SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

TENSILE TESTING METALLURGICAL LABORATORY
4520 Willow Parkway
Cleveland, OH 44125
Joseph Boyle Phone: 216 641 3290

CHEMICAL

Valid To: May 31, 2025 Certificate Number: 0161.01

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 the following tests on aerospace, nuclear, automotive parts, bar, forgings, castings, fasteners, medical implants, heat treated parts, eyebolts, weldments, coatings, paint, billets, stampings, rebar, wire, buckles, shackles, hitches, hooks, chains, cargo rings, clevis, turnbuckles, inserts and tubular products:

Test	Test Method(s)
Spectroscopy	
Optical Emission Spectrochemical Analysis - Argon Path (OES) (Al, As, B, Bi, C, Cd, Co, Cr, Cu, Mg, Mn, Mo, Ni, P, Pb, Sb, Sn, Ti, V, W, Zn)	ASTM E415, E1086, E1251, E1999
Combustion	
LECO Carbon and Sulfur Analyzer (C, S)	ASTM E1019
LECO Oxygen, Nitrogen, and Hydrogen Analyzer (O, N, H)	ASTM E1019, E1447

Note: Testing performed on the following materials: Aluminum, Carbon and Alloy Steel, Copper Alloys (Brass, Bronze), Titanium, Cobalt, Superalloys, Tool Steels, Hadfield Manganese and Stainless Steels.

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8398 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Accredited Laboratory

A2LA has accredited

TENSILE TESTING METALLURGICAL LABORATORY

Cleveland, OH

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 laboratory also meets the requirements of GE Aviation S-400 in the Chemical field. 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 10th day of May 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0161.01
Valid to May 31, 2025

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

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

TENSILE TESTING METALLURGICAL LABORATORY
4520 Willow Parkway
Cleveland, OH 44125
Joseph Boyle Phone: 216 641 3290

MECHANICAL

Valid To: May 31, 2025 Certificate Number: 0161.02

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 the following tests on aerospace, nuclear, automotive parts, bar, forgings, castings, fasteners, medical implants, heat treated parts, eyebolts, weldments, coatings, coils, plates, paint, billets, stampings, rebar, wire, buckles, shackles hitches, hooks, chains, cargo rings, clevis, turnbuckles, inserts and tubular products[1]:

Test:	Test Method(s):
Mechanical:	
Ball Punch Deformation (Olsen, Erichsen)	ASTM E643
Bend Test	ASTM A370 (Sec. 15), A489, E190, E290; ISO 5173, 7438
Charpy Impact (-320, -300 to 212) °F	ASTM A370 (Sec. 20-29), A923 (Method B), E23; EN 10045-1; ISO 083, 148
Compression	ASTM E9
Flare Test	ASTM A370 (Sec. A2.5.1.4)
Flattening Test	ASTM A370 (Sec. A2.5.1.1)
Fracture Toughness	ASTM E399, ISO 12135
Hardness:	
Brinell (500, 1500 & 3000) Kg	ASTM E10; ISO 6506, ISO 898-5 (6.1.2)
Rockwell / Superficial Rockwell (HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRHW, HRKW, HR15TW, HR30TW, HR45TW, HR15N, HR30N, HR45N)	ASTM E18, F606/F606M; NASM 1312-6; ISO 6508, ISO 898-5 (6.1.3)
Jominy Hardenability	ASTM A255; SAE J406
Microhardness:	
Knoop (100, 200, 500) g	ASTM E384, E92, F606/F606M; NASM 1312-6; ISO 5454
Vickers (300 g, 500 g, 1000 g, 10 Kg)	ASTM E92, E384, F606/F606M; NASM 1312-6; ISO 6507, ISO 898-5 (6.1.1)
Tape Adhesion	ASTM D3359

