Omega$ to 1 k $\Omega$	0.014 % of reading	
	1 k $\Omega$ to 3 k $\Omega$	0.012 % of reading	
	3 k $\Omega$ to 10 k $\Omega$	0.012 % of reading	
	10 k $\Omega$ to 30 k $\Omega$	0.011 % of reading	
	30 k $\Omega$ to 100 k $\Omega$	0.011 % of reading	
	100 k $\Omega$ to 300 k $\Omega$	0.014 % of reading	
	0.3 M $\Omega$ to 1 M $\Omega$	0.014 % of reading	
	1 M $\Omega$ to 3 M $\Omega$	0.017 % of reading	
	3 M $\Omega$ to 10 M $\Omega$	0.017 % of reading	
	10 M $\Omega$ to 30 M $\Omega$	0.066 % of reading	
	30 M $\Omega$ to 100 M $\Omega$	0.12 % of reading	
	100 M $\Omega$ to 300 M $\Omega$	0.51 % of reading	
300 M $\Omega$ to 1 000 M $\Omega$	1.3 % of reading	Resistance Substituter Internal Procedure ATE-057	
Temperature Calibration, Indication and Control Equipment Used with RTD Type Pt 385, 100 $\Omega$ <sup>FO</sup>	-200 °C to 800 °C	0.077 °C	Fluke Calibrator 5500A Electrical Simulation of RTD Output Internal Procedure ATE-048



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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
Temperature Calibration, Indication and Control Equipment Used with RTD Type Pt 3916, 100 $\Omega^{FO}$	-200 °C to 600 °C	0.071 °C	Fluke Calibrator 5500A Electrical Simulation of RTD Output Internal Procedure ATE-048
Temperature Calibration, Indication and Control Equipment Used with RTD Type Pt 3926, 100 $\Omega^{FO}$	-200 °C to 600 °C	0.077 °C	
Temperature Calibration, Indication and Control Equipment Used with RTD Type Cu 10 $\Omega^{FO}$	-100 °C to 250 °C	0.31 °C	
Temperature Calibration, Indication and Control Equipment Used with RTD Type Ni 120 $\Omega^{FO}$	-80 °C to 250 °C	0.099 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type B <sup>FO</sup>	600 °C to 1 800 °C	0.31 °C	Fluke Calibrator 5500A Electrical Simulation of Thermocouple Output Internal Procedure ATE-048
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type E <sup>FO</sup>	-250 °C to 1 000 °C	0.15 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type J <sup>FO</sup>	-210 °C to 1 200 °C	0.15 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type K <sup>FO</sup>	-200 °C to 1 370 °C	0.17 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type R <sup>FO</sup>	-0 °C to 1 760 °C	0.34 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type S <sup>FO</sup>	-0 °C to 1 760 °C	0.37 °C	



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#### Electrical

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Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type T <sup>FO</sup>	-250 °C to 400 °C	0.15 °C	Fluke Calibrator 5500A Electrical Simulation of Thermocouple Output Internal Procedure ATE-048
Temperature Calibration, Indication and Control Equipment Used with RTD Type Pt 385, 100 Ω <sup>FO</sup>	-200 °C to 800 °C	0.11 °C	Altek Calibrator 211 Electrical Simulation of RTD Measure Internal Procedure ATE-084
Temperature Calibration, Indication and Control Equipment Used with RTD Type Pt 3916, 100 Ω	-100 °C to 600 °C	0.11 °C	
Temperature Calibration, Indication and Control Equipment Used with RTD Type Pt 3926, 100 Ω <sup>FO</sup>	-200 °C to 600 °C	0.11 °C	Altek Calibrator 422 Electrical Simulation of Thermocouple Measure Internal Procedure ATE-084
Temperature Calibration, Indication and Control Equipment Used with RTD Type Cu 10 Ω <sup>FO</sup>	-100 °C to 250 °C	0.32 °C	
Temperature Calibration, Indication and Control Equipment Used with RTD Type Ni 120 Ω <sup>FO</sup>	-70 °C to 260 °C	0.12 °C	Altek Calibrator 422 Electrical Simulation of Thermocouple Measure Internal Procedure ATE-084
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type B <sup>FO</sup>	600 °C to 1 800 °C	0.32 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type E <sup>FO</sup>	-250 °C to 1 000 °C	0.16 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type J <sup>FO</sup>	-210 °C to 1 200 °C	0.16 °C	Altek Calibrator 422 Electrical Simulation of Thermocouple Measure Internal Procedure ATE-084
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type K <sup>FO</sup>	-200 °C to 1 370 °C	0.18 °C	



