PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Sistema de Gestión Metrológica, S.A. de C.V.

Asunción 201, Col. Paraje Santa Rosa
Apodaca, Nuevo León, México. C.P. 66607

(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, Mass, Force and Weighing Devices, Time and Frequency, Thermodynamic, 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

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
May 27, 2020	June 23, 2022	July 31, 2024

Accreditation No.:	*Certificate No.:*
109337	L22-456

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

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

Certificate of Accreditation: Supplement

Sistema de Gestión Metrológica. S.A. de C.V.

Asunción 201, Col. Paraje Santa Rosa
Apodaca, Nuevo León, México. C.P. 66607
Contact Name: Claudia Silvina Sauceda Huerta Phone: 818-082-2565

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
Outside Micrometer[FO]	0.1 mm to 508 mm	(1.46 + 2.09 x 10^{-3}L) µm	Comparation Master Block Jingstone Grade 0 JIS B 7502
Inside Micrometer[FO]	1 mm to 300 mm	(1.28 + 7.33 x 10^{-3}L) µm	
Depth Micrometer[FO]	1 mm to 300 mm	(1.16 + 7.79 x 10^{-3}L) µm	
Calipers[FO]	0.1 mm to 1 000 mm	(11.46 + 3.36 x 10^{-4}L) µm	Comparation Master Block Jingstone Grade 0 JIS B 7507
Flexometers[FO]	0.1 mm to 1 000 mm	(0.07 + 0.059L) mm	Comparation Rule Master Mitutoyo JIS B 7512
Granite Surface Plates Flatness Only[FO]	300 mm to 3 600 mm	(5.342 + 3.51 x 10^{-3} D) µm	Level Electronics Mahr Federal JIS B 7513
Height Caliper[FO]	12.7 mm to 609.6 mm	(11.49 + 4.27 x 10^{-3}L) µm	Comparation Master Block Jingstone Grade 0 JIS B 7517
Ping Gages[FO]	0.152 mm to 25.4 mm	(2.26 + 1.6 X 10^{-2}L) µm	Micrometer Jingstone Asme B 89.1.5
Dial Indicators[FO]	0.1 mm to 25.4 mm	(2.49 + 1.28 X 10^{-2}L) µm	Calibration Tester Mitutoyo UDT-2 JIS B 7503
Protactor Angle Meter[FO]	0° to 90°	0.38°	Angle Blocks NMX-CH-151
Thickness Gages[FO]	0.022 mm to 1 mm	(2.37 + 0.8L) µm	Thickness Gages ASTM E 797
Feeler Gauge[FO]	0.03 mm to 0.9 mm	(11.6 + 1.03 X 10^{-1}L) µm	Micrometer Digital JIS B 7524
Coordinate Measuring Machines (CMM) Verification Length Error[O]	Up to 2 000 mm	(0.25 + 8.4 x 10^{-4}L) mm	ISO 10360-2 ISO 10360-5 & ASME B 89.4.10360.2 Gauge Block
Coordinate Measuring Machines (CMM) Verification Volumetric Measuring Error[O]	Up to 2 000 mm	0.51 µm	Master Spheres ISO 10360-5
Articulated Arm (ACMM) Verification[FO]	Up to 3 000 mm	(10.77 + 0.013L) mm	Spheres Bar Blocks Master Grade 0 ASME B89.4.22 ISO 10360-12

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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
Balances[FO]	20 g to 200 g (Res.= 0.01 g)	$(1.2 \times 10^{-2} + 2.5 \times 10^{-8}Wt)$ g	Class F1 Weights CENAM, Technical Guide
	200 g to 2 kg (Res.= 0.1 g)	$(1.2 \times 10^{-1} + 2.6 \times 10^{-8}Wt)$ g	Class F1 Weights CENAM, Technical Guide
	2kg to 5 kg (Res.= 1 g)	$(1.2 + 7.8 \times 10^{-7}Wt)$ g	
	20 kg to 200 kg (Res.= 10 g)	$(1.2 + 2.4 \times 10^{-6}Wt)$ g	Class M2 Weights CENAM, Technical Guide
	100 kg to 1 000 kg (Res.= 0.5 kg)	$(577 + 4.4 \times 10^{-8}Wt)$ g	

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
Equipment to Output RPM[FO]	6 rpm to 4 000 rpm	0.000 25 rpm + 0.001 rpm	No contact, Tachometer AS432B UNI-T UT370
Equipment to Output Time[FO]	Up to 3 600 s	16 s/day	Extech Hw30 Stopwatch 0.01 s ITTC-7.6-02-07

