



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## *Certificate of Accreditation*

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

***Solve Metrology***  
5641 Barcroft Rd, Grandville, MI 49419

*(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, Mechanical, and Mass, Force, and Weighing Devices 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.

Tracy Szerszen  
President

Perry Johnson Laboratory  
Accreditation, Inc. (PJLA)  
755 W. Big Beaver, Suite 1325  
Troy, Michigan 48084

*Initial Accreditation Date:*

October 1, 2015

*Issue Date:*

February 9, 2024

*Expiration Date:*

February 28, 2026

*Accreditation No.:*

85517

*Certificate No.:*

L24-118

*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

## Solve Metrology

5641 Barcroft Rd, Grandville, MI 49419

Contact Name: Mr. Curtis Kopko Phone: 616-481-5935

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
Micrometers <sup>FO</sup>	0.1 in to 12 in	(53 + 4.7L) $\mu$ in	Gage Blocks, ASME B89.1.13, WI-048
	12 in to 24 in	(76 + 1.1L) $\mu$ in	
Depth Micrometers <sup>FO</sup>	0.001 in to 12 in	(290 + 2.5L) $\mu$ in	Gage Blocks, B89.1.13, WI-047
Calipers <sup>FO</sup>	0.1 in to 12 in	(290 + 1.0L) $\mu$ in	Gage Blocks, B89.1.14, GGG-C-111c, Gage Blocks, WI-002, WI-007
	12 in to 20 in	(310 + 0.4L) $\mu$ in	
	20 in to 80 in	(260 + 2.0L) $\mu$ in	
Indicators <sup>FO</sup>	0.000 02 in to 0.002 in	(14 + 349L) $\mu$ in	Gage Blocks, B89.1.10-M, WI-046
	0.000 1 in to 4 in	(58+5.3L) $\mu$ in	
	0.000 1 in to .5 in	(33 + 0.08L) $\mu$ in	
	.000 5 in to 1 in	(280 +53.1L) $\mu$ in	
	.000 05 in to 1 in	(30 + 4.9L) $\mu$ in	
Machine Digital Readout <sup>FO</sup>	0.1 in to 48 in	(83 + 12L) $\mu$ in	Indicator, Step Master, WI-012
Optical/Video Measuring Systems Scales <sup>FO</sup>	0.1 in to 12 in	(94 + 1.2L) $\mu$ in	Glass Master, Glass Scale, WI-013
Magnification <sup>FO</sup>	10 X to 250 X	180 $\mu$ in	
Squareness <sup>FO</sup>	0.1 in to 4 in	20 $\mu$ in/in	
Angularity <sup>FO</sup>	0° to 90°	0.03°	
Surface Plates <sup>O</sup>	6 in x 6 in to 20 ft x 20 ft	(28 + .4L) $\mu$ in	Electronic Level, Repeat-O-Meter, ASME B89.3.7, WI-014
Flatness <sup>O</sup>	0.002 in	26 $\mu$ in	
Repeat Reading <sup>O</sup>			
Linear Measuring Machine <sup>O</sup>	0.1 in to 84 in	(93 + 8L) $\mu$ in	Long Blocks, WI-011
Precision Levels <sup>FO</sup>	4 in to 15 in	(190 – 2.6L) $\mu$ in/ft	Surface Plate GGG-L-211D, A-A 50685 WI-049
Protractors <sup>FO</sup>	0.1° to 90°	(0.06 + 0.000 02A)°	Angle Blocks, Surface Plate, AA-3084, AA-3085, WI-028



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Pin/Plug Gages <sup>FO</sup>	0.001 in to 7 in	(19 + 2.4L) $\mu$ in	Gage Blocks, Bench Mic, Indicator, B89.1.5-1988
Thread Gages Pitch Diameter <sup>FO</sup>	0.1 in to 4 in	(74 + 2.6L) $\mu$ in	Bench Micrometer Thread Wire
Thread Gages Major Diameter <sup>FO</sup>	0.1 in to 4 in	(46 + 3.9L) $\mu$ in	Gage Blocks, opt comp ASME B1.2-1991 ASME B1.16M WI A - 1,2,3,4,5,6,7
Extensometer <sup>FO</sup>	0.001 in to .25 in	(110 + 49L) $\mu$ in	Extensometer Calibrator WI-16, ASTM E4
Length Standards/End Measuring Rods <sup>FO</sup>	(20 + 3.0L) $\mu$ in	(13 + 4L) $\mu$ in	Indicator Gage Blocks B89.1.13-2013
Height Gages <sup>FO</sup>	0.000 5 in to 40 in	(400 + 0.6L) $\mu$ in	Gage Blocks, Step Master, GGG-C-111c, WI-008
Amplifier Indicator <sup>FO</sup>	0.000 1 in to 0.004 in	14 $\mu$ in	Gage Blocks, B89.1.10-M, WI-046
Roundness Tester Magnification Radial Error <sup>FO</sup>	450 $\mu$ in 1 $\mu$ in to 40 000 $\mu$ in	6 $\mu$ in 3.4 $\mu$ in	ASME B89.3.1, WI-010, Flick Master, Precision Ball, Gage Blocks
Surface Roughness Tester Magnification Straightness <sup>FO</sup>	120 $\mu$ in Ra 4 in	3.6 $\mu$ in 5.6 $\mu$ in	ASME B46.1, WI-026, Roughness Master, Optical Flat
Contour Tester Magnification Straightness <sup>FO</sup>	8 in	26 $\mu$ in 6.6 $\mu$ in	WI-030 Contour Master Optical Flat
Angle Plate Squareness <sup>FO</sup> Parallelism <sup>FO</sup>	3 in to 12 in 0.000 1 in to 0.010 in	(79 + 17L) $\mu$ in/in (73 + 5.8L) $\mu$ in/in	GGG-P-441a Cylindrical Square Gage Blocks
Square <sup>FO</sup>	2 in to 12 in	(79 + 17L) $\mu$ in/in	WI-037, GGG-S-656d, Cylindrical Square, Gage Blocks
Radius Gage <sup>F</sup>	0.005 in to 2 in	0.000 15 in	WI-040, GGG-G-791h, Video Inspection
Rules <sup>F</sup>	6 in to 48 in	(140 + 7.6L) $\mu$ in	WI-040, GGG-G-791h, Video Inspection
Stage Micrometer <sup>F</sup>	0.02 mm to 10 mm	3.5 $\mu$ m	
Angle <sup>F</sup>	1° to 90°	0.004°	



