



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017¹

IMR TEST LABS
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MECHANICAL

Valid to: April 30, 2022

Certificate Number: 1140.01

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 types of tests listed below on adhesives, aluminum alloys, brass and bronze, cables, carbon steel, cast iron, ceramics, coatings, composites, copper alloys, electronics, elastomers, fasteners, labels, low alloy steel, nickel, paints, plastics, powder metals, power and hand tools, rubber, stainless steel, super alloys, titanium alloys, zinc alloys, thermal spray, oil and oil products for the following industries: aerospace, automotive, nuclear, medical device, consumer products and industrial goods, metal production, general manufacturing, utilities, petrochemical and power generation:

<u>Test²:</u>	<u>Test Method(s):</u>
<u>Mechanical Properties</u>	
Bend	ASTM A370, D522 Method B; ASME Section IX
Ductility (Bend)	ASTM E290
Elevated Tensile Test ≤ 2000 °F	ASTM E21
Impact (Charpy -320 to 400 °F)	ASTM A370, E23
Lap Shear	ASTM D1002, D3163, D3528
Surface Roughness	ANSI/ASME B46.1
Strain Gaging	ASTM E1237
Tension (TS, YS, EL, RA) (up to 160,000 lbs.)	ASTM A48/A48M, A370, B557, E8/E8M, E345, F606/F606M
Compression	ASTM E9
Young's, Tangent, and Chord Modulus (Room Temperature)	ASTM E111
Creep	ASTM E139
Stress Rupture	ASTM E139, E292
Hydrogen Embrittlement Testing of Plated Parts	ASTM F519
Shear Testing of Aluminum	ASTM B769
Pin-Type Bearing Test	ASTM E238
<u>Coatings & Platings</u>	
Adhesion (File and Grind-Saw)	ASTM B571 Method 7 and 8 (<i>except draw</i>), D3359
Adhesion or Cohesion Strength of Thermal Spray Coatings	ASTM C633
Microhardness of Coatings	ASTM B578

<u>Test²:</u>	<u>Test Method(s):</u>
<u>Coatings & Platings (cont'd)</u>	
Surface Evaluation (Dubpernell Active Site Test)	ASTM B456 (Appx. 4)
Tension Testing of Calcium Phosphate & Metal	ASTM F1147
Thickness by SEM	ASTM B748
Thickness by Cross Section	ASTM B487
Wet Tape Adhesion	FED-STD-141 Method 6301
<u>Corrosion/ Environmental Testing</u>	
Acetic Acid	ASTM G85; DIN 50 021; ISO 9227
Accelerated Corrosion	ASTM G34; GMW14872
Chemical Passivation Treatments for Stainless Steel Parts	ASTM A967/A967M; AMS 2700
Condensing (Relative Humidity 100%)	ASTM D2247
Conversion Coatings	MIL-DTL-5541, MIL-DTL-81706
Cyclic	GMW14872
Cyclic Potentiodynamic Polarization Measurement to Determine Corrosion	ASTM F2129, G61
Dezincification	Australian Std AS 2345; ISO 6509-1
Humidity (Relative Humidity 95%)	ASTM D1735; NASM 1312-3
Laboratory Immersion Corrosion Testing	ASTM G31
Potentiodynamic Corrosion	ASTM G5, G59
QUV	ASTM G154
Salt Spray	ASTM B117, D610, G85; ISO 9227
Slow Strain Rate testing for Environmental Cracking	ASTM G129
Susceptibility to Stress Corrosion Cracking in Copper Alloys	ASTM B154, B858; ISO 12614-2
U-Bend Stress Corrosion Sample Preparation	ASTM G30
Pitting and Crevice Corrosion Resistance of Stainless Steel	ASTM G48
Galvanic Corrosion of Medical Implants	ASTM F3044
Stress-Corrosion of Titanium Alloys	ASTM F945
<u>Fasteners</u>	
Hardness	ASTM F606/F606M
Tensile (up to 160,000 lbs.)	
Axial & Wedge (up to ½ in.)	ASTM A370, E8/E8M, F606/F606M; NASM 1312-8; SAE J429, J995
Proof (Internal & External Threads)	ASTM A370, F606/F606M; SAE J429, J995
Stress Durability (Hydrogen Embrittlement)	ASTM F606/F606M; CHRYSLER PS-9500; SAE/USCAR-7
<u>Fatigue</u>	
Axial (High Cycle/Low Cycle Fatigue) (0 to 55) kip	ASTM E606, E466, F1624; MAP-046
Coating Shear	ASTM F1160
Measurement of Fatigue Crack Growth Rates	ASTM E647
Fracture Toughness/Mechanics	ASTM B645, E399, E1820



