



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Metrocal, S.A. de C.V.

***Av. Lázaro Cardenas # 3141, Col. Valle del Márquez
Monterrey, Nuevo Leon, México. C.P. 64790***

*and hereby declares that the Organization is accredited in accordance with
the recognized International Standard:*

ISO/IEC 17025:2017

Whereby, technical competence has been confirmed for the associated scope supplement, in the fields of:

***Optical, Dimensional, Thermodynamic, Mass, Force, and Weighing Devices,
Chemical, Mechanical, Fluid Quantities and Time & Frequency Calibration
(As detailed in the supplement)***

Accreditation claims for conformity assessment activities shall only be made from the addresses referenced within this certificate and shall apply solely to those activities identified in the related scope. This Accreditation is granted subject to the Accreditation Body rules governing the Accreditation referred to above, and the Organization hereby commits to observing and complying with those rules in their entirety.

For PJLA:

Initial Accreditation Date:

Issue Date:

Expiration Date:

December 14, 2004

October 15, 2025

December 31, 2027

Accreditation No.:

Certificate No.:

46962

L25-776

Tracy Szerszen
President

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.pjlab.com*



Certificate of Accreditation: Supplement

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Av. Lázaro Cardenas # 3141, Col. Valle del Márquez
 Monterrey, Nuevo Leon, México. C.P. 64790
 Contact Name: Isaac Gonzalez Phone: 818-365-7188

Accreditation is granted to the facility to perform the following conformity assessment activities:

FIELD OF CALIBRATION	MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	EXPANDED MEASUREMENT UNCERTAINTY (\pm) ¹	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED	FLEX CODE	LOCATION OF ACTIVITY
Optical	Equipment to Measure ρ (λ) Spectral Reflectance (400 nm to 700 nm):	0.35 % to 92.13 %	2.5 % of reading	Ceramic Research Tiles	ASTM E-1164	F1, F2	F, O
Optical	Equipment to Measure Color Values (CIE L*)	4.19 to 96.61	0.5	Ceramic Research Tiles	ASTM E-1164	F1, F2	F, O
Optical	Equipment to Measure Color Values (CIE a*)	-34.83 to 58.01	0.5	Ceramic Research Tiles	ASTM E-1164	F1, F2	F, O
Optical	Equipment to Measure Color Values (CIE b*)	-40.49 to 87.63	0.5	Ceramic Research Tiles	ASTM E-1164	F1, F2	F, O
Optical	Equipment to Measure Color Values (X)	0.42 to 101.56	0.5	Ceramic Research Tiles	ASTM E-1164	F1, F2	F, O
Optical	Equipment to Measure Color Values (Y)	0.46 to 91.48	0.5	Ceramic Research Tiles	ASTM E-1164	F1, F2	F, O
Optical	Equipment to Measure Color Values (Z)	0.3 to 106.22	0.5	Ceramic Research Tiles	ASTM E-1164	F1, F2	F, O
Optical	Spectrophotometers τ : (λ) Transmittance	τ : 3 % to 90 %	0.4 % of reading	CENAM Glass Filters	ASTM E-275	F1, F2	F, O
Optical	Spectrophotometers α (λ) Absorbance	α (λ): 0.02 to 2	0.05 % of reading	CENAM Glass Filters	ASTM E-275	F1, F2	F, O
Optical	Spectrophotometers λ Wavelength	λ : 230 nm to 700 nm	0.27 nm	Holmium Oxide	ASTM E-275	F1, F2	F, O



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Optical	ρ (e): Glossmeters (@ 20°)	0.4 GU to 92.1 GU	0.3 GU	Ceramic Research Gloss and Semi-Gloss Std.	ASTM D-523	F1, F2	F, O
Optical	ρ (e): Glossmeters (@ 60°)	4.4 GU to 94.9 GU	0.3 GU	Ceramic Research Gloss and Semi-Gloss Std.	ASTM D-523	F1, F2	F, O
Optical	ρ (e): Glossmeters (@ 85°)	17.6 GU to 99.8 GU	0.3 GU	Ceramic Research Gloss and Semi-Gloss Std.	ASTM D-523	F1, F2	F, O
Optical	ρ (e): Gloss Tiles (@ 20°)	0.4 GU to 92.1 GU	0.3 GU	Elcometer 480T Glossmeter 20 / 60 / 85	ASTM D-523	F1, F2	F
Optical	ρ (e): Gloss Tiles (@ 60°)	4.4 GU to 94.9 GU	0.3 GU	Elcometer 480T Glossmeter 20 / 60 / 85	ASTM D-523	F1, F2	F
Optical	ρ (e): Gloss Tiles (@ 85°)	17.6 GU to 99.8 GU	0.3 GU	Elcometer 480T Glossmeter 20 / 60 / 85	ASTM D-523	F1, F2	F
Optical	Equipment to Measure E_v Illuminance	120 lux to 3 000 lux	1.3 % of reading	LC-1 Meter	NIST Special Pub 250-37	F1, F2	O
Optical	Equipment to Measure E_v Light Color	2 856 K	15 K	LC-1 Meter	NIST Special Pub 250-37	F1, F2	O
Optical	Equipment to Measure $E(v)$ Light Meters	120 lux to 3 000 lux	2 % of reading	LC-1 Meter, Optical Bench	NIST Special Pub 250-37	F1, F2	F
Optical	Equipment to Measure $E(\lambda)$ UV Spectral Radiance	220 nm to 420 nm	5 % of reading	UV Radiometer UVCN-20	CENAM Technical Guide	F1, F2	O



