



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Qual Tech Labs, Inc.

301 National Road, Suite #100, Exton, PA 19341

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2017

& Meets the Requirements of ANSI/NCSI Z540.3-2006 sub clause 5.3

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):

***Laboratory and Field Calibration of Dimensional, Torque, Pressure,
Thermodynamic, Electrical 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

Initial Accreditation Date:

May 25, 2007

Issue Date:

September 27, 2021

Expiration Date:

November 30, 2023

Accreditation No.:

59337

Certificate No.:

L21-575

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



Certificate of Accreditation: Supplement

Qual Tech Labs, Inc.

301 National Road Suite #100, Exton, PA 19341
 Contact Name: Tracy Williams Phone: 610-524-7870

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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Gage Blocks ^F	1.27 mm to 101.6 mm (0.05 in to 4 in)	(0.08 + 0.000 9L) μ m [(3.1 + 0.9L) μ in]	Gage Block Comparator and Master Gage Blocks CP-0001
	101.6 mm to 304.8 mm (4 in to 12 in)	(0.127 + 0.001 1L) μ m [(5 + 1.1L) μ in]	P&W Labmaster and Master Gage Blocks CP-0001
Length Standards ^F	25 mm to 635 mm (1 in to 25 in)	(0.584 + 0.000 7L) μ m [(23 + 0.7L) μ in]	Super micrometer, Gage Blocks CP-0009
Micrometers ^{FO}	1.27 mm to 635 mm (0.05 in to 25 in)	(1.753 + 0.002 55L) μ m [(69 + 2.55L) μ in]	Gage Blocks CP-0009
Plain Ring Gages ^F	1.50 mm to 6.35 mm (0.06 in to .25 in)	0.486 μ m (19 μ in)	Universal Measuring Machine P & W Lab-Master, Master Gage Blocks, Master Ring Gages CP-0002
	6.35 mm to 25.4 mm (0.25 in to 1 in)	0.533 μ m (21 μ in)	
	25.4 mm to 76.2 mm (1 in to 3 in)	0.584 μ m (23 μ in)	
	76.2 mm to 177.8 mm (3 in to 7 in)	0.711 μ m (28 μ in)	
	177.8 mm to 254 mm (7 in to 10 in)	1.219 μ m (48 μ in)	
	254 mm to 330.2 mm (10 in to 13 in)	1.727 μ m (68 μ in)	
Dial / Vernier Calipers ^{FO}	1.27 mm to 609.6 mm (0.05 in to 24 in)	(37.08 + 0.017 1L) μ m [(1 460 + 17.1L) μ in]	Comparison to Gage Blocks CP-0006
Digital Calipers ^{FO}	1.27 mm to 609.6 mm (0.05 in to 24 in)	(17.526 + 0.018 41L) μ m [(690 + 18.4L) μ in]	
Thread Plugs Pitch Diameter ^F	4-96 Threads per inch (0.060 in to 4.0 in)	(131.4 + 55.9D) μ in	Super Micrometer, Gage Blocks, Thread Measuring Wires CP-0005
Thread Plugs Major Diameter ^F	4-96 Threads per inch (0.060 in to 4.0 in)	(28.3 + 0.8L) μ in	Super Micrometer, Gage Blocks CP-0005
Pin Gauges ^F	0.006 in to 1.0 in	(28.3 + 0.8L) μ in	Super Micrometer, Gage Blocks CP-0003
Plug Gauges ^F	0.05 in to 10 in	(4.3 + 3.9L) μ in	P&W Lab Master, Master Gage Blocks CP-0003
Indicators ^F	0.001 in to 4 in	34 μ in	Gage Blocks, Surface Plate CP-0017
Surface Plate Repeat reading ^{FO}	0.051 mm (.002 in)	0.863 6 μ m (34 μ in)	Repeat-O-Meter w/Mahr indicator CP-0021
Surface Plate Unilateral Flatness ^{FO}	254 mm to 1 778 mm (10 in to 70 in Diagonal)	(0.974 + 0.000 467D) (38.3 + 0.47D) μ in	Planakator w/Mahr indicator CP-0021
Surface Plate Unilateral Flatness ^{FO}	1 219 mm to 6 096 mm	0.889 μ m	Federal Electronic Level CP-0021
	48 in to 240 in Diagonal	35 μ in	