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### Electrical

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Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type R <sup>FO</sup>	-0 °C to 1 760 °C	0.35 °C	Altek Calibrator 422 Electrical Simulation of Thermocouple Measure Internal Procedure ATE-084
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type S <sup>FO</sup>	-0 °C to 1 760 °C	0.38 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type T <sup>FO</sup>	-250 °C to 400 °C	0.16 °C	
Equipment to Output DC Voltage <sup>FO</sup>	3.3 mV to 329 mV	0.006 9 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-059
	0.329 V to 3.29 V	0.005 2 % of reading	
	3.29 V to 32.9 V	0.005 2 % of reading	
	32.9 V to 329 V	0.005 3 % of reading	
	329 V to 1 000 V	0.005 7 % of reading	
	1 kV to 6 kV	2 % of reading	Hi pot Tester 3565D Internal Procedure ATE-059
Equipment to Output AC Voltage At the listed frequency 45 Hz to 10 kHz <sup>FO</sup>	3 mV to 33 mV	0.11 % of reading	Fluke Calibrator 5500A Internal Procedure ATE-061
	33 mV to 330 mV	0.057 % of reading	
	0.33 V to 3.3 V	0.033 % of reading	
	3.3 V to 33 V	0.033 % of reading	
	33 V to 330 V	0.043 % of reading	
	330 V to 1 000 V	0.059 % of reading	
Equipment to Output AC Voltage At the listed frequencies 50 to 60 Hz <sup>FO</sup>	1 kV to 5 kV	2.1 % of reading	Hi pot Tester 3565D Internal Procedure ATE-061
Equipment to Measure DC Voltage <sup>FO</sup>	2 mV to 200 mV	0.008 7 % of reading	6 ½ DDM Keithley Internal Procedure ATE-060
	0.2 V to 2 V	0.006 % of reading	
	2 V to 20 V	0.006 % of reading	
	20 V to 200 V	0.006 % of reading	
	200 V to 1 000 V	0.007 2 % of reading	



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Equipment to Measure DC Voltage <sup>FO</sup>	1 kV to 6 kV	2 % of reading	Fluke 80K-6 Internal Procedure ATE-060
	6 kV to 40 kV	2 % of reading	Fluke 80K-40 Internal Procedure ATE-060
Equipment to Measure AC Voltage At the listed frequency 50 Hz to 1 kHz <sup>FO</sup>	0 mV to 200 mV	0.093 % of reading	6 ½ DDM Keithley Internal Procedure ATE-062
	0.2 V to 2 V	0.093 % of reading	
	2 V to 20 V	0.097 % of reading	
	20 V to 200 V	0.1 % of reading	
	200 V to 750 V	0.11 % of reading	
Equipment to Measure AC Voltage At the listed frequency 50 Hz to 60 kHz <sup>FO</sup>	0.75 kV to 6 kV	5 % of reading	Fluke 80k-40 Internal Procedure ATE-062
	6 kV to 28 kV	5 % of reading	
pH Meter <sup>FO</sup>	-1 000 mV to 1 000 mV (Up to 14 pH)	0.12 % of reading	Simulator of pH and Measure pH/mV Calibrator HANNA Internal Procedure ATE-059

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<sup>F</sup> would mean that the laboratory performs this calibration at its fixed location.





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

4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations. Example: Outside Micrometer<sup>O</sup> 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<sup>FO</sup> 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 Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.