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Roughness Standard Ra <sup>FO</sup>	10 $\mu$ m to 250 $\mu$ m	3.9 $\mu$ m	Profilometer, ANSI B46.1, WI-032

### 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
Tension/Compression Tester <sup>FO</sup>	1 ozf to 50 lbf	0.1 ozf + 1% of reading	WI-015, ASTM E4 Class 6 Weights Class 7 Weights Load Cells
	50 lbf to 500 lbf	1 % of reading	
	500 lbf to 5 000 lbf	1 % of reading	
	5 000 lbf to 30 000 lbf	1 % of reading	
	30 000 lbf to 100 000 lbf	1 % of reading	
Force Gage <sup>FO</sup>	1 lbf to 100 lbf	0.12 lbf	Class 6 & 7 Weights WI-033, ASTM E4
Scales <sup>O</sup>	0.5 g to 5 000 g	(0.001 + 0.000 54Wt) g	Class 5 weights NIST Handbook 44 , WI-042, NISTIR 6919
	0.1 lb to 1 000 lb	(0.012 + 0.000 52Wt) lb	

### Mechanical

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Brinell Scopes <sup>FO</sup>	0.1 mm to 7 mm	0.07 mm	Stage Micrometer, WI-025, ASTM E10
Indirect Verification of Rockwell Hardness and Rockwell Superficial Hardness Testers <sup>O</sup>	> 80 HRA	0.23 HRA	ASTM-E-18 EURAMET cg-16 Test Blocks
	60 HRA to 80 HRA	0.32 HRA	
	< 60 HRA	0.31 HRA	
	> 80 HRBW	0.52 HRBW	
	60 HRBW to 80 HRBW	0.35 HRBW	
	< 60 HRBW	0.4 HRBW	
	> 60 HRC	0.3 HRC	
	40 HRC to 60 HRC	0.31 HRC	
	< 40 HRC	0.33 HRC	
	$\geq$ 90 HR15N	0.3 HR15N	
	80 HR15N to 90 HR15N	0.33 HR15N	
	< 80 HR15N	0.4 HR15N	



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### Mechanical

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Indirect Verification of Rockwell Hardness and Rockwell Superficial Hardness Testers <sup>O</sup>	$\geq 79$ HR30N	0.28 HR30N	ASTM-E-18 EURAMET cg-16 Test Blocks
	60 HR30N to 79 HR30N	0.34 HR30N	
	$\leq 60$ HR30N	0.44 HR30N	
	$\geq 65$ HR45N	0.25 HR45N	
	50 HR45N to 65 HR45N	0.48 HR45N	
	$\leq 50$ HR45N	0.48 HR45N	
	$\geq 70$ HR30TW	0.38 HR30TW	
	50 HR30TW to 70 HR30TW	0.44 HR30TW	
	$\leq 55$ HR30TW	0.48 HR30TW	
	$\geq 50$ HR45TW	0.48 HR45TW	
	25 HR45TW to 50 HR45TW	0.53 HR45TW	
$\leq 25$ HR45TW	0.52 HR45TW		
Indirect Verification of Brinell Hardness Testers <sup>O</sup>	2.5 mm to 4.8 mm	0.09 mm	WI-018, ASTM E-10, Test Blocks, Brinell Scope
Torque Wrench <sup>F<sup>O</sup></sup>	25 lbf-ft to 250 lbf-ft	(0.49 + 0.004T) lbf-ft	Torque calibrator EURAMET cg-14 ASME B107.300 -2010
	30 lbf-in to 300 lbf-in	0.87 lbf-in	
Indirect Verification of Knoop and Vickers Hardness Tester, $\leq 1$ kgf <sup>O</sup>	100 HV to 800 HV	10.0 HV	ASTM E384, WI-041, Test Blocks
	100 HK to 650 HK	11.7 HK	
	$> 650$ HK	8.4 HK	
Indirect Verification Vickers Hardness Tester, $\geq 1$ kgf <sup>O</sup>	100 HV to 800 HV	8.8 HV	ASTM E384 , WI-041, Test Blocks

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.



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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. 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.
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 "X" preceded by a number represents the number of times a lense system magnifies an image relative to its actual size. CMC stated as "% of magnification" represents the CMC of magnification expressed as a percentage of the total magnification.
8. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
9. The term D represents diameter in inches or millimeters as appropriate to the uncertainty statement.
10. The term A represent angle in as appropriate to the uncertainty statement.
11. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.
12. The term T represents torque in N•m (including SI multiple and submultiple units) for the international system of units (the SI) or ozf•in, lbf•in and lbf•ft for the USC system of units.