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-Measure Thermometers Radiations[FO]	50 °C to 1 200 °C	1.6 °C	Infrared Blackbody Presys T-1200PH CENAM Technical Guide
Temperature Generation Ovens, Furnaces, Muffles And Freezers[FO]	0 °C to 1 300 °C	1.7 °C	Fluke 754 with TC Type J Temperature Calibration CENAM Technical Guide
Thermo Hygrometer[FO]	30 % RH to 90 % RH	2 % RH	Psychrometer CEM Model DT-321s Humidity Chamber Complete Calibrator Euramet-cg-20
	25 °C to 50 °C	0.24 °C	

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Mechanical

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Torque Wrench Clockwise and Counter Clockwise[FO]	0.11 N·m to 1.13 N·m	0.006 4 N·m	ISO 6789 NMX-CH-6789-IMNC Torque Tester Mountz (BMX10I,) PTT
	1.13 N·m to 36.87 N·m	0.066 N·m	ISO 6789 NMX-CH-6789-IMNC Torque Tester Mountz (BMX100I) PTT (BMX 50F) PTT
	36 N·m to 67.79 N·m	0.066 N·m	
Pressure Gages[FO]	-103.42 kPa to -6.89 kPa	0.2 % of reading	Pressure Gauge 700 PV4 Fluke 754 Euramet-cg-17
	6.89 kPa to 68.94 kPa	0.2 % of reading	
	68.94 kPa to 3 447 kPa	0.15 % of reading	Pressure Gauge 750 P07 Fluke 754 Euramet-cg-17 NOM-013-SCFI
	689.47 kPa to 6894.76 kPa	1.5 % of reading	Pressure Gauge 700 P08 Fluke 754 Euramet-cg-17 NOM-013-SCFI
	6 894.76 kPa to 68 947.57 kPa	0.23 % of reading	Manometer Crystal Euramet-cg-17 NOM-013-SCFI

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
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B[FO]	600 °C to 800 °C	0.44 °C	Fluke 754 Electrical Simulation of Thermocouple Output ASTM E 230
	600 °C to 1 000 °C	0.34 °C	
	1 000 °C to 1 550 °C	0.3 °C	
	1 550 °C to 1 820 °C	0.26 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C[FO]	0 °C to 150 °C	0.3 °C	
	150 °C to 650 °C	0.26 °C	
	650 °C to 1 000 °C	0.31 °C	
	1 000 °C to 1 800 °C	0.5 °C	
	1 800 °C to 2 316 °C	0.84 °C	

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Electrical

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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E	-250 °C to -100 °C	0.5 °C	Fluke 754 Electrical Simulation of Thermocouple Output ASTM E 230
	-100 °C to -25 °C	0.16 °C	
	-25 °C to 350 °C	0.14 °C	
	350 °C to 650 °C	0.16 °C	
	650 °C to 1 000 °C	0.21 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J^{FO}	-210 °C to -100°C	0.27 °C	
	-100 °C to -30 °C	0.16 °C	
	-30 °C to 150 °C	0.14 °C	
	150 °C to 760 °C	0.17 °C	
	760 °C to 1 200 °C	0.23 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K^{FO}	-200 °C to -100 °C	0.33 °C	
	-100 °C to -25 °C	0.18 °C	
	-25 °C to 120 °C	0.016 °C	
	120 °C to 1 000 °C	0.26 °C	
	1 000 °C to 1 372 °C	0.4 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type L^{FO}	-200 °C to -100 °C	0.37 °C	
	-100 °C to 800 °C	0.26 °C	
	800 °C to 900 °C	0.17 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N^{FO}	-200 °C to -100 °C	0.4 °C	
	-100 °C to -25 °C	0.22 °C	
	-25 °C to 120 °C	0.19 °C	
	120 °C to 410 °C	0.18 °C	
	410 °C to 1 300 °C	0.27 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R^{FO}	0 °C to 250 °C	0.57 °C	
	250 °C to 400 °C	0.35 °C	
	400 °C to 1 000 °C	0.33 °C	
	1 000 °C to 1 767 °C	0.4 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T^{FO}	-250 °C to -150 °C	0.63 °C	
	-150 °C to 0 °C	0.24 °C	
	0 °C to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	