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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
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type E ^{FO}	-196 °C to -100 °C	0.5 °C	Electrical Simulation of Thermocouple Output Fluke 5522A CP-0083
	-100 °C to -25 °C	0.16 °C	
	-25 °C to 350 °C	0.14 °C	
	350 °C to 650 °C	0.16 °C	
	650 °C to 1 000 °C	0.21 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type J ^{FO}	-196 °C to -100 °C	0.27 °C	
	-100 °C to -30 °C	0.16 °C	
	-30 °C to 150 °C	0.14 °C	
	150 °C to 760 °C	0.17 °C	
	760 °C to 1 200 °C	0.23 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type K ^{FO}	-196 °C to -100 °C	0.33 °C	
	-100 °C to -25 °C	0.18 °C	
	-25 °C to 120 °C	0.16 °C	
	120 °C to 1 000 °C	0.26 °C	
	1 000 °C to 1 372 °C	0.4 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type S ^{FO}	0 °C to 250 °C	0.47 °C	
	250 °C to 1 000 °C	0.36 °C	
	1 000 °C to 1 400 °C	0.37 °C	
	1 400 °C to 1 767 °C	0.46 °C	
Temperature Calibration, Indication, and Control Equipment used with Thermocouple Type T ^{FO}	-196 °C to -150 °C	0.63 °C	
	-150 °C to 0 °C	0.24 °C	
	0 °C to 120 °C	0.16 °C	
	120 °C to 400 °C	0.14 °C	
Equipment to Measure DC Voltage ^{FO}	10 μ V to 329.999 mV	0.006 % of output + 3 μ V	Fluke 5522A CP-0080
	330mV to 3.299 V	0.005 % of output + 5 μ V	
	3.3V to 32.999 V	0.005 % of output + 50 μ V	
	33 V to 329.999 9 V	0.005 5 % of output + 500 μ V	
	330 V to 1 020 V	0.005 5 % of output + 1 500 μ V	



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Equipment to Measure DC Current ^{FO}	0.15 μ A to 3.299 99 mA	0.013 % of output + 0.05 μ A	Fluke 5522A CP-0080
	3.3 mA to 32.999 9 mA	0.01 % of output + 0.25 μ A	
	33 mA to 329.999 mA	0.01 % of output + 3.3 μ A	
	330 mA to 2.199 99 A	0.03 % of output + 44 μ A	
	2.2 A to 11 A	0.06 % of output + 330 μ A	
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			
45 Hz to 10 kHz	1 mV to 32.999 mV	0.15 % of output + 20 μ V	
10 kHz to 20 kHz	1 mV to 32.999 mV	0.2 % of output + 20 μ V	
20 kHz to 50 kHz	1 mV to 32.999 mV	0.25 % of output + 20 μ V	
50 kHz to 100 kHz	1 mV to 32.999 mV	0.35 % of output + 33 μ V	
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			
45 Hz to 10 kHz	33 mV to 329.999 mV	0.05 % of output + 20 μ V	
10 kHz to 20 kHz	33 mV to 329.999 mV	0.1 % of output + 20 μ V	
20 kHz to 50 kHz	33 mV to 329.999 mV	0.16 % of output + 40 μ V	
50 kHz to 100 kHz	33 mV to 329.999 mV	0.24 % of output + 170 μ V	
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			
45Hz to 10 kHz	0.33 V to 3.299 99 V	0.03 % of output + 60 μ V	
10 kHz to 20 kHz	0.33 V to 3.299 99 V	0.08 % of output + 60 μ V	
20 kHz to 50 kHz	0.33 V to 3.299 99 V	0.14 % of output + 300 μ V	
50 kHz to 100 kHz	0.33 V to 3.299 99 V	0.24 % of output + 1 700 μ V	
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			
45 Hz to 10 kHz	3.3 V to 32.999 9 V	0.04 % of output + 600 μ V	
10 kHz to 20 kHz	3.3 V to 32.999 9 V	0.08 % of output + 2 600 μ V	
20 kHz to 50 kHz	3.3 V to 32.999 9 V	0.19 % of output + 5 000 μ V	
50 kHz to 100 kHz	3.3 V to 32.999 9 V	0.24 % of output + 17 000 μ V	
Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			
45 Hz to 1 kHz	33 V to 329.999 V	0.05 % of output + 6.6 mV	
1 kHz to 10 kHz	33 V to 329.999 V	0.08 % of output + 15 mV	
10 kHz to 20 kHz	33 V to 329.999 V	0.09 % of output + 33 mV	



