PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Métrica Monterrey S.A de C.V.

Valle de Juarez # 506 Col. Valle Hermoso 2do. Sector,
Guadalupe N.L. México C.P. 67160

(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, Acoustic, Time and Frequency, Thermodynamic, Mass, Force and Weighting Devices, Mechanical 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/Operations Manager

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

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
October 21, 2016	October 21, 2016	December 31, 2018

Accreditation No.:	*Certificate No.:*
92325	L16-439

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

Métrica Monterrey S.A de C.V.
Valle de Juarez # 506 Col. Valle Hermoso 2do. Sector,
Guadalupe N.L. México C.P. 67160
Contact Name: Francisco Montañez. Phone: 812-230-5878

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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Optical Comparator Length X and Y Axis[O]	5 mm to 200 mm	(1.2 µm + 1.2L) mm	Glass Scales Mitutoyo
Optical Comparator Magnification[O]	10X	1% of reading	
	50X	1% of reading	
Optical Comparator Angularity [O]	0° to 360°	0.1°	Angle block
Optical Comparator Squareness X and Y Axis[O]	90°	0.12°	Square
Outside Micrometers Length[FO]	1.4 mm to 25.4 mm	(0.8 µm + 0.001L) mm	Gage Block Grade 1
Calipers	12.7 mm to 266.7 mm	(6.3 µm + 14.5L) mm	Height Master Mitutoyo
Height Gage[FO]	12.7 mm to 266.7 mm	(5.05 µm + 10.4L) mm	Height Master Mitutoyo
Displacement Indicators[FO]	1 mm to 25.4 mm	(0.01 µm + 11.5L) mm	Indicator Calibrator
Pin Gages[F]	0.25 mm to 50.8 mm	(0.003 µm + 0.4L) mm	Laser Scan Micrometer Z-Mike
Surface Plates[O] (Repeat Measurement)	0.038 mm	2.5 µm	Repeat–O–Meter
Metals Rules / Tapes[F]	50 mm to 3 000 mm	(6.6 µm + 128L) mm	Glass Scale Mitutoyo Magnifying Glass 10X Mitutoyo

Acoustic

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
Sound Level Meter[FO]	94 dB to 114 dB	0.61 dB	Amprobe Calibrator SM-Cal-1 @ 1 kHz

Time and Frequency

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
Stopwatch and Timers[FO]	1 s to 3 600 s	0.71 s/h	Stopwatch
Equipment to Measure Frequency[FO]	10 Hz to 10 MHz	(0.6 Hz + 1 x 10^{-5}F) Hz	Universal Counter BK
	10 MHz to 500 MHz	(0.1 Hz + 1 x 10^{-4}F) Hz	
	0.5 GHz to 2.7 GHz	(6 x 10^{-4} + 6 x 10^{-6}F) Hz	
Equipment to Output Frequency[FO]	0.25 MHz to 1 000 MHz	(3.2 x 10^{-5} + 2 x 10^{-6}F) Hz	Signal Generator Agilent

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

Thermodynamic

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
Temperature Contact Thermometer[FO]	30 °C to 400 °C	0.43 °C	Dry-Well Block, Temperature Calibrator
Temperature Measuring Equipment[F]	20 °C to 50 °C	0.3 °C	Vaisala HM34C
Humidity Measuring Equipment @ 30°C[F]	20 % RH to 80 % RH	1.6 % RH	
Infrared Temperature Measuring Equipment[F]	30 °C to 400 °C	(1.62 + 0.04T) °C	Blackbody Calibrator Omega BB703 Infrared Thermometer Fluke 62

Mass, Force and Weighting 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
Balances[O]	1 g to 1 000 g (Res.= 0.01 g)	0.018 g	Mass Class F1
Scales[O]	1 kg to 500 kg (Res.= 0.1 g)	(140 + 0.04Wt) g	Mass Class M1

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 Gauge[FO]	-12.6 psi to 1 psi	(0.05 + 0.000 35P) psi	Crystal Pressure Gauge
	1 psi to 20 psi	(0.03 + 0.000 31P) psi	
	20 psi to 100 psi	(0.001 + 0.008P) psi	
	100 psi to 1 000) psi	(0.000 9 + 0.35P) psi	
	1 000 psi to 5 000 psi	(0.001 2 + 0.1P) psi	
Torque Wrench[F]	10 lbf.in to 100 lbf.in	0.94% of reading	Torque Analyzer Mountz and Torque Sensor Mountz
	50 lbf.ft to 500 lbf.ft	0.65% of reading	
Universal Machine[O]	2 000 lbf to 20 000 lbf	0.61% of reading	Load Cell Omega
Indirect Verification of Rockwell Hardness Tester HRB[O]	40 HRB to 59 HRB	0.5 HRB	Hardness Standard Test Block Buehler
	60 HRB to 79 HRB	0.46 HRB	
	80 HRB to 100 HRB	0.35 HRB	
Indirect Verification of Rockwell Hardness Tester HRC[O]	20 HRC to 30 HRC	0.29 HRC	
	35 HRC to 55 HRC	0.21 HRC	
	60 HRC to 65 HRC	0.24 HRC	

