SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT BROKEN ARROW
3100 North Hemlock Circle
Broken Arrow, OK 74012
Mia Atherton Phone: 918 258 6066
mia.atherton@element.com

MECHANICAL

Valid To: September 30, 2028 Certificate Number: 1089.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on fasteners, metals, alloys, adhesives and sealants, aircraft components, automotive components, coatings, films, packaging; gaskets, seals and packings; composites; plastics and polymers; pipes, hoses, rubber and rubber products:

Test	**Test Method(s)**
Metallurgical Testing	
Tension	ASME Section IX; BS EN 895:1995 (Withdrawn 2011); EN10002-1:2001 (Withdrawn 2009); ASTM A370 (Sections 6-14), A770/770M, A1034/1034M[1], B557/B557M, E8/E8M, E111; ISO 4136, 6892-1
Bend	API 1104; ASME Section IX; ASTM A6/A6M, A370 (Section 15), E190, E290; AWS D1.1/D1.1M, D1.5/D1.5M, D17.1/D17.1M, B2.1/B2.1M; EN910 (Withdrawn 1996); ISO 15614-1, 5173; SOP A203
Hardness	
Portable Hardness (HRC)	ASTM A1038, E110; SOP A206
Brinell (3000 kgf)	ASTM A370 (Section 17), F606/F606M, E10
Rockwell Hardness (HRA, HRBW, HRC, HREW, HRFW, HRHW)	ASTM E18, A370 (Section 18), F606/F606M; NASM-1312-6
Superficial Rockwell Hardness (HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HR15WW)	ASTM E18, A370 (Section 18); NASM-1312-6
Vickers (1 to 10) kgf	ASTM E92, F606/F606M
Charpy Impact (-325 to 80) °F (U- and V- Notch)	ASTM A370 (Section 20-27), E23, A923; ISO 148-1
Flattening	API 1104; ASTM A370 (Section A.2.5.1.1); A530/A530M (Section 21), A1016/A1016M (Section 19), A999/A999M (Section 21), A450/A450M (Section 18); SOP A208

Controlled When Printed

Test	Test Method(s)
Metallurgical Testing (cont'd)	
Flare & Flange Test	ASTM A370 (Section A 2.5.1.4, A 2.5.1.5), A450/A450M, A1016A/A1016M
Nick Break	API 1104 (Section 5.6.3); AWS B4.0 (Section 9.1)
Electrical Conductivity	ASTM E1004; EN 2004-1
Visual Examination	ASME Section IX
Fillet Weld Fracture	ASME Section IX (QW-182)
Tensile Test of Fasteners	
Axial Tensile (Up to ½ in)	ASTM A370 (Section A3.2), E8/E8M, F606/F606M; NASM-1312-8
Proof Load (Interior Thread)	ASTM A370 (Section A4.2), F606/F606M; NASM-1312-8
Wedge Tensile (Up to ½ in)	ASTM A370 (Section A3.2.1.6), F606/F606M
Shear Test of Fasteners	
Double Shear	ASTM B565, F606/F606M, B769; NASM-1312-13
Torque Tests of Fasteners	
Threaded Fasteners	NASM-1312-31
Self-Locking Nuts	NASM-25027, 85730
Metallographic Evaluation	
Metallographic Preparation	ASTM E3
Grain Size	ASTM E112, E930
Macro Etching	ASTM E340, E381
Micro Etching	ASTM E407
Microstructure	ASTM A247; ASM Metals Handbook Vol. 9
Inclusion Content	ASTM E45 (Method A)
Case Depth	ASTM E1077 (except Section 7.5 Chemical Analysis Method); SAE J423 (except Section 4 Chemical Analysis Method)
Visual and Macroscopic Evaluation of Welds	AMS-STD-1595A 1998 (Cancelled 2002); API 1104; ASME Sec IX, VIII-Div 1; AWS B2.1/B2.1M, B2.2/B2.2M, D1.1/D1.1M, D1.2/D1.2M. D1.4/D1.4M, D1.5/D1.5M, D1.6/D1.6M, D17.1/D17.1M; BS EN 287-1 (Withdrawn 2011), 1321:1997 (Withdrawn 2013); BS EN ISO 15614-1, 15614-8; ISO 5817, 15614-5, 17637, 17639; CSA W47.1; EN ISO 9606-1, 9606-4; NAVSEA S9074-AQ-GIB-010/248

