



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

***ACS, American Calibration Services EIRL
Malek Multiservicios, SRL***

Calle Atalaya, Res. Santisima Trinidad II, Suite N303, La Julia, Santo Domingo, CP 10108

*(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):

***Acoustic, Chemical, Dimensional, Mechanical, Electrical, Mass, Force and
Weighing Devices, Time & Frequency and Thermodynamic 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

Initial Accreditation Date:

May 7, 2021

Issue Date:

May 7, 2021

Expiration Date:

July 31, 2023

Accreditation No.:

114217

Certificate No.:

L21-310

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.pjilabs.com*



Certificate of Accreditation: Supplement

ACS, American Calibration Services EIRL Malek Multiservicios, SRL

Calle Atalaya, Res. Santisima Trinidad II, Suite N303,
La Julia, Santo Domingo, CP 10108

Contact Name: Alfred Malek Phone: 809-747-8649

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

Acoustic

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
Sound Level Meter ^{FO}	1.6 dB to 125 dB	4.0 dB	Quest Electronics OEM PROCEDURES

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, fixed points ^{FO}	4 pH	0.03 pH	pH Buffers Fluke 5500 OEM PROCEDURES
	7 pH	0.04 pH	
	10 pH	0.03 pH	
Conductivity Meters ^{FO}	10 μ S/cm @ 25°C	0.69 μ S/cm	Conductivity Solutions OEM PROCEDURES
	100 μ S/cm @ 25°C	2.7 μ S/cm	
	1 000 μ S/cm @ 25°C	6.6 μ S/cm	
	10 000 μ S/cm @ 25°C	15 μ S/cm	

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}	Up to 12 in	(33.4 + 4.4L) μ in	Gage Blocks, Parallels CP-0000
Calipers ^{FO}	Up to 12 in	(341 + 4.3L) μ in	Gage Blocks CP-0000
Indicators ^{FO}	Up to 2 in	(67 + 19L) μ in	Micrometer Head Cal Unit, Blocks CP-0000
Height Gages ^{FO}	Up to 12 in	(281 + 10L) μ in	Gage Blocks CP-0000
Gage Blocks ^F	Up to 4 in	20 μ in	Comparator/Master Blocks
Pin Gage ^{FO}	0.011 in to 2 in	(342 + 22L) μ in	Mahr Micrometer CP0100
Rulers & Tapes ^{FO}	Up to 48 in	(290 + 4.6L) μ in	Ceramic Gage Blocks CP0000
Laser Micrometer ^F	0.01 in to 1 in	34 μ in	Class xx pin gages CP0048
Microscopes ^F	1 mm to 25 mm	1.2 μ m	Stage Micrometer Calibration Slide KR-812 CP0102



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Electrical

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Equipment to Output DC Voltage ^{FO}	5.3 mV to 20 mV	5.36 μ V + 11.56 μ V/mV	Multimeter-Fluke 8842A OEM
	20 mV to 200 mV	8.1 μ V + 99.9 μ V/mV	
	200 mV to 2 V	18 μ V + 68.5 μ V/mV	
	2 V to 20 V	419 μ V + 67 μ V/ mV	
	20 V to 200 V	1.6 μ V + 0.06 mV/ V	
	200 V to 1 000 V	35 μ V + 0.09 mV/ V	
Equipment to Measure DC Current ^{FO}	15 μ A to 200 μ A	5.1 μ A	Fluke 5100 OEM
	0.2 mA to 2 mA	0.041 mA	
	2 mA to 20 mA	0.41 mA	
	20 mA to 200 mA	4.1 mA	
	0.2 A to 2 A	41 mA	
Equipment to Output DC Current ^{FO}	1 mA to 10 mA	47 μ A + 840 μ A/A	DMM Fluke 8842A OEM
	10 mA to 200 mA	48 μ A + 909 μ A/A	
	200 mA to 2 A	41 μ A + 1.1 mA/A	
	2 A to 10 A	0.42 mA + 16 mA/A	
Equipment to Output DC Resistance ^{FO}	5 Ω to 200 Ω	0.048 m Ω + 0.170 m Ω / Ω	DMM Fluke 8842A OEM
	200 Ω to 2 k Ω	0.049 m Ω + 0.137 m Ω / Ω	
	2 k Ω to 20 k Ω	376 m Ω + 0.115 m Ω / Ω	
	20 k Ω to 200 k Ω	3.7 Ω + 14 μ Ω / Ω	
	200 k Ω to 2 M Ω	39.7 Ω + 0.345 m Ω / Ω	
	2 M Ω to 20 M Ω	160 Ω + 1 m Ω / Ω	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			Fluke 5100 OEM
50 Hz to 10 kHz	1 mV to 20 mV	0.07 % of reading + 0.120 5 mV	
	20 mV to 200 mV	0.07 % of reading + 1.205 mV	
	0.2 V to 2 V	0.07 % of reading + 0.012 05 V	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			
50 Hz to 10 kHz	2 V to 20 V	0.05 % of reading + 0.100 5 V	
	20 V to 200 V	0.05 % of reading + 1.005 V	
	200 V to 1 100 V	0.05 % of reading + 5.500 5 V	



