PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Mess Servicios Metrológicos S. de R.L. de C.V.

***HQ**: Acceso III No. 16 A Nave 10 Parque Industrial,*
Benito Juárez, Querétaro, Querétaro, 76120

***Site:** Pirineos No. 515 Nave 2, Micro Parque Industrial Santiago,*
Parque Ind. Benito Juarez.
Querétaro, Querétaro, México C.P.76120.

(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 January 2009):

Dimensional, Mechanical, Thermodynamic, Electrical, Mass, Force and Weighing Devices 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/Operations Manager

Perry Johnson Laboratory Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
July 29, 2015	July 13, 2017	October 31, 2019

Accreditation No.:	*Certificate No.:*
56695	L17-311

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: www.pjlabs.com

Certificate of Accreditation: Supplement

Mess Servicios Metrológicos S. de R.L. de C.V.
HQ: Acceso III No. 16 A Nave 10 Parque Industrial,
Benito Juarez, Querétaro, Querétaro, 76120
Contact Name: José Tomas Morales Garcia Phone: 442-196-4938

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

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Torque[FO]	0.2 N·m to 1 N·m	0.13 % of reading	Torque Transducers and Digital Indicators ISO 6789
	1 N·m to 10 N·m	0.12 % of reading	
	10 N·m to 25 N·m	0.13 % of reading	
	25 N·m to 400 N·m	0.27 % of reading	
	400 N·m to 1 500 N·m	0.32 % of reading	

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Coordinate Measuring Machines (CMM) Verification– EL - Length Error of Indication	10 mm to 2 000 mm	(0.5 + 1.1L) µm	Laser Interferometer, Step Gage, Gage Blocks, Master sphere ASME B89.4.10360-2 ISO 10360-2
Surface Finish Measuring Machines (Profilometers) Ra[FO]	0.3 µm to 3.2 µm	0.05 µm	Roughness Standards, Master Sphere, Optical Flat ISO 12179
Surface Finish Measuring Machines (Profilometers) Rz[FO]	1.5 µm to 10 µm	0.08 µm	
Surface Finish Measuring Machines(Profilometers) Pt[FO]	0.36 µm to 2.6 mm	0.08 µm	
Surface Finish Measuring Machines Rsm[FO]	15 µm to 100 µm	0.08 µm	
Surface Geometric Analyzers (Contours Instruments) X Axis[O]	1.3 µm to 1 mm	1.3 µm	Gage Blocks, Master Sphere, Contour Standard ISO 12179
Surface Geometric Analyzers (Contours Instruments) X Axis[O]	1 mm to 10 mm	1.6 µm	

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Surface Geometric Analyzers (Contour Instruments) X axis[O]	10 mm to 200 mm	(1.7 + 4.5L) µm	Gage Blocks, Master Sphere, Contour Standard. ISO 12179
Surface Geometric Analyzers (Contour Instruments) Z axis[O]	1 mm to 50 mm	(0.12 + 5L) µm	
Surface Geometric Analyzers (Contour Instruments) Radius[O]	2.5 mm to 6.5 mm	(1.7 + 4.5L) µm	
Surface Geometric Analyzers (Contour Instruments) Angle[O]	90°	1.5’	
Roundness Measuring Machine Sensitivity (Displacement Error) Radial Error Axial Error[O]	0.4 µm to 10 µm	65 nm + 46 nm/µm	Slope Table Standard Gage Blocks; Optical Flat; Roundness Standard ISO 4291
	160 µm to 500 µm	0.09 µm	
	Sphere Radius: 6 mm to 25 mm	0.05 µm	
	Optical Flat Radius: 15 mm to 70 mm	0.04 µm	
Optical Comparators – Vision Systems & Measuring Microscopes[O]			
X and Y Axis –Error of Indication	0.01 mm to 300 mm	(1.1+ 3.5L) µm	Glass Scale, Gage Blocks Angular Reticule JIS B 7184
X and Y Axis –Error of Indication	300 mm to 500 mm	(3 + 4.5L) µm	
Z Axis– Error of Indication	0.16 mm to 300 mm	(2.4 + 3.2L) µm	
Angle	1° to 180°	1.3’	

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

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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Force Measuring Devices – Tension and Compression[FO]	0.2 N to 1 600 N	0.033 % of reading	Mass M1, M2 ISO 7500-1, ISO 376
	1.6 kN to 10 kN	0.02 % of reading	ISO 7500-1, ISO 376 Load cells and digital indicators
	10 kN to 100 kN	0.022 % of reading	
	100 kN to 890 kN	0.22 % of reading	

