



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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MECHANICAL

Valid to: August 31, 2021

Certificate Number: 1719.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory for the following environmental simulation and mechanical tests on the following products and materials: aircraft components, automotive components, gaskets, seals and packings, packaging and containers, pipes, hoses, valves and fittings, rubber and rubber products, tools, windows and doors, wiring harnesses, subassemblies, telecommunication cabinets and components in the Telecommunications, Aircraft, Aerospace, Automotive, Medical, Defense, Electronics and Agriculture industries.

**Test Technology/Description:**

**Test Method(s)/Standard(s):**

Compression

ASTM D642;  
GR-3125-CORE;  
GR-3121-CORE;  
GR-3120-CORE;  
GR-487-CORE;  
GR-771-CORE;  
GR-950-CORE;  
GR-3178-CORE

Explosion

MIL-STD-810, Method 511;  
RTCA/DO-160, Section 9;  
ISO 8846

Earthquake / Seismic<sup>1</sup>

*Frequency: (1 to 500) Hz  
Velocity: 40 in/sec  
Displacement: 10.5 in*

GR-63-CORE;  
ICC-ES AC 156;  
GR-3121-CORE;  
GR-3123-CORE;  
GR-3125-CORE;  
GR-13-CORE;  
GR-487-CORE;  
GR-950-CORE ;  
GR-3108-CORE;  
GR-3178-CORE

**Test Technology/Description:**

**Test Method(s)/Standard(s):**

Firearms Resistance

GR-487-CORE;  
GR-3125-CORE;  
GR-13-CORE;  
GR-771-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3108-CORE;  
GR-3178-CORE

Fire Test / Flammability

DOT/FAA AC 20-135;  
ISO 2685;  
RTCA/DO-160, Section 26;  
SAE AS4273;  
SAE AS1055;  
UL 94;  
GR-13-CORE;  
GR-63-CORE;  
GR-487-CORE;  
ANSI T1-319;  
GR-3120-CORE;  
GR-3125-CORE;  
GR-771-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3178-CORE;  
GR-326-CORE

Fungus

ASTM C1338;  
ASTM D3273;  
ASTM G21;  
GR-13-CORE;  
GR-487-CORE;  
MIL-STD-810, Method 508;  
RTCA/DO-160, Section 13;  
SAE J1455;  
GR-771-CORE;  
GR-950-CORE;  
MIL-PRF-28800 F;  
ASTM D2020

Hosedown / Water Resistance /  
Waterproofness / Enclosure Protection

IEC 60529, IPX3, Section 14.2.3;  
IEC 60529, IPX4, Section 14.2.4;  
IEC 60529, IPX5, Section 14.2.5;  
IEC 60529, IPX6, Section 14.2.6;  
IEC 60529, IPX7, Section 14.2.7;  
IEC 60529, IPX8, Section 14.2.8;  
NEMA 250 (2014);  
RTCA/DO-160, Section 10;  
UL 50 (2007);  
UL 50E (2007);  
MIL-STD-810, Method 512 (Immersion);  
GR-3125-CORE;

**Test Technology/Description:**

**Test Method(s)/Standard(s):**

Hosedown / Water Resistance /  
Waterproofness / Enclosure Protection  
(*cont.*)

GR-13-CORE;  
GR-487-CORE;  
GR-771-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3108-CORE;  
GR-3178-CORE

Humidity<sup>1</sup>  
*Up to 98% RH*  
*Temperature: (40 to 200) °F*

GR-487-CORE;  
GR-63-CORE;  
MIL-STD-810, Method 507;  
RTCA/DO-160, Section 6;  
SAE J1455;  
IEC 60945, Section 8.3;  
IEC 60068-2-30;  
IEC 60068-2-38;  
IEC 60068-2-56;  
IEC 60068-2-61;  
IEC 60068-2-78;  
IEC 60068-3-4;  
ASTM D4332;  
GR-3120-CORE;  
GR-3121-CORE;  
GR-3123-CORE;  
GR-3125-CORE;  
GR-13-CORE;  
GR-771-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3108-CORE;  
GR-3178-CORE;  
GR-326-CORE

Impact Resistance

ASTM D2794;  
GR-487-CORE;  
GR-3120-CORE;  
GR-3121-CORE;  
GR-3123-CORE;  
GR-3125-CORE;  
GR-13-CORE;  
GR-771-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3178-CORE;  
GR-326-CORE