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Optical	Equipment to Measure E (λ) UV Spectral Radiance	Up to 2 W/m ² /nm	5 % of reading	UV Radiometer UVCN-20	CENAM Technical Guide	F1, F2	O
Dimensional	Micrometers	1.588 mm to 76.2 mm	0.8 μ m	Gage Blocks Grade 0	ASME B89.1.13	F1, F2	F
Dimensional	Micrometers	0.06 in to 3 in	0.032 μ in	Gage Blocks Grade 0	ASME B89.1.13	F1, F2	F
Dimensional	Calipers	1.27 mm to 304.8 mm	10 μ m	Gage Blocks Grade 0	ASME B89.1.14	F1, F2	F
Dimensional	Calipers	0.05 in to 10 in	0.39 μ in	Gage Blocks Grade 0	ASME B89.1.14	F1, F2	F
Dimensional	Metal Rules	10 mm to 1 000 mm	(0.1 + 1.2 x 10 ⁻⁴ L) mm	Reticule Glass, Graduate Rule Vision System	CENAM Technical Guide	F1, F2	F
Dimensional	Measuring Tape	0.1 m to 5 m	1 mm	Chrome Rule Starrett	ASME B89.1.7	F1, F2	F
Dimensional	Coating Thickness Gauge (Ferrous Base)	12.5 μ m to 13 000 μ m	(1 + 3 x 10 ⁻⁴ L) μ m	Foil Thickness Standards	ASTM D 7091p	F1, F2	F
Dimensional	Coating Thickness, Gauge (Non-Ferrous Base)	12.5 μ m to 13 000 μ m	(1 + 3 x 10 ⁻⁴ L) μ m	Foil Thickness Standards	ASTM E 376	F1, F2	F
Dimensional	Ultrasonic Thickness Gauge	2.5 mm to 25 mm	0.02 mm	Block Gages	ASTM E797	F1, F2	F, F
Thermodynamic	Glass Thermometers	-80 °C to 0 °C	(0.02 + 1.39 x 10 ⁻³ T) °C	Agilent 344110A Liquid Bath, Standard Pt100	ASTM E1	F1, F2	F, O
Thermodynamic	Glass Thermometers	0 °C to 150 °C	(0.02 + 6.34 x 10 ⁻⁴ T) °C	Agilent 344110A Liquid Bath, Standard Pt100	ASTM E1	F1, F2	F, O



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Thermodynamic	Thermocouple Type B, E, J, K, N, R, S, T	-80 °C to 0 °C	$(0.1 + 4.2 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Liquid Bath, Standard Pt100	ASTM E230	F1, F2	F, O
Thermodynamic	Thermocouple Type B, E, J, K, N, R, S, T	0 °C to 1 100 °C	$(0.1 + 8.42 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Dry Block Thermocouple	ASTM E230	F1, F2	F, O
Thermodynamic	Thermometer RTD	-80 °C to 0 °C	$(0.02 + 2.04 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Liquid Bath, Standard Pt100	ASTM E1137	F1, F2	F, O
Thermodynamic	Thermometer RTD	0 °C to 400 °C	$(0.02 + 1.02 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Liquid Bath, Dry Block, Standard Pt100	ASTM E1137	F1, F2	F, O
Thermodynamic	Thermistor	-80 °C to 0 °C	$(0.02 + 2.04 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Liquid Bath, Standard Pt100	ITS-90	F1, F2	F, O
Thermodynamic	Thermistor	0 °C to 300 °C	$(0.02 + 1.02 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Liquid Bath, Dry Block Standard Pt100	ITS-90	F1, F2	F, O
Thermodynamic	Digital Thermometer (Indicator and Probe)	-80 °C to 0 °C	$(0.02 + 2.04 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Liquid Bath, Dry Block Standard Pt100 Thermocouple	EA Guide 13	F1, F2	F, O
Thermodynamic	Digital Thermometer (Indicator and Probe)	0 °C to 400 °C	$(0.02 + 1.02 \times 10^{-4}T) \text{ °C}$	Agilent 344110A Liquid Bath, Dry Block Standard Pt100 Thermocouple	EA Guide 13	F1, F2	F, O



