



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

3Dimensional Laboratorios S. de R.L. de C.V.

**Plaza España No 7320, Fraccionamiento Roma Poniente
Ciudad Juarez, Chihuahua, México. C.P. 32695**

*(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, Force, Mass and Weighing Devices, Mechanical, Thermodynamic, Chemical 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:

September 12, 2016

Issue Date:

November 11, 2020

Expiration Date:

November 30, 2022

Accreditation No.:

84633

Certificate No.:

L20-678

*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.pjilabs.com*



Certificate of Accreditation: Supplement

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Plaza España No 7320, Fraccionamiento Roma Poniente
Ciudad Juárez, Chihuahua, México. C.P. 32695

Contact Name: Victor Manuel Martinez Sastré Phone: 656-679-0097

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
Micrometers ^{FO}	0.5 mm to 500 mm	(1.3 + 0.03L) μ m	Gage Blocks UNE 82306 UNE 82317 UNE 82310
Calipers ^{FO}	0.5 mm to 500 mm	(5.77 + 0.001L) μ m	
Indicators ^{FO}	0.001 mm to 60 mm	(2.2 + 0.6L) μ m	
Protractor ^F	05 mm to 1 000 mm	0.014°	Angle Blocks BS1685
Thread Plug Gages ^{FO}	0-80 TPI & 4-20 TPI	60 μ in	Thread Wires & Bench Micrometer Euramet-cg-10-01
Optical Comparator ^O X axis Linearity Y axis Linearity	1 mm to 500 mm 1 mm to 500 mm	(3.86 + 0.025 4L) μ m	Master Glass Scale Angle Blocks JIS B 7184
Optical Comparator ^O Angulatory	0° to 180°	0.03°	
Optical Comparator ^O Magnification	10X 20X 50X	0.05 % Magnification 0.05 % Magnification 0.05 % Magnification	
Roughness Standard ^O	0.05 Ra to 6.3 Ra	12 % of reading	Surface Roughness Standard ISO 4288

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 ^{FO}	4 pH	0.013 pH	pH Buffer Solutions CENAM Technical Guide
	7 pH	0.013 pH	
	10 pH	0.013 pH	
Conductivity Meters ^{FO}	9.35 μ S/cm	0.28 μ S/cm	Conductivity Solutions CENAM Technical Guide
	100 μ S/cm	0.29 μ S/cm	
	999 μ S/cm	3 μ S/cm	
	9 985 μ S/cm	30 μ S/cm	



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Thermodynamic

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IR Thermometers ^{FO}	10 °C to 400 °C (20 °F to 752 °F)	1.4 °C (2.5 °F)	Omega Infrared Calibrator CENAM Technical Guide
Humidity Meters ^{FO}	10 % RH to 90 % RH	2.3 % of reading	Humidity Calibration Salt CENAM Technical Guide

Force, Mass and Weighing Devices

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
Force –Compression and Tension- Source and Measure ^{FO}	4.44 kN to 44.48 kN	1 % of reading	Load Cell
	1.1 N to 2.5 N	0.24 % of reading	Test Weight Set F Class CENAM Technical Guide
	2.6 N to 10 N	0.24 % of reading	
	10.1 N to 50 N	0.24 % of reading	
51 N to 100 N	0.24 % of reading		
Force –Compression and Tension- Source and Measure ^{FO}	101 N to 250 N	0.24 % of reading	
	251 N to 500 N	0.24 % of reading	
	501 N to 1 000 N	0.24 % of reading	
	1 001 N to 5 000 N	0.24 % of reading	
Scales and Balances Class III ^O	1 lb to 10 lb (Res.= 0.000 5 lb)	$(1 \times 10^{-4} + 1.8 \times 10^{-4}Wt)$ lb	
	1 lb to 20 lb (Res.= 0.000 1 lb)	$(1 \times 10^{-4} + 2.34 \times 10^{-4}Wt)$ lb	
	1 lb to 50 lb (Res.= 0.000 2 lb)	$(2 \times 10^{-4} + 1.12 \times 10^{-4}Wt)$ lb	
	1 lb to 100 lb (Res. = 0.001 lb)	$(1.1 \times 10^{-3} + 1.08 \times 10^{-4}Wt)$ lb	
Scales and Balances Class III ^O	50 lb to 500 lb (Res. = 0.05 lb)	$(5.54 \times 10^{-2} + 5.25 \times 10^{-5}Wt)$ lb	
Weights M1, M2, M3 ^{FO}	100 g	1.6 mg	Weight Set F1 OIML R111 CENAM Technical Guide ABBA
	200 g	1.8 mg	
	20 kg	170 mg	
Weights M2, M3 ^{FO}	2 g	1.5 mg	
	5 g	1.5 mg	
	10 g	1.5 mg	



