



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

WESTMORELAND MECHANICAL TESTING & RESEARCH, INC.

221 Westmoreland Drive

Youngstown, PA 15696

Charles Connors Jr. Phone: 724 537 3131

E-mail: c.connors@wmtr.com

CHEMICAL

Valid To: September 30, 2021

Certificate Number: 0621.02

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 metals and fastener tests on steel, stainless steel, aluminum & alloys, nickel & alloys, titanium & alloys, cobalt & alloys, copper & alloys and magnesium & alloys:

<u>Test:</u>	<u>Test Method(s):</u>
Spectroscopy	
Atomic Absorption (AAS)	ASTM E34, E1184; WMT&R-5110 ¹
Ag, As, Ba, Bi, Cd, Cr, Ga, Ni, Pd, Sb, Se, Sn, Ta, Te, Tl, Zn	
Combustion / Fusion (LECO)	ASTM E1019, E1447, E1409, E1941, E1947; WMT&R-5168 ¹
C, H ₂ , N ₂ , O ₂ & S	
ICP - AES	ASTM E2371, E2594, E3061; WMT&R-5900 ¹
Ag, Al, As, Au, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Ho, In, Ir, La, Li, Lu, K, Mg, Mn, Mo, Na, Nb, Nd, Ni, Os, P, Pb, Pd, Pr, Pt, Rb, Re, Rh, Ru, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Tc, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, Zn, Zr	
ICP - MS	ASTM E2823; WMT&R-5925 ¹
Ag, Al, As, Au, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Ho, In, Ir, La, Li, Lu, K, Mg, Mn, Mo, Nb, Nd, Ni, Os, P, Pb, Pd, Pr, Pt, Rb, Re, Rh, Ru, Sb, Sc, Se, Si, Sm, Sn, Sr, Tb, Tc, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, Zn, Zr	
Optical Emission Spectroscopy (OES)	ASTM E415, E1086, E1251, B954, E3047; WMT&R-5173 ¹
Al, B, Be, Bi, C, Ca, Cd, Ce, Co, Cr, Cu, Dy, Er, Fe, Ga, Gd, La, Li, Mg, Mn, Mo, Na, Nb, Nd, Ni, P, Pb, Pr, S, Sb, Si, Sn, Sr, Ta, Te, Th, Ti, V, W, Y, Yb, Zn, Zr	

<u>Test:</u>	<u>Test Method(s):</u>
XRF	ASTM E1621, E1085, E572, E2465, E539
Al, Be, Bi, Ca, Co, Cr, Cu, Fe, Ga, Li, Mg, Mn, Mo, Nb, Ni, P, Pb, Pd, Ru, Sb, Si, Sn, Sr, Ta, Ti, V, W, Y, Zn, Zr	

¹In-house method.





Accredited Laboratory

A2LA has accredited

WESTMORELAND MECHANICAL TESTING & RESEARCH

Youngstown, PA

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 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 21st day of November 2019.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0621.02
Valid to September 30, 2021

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

WESTMORELAND MECHANICAL TESTING & RESEARCH, INC.¹
221 Westmoreland Drive
Youngstown, PA 15696
Charles Connors Jr. Phone: 724 537 3131
E-mail: c.connors@wmtr.com

MECHANICAL

Valid Until: September 30, 2021

Certificate Number: 0621.01

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 at the location listed above as well as the one satellite laboratory location listed below to perform the following tests on aircraft components, automotive components, fasteners, metals & alloys, and plastics & polymers:

<u>Test:</u>	<u>Test Method(s):</u>
Bearing Strength	E238
Compression	ASTM E9
Elevated Temperatures with Conventional or Rapid Heating Rates and Strain Rate	ASTM E209
Environmental Simulation	
CASS	ASTM B368
Corrosion Testing	
Exfoliation Corrosion	ASTM G34, G66
Visual Assessment of Exfoliation Corrosion Susceptibility of 5xxx Series Aluminum Alloys (ASSET Test)	ASTM G66
Intergranular Corrosions Susceptibility	ASTM A262 (Methods A & E), G28, G67
Determining the Susceptibility to Intergranular Corrosion of 5xxx Series Aluminum Alloys by Mass Loss after Exposure to Nitric Acid (NAMLT Test)	ASTM G67
Pitting & Crevice Corrosion Susceptibility	ASTM G48
Stress Corrosion Cracking Susceptibility	ASTM G38, G39, G44, G47, G49
Humidity Exposure	MIL-STD-1312-3; NASM-1312-3
Salt Spray (Fog)	ASTM B117, G85
Modified Salt Spray (Fog) Testing	ASTM G85
Drop Weight	ASTM E208
Dynamic Tear Strength	ASTM E604