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Thermodynamic	Digital Thermometer (Indicator and Probe)	400 °C to 1 100 °C	$(0.1 + 8.42 \times 10^{-4}T)$ °C	Fluke 54 II B Liquid Bath, Dry Block Standard Pt100 Thermocouple	EA Guide 13	F1, F2	F, O
Thermodynamic	Infrared Thermometer	100 °C to 400 °C	0.5 °C	Blackbody Source OMEGA BB703	CENAM Technical Guide	F1, F2	F, O
Thermodynamic	Hygrometer	30 % RH to 70 % RH	2 % RH	Digital Hygometer Lutron MHB-382SD	CENAM Technical Guide	F1, F2	F, O
Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	1 g	18 µg	Double Substitution with Class E2 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	2 g	22 µg	Double Substitution with Class E2 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	5 g	26 µg	Double Substitution with Class E2 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	10 g	34 µg	Double Substitution with Class E2 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	20 g	44 µg	Double Substitution with Class E2 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	50 g	110 µg	Double Substitution with Class E2 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F



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Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	100 g	140 μ g	Double Substitution with Class E2 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F1, F2 M1, M2, M3	200 g	210 μ g	Double Substitution with Class E2 Weights,	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F2 M1, M2, M3	500 g	1.6 mg	Double Substitution with Class F1 Weights,	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F2 M1, M2, M3	1 kg	2.7 mg	Double Substitution with Class F1 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F2 M1, M2, M3	2 kg	9.5 mg	Double Substitution with Class F1 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F2 M1, M2, M3	5 kg	16 mg	Double Substitution with Class F1 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F2 M1, M2, M3	10 kg	85 mg	Double Substitution with Class F1 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Weights F2 M1, M2, M3	20 kg	90 mg	Double Substitution with Class F1 Weights	CENAM Technical Guide M-01 Pesas	F1, F2	F
Mass, Force, and Weighing Devices	Balance	10 g to 2 000 g	(1.34 + 2.2 x 10 ⁻³ Wt) mg	F1 Weights SIM-MWG7	CENAM Technical Guide	F1, F2	O



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Mass, Force, and Weighing Devices	Balance	100 g to 20 kg	$(9.05 + 2.2 \times 10^{-3}Wt)$ mg	F1 Weights SIM-MWG7	CENAM Technical Guide	F1, F2	O
Mass, Force, and Weighing Devices	Scales	10 kg to 200 kg	$(0.39 + 4.7 \times 10^{-5}Wt)$ g	M2 Weights SIM-MWG7	CENAM Technical Guide	F1, F2	O
Mass, Force, and Weighing Devices	Analytical Balances	1 mg to 20 g	$(0.017 + 2 \times 10^{-3}Wt)$ mg	E2 Weights SIM-MWG7	CENAM Technical Guide	F1, F2	O
Mass, Force, and Weighing Devices	Analytical Balances	1 g to 200 g	$(0.15 + 1.5 \times 10^{-3}Wt)$ mg	E2 Weights SIM-MWG7	CENAM Technical Guide	F1, F2	O
Mass, Force, and Weighing Devices	Force-Tension Load cell, Dynamometer	980.67 N to 9 806.65 N	0.5 % of reading	Load Cell	NMX-CH-7500-1	F1, F2	F
Mass, Force, and Weighing Devices	Pycnometer	10 g/cm ³ to 100 g/cm ³	2 % of reading	Analytical Balance and GR-300	CENAM Technical Guide	F1, F2	F
Chemical	pH Meter (Fixed Point)	2 pH	0.028 pH	CRMs-pH Buffer Solution	CENAM Technical Guide	F1, F2	F, O
Chemical	pH Meter (Fixed Point)	4 pH	0.022 pH	CRMs-pH Buffer Solution	CENAM Technical Guide	F1, F2	F, O
Chemical	pH Meter (Fixed Point)	7 pH	0.044 pH	CRMs-pH Buffer Solution	CENAM Technical Guide	F1, F2	F, O
Chemical	pH Meter (Fixed Point)	10 pH	0.044 pH	CRMs-pH Buffer Solution	CENAM Technical Guide	F1, F2	F, O