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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type U[FO]	-200 °C to 0 °C	0.56 °C	Fluke 754 Electrical Simulation of Thermocouple Output ASTM E 230
	0 °C to 600 °C	0.27 °C	
Equipment to Measure DC High Voltage[FO]	1 kV to 30 kV	1 kV	Multimeter Fluke 177 + Voltage Divisor CEW IPTS-68 / ITS-90 Euramet-cg-1
Equipment to Measure DC Voltage[FO]	1 mV to 99 mV	0.005 % of reading + 0.003 5 mV	Agilent 34401A Multimeter CENAM Technical Guide
	100 mV to 0.99 V	0.004 % of reading + 0.000 7 mV	
	1 V to 9.99 V	0.003 5 % of reading + 0.000 5 mV	
	10 V to 99.9 V	0.004 5 % of reading + 0.000 6 mV	
	100 V to 1 000 V	0.004 5 % of reading + 0.001 V	
Equipment to Measure AC Voltage At the listed frequencies[FO]			
3 Hz to 5 Hz	10 mV to 100 mV	1 % of reading + 0.04 mV	
5 Hz to 10 Hz	10 mV to 100 mV	0.35 % of reading + 0.04 mV	
10 Hz to 20 kHz	10 mV to 100 mV	0.06 % of reading + 0.04 mV	
20 kHz to 50 kHz	10 mV to 100 mV	0.12 % of reading + 0.04 mV	
50 kHz to 100 kHz	10 mV to 100 mV	0.6 % of reading + 0.08 mV	
100 kHz to 300 kHz	10 mV to 100 mV	4 % of reading + 0.5 mV	
Equipment to Measure AC Voltage At the listed frequencies[FO]			
3 Hz to 5 Hz	100 mV to 1 V	1 % of reading + 0.03 V	
5 Hz to 10 Hz	100 mV to 1 V	0.35 % of reading + 0.03 V	
10 Hz to 20 kHz	100 mV to 1 V	0.06 % of reading + 0.03 V	
20 kHz to 50 kHz	100 mV to 1 V	0.12 % of reading + 0.04 V	
50 kHz to 100 kHz	100 mV to 1 V	0.6 % of reading + 0.08 V	
100 kHz to 300 kHz	100 mV to 1 V	4 % of reading + 0.5 V	
Equipment to Measure AC Current At the listed frequencies[FO]			
3 Hz to 5 Hz	1 V to 750 V	1 % of reading + 0.03 V	
5 Hz to 10 Hz	1 V to 750 V	0.35 % of reading + 0.03 V	

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Equipment to Measure AC Current At the listed frequencies[FO]			Agilent 34401A Multimeter CENAM Technical Guide
10 Hz to 20 kHz	1 V to 750 V	0.06 % of reading + 0.03 V	
20 kHz to 50 kHz	1 V to 750 V	0.12 % of reading + 0.04 V	
50 kHz to 100 kHz	1 V to 750 V	0.6 % of reading + 0.08 V	
100 kHz to 300 kHz	1 V to 750 V	4 % of reading + 0.5 V	
Equipment to Measure AC Current At the listed frequencies[FO]			
3 Hz to 5 Hz	1 mA to 0.999 99 A	1 % of reading + 0.04 A	
5 Hz to 10 Hz	1 mA to 0.999 99 A	0.3 % of reading + 0.04 A	
10Hz to 5 kHz	1 mA to 0.999 99 A	0.1 % of reading + 0.04 A	
Equipment to Measure AC Current At the listed frequencies[FO]			
3 Hz to 5 Hz	1 A to 3 A	1 % of reading + 0.04 A	
5 Hz to 10 Hz	1 A to 3 A	0.3 % of reading + 0.04 A	
10 Hz to 5 kHz	1 A to 3 A	0.1 % of reading + 0.04 A	
Equipment to Measure Resistance[FO]	Up to 100 Ω	0.01 % of reading + 0.004 Ω	
	100 Ω to 1 000 Ω	0.01 % of reading + 0.001 Ω	
	1 kΩ to 10 kΩ	0.01 % of reading + 0.001 kΩ	
	10 kΩ to 100 kΩ	0.01 % of reading + 0.001 kΩ	
	100 kΩ to 1 MΩ	0.01 % of reading + 0.001 MΩ	
	1 MΩ to 10 MΩ	0.04 % of reading + 0.001 MΩ	
	10 MΩ to 100 MΩ	0.8 % of reading + 0.01 MΩ	
Equipment to Measure Frequency At the listed voltage (100 mV to 750 V)[FO]	3 Hz to 5 Hz	0.1 % of reading	
	5 Hz to 10 Hz	0.05 % of reading	
	10 Hz to 40 Hz	0.03 % of reading	
	40 Hz to 300 Hz	0.01 % of reading	

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