



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## Certificate of Accreditation

**GAHP Metrología, S.A. de C.V.**  
Genaro Codina No 503, Col. Lomas del Roble  
San Nicolás de los Garza, Nuevo León, México. C.P. 66450

*(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, Time and Frequency, Mechanical, Mass, Force and Weighing Devices, Thermodynamic, Optical, Electrical and Chemical 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:

*Initial Accreditation Date:*

*Issue Date:*

*Expiration Date:*

July 05, 2012

September 09, 2024

September 09, 2026

*Accreditation No.:*

*Certificate No.:*

72297

L24-690

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



# Certificate of Accreditation: Supplement

## GAHP Metrología, S.A. de C.V.

Genaro Codina No 503, Col. Lomas del Roble  
 San Nicolás de los Garza, Nuevo León, México. CP. 66450  
 Contact Name: Horacio Meléndez. Phone: v

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

### Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Caliper <sup>F</sup>	0.5 mm to 600 mm	$(23.86 + 1.65 \times 10^{-2}L) \mu\text{m}$	Gage Block Grade 0	JIS B 7507 NMX-CH-002
Micrometer <sup>F</sup>	0.5 mm to 600 mm	$(2.05 + 1.78 \times 10^{-2}L) \mu\text{m}$		JIS B 7502 NMX-CH-099
Indicator <sup>F</sup>	0.5 mm to 50.8 mm	2.8 $\mu\text{m}$		JIS B 7503 NMX-CH-036
Height Gage <sup>F</sup>	50 mm to 600 mm	$(5.04 \times 10^{-4} + 7 \times 10^{-6}L) \text{mm}$		JIS B 7517 NMX-CH-141- IMNC
Rules <sup>F</sup>	0.5 mm to 1 000 mm (Res.= 0.1 mm)	$(2.49 \times 10^{-2} + 1.76 \times 10^{-4}L) \text{mm}$	Ruler Brand: Mitutoyo Model: 182-309	JIS B 7516
Measuring Tape <sup>F</sup>	0.1 m to 50 m (Res.= 1 mm)	$(2.41 \times 10^{-4} + 5.96 \times 10^{-4}L) \text{mm}$	Tape Brand: Truper Model: 5m	JIS B 7512
Odometer <sup>F</sup>	1 m to 3 000 m (Res.= 0.1 m)	0.3 m	Tachometer Brand: NIDEC Model: 207LR	NMX-CH-74
Coating Thickness Gauge Ferrous Base <sup>FO</sup>	23.2 $\mu\text{m}$ to 2 888 $\mu\text{m}$	$(1.65 \times 10^{-1} + 2.24 \times 10^{-4}L) \text{mm}$	Elcometer Calibration Standards	Dfelsko Procedure
Coating Thickness Gauge Non-Ferrous Base <sup>FO</sup>	23.2 $\mu\text{m}$ to 2 888 $\mu\text{m}$	$(2.41 \times 10^{-4} + 5.96 \times 10^{-4}L) \text{mm}$		
Ultrasonic Thickness Gage <sup>FO</sup>	23.2 $\mu\text{m}$ to 2 888 $\mu\text{m}$	$(2.41 \times 10^{-4} + 5.96 \times 10^{-4}L) \mu\text{m}$		
Foils Thickness <sup>FO</sup>	0.001 mm to 25 mm	0.004 mm	Digital Micrometer	Dfelsko Procedure

### Time and Frequency

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Frequency of Rotation (Tachometer) <sup>FO</sup>	1.8 m/min to 9 999.9 m/min	2 % of reading	Tachometer Nidec	DT-207LR
Chronometer Stopwatch Timers <sup>FO</sup>	60 s to 1 800 s	0.7 s	Stopwatch Brand: Accusplit Model: 705X NIST Recommended	NIST 960-12



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 Contact Name: Horacio Meléndez Phone: 812-261-8900