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Force, Mass and Weighing Devices

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Weights M2, M3 ^{FO}	20 g	1.5 mg	Weight Set F1 OIML R111 CENAM Technical Guide ABBA
	50 g	1.5 mg	
	5 kg	140 mg	
Weights M3 ^{FO}	1 g	1.5 mg	
	1 kg	140 mg	
	2 kg	140 mg	
Balances ^{FO} Class II	10 g to 300 g (Res.= 0.001 g)	$(1.18 \times 10^{-3} + 2 \times 10^{-6}Wt) \text{ g}$	Weight Set F1 OIML R111 CENAM Technical Guide
	30 g to 500 g (Res.= 0.01 g)	$(1.16 \times 10^{-2} + 1.5 \times 10^{-5}Wt) \text{ g}$	
	100 g to 2 000 g (Res.= 0.01 g)	$(1.16 \times 10^{-2} + 4 \times 10^{-6}Wt) \text{ g}$	
	500 g to 5 000 g (Res.= 0.1 g)	$(1.12 \times 10^{-1} + 1.6 \times 10^{-5}Wt) \text{ g}$	
	1 000 g to 20 000 g (Res.= 1 g)	$(1.17 + 3.2 \times 10^{-5}Wt) \text{ g}$	

Mechanical

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
Indirect Verification of Machine Hardness Tester HRB ^O	40 HRB to 59 HRB	0.9 HRB	Hardness Standard Blocks ASTM E18
	60 HRB to 79 HRB	0.7 HRB	
	80 HRB to 100 HRB	0.5 HRB	
Indirect Verification of Machine Hardness Tester HRC ^O	25 HRC to 39 HRC	0.6 HRC	
	40 HRC to 59 HRC	1 HRC	
	60 HRC to 70 HRC	0.5 HRC	
Torque Wrenches ^F	1 lbf·in to 50 lbf·in	0.7 % of reading	CDI Torque Tester CENAM Technical Guide
	60 lbf·in to 600 lbf·in	0.7 % of reading	
Pressure - Pneumatic Gage ^O	12.5 psi to 10 000 psi	20 psi	Additel Hydraulic Press Test Pump & Digital Pressure CENAM Technical Guide



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Electrical

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Equipment to Output RF Power ^{FO}	-30 dB to 20 dB	4 % of reading + 0.03 dB	437B Power Meter with 8482A Power Meter CENAM Technical Guide
Equipment to Measure DC Current ^{FO}	0.3 A to 3 A	1.5 mA/A + 0.6 mA	HP 34401A CENAM Technical Guide
Equipment to Measure AC Current At the Current frequencies ^{FO}			
3 Hz to 5 kHz	100 μ A to 3A	1 mA/A + 1.2 mA	
5 kHz to 10 kHz	100 μ A to 3A	2 mA/A + 1.2 mA	
Equipment to Output Capacitance 10 Hz to 2 MHz ^{FO}	50 pF to 1.111 15 μ F	0.5 % of reading + 5 pF	
Equipment to Measure DC Voltage ^{FO}	Up to 104 mV	0.008 % of reading + 10 μ V	Transmille Multiproduct Calibrator CENAM Technical Guide
	0.104 V to 1.04 V	0.008 % of reading + 30 μ V	
	1.04 V to 10.4 V	0.008 % of reading + 300 μ V	
	10.4 V to 100.4 V	0.008 % of reading + 3 000 μ V	
	104 V to 1 020 V	0.008 % of reading + 30 000 μ V	
Equipment to Measure DC Current ^{FO}	Up to 104 μ A	0.03 % of reading + 0.03 μ A	
	0.104 mA to 1.04 mA	0.03 % of reading + 0.1 μ A	
	1.04 mA to 10.4 mA	0.03 % of reading + 1 μ A	
	10.4 mA to 104 mA	0.03 % of reading + 10 μ A	
	104 mA to 1 040 mA	0.03 % of reading + 150 μ A	
	1.04 A to 10.2 A	0.03 % of reading + 2 000 μ A	
Equipment to Measure AC Current 10 Hz to 2 kHz ^{FO}	10.4 μ A to 104 μ A	0.1 % of reading + 0.4 μ A	
	0.104 mA to 1 mA	0.1 % of reading + 0.8 μ A	
	1.04 mA to 10.4 mA	0.1 % of reading + 8 μ A	
	10.4 mA to 104 mA	0.1 % of reading + 80 μ A	
	104 mA to 1 040 mA	0.1 % of reading + 800 μ A	
	1.04 mA to 10.4 A	0.1 % of reading + 15 000 μ A	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			
10 Hz to 1.999 kHz	Up to 104 mV	0.08 % of reading + 0.03 mV	
2 kHz to 20 kHz	Up to 104 mV	0.15 % of reading + 7 mV	
40 Hz to 1 kHz	10.4 V to 104 V	0.08 % of reading + 30 mV	
40 Hz to 1 kHz	104 V to 1 020 V	0.08 % of reading + 300 mV	