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Chemical	Conductivity Meters (Fixed Point)	25 μ S	1.5 μ S	CRMs-Conductivity Solution	CENAM Technical Guide	F1, F2	F, O
Chemical	Conductivity Meters (Fixed Point)	1 015 μ S	5 μ S	CRMs-Conductivity Solution	CENAM Technical Guide	F1, F2	F, O
Chemical	Conductivity Meters (Fixed Point)	12 850 μ S	45 μ S	CRMs-Conductivity Solution	CENAM Technical Guide	F1, F2	F, O
Chemical	Dynamic Viscosity Rotational Meter	100 mPa.s to 30 000 mPa.s	0.4% of reading	Cannon, Brookfield STD	CENAM Technical Guide	F1, F2	F, O
Chemical	Kinematic Viscosity Zahn, Ford, Din and ISO Cup	15 mm ² /s to 1 200 mm ² /s	0.8 % of reading	Cannon, Flow Time 20 s to 100 s	ASTM D1200 ASTM D4212 ASTM D5125	F1, F2	F, O
Mechanical	Vacuum Gauge	-80 kPa to -0.8 kPa	0.5 % of reading	Digital Vacuum Gage OMEGA DPG8000-VAC	CENAM Technical Guide	F1, F2	F, O
Mechanical	Pressure Gauge	0.4 MPa to 4 MPa	0.05 % of reading	Manometer Tek Know PM350	CENAM Technical Guide	F1, F2	F, O
Fluid Quantities	Micropipettes	1 μ L to 10 μ L	1.4 % of reading	Analytical Balance and AD4212B-101	CENAM Technical Guide	F1, F2	F
Fluid Quantities	Micropipettes	10 μ L to 1 000 μ L	0.12 % of reading	Analytical Balance and AD4212B-101	CENAM Technical Guide	F1, F2	F
Fluid Quantities	Pipettes	1 mL to 10 mL	0.08 % of reading	Analytical Balance and GR-300	CENAM Technical Guide	F1, F2	F
Fluid Quantities	Pipettes	10 mL to 100 mL	0.02 % of reading	Analytical Balance and GR-300	CENAM Technical Guide	F1, F2	F
Fluid Quantities	Burette	100 mL to 2 000 mL	0.015 % of reading	Precision Balance and GF30K	CENAM Technical Guide	F1, F2	F



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Fluid Quantities	Flask	2 L to 20 L	0.007 % of reading	Precision Balance and GF30K	CENAM Technical Guide	F1, F2	F
Time and Frequency	Tachometer	50 r/min to 25 000 r/min	$(1 + 1.1 \times 10^{-4}L)$ r/min	Tachometer Shimpo DT-205L	CENAM Technical Guide	F1, F2	F
Time and Frequency	Centrifuges	50 r/min to 25 000 r/min	$(1 + 1.1 \times 10^{-4}L)$ r/min	Tachometer Shimpo DT-205L	CENAM Technical Guide	F1, F2	F, O

- The CMC (Calibration and Measurement Capability) is expressed in terms of measurement instrument/aspect being calibrated, range, expanded measurement uncertainty, equipment, and method/procedure. The expanded measurement uncertainty 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 measurement uncertainty included on this scope 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.
- The laboratory's range of calibration capability for all disciplines for which it is 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.
- Location of activity:

Location Code	Location
F	Conformity assessment activity is performed at the CAB's fixed facility
O	Conformity assessment activity is performed onsite at the CAB's customer location
- Measurement uncertainties obtained for calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratory's 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 laboratory's fixed location.



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5. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
6. The term T represents temperature in °C or °F as appropriate to the uncertainty statement.
7. Flex Codes

F0: When no flexibility is identified. There are no changes to items calibrated, characteristics identified or versions of methods except for updating to the most recent version of a standard method after verification.

F1: The laboratory has the capability to introduce a new instrument, quantity, or gauge for an accredited calibration method.

F2: The laboratory has the capability to introduce the newest revision of an accredited authoritative standard method (with no modifications) identified on the scope

F3: The laboratory has the capability to introduce a new revision of an accredited non-standard method using the same technology or technique identified on the scope

F4: The laboratory has the capability to introduce a validated method that is equivalent to an accredited method (using the same Calibration Equipment or Reference Standards identified on the scope for the same parameter, component, or analyte identified on the line item of the scope.