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### Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Pressure Gage <sup>FO</sup>	-14 psi to -0.2 psi	0.063 psi	Pressure Gauge Dwyer DPGW-00; DPGW-10 DPG-109; DPG-111	CENAM Technical Guide
	10 psi to 300 psi	0.33 psi		
	300 psi to 1 000 psi	5.8 psi		
	500 psi to 5 000 psi	29 psi		
Viscosity Meters Dynamic Viscosity <sup>FO</sup>	100 mPa·s to 30 000 mPa·s	2.5 % of reading	Cannon Standard Oil	
Kinematic Viscosity Ford cups 2, 3, 4, 5 <sup>FO</sup>	1.44 mm <sup>2</sup> /s to 367 mm <sup>2</sup> /s	2.5 % of reading		
Kinematic Viscosity Zhan Cups 2,3,4,5 <sup>FO</sup>	3.5 mm <sup>2</sup> /s to 400 mm <sup>2</sup> /s	2.5 % of reading		
Kinematic Viscosity ISO Cups 3, 4, 6 <sup>FO</sup>	0.443 mm <sup>2</sup> /s to 570 mm <sup>2</sup> /s	2.5 % of reading		
Kinematic Viscosity DIN Cups 4 <sup>FO</sup>	4.57 mm <sup>2</sup> /s to 452 mm <sup>2</sup> /s	2.5 % of reading		
Kinematic Viscosity Shell Cups: 2, 2 ½, 3, 3 ½, 4, 5, 6 <sup>FO</sup>	0.226 mm <sup>2</sup> /s to 452 mm <sup>2</sup> /s	2.5 % of reading		
Flow Meter <sup>O</sup>	0.5 L to 5 000 L	0.023 L	Flow Meter Brand: PCE INST. Model: TDS-100H	ASME MFC-5.3
Pipettes <sup>FO</sup>	1 mL to 10 mL	0.001 mL	Analytical Balance Brand: INPES Model: JF2204	CENAM Technical Guide
	10 mL to 100 mL	0.01 mL		
Burette <sup>FO</sup>	100 mL to 2 000 mL	0.1 mL	Analytical Balance Brand: Mettler Toledo Model: XS2002S	
Flask <sup>FO</sup>	2 L to 20 L	0.01 L	Balance Brand: Mettler Toledo Model: IND560	
Pycnometer <sup>F</sup>	10 mL to 500 mL	0.01 mL	Analytical Balance Brand: Mettler Toledo Model: XS203S Model: XS2002S	



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### Mass, Force and Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Analytical Balance <sup>O</sup>	1 mg to 6 000 g (Res.= 0.01 mg)	$(2 \times 10^{-4} + 5.01 \times 10^{-6}Wt)$ g	OIML E2 Class Weights	NOM-010-SCFI
	1 mg to 200 g (Res.= 0.000 1 g)	$(2 \times 10^{-4} + 5.01 \times 10^{-6}Wt)$ g	OIML F1 Class Weights	
Precision Balance <sup>O</sup>	0.1 g to 30 000 g (Res.= 0.01 g)	$(1.16 \times 10^{-2} + 4.16 \times 10^{-6}Wt)$ g		
Scale <sup>O</sup>	5 kg to 1 000 kg (Res.= 1 g)	$(1.154 2 + 5.72 \times 10^{-4}Wt)$ g	OIML M1 Weights	
Mass Class F1, F2 <sup>F</sup>	200 g	0.33 mg	Analytical Balance, Mass Set Class E2	OIML R 111 CENAM Technical Guide
	500 g	0.83 mg		
	1 000 g	1.6 mg		
	2 000 g	3.3 mg		
Mass Class M1, M2, M3 <sup>F</sup>	1 g	0.033 mg		
	2 g	0.4 mg		
	5 g	0.53 mg		
	10 g	0.66 mg		
	20 g	0.83 mg		
	50 g	1 mg		
	100 g	1.6 mg		
	200 g	3.3 mg		
Mass Class M1, M2, M3 <sup>F</sup>	500 g	8.3 mg	Analytical Balance Brand: Mettler Toledo Model: XS2002S Mass Set Class, Brand: Troemner, Class: E2	
	1 000 g	17 mg		
	2 000 g	33 mg		
	5 000 g	83 mg	Balance, Brand: Velab Mass Set Class, Brand: Troemner, Class F1	
	10 000 g	170 mg		
	20 000 g	340 mg		
Dynamometer Force Compression and Tension <sup>F</sup>	0.1 kg to 10 kg (Res.= 0.01 kg)	$(1.16 \times 10^{-2} + 2.33 \times 10^{-7}Wt)$ kg	Mass Class F1	ASTM E4-20
	10 kg to 100 kg (Res.= 0.1 kg)	$(1.15 \times 10^{-1} + 2.54 \times 10^{-5}Wt)$ kg	Mass Class M1	
	100 kg to 200 kg (Res.= 0.1 kg)	$(1.2 \times 10^{-1} + 2.22 \times 10^{-5}Wt)$ kg		



