



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

ELEMENT NEWTOWN
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MECHANICAL

Valid To: April 30, 2020

Certificate Number: 0478.01

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 tests on metals, metal alloys, metal fasteners and aircraft components:

<u>Test</u>	<u>Test Method(s)</u>
Blind Rivet	IFI 114, 520
Charpy Impact, V-notch (-320 to +212) °F	ASTM A370, E23, F541
Direct Tension Indicator Compression	ASTM F959/F959M
Discontinuities	AS 7452, 7454, 7455, 7456, 7459, 7460, 7461, 7466, 7470, 7471, 7472, 7473, 7474, 7477, 7478, 7479; FF-N-836; FF-S-85, FF-S-86; DIN 267-19, 267-20; ISO 6157; MIL-B-8906, MIL-B-85604, MIL-B-87114; MIL-N-7873; MIL-S-21472, MIL-S-45909; MIL-STD-1907, MIL-STD-2035; SAE J122, J123, J1061; NASM 25027
Failure Analysis – SEM with EDS	SOP 60.06 and ASM Handbook Vol. 11 using the test methods listed on the lab's scopes.
Tube and Pipe Flattening	ASTM A450, A530, A999, B153; ASME SB-111
Heat Treat (Sample Preparation)	AMS 2750
Hydrostatic (9,000 PSI MAX)	ASME V Art. 1, SA450, SA530; ASTM E1003, F1387
Stress Durability (Hydrogen Embrittlement)	ASTM F519, F606/F606M; MIL-S-8831; NASM 1312-5, NASM 1312-14; USCAR-7

Test

Test Method(s)

Stress Rupture

ASTM E139, E292; NASM 1312-10

Washer Tests
(Twist, Temper, Pressure, Free Height,
Interlinking, Hydrogen Embrittlement,
Compressive Load, Permanent Load,
Permanent Set)

ASME B18.21.1; DIN 267-26, 6799; FF-W-84A,
FF-W-92, FF-W-100; MIL-W-12133; SAE J238, J773

Weld Procedure / Welder
Qualification Testing

Using the tensile, bend, impact, hardness, and macroetch
methods listed in this document in accordance with:
ASME Sec. IX.; AWS D1.1-D1.5;
T9074-AQ-GIB-010/248

Coating Quality Tests

Adhesion

AMS 2400, 2416H, 2411E; AMS QQ P-416F;
ASTM B571 (Sec. 4, 5, 8, 9, 13); GM9071P (2002)¹,
GM9102P (2010)¹, GM9506P (1988)¹;
GMW14829, GMW15282; SAE J207

Coating Weight

ASTM A90, B137; MIL-DTL-16232g (Sec. 4.7.2)

Ductility

Bend

ASTM E190, E290; FF-S-92; GM4473P,
GM4482P (1988)¹; IFI 112, 113; NASM 6812, A370

Full-Size Eyebolts (Bend Test)

ASTM A489, F541

Hardness

Rockwell (A, B, C, F, N, T)

ASTM E18, F606/F606M; DIN 267-4; Ford ESS-
M1A160-A; GM455M (Sec. 5.1) (1989)¹, GM500M
(Sec. 5.1, 5.2) (2010)¹; ISO 898-1, 898-2, 898-5;
NASM 1312-6

Material Specifications²:

GM 255M (2011)¹, GM260M (1989)¹, GM275M
(1987)¹, GM280M (1989)¹, GM300M (1989)¹,
SAE J429

Microhardness

Knoop (100, 200, 500) gf
Vickers (100, 200, 500, 1000) gf

ASTM E384; NASM 1312-6
ASTM E384; NASM 1312-6

Metallographic Evaluation

Preparation

ASTM E3

Alpha Case

AMS 2380; PWA E142; GE Photographic Standards



Test

Test Method(s)

Metallographic Evaluation (cont'd)

Banding / Orientation of Microstructures	ASTM E930, E1181, E1268
Case Depth (Carburization)	ASTM E384; SAE J423
Corrosion Resistance (IGA)	ASTM A262 (Practice A, E); GE E50YP11; PWA E50
Delta Ferrite	AMS 2315; ASTM E562
Depth of Decarburization	ASTM E1077, F835, F912; FF-S-85C; GM6104M (Sec. 4) (2011) ¹ ; ISO 898-1, 898-5; SAE J121
Determining Volume Fraction	ASTM E562
Discontinuities	GM6102M (Sec. 4) (2011) ¹ ; SAE J122, J123
Grain Size	ASTM E112, E1181
Graphite Rating	ASTM A247
Inclusion Content	ASTM E45 (Method A, D); SAE J422
Macroetch / Microetch	ASTM E340, E407
Macroetch Evaluation	ASTM A604, E381
Magnetic Permeability	ASTM A342; MIL-I-17214
Plating Thickness	ASTM B487; NASM 1312-12
Salt Spray	ASTM B117, D1654; NASM 1312-1

Nondestructive³

Liquid Penetrant Fluorescent Water Washable Fluorescent Post Emulsifiable	AMS 2645, 2646, 2647; ASME Sec. III, V; ASTM E165, E1417, E1418; MIL-STD-6866; SAE J426; T9074-AS-GIB-010/271
Magnetic Particle Bench Fluorescent Yoke Dry Powder	AMS 2640; ASME Sec. III, V; ASTM A275, E709, E1444; MIL-I-6868, MIL-STD-1949, MIL-STD-271; SAE J420; T9024-25-GIB-010/271
Ultrasonic (Contact & Immersion, Straight and Angle Beam)	AMS-STD-2154; MIL-STD-2154; AWS D1.1; ASME III, V; ASTM A388/A388M, A435/A435M, A578/A578M, B548, E114, E164, E213, E587; T9074-AS-GIB-010/271; SAE AMS 2634