Uncontrolled if Printed

Test	Test Method(s)
Metallographic Evaluation (cont'd)	
Microhardness	
Knoop (100 to1000) gf	ASTM B578, E92, E384, F606/F606M; NASM 1312-6; NAVSEA S9074-GIB-010/248
Vickers (100 to 1000) gf	ASTM B578, E92, E384, F606/F606M; NASM 1312-6
Microscopic Determination of	
Constituent Percent	ASTM A800/A800M, E562, E1245
Plating Thickness	ASTM B487; ISO 1463; NASM-1312-12
Failure Analysis	SOP-G200; ASM Handbook Volume 11 (using test methods contained in this scope)
Hydrostatic Pressure Testing	SOP G202; ASTM E1003-13
Scanning Electron Microscope/Energy Dispersive Spectroscopy	ASTM B748, E1508; ASM Handbook Volume 12
Environmental Exposure Simulation	
Effects of Liquids (Rubber)	ASTM D471
Hardness	
Durometer Type: A, M, D	ASTM D2240
Impact	
Izod/Charpy	ASTM D256, D4812, D6110
Mechanical Properties	
Tensile	ASTM D412, D638, D695, D1414 (Section 8), D1708; ISO 527-1
Peel	ASTM D1876, D3167
Shear	ASTM D1002
Tear	ASTM D624
Flexural Properties of Plastics	ASTM D790; ISO 178
Physical Properties	
Density/Specific Gravity	ASTM D792, D297
Taber Abrasion	ASTM D4060; MIL-A-8625
pH	ASTM E70
Corrosion/Environmental Testing	
Coating Evaluation	ASTM D610, D714, D1654, D3359
Salt Spray (Fog)	ASTM B117
Weathering UV Fluorescent	ASTM G151, G154
Weathering Xenon	ASTM G151, G155

Uncontrolled If Printed

I. Dimensional Testing[2]

Parameter	Range	CMC[3] (±)	Technique / Standards
Linear[4]	Up to 1 in Up to 2 in Up to 6 in	0.000054 in 0.0002 in 0.001 in	Digital Micrometer/ASME Y14.5 Optical Comparator/ASME Y14.5 Calipers/ASME Y14.5
Angle[4]	(0 to 45)°	0.048°	Optical Comparator/ASME Y14.5

[1] This laboratory meets the requirements of *ASTM E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection* for the testing of steel construction materials, steel reinforcing bars, and qualification of welding personnel.

[2] This laboratory offers commercial dimensional testing service only.

[3] Calibration and Measurement Capability (CMC) uncertainty is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine measurements of nearly ideal measurement standards or nearly ideal measuring equipment. Calibration and Measurement Capability uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific measurement performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific measurement.

[4] This test is not equivalent to that of a calibration.

[5] The laboratory is only accredited for the test methods listed above. The accredited test methods are used in determining compliance with the material specifications listed below. The inclusion of these material specifications on this Scope does not confer laboratory accreditation to the material specifications.

