



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, 2023

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; TTML C-01

Combustion

LECO Carbon and Sulfur Analyzer (C, S)

ASTM E1019; TTML C-04

LECO Oxygen, Nitrogen, and Hydrogen Analyzer
(O, N, H)

ASTM E1019, E1447; TTML C-05

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.



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 28th day of May 2021.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0161.01
Valid to May 31, 2023

For the types of 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, 2023

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 products¹:

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)

Pencil Hardness

ASTM D3363

Tape Adhesion

ASTM D3359

Test:

Evaluation of the Degree of Blistering of Paints
 Stress Rupture (Up to 1500) °F
 w/ Smooth, Notch and Combination Bars
 Tensile
 Room Temperature (Up to 400K for
 Ultimate Tension, Yield, Modulus)

 R Value
 N Value
 Elevated Temperature (Up to 1500) °F

Test Method(s):

ASTM D714
 ASTM E139, E292; ISO 204; NASM 1312-14

 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
 ASTM E517; ISO 10113
 ASTM E646; ISO 10275
 ASTM E21; NASM 1312-18

Fastener:

Discontinuities

 Ductility
 Hydrogen Embrittlement / Debrittlement
 Verification (Stress Durability)
 Prevailing Torque
 Proof (Internal & External Threads)

 Rotational Capacity (RoCap)

 Tensile
 Axial Tensile

 Wedge Tensile

 Screw Thread Insert
 Shear / Double Shear

 Torque Tension
 Torque Testing

 Turnbuckle Test

ASTM F788, F812; SAE J122, J123 (Cancelled
 2012)²; ISO 6157
 SAE J78, J81
 ASTM F519, F606/F606M; NASM 1312-5
 USCAR-5, USCAR-7
 IFI 100/107
 ASTM A370 (Annex A3), F606; SAE J429, J995;
 ISO 898-2, -6
 AASHTO M164 (Withdrawn 2005)²;
 ASTM A325 (Sec. 10.2), F3125

 ASTM F606/F606M; ISO 898-1;
 ICC AC437 (Sec. 4-1-4.3 only)
 ASTM F606/F606M; ISO 898-1

 MIL-I-45914A
 ASTM F606; NASM 1312-13, 1312-20;
 ICC AC437 (Sec. 4-1-4.3 only)
 ISO 16047
 ASTM F738 (Sec. 10.2.4), F880 (Sec. 12.3),
 F912 (Sec. 11.2); IFI 101; ISO 898-5 (6.3), -7
 ASTM F1145

Metallographic Evaluation:

Alpha Case
 Banding / Orientation of Microstructures
 Case Depth
 Depth of Decarburization / Chord Method

 Ferrite Rating
 Graphite in Castings / Nodularity
 Grain Size (Comparison Method)
 Volume Fraction by Systematic Manual Point Count
 Inclusion Rating / Microcleanliness
 Metallographic Specimen Preparation
 Macro / Micro Etch

ASTM E407; TTML LI-019
 ASTM E1268; ASM Handbook (Vol. 9)
 SAE J423, J121 (Cancelled 2013)²; ISO 18203
 ASTM A574, E1077, F2328; SAE J121,
 SAE ARP 1820, ISO 898-5 (6.2)
 AMS 2315
 ASTM A247; GM9095P
 ASTM E112, E930
 ASTM E562
 ASTM E45 (Method A & D)
 ASTM E3
 ASTM A604, E340, E381, E407

Test:

Photomicrography
Plating Thickness / Coating Thickness

Material Property Analysis:

Coating Weight
Conductivity
Surface Roughness / Surface Finish
Adhesion of Metallic Coatings

Test Method(s):

ASTM E883
ASTM B487

ASTM A90, A428, B137; NASM 1312-12
ASTM E1004
ASME B46.1
ASTM B571 (Methods 3, 4, 7, 8, 9)

Corrosion:

Corrosion Test
Intergranular Corrosion (IGA)
Salt Spray
Humidity

ASTM A923 (Method A & C)
ASTM A262 (Practice A & E)
ASTM B117; ISO 9227
ASTM D1735; ISO 7253

Other:

Failure Analysis
(using the test technologies listed above)
Heat Treat³
Weld Evaluation – PQR, WPS

TTML LI-011; ASM Metals Handbook Vol. 11

SAE-AMS-H6875, AMS 2750
ASME Section IX, AWS D1.1, D1.5

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

²This 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.

³Heat 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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Vice President, Accreditation Services
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