PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Arrow Laboratory, Inc.

1333 N. Main Street, Wichita, KS 67203

(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 Chemical 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:*
May 8, 2011	October 11, 2021	October 31, 2023

Accreditation No:	*Certificate No:*
69627	L21-600

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

Arrow Laboratory, Inc.
1333 N. Main Street, Wichita, KS 67203
Contact Name: Jennifer Unrein Phone: 316-267-2893

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

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	RANGE (WHERE APPROPRIATE) AND DETECTION LIMIT
Mechanical [F]	Metal	Room Temperature Tensile Test	ASTM E8, ASTM A370, ASTM B557	50 lbf to 120 000 lbf
		Rockwell Hardness	ASTM E18	Scale: A, B, C, E
		Rockwell Hardness-Superficial		Scale: 15N, 15T, 30T
		Brinell Hardness	ASTM E10	500 lbf, 1 500 lbf, 3 000 lbf
		MicroHardness – Vickers & Knoop	ASTM E384	Vickers – 1 000 gm Max
		Electrical Conductivity (% IACS)	ASTM E1004	0.5 % IACS to 100 % IACS (3.4 MS/m to 58 MS/m) DL: 0.5 % IACS (3.4 MS/m)
		Metallographic Preparation	ASTM E3	N/A
		Corrosion	ASTM B117, ASTM G34, ASTM G110	Visual
		Decarburization	ASTM E1077, ASTM E384	0.000 5 in Min at 20 Knoop
		Intergranular Attack and End Grain Pitting	ASTM F2111, BSS 7219	D.L. = 0.000 2 in at 500X
		Case Depth	SAE J 423, ASTM E384	0.003 in Min
		Macro-etching	ASTM E340	N/A
		Micro-etching	ASTM E07	
Chemical [F]	Metal	Wet Chemistry – Gravimetric	ASTM E34, ASTM E350, ASTM E351, ASTM E352 ASTM E353, ASTM E354,	Si Only 0.01 % to 12 % D.L. = 0.01 %
		Combustion – (Leco) Carbon & Sulfur	ASTM E1019	C: 0.005 % to 4 % S: 0.005 % to 0.35 % D.L. = 0.005 %

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Chemical [F]	Metal	ICP	ASTM E1479	Al Alloys Mn: 0.01 % to 1.3 % Cu: 0.01 % to 4.5 % Cr: 0.01 % to 0.25 % Mg: 0.1 % to 3.5 % Zn: 0.01 % to 7 % Fe: 0.10 % to 1 % Ti: 0.01 % to 0.25 % Sn: 0.01 % to 0.1 % Ni: 0.01 % to 0.7 % V: 0.01 % to 0.03 % Be: 0.001 % to 0.01 %
				Low - Alloy Steel Mn: 0.1 % to 1.7 % Cu: 0.01 % to 1.2 % Ni: 0.01 % to 2.2 % Cr: 0.01 % to 1.3 % Mo: 0.01 % to 0.7 % V: 0.01 % to 0.35 % Al: 0.01 % to 1.2 % Ti: 0.01 % to 0.1 % B: 0.005 % to 0.06 % P: 0.01 % to 0.4 %
				High - Alloy Steel Mn: 0.3 % to 2 % Cu: 0.1 % to 4 % Ni: 0.2 % to 26 % Cr: 4 % to 21 % Mo: 0.15 % to 6 % Ti: 0.2 % to 2.5 % V: 0.2 % to 2 % Al: 0.1 % to 1.4 % P: 0.01 % to 0.03 % Nb: 0.1 % to 0.3 %
				Nickel Base Alloys Mn: 0.15 % to 0.5 % Cu: 0.3 % to 0.5 % Ni: 50 % to 80 % Cr: 14 % to 25 % Mo: 0.15 % to 10 % Co: 0.1 % to 15 % Ti: 0.2 % to 3.2 % Al: 0.15 % to 1.5 % Fe: 0.1 % to 10 % P: 0.005 % to 0.02 % Nb: 0.1 % to 3.5 %

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

1. The presence of a superscript F means that the laboratory performs testing of the indicated parameter at its fixed location. Example: Outside Micrometer^{F} would mean that the laboratory performs this testing at its fixed location.