



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

ELEMENT MATERIALS TECHNOLOGY DENVER

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MECHANICAL

Valid To: July 31, 2020

Certificate Number: 2582.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on aircraft components, automotive components, marine components, coatings, packaging and containers, electronics and consumer goods:

<u>Test:</u>	<u>Parameters:</u>	<u>Test Method(s):</u>
Mechanical Vibration <sup>1</sup> : Includes: Sine Random Sine-on-Random Gunfire	(1 to 3,000) Hz 3" Stroke 40,000 lbs Force	ASTM D4169; BellCore GR-63-CORE 5.4.2, 5.4.3; IEC 68-2-59, Test Fe; IEC 68-2-34, Test Fd; IEC 68-2-35, Test Fda; IEC 68-2-6, Test Fc; JESD22 B103B; MIL-STD-810E, Method 514.4, 519.4; MIL-STD-810F, Method 514.5, 519.5; MIL-STD-810G, Method 514.6, 519.6; MIL-STD-167-1 (A SHIPS); MIL-STD-202G, Method 201A, 204D, 214A; MIL-STD-883G, Method 2005.2, 2007.3, 2026; MIL-STD-883H, Method 2005.2, 2007.3, 2026; MIL-STD-1344A, Method 2005.1; RTCA DO-160D, E, F, G, Sec. 8.0; RTCA DO-227 6/23/1995, Sec. 2.3.1; SAE J1455, Sec. 4.10; SAE J1211, Sec. 4.7; UN ST/SG/AC.10/11 Rev. 5, Para. 38.3.4.3

<u>Test:</u>	<u>Parameters:</u>	<u>Test Method(s):</u>
Mechanical Shock <sup>1</sup>	Drop Shock: Force 600 G Period (2 to 80) ms  Vibe Shock: 3" Stroke 30 000 lbs Force	IEC 68-2-27, Test Ea; IEC 68-2-29, Test Eb; JESD22 B104C Conditions A, C, D, E; MIL-STD-810E, Method 516.4; MIL-STD-810F, Method 516.5; MIL-STD-810G, Method 516.6; MIL-STD-202G, Method 213B; MIL-STD-883G, Method 2002.4; MIL-STD-883H, Method 2002.5; MIL-STD-1344A, Method 2004.1; RTCA DO-160D, E, F, G, Sec. 7.2; RTCA DO-227 6/23/1995, Sec. 2.3.2; SAE J1455, Sec. 4.11; SAE J1211, Sec. 4.8; UN ST/SG/AC.10/11 Rev. 5, Para. 38.3.4.4
Acceleration <sup>1</sup>	r=36" 250 RPM	MIL-STD-810E, Method 513.4; MIL-STD-810F, Method 513.5; MIL-STD-810G, Method 513.6; MIL STD-202G, Method 212A; MIL-STD-1344A, Method 2011.1; RTCA DO-160D, E, F, G, Sec. 7.3
Thermal (Temperature) <sup>1</sup> : Includes: High/Low Temperature Thermal Shock Temperature Cycling	High 260 °C Low -70 °C  Temperature Shock (-70 to 150) °C  Temperature Cycle (-70 to 150) °C	BellCore GR-63-CORE, Sec. 5.1.1.1, 5.1.1.2; IEC 68-2-1 Test A; IEC 68-2-2, Test B; JESD 22, Sec. A104C; MIL-STD-810E, Method 501.3, 502.3; MIL-STD-810F, Method 501.4, 502.4; MIL-STD-810G, Method 501.5, 502.5; MIL-STD-810E, Method 503.3, 520.1; MIL-STD-810F, Method 503.4, 520.2; MIL-STD-810G, Method 503.5, 520.3; MIL-STD-202G, Method 107G; MIL STD-883G, H, Method 1010.8; MIL-STD-1344A, Method 1003.1; RTCA DO-160D, E, F, G, Sec. 5.0; RTCA DO-227 6/23/1995, Sec. 2.3.3; SAE J1455, Sec. 4.1; SAE J1211, Sec. 4.1; UN ST/SG/AC.10/11 Rev. 5, Para. 38.3.4.2

