SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT CLEVELAND
5405 East Schaaf Road
Cleveland, OH 44131
Andrew Kearns Phone: 440 243 3311
Andrew.Kearns@element.com

MECHANICAL

Valid To: September 30, 2024 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:

Test	**Test Method(s)**
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[1]
Mechanical Tests of Metals and Metal Products	
Bend	ASTM E190, E290; AWS B4.0, D1.1, D1.2, D1.5; DIN EN 910
Compression	SOP 39.50[1]
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

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8515 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Test	Test Method(s)
Mechanical Tests of Metals and Metal Products cont'd	
Hydrogen Embrittlement	ASTM F606, F606M; NASM 1312-5, 1312-14; SAE J78, J81, J1237, J238, J773, USCAR-7; 6010M, 6171M; MIL-DTL-32119
Impact (-425 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 E384, E92; NASM 1312-6
Vickers (300gf, 500gf, 100gf, 10kgf, 30kgf)	ASTM E384, E92; NASM 1312-6
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) [2]; 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
Tensile Strength (Room Temperature)	ASTM A370, B557, E8/E8M, E517; DIN 895, 10237, 20125, 50140; 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
Metallography and Micrography of Ferrous and Nonferrous Materials	
Alpha Case	AMS 4928, 4965
Carburization	SAE J121 (Withdrawn Jan 2013)[2]; ISO 898-1,898-5
Carbide Microstructure	ASTM B276, B390, B657, B665; SAE J439

Test	Test Method(s)
Metallography and Micrography of Ferrous and Nonferrous Materials cont'd	
Case & Core Hardness	ASTM F606/F606M; SAE J78, J429; NASM 1312-6
Case Depth	SAE J423
Corrosion Resistance	ASTM A262 (Methods A, C & E), A923 (Methods A & C), G48, G28 (Method A); AMS 5656; DIN 50914; EN ISO 3651, 6957
Decarburization	ASTM E1077, F835 F2328; FF-S-85; SAE J121(Withdrawn Jan 2013)[2], J419; 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; GM4460P
Specimen Preparation	ASTM E3, E407
Microcleanliness	ASTM E45 (Methods A & D), E766; DIN 50602; 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[1]
Sample Heat Treatment	AMS 2750; SOP 39.00[1]
Weld Examination	ASME Sect. IX; API 1104; AWS D1.1/D1.1M, D1.2/D1.2M, D1.3/D1.3M, D1.4/D1.4M, D1.5/D1.5M, D1.6/D1.6M, D14.1/D14.1M, D14.3/D14.3M, D14.4/D14.4M, D14.6/D14.6M, D15.1/D15.1M, D17.1/D17.1M; DIN EN ISO 9606-1, 9606-2; ISO 15614-1, 15614-2
Failure Analysis:	Using the methods listed above and on scopes of accreditation 0100.02 and 0100.10 in accordance with ASM Handbook Volume II.
SEM/EDS	ASTM E1508; SOP 60.36[1]
Density – Physical Property	ASTM B311

[1]In-house test procedure.

[2]This laboratory's scope contains withdrawn or superseded methods. As a clarifier, this indicates that the applicable method itself has been withdrawn or is now considered "historical" and not that the laboratory's accreditation for the method has been withdrawn.

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 laboratory also meets the requirements of R223 – Specific Requirements – GE Aviation S-400 Accreditation Program. 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 24th day of August 2022.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0100.01
Valid to September 30, 2024

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