Package Testing

ASTM D4169;  
GR-3120-CORE;  
GR-3121-CORE;  
GR-3123-CORE;  
GR-3125-CORE;  
GR-13-CORE

**Test Technology/Description:**

**Test Method(s)/Standard(s):**

Package Testing (*cont.*)

GR-487-CORE;  
GR-771-CORE;  
GR-950-CORE;  
GR-3108-CORE;  
GR-3178-CORE;  
GR-326-CORE

Salt Spray and Corrosion Resistance<sup>1</sup>  
*8'H x 8'W x 12'L Chamber*  
*Temperature: (30 to 55) °C*

ASTM B117; ASTM G85;  
GR-487-CORE;  
MIL-STD-810, Method 509;  
NEMA 250 (2014);  
RTCA/DO-160, Section 14;  
SAE J1455;  
UL 50 (2007); UL 50E (2007);  
IEC 60068-2-11;  
IEC 60945, Section 8.12;  
GR-3121-CORE;  
GR-3125-CORE;  
GR-13-CORE;  
GR-771-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3108-CORE;  
GR-3178-CORE;  
GR-326-CORE

Cyclic Corrosion Testing<sup>1</sup>  
*Temperature: (30 to 55) °C*

IEC 60945, Section 8.12;  
IEC 60068-2-52

Rain / Blowing Rain / Wind Driven Rain<sup>1</sup>  
*Velocity: up to 90 mph*  
*Rainfall Rate: up to 6 in/hr*

GR-487-CORE;  
MIL-STD-810, Method 506;  
NEMA 250 (2014);  
UL 497, Para. 34;  
UL 50 (2007);  
UL 50E (2007);  
IEC 60945, Section 8.8;  
GR-3125-CORE;  
GR-771-CORE;  
GR-950-CORE;  
GR-3178-CORE;  
GR-326-CORE

Temperature Exposure /  
High or Low / Thermal Shock<sup>1</sup>  
*Temperature: (-100 to 2,000) °F*

GR-487-CORE;  
GR-63-CORE;  
MIL-STD-810, Methods 501 and 502;  
NEMA 250 (2014);  
RTCA/DO-160, Section 4;  
SAE J1455;  
IEC 60945, Sections 8.2 and 8.4;  
IEC 60068-2-1;  
IEC 60068-2-2;  
IEC 60068-2-14;

**Test Technology/Description:**

**Test Method(s)/Standard(s):**

Temperature Exposure /  
High or Low / Thermal Shock<sup>1</sup>

*Temperature: (-100 to 2,000) °F  
(cont.)*

IEC 60068-2-53;  
IEC 60068-2-61;  
GR-3120-CORE;  
GR-3121-CORE;  
GR-3123-CORE;  
GR-3125-CORE;  
GR-13-CORE;  
GR-771-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3108-CORE;  
GR-3178-CORE;  
GR-326-CORE

Temperature Shock<sup>1</sup>

*Temperature: (-150 to 350) °F*

SAE J1455;  
MIL-STD-810, Method 503;  
IEC 60945;  
ASTM D4332;  
GR-13-CORE;  
GR-63-CORE;  
GR-487-CORE;  
GR-950-CORE

Tensile

ASTM D638;  
GR-326-CORE;  
GR-3120-CORE

Ultraviolet Resistance

ASTM D4459;  
ASTM G53-1996;  
ASTM G151;  
ASTM G154;  
ASTM G155;  
GR-487-CORE;  
IEC 60945, Section 8.10;  
IEC 60068-2-5;  
SAE J2527;  
UL 746C;  
UL 1581;  
MIL-STD-810, Method 505

Altitude / Pressure / Decompression<sup>1</sup>  
*(-2,000 to 120,000) ft*

GR-63-CORE;  
MIL-STD-810, Method 500, Procedures I, II, III, IV;  
RTCA/DO-160, Section 4;  
SAE J1455;  
IEC 60068-2-13;  
IEC 60068-2-40;  
IEC 60068-2-41;  
UL 50 (2007);  
UL 50E (2007);  
ASTM D6653;  
GR-3108-CORE

Combined Environment (excluding vibration)

