

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005¹

MNP CORPORATION
TECHNICAL AND RESEARCH SERVICES
(Corporate Facility)
44225 Utica Road
Utica, MI 48317
Christopher B. Wackrow Phone: 586 254 1320

MECHANICAL

Valid to: December 31, 2008

Certificate Number: 0107.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform tests and measurements on externally threaded fasteners and cold-headed steel products using the following methods:

<u>Test</u>	<u>Test Methods</u>
<u>Sampling Plans</u>	Customer Specs, MNP Control Plans ANSI/ASME B18.18.2M, B18.18.3M, B18.18.6M; ASTM E1806, F1470
<u>Hardness Rockwell</u> (B, C, 15N, 30N)	ASTM E18; SAE J417
<u>Micro Hardness</u> Knoop Vickers	ASTM E384 ASTM E384
<u>Tensile Test</u> Axial & Wedge Proof Load Rod & Wire	ASTM A370, E8, F606, F606(M); SAE J82, J429; FMVSS209; PF-4730; ISO 898-1 ASTM A370
<u>Chemical</u> Optical Emission (OES) Leco – Carbon	ASTM E415 ASTM E1019
<u>Coating Thickness</u> Microscopic XRF	ASTM B487 ASTM B568

Test

Test Methods

Hydrogen Embrittlement

SAE/USCAR 7; PS-9500; ASTM F606, F606(M)
SAE J78, J81, J773, J1237

Metallography

Sample Preparation

ASTM E3, E304, E1806

Decarburization

ASTM E1077; SAE J121/J121M, J419; ISO 898-1

Carburization

SAE J423, J1102/J1102M

Macro Inspection

ASTM E340

Micro Inspection

ASTM E45; SAE J422

Grain Flow

SAE/USCAR 8

Screw Test

Drive Test

SAE J78, J81

Ductility

GM 6010 using 10° Block;

SAE J78, J81 using 10° Block

Corrosion Test

Salt Fog

ASTM B117; SAE/USCAR 1; FMVSS 209

Visual Inspection

Discontinuities

ASTM F788/F788M; SAE J123, J1061

ISO 6157-1, 6157-2

Torque

Torsional Strength

SAE J78, J81; ISO 898-1, 2320

Prevailing Torque

GM 6175M, 6194M, 6189P; FORD WA970, WX200

ESS-M11P24-A1, ESS-M11P24-A2;

Prevailing Torque/Tension

ASME B18.16.2M; IFI 101, 100/107

Dimensional Testing:

<u>Parameter</u>	<u>Range</u>	<u>*Best Uncertainty (+/-)</u>	<u>Comments</u>
Linear	(0 to 1) in	0.0001 in	Digital micrometer
	(0 to 25.4) mm	0.003 mm	
	(0 to 6) in	0.0013 in	Digital calipers
	(0 to 12) in	0.0013 in	
	(0 to 150) mm	0.018 mm	
	(0 to 300) mm	0.018 mm	
	(0 to 6) in	0.0007 in	Optical comparator
	(0 to 150) mm	0.018 mm	

<u>Parameter</u>	<u>Range</u>	<u>*Best Uncertainty (+/-)</u>	<u>Comments</u>
Angle	(0 to 360) degree	1 degree	Optical comparator
Radius	(0 to 2.5) in (0 to 63.5) mm	0.0028 in 0.078 mm	Optical comparator
Thread Functional Pitch Diameter	6-32 UNC 2B to 7/8-9 UNC 2B; 1/4-28 UNF 2B to 3/4-16 UNF 2B 6-32 UNC 2A & 3A to 2-4.5 UNC 2A & 3A 1/4-28 UNF 2A & 3A to 1-12 UNF 2A & 3A M4 X 0.7 6g & h to M24 x 3.0 6g & h	N/A N/A N/A N/A N/A N/A N/A N/A N/A	Thread ring gages
Concentricity	(0 to 1) in (0 to 25.4) mm	0.0009 in 0.022 mm	Concentricity gage
Thread Pitch Diameter	(0.2 to 1) in (4 to 20) mm	0.0005 in 0.012 mm	Johnson gage
Thread Functional Pitch Diameter	(0.2 to 1) in (4 to 20) mm	0.0005 in 0.012 mm	Johnson gage

¹ **This accreditation covers testing performed at the main laboratory listed above, and the following satellite laboratories listed below:**

