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 17025:2005

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 January 2009):

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:

Initial Accreditation Date:	*Accreditation No.:*	*Certificate No.:*
May 8, 2011	69627	L13-128

Tracy Szerszen
President/Operations Manager

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

Arrow Laboratory, Inc.
1333 N. Main Street, Wichita, KS 67203
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	Metal	Room Temperature Tensile Test	ASTM E8, ASTM A370, & ASTM B 557	50 lbf to 120 000 lbf
		Charpy Impact Testing	ASTM E 23 & ASTM A 370	8.5 J to 144.85 J (6.3 ft·lbf to 106.8 ft-lbf)
		Rockwell Hardness	ASTM E 18	Scale: A,B,C,E
		Rockwell Hardness-Superficial	ASTM E 18	Scale: 15N, 15T, 30T
		Brinell Hardness	ASTM E10	500 lbf, 1 500 lbf, 3 000 lbf
		MicroHardness – Vickers & Knoop	ASTM E 384	Vickers – 1 000 gm Max
		Electrical Conductivity (% IACS)	ASTM E 1004	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 E 3	N/A
		Corrosion	ASTM G 38, ASTM G 49, ASTM B 117, ASTM G 34, & ASTM G 110	Visual
		Decarburization	ASTM E 1077 & ASTM E 384	0.000 5 in Minimum @ 20 Knoop
		Intergranular Attack and End Grain Pitting	ASTM F 2111 & BSS 7219	DL: 0.000 2 in @ 500X
		Case Depth	SAE J 423 & ASTM E 384	0.003 in Minimum
		Macro-etching	ASTM E 340	N/A
		Micro-etching	ASTM E407	N/A
Chemical	Metal	Wet Chemistry – Gravimetric	ASTM E34, ASTM E 350, ASTM E 351, ASTM E 352 ASTM E 353, & ASTM E 354,	Si Only 0.01 % to 12.0 % DL: 0.01 %
		Combustion – (Leco) Carbon & Sulfur	ASTM E 1019	C - 0.005 % to 4 % S - 0.005 % to 0.35 % DL: 0.005 %

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Chemical	Metal	ICP	ASTM E 1479	<u>Al Alloys</u> Mn – 0.01 % to 1.30 % Cu – 0.01 % to 4.50 % Cr – 0.01 % to 0.25 % Mg – 0.1 % to 3.50 % Zn – 0.01 % to 7.00 % Fe – 0.10 % to 1.00 % Ti – 0.01 % to 0.25 % Sn – 0.01 % to 0.10 % Ni – 0.01 % to 0.70 % V – 0.01 % to 0.03 % Be – 0.001 % to 0.010 %
				<u>Low - Alloy Steel</u> Mn – 0.10 % to 1.70 % Cu – 0.01 % to 1.20 % Ni – 0.01 % to 2.20 % Cr – 0.01 % to 1.30 % Mo – 0.01 % to 0.70 % V – 0.01 % to 0.35 % Al – 0.01 % to 1.20 % Ti – 0.01 % to 0.10 % B – 0.005 % to 0.06 % P – 0.01 % to 0.40 %
				<u>High - Alloy Steel</u> Mn – 0.3 % to 2.0 % Cu – 0.1 % to 4.0 % Ni – 0.2 % to 26.0 % Cr – 4.0 % to 21.0 % Mo – 0.15 % to 6.0 % Ti – 0.2 % to 2.5 % V – 0.2 % to 2.0 % Al – 0.1 % to 1.4 % P – 0.01 % to 0.03 % Nb – 0.1 % to 0.30 %

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Chemical	Metal	ICP	ASTM E 1479	Nickel Base Alloys Mn – 0.15 % to 0.5 % Cu – 0.3 % to 0.5 % Ni – 50.0 % to 80.0 % Cr – 14.0 % to 25.0 % Mo – 0.15 % to 10.0 % Co – 0.1 % to 15.0 % Ti – 0.2 % to 3.2 % Al – 0.15 % to 1.5 % Fe - 0.1 % to 10.0 % P – 0.005 % to 0.020 % Nb – 0.1 % to 3.5 %