PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Calidad Mx, S.A. de C.V.

Pino 3908 A Col. Jardines de San Rafael,
Guadalupe, Nuevo León, México. C.P. 67110

(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, Optical, Chemical, Volume, Thermodynamic, Mechanical, Time & Frequency, and Mass, Force and Weighing Devices

(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 14, 2011	December 29, 2017	January 31, 2020

Accreditation No.:	*Certificate No.:*
70242	L17-556

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

Calidad Mx., S.A. de C.V.
Pino 3908 A Col. Jardines de San Rafael,
Guadalupe, Nuevo León México. CP. 67100
Contact: Alejandro Lujan. Phone: 818-379-2710

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
Caliper[FO]	0.105 in to 24 in	(424.13 + 20.76L) µin	Mitutoyo Gage Block, Grade 0 Technical Guide CENAM
Micrometer[FO]	0.105 in to 24 in	(61.04 + 23.76L) µin	
Coating Thickness Gauge[FO]	20 µm to 2 600 µm	$(5.78 \times 10^{-2} + 1.84 \times 10^{-1}L)$ µm	Defelsco Certified Thickness Standards
Tape[FO]	50 m maximum	0.1 cm	Standard Tape NOM-046-SCFI-1999
Rule[FO]	100 cm maximum	0.006 cm	Standard Rule Glass Microrule NOM-040-SCFI-1994
Sieves[F]	45 µ to 13 200 µm	0.38 µm	Microscope ASTM E11-15
	16 mm to 125 mm	0.012 mm	Interior Caliper ASTM E11-15
CMM Volumetric Accuracy[O]	150 mm to 1 000 mm	(3.19 + 0.01L) µm	Steel Blocks ISO 10360

Optical

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
ρ (λ) Spectral Reflectance[FO] CIE L: CIE a*: CIE b*:	Color Values:		White Standard Tile
	0 to 100	0.72 Units	ASTM E1164 - 12
	-28 to 36	0.4 Units	ASTM D2244 - 16
	-26 to 63	0.7 Units	
Spectrophotometers Transmittance[FO]	τ: 1 % to 95 %	0.27 % of reading	Neutral density Filters, Holmium Oxide Glass ASTM E275 - 08
	λ: 230 nm to 700 nm	0.5 nm	
Gloss/Specular Reflectance Angle of Incline [FO]	20º to 92.1º 60º to 94.9º 85º to 99.8º	0.5 Gloss Units 0.5 Gloss Units 0.5 Gloss Units	Ceram Research Gloss and Semi-Gloss Standards ASTM D-523
Eν Illuminance[O]	100 lux to 6 000 lux	1 % of reading	Luxmeter Minolta CL-200
Eν Light Color[O]	60 K to 6 500 K	20 K	
Eν Light Meters[F]	100 lux to 6 000 lux	2 % of reading	Luxometer Minolta CL-200 NIST SP 250-37

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

Chemical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
pH Meters[FO]	4 pH to 10 pH	0.1 pH	SRM NIST Traceable, (Buffer, 4.01, 7.01, 10.01)
Conductivity Meters Fixed points[FO]	84 µS/cm	1 µS/cm	SRM NIST Traceable
	1 413 µS/cm	7 µS/cm	
Turbidity[FO]	0.1 NTU to 100 NTU	0.5 NTU	NTU EPA Method 180.1, HACH Standard
	100 NTU to 800 NTU	5 NTU	
Refractive Index[FO]	1 ºBrix to 80 ºBrix	0.55 % of reading	Sucrose Standards, OIML R-108

Volume

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
Burette[F]	10 mL	14 µL	Analytical Balance AND HR200 Technical Guide CENAM
	25 mL	35 µL	
	50 mL	50 µL	
Volumetric Pipettes and Pipettes[F]	1 mL	3.3 µL	
	5 mL	3.3 µL	
	10 mL	3.3 µL	
	25 mL	5.3 µL	
Micropipettes and Pipettes[F]	1 µL	0.023 µL	Micro Analytical Balance AND AD-4212B-PT Analytical Balance AND HR200 Technical Guide CENAM
	2 µL	0.023 µL	
	5 µL	0.059 µL	
	10 µL	0.051 µL	
	20 µL	0.042 µL	
	50 µL	0.015 µL	
	100 µL	0.015 µL	
	200 µL	0.083 µL	
	500 µL	0.32 µL	
	1 000 µL	0.32 µL	
	2 000 µL	0.32 µL	

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Volume

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
Graduated Cylinder[F]	25 mL	1.2 mL	Analytical Balance AND HR200 OHAUS SPX2202 Technical Guide CENAM
	50 mL	1.2 mL	
	100 mL	1.2 mL	
	250 mL	1.2 mL	
	500 mL	1.2 mL	
	1 000 mL	1.2 mL	
	2 000 mL	1.2 mL	
Volumetric Flask[F]	50 mL	0.02 µL	
	100 mL	0.03 mL	
	250 mL	0.07 mL	
	500 mL	0.08 mL	
	1 000 mL	0.15 mL	
	2 000 mL	0.33 mL	
Containers[F]	10 L	0.34 mL	
	20 L	0.34 mL	
	200 L	1.7 mL	

