SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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MECHANICAL

Valid To: March 31, 2024 Certificate Number: 3990.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above to perform the following tests on aircraft components, automotive components, coatings/platings, fasteners, metals and alloys, pipes, hoses, valves and fittings and pressure vessels, welds and metal-related substances:

Test	Test Method
Tension (Up to 300,000 lbs.)	ASME Section IX (sec. QW-150); ASTM A370, B557/B557M, E8/E8M; AWS D1.1/D1.1M (sec. 6.10.3.4 and 6.10.3.6), D1.2/D1.2M (sec. 3.7), D15.1/D15.M (Sec. 10.9.1), D17.1/D17.1M (sec. 5.2.2.2), B4.0 (sec. 4); ISO 15614-1
Impact	
Charpy at Controlled Temperatures (-80°F to Room Temperature)	ASTM A370, E23; AWS D1.1/D1.1M (sec. 6.26), D15.1/D15.1M (sec. 10.2.1.7), B4.0 (sec. 7); ISO 15614-1; ASME Section IX (sec. QW-170)
Hardness	
Brinell (10mm ball @ 500kg and 3000kg)	ASTM E10
Rockwell (B and C)	ASTM E18
Superficial (15N, 30N, 15T , 30T)	ASTM E18
Vickers (10kg)	ASTM E92
Microhardness	
Vickers (200, 300, 500 and 1000) gm Knoop (200, 300, 500) gm	ASTM E384; ISO 15614-1
Metallographic Evaluation	
Sample Preparation	ASTM E3
Alpha Case	SAE AMS-4928, SAE AMS-4965
Case Depth	SAE J423
Depth of Decarburization	ASTM E1077

Test	Test Method
Metallographic Evaluation (*continued*)	
Grain Size	ASTM E112 – Comparison Method only
Macro-Etching	ASTM E340, E381; GMW 14058
Micro-Etching	ASTM E407
Plating Thickness	ASTM B487
Optical Microscopy	ASTM E883
Weld Evaluation	GMW 14058; ISO 15614-1
Chemical	
Glow Discharge Optical Emission Spectrometry (GD-OES)	ASTM E415, E1086, E1251, E1999; ISO 14707 Fe Based (Al, B, C, Co, Cr, Cu, Fe, Mn, Mo, Nb, Ni, P, Pb, S, Si, Sn, Ti, V, W, Zr) Al Based (Al, Co, Cr, Cu, Fe, Ga, Mg, Mn, Ni, Pb, Si, Sn, Ti, V, Zr)
Bend Test	ASME BPVC Section IX (sec. QW-160); AWS D1.1/D1.1M (sec. 6.10.3.1 & 6.10.3.2), AWS D1.2/D1.2M (sec. 3.8); D15.1/D15.1M (sec 10.9.2), B4.0 (sec. 6); ISO 15614-1
Break (Fillet Weld)	AWS D1.1/D1.1M (sec. 6.13), D15.1/D15.1M (sec. 10.6.3), B4.0 (sec. 9); ISO 15614-1; ASME Section IX (QW-180)
Weld Procedure and Operator Qualification Testing	Using the methods listed on this Scope of Accreditation in accordance with ASME BPVC Section IX (Article 2 & 3); AWS D1.1/D1.1M (Clause 6), D1.2/D1.2M (Clause 3), D15.1/D15.1M (Clause 9), D17.1/D17.1M (sec. 5&9), B4.0; ISO 15614-1; NAVSEA S9074-AQ-GIB-010/248
Resistance Spot Weld Evaluation (Process Validation)[1]	AWS C1.4/C1.4M, PS10947 <s>, AWS 8.1 M, GMW 14057, GMW 16967
Non-Destructive Testing[1]	
Ultrasonic Testing Contact Straight Beam Contact Angled Beam Contact Phased Array	ASME BPVC Sec. V, Article 4 and 5; AWS D1.1/D1.1M (sec. 8, part F; Annex Q), D1.2/D1.2M (sec. 5, part C), D15.1/D15.1M (sec. 16.2), D17.1/D17.1M (sec. 7.3.4 ASTM E164); SOP-NDT-UT-001; SAE-AMS-STD-2154
Penetrant Examination Visible Fluorescent	ASME BPVC Section V, Article 6; ASTM E1417/E1417M; AWS D1.1/D1.1M (sec. 8 part C, ASTM E165/E165M), D1.2/D1.2M (sec. 5.7 ASTM E165/E165M), D15.1/D15.1M (Sec. 16.3, ASTM E165/E165M), D17.1/D17.1M (sec. 7.3.1, ASTM E1417/E1417M); ISO 15614-1

Test	Test Method
Non-Destructive Testing[1] (*continued*)	
Magnetic Particle Examination Yoke – Visible Dry Yoke – Wet Fluorescent	ASME BPVC Section V, Article 7; ASTM E1444/E1444M; AWS D1.1/D1.1M (sec. 8 part C, ASTM E709), D17.1/D17.1M (sec. 7.3.2, ASTM E1444/E1444M); D15.1/D15.1M (sec. 16.4, ASTM E709)
Visual Inspection	ASME BPVC Section V, Article 9; AWS D1.1/D1.1M (sec. 8, part A, B, & C), D1.2/D1.2M (sec. 5), D17.1/D17.1M (sec. 7.2); D15.1 (sec. 14)
SEM/EDS	ASTM E1508
Failure Analysis[1]	Using the methods listed on this Scope of Accreditation in accordance with the ASM Handbook, Volume 11
Radiography	ASME BPVC Section V, Article 2, ASTM E1742, ASTM E2339, AWS D1.1 Section 8 Part E, AWS D1.2 Clause 5 Part B, AWS D1.6 Section 8 Part E, AWS D17.1 Section 7.3.3, ASTM E2007

[1]This laboratory performs field testing activities for these tests.

Note: The laboratory is only accredited for the test methods listed above. The accredited test methods are used in determining compliance with the material specifications 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.*

ASME B31.3

Accredited Laboratory

A2LA has accredited

UNITED TECHNICAL, INC.

Whitmore Lake, MI

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 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 2022.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3990.01
Valid to March 31, 2024

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