



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT BROKEN ARROW
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MECHANICAL

Valid To: September 30, 20

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 types of tests 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.

| <u>Test</u> | <u>Test Method(s)</u> |
|--|---|
| <u>Metallurgical Testing</u> | |
| Tension | ASME Section IX; BS EN 895:1995 (Withdrawn 2011); EN100024:2001 (Withdrawn 2009); ASTM A370 (Sections 614), A770/770M, A1034/1034M, B557, B557M, E8/E8M, E111; ISO 4136, 6892 |
| Bend | API 1104; ASME Section IX; ASTM A6A6M, A370 (Section 1), E190, E290; AWS D1.1/D1.1M, D1.5/D1.5M, D17.1/D17.1M B2.1/B2.1M EN910 (Withdrawn 1996); ISO 15614, 5173; SOP A203 |
| Hardness | |
| Portable Hardness | ASTM A1038 E110 SOP A206 |
| Brinell (3000 kgf) | ASTM A370 (Section 17), F606/F606M E10; ISO 6506-1 |
| Rockwell (A, B, C, E, F, H) | ASTM E18, A370 (Section 18), F606/F606M ISO 6508-1; NASM-13126 |
| Superficial (15N, 30N, 45N, 15T, 30T, 45T 15W) | ASTM E18, A370 (Section 18); ISO 6508-1; NASM-13126 |
| Vickers (1 to 10 kg) | ASTM E92 F606/F606M; BS EN 1043:1996 (Withdrawn 2011); ISO 6507-1, 9015-1 |

Charpy Impact (25 to 80) °F



| <u>Test</u> | <u>Test Method(s)</u> |
|--|--|
| <u>Metallurgical Testing (cont'd)</u> | |
| Flare & Flange Test | ASTM A370 (Section A.2.5.1.4, A.2.5.1.5), A450/A450M, A1016A/A1016M |
| Nick Breaks | API 1104; AWS B4.0 |
| Electrical Conductivity | ASTM E1004 EN 20041, EN 20047 |
| Visual Examination | ASME Section IX |
| Fillet Weld Fracture | ASME Section IX |
| <u>Tensile Test of Fasteners</u> | |
| Axial Tensile (Up to ½ in) | ASTM A370 (Section A3.2), E8M, F606/F606M; NASM13128 |
| Proof Load (interior & exterior thread) | ASTM A370 (Section A3.2) F606/F606M; NASM-13128 |
| Wedge Tensile (Up to ½ in) | ASTM A370 (Section A3.2.1.6), F606/F606M; SAE J429 |
| <u>Shear Test of Fasteners</u> | |
| Double | ASTM B565, F606/F606M; NASM1312-13 |
| <u>Torque Tests of Fasteners</u> | |
| Threaded Fasteners | NASM-131231 |
| Self-Locking Nuts | NASM-25027, 85730 |
| <u>Metallographic Evaluation</u> | |
| Metallographic Preparation | ASTM E3 |
| Grain Size | ASTM E112, E930, E1382 |
| Macro Etching | ASTM E340, E381 |
| Micro Etching | ASTM E407 |
| Microstructure | ASTM A247 |
| Inclusion Content | ASTM E45 (Method A) |
| Case Depth | ASTM E1077; SAE J423 |
| Visual and Macroscopic Evaluation of Welds | AMS-STD-1595A 1998 (Cancelled 2002) API 1104; ASME Sec IX, VIH Div 1; |



I. Dimensional Testing³

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

¹ 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



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



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