



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

METALLURGICAL SOLUTIONS, INC.
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MECHANICAL

Valid To: February 28, 2023

Certificate Number 2037.01

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 types of tests on automotive components, metals, alloys, and coatings:

<u>Test</u>	<u>Test Method(s)</u>
Hardness: Rockwell (HRB, HRC, HR15T, HR30T, & HR30N) Brinell Hardness (10/500 Kgf and 10/3000 Kgf)	ASTM E18, F606/F606M ASTM E10
Microindentation Hardness Vickers (50, 300, 500, and 1000 gf) Knoop (25, 50, 300, 500, and 1000 gf)	ASTM E384, E92
Charpy Impact (Up to 240 ft·lbs/325 J/ (-50 to 95) °F)	ASTM E23
Tensile r-Value n-Value	ASTM A370, E8/8M, B557 ASTM E517 ASTM E646
Fastener Tensile (Axial – Load to 60,000 lbs)	ASTM F606/F606M
Bond Strength of Thermal Spray Coatings	ASTM C633
Bend Test	ASTM E190, E290
Coating Mass	ASTM A90
Salt Fog	ASTM B117
Case Depth	SAE J423
Microstructure	ASM Metals Handbook Vol. 9

Test**Metallographic Evaluation:**

Alpha Case
Carbide Content
Preparation
Plating Thickness
Inclusion Content
Susceptibility to IGA of Austenitic Stainless Steel
Intergranular Attack/Oxidation
Depth of Decarburization
Grain Size
Microetch / Macroetch
Replication¹
SEM Performance

Test Method(s)

MSI PWI #38
ASTM A892
ASTM E3
ASTM B487
ASTM E45 (Method A)
ASTM A262 (Method A)
MSI PWI #35
ASTM E1077
ASTM E112
ASTM E340, E407
ASTM E1351
ASTM E986

Chemical Analysis**Glow Discharge Optical Emission Spectroscopy**

Low Alloy Steel (Al, C, Cr, Cu, Mn, Mo, Nb, Ni, P, S, Si, Ti, V)
Cast Iron (C, Cr, Cu, Mn, Mo, Ni, P, S, Si, Ti, V)
High Alloy Steel (C, Co, Cr, Cu, Mn, Mo, Nb, Ni, P, S, Ti, W, V)
Aluminum (Cr, Cu, Fe, Mn, Ni, Si, Ti, V, Zn, Mg)
Titanium (Al, Cr, Fe, Mo, V)

ASTM A751, E415, E1086, E1999,
E1251, E2994

Wavelength Dispersive X-ray Fluorescence Spectroscopy

Low Alloy Steel (Al, Cr, Cu, Mn, Mo, Nb, Ni, P, S, Si, Ti, V)
High Alloy Steel (Al, Cr, Cu, Mn, Mo, Nb, Ni, P, S, Si, Ti, V, W)
Nickel (Al, Co, Cr, Cu, Fe, Mn, Mo, Nb, Ti, P)
Titanium (Al, Cr, Fe, Mn, Mo, Nb, Sn, V, Zr)

ASTM E1085, E572, E2465, E539

Combustion Analysis (C, H, N, O, S)

ASTM E1019, E1941, E1409, E1447

Weld Examination (Operator & Procedure Qualification)

ASME IX; AWS D1.1/D1.1M;
AWS D1.2/D1.2M, AWS D1.6/D1.6M,
AWS D1.9/D1.9M,
AWS D17.1/D17.1M

Failure Analysis

ASME IX; AWS D1.1/D1.1M,
AWS D1.2/D1.2M, AWS D1.6/D1.6M,
AWS D1.9/D1.9M,
AWS D17.1/D17.1M;
ASM Metals Handbook Vol. 11;
ASTM E620, E678, E860, E2332

¹This laboratory performs field testing activities for these tests.





Accredited Laboratory

A2LA has accredited

METALLURGICAL SOLUTIONS INC.

Dayton, OH

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 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 20th day of April 2021.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2037.01
Valid to February 28, 2023

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