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Contact Name: José Tomas Morales Garcia Phone: 442-196-4938

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

Dimensional

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Articulated Arm Coordinate Measuring Machines (AACMM) Verification3 – Volumetric Performance Effective Diameter Performance[FO]	 Radius: Up to 1 500 mm Sphere Diameter: 30 mm (Nominal)	 (4.5 + 7L) µm 2 µm	Gage Blocks; Step Gage, Calibrated Cone, Master Sphere ASME B89.4.22
Universal Length Machine[F]	0.5 mm to 100 mm	(0.25 + 2L) µm	Gage Blocks Laser Interferometer ISO-230-1 / ISO-230-2 NC 90-01-54
	100 mm to 2 000 mm	(0.25 + 1.6L) µm	
Surface Plates Flatness Only[O]	160 mm x 100 mm to 4 000 mm x 1 600 mm, Grade 0, 1, 2 and 3	(1.7 + 0.001 6L) µm	Autocollimator Photoelectric (Res.= 0.1 second) NMX-CH-8512-2:IMNC Level
Height Gages[FO]	0.01 mm to 1 000 mm (Res.= 0.01 mm)	(11 + 0.001 9L) µm	Gage Block Sets NMX-CH-141
Vertical Measurement System[FO]	0 mm to 1 000 mm (Res.= 0.5 µm)	(0.7 + 0.003 8L) µm	Gage Block Sets NMX-CH-141
Outside Micrometers[F]	0.5 mm to 1 000 mm (Res.= 0.001 mm)	(0.85 + 16L) µm	Gage blocks NMX-CH-099-IMNC
Calipers[F]	0.5 mm to 1 000 mm (Res.= 0.01 mm)	(9 + 20L) µm	Gage blocks NMX-CH-002-IMNC
Dial Indicators[F]	0.001 mm to 101.6 mm (Res.= 0.001 mm)	(1.1 + 0.002 L) µm	Universal Length Machine (Res.= 0.1 µm) ASME B89.1.10M
Plain Rings Standard[F]	3 mm to 150 mm Class "Z, ZZ"	1.4 µm	Standard Ring Class "Y" ANSI/ASME B89.1.6-2002 Universal Length Machine (Res.= 0.1 µm)
Discs and Plug Gage[F]	0.1 µm to 100 mm	(0.53 + 0.004L) µm	Universal length Machine (Res.= 0.1 µm) ASME B89.1.5
Feeler Gauges Steel Material[F]	0.01 mm to 3 mm	1.7 µm	Universal Length Machine (Res.= 0.1 µm) JIS B 7524
Feeler Gauges Plastic Material[F]	0.01 mm to 3 mm	1.7 µm	
Thickness Standard[F]	0.01 mm to 3 mm	1.6 µm	

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Sphere[F]	0.1 mm to 100 mm	(0.53 + 0.004L) µm	Universal Length machine (Res.= 0.1 µm) ISO 3290-1, ISO 3290-2 Class G 10 to G 200
Micrometer Heads[F]	0.1 µm to 50.8 mm (Res.= 0.001 mm)	(0.71 + 0.008 3L) µm	Universal Length Machine (Res.= 0.1 µm) NC 90-01-34, JIS B7502
Bore Gage[F]	6 mm to 100 mm (Effective Range Measuring 50.8 mm) (Res.= 0.001 mm)	(0.89 + 0.007L) µm	Universal Length Machine (Res.= 0.1 µm) JIS B 7515
Stylus Test Indicator[F]	0.1 µm to 2 032 mm (Res.= 0.001 mm)	(0.64 + 0.063L) µm	Universal Length Machine (Res.= 0.1 µm) ASME B89.1.10M
Length Bars[F]	10 mm to 550 mm	(0.81 + 0.001L) µm	Steel Standard Blocks Grade "0 and 1" Under NMX-CH-3650:2004, BS 5317 Universal Length Machine (Res.= 0.1 µm)
Pin Gages[F]	0.5 mm to 20 mm	0.86 µm	Universal Length Machine (Res.= 0.1 µm) Bolt Master Class "0" Roundness DIN 2269
Wire Cloth and Sieves for Testing Purposes[F]	0.075 mm to 40 mm	(2 + 0.22L) µm	Vision System (Res.= 0.1 µm) Accuracy (2.5 + 6L/1 000) µm JIS B 7541
Standard Radius[F]	0.1 µm to 25.4 mm	1.6 µm	
Standard Scales[F]	0.01 mm to 300 mm	(1.3 + 0.004 8L) µm	