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### Thermodynamic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Infrared Temperature Measuring Equipment <sup>FO</sup>	50 °C to 500 °C	1.2 °C	Hart Calibrator Black Body	CENAM Technical Guide
Thermal Chamber Thermal Oven Temperature Controllers <sup>FO</sup>	-50 °C to 1 200 °C	0.6 °C	Thermometer with TC Type K Digital Thermometer Fluke 714b,	
Glass Thermometer <sup>FO</sup>	-30 °C to 500 °C	1.1 °C	Dry Block with Thermocouple Refrigerated Bath Circulator, Brand: Labtech Model: LCB- R13 Fluke 714b with RTD	NOM-011-SCFI NMX-CH-070 NIST SP250-35 OIML R084
Bimetallic Thermometer <sup>FO</sup>	-30 °C to 500 °C	1.1 °C		
Temperature Measurement with Thermocouple Type B <sup>FO</sup>	-30 °C to 500 °C	0.3 °C		
Temperature Measurement with Thermocouple Type C <sup>FO</sup>	-30 °C to 500 °C	0.3 °C		
Temperature Measurement with Thermocouple Type E <sup>FO</sup>	-30 °C to 500 °C	0.3 °C		
Temperature Measurement with Thermocouple Type J <sup>FO</sup>	-30 °C to 500 °C	0.4 °C		
Temperature Measurement with Thermocouple Type K <sup>FO</sup>	-30 °C to 500 °C	0.4 °C		
Temperature Measurement with Thermocouple Type L <sup>FO</sup>	-30 °C to 500 °C	0.6 °C		
Temperature Measurement with Thermocouple Type N <sup>FO</sup>	-30 °C to 500 °C	0.6 °C		
Temperature Measurement with Thermocouple Type R <sup>FO</sup>	-30 °C to 500 °C	0.6 °C		
Temperature Measurement with Thermocouple Type S <sup>FO</sup>	-30 °C to 500 °C	0.6 °C		
Temperature Measurement with Thermocouple Type T <sup>FO</sup>	-30 °C to 400 °C	0.6 °C		
Temperature Measurement with Thermocouple Type U <sup>FO</sup>	-30 °C to 500 °C	0.6 °C		
Temperature Measurement RTD Pt 100 <sup>FO</sup>	-30 °C to 500 °C	0.6 °C		
Relative Humidity <sup>O</sup>	11.3 % RH	0.7 % RH		
	32.9 % RH	0.6 % RH		
	75.4 % RH	0.9 % RH		
	97.4 % RH	1.5 % RH		





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### Thermodynamic

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Relative Humidity <sup>FO</sup>	10 % RH to 100 % RH	1.7 % RH	Humidity Chamber Thermohygrometer Digital Psychrometer Brand: CEM, Model, DT-321S	CENAM Technical Guide
Freezer <sup>FO</sup> System Accuracy Test	-100 °C to 50 °C	0.7 °C	Thermocouple Calibrator, Brand: Fluke 712b with RTD	

