PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Willrich Precision Instrument Company

80 Broadway, Cresskill, NJ 07626

(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 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:*
October 10, 2017	March 22, 2022	June 30, 2024

Accreditation No.:	*Certificate No.:*
93289	L22-216

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

Certificate of Accreditation: Supplement

Willrich Precision Instrument Company
80 Broadway, Cresskill, NJ 07626
Contact Name: George Chitos Phone: 201-567-1411

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 (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Optical Comparators[O] XY Linearity	Up to 12 in	100 µin + 7.27 µin/in	Glass Scale (Lengths, Diameters, Angles, and Magnification) and Method: SCD_2022_0004
Tool-Makers Microscopes XY Linearity	Up to 2 in.	100 µin + 7.27 µin/in	Glass Scale Method: SCD 2022 0011
Vision Systems[O] X, Y, & Z	15 in x 15 in	100 µin + 8.47 µin/in	Glass Scales and Method SCD_2022_0001
Surface Plates Flatness[O] Repeat[O]	 Up to 60 DL in (> 60 to 120) DL in 0.002 in	 31 + 0.2 DL) µin (30 + 0.3 DL) µin 40 µin	Mahr Federal Level Systems Repeat-o-meter SCD_2022_0009 IAW ASME B89-3-7 (2018)

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Indirect Verification of Rockwell and Rockwell Superficial Hardness Testers[O]	60 HRA to70 HRA	0.27 HRA	Indirect verification per ASTM Designation E18-20, Willrich Precision WI: WPI_HR13 and Hardness Test Block Masters
	70 HRA to 80 HRA	0.17 HRA	
	80 HRA to 90 HRA	0.15 HRA	
	40 HRBW to 60 HRBW	0.36 HRBW	
	60 HRBW to 80 HRBW	0.26 HRBW	
	80 HRBW to 90 HRBW	0.38 HRBW	
	20 HRC to 40 HRC	0.41 HRC	
	40 HRC to 60 HRC	0.32 HRC	
	660 HRC to 70 HRC	0.31 HRC	
	70 HR15N to 75 HR15N	0.43 HR15N	
	75 HR15N to 85 HR15N	0.41 HR15N	
	85 HR15N to 95 HR15N	0.50 HR15N	
	40 HR30N to 60 HR30N	0.35 HR30N	
	60 HR30N to 75 HR30N	0.46 HR30N	
	75 HR30N to 85 HR30N	0.54 HR30N	

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Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
HR45N[O]	20 HR45N to 40 HR45N	0.31 HR45N	Indirect verification per ASTM Designation E18-20, WI: WPI_HR13 and Hardness Test Block Masters
	40 HR45N to 60 HR45N	0.33 HR45N	
	60 HR45N to 80 HR45N	0.22 HR45N	
HR15TW[O]	20 HR15TW to 40 HR15TW	0.25 HR15TW	Indirect verification per ASTM Designation E18-20, WI: WPI_HR13 and Hardness Test Block Masters
	40 HR15TW to 60 HR15TW	0.22 HR15TW	
	60 HR15TW to 80 HR15TW	0.20 HR15TW	
HR30TW[O]	20 HR30TW to 40 HR30TW	0.27 HR30TW	Indirect verification per ASTM Designation E18-20, WI: WPI_HR13 and Hardness Test Block Masters
	40 HR30TW to 60 HR30TW	0.25 HR30TW	
	60 HR30TW to 80 HR30TW	0.22 HR30TW	
HR45TW[O]	20 HR45TW to 40 HR45TW	0.22 HR45TW	Indirect verification per ASTM Designation E18-20, WI: WPI_HR13 and Hardness Test Block Masters
	40 HR45TW to 60 HR45TW	0.25 HR45TW	
	60 HR45TW to 80 HR45TW	0.22 HR45TW	
HRGW[O]	30 HRGW to 50 HRGW	0.78 HRGW	Indirect verification per ASTM Designation E18-20, WI: WPI_HR13 and Hardness Test Block Masters
	50 HRGW to 70 HRGW	0.21 HRGW	
	70 HRGW to 90 HRGW	0.23 HRGW	
HRRW[O]	100 HRRW to 110 HRRW	0.33 HRRW	Indirect verification per ASTM Designation E18-20, WI: WPI_HR13 and Hardness Test Block Masters
	110 HRRW to 120 HRRW	0.33 HRRW	
	120 HRRW to 130 HRRW	0.33 HRRW	
Vickers[O]	100 HV to 240 HV	4.5 HV	ASTM E92-17, WI: WPI-13 ISO EN 6507-2
	240 HV to 600 HV	7.3 HV	
	>600 HV	15 HV	
Knoop[O]	100 HK to 250 HK	6.5 HK	ASTM E92-17, WI: WPI-13 ISO EN4545-2
	250 HK to 650 HK	10 HK	
	>650 HK	20 HK	

Mass, Force, & Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Force Gauges and Cells Compression & Tension [O]	0.5 lbf to 50 lbf	0.06 % Reading	Class 7 Masses, or Load Cells, WI: WPI-FG13 IAW ASTM E4-2021
	50 lbf to 250 lbf	0.06 % Reading	
	250 lbf to 2 000 lbf	0.12 % Reading	

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

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^{F} 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^{O} would mean that the laboratory performs this calibration onsite at the customer's location.

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. DL is the numerical value of the error in the length added to the base value uncertainty per inch travel.