Test:	Test Method(s):
Ductility (Bend)	ASTM E190, E290
Electrical Conductivity	ASTM E1004
Fatigue	
Crack Growth	ASTM E647
Low/High Cycle, Axial, Flexural, Rotating Beam	ASTM E466, E606; NASM-1312-11; ISO 1143
Fracture Toughness Testing	ASTM E399, E1820; EN 2002-23; ISO 12737
Fracture Testing of Surface-Crack Tension Specimens	ASTM E740/E740M
K-R Curve Testing	ASTM E561
Plane-Strain (Chevron-Notch) Fracture Toughness	ASTM E1304
Hardness Testing	
Brinell (10 mm – 500 & 3000 kg; 2.5 mm – 187.5 kg)	ASTM E10
Rockwell (A, B, C, E, F)	ASTM E18; NASM-1312-6
Superficial (15, 30, 45 N & T)	ASTM E18; NASM-1312-6
Vickers (5, 10) kg	ASTM E92
Microhardness Knoop (10, 25, 50, 100, 200, 300, 500, 1000) gf Vickers (10, 25, 50, 100, 200, 300, 500, 1000) gf	ASTM E384; NASM-1312-6
High Pressure (Hydraulic) Burst	ABM 2-3026; AMS 4081, 4083, 4071; MIL-T-7081D
Impact (Charpy, Izod)	ASTM E23, A370
Jominy	ASTM A255
Metallographic Evaluation	
Alpha Case	WMTR-7003; GE P3TF19, GE P3TF32
Microetching and Identification of Microstructures	ASTM E407; ASM Metals Handbook Vol. 9
Depth of Decarburization	ASTM E1077; SAE J121
Detecting Detrimental Intermetallic Phase in Duplex Austenitic / Ferritic Stainless Steels	ASTM A923 (Method A)
Grain Size, ALA Grain Size	ASTM E112, E930
Inclusion Content	ASTM E45 (Methods A & D)
Macro Examination	E340, E381, E604; AMS 2643
Plating Thickness	ASTM B487; NASM-1312-12
Preparation	ASTM E3
SEM with Energy Dispersive Spectroscopy	ASTM E1508; WMT&R-7302
Volume Fraction	ASTM E562, E1245
Shear / Double Shear	ASTM F606/F606M; NASM-1312-13, 1312-20
Shear Testing of Aluminum Alloys	ASTM B769, B831
Sieve Analysis of Metal Powders	ASTM B214

Test:	Test Method(s):
Stress Durability (Hydrogen Embrittlement)	ASTM F519; NASM-1312-5A
Tensile	ASTM E8/E8M, E21
Tensile (1,000,000 lbs capacity)	ASTM A370, D638, E8/E8M, E21
Wedge, Axial and Proof Load	ASTM F606/F606M, E111; NASM-1312-8
Tensile Properties of Aluminum and Magnesium Alloy	ASTM B557
Tensile Strain-Hardening Exponents (n-Values) of Metallic Sheet Materials	ASTM E646, E517
Weld Operator and Procedure Qualification Testing	AWS D1.1, D1.2, D1.5, D4.0; ASME Sec. IX

I. Dimensional Testing³:

Parameter	Range	CMC ⁴ (±)	Technique / Method
Linear	Up to 3 inch Up to 12 inch Up to 1 inch Up to 1 inch Up to 1 inch Up to 21 mm X:15", Y:18", Z:12" X:15", Y:15" X: 1-8", Y: 1-4"	0.00016 inch 0.001 inch 0.0003 inch 0.0005 inch 0.00002 inch 0.0002 mm 0.0002 inch 0.00008 inch 0.00014 inch	Digital micrometers Digital calipers Digital dial indicators Drop weight height gauge (analog) Laser micrometer Scanning electron microscope CMM RAM Optical Optical Comparator
Angle	Up to 180 °	18 minutes	Comparator
Radii	Up to 10 inch	0.0004 inch	Comparator

¹This accreditation covers testing performed at the main laboratory and the satellite laboratory listed below:

WESTMORELAND MECHANICAL TESTING & RESEARCH, INC.
14 Bay Hill Drive
Latrobe, PA 15650

