



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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MECHANICAL

Valid To: September 30, 2026

Certificate Number: 0100.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following types of tests on metals, threaded fasteners, wire, tube, lifting gear, welded chain, wire rope and fittings, springs, and energy absorbing devices and products:

| <b>Test</b>                                            | <b>Test Method(s)</b>                                                                                                                        |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Coatings, Conversions and Platings                     | ASTM B487, B748                                                                                                                              |
| Coating Thickness                                      | EN ISO 1463; NASM 1312-12                                                                                                                    |
| Coating Weight                                         | ASTM A90, A428, B137; MIL-DTL-16232                                                                                                          |
| Conductivity                                           | ASTM E1004                                                                                                                                   |
| Hydrostatic Pressure Tests (0 to 40,000) psi           | SOP 44.00 <sup>1</sup>                                                                                                                       |
| <b>Mechanical Tests of Metals and Metal Products</b>   |                                                                                                                                              |
| Bend                                                   | ASTM E190, E290; AWS B4.0, D1.1, D1.2, D1.5; DIN EN 910                                                                                      |
| Compression                                            | SOP 39.50 <sup>1</sup>                                                                                                                       |
| Creep                                                  | ASTM E139                                                                                                                                    |
| Direct Tension Indicating Washers (Compression)        | ASTM F606/F606M                                                                                                                              |
| Ductility-Fasteners                                    | ASTM A370; ASME BPVC Sec IX; ASME B18.21.1; ASTM A489, E190, E290, F541; FF-S-92; FORD ESS-M1A160A; GM4473; IFI-112, 113; NASM 6812; SAE J78 |
| Radial Crush Test                                      | ASTM B438, B939                                                                                                                              |
| Flattening and Flaring (Tube and Pipe)                 | ASTM A370, B153, B968                                                                                                                        |
| Fracture Toughness                                     | ASTM B909, E399                                                                                                                              |
| Hardenability (Jominy)                                 | ASTM A255                                                                                                                                    |
| Hardness                                               |                                                                                                                                              |
| Rockwell (A, B, C, E, F, 15N, 30N, 45N, 15T, 30T, 45T) | ASTM E18, F606/F606M; EN 1043-1; EN 10109-1; EN ISO 6508; NASM 1312-6                                                                        |
| Brinell (500, 1000, 1500 and 3000) kgf                 | ASTM E10; DIN EN 10003-1; EN ISO 6506                                                                                                        |

| <b>Test</b>                                                                                                                | <b>Test Method(s)</b>                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <i>Mechanical Tests of Metals and Metal Products cont'd</i>                                                                |                                                                                                                               |
| Hydrogen Embrittlement                                                                                                     | ASTM F606, F606M; NASM 1312-5, 1312-14; SAE J78, J81, J1237, J238, J773, USCAR-7; 6010M, 6171M; MIL-DTL-32119                 |
| Impact (-452 to +500) °F                                                                                                   | ASTM E23; DIN 50115, DIN 10045-1; ISO 148-1                                                                                   |
| Magnetic Permeability                                                                                                      | ASTM A342/A342M (Method 3)                                                                                                    |
| Mandrel Break Load Test/Blind Head Formation / Mandrel Retention (Blind Rivets)                                            | IFI-135                                                                                                                       |
| Microhardness                                                                                                              |                                                                                                                               |
| Knoop (100 to 500) gf                                                                                                      | ASTM B578, E384, E92; NASM 1312-6; ISO 4545-1                                                                                 |
| Vickers (300gf, 500gf, 100gf, 10kgf, 30kgf)                                                                                | ASTM E384, E92; NASM 1312-6; ISO 6507-1                                                                                       |
| Room Temperature Stress Rupture                                                                                            | ASTM F519, E139, E292                                                                                                         |
| Proof Load Tests                                                                                                           |                                                                                                                               |
| External                                                                                                                   | ASTM A370, F606/F606M; NASM 1312-8; ISO 898-1                                                                                 |
| Internal                                                                                                                   | ASTM A962/A962M, F606/F606M; EN 493; ISO 898-2, 10485; SAE J1216; GM510M (Section 6.1) (2011); DIN 267-4; IFI 100/107         |
| Axial and Cone                                                                                                             | ASTM F606/F606M; GM 510M; SAE J122, J1965                                                                                     |
| Full Size Eyebolts                                                                                                         | ASTM A489, F541                                                                                                               |
| Shear                                                                                                                      | ASTM B565, F606/F606M; NASM 1312-13, -20; IFI-135                                                                             |
| Stress Rupture (Elevated Temperature)                                                                                      | ASTM E139, E292; NASM 1312-10, EN 2002-005                                                                                    |
| Tensile Strength (Room Temperature)                                                                                        | ASTM A370, B557, E8/E8M, E517; DIN 895, 10237, 20125, 50140; EN 2002-1; ISO 6892-1, 6892-2; NASM 1312-8                       |
| N Value                                                                                                                    | ASTM E646                                                                                                                     |
| R Value                                                                                                                    | ASTM E517                                                                                                                     |
| Tensile Strength (Elevated Temp, Up to 2000) °F                                                                            | ASTM E21; EN 10002-5, 2002-2; ISO 6892-2; NASM 1312-18                                                                        |
| Tension (Axial and Wedge)                                                                                                  | ASTM A370, A489, F541, F606/F606M, F837, F879; ISO 898-1, 3506-1; DIN 267 Part 11; IFI-135; GM 455M, 500M, 6171M; NASM 1312-8 |
| Full Size Extension of Bolts                                                                                               | ASTM F606/F606M; F837; F879; ISO 3506-1; DIN 267- 11                                                                          |
| Torque                                                                                                                     |                                                                                                                               |
| Prevailing Torque                                                                                                          | DIN 267-15; ISO 898-5, 2320; NASM 25027; IFI 100/107, 124; GM9092P                                                            |
| Torsional Strength                                                                                                         | DIN 267-11; ESS M1A160A; ISO 3506-1; NASM 1312-31; SAE J1237                                                                  |
| Torque-Tension                                                                                                             | IFI-101; NASM 1312-15; SAE J174, J1965                                                                                        |
| Washer Tests (Twist, Temper, Pressure, Free Height, Interlinking, Hydrogen Embrittlement, Compressive Load, Permanent Set) | ASTM F606; SAE J238, J773; FF-W-84, FF-W-100; DIN 267-26, 6799; MIL-W-12133                                                   |
|                                                                                                                            |                                                                                                                               |
| <b>Metallography and Micrography of Ferrous and Nonferrous Materials</b>                                                   |                                                                                                                               |
| Alpha Case                                                                                                                 | AMS 4928, 4965                                                                                                                |
| Carburization                                                                                                              | SAE J121 (Withdrawn Jan 2013); ISO 898-1,898-5                                                                                |