<u>Test²:</u>	<u>Test Method(s):</u>
Hardness	
Brinell (500, 1000, 1500, 3000Kgf)	ASTM A370, E10
Rockwell & Superficial (A, B, C, F, 15N, 30N, 45N, 15T, 30T, 45T, E, 15Y)	ASTM A370, E18, F606/F606M; SAE J429, J995
Macro-Vickers (1 to 10) kg	ASTM E92
Microhardness	
Knoop (10 to 1000) gf	ASTM E384/E92
Vickers (10 to 1000) gf	ASTM E384/E92
Hydrostatic Leak Testing	MAP-063
Metallurgical Exam	
Preparation of Specimens	ASTM E3
Alpha Case	FAP-032; GE P3TF19
Case Depth/Carburization	SAE J423
Depth of Decarburization	ASTM E1077, F2328; SAE J419
Delta Ferrite Content	AMS 2315
Grain Size	ASTM E112, E1382; GE E50TF133
Inclusion Content	ASTM E45, E1245
Intergranular Attack	AMS 2772; ASTM A262, G28, G110, BSS 7219
Microstructure	ASTM A247, E1268; ISO 945-1
Microetching	ASTM E407
Macroetching	ASTM E340, E381
Chord Method-Microstructure	SAE ARP 1820
Non-Metallic Testing	
Abrasion (Taber)	ASTM C501, D968, D4060; MIL-A-8625
Brookfield Viscometry	ASTM D2196
Compression Set	ASTM D395 Method B, D3575 (Suffix B)
Compressive Properties	ASTM D695, D3575 (Suffix D)
Conditioning	ASTM D618
Durometer (A, D, M)	ASTM D2240; ISO 868
Flammability	ASTM D5132; FMVSS 302; ISO 3795; SAE J369; UL94 (<i>except Section 10-radiant panel</i>)
Flexural Properties of Plastics	ASTM D790
Gardner Impact	ASTM D2794, D5420
Mass Per Unit Area of Fabric	ASTM D3776
Melt Index	ASTM D1238
Rockwell (E, R, M)	ASTM E18
Rubber O-Rings	ASTM D1414 Section 7
Polymer Aging (Air, Liquids)	ASTM D471, D543, D573, D3575 (Suffix S)
Tear Resistance of Films & Sheetting	ASTM D1004
Tear – Rubbers & Elastometers	ASTM D624 (Type B & C), D3575 (Suffix G)
Tensile/Elongation	ASTM D412, D638, D882, D3575 (Suffix T); ISO 527 (Parts 1-5)
Vickers Hardness Testing of Advanced Ceramics	ASTM C1327

<u>Test²:</u>	<u>Test Method(s):</u>
<u>Paint & Coatings</u>	
Adhesion	ASTM D3359
Blistering	ASTM D714
Coefficient of Friction	ASTM D1894
Corrosion Creepback	ASTM D1654
Pencil Hardness	ASTM D3363
Mandrel Bend	GMW16746
<u>Polymer Composite Materials Testing</u>	
Bearing/Bypass Interaction Response Polymer Matrix Composite Laminates	ASTM D5961, D7248
Climbing Drum Peel Strength of Adhesives	ASTM D1781
Compressive Properties Using Combined Loaded Compression	ASTM D6641
Compressive Properties with Unsupported Gage Section by Shear Loading	ASTM D3410
Conditioning of Polymer Composites	ASTM D5229
Constituent Content	ASTM D2584, D2734, D3171, D3529
Core Shear Properties of Sandwich Construction by Beam Flexure	ASTM C393
Curved Beam Strength of Fiber Reinforced Polymer Matrix Composite	ASTM D6415/D6415M
Filled Hole Tension & Compression Testing of Polymer Matrix Composite Laminates	ASTM D6742/D6742M
Flatwise Compressive Properties of Sandwich Core Materials	ASTM C365
Flexural Properties of Polymer Matrix Composites	ASTM D7264
Floating Roller Peel Strength	ASTM D3167
Gel Time	ASTM D3532
In-Plane Shear Response	ASTM D3518/D3518M
Open Hole Compression	ASTM D6484
Open Hole Tensile Testing	ASTM D5766
Shear Properties of Polymer Materials (V-Notch)	ASTM D5379/D5379M
Shear Properties of Sandwich Core Materials	ASTM C273
Short Beam Strength	ASTM D2344
Resin Flow of Carbon Fiber-Epoxy PrePreg	ASTM D3531
Tensile Properties of Polymer Composites	ASTM C297/C297M, D3039/D3039M
Void Content	ASTM D2734
Volatiles Content	ASTM D3530, D3532
<u>Powdered Metals</u>	
Case Depth	MPIF 52
Charpy Impact	ASTM E23; MPIF 59; ISO 148-1
Microhardness (HV 500g)	ASTM E384; MPIF 51
Tensile Properties	ASTM E8/E8M; MPIF 10
Shot Peen Qualification	MI-QC0-01-11A

<u>Test²:</u>	<u>Test Method(s):</u>
Stereological Evaluation of Porous Coatings on Medical Implants	ASTM F1854
Volume Resistivity	ASTM B193
Weld Testing	Using the methods listed above (and if applicable, on Scope of Accreditation 1140.02) in accordance with ASME Section IX, AWS D1.1/D1.1M, D1.2/D1.2M, D1.5/D1.5M, D17.1/D17.1M; BS EN ISO 9606-1, BS EN ISO 15614-1; ISO 5173, BS EN ISO 5817; DIN ISO 9015-1
Failure Analysis	Using the test methods listed above and on Scope 1140.02, referencing the ASM handbook; ASTM E620, E678, E860, E883, and E1188

I. Dimensional Testing^{3,4}

Parameter/Equipment	Range	Uncertainty (±)	Comments
Linear (1D)	Up to 1 in Up to 1 in Up to 8 in Up to 24 in	0.0001 in 0.0005 in 0.001 in 0.001 in	Digital dial indicators Digital micrometers Digital calipers Vernier caliper

¹This laboratory also meets the requirements of ISO/IEC 17025:2005.

²The laboratory is only accredited for the test methods listed above. The accredited test methods are used in determining compliance with any material specifications included on this scope and listed below. The inclusion of these material specifications on this Scope does not confer laboratory accreditation to the material specifications nor does it confer accreditation for the method(s) embedded within the specifications.

- Medical Polymer Testing – ASTM F648
- Steel Tubing for Fluid Handling (Pressure Test) – GMW 17334, SAE J526

³This laboratory offers commercial dimensional testing service only. These tests are not equivalent to that of a calibration.

⁴This scope meets A2LA's *P112 Flexible Scope Policy*.



Accredited Laboratory

A2LA has accredited

IMR TEST LABS

Lansing, NY

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 S400 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 14th day of April 2020.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1140.01
Valid to April 30, 2022

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