**MNP Steel Services
3401 Martin
Detroit, MI 48210
Phone : 313 843 7152**

Test

Test Method

Sampling Plans

Customer Specs, MNP Control Plans
ANSI/ASME B18.18.2M, B18.18.3M,
B18.18.6M; ASTM E1806, F1470

Hardness Rockwell
(B Scale)

ASTM E18; SAE J417

Tensile Test
Rod & Wire

ASTM A370

Test

Test Method

Metallography

Sample Preparation
Decarburization
Micro Inspection

ASTM E3, E304, E1806
ASTM E1077; SAE J121/J121M, J419; ISO 898-1
ASTM E45

**MNP Engineering Center
1524 E. 14 Mile Road
Madison Heights, MI 48071
Phone: 248 585 5010**

Test

Test Method

Sampling Plans

Customer Specs, MNP Control Plans
ANSI/ASME B18.18.2M, B18.18.3M,
B18.18.6M; ASTM E1806, F1470

Torque

Prevailing Torque/Tension
Torque/Tension

ASME B18.16.2M ; IFI 101, 100/107
DIN EN ISO 16047; SAE/USCAR 10, 11 ;
FORD WZ100,WZ101

Fatigue

ISO 3800

**Cadon Plating & Coatings
3715 11th Street
Wyandotte, MI 48192
Phone: 734 282 8100**

Test

Test Method

Sampling Plans

Customer Specs, MNP Control Plans
ANSI/ASME B18.18.2M, B18.18.3M,
B18.18.6M; ASTM E1806, F1470

Coating Thickness

Magnetic
Eddy Current

ASTM E376

Coating Weight

ASTM B767

Corrosion Test

Salt Fog

ASTM B117; SAE/USCAR 1

Torque

Torque/Tension

SAE/USCAR 10, 11 ; FORD WZ100, WZ101

PST Heat Treating, LLC
24200 Plymouth Road
Redford, MI 48239
Phone: 313 538 4600

<u>Test</u>	<u>Test Method</u>
<u>Sampling Plans</u>	Customer Specs, MNP Control Plans ANSI/ASME B18.18.2M, B18.18.3M, B18.18.6M; ASTM E1806, F1470
<u>Hardness Rockwell</u> (B, C, 15N, 30N)	ASTM E18; SAE J417
<u>Micro Hardness</u> Vickers	ASTM E384
<u>Tensile Test</u> Axial & Wedge Proof Load	ASTM A370, E8, F606, F606(M); SAE J82, J429; FMVSS209; PF-4730; ISO 898-1
<u>Metallography</u> Sample Preparation Decarburization Carburization Micro Inspection	ASTM E3, E304, E1806 ASTM E1077; SAE J121/J121M, J419; ISO 898-1 SAE J423, J1102/J1102M ASTM E45

MNP Manufacturing and Heat Treating Area
44225 Utica Road
Utica, MI 48317

<u>Test</u>	<u>Test Method</u>
<u>Hardness Rockwell</u> (B, C, 15N, 30N)	ASTM E18, SAE J417
<u>Metallography</u> Macro Inspection Grain Flow	ASTM E340 SAE/USCAR 8

Dimensional Testing (performed at on-site inspection stations):

<u>Parameter</u>	<u>Range</u>	<u>*Best Uncertainty (+/-)</u>	<u>Comments</u>
Linear	(0 to 1) in (0 to 25.4) mm	0.0001 in 0.003 mm	Digital micrometer

<u>Parameter</u>	<u>Range</u>	<u>*Best Uncertainty (+/-)</u>	<u>Comments</u>
Linear	(0 to 6) in	0.0013 in	Digital calipers
	(0 to 12) in	0.0013 in	
	(0 to 150) mm	0.018 mm	
	(0 to 300) mm	0.018 mm	
	(0 to 6) in	0.0007 in	Optical comparator
	(0 to 150) mm	0.018 mm	
Angle	(0 to 360) degree	1 degree	Optical comparator
Radius	(0 to 2.5) in	0.0028 in	Optical comparator
	(0 to 63.5) mm	0.078 mm	
Thread Functional Pitch Diameter	6-32 UNC 2B to	N/A	Thread ring gages
	7/8-9 UNC 2B;	N/A	
	1/4-28 UNF 2B to	N/A	
	3/4-16 UNF 2B	N/A	
	6-32 UNC 2A & 3A to	N/A	
	2-4.5 UNC 2A & 3A	N/A	
	1/4-28 UNF 2A & 3A to	N/A	
	1-12 UNF 2A & 3A	N/A	
Concentricity	(0 to 1) in	0.0009 in	Concentricity gage
	(0 to 25.4) mm	0.022 mm	
Thread Pitch Diameter	(0.2 to 1) in	0.0005 in	Johnson gage
	(4 to 20) mm	0.012 mm	
Thread Functional Pitch Diameter	(0.2 to 1) in	0.0005 in	Johnson gage
	(4 to 20) mm	0.012 mm	

