PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Phoenix National Laboratories, LLC

941 S. Park Lane, Tempe, AZ 85281

(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):

Mechanical and Nondestructive Testing

(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

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

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
February 20, 2012	July 13, 2024	July 31, 2026

Accreditation No.:	*Certificate No.:*
71936	L24-531

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

Phoenix National Laboratories, LLC
941 S. Park Lane, Tempe, AZ 85281
Contact Name: Alexander Zuran III Phone: 602-431-8887

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

FLEX CODE	FIELD OF TEST	ITEMS, MATERIALS, OR PRODUCTS TESTED	COMPONENT, CHARACTERISTIC, PARAMETER TESTED	SPECIFICATION OR STANDARD METHOD	TECHNOLOGY OR TECHNIQUE USED
F1, F2	Mechanical [F]	Elastomeric Bridge Bearings, Expansion Joints and Seals, Sealants, Rubber, Plastics, PTFE	Tensile Strength, Ultimate Elongation, Permanent Set	ASTM D412 ASTM 4894	Universal Machine
F1, F2			Tensile Strength, Tensile Stress at Yield, Ultimate Elongation	ASTM D638	
F1, F2			Hardness	ASTM D2240	Durometer
F1, F2			Heat Resistance, Change in Hardness, Tensile Strength, Ultimate Elongation	ASTM D573	Universal Machine
F1, F2			Compression Set, oven aged	ASTM D395 Method B	Oven
F1, F2			Compression Set, low temp	ASTM D1229	Freezer
F1, F2			Ozone Resistance	ASTM D1149 ASTM D518	Ozone Chamber
F1, F2			Low Temperature Brittleness	ASTM D746 Procedure B	Brittleness Impact
F1, F2			Instantaneous Thermal Stiffening (Clashburg)	ASTM D1043	Rotational Tester
F1, F2			Shear Modulus	ASTM D4014, Annex A	Universal Machine
F1, F2			Low Temperature Crystallization	AASHTO LRFD, Sect 18, AASHTO M251	
F1, F2			Adhesion	ASTM D429, Method B	
F1, F2			Adhesion	TX-601-J	
F1, F2			Creep/Shear Bond	AASHTO M251-06	
F1, F2			Tear Strength	ASTM D624 (Type C)	
F1, F2			Oil Swell	ASTM D471	Volume
F1, F2			Chlorinated Compound Test	TX-601-J	Visual

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F1, F2	Mechanical [F]	Elastomeric Bridge Bearings, Expansion Joints and Seals, Sealants, Rubber, Plastics, PTFE	Short/Long Duration Compression Test	AASHTO LRFD, Sect. 18 CHB Design Code S6	Custom Compression Machine
F1, F2			Compression Strain	AASHTO M251 CHB Design Code S6 LS-428	
F1, F2			Low/High Temperature Recovery	ASTM D2628	
F1, F2			Compression Deflection	ASTM D575	
F1, F2			Density and Specific Gravity	ASTM D4894 ASTM D792, Method A	Direct Measurement
F1, F2		Structural Steel, Welded Plate and Pipe	Mechanical Properties Tension Test Bend Test Hardness Test (Charpy Impact Test - subcontracted)	ASTM A370 ASTM E18	Universal Machine
F1, F2			Tension Testing of Metallic Materials	ASTM E8	
F1, F2			Testing of Steel Reinforcement Bars – Tension / Elongation / Yield Load/Bend	ASTM A615 ASTM A706	
F1, F2	Non-Destructive [F]	Metals/Metallic Coatings	Grain Size	ASTM E112	Microscope
F1, F2			Hardness, HV or HK	ASTM E92	Indentation
F1, F2			Metallic Coating Thickness, Cross-sectioning	ASTM B748	Microscope
F1, F2			Scanning Electron Microscope Analysis (SEM) With Energy Dispersive Spectroscopy (EDS)	SOP SEM-1	SEM Spectroscopy

