



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## Certificate of Accreditation

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

### ***Asesoría Industrial en Mantenimiento y Calibración (AIMEC) / Ignacio Grande Morales***

***Calle Adolfo López Mateos # 1-A  
Ocotlán, Tlaxcala, México. C.P. 90100***

*(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):

### ***Mass, Force and Weighing Devices, Mechanical, Thermodynamic and Electrical, Dimensional and Time and Frequency 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

*Initial Accreditation Date:*

April 12, 2013

*Issue Date:*

May 23, 2019

*Expiration Date:*

May 31, 2021

*Accreditation No.:*

75284

*Certificate No.:*

L19-254

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.pjllabs.com](http://www.pjllabs.com)*



# Certificate of Accreditation: Supplement

**Asesoría Industrial en Mantenimiento y Calibración (AIMEC) /  
Ignacio Grande Morales**

Calle Adolfo López Mateos # 1-A, Ocotlán  
Ocotlán, Tlaxcala, México. C.P 90100

Contact Name: Ignacio Grande Morales Phone: (52) 246-462-3570

*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 ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Balance <sup>o</sup>	1 g to 200 g (Res.= 0.2 mg)	0.63 mg	Weight OIML Class F1 OIML R-76
	1 g to 10 g (Res.= 0.1 mg)	0.36 mg	
	1 g to 100 g (Res.= 0.2 mg)	0.73 mg	
	1 g to 500 g (Res.= 0.5 mg)	1.8 mg	
	1 g to 1 000 g (Res.= 2 mg)	5.2 mg	
	1 g to 2 000 g (Res.= 5 mg)	12 mg	
	1 g to 5 000 g (Res.= 10 mg)	26 mg	
	1 000 g to 20 000 g (Res.= 500 mg)	0.12 g	
	200 g to 1 000 g (Res.= 2 mg)	5.2 mg	
	1 000 g to 10 000 g (Res.= 0.1 mg)	52 mg	
Scales <sup>o</sup>	5 kg to 150 kg (Res.= 5 g)	5.3 g	OIML Class M1 OIML R-76
	5 kg to 200 kg (Res.= 10 g)	16 g	
	5 kg to 500 Kg (Res.= 20 g)	22 g	
	5 kg to 1 000 Kg (Res.= 50 g)	80 g	
	200 kg to 1 000 Kg (Res.= 50 g)	70 g	
Force – Compression and Tension- Source and Measure <sup>o</sup>	20 N to 200 N (Res.= 0.02 N)	0.2 % of reading	Load Cells Omega Dyne Inc. Mod: LC-101-25 Mass F1 NMX-CH-7500-1-IMNC
	200 N to 2 000 N (Res.= 0.1 N)	0.2 % of reading	Load Cells Cell: H3G 500Kg
	2 000 N to 10 000 N (Res.= 10 N)	0.5 % of reading	Brand: Imada Model: DPZS Cells: H3G 1 000 kg NMX-CH-7500-1-IMNC



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Force – Compression and Tension- Source and Measure <sup>o</sup>	0.2 N to 10 N (Res.= 0.02 N)	0.2 % of reading	Mass F1 NMX-CH-7500-1-IMNC Technical Guide
	9.8 N to 98.1 N (Res.= 0.1 N)	0.3 % of reading	
	49 N to 5 000 N (Res.= 0.1 N)	0.4 % of reading	Mass M1 Load Cells Model: H3G 500 kg Indicator Brand: Radweg Model: PUE C731 NMX-CH-7500-1-IMNC Technical Guide
Weights F1, F2, M1 <sup>F</sup>	2 mg	0.006 6 mg	OIML Class E2 Weights NOM-038-SCFI
	10 mg	0.008 3 mg	
	20 mg	0.01 mg	
	50 mg	0.013 mg	
	100 mg	0.016 mg	
	200 mg	0.02 mg	
	500 mg	0.026 mg	
Weights F1, F2, M1 <sup>F</sup>	1 g	0.033 mg	OIML Class F1 Weights NOM-038-SCFI
	2 g	0.04 mg	
	5 g	0.053 mg	
	10 g	0.066 mg	
	20 g	0.083 mg	
	50 g	0.1 mg	
	100 g	0.16 mg	
	200 g	0.33 mg	
	500 g	0.83 mg	
	1 000 g	1.6 mg	
Weights F2, M1 <sup>F</sup>	2 kg	10 mg	OIML Class F1 Weights NOM-038-SCFI
	5 kg	27 mg	
	10 kg	54 mg	
	20 kg	100 mg	