**MNP Plant 2 Production Facility
1524 E. 14 Mile Road
Madison Heights, MI 48071**

<u>Test</u>	<u>Test Method</u>
<u>Metallography</u>	
Macro Inspection	ASTM E340
Grain Flow	SAE/USCAR 8

Dimensional Testing (performed at on-site inspection stations):

<u>Parameter</u>	<u>Range</u>	<u>*Best Uncertainty (+/-)</u>	<u>Comments</u>
Linear	(0 to 1) in	0.0001 in	Digital micrometer
	(0 to 25.4) mm	0.003 mm	
	(0 to 6) in	0.0013 in	Digital calipers
	(0 to 12) in	0.0013 in	
(0 to 150) mm	0.018 mm	Optical comparator	
(0 to 300) mm	0.018 mm		
Angle	(0 to 6) in	0.0007 in	Optical comparator
	(0 to 150) mm	0.018 mm	
Radius	(0 to 2.5) in	0.0028 in	Optical comparator
	(0 to 63.5) mm	0.078 mm	
Thread Functional Pitch Diameter	6-32 UNC 2B to	N/A	Thread ring gages
	7/8-9 UNC 2B;	N/A	
	1/4-28 UNF 2B to	N/A	
	3/4-16 UNF 2B	N/A	
	6-32 UNC 2A & 3A to	N/A	
	2-4.5 UNC 2A & 3A	N/A	
	1/4-28 UNF 2A & 3A to	N/A	
	1-12 UNF 2A & 3A	N/A	
M4 X 0.7 6g & h to	N/A	N/A	
M24 x 3.0 6g & h	N/A		
Concentricity	(0 to 1) in	0.0009 in	Concentricity gage
	(0 to 25.4) mm	0.022 mm	
Thread Pitch Diameter	(0.2 to 1) in	0.0005 in	Johnson gage
	(4 to 20) mm	0.012 mm	
Thread Functional Pitch Diameter	(0.2 to 1) in	0.0005 in	Johnson gage
	(4 to 20) mm	0.012 mm	

**MNP Utica Washer
3105 Beaufait St.
Detroit, MI 48207**

<u>Test</u>	<u>Test Method</u>
<u>Hardness Rockwell</u> (B, C, 15N, 30N)	ASTM E18, SAE J417

Dimensional Testing (performed at on-site inspection stations):

<u>Parameter</u>	<u>Range</u>	<u>*Best Uncertainty (+/-)</u>	<u>Comments</u>
Linear	(0 to 1) in	0.0001 in	Digital micrometer
	(0 to 25.4) mm	0.003 mm	
	(0 to 6) in	0.0013 in	Digital calipers
	(0 to 12) in	0.0013 in	
	(0 to 150) mm	0.018 mm	
Thread Functional Pitch Diameter	(0 to 300) mm	0.018 mm	Thread ring gages
	6-32 UNC 2B to	N/A	
	7/8-9 UNC 2B;	N/A	
	1/4-28 UNF 2B to	N/A	
	3/4-16 UNF 2B	N/A	
	6-32 UNC 2A & 3A to	N/A	
	2-4.5 UNC 2A & 3A	N/A	
	1/4-28 UNF 2A & 3A to	N/A	
1-12 UNF 2A & 3A	N/A		
Concentricity	M4 X 0.7 6g & h to	N/A	Concentricity gage
	M24 x 3.0 6g & h	N/A	
Thread Pitch Diameter	(0 to 1) in	0.0009 in	Concentricity gage
	(0 to 25.4) mm	0.022 mm	
Thread Functional Pitch Diameter	(0.2 to 1) in	0.0005 in	Johnson gage
	(4 to 20) mm	0.012 mm	
Thread Functional Pitch Diameter	(0.2 to 1) in	0.0005 in	Johnson gage
	(4 to 20) mm	0.012 mm	

*“Best Uncertainty” is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine inspections of nearly ideal measurement standards with nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The best uncertainty of a specific test performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer’s test piece, to the environment (if the dimensional testing is performed in the field) and to influences from the circumstances of the specific test.