SAE J429

Uncontrolled If Printed

Accredited Laboratory

A2LA has accredited

ELEMENT BROKEN ARROW

Broken Arrow, OK

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 1st day of September 2026.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1089.01
Valid to September 30, 2028

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

Uncontrolled if printed

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT BROKEN ARROW
3100 North Hemlock Circle
Broken Arrow, OK 74012
Mia Atherton Phone: 918 258 6066
mia.atherton@element.com

CHEMICAL

Valid To: September 30, 2028 Certificate Number: 1089.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on fasteners, metals, alloys, adhesives and sealants, aircraft components, automotive components, coatings, films, packaging; gaskets, seals and packings; composites; plastics and polymers; pipes, hoses, rubber and rubbers products, minerals and inorganics, corrosion/scale:

Test	Test Method(s)
Metallic Testing	
Combustion Analysis	
Carbon & Sulfur	ASTM E1019
Spectroscopy (OES)	
Iron Base (Al, As, B, Bi, Ca, Co, Cr, Cu, Fe, Mn, Mo, N, Nb, Ni, P, Pb, S, Sb, Si, Sn, Ta, Ti, W, V, Zn, Zr)	ASTM E415, E1999, E1086
Aluminum Base (Be, Ca, Cd, Cr, Cu, Fe, Mg, Mn, Ni, Pb, P, Sb, Si, Sn, Ti, V, Zn, Zr)	ASTM E1251
Nickel Base (Al, B, C, Co, Cr, Cu, Fe, Mg, Mn, Mo, Nb, P, Si, Sn, S, Ta, Ti, V, W, Zr)	ASTM E3047
Copper Base (Al, As, Bi, Cd, Co, Cr, Fe, Mg, Mn, Ni, Pb, P, Sb, Si, Sn, S, Zn)	SOP C223
Intergranular Attack Corrosion	ASTM A262 (A, B, C, E), A923 (A and C), A1084 (A and C), G28, G48; ISO 3651-1, -2
Wet Chemistry	SOP C218
ICP- OES Low-Alloy Steel (Al, Sb, As, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Au, Hf, In, Fe, La, Pb, Mg, Mn, Mo, Ni, Nb, Pd, P, Se, Si, Ag, S, Ta, Sn, Ti, W, V, Y, Zn, Zr)	ASTM E1479; SOP C225
ICP-OES Stainless Steel (Al, Sb, As, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Au, Hf, In, Fe, La, Pb, Mg, Mn, Mo, Ni, Nb, Pd, P, Se, Si, Ag, S, Ta, Sn, Ti, W, V, Y, Zn, Zr)	ASTM E1479; SOP C225

Uncontrolled if Printed

Test	**Test Method(s)**
ICP-OES Nickel Base (Al, Sb, As, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Au, Hf, In, Fe, La, Pb, Mg, Mn, Mo, Ni, Nb, Pd, P, Se, Si, Ag, S, Ta, Sn, Ti, W, V, Y, Zn, Zr)	ASTM E1479; SOP C225
ICP-OES Plating Solutions (Al, Cu, Fe, Ti)	ASTM E1479; SOP C225
ICP-OES Aluminum (Al, Sb, As, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Au, Hf, In, Fe, La, Pb, Mg, Mn, Mo, Ni, Nb, Pd, P, Se, Si, Ag, S, Ta, Sn, Ti, W, V, Y, Zn, Zr)	ASTM E1479; SOP C225
pH	ASTM E70
Nonmetallic Testing	
Fourier Transform Infrared Spectroscopy (FTIR)	ASTM D276, D2124, D3677, E168, E334, E1252
Differential Scanning Calorimetry (DSC)	ASTM D3418, D4591, E793, E794, E1356; SOP N215
X-Ray Diffraction Spectrometry (XRD)	ASTM D934; JIS K 0131; SOP N214
Volatiles Content	ASTM D3530
Matrix Solids Content and Matrix Content	ASTM D3529
Ash Content (Burn off)	ASTM D3171 (G), D4745, D5630; ISO 3451-1
Water Absorption	ASTM D570
Coatings	
Coating Weight	ASTM A90/A90M, B137
Corrosion	
Residual Stress Detection	ASTM B154, G36
Exfoliating Corrosion	ASTM G67

Uncontrolled if printed

Accredited Laboratory

A2LA has accredited

ELEMENT BROKEN ARROW

Broken Arrow, OK

for technical competence in the field of

Chemical 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 1st day of September 2026.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1089.02
Valid to September 30, 2028

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

Uncontrolled if printed