| <b>Test</b>                                                                     | <b>Test Method(s)</b>                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Metallography and Micrography of Ferrous and Nonferrous Materials cont'd</i> |                                                                                                                                                                                                                                                            |
| Carbide Microstructure                                                          | ASTM B276, B390, B657, B665; SAE J439                                                                                                                                                                                                                      |
| Case & Core Hardness                                                            | ASTM F606/F606M; SAE J78, J429;<br>NASM 1312-6                                                                                                                                                                                                             |
| Case Depth                                                                      | SAE J423                                                                                                                                                                                                                                                   |
| Corrosion Resistance                                                            | ASTM A262 (Methods A, C & E), A923 (Methods<br>A & C), G48, G28 (Method A); AMS 5656;<br>DIN 50914; EN ISO 3651, 6957                                                                                                                                      |
| Decarburization                                                                 | ASTM E1077, F835 F2328; FF-S-85;<br>SAE J121(Withdrawn Jan 2013), J419;<br>GM 6104M; ISO 898-1, 898-5                                                                                                                                                      |
| Delta Ferrite                                                                   | AMS 2315; ASTM E562                                                                                                                                                                                                                                        |
| Grain Size                                                                      | ASTM E112, E930, E1181                                                                                                                                                                                                                                     |
| Graphite Type and Distribution                                                  | ASTM A247                                                                                                                                                                                                                                                  |
| Macroscopic Preparation/Examination                                             | ASTM A561, A604, E381, E340; AMS 2433;<br>GM4460P                                                                                                                                                                                                          |
| Specimen Preparation                                                            | ASTM E3, E407                                                                                                                                                                                                                                              |
| Microcleanliness                                                                | ASTM E45 (Methods A & D), E766; DIN 50602;<br>SAE J422                                                                                                                                                                                                     |
| Photomicrography                                                                | ASTM E883                                                                                                                                                                                                                                                  |
| Surface Discontinuities                                                         | ASTM F788; SAE J122, J123, J1061                                                                                                                                                                                                                           |
| Surface Finish                                                                  | ASME B46.1                                                                                                                                                                                                                                                 |
|                                                                                 |                                                                                                                                                                                                                                                            |
| Pneumatic Pressure Tests (0 to 6000) psi                                        | SOP 44.00 <sup>1</sup>                                                                                                                                                                                                                                     |
|                                                                                 |                                                                                                                                                                                                                                                            |
| Sample Heat Treatment                                                           | AMS 2750 <sup>2</sup> ; SOP 39.00 <sup>1</sup>                                                                                                                                                                                                             |
|                                                                                 |                                                                                                                                                                                                                                                            |
| Weld Examination                                                                | ASME Sect. IX; API 1104; AWS D1.1/D1.1M,<br>D1.2/D1.2M, D1.3/D1.3M, D1.4/D1.4M,<br>D1.5/D1.5M, D1.6/D1.6M, D14.1/D14.1M,<br>D14.3/D14.3M, D14.4/D14.4M, D14.6/D14.6M,<br>D15.1/D15.1M, D17.1/D17.1M;<br>DIN EN ISO 9606-1, 9606-2;<br>ISO 15614-1, 15614-2 |
|                                                                                 |                                                                                                                                                                                                                                                            |
| Failure Analysis                                                                | Using the methods listed above and on scopes of<br>accreditation 0100.02 and 0100.10 in accordance<br>with ASM Handbook Volume II.                                                                                                                         |
|                                                                                 |                                                                                                                                                                                                                                                            |
| SEM/EDS                                                                         | ASTM E1508; SOP 60.36 <sup>1</sup>                                                                                                                                                                                                                         |
|                                                                                 |                                                                                                                                                                                                                                                            |
| Density – Physical Property                                                     | ASTM B311                                                                                                                                                                                                                                                  |

<sup>1</sup>In-house test procedure.

<sup>2</sup>Please note that this is not a test method but rather a heat treatment specification covering the pyrometric requirements for sample and specimen preparation.



# Accredited Laboratory

A2LA has accredited

**ELEMENT CLEVELAND**

*Cleveland, OH*

for technical competence in the field of

**Mechanical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 6<sup>th</sup> day of September 2024.

A blue ink signature of Mr. Trace McInturff, written over a horizontal line.

Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 0100.01  
Valid to September 30, 2026

*For the types of tests to which this accreditation applies, please refer to the laboratory's Mechanical Scope of Accreditation.*