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Equipment to Measure Frequency ^{FO}	10 Hz to 100 kHz	0.002 % of reading	Transmille Multiproduct Calibrator	
Equipment to Measure Resistance ^{FO}	Up to 10 Ω	0.2 % of reading	CENAM Technical Guide	
	10 Ω to 50 Ω	0.2 % of reading		
	50 Ω to 100 Ω	0.2 % of reading		
	101 Ω to 1 k Ω	0.2 % of reading		
	1.01 k Ω to 10 k Ω	0.2 % of reading		
	10.1 k Ω to 100 k Ω	0.2 % of reading		
	101 k Ω to 1 M Ω	0.2 % of reading		
Equipment to Measure Capacitance ^{FO}	1.01 M Ω to 10 M Ω	0.5 % of reading		
	Up to 10 nF	0.8 % of reading		
	10 nF to 100 nF	0.8 % of reading		
Equipment to Measure Capacitance ^{FO}	100 nF to 1 μ F	0.8 % of reading		
	Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type B ^{FO}	600 °C to 1 820 °C	1.5 °C	Electrical Simulation of Thermocouple Output Transmille Multiproduct Calibrator CENAM Technical Guide
	Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type C ^{FO}	0 °C to 1 000 °C	0.6 °C	
1 000 °C to 2 310 °C		1.4 °C		
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type E ^{FO}	-250 °C to -100 °C	1 °C		
	-100 °C to 650 °C	0.24 °C		
	650 °C to 1 000 °C	0.3 °C		
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type J ^{FO}	210 °C to -100 °C	0.46 °C		
	-100 °C to 150 °C	0.22 °C		
	150 °C to 760 °C	0.28 °C		
	760 °C to 1 200 °C	0.38 °C		
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type K ^{FO}	200 °C to -100 °C	0.54 °C		
	-100 °C to 120 °C	0.3 °C		
	120 °C to 1 370 °C	0.52 °C		
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type L ^{FO}	-200 °C to 900 °C	0.68 °C		



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Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type N ^{FO}	-200 °C to -100 °C	0.84 °C	Electrical Simulation of Thermocouple Output Transmille Multiproduct Calibrator CENAM Technical Guide
	-100 °C to 410 °C	0.4 °C	
	410 °C to 1 300 °C	0.48 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type R ^{FO}	0 °C to 250 °C	1.6 °C	
	250 °C to 1 760 °C	1.1 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type S ^{FO}	0 °C to 250 °C	1.6 °C	
	250 °C to 1 760 °C	1.1 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type T ^{FO}	-250 °C to -150 °C	1.2 °C	
	-150 °C to 400 °C	0.22 °C	
Temperature Calibration, Indication and Control Equipment Used with Thermocouple Type U ^{FO}	-200 °C to 600 °C	0.8 °C	

Acoustical

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Sound Level Meter Fixed Point ^{FO}	94 dB	0.5 dB	Acoustical Calibrator @ 1 kHz CENAM Technical Guide
	114 dB	0.5 dB	

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.



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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.