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]	1 psi to 1 000 psi	0.6 % of reading	Digital Manometer CENAM Technical Guide
	1 000 psi to 10 000 psi	0.2 % of reading	
Dynamic Viscosity Meters[FO]	0.1 Pa·s to 30 Pa·s	0.58 % of reading	Cannon Standard OIL
Kinematic Viscosity Ford Cup No.4[FO]	121.6 mm²/s	1.4 % of reading	
Kinematic Viscosity Zahn Cups No. 2[FO]	48.75 mm²/s	1.1 % of reading	
Kinematic Viscosity Zahn Cups No. 3[FO]	42.37 mm²/s	1.1 % of reading	
Kinematic Viscosity Zahn Cups No. 4[FO]	32.57 mm²/s	1.1 % of reading	
Torque[F]	2 N·m to 500 N·m	1 % of reading	Torque Transducer CEDAR Mod. DIS-IP500 500 N·m

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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
Indirect Verifications Hardness Tester HRC[O]	20 HRC to 30 HRC	0.42 HRC	ISO-6508-2 ASTM E18-16 Test Blocks
	30 HRC to 60 HRC	0.39 HRC	
	60 HRC to 70 HRC	0.38 HRC	
Indirect Verifications Hardness Tester HRB[O]	40 HRB to 60 HRB	0.38 HRB	
	60 HRB to 80 HRB	0.36 HRB	
	80 HRB to 100 HRB	0.42 HRB	
Indirect Verifications Hardness Tester HB[O]	120 HB to 300 HB at 10/1 500 kgf	1.8 HB	
	300 HB to 600 HB at 10/3 000 kgf	6 HB	

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
Force Compression and Tension [FO]	1 N to 4 906 N	0.3 % of reading	Transducer Load Cell
	4 906 N to 44 444 N	0.3 % of reading	
	44 444 N to 222 222 N	0.1 % of reading	
Analytical Balance[FO]	1 mg to 200 g (Res. = 0.1 mg)	$(2 \times 10^{-4} + 5.21 \times 10^{-6}Wt)$ g	OIML F1 Weights
Precision Balance[FO]	0.1 g to 10 000 g (Res = 0.01 g)	$(1.16 \times 10^{-2} + 3.35 \times 10^{-6}Wt)$ g	
Scale[FO]	5 kg to 200 kg (Res.= 1 g)	$(1.142\ 9 + 2.45 \times 10^{-6}Wt)$ g	OIML M1 Weights
Weighing Devices[O]	200 kg to 10 000 kg (Res.= 0.5 kg)	$(5.85 \times 10^{-1} + 3.1 \times 10^{-5}Wt)$ kg	OIML M1 and M2 Weights
Mass Class F1, M1 Weights[FO]	0.1 g	0.05 mg	Class E2 and F1Mass Micro and Analytical Balance Precision Balance (Res.= 0.01 g)
	0.5 g	0.05 mg	
	1 g	0.13 mg	
	2 g	0.16 mg	
	5 g	0.18 mg	
	10 g	0.22 mg	
	20 g	0.28 mg	

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

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
Mass Class F1, M1 Weights[FO] (Res.= 0.01 g)	50 g	0.1 mg	Class E2 and F1 Mass Analytical Balance Precision Balance
	100 g	0.18 mg	
	200 g	0.34 mg	
	500 g	0.13 mg	
Mass Class M1, M2 Weights[FO] (Res.= 0.01 g)	1 kg	19 mg	Class F1 Mass Precision Balance
	2 kg	35 mg	
	5 kg	150 mg	
Mass Class M2, M3 Weights[FO]	10 kg	580 mg	Class M1 Mass Balance
	20 kg	580 mg	

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
Thermocouple K[FO]	0 ºC to 500 ºC	0.24 ºC	Fluke 724, Dry Well
	501 ºC to 1 100 ºC	0.24 ºC	
Thermocouple J[FO]	0 ºC to 500 ºC	0.24 ºC	
	501 ºC to 1 100 ºC	0.24 ºC	
Bimetallic Thermometer[FO]	-20 ºC to 500 ºC	1.2 ºC	
Temperature Controllers[FO]	0 ºC to 1 100 ºC	0.5 ºC	
IR Thermometer[FO]	50 ºC to 500 ºC	0.64 ºC	Fluke 724 Dry Block Black Body (Temperature Generator)
Temperature Generation: Ovens, Furnaces, Muffles, Freezers and Incubators[FO]	-20 ºC to 0 ºC	1.4 ºC	Fluke 724
	0 ºC to 25 ºC	1.4 ºC	
	25 ºC to 100 ºC	1.5 ºC	
	100 ºC to 450 ºC	1.7 ºC	
	450 ºC to 900 ºC	1.9 ºC	
Relative Humidity[FO]	11.3 % RH	1.5 % RH	Saturated Salt Solution, OIML R-121
	35 % RH	1.5 % RH	
	95 % RH	1.5 % RH	

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

Time & Frequency

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Stopwatch[F]	60 s to 86 400 s	16 s/day	Direct Comparison Stop Watch, UTC
Tachometer[F]	1 rev/min to 10 000 rev/min	2 % of reading	Tachometer

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.