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Test:	Test Method(s):
Evaluation of the Degree of Blistering of Paints	ASTM D714
Stress Rupture (Up to 1500) °F w/ Smooth, Notch and Combination Bars	ASTM E139, E292; ISO 204; NASM 1312-14
Tensile:	
Room Temperature (Up to 400K for Ultimate Tension, Yield, Modulus)	ASTM A370 (Sec. 6-14), A770, B557, E8/E8M; DIN 50125; EN 10002 (Withdrawn 2001)[2], 10164; JIS Z2201, Z2241; NASM 1312-8; ISO 6892-1
R Value	ASTM E517; ISO 10113
N Value	ASTM E646; ISO 10275
Elevated Temperature (Up to 1500) °F	ASTM E21; NASM 1312-18; ISO 6892-2
Fastener:	
Discontinuities	ASTM F788, F812; SAE J122, J123 (Cancelled 2012)[2]; ISO 6157
Ductility	SAE J78, J81
Hydrogen Embrittlement / Debrittlement	ASTM F519, F606/F606M; NASM 1312-5
Verification (Stress Durability)	USCAR-5, USCAR-7
Prevailing Torque	IFI 100/107
Proof (Internal & External Threads)	ASTM A370 (Annex A3), F606; SAE J429, J995; ISO 898-2, -6
Rotational Capacity (RoCap)	AASHTO M164 (Withdrawn 2005)[2]; ASTM A325 (Sec. 10.2), F3125
Tensile:	
Axial Tensile	ASTM F606/F606M; ISO 898-1; ICC AC437 (Sec. 4-1-4.3 only)
Wedge Tensile	ASTM F606/F606M; ISO 898-1
Screw Thread Insert	MIL-I-45914A
Shear / Double Shear	ASTM F606; NASM 1312-13, 1312-20; ICC AC437 (Sec. 4-1-4.3 only)
Torque Tension	ISO 16047
Torque Testing	ASTM F738 (Sec. 10.2.4), F880 (Sec. 12.3), F912 (Sec. 11.2); IFI 101; ISO 898-5 (6.3), -7
Turnbuckle Test	ASTM F1145
Metallographic Evaluation:	
Alpha Case	ASTM E407
Banding / Orientation of Microstructures	ASTM E1268; ASM Handbook (Vol. 9)
Case Depth	SAE J423, J121 (Cancelled 2013)[2]; ISO 18203
Depth of Decarburization / Chord Method	ASTM A574, E1077, F2328; SAE J121, SAE ARP 1820, ISO 898-5 (6.2)
Ferrite Rating	AMS 2315

Test:	Test Method(s):
Graphite in Castings / Nodularity	ASTM A247; GM9095P
Grain Size (Comparison Method)	ASTM E112, E930
Volume Fraction by Systematic Manual Point Count	ASTM E562
Inclusion Rating / Microcleanliness	ASTM E45 (Method A & D)
Metallographic Specimen Preparation	ASTM E3
Macro / Micro Etch	ASTM A604, E340, E381, E407
Photomicrography	ASTM E883
Plating Thickness / Coating Thickness	ASTM B487
Material Property Analysis:	
Coating Weight	ASTM A90, A428, B137; NASM 1312-12
Conductivity	ASTM E1004
Surface Roughness / Surface Finish	ASME B46.1
Adhesion of Metallic Coatings	ASTM B571 (Methods 3, 4, 7, 8, 9)
Corrosion:	
Corrosion Test	ASTM A923 (Method A & C)
Intergranular Corrosion (IGA)	ASTM A262 (Practice A & E)
Salt Spray	ASTM B117; ISO 9227
Humidity	ASTM D1735; ISO 7253
Other:	
Failure Analysis (using the test technologies listed above)	ASM Metals Handbook Vol. 11
Heat Treat[3]	SAE-AMS-H6875, AMS 2750
Weld Evaluation – PQR, WPS	ASME Section IX, AWS D1.1, D1.5

[1]Testing performed on the following materials: Aluminum, Carbon and Alloy Steel, Copper Alloys (Brass, Bronze), Titanium, Cobalt, Superalloys, Tool Steels, Nickel Alloys and Stainless Steels.

[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.

[3]Heat Treatment Performed Only on Samples Prior to Testing. (Heat Treat Capability) including age, anneal, austenitize, bake, heat resistance, normalize, PWHT (Post Weld), stress relieve, quench & temper, 24 hour on nuts.

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Presented this 10th day of May 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0161.02
Valid to May 31, 2025

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