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## Mechanical

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Pressures Gauges – Direct Comparison <sup>O</sup>	3 435.86 kPa to 34 374.87 kPa	0.3 % of reading	Fluke700P30 / Fluke 701 Technical Guide NMX-CH-013-SCFI
	688.79 kPa to 6 894.07 kPa	4.9 kPa	Pressure Gage Veris Technical Guide NMX-CH-013-SCFI
	206.84 kPa to 2 068.84 KPa	0.3 % of reading	Crystal XP2i Technical Guide NMX-CH-013-SCFI
	20.68 kPa to 206.84 KPa	0.4 % of reading	Fluke700P05 / Fluke 701 Technical Guide NMX-CH-013-SCFI
Vacuum Meters (Manovacuum Meters) Direct Comparison <sup>O</sup>	76.2 mmHg to 762 mmHg	0.6 % of reading	Technical Guide NMX-CH-013-SCFI
	-68.95 KPa to -6.89 kPa	4.9 kPa	Pressure Gage Veris Technical Guide NMX-CH-013-SCFI
Piston-Operated Pipettes and Dispensers Micropipettes <sup>F</sup>	10 $\mu$ L to 1 000 $\mu$ L	0.4 % of reading	Analytical Balance Sartorius (Res.= 0.1 mg) Thermometer Fluke 51 II ISO 4787 NMX-CH-20461
Volumetric Instruments (Pipettes, Burettes) <sup>F</sup>	0.1 mL to 10 mL	0.3 % of reading	Analytical Balance Sartorius (Res.= 0.1 mg) ISO 4787 Thermometer Fluke 51 II NMX-CH-20461
	10 mL to 100 mL	0.3 % of reading	
Volumetric Instruments (Volumetric Flasks, Graduated Cylinders) <sup>F</sup>	1 mL to 100 mL	0.3 % of reading	Analytical Balance Sartorius (Res.= 0.1 mg) Analytical Balance and (Res.= 1 mg) Analytical Balance Shimadzu (Res.= 0.01 g) ISO 4787 Thermometer Fluke 51 II NMX-CH-20461
	100 mL to 5 000 mL	0.7 % of reading	
Volumetric Measurement (Metallic Graduated Neck for Liquids) <sup>F</sup>	1 000 mL to 20 000 mL	0.7 % of reading	Balance Radwag, Balance Shimadzu (Res.= 0.1 mg) ISO 4787 Thermometer Fluke 51 II NOM-042-SCFI-1997



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Security Valves Relief Point <sup>FO</sup>	3 psi to 300 psi	0.28 psi	Digital Pressure Gage NOM-093-SCFI Crystal XP2i

## 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
Caliper <sup>F</sup>	2.5 mm to 450 mm	$(10.1 + 9 \times 10^{-3}L) \mu\text{m}$	Master Block Grade "1" NMX-CH-002-IMNC
Micrometer <sup>F</sup>	2.5 mm to 300 mm	$(0.9 + 6 \times 10^{-3}L) \mu\text{m}$	Master Block Grade "1" NMX-CH-099-IMNC
Height Gauges <sup>F</sup>	0.1 mm to 600 mm	$(8.1 + 8 \times 10^{-4}8L) \mu\text{m}$	Gauge and Vision Master Block Grade "1" NMX-CH-141-IMNC
Indicator <sup>F</sup>	0.1 mm to 50 mm	$(0.75 + 1.8 \times 10^{-3}L) \mu\text{m}$	Master Block Grade "1" NMX-CH-463-IMNC
Graduate Ruler <sup>F</sup>	5 mm to 3 000 mm	$(123 + 0.2L) \mu\text{m}$	Gauge and Vision NMX-CH-148-IMNC
Measurement Tape <sup>F</sup>	5 mm to 20 000 mm	$(254.7 + 0.2L) \mu\text{m}$	

## Electrical

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
Temperature Calibration Indication and Control Equipment used with Thermocouple Type J <sup>O</sup>	-200 °C to 0 °C	0.46 °C	Electrical Simulation of Thermocouple Output Process Calibrator 701 /725 Technical Guide
	0 °C to 800 °C	0.43 °C	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K <sup>O</sup>	-200 °C to 0 °C	0.58 °C	
	0 °C to 1 200 °C	0.48 °C	
Temperature Calibration Indication and Control Equipment used with RTD Type Pt 385 $\Omega$ <sup>O</sup>	1 °C to 300 °C	0.62 °C	Electrical Simulation of RTD Output Process Calibrator 701 / 725 Technical Guide
	300 °C to 700 °C	0.72 °C	



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## Time and Frequency

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Tachometers Meters <sup>FO</sup>	90 000 r/min	0.2 r/min	Digital Tachometer Amprobe Tach 200.1 r/min

## Thermodynamic

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
Liquids in Glass Thermometers <sup>FO</sup>	0 °C to 250 °C	0.31 °C	A Stirred Liquid Bath Thermometer Digital Luff C110 ITS-90
Industrial Thermometer - Indicator and Sensor RTD Pt 385 100 <sup>FO</sup>	-5 °C to 250 °C	0.35 °C	Dry Well Ametek ATC-157B / Dry Well Ametek ETC 400A / Thermometer Digital Luff C110 Technical Guide ITS-90
	200 °C to 250 °C	0.46 °C	
Industrial Thermometer - Indicator and Thermocouple Type J <sup>FO</sup>	0 °C to 400 °C	0.53 °C	Dry Well Ametek ETC 400A / Process Calibrator 701 / 725 Muffle Controller Eurotherm 3216i Technical Guide ITS-90
	400 °C to 700 °C	0.54 °C	
Industrial Thermometer Indicator and Thermocouple Type K <sup>FO</sup>	0 °C to 300 °C	0.41 °C	
	300 °C to 700 °C	0.58 °C	
	700 °C to 1 200 °C	0.58 °C	
Industrial Thermometer Indicator and Thermocouple Type T <sup>FO</sup>	0 °C to 400 °C	0.68 °C	
Bi-Metal Thermometers <sup>FO</sup>	-5 °C to 250 °C	0.35 °C	A Stirred Liquid Bath Thermometer Digital Luff C110 Technical Guide NMX-CH-140-IMNC ITS-90
	200 °C to 250 °C	0.46 °C	
Hygrometers <sup>F</sup>	10 % RH to 90 % RH	1.2 % RH	Capacitance Hygrometers Vaisala MI70 Delta Ohm HD11 Standard Salts Cal, Kit Exttech Rh300 Standard Salts Cal Humidity Chamber ASTM 104-85



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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<sup>F</sup> 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<sup>O</sup> 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<sup>FO</sup> 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.