### Optical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
p( $\lambda$ ) Spectral Reflectance <sup>FO</sup>	P: 360 nm to 740 nm, 0 % to 100 %  X: 0.3 to 95 Y: 0.3 to 100 Z: 0.3 to 100	2.5 % of reading  0.59 units 0.57 units 0.69 units	White, Medium Gray, Black, Cyan, Gray Standard Tile, Blue, Green, and Red	ASTM D2244 ASTM E-1164 ASTM E-1331 ASTM E-1347
Color Values: CIE L*: CIE a*: CIE b*:	0 to 100 -30 to 35 -26 to 70	0.9 units 0.7 units 0.8 units		
Spectrophotometers Transmittance Absorbance At these Wave Lengths $\lambda$ : 230 nm to 700 nm <sup>FO</sup>	$\tau$ : 1 % to 95 % $\alpha$ : 0.03 to 2.2	0.1 % of reading 0.05 % of reading	Neutral Density Filters, Holmium Oxide Glass	CENAM Technical Guide
Transmittance Density (400 nm to 700 nm) <sup>FO</sup>	0.25 % OD to 4 % OD	0.02 % OD	Density Filter Standard	ASTM E1079
Reflective Density (400 nm to 700 nm) <sup>FO</sup>	0.06 to 2	0.02 % OD	Target Density Calibration	ASTM D7305
Gloss / Specular Reflectance Angle of Incline <sup>FO</sup>			By Gardner Gloss and Semi-Gloss Standards	ASTM D 523
	p(e): 20 ° p(e): 60 ° p(e): 85 °	0.14 Gloss Units 0.15 Gloss Units 0.17 Gloss Units		



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Ev Illuminance	Up to 6 000 lux	1.3 % of reading	Luxometer	CENAM Technical Guide
Ev Light Color Temperature Fixed Point	2 856 K	15 K		
Ev Light Meter <sup>FO</sup>	100 lux to 3 000 lux	2 % of reading		
Refractometer <sup>FO</sup>	1 ° Brix to 80 ° Brix	0.55 % of reading	Sucrose Standards	OIML R-108
Luxometer <sup>F</sup>	3 lux to 5 000 lux	0.86 lux	Quartz Tungsten Halogen Lamps Light Meter	CENAM Technical Guide NIST 250-37

### Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration, Indication and Control Equipment Used With Thermocouple Type B, C, D, E, G, J, K, M, N, P, R, S, T, L, U <sup>FO</sup> (Measure)	-200 °C to 1 800 °C	0.6 °C	Fluke 725 Electrical Simulation of Thermocouple Output	Euramet cg-11
Temperature Calibration Indication and Control Equipment used with RTD Ni 120 (Measure) <sup>FO</sup>	-200 °C to 1 800 °C	0.33 °C	Fluke 725 Electrical Simulation of RTD Output	
Temperature Calibration Indication and Control Equipment used with RTD Pt 385, 100 $\Omega$ (Measure) <sup>FO</sup>	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD Pt 385, 200 $\Omega$ (Measure) <sup>FO</sup>	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD Pt 385, 500 $\Omega$ (Measure) <sup>FO</sup>	-200 °C to 1 800 °C	0.33 °C		



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### Electrical

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Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Pt 385, 1 000 $\Omega$ (Measure)	-200 °C to 1 800 °C	0.33 °C	Fluke 725 Electrical Simulation of RTD Output	Euramet cg-11
Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Pt 392, 100 $\Omega$ (Measure)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Pt 3926, 100 $\Omega$ <sup>F0</sup> (Measure)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Pt 3916, 100 $\Omega$ (Measure)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration, Indication and Control Equipment Used With Thermocouple Type B, C, D, E, G, J, K, M, N, P, R, S, T, L, U <sup>F0</sup> (Output)	-200 °C to 1 800 °C	0.27 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Ni 120 (Output)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Pt 385, 100 $\Omega$ (Output)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Pt 385, 500 $\Omega$ (Output)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>F0</sup> Pt 385, 1 000 $\Omega$ (Output)	-200 °C to 1 800 °C	0.33 °C		