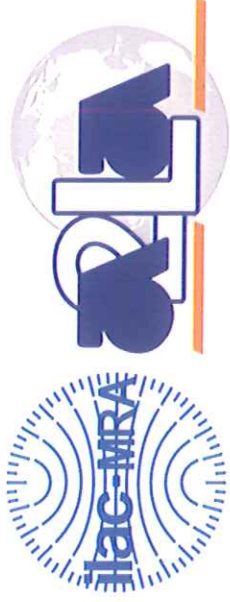
<u>Test:</u>	<u>Parameters:</u>	<u>Test Method(s):</u>
Temperature/Humidity <sup>1</sup>	(10 to 95) % RH	BellCore GR-63-CORE 5.1.1.3, 5.1.2; IEC 68-2-30, Test Db; MIL-STD-810E, Method 507.3; MIL-STD810F, Method 507.4; MIL-STD-810G, Method 507.5; MIL-STD-202G, Method 103B, 106G; MIL-STD-883G, H, Method 1004.7; MIL-STD-1344A, Method 1002.2; RTCA DO-160D, E, F, G, Sec. 6.0; RTCA DO-227 6/23/1995, Sec. 2.3.6; SAE J1455, Sec. 4.2; SAE J1211, Sec. 4.2
Salt Spray Salt Fog, Corrosion		ASTM B117; GM 9540P (supersede 2013) <sup>2</sup> ; IEC 68-2-52, Test Kb; MIL-STD-810E, Method 509.3; MIL-STD-810F, Method 509.4; MIL-STD-810G, Method 509.5; MIL-STD-202G, Method 101E; MIL-STD-883G, H, Method 1009.8; MIL-STD-1344A, Method 1001.1; NEMA 250, Sec. 5.8, 5.9; RTCA DO-160D, E, F, G, Sec. 14.0; SAE J1455, Sec. 4.3; SAE J2334; SAE J1211, Sec. 4.3
Evaluation: Corrosion Creep-back		ASTM D1654
Evaluation: Tape Adhesion		ASTM D3359
Altitude (Barometric Pressure) <sup>1</sup> Temperature Altitude	(5,000 to 70,000) ft (-70 to 140) °C	MIL-STD-810E, Method 500.3; MIL-STD-810F, Method 500.4; MIL-STD-810G, Method 500.5; MIL-STD-202G, Method 105C; MIL-STD-883G, H, Method 1001.1; MIL-STD-1344A, Method 1011; SAE J1455, Sec. 4.9; SAE J1211, Sec. 4.6; UN ST/SG/AC 10/11 Rev. 5 Para. 38.3.4.1; RTCA DO-160 D, E, F, G, Sec. 4.0



<u>Test:</u>	<u>Parameters:</u>	<u>Test Method(s):</u>
Thermal Vacuum	Pressure: (10 <sup>-5</sup> ) Torr or Lower  Temperature: (-100 to +190) °C	SOP 011 Thermal Vacuum Test
Altitude <sup>1</sup> : Decompression/Overpressure	Up to 100 psi	MIL-STD-810E, Method 500.3; MIL-STD-810F, Method 500.4; MIL-STD-810G, Method 500.5; RTCA DO-160D, E, F, G, Sec. 4.6; RTCA DO-227 6/23/1995, Sec. 2.3.4, Sec. 2.3.5
Combined Environment Temp at Vibe	(1 to 3,000) Hz 3" Stroke 40,000 lbs Force  Temperature Cycle (-70 to 150) °C	MIL-STD-810E, Method 520.1; MIL-STD-810F, Method 520.2; MIL-STD-810G, Method 520.3
Drop Shock: Corner, Edgewise, Flat		ASTM D4169; BellCore GR-63-CORE, Sec. 5.3
Dust		IEC 60529, Sec. IP5X, IP6X; MIL-STD-810F, Sec. 510.4, Procedure III only
Waterproofness / Drip		IEC 60529, Sec. IP X3, X4, X5, X6, X7, X8; MIL-STD-810E, Method 512.3; MIL-STD-810F, Method 512.4; MIL-STD-810G, Method 512.5; NEMA 250, Sec. 5.7; RTCA DO-160F, Sec. 10.0; SAE J1211, Sec. 4.4
Icing / Freezing Rain		MIL-STD-810E, Method 521.1; MIL-STD-810F, Method 521.2; MIL-STD-810G, Method 521.3; NEMA 250, Sec. 5.6; RTCA DO-160D, E, F, G, Sec. 24, Cat. A & C
UV Fluorescent Light Exposure		ASTM G 154
Protection Against Solid Foreign Objects		IEC 60529, Sec. IPX5, IPX6
Fluid Susceptibility		MIL-STD-810F, Method 504; MIL-STD-810G, Method 504.1; RTCA DO 160D, E, F, G, Sec. 11
HALT/HASS		Qualmark Guideline 9.0

<sup>1</sup>Also using customer specified test methods based on the parameters listed above.

<sup>2</sup>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

## ELEMENT MATERIALS TECHNOLOGY DENVER

Longmont, CO

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 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 19<sup>th</sup> day of June 2018.

A handwritten signature in black ink, appearing to read 'L. ...', positioned above a horizontal line.

President and CEO  
For the Accreditation Council  
Certificate Number 2582.02  
Valid to July 31, 2020