MIL-STD-810, Method 520

**Test Technology/Description:**

**Test Method(s)/Standard(s):**

Sand and Dust

GR-487-CORE;  
IEC 60529, IP5X, Sections 13.4 and 13.5;  
IEC 60529, IP6X, Sections 13.4 and 13.6;  
RTCA/DO-160, Section 12;  
MIL-STD-810, Method 510;  
MIL-STD-202, Method 110;  
IEC 60068-2-68;  
GR-326-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3120-CORE;  
GR-3123-CORE;  
GR-3125-CORE

Highly Accelerated Life Testing (HALT)<sup>1</sup>  
Highly Accelerated Stress Screening (HASS)<sup>1</sup>  
*Temperature: (-100 to 200) °C*  
*Ramp Rate: 70 °C/min*  
*50 Grms Repetitive Shock with Six*  
*Degrees of Freedom*

HALT and HASS (Section 3), Gregg K. Hobbs, Ph.D.,  
PE; Hobbs Engineering; 1992. *Accelerated Reliability*  
*Engineering: HALT and HASS* (pp. 31-75);  
  
*HALT, HASS & HASA Explained: Accelerated*  
*Reliability Techniques* (pp. 2-25) Harry W. McLean,  
ASQ Quarterly Press, 2000

Shock / Drop

GR-487-CORE;  
GR-63-CORE;  
MIL-STD-810, Method 516;  
RTCA/DO-160, Section 7;  
SAE J1455;  
IEC 60945, Section 8.6;  
IEC 60068-2-27;  
IEC 60068-2-31;  
ASTM D5276;  
GR-3121-CORE;  
GR-3123-CORE

Vibration, Standard / Transportation<sup>1</sup>  
*(1 to 3,000) Hz @*  
*18,000 lbf Sine or*  
*15,000 lbf Random*

GR-487-CORE;  
GR-63-CORE;  
MIL-STD-810, Method 514;  
RTCA/DO-160, Section 8;  
SAE J1455;  
IEC 60945, Section 8.7;  
IEC 60068-2-6;  
IEC 60068-2-50;  
IEC 60068-2-51;  
IEC 60068-2-53;  
IEC 60068-2-64;  
IEC 60079-29-1, Section 5.4.13;  
IEC 60079-29-4, Section 5.4.8;  
ASTM D4728;  
ASTM D999;  
MIL-STD-167;  
GR-326-CORE

**Test Technology/Description:**

**Test Method(s)/Standard(s):**

Vibration, Standard / Transportation<sup>1</sup>  
*(1 to 3,000) Hz @  
18,000 lbf Sine or  
15,000 lbf Random  
(cont.)*

GR-3120-CORE;  
GR-3121-CORE;  
GR-3123-CORE;  
GR-3125-CORE

Acceleration<sup>1</sup>  
*Range: (0 to 110) Gs*

MIL-STD-810, Method 513, Procedures I and II;  
RTCA/DO-160, Section 7;  
IEC 60068-2-7

Icing / Freezing Rain

MIL-STD-810, Method 521;  
NEMA 250 (2014);  
RTCA/DO-160, Section 24;  
UL 50 (2007);  
UL 50E (2007);  
GR-487-CORE;  
GR-771-CORE;  
GR-950-CORE;  
GR-3120-CORE;  
GR-3125-CORE

Fluid Susceptibility / Immersion and Splash /  
Contamination by Fluids

MIL-STD-810, Method 504;  
RTCA/DO-160, Section 11;  
SAE J1455;  
IEC 60945, Sections 8.8, 8.9, and 8.11;  
IEC 60068-2-18;  
GR-487-CORE;  
GR-13-CORE;  
GR-771-CORE;  
GR-902-CORE;  
GR-937-CORE;  
GR-950-CORE;  
GR-3120-CORE;  
GR-3121-CORE;  
GR-3123-CORE;  
GR-3125-CORE

Acoustic Noise

GR-63-CORE;  
GR-487-CORE;  
GR-3108-CORE

Steam Cleaning / Pressure Washing

SAE J1455

## **Telecommunications Tests:**

ANSI/SCTE 09 – Test Method for Cold Bend;  
ANSI/SCTE 10 – Test Method for Flexible Coaxial Cable Impact;  
ANSI/SCTE 31 – Test Method for Measuring Diameter Over Core;  
ANSI/SCTE 33 – Test Method for Diameter of Drop Cable;  
ANSI/SCTE