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Equipment to Measure AC Voltage (At the listed frequencies) ^{FO}			Fluke 5522A CP-0080
45 Hz to 1 kHz	330 V to 1 020 V	0.05 % of output + 80 mV	
1 kHz to 5 kHz	330 V to 1 020 V	0.2 % of output + 100 mV	
5 kHz to 10 kHz	330 V to 1 020 V	0.2 % of output + 500 mV	
Equipment to Measure AC Current (At the listed frequencies) ^{FO}			
45 Hz to 1 kHz	0.029 mA to 0.329 99 mA	0.13 % of output + 0.25 μ A	
1 kHz to 5 kHz	0.029 mA to 0.329 99 mA	0.4 % of output + 0.15 μ A	
Equipment to Measure AC Current (At the listed frequencies) ^{FO}			
20 Hz to 45 Hz	0.33 mA to 3.299 9 mA	0.1 % of output + 0.3 μ A	
45 Hz to 1 kHz	0.33 mA to 3.299 9 mA	0.1 % of output + 0.3 μ A	
1 kHz to 5 kHz	0.33 mA to 3.299 9 mA	0.2 % of output + 0.3 μ A	
5 kHz to 10 kHz	0.33 mA to 3.299 9 mA	0.6 % of output + 0.3 μ A	
Equipment to Measure AC Current (At the listed frequencies) ^{FO}			
20 Hz to 45 Hz	3.3 mA to 32.999 mA	0.1 % of output + 3 μ A	
45 Hz to 1 kHz	3.3 mA to 32.999 mA	0.09 % of output + 3 μ A	
1 kHz to 5 kHz	3.3 mA to 32.999 mA	0.2 % of output + 3 μ A	
5 kHz to 10 kHz	3.3 mA to 32.999 mA	0.6 % of output + 3 μ A	
Equipment to Measure AC Current (At the listed frequencies) ^{FO}			
20 Hz to 45 Hz	33 mA to 329.99 mA	0.1 % of output + 30 μ A	
45 Hz to 1 kHz	33 mA to 329.99 mA	0.09 % of output + 30 μ A	
1 kHz to 5 kHz	33 mA to 329.99 mA	0.2 % of output + 30 μ A	
5 kHz to 10 kHz	33 mA to 329.99 mA	0.6 % of output + 30 μ A	
Equipment to Measure AC Current (At the listed frequencies) ^{FO}			
45 Hz to 1 kHz	0.33 A to 2.199 99 A	0.2 % of output + 300 μ A	
1 kHz to 5 kHz	0.33 A to 2.199 99 A	0.75 % of output + 300 μ A	



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Equipment to Measure AC Current (At the listed frequencies) ^{FO}			Fluke 5522A CP-0080
45 Hz to 65 Hz	2.2 A to 11 A	0.06 % of output + 2 000 μ A	
65 Hz to 500 Hz	2.2 A to 11 A	0.10 % of output + 2 000 μ A	
500 Hz to 1 kHz	2.2 A to 11 A	0.33 % of output + 2 000 μ A	
Equipment to Measure Resistance ^{FO}	24 m Ω to 10.99 Ω	0.012 % of output + 0.008 Ω	
	11 Ω to 32.99 Ω	0.012 % of output + 0.015 Ω	
	33 Ω to 109.999 Ω	0.009 % of output + 0.015 Ω	
	110 Ω to 329.999 Ω	0.009 % of output + 0.015 Ω	
	330 Ω to 1.099 99 k Ω	0.009 % of output + 0.06 Ω	
	1.1 k Ω to 3.299 99 k Ω	0.009 % of output + 0.06 Ω	
	3.3 k Ω to 10.999 9 k Ω	0.009 % of output + 0.6 Ω	
	11 k Ω to 32.999 9 k Ω	0.009 % of output + 0.6 Ω	
	33 k Ω to 109.999 k Ω	0.011 % of output + 6 Ω	
	110 k Ω to 329.999 k Ω	0.012 % of output + 6 Ω	
	330 k Ω to 1.099 99 M Ω	0.015 % of output + 55 Ω	
	1.1 M Ω to 3.299 99 M Ω	0.015 % of output + 55 Ω	
	3.3 M Ω to 10.999 9 M Ω	0.06 % of output + 550 Ω	
11 M Ω to 32.999 9 M Ω	0.1 % of output + 550 Ω		
33 M Ω to 109.999 M Ω	0.5 % of output + 5.5 k Ω		
110 M Ω to 330 M Ω	0.5 % of output + 16.5 k Ω		

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
Weighing Devices ^{FO}	1 g to 3 000 g (Res = 0.001 g)	(1.2 x 10 ⁻³ + 2.53 x 10 ⁻⁶ Wt) g	Class 1 Weights CP-0052
	1 lb to 500 lb (Res = 0.001 lb)	(1.1 x 10 ⁻³ + 1.13 x 10 ⁻⁴ Wt) lb	Class F Weights CP-0052



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Mechanical

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Torque Wrenches ^F	5 to 50 in/lbs	0.212% + 0.21 % of reading	CDI Suretest 2400-400-02 CP-0008
	40 to 400 in/lbs	0.356% + 0.255 % of reading	
	100 to 1000 in/lbs	0.624% + 0.073 % of reading	
	25 to 250 Ft/lbs	0.44% + 0.32 % of reading	
Pressure Gages and Transducers ^{FO}	10 psi to 10 000 psi	0.11 % +0.19 % of reading	Ametek Deadweight Tester Jofra HPC500 700G Jofra APC200CINDG CP-0014

- 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.
- 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.
- The term L represents length in inches or millimeters appropriate to the uncertainty statement.
- The term D represents the diameter of the device being measured in inches or millimeters appropriate to the uncertainty statement.
- The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.
- 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/or Onsite at customer locations.
- 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.
- 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.