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Temperature Calibration Indication and Control Equipment used with RTD <sup>FO</sup> Pt 385, 200 $\Omega$ (Output)	-200 °C to 1 800 °C	0.33 °C	Fluke 725 Electrical Simulation of RTD Output	Euramet cg-11
Temperature Calibration Indication and Control Equipment used with RTD <sup>FO</sup> Pt 392, 100 $\Omega$ (Output)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>FO</sup> Pt 3926, 100 $\Omega$ v (Output)	-200 °C to 1 800 °C	0.33 °C		
Temperature Calibration Indication and Control Equipment used with RTD <sup>FO</sup> Pt 3916, 100 $\Omega$ (Output)	-200 °C to 1 800 °C	0.33 °C		
Equipment to Measure High AC Voltage <sup>FO</sup> At he listed frequencies (10 Hz to 40 k Hz)	0.1 kV to 40 kV	0.01 kV	Fluke 80K-40 High Voltage Probes Fluke 87	Manual Fabricant
Equipment to Measure High DC Voltage <sup>FO</sup>	0.1 kV to 40 kV	0.01 kV		
Equipment to Measure High AC Current <sup>FO</sup> At he listed frequencies (10 Hz to 40 k Hz)	0.1 A to 40 A	0.01 A	Resistence Decade Current Probes Fluke 87	
Equipment to Measure High DC Current <sup>FO</sup>	0.1 A to 40 A	0.01 A		
Equipment to Output DC Voltage <sup>FO</sup>	Up to 202 mV	0.62 % of reading	Transmille 9050A and Coil Transmille EA002	Euramet cg-15
	0.2 V to 2.02 V	0.36 % of reading		
	2 V to 20.2 V	0.48 % of reading		
	20 V to 202 V	0.54 % of reading		
	200 V to 1 025 V	0.87 % of reading		
Equipment to Output AC Voltage <sup>FO</sup> At the listed frequencies 10 Hz to 20 kHz	Up to 202 mV	0.011 % of reading		



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### Electrical

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Equipment to Output AC Voltage <sup>FO</sup> At the listed frequencies 10 Hz to 100 kHz	0.2 V to 2.02 V	0.34 of reading	Transmille 9050A and Coil Transmille EA002	Euramet cg-15
	2 V to 20.2 V	0.041 % of reading		
Equipment to Output AC Voltage <sup>FO</sup> At the listed frequencies 40 Hz to 20 kHz	20 V to 202 V	0.014 % of reading		
Equipment to Output AC Voltage <sup>FO</sup> At the listed frequencies 40 Hz to 10 kHz	200 V to 1 020 V	0.017 % of reading		
Equipment to Output AC Current <sup>FO</sup> At the listed frequencies 10 Hz to 10 kHz	20 to 202 $\mu$ A	0.24 % of reading		
	0.2mA to 2.02 mA	0.72 of reading		
	2mA to 20.2 mA	0.012 % of reading		
	20 mA to 202 mA	0.015 % of reading		
Equipment to Output AC Current <sup>FO</sup> At the listed frequencies 10 Hz to 2.02 kHz	0.2 A to 2.02 A	0.016 % of reading		
Equipment to Output AC Current <sup>FO</sup> At the listed frequencies 10 Hz to 1 kHz	2 A to 22 A	0.033 % of reading		
	20 A to 1 500 A	0.033 % of reading		
Equipment to Output DC Current <sup>FO</sup>	Up to 202 $\mu$ A	0.006 5 % of reading		
	0.2 mA to 2.02 mA	0.002 1 % of reading		
	2 mA to 20.2 mA	0.002 2 % of reading		
	20 mA to 202 mA	0.002 2 % of reading		
	0.2 A to 2.02 A	0.004 2 % of reading		
	2 A to 22 A	0.004 1 % of reading		
	20 A to 1 500 A	0.008 % of reading		
Equipment to Output Resistance <sup>FO</sup>	10 $\Omega$	0.001 % of reading	Transmille 9050A	
	100 $\Omega$	0.001 % of reading		
	1 k $\Omega$	0.01 % of reading		
	10 k $\Omega$	0.01 % of reading		
	100 k $\Omega$	0.01 % of reading		