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Pressure[FO]	100 psi to 1 000 psi	1.4 psi	Fluke 750P08
	150 psi to 1500 psi	1.5 psi	Fluke 750P09
	300 psi to 3 000 psi	2.7 psi	Fluke 750P29
	500 psi to 5 000 psi	4.3 psi	Fluke 750P30
	1 000 psi to 10 000 psi	11 psi	Fluke 750P31

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

Thermodynamic

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Thermocouple Sensor Type RTD[F]	-15 °C to 110 °C	0.15 °C	Fluke 9009
	110 °C to 350 °C	0.25 °C	
Thermocouple Sensor Type Thermistor[F]	-15 °C to 110 °C	0.15 °C	
	110 °C to 350 °C	0.25 °C	
Bimetallic Thermometer[F]	-15 °C to 110 °C	0.15 °C	
	110 °C to 350 °C	0.25 °C	

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure DC Voltage[F]	33 mV to 330 mV	0.012 mV	Fluke 5522A
	0.33 V to 3.3 V	0.000 12 V	
	3.3 V to 33 V	0.001 2 V	
	33 V to 330 V	0.012 V	
	330 V to 1 020 V	0.12 V	
Equipment to Output DC Voltage[FO]	10 mV to 100 mV	0.004 8 mV	Fluke 8845A
	0.1 V to 1 V	0.017 mV	
	1 V to 10 V	0.15 mV	
	10 V to 100 V	1.7 mV	
	100 V to 1 000 V	0.020 V	
	0.1 kV to 6 kV	0.012 kV	Fluke 80K-6
Equipment to Measure DC Current[F]	3.3 µA to 329.999 µA	0.026 µA	Fluke 5522A
	0.33 mA to 3.299 99 mA	0.15 µA	
	3.3 mA to 32.999 9 mA	1.3 µA	
	33 mA to 329.999 mA	0.055 mA	
	0.33 A to 2.199 99 A	1.3 mA	
	2.2 A to 11 A	0.014 A	
	11 A to 20.5 A	0.024 A	
Clamp-On Meters[F]	11 A to 1 025 A	0.12 A	Fluke 5522A and 50 Turn Coil (Type Thyroid)
Equipment to Output DC Current[FO]	1 mA to 10 mA	0.011 mA	Fluke 8845A
	10 mA to 100 mA	0.016 mA	
	0.1 A to 1 A	1.2 mA	
	1 A to 3 A	2.4 mA	
	3 A to 10 A	0.07 A	

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Electrical

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Equipment to Measure Resistance[F]	1.1 Ω to 10.99 Ω	0.007 1 Ω	Fluke 5522A
	11 Ω to 32.999 Ω	0.008 Ω	
	33 Ω to 109.999 Ω	0.014 Ω	
	110 Ω to 329.999 Ω	0.012 Ω	
	0.33 kΩ to 1.099 99 kΩ	0.12 Ω	
	1.1 kΩ to 3.299 99 kΩ	0.13 Ω	
	3.3 kΩ to 10.999 9 kΩ	1.2 Ω	
	11 kΩ to 32.999 9 kΩ	1.3 Ω	
	33 kΩ to 109.999 kΩ	0.012 kΩ	
	110 kΩ to 329.999 kΩ	0.013 kΩ	
	0.33 MΩ to 1.099 99 MΩ	0.12 kΩ	
	1.1 MΩ to 3.299 99 MΩ	0.44 kΩ	
	3.3 MΩ to 10.999 9 MΩ	0.001 6 MΩ	
	11 MΩ to 32.999 9 MΩ	0.034 MΩ	
	33 MΩ to 109.999 MΩ	0.13 MΩ	
	110 MΩ to 330 MΩ	1.9 MΩ	
	330 MΩ to 1 000 MΩ	12 MΩ	
Equipment to Measure AC Voltage At the listed frequencies 45 Hz to 10 kHz[F]	3.3 mV to 32.999 mV	0.015 mV	
	33 mV to 329.999 mV	0.12 mV	
	0.33 V to 3.299 99 V	1.3 mV	
	3.3 V to 32.999 9 V	0.014 V	
Equipment to Measure AC Voltage At the listed frequencies 45 Hz to 1 kHz[F]	33 V to 329.999 V	0.032 V	
	330 V to 1 020 V	0.26 V	
Equipment to Output AC Voltage At the listed frequencies 10 Hz to 20 kHz[FO]	10 mV to 100 mV	0.053 mV	Fluke 8845A
	0.1 V to 1 V	0.40 mV	
	>1 V to 10 V	4.2 mV	
	>10 V to 100 V	0.041 V	
	1 V to 750 V	0.32 V	
Equipment to Output AC Voltage At the listed frequencies 45 Hz to 500 Hz[FO]	0.1 kV to 6 kV	0.012 kV	Fluke 80K-6

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Equipment to Measure AC Current At the listed frequencies 45 Hz to 1 kHz[F]	33 µA to 329.99 µA	0.12 µA	Fluke 5522A
	0.33 mA to 3.299 mA	1.3 µA	
	3.3 mA to 32.999 mA	0.013 mA	
	33 mA to 329.99 mA	0.12 mA	
	0.33 A to 1.099 9 A	1.8 mA	
	1.099 A to 2.999 9 A	0.012 A	
Equipment to Measure AC Current At the listed frequencies 45 Hz to 100 Hz[F]	3 A to 11.999 9 A	0.028 A	
	11.999 9 A to 20.5 A	0.075 A	
Equipment to Measure AC Current Clamp-On Meters At the listed Frequencies 45 Hz a 65 Hz (Type Thyroid)[F]	11 A to 1 025 A	0.12 A	Fluke 5522A and 50 Turn Coil
Equipment to Output AC Current At the listed frequencies 10 Hz to 5 kHz[FO]	0.1 A to 1 A	0.59 mA	Fluke 8845A
	1 A to 3 A	4.0 mA	
Equipment to Output AC Current At the listed frequencies 40 Hz to 1 kHz[FO]	3 A to 10 A	0.087 A	Fluke 8845A
Equipment to Output Resistance[FO]	1 Ω to 10 Ω	0.012 Ω	
	10 Ω to 100 Ω	0.012 Ω	
	0.1 kΩ to 1 kΩ	0.12 Ω	
	1 kΩ to 10 kΩ	1.2 Ω	
	10 kΩ to 100 kΩ	11 Ω	
	0.1 MΩ to 1 MΩ	120 kΩ	
	1 MΩ to 10 MΩ	1.3 kΩ	
	10 MΩ to 100 MΩ	0.10 MΩ	
	0.1 GΩ to 1 GΩ	0.023 MΩ	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 385, 100Ω[FO]	-200 °C to 800 °C	0.071 °C	Electrical Simulation of RTD Output Fluke 5522A

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Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 3 926, 100Ω[F]	-200 °C to 630 °C	0.071°C	Electrical Simulation of RTD Output Fluke 5522A
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 3 916, 100Ω[F]	-200 °C to 630 °C	0.071 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 385, 200Ω[F]	-190 °C to 630 °C	0.062 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 385, 500Ω[FO]	-190 °C to 630 °C	0.062 °C	Electrical Simulation of RTD Output Fluke 5522A / Fluke 725
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt 385, 1 000Ω[FO]	-190 °C to 630 °C	0.054 °C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Pt Ni 385, 120Ω (Ni 120Ω)	-80 °C to 260 °C	0.10°C	
Temperature Calibration, Indication and Control Equipment used with RTD Type Cu 42 710Ω[FO]	-100 °C to 260 °C	0.35 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B[FO]	600 °C to 1 820 °C	0.37 °C	Electrical Simulation of Thermocouple Input / Output Fluke 5522A / Fluke 725
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C[FO]	0 °C to 2 316 °C	0.33 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E[FO]	-250 °C to 1 000 °C	0.21 °C	

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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J^{FO}	-210 °C to 1 200 °C	0.21 °C	Electrical Simulation of Thermocouple Input /Output Fluke 5522A / Fluke 725
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K^{FO}	-200 °C to 1 372 °C	0.23 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N^{FO}	-200 °C to 1 300 °C	0.25 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R^{FO}	0 °C to 1 767 °C	0.41 °C	Electrical Simulation of Thermocouple Input /Output Fluke 5522A / Fluke 725
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S^{FO}	0 °C to 1 767 °C	0.44 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T^{FO}	-250 °C to 400 °C	0.21 °C	

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.

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3. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its fixed location. Example: Outside Micrometer^{F} would mean that the laboratory performs this calibration at its fixed location.

4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations. Example: Outside Micrometer^{O} 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^{FO} 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 meters or millimeters as appropriate to the uncertainty statement.