Test

Test Method(s)

Proof Load

Cone Strip Proof Load

ASTM A194/A194M, F606/F606M, F812/F812M;
SAE J122

External Threads

ANSI B18.16.1M; ASTM A370, F606/F606M;
GM455M (Sec. 5.2) (1989)¹, GM500M (Sec. 5.3)
(2010)¹; ISO 898-1, 898-5; SAE J1216

Material Specifications²:

GM255M (2011)¹, GM275M (1987)¹, GM280M (1989)¹,
GM290M (1989)¹, GM300M (1989)¹; SAE J429

Full-Size Eyebolts

ASTM A489, F541

Internal Threads

ASTM A370, F606/F606M; DIN 267-4;
GM510M (Sec. 6.1) (2011)¹; IFI 100/107; ISO 898-2;
SAE J995, J1965

Material Specifications²:

GM284M (2011)¹, GM286M¹, GM301M (1989)¹,
GM305M (1989)¹, GM456M (1989)¹

Shear

Double

ANSI/ASME B18.8.2; AS 7207; ASTM B565; IFI 135;
MIL-P-10961, MIL-R-5674; NASM 1312-13; SAE J496

Single

ASTM F606/F606M; NASM 1312-20

Tapping Screws

Ductility

Ford ESS-M1A160A; SAE J78

Hydrogen Embrittlement

ANSI/ASME B18.6.4, B18.6.5.M;
GM6010M (Sec 4.7) (2011)¹, GM6170M (Sec. 4.8)
(2011)¹, GM6171M (Sec. 4.8) (2011)¹,
GM6172M (Sec. 4.8) (2011)¹; SAE J78, J81, J1237

Tensile

Breaking Strength of Full-size
Eyebolt

ASTM A489, 541

Elevated Temperature
(up to 2000° F)

ASTM E21; NASM 1312-18

Fastener
Axial

ASTM A370, F541, F606/F606M; DIN 275-11;
GM455M (Sec. 5.3) (1989)¹,
GM500M (Sec. 5.4) (2010)¹, GM6171M (Sec. 4.4);
ISO 898-1; NASM 1312-8



Test

Test Method(s)

Fastener (cont'd)
Axial (cont'd)

Material Specifications²:
GM 255M (2011)¹, GM275M (1987)¹, GM280M
(1989)¹, GM290M (1989)¹, GM300M (1989)¹; SAE J429

Wedge

ASTM A370, F606/F606M; GM455M (Sec. 5.4) (1989)¹,
GM500M (Sec. 5.5) (2010)¹; ISO 898-1, 898-5

Material Specifications²:
GM 255M (2011)¹, GM275M (1987)¹, GM280M
(1989)¹, GM290M (1989)¹, GM300M (1989)¹; SAE J429

Full-Size Extension Test

ASTM F837/F837M, F879/F879M; DIN 267-11;
ISO 3506

Machined Specimen Tensile (Yield,
Elongation & Reduction of Area)

ASTM A370, E8/E8M, F606/F606M;
GM500M (Sec. 5.6) (2010)¹

Torque

Prevailing Torque

ANSI/ASME B18.16.1M; DIN 267-15; GM9092P;
IFI 100/107, 101, 124, 125; ISO 898-5; MIL-N-45913

Rotational Capacity

AASHTO M164; ASTM A325/A325M

Torque

DIN 267-11; ISO 3506; SAE J1237; NASM 1312-31;
FORD ES M1A160A

Torque Tension

IFI 101; NASM 1312-15; SAE J174, J1965



I. Dimensional Testing⁴

Parameter	Range	CMC ⁵ (±)	Comments
External Thread Gauging	#4 to 1.5 in	N/A	ANSI/ASME B1.2, B1.3 (system 21, 22); FED-STD-H28-20A; MIL-S-7742; IFI 138 Go/No Go ring gauge
Internal Thread Gauging	#10 to 1 in	N/A	ANSI/ASME B1.2, B1.3 (system 21); FED-STD-H28-20A; MIL-S-7742 Go/No Go thread plug gauge
Length –			
(1D)	Up to 12 in	0.0012 in	Calipers / MIL-STD-120
(1D)	Up to 1 in	0.0019 in	Micrometers / MIL-STD-120
(2D)	Up to 6 in	0.00011 in	Optical comparator / MIL-STD-120
Radii	Up to 6 in	0.0014 in	Optical comparator / MIL-STD-120
Angles	Up to 360°	0.04°	Optical comparator / MIL-STD-120
Head Height	Up to 1.3 in	0.0006 in	Digital indicator / MIL-STD-120
Depths	Up to 1 in	0.0014 in	Depth micrometer / MIL-STD-120
	Up to 1.3 in	0.0006 in	Digital indicator / MIL-STD-120

¹ 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.

² This material specification is not an accredited test and the inclusion of this material specification on this Scope does not confer laboratory accreditation to the material specification nor does it confer accreditation for the method(s) embedded within the specification. The accredited test methods listed on this scope are used in determining compliance with this material specification.

³ This laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these tests or calibrations.

⁴ This laboratory offers commercial dimensional testing service only. These tests are not equivalent to that of a calibration.

⁵ Calibration 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.

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Accredited Laboratory

A2LA has accredited

ELEMENT NEWTOWN

Newtown, PA

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 14th day of May 2018.

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President and CEO
For the Accreditation Council
Certificate Number 0478.01
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.