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Equipment to Measure AC Current At the listed frequencies ^{FO}			Fluke 5100 OEM
50 Hz to 1 kHz	20 μ A to 200 μ A	0.25 % of reading + 0.5 μ A	
	0.2 mA to 2 mA	0.25 % of reading + 0.005 mA	
	2 mA to 20 mA	0.25 % of reading + 0.05 mA	
	20 mA to 200 mA	0.25 % of reading + 0.5 mA	
	0.2 A to 2 A	0.25 % of reading + 0.005 A	
Equipment to Output AC Current At the listed frequencies ^{FO}			Multimeter-Fluke 8842A OEM
3 Hz to 5 Hz	0.07 A to 1 A	3.2 μ A + 0.03 mA/A	
5 Hz to 10 Hz	0.07 A to 1 A	3.6 μ A + 0.008 mA/A	
10 Hz to 5 kHz	0.07 A to 1 A	3.7 μ A + 0.007 mA/A	Fluke 5500A OEM
Equipment to Output AC Current At the listed frequencies ^{FO}			
3 Hz to 5 Hz	1 A to 3 A	27 μ A + 0.007 mA/A	
5 Hz to 10 Hz	1 A to 3 A	7.1 mA + 2.3 mA/A	
10 Hz to 5 kHz	1 A to 3 A	6.7 mA + 1.9 mA/A	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			
10 Hz to 45 Hz	1 mV to 33 mV	0.35 % of reading + 20 μ V	
45 Hz to 10 kHz	1 mV to 33 mV	0.15 % of reading + 20 μ V	
10 kHz to 20 kHz	1 mV to 33 mV	0.2 % of reading + 20 μ V	
20 kHz to 50 kHz	1 mV to 33 mV	0.25 % of reading + 20 μ V	
50 kHz to 100 kHz	1 mV to 33 mV	0.35 % of reading + 33 μ V	
100 kHz to 500 kHz	1 mV to 33 mV	1 % of reading + 60 μ V	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			
10 Hz to 45 Hz	33 mV to 330 mV	0.25 % of reading + 50 μ V	
45 Hz to 10 kHz	33 mV to 330 mV	0.05 % of reading + 20 μ V	
10 kHz to 20 kHz	33 mV to 330 mV	0.1 % of reading + 20 μ V	
20 kHz to 50 kHz	33 mV to 330 mV	0.16 % of reading + 40 μ V	
50 kHz to 100 kHz	33 mV to 330 mV	0.24 % of reading + 170 μ V	
100 kHz to 500 kHz	33 mV to 330 mV	0.7 % of reading + 330 μ V	



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Equipment to Measure AC Voltage At the listed frequencies ^{FO}			Fluke 5500A OEM
10 Hz to 45 Hz	330 mV to 3.3 V	0.15 % of reading + 250 μ V	
45 Hz to 10 kHz	330 mV to 3.3 V	0.03 % of reading + 60 μ V	
10 kHz to 20 kHz	330 mV to 3.3 V	0.08 % of reading + 60 μ V	
20 kHz to 50 kHz	330 mV to 3.3 V	0.14 % of reading + 300 μ V	
50 kHz to 100 kHz	330 mV to 3.3 V	0.24 % of reading + 1 700 μ V	
100 kHz to 500 kHz	330 mV to 3.3 V	0.5 % of reading + 3 300 μ V	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			
10 Hz to 45 Hz	3.3 V to 33 V	0.15 % of reading + 2 500 μ V	
45 Hz to 10 kHz	3.3 V to 33 V	0.04 % of reading + 600 μ V	
10 kHz to 20 kHz	3.3 V to 33 V	0.08 % of reading + 2 600 μ V	
20 kHz to 50 kHz	3.3 V to 33 V	0.19 % of reading + 5 000 μ V	
20 kHz to 50 kHz	3.3 V to 33 V	0.19 % of reading + 5 000 μ V	
50 kHz to 100 kHz	3.3 V to 33 V	0.24 % of reading + 17 000 μ V	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			
45 Hz to 1 kHz	33 V to 330 V	0.05 % of reading + 6.6 mV	
1 kHz to 10 kHz	33 V to 330 V	0.08 % of reading + 15 mV	
10 kHz to 20 kHz	33 V to 330 V	0.09 % of reading + 33 mV	
Equipment to Measure AC Voltage At the listed frequencies ^{FO}			
45 Hz to 1 kHz	33 V to 330 V	0.05 % of reading + 80 mV	
1 kHz to 5 kHz	33 V to 330 V	0.2 % of reading + 100 mV	
5 kHz to 10 kHz	33 V to 330 V	0.2 % of reading + 500 mV	
Equipment to Measure DC Voltage ^{FO}	1 mV to 330 mV	0.006 % of reading + 3 μ V	
	330 mV to 3.3 V	0.005 % of reading + 5 μ V	
	3.3 V to 33 V	0.005 % of reading + 50 μ V	
	50 V to 300 V	0.005 % of reading + 500 μ V	
	100 V to 1 000 V	0.005 % of reading + 1 500 μ V	