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F1, F2	Non-Destructive [FO]	Commercial and Industrial Based Construction Projects including Bridges, Buildings, Pressure Vessels, Pipelines, Tanks; Manufacturing during and after fabrication of materials and products	Ultrasonic Testing (UT)	ASME Section V Articles 4 and 5; ASME Sections I, VIII, IX, B31.1, B31.3; AWS D1.1, D1.5, API 1104, 650 ASTM A388, E164, A609, E797	Pulse-Echo Flaw Detectors and Thickness gauges
F1, F2			Ultrasonic Phased Array Testing (UTPA)	ASME Section V Article 4, Section VIII – Division 2, API 650, AWS D1.1, D1.5	Automated and Semiautomated
F1, F2			Radiographic Testing (RT)	ASME Section V Article 2; ASME Sections I, VIII, IX, B31.1, B31.3; AWS D1.1, D1.5; API 1104, 650; ASTM E94, E1032, E1742 AWWA D100	Gamma X-ray
F1, F2			Computed Radiographic Testing (CRT)	ASME Section V Article 2, Appendix VIII, AWS D1.1	
F1, F2			Magnetic Particle Testing (MT)	ASME Section V Article 7; ASME Sections I, VIII, IX, B31.1, B31.3; AWS D1.1, D1.5; API 1104, 650, ASTM E709	Cables, Prods, Yokes
F1, F2			Liquid Penetrant Testing (PT)	ASME Section V Article 6; ASME Sections I, III, VIII, IX, B31.1, B31.3; AWS D1.1, D1.5; API 1104, 650, ASTM E165	Type I, Type II Method C
F1, F2			Electromagnetic Testing (ET)	ASME Section V Article 8	Inside coil Pencil probe

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F1, F2	Non-Destructive [FO]	Commercial and Industrial Based Construction Projects including Bridges, Buildings, Pressure Vessels, Pipelines, Tanks; Manufacturing during and after fabrication of materials and products	Visual Testing (VT)	ASME Section V Article 9; ASME Sections I, III, VIII, IX, B31.1, B31.3; AWS D1.1, D1.2, D1.3, D1.4, D1.5, D1.6; API 1104, 650, 653	Direct and Remote
F1, F2			Leak Test (Bubble, Pressure, Voltage)	API 650, ASME B31.3, ASTM E1003	Bubble, Pressure, Voltage
F1, F2			Magnetic Flux Leakage (MFL)	API 653 Annex G	Magnetics
F1, F2			Equipment Evaluations	API 510, 570, 653 API 579/ASME FFS-1	Engineering Evaluators
F1, F2			Metallurgical Field Replications	ASTM E1351	Microscopic
F1, F2		Special Inspections per the International Building Code (IBC)	ICC – Spray Applied Fireproofing	IBC Section 1702, ASTM E605, ASTM E736, Technical Manuals 12A and 12B	Field and Shop Inspection
F1, F2			ICC – High Strength Bolts and Structural Steel	IBC, Section 1702 AISC Specification for A325 and A490 High Strength Bolts	
F1, F2			ICC – Welding Inspection	IBC Section 1702, AWS D1.1, D1.3, D1.4, AISC Code of Standard Practice	
F1, F2			ICC – Epoxied Anchors	IBC Section 1702 and Manufacturer's Documentation	Field Inspection
F1, F2			IFC- Firestop	ASTM E2174 ASTM E2393	
F1, F2		Structural Steel, Welded Plate and Pipe	Hardness	ASTM A833 ASTM E110	UCI Leebs Tellebrineller
F1, F2			Positive Material Identification	Thermo Scientific Niton XL3t Sciaps Z200C+	XRF
F1, F2		Structural Concrete	Ground Penetrating Radar	Geophysics Structure Scan SIR-3000	Electromagnetic Radar
F1, F2			Anchor Bolt Pull Out Tests	ASTM E488	Hydraulic

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F1, F2	Non-Destructive [FO]	Welding Procedure Qualification and Welder Qualifications	Administration of Qualifications at PNL weld test booths or in Field	ASME IX; API 1104; AWS B2.1, D1.1, D1.2, D1.3, D1.4, D1.5, D1.6, D17.1	Administrative
F1, F2		PQR and WPQ testing	X-ray, Tensile Tests, Bend Tests, Fillet Weld Break Tests, Macro-etching, Twist Tests, Nick Break Tests, Hardness Profiles	ASME IX; API 1104; AWS B2.1, D1.1, D1.2, D1.3, D1.4, D1.5, D1.6, D17.1 ASTM A370	Mechanical Testing
F1, F4	Non-Destructive [F]	Organic Compounds	Positive Material Identification, Identity	PNL Procedure FTIR-1	FTIR

1. The presence of a superscript F means that the laboratory performs testing of the indicated parameter at its fixed location.

2. The presence of a superscript FO means that the laboratory performs testing of the indicated parameter both at its fixed location and onsite at customer locations.

3. Flex Code:
   F1-Introduction of the testing of a new item, material, matrix, or product for an accredited test method
   F2-Introduction of a new version of an accredited standard method (with no modifications)
   F3-Introduction of a new parameter/component/analyte to an accredited test method
   F4- Introduction of a new version or modifications of an accredited non-standard method
   F5-Introduction of a new method that is equivalent to an accredited method (using same technology or technique)