



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

IMR METALLURGICAL SERVICES  
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MECHANICAL

Valid to: April 30, 2020

Certificate Number: 1140.03

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 materials and products tests: adhesives, aerospace and automotive products, aluminum alloys, brass and bronze, cables, carbon steel, cast iron, ceramics, coatings, copper alloys, elastomers, fasteners, labels, low alloy steel, nickel, paints, plastics, powder metals, power and hand tools, rubber, stainless steel, superalloys, titanium alloys, zinc alloys, thermal spray, oil and oil products:

<u>Test:</u>	<u>Test Method(s):</u>
Mechanical Properties - General	
Bend	ASME Section IX; ASTM A370, E190, E290
Impact (Charpy)	ASTM A370, E23; JIS Z 2242
Tension (UTS, YS, EL, R/A) (Room Temp.)	API-5L; ASTM A48, A370, B557, E8/E8M, F606/ F606M; JIS Z 2201(Superseded 2012) <sup>1</sup> ; (ISO 6892); JIS Z 2241
n-Value (Strain Hardening Exponent)	ASTM E646; JIS Z 2253
r-Value (Plastic Strain Ratio)	ASTM E517; JIS Z 2254
Young's Modulus	ASTM E111
Creep	ASTM E139
Stress Rupture	ASTM E292
Cleanliness Testing	ASTM F2459; CLP-049, CLP-074
Coatings and Platings	
Coating Adhesion	ASTM D3359; ISO 2409
Coating Testing and Evaluation (Scribe, Degree of Rusting, Blistering, Cross-cut & Scratch Adhesion, Subsurface Corrosion/Rust Creep/Infiltration, Thickness)	ASTM D609, D610, D714, D1654; DBL 7381, 7391, 7399, 8451, 8461, 9440, 7382, 8440; GS 90010, 90011; ISO 4628-2, 4628-3; 20567-1; MIL-DTL-5541, 53072; MBN 10494-1, 2, 3, 4, 5, 6; ASM-QQ-P-416; DIN 50018 AHT 2.0S
Microhardness of Coatings (100 gf)	ASTM B578
Thickness by SEM	ASTM B748
Thickness by Cross Section	ASTM B487; MIL-STD-1312-12 (Superseded 2012) <sup>1</sup> ; NASM 1312-12
Thickness by the Magnetic Method	ASTM B499

<u>Test:</u>	<u>Test Method(s):</u>
<b>Corrosion/Environmental Testing</b>	
Cyclic Corrosion	ISO 11997-1; VDA 621-415L
Humidity, Condensation/Water Fog	ASTM D1735, D2247; DIN 50017; ISO 6270-2, 4628-3
Hydrogen Embrittlement	ASTM F519
Salt Spray	ASTM B117, D610, G85 (Except A4); DIN 50021; HES D6501; ISO 9227; MIL-STD 1312-1(Superseded 2010) <sup>1</sup> ; NASM 1312-1
<b>Fasteners</b>	
Coating Thickness	MIL-STD-1312-12 (Superseded 2012) <sup>1</sup> ; NASM 1312-12
Discontinuities	ASTM F788, F812
Proof (External Threads)	ASTM A370, F606/F606M; MIL-STD-1312-8 (Superseded 2011) <sup>1</sup> ; NASM 1312- 8; SAE J429, J995
Tensile (Axial and Wedge)	ASTM A370, F606/F606M; MIL-STD-1312-8 (Superseded 2011) <sup>1</sup> ; NASM 1312- 8; SAE J429, J995
<b>Hardness</b>	
Brinell (1500, 3000) Kgf	ASTM A370, E10
Rockwell and Superficial (A, B, C, E, F, 15N, 30N, 45N, 15T, 30T, 45T)	ASTM A370, E18, F606/F606M; MIL-STD-1312-6 (Superseded 2013) <sup>1</sup> ; NASM 1312- 6; SAE J429, J995
<b>Microhardness</b>	
Knoop (100, 500, 1000) gf	ASTM E384, B933; MIL-STD 1312-6 (Superseded 2013) <sup>1</sup> ; NASM 1312-6
Vickers (100, 300, 500, 1000) gf	ASTM E384, B933; MIL-STD 1312-6 (Superseded 2013) <sup>1</sup> ; NASM 1312-6
MacroVickers (5000, 10,000) g	ASTM E92
<b>Metallographic Examination</b>	
Preparation of Samples	ASTM E3
Alpha Case	FLP-062; GE P3TF19
Case Depth	ASTM B934; SAE J423
Depth of Decarburization	ASTM E1077; SAE J121, J419
Dezincification	ISO-6509-1, 6509-2
Grain Size	ASTM E112; E50TF133
Inclusion Content	ASTM E45 (Method A)
Intergranular Attack	ASTM A262, A923; SAE AMS-H-6088 (Superseded 2014) <sup>1</sup>
Microstructure – Cast Iron	ASTM A247
Microetching	ASTM E407
Macroetching	ASTM E340, E381
Orientation in Microstructure	ASTM E1268; ASM Metals Handbook Volume 9
Phase Volume Determination	ASTM E562

<u>Test:</u>	<u>Test Method(s):</u>
Metallographic Examination (cont'd)	
Replication	ASTM E1351
Pipeline Integrity (Steel Pipe) (Bend, Tensile, Visual, Chemical)	49 CFR Part 192 (App. B & C)
Welder and Procedure Qualification Testing	Using the methods listed above in accordance with: ABS Rules for Welding Part 2; ASME Section IX; API RP 582; API Std. 1104; AWS C1.1, C1.4, D1.1, D1.2, D1.5; SAE; AMS-W-6858A; NAVSEAS9074-AQ-G1B-010/248; ISO 15614, 895, 910, 148-1
Failure Analysis	Using the test methods listed above, referencing the ASM Handbook; ASTM E620, E678, E860, E883 and E1188.

<sup>1</sup> NOTE: 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

### **IMR METALLURGICAL SERVICES**

*Louisville, KY*

for technical competence in the field of

### **Mechanical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *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 22<sup>nd</sup> day of March 2018.

A handwritten signature in black ink, written over a horizontal line.

President and CEO  
For the Accreditation Council  
Certificate Number 1140.03  
Valid to April 30, 2020

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