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Equipment to Measure Capacitance 50 Hz to 1 000 Hz ^{FO}	0.33 nF to 0.5 nF	0.5 % of reading + 0.01 nF	Fluke 5500A OEM
	0.5 nF to 1.1 nF	0.5 % of reading + 0.01 nF	
	1.1 nF to 3.3 nF	0.5 % of reading + 0.01 nF	
	3.3 nF to 11 nF	0.5 % of reading + 0.01 nF	
	11 nF to 33 nF	0.25 % of reading + 0.1 nF	
	33 nF to 110 nF	0.25 % of reading + 0.1 nF	
	110 nF to 330 nF	0.25 % of reading + 0.3 nF	
	0.33 μ F to 1.1 μ F	0.25 % of reading + 1 nF	
	1.1 μ F to 3.3 μ F	0.35 % of reading + 3 nF	
	3.3 μ F to 11 μ F	0.35 % of reading + 10 nF	
	11 μ F to 33 μ F	0.4 % of reading + 30 nF	
	33 μ F to 110 μ F	0.5 % of reading + 100 nF	
	110 μ F to 330 μ F	0.7 % of reading + 300 nF	
	330 μ F to 1.1 mF	1 % of reading + 300 nF	
Equipment to Measure Resistance ^{FO}	1 Ω to 11 Ω	0.012 % of reading + 0.008 Ω	
	11 Ω to 33 Ω	0.012 % of reading + 0.015 Ω	
	33 Ω to 330 Ω	0.009 % of reading + 0.015 Ω	
	330 Ω to 3.3 k Ω	0.009 % of reading + 0.006 Ω	
	3.3 k Ω to 33 k Ω	0.009 % of reading + 0.6 Ω	
	33 k Ω to 110 k Ω	0.011 % of reading + 6 Ω	
	110 k Ω to 330 k Ω	0.012 % of reading + 6 Ω	
	330 k Ω to 3.3 M Ω	0.012 % of reading + 55 Ω	
	3.3 M Ω to 11 M Ω	0.006 % of reading + 550 Ω	
	11 M Ω to 33 M Ω	0.1 % of reading + 550 Ω	
	33 M Ω to 110 M Ω	0.5 % of reading + 5 500 Ω	
	110 M Ω to 330 M Ω	0.5 % of reading + 16 500 Ω	



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Temperature Calibration, Indication, and Control Equipment use with Thermocouple Type J ^{FO}	-210 °C to -100 °C	2.4 °C	Electrical Simulation of Thermocouple Output Using Fluke 5100 to provide mV signals per NIST Monograph 175 revised to ITS-90 OEM
	-100 °C to -30 °C	2.3 °C	
	-30 °C to 150 °C	2.5 °C	
	150 °C to 760 °C	2.7 °C	
	760 °C to 1 200 °C	2.9 °C	
Temperature Calibration, Indication, and Control Equipment use with Thermocouple Type K ^{FO}	-200 °C to -100 °C	2.7 °C	
	-100 °C to -25 °C	2.5 °C	
	-25 °C to 120 °C	2.4 °C	
	120 °C to 1 000 °C	2.5 °C	
	1 000 °C to 1 372 °C	2.5 °C	
Temperature Calibration, Indication, and Control Equipment use with Thermocouple Type T ^{FO}	-250 °C to -150 °C	2.9 °C	
	-150 °C to 0 °C	2.5 °C	
	0 °C to 120 °C	2.3 °C	
	120 °C to 400 °C	2.2 °C	
Temperature Calibration, Indication, and Control Equipment use with Thermocouple Type J ^{FO}	-210 °C to -100 °C	0.69 °C	Electrical Simulation of Thermocouple Output Using Fluke 5500 OEM
	-100 °C to -30 °C	0.67 °C	
	-30 °C to 150 °C	0.69 °C	
	150 °C to 760 °C	0.91 °C	
	760 °C to 1 200 °C	1.1 °C	
Temperature Calibration, Indication, and Control Equipment use with Thermocouple Type K ^{FO}	-200 °C to -100 °C	0.82 °C	Electrical Simulation of Thermocouple Output Using Fluke 5500 OEM
	-100 °C to -25 °C	0.82 °C	
	-25 °C to 120 °C	0.92 °C	
	120 °C to 1 000 °C	1.1 °C	
	1 000 °C to 1 372 °C	1.3 °C	
Temperature Calibration, Indication, and Control Equipment use with Thermocouple Type T ^{FO}	-250 °C to -150 °C	0.84 °C	
	-150 °C to 0 °C	0.82 °C	
	0 °C to 120 °C	0.86 °C	
	120 °C to 400 °C	0.84 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type J ^{FO}	-210 °C to 1 200 °C	0.32 °C	Electrical Simulation of Thermocouple Output Fluke 5500A OEM
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K ^{FO}	-210 °C to 1 372 °C	0.41 °C	