# Certificate of Accreditation: Supplement

## GAHP Metrología, S.A. de C.V.

Genaro Codina No 503, Col. Lomas del Roble  
 San Nicolás de los Garza, Nuevo León, México. CP. 66450  
 Contact Name: Horacio Meléndez Phone: 812-261-8900

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

### Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Output Resistance <sup>FO</sup>	1 MΩ	0.01 % of reading	Transmille 9050A	Euramet cg-15
	10 MΩ	0.011 % of reading		
	100 MΩ	0.018 % of reading		
	1 GΩ	0.01 % of reading		
Equipment to Output Capacitance <sup>FO</sup>	10 nF	0.077 % of reading		
	20 nF	0.077 % of reading		
	50 nF	0.11 % of reading		
	100 nF	0.077 % of reading		
	1 μF	0.077 % of reading		
Equipment to Output Frequency <sup>FO</sup>	1 Hz	0.001 % of reading		
	10 Hz	0.001 % of reading		
	100 Hz	0.01 % of reading		
	1 kHz	0.01 % of reading		
	10 kHz	0.01 % of reading		
	100 kHz	0.01 % of reading		
	1 MHz	0.011 % of reading		
	10 MHz	0.018 % of reading		
Equipment to Measure DC Voltage	Up to 200 mV	0.62 % of reading	Agilent 34401A	
	0.2 V to 2 V	0.36 % of reading		
	2 V to 20 V	0.48 % of reading		
	20 V to 200 V	0.54 % of reading		
	200 V to 1 000 V	0.87 % of reading		
Equipment to Measure DC Current <sup>FO</sup>	0.2 mA to 2 mA	0.006 2 % of reading		
	2 mA to 20 mA	0.003 6 % of reading		
	20 mA to 200 mA	0.004 8 % of reading		
	0.2 A to 3 A	0.005 4 % of reading		
Equipment to Measure AC Voltage At the listed frequencies (3 Hz to 300 KHz) <sup>FO</sup>	1 mV to 200 mV	0.62 % of reading		
	0.2 V to 2 V	0.36 % of reading		
	2 V to 20 V	0.48 % of reading		
	20 V to 200 V	0.54 % of reading		
	200 V to 750 V	0.87 % of reading		



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### Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure AC Current At the listed frequencies 3 Hz to 5 KHz <sup>FO</sup>	0.2 mA to 2 mA	0.006 2 % of reading	Agilent 34401A	Euramet cg-15
	2 mA to 20 mA	0.003 6 % of reading		
	20 mA to 200 mA	0.004 8 % of reading		
	0.2 A to 2 A	0.005 4 % of reading		
	2 A to 10 A	0.008 7 % of reading		
Equipment to Measure Resistance <sup>FO</sup>	20 $\Omega$ to 200 $\Omega$	0.000 15 % of reading		
	200 $\Omega$ to 2 000 $\Omega$	0.000 2 % of reading		
	2 k $\Omega$ to 20 k $\Omega$	0.000 2 % of reading		
	20 k $\Omega$ to 200 k $\Omega$	0.000 21 % of reading		
	200 k $\Omega$ to 2000 k $\Omega$	0.000 2 % of reading		
	2 M $\Omega$ to 20 M $\Omega$	0.000 22 % of reading		
	20 M $\Omega$ to 200 M $\Omega$	0.000 21 % of reading		
	0.2 G $\Omega$ to 1 G $\Omega$	0.000 23 % of reading		

### Chemical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
pH Meters <sup>FO</sup>	4.01 pH	0.013 pH	Reference Material Standards Fermont	CENAM Technical Guide
	7.01 pH	0.012 pH		
	10.01 pH	0.014 pH		
Conductivity Meters <sup>FO</sup>	84 $\mu$ S/cm	1 $\mu$ S/cm	Reference Material HANNA	
	1 413 $\mu$ S/cm	7 $\mu$ S/cm		
	5 000 $\mu$ S/cm	20 $\mu$ S/cm		
	12 880 $\mu$ S	64 $\mu$ S/cm		

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

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.
4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations.
5. 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.
6. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
7. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.

