SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT MATERIALS TECHNOLOGY CHICAGO
194 Internationale Boulevard
Glendale Heights, IL 60139
Arvid Casler Phone: 630 221 0385 x76243
E-mail: arvid.casler@element.com

MECHANICAL

Valid to: June 30, 2022 Certificate Number: 0104.02

In recognition of the successful completion of the A2LA evaluation process (including compliance to R223 – Specific Requirements – GE Aviation S-400 Accreditation Program), accreditation is granted to this laboratory to perform failure analysis and the following tests on the following products: forgings; castings; powder metal; threaded fasteners; sheets; weldments of materials including aluminum and aluminum alloys, copper and copper alloys; carbon steel; low alloy steel; silicon electric steel; stainless steel; cemented carbides; ingot iron; wrought iron; cast iron; titanium; lead and tin solders; magnesium; tool steels; zinc base for the automotive, railroad, aerospace, nuclear, medical, agricultural, electronic, power generation, tool and die, consumer and construction industries.

Test	**Test Method(s)**
Metals	
Adhesion	ASTM A123/A123M, B571 (Methods 5, 11, 13), D3359
Bend Test	ASME (Section IX); ASTM A370, E190, E290; BS EN 910 (2000)[1]; BS EN ISO 5173
Coating Thickness	ASTM B748
Corrosion Tests	
Salt Spray	ASTM B117, B537; NASM 1312-1
Humidity	ASTM D1735, D2247; NASM 1312-3
Intergranular Corrosion	ASTM A262, A763, G28, G46, G48
Fastener Proof Load (400,000 lbs Max Capacity) (Internal and External Threads and Cone Method)	ASTM A370, F606/F606M; SAE J1216
Axial Tensile & Wedge Tensile	ASTM F606/F606M
Fillet Fracture Test	AWS B2.1/B2.1M, D1.1/D1.1M, D1.3/D1.3M, D14.1/14.1M; ASME (Section IX); MIL-STD 1595 (1998)[1]

Test	**Test Method(s)**
Metals Continued	
Hardenability	ASTM A255
Hardness	
Rockwell (A, B, C, E, F, 15N, 30N, 45N, 15T, 30T, 45T)	ASTM A370, A623, B294, E18, F606/606M; NASM 1312-6
Brinell (500 and 3000) kgf	ASTM A370, E10
Microhardness – Knoop and Vickers (25 to 1000) gf	ASTM E384; NASM 1312-6
Macrohardness – Vickers (5 and 10) kgf	ASTM E92
Heat Treat (Raw Material)	AMS 2750E
Impact Testing (Charpy and Izod) (-320 to 450) °F	ASTM A370, E23; BS EN ISO 148-1; BS EN 10045-1 (2001)[1]
Metallographic Evaluation	
Alpha Case	ASTM F136; SOP 02-11-S007
Case Depth	ASTM F2328; SAE J423
Delta Ferrite Determination	AMS 2315
Depth of Decarburization	ASTM E1077; SAE J121 (2013)[1], J419, F2328
Discontinuities (Surface)	ASTM F788, F812; ISO 6157; SAE J122, J123 (2012)[1], J1061
Grain Size	ASTM E112, E930, E1181
Inclusions in Steel	ASTM E45 (Methods A&D), E1245; SAE J422
Macroetch	ASTM A561, A604/A604M, E381, E340; ASME (Section IX)
Microetch	ASTM E407
Microstructure Evaluation	ASTM A247, A892, E1268; ASM Metals HBK, Vol. 9
Plating Thickness	ASTM B487
Preparation	ASTM E3
Volume Fraction by Point Count	ASTM E562, A800/A800M
Passivation Testing	ASTM A380/A380M, A967/A967M, F1089
Peel	ASME (Section IX)
SEM/EDS	ASTM B748, E1508
Shear - Single	ASTM F606/F606M
Shear – Double	ASTM B769; NASM 1312-13
Stress Rupture	ASTM E139, E292
Surface Roughness	ASME B46.1
Tension	ASTM A48/A48M, A370, B557, E8, F606/606M; BS EN 10002-1 (2000)[1]; BS EN ISO 6892-1; NASM 1312-8

Test	Test Method(s)
Metals Continued	
n-Value (Strain Hardening Exponent)	ASTM E646
R-Value (Plastic Strain Ratio)	ASTM E517
Tension – Elevated Temperature	ASTM E21; BS EN 10002-5 (2000)[1]; BS EN ISO 6892-2; NASM 1312-18
Fracture Toughness (K, J and CTOD)	ASTM E399, E1290; BS 7448-1 (1999)[1], 7448-2 (2010)[1], 7448-4
Torque	ASME B18.16.6; IFI 100/107, 125; SAE J174
Water Immersion	ASTM D870
Weld Procedure and Welder Qualification (Visual, Mechanical and Metallographic)	ASME (Section IX); AWS B2.1, D1.1/D1.1M, D1.2/D1.2M, D1.3/D1.3M, D1.5/D1.5M, D14.1/D14.1M, D15.1/D15.1M, D17.1/D17.1M, D17.2/D17.2M; AMS W6858, 1595(2002)[1]; API 1104, 5L; BS EN 1321(2013)[1], 288-3(2004)[1]; BS EN ISO 5817, 15614-1, 15620; MIL-STD-1595(1998)[1]
Failure Analysis	Using ASM Handbook Vol 11 and the methods listed on scopes.

[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 laboratory's accreditation for the method has been withdrawn.

Accredited Laboratory

A2LA has accredited

ELEMENT MATERIALS TECHNOLOGY CHICAGO

Glendale Heights, IL

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 31st day of July 2020.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0104.02
Valid to June 30, 2022

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