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Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T ^{FO}	-250 °C to 400 °C	0.64 °C	Electrical Simulation of Thermocouple Output Fluke 5500A OEM
Humidity ^{FO}	0 % RH to 85% RH	1.2 % RH	RELATIVE HUMIDITY METER VAISALA HMC 20 WITH HMP20 B PROBE/ Control Company Model 244-355 OEM

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
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T ^{FO}	-250 °C to 400 °C	0.64 °C	Electrical Simulation of Thermocouple Output Fluke 5500A OEM
Humidity ^{FO}	0 % RH to 85% RH	1.2 % RH	RELATIVE HUMIDITY METER VAISALA HMC 20 WITH HMP20 B PROBE/ Control Company Model 244-355 OEM
Analytical Balances/Scales ^{FO}	1 mg to 300 mg	$(1.02 \times 10^{-2} + 1.21 \times 10^{-7}Wt)$ g	Class 1 Standards OEM
Industrial Scales and Balances ^{FO}	5 lb to 20 000 lb	14 lb	Class F Standards, NIST Handbook 44
Balances ^{FO}	1 g to 500 g	0.85 μ g	Class 1 kit OEM
	5 g to 300 g	12 mg	
	1 kg to 20 kg	32 mg	Class F standards



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Mechanical

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Pressure Gauges ^{FO}	10 psig to 600 psig	0.72 % of reading + 3 psi	Hiess PTE/Ashcroft CP0093 CP0056
Vacuum Gauges ^{FO}	-12 psi to 1 psi	1 % of reading + 0.56 psi	Heis PTE-1 33k6-4-430-1 CP0061
Torque Wrenches ^{FO}	5 lbf·in to 600 lbf·in	1.5 % of reading	Acratork L1, CP0059 CP0085 CP0092
Indirect Verification of Rockwell Hardness Testers HRC ^{FO}	20 HRC to 30 HRC	0.57 HRC	ASTM E 18 and calibrated Rockwell Hardness Test Blocks CP0114
	30 HRC to 60 HRC	0.57 HRC	
	60 HRC to 65 HRC	0.58 HRC	
Pipettes ^{FO}	100 μ L to 200 μ L	0.11 μ L	Sartorius Micro Balance. Gravimetric record reference to mass balances CP0116
	200 μ L to 2 000 μ L	1.5 μ L	
	2 000 μ L to 10 000 μ L	4.9 μ L	
Pressure Gauges ^{FO}	10 psig to 15 000 psig	0.72 % of reading + 2.5 psi	Heis PTE-1/Ashcroft CP0093 CP0056
Vacuum Gauges ^{FO}	-12 psi to 1 psi	1 % of reading + 0.56 psi	Heis PTE-1 CP0061



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Thermodynamic

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Thermometers- Infrared/Pyrometers ^{FO}	35 °C to 550 °C	3 °C	ISOTech Gemini I Model 976 OEM
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type J ^{FO}	-210 °C to 1 200 °C	0.32 °C	Electrical Simulation of Thermocouple Output Fluke 5500A OEM
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K ^{FO}	-210 °C to 1 372 °C	0.41 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T ^{FO}	-250 °C to 400 °C	0.64 °C	
Humidity ^{FO}	0 % RH to 85 % RH	1.2 % RH	RELATIVE HUMIDITY METER VAISALA HMC 20 WITH HMP20 B PROBE/ Control Company Model 244-355 OEM

Time and Frequency

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Stop Watch ^{FO}	2.8 s to 24 hr	0.24 s	Control Company Model 1051 CP0074

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represent the smallest measurement uncertainties attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is 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. Example: Outside Micrometer^F would mean that the laboratory performs this calibration at its fixed location.
4. 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.
5. When calibrations are performed at customer locations the resulting measurement uncertainty associated with the calibration will typically be larger than the CMC stated on this scope of accreditation. This is due in large part to variation of environmental conditions at customer facilities, the effects of transport on any standards or equipment taken to customer sites and the resolution and repeatability unique to the device being calibrated.
6. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.
7. The term L represents length in inches or millimeters appropriate to the uncertainty statement.