Buildings AP14 and AP209

Test:	Test Method(s):
Bearing Strength	ASTM D5961/D5961M, D953, E238



Test:	Test Method(s):
Conditioning (Composites)	ASTM D5229
Constituent Content	ASTM D3171 (Method I – Procedure A, B, C, D, E, F, G), D3529
Compression	ASTM E9
Strain Measurement	ASTM D695, D6641/D6641M
Plain, Open Hole and Filled Hole	ASTM D6484/D6484M
Edgewise / Flatwise Sandwich	ASTM C364/C364M, C365/C365M
Shear Loading	ASTM D3410/D3410M
Compression Set	ASTM D395
Compression After Drop Weight	ASTM D7136, D7137
Electrical Conductivity	ASTM E1004
Fatigue	
Room Temperature to 2200 °F	ASTM E466, E606; EN6072; ISO 1099; NASM 1312-11
Flexural	ASTM D7774
Uniaxial	ASTM D7791
Crack Growth Rate (FCGR)	ASTM E647
Flammability	
Cabin and Cargo Component Materials	AMFTH CH 1, 2, 3
Flexural	
Ambient	ASTM C393, C1161, D6272, D7249/D7249M, D7250, D790; EN 2562
Non-Ambient Temperature	ASTM C393, D7249/D7249M, D7250, D790, D7264
Fracture Toughness	ASTM E399, E1820
Determination of the Opening Mode I	ASTM D5528
K-R Curve Testing	ASTM E561
Mixed Mode	ASTM D6671/D6671M (Propagation Option Only)
Mode II Interlaminar Unidirectional	ASTM D7905/D7905M
Plane-Strain Fracture Toughness	ASTM D5045
Hardness	
Shore Hardness (A, D, M)	ASTM D2240
Barcol Hardness	ASTM D2583
Brinell (10 mm – 500 & 3000 kg; 2.5 mm – 187.5 kg)	ASTM E10
Rockwell (A, B, C, E, F)	ASTM E18; NASM-1312-6
Superficial (15, 30, 45 N & T)	ASTM E18; NASM-1312-6
Impact	
Charpy / IZOD Impact	ASTM E2248, D256, D6110; ISO 179, 180

Test:	Test Method(s):
Metallographic Evaluation	
Alpha Case	WMTR-7003
Microetching and Identification of Microstructures	ASTM E407; ASM Metals Handbook Vol. 9
Depth of Decarburization	ASTM E1077; SAE J121
Grain Size	ASTM E112
Inclusion Content	ASTM E45 (Methods A & D)
Plating Thickness	ASTM B487; NASM-1312-12
Preparation	ASTM E3
Pin Bearing	ASTM E238
Peel	
Adhesive Peel	EN 2243-1, 2243-3
Climbing Drum Peel	ASTM D1781
T-Peel	ASTM D1876
Floating Roller Peel	ASTM D3167
Peel (180°)	ASTM D903
Residual Stress by Hole Drilling Strain Gauge	ASTM E837
Shear	
Core Shear (-320 to 572) °F	ASTM C273/C273M
Ambient Temperature by SBS	ASTM D2344/D2344M; ISO 14130; EN 2377, 2563
Ambient Temperature ±45 ° Tension	ASTM D3518/D3518M; ISO 14129
Ambient Temperature by Compression	ASTM D3846
Ambient Temperature by V Notch	ASTM D7078/D7078M, D5379
Plane -Strain Fracture Toughness	ASTM D5045
Lap Shear	ASTM D1002, D3163, D3164, D3165
Shear by Punch	ASTM D732
Shear Testing of Aluminum Alloys	ASTM B831
Specific Gravity / Density	ASTM B311, D792
Stress Durability (Hydrogen Embrittlement)	ASTM F519; NASM-1312-5A
Stress Rupture / Creep	ASTM E139, E292, D2990
Tensile	ASTM D638, D3039, D5766, D6742, E8/E8M, E21, E111, B557, F606/F606M; ISO 6892, 527; NASM 1312-8;
Flatwise Tension	ASTM C297, D7291
Vulcanized Rubber / Thermoplastic Elastomers	ASTM D412, (Except for Method A Straight and Method B Ring Specimens)
PTFE	ASTM D1708

Test:	Test Method(s):
Thermal Analysis	
DMA (Dynamic Mechanical Analysis)	ASTM D7028
DSC (Differential Scanning Calorimetry)	ASTM D3418
TMA (Thermomechanical Analysis)	ASTM E831, E2092
Glass Transition (TG) Temperature	ASTM D7426, E1545, E1640; EN6032; ISO 11357-2
Specific Heat (DSC)	ASTM E1269
Coefficient of Linear Thermal Expansion	ASTM E228
Thermal Diffusivity by the Flash Method	ASTM E1461
Water Absorption	ASTM D570; ISO-62

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.

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

⁴Calibration and Measurement Capability (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine measurements of nearly ideal measurement standards or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95% level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific measurement performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific measurement.



Accredited Laboratory

A2LA has accredited

WESTMORELAND MECHANICAL TESTING & RESEARCH

Youngstown, PA

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 21st day of November 2019.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0621.01
Valid to September 30, 2021

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