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

Electrical

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Equipment to Measure DC Voltage[FO]	0 V to 1 000 V	0.0014 mV/V + 0.0167 mV	Keithley 2015
Equipment to Measure DC Current[FO]	0 A to 3 A	1.5 mA/A + 0.001 4 mA	Keith ley 2015 Fluke 289
	3 A to 10 A	0.44 mA/A + 6.5 mA	
Equipment to Measure High AC Voltage[FO]	1 kV to 28 kV	0.03 V/kV + 10 V	High Voltage Probe Fluke 80K-40 Fluke 289
Equipment to Measure High DC Voltage[FO]	1 kV to 40 kV	0.03 V/kV + 10 V	
Equipment to Measure High AC Current At the listed frequency[FO]			Fluke 355
50 Hz to 100 Hz	4 A to 1 500 A	0.01 A/A + 0.6 A	
Equipment to Measure High DC Current [FO]	4 A to 1 500 A	0.01 A/A + 0.6 A	
Equipment to Measure AC Voltage @ 60 Hz[FO]	0.1 V to 750 V	1.05 mV/V + 0.005 mV	Keithley 2015
Equipment to Measure AC Voltage @ 1 kHz[FO]	0.1 V to 750	1.05 mV/V + 0.007 mV	
Equipment to Measure AC Current At the listed frequency[FO]			Keithley 2015 Fluke 289
10 Hz to 3 000 Hz	0 A to 3 A	2.4 mA/A + 0.37 mA	
45 Hz to 1 000 Hz	3 A to 10 A	9.5 mA/A + 5.4 mA	
Equipment to Measure Resistance[FO]	0 Ω to 100 Ω	0.0045 mΩ/Ω + 1.7 mΩ	Keithley 2015
	1 Ω to 10 kΩ	0.36 mΩ/Ω + 122 mΩ	
	10 kΩ to 100 kΩ	3.7 mΩ/Ω + 1.3 Ω	
	100 kΩ to 1 000 kΩ	40 mΩ/Ω + 1.3 Ω	
	1 MΩ to 10 MΩ	1.5 Ω/Ω + 107.2 Ω	
	10 MΩ to 100 MΩ	54.1 Ω/Ω + 4 kΩ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E[FO]	-200 °C to 950 °C	0.0003 C/°C + 1.2 °C	Electrical Simulation of Thermocouple Indicators & Indicating Systems Fluke 724
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J[FO]	-200 °C to 1 200 °C	1.3 °C	

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

Electrical

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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K[FO]	-200 °C to 1 370 °C	1.1 °C	Electrical Simulation of Thermocouple Indicators & Indicating Systems Fluke 724
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R[FO]	20 °C to 1 750 °C	0.0007 °C/°C + 3 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S[FO]	20 °C to 750 °C	0.00062 °C/°C + 3 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T[FO]	-200 °C to 400	0.0004 °C/°C + 1.2 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type RTD Type Pt 385, 100 Ω[FO]	-200 °C to 800 °C	0.41 °C	Electrical Simulation of RTD Indicators & Indicating Systems Fluke 724
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type RTD Type Pt 385, 200 Ω[FO]	-200 °C to 630 °C	0.27 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type RTD Type Pt 385, 500 Ω[FO]	-200 °C to 630 °C	0.4 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type RTD Type Pt 385, 1 000 Ω[FO]	-200 °C to 630 °C	0.33 °C	
Equipment to Output DC Voltage[FO]	0 V to 15 V	0.004 V/V + 0.01 V	Agilent 66309D
Equipment to Output High Resistance[FO]	0.001 MΩ to 100 MΩ	0.14 kΩ/MΩ + 0.2 kΩ	High Resistance Decade Substitute RDS77-A
Equipment to Output Resistance[FO]	15 MΩ to 3 200 Ω	0.35 mΩ/Ω + 0.11 Ω	Fluke 724

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

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^{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 inches or millimeters as appropriate to the uncertainty statement.

8. The term P represents pressure in units appropriate to the uncertainty statement.

9. The term T represents temperature in ºC or ºF as appropriate to the uncertainty statement.

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

11. The term F represents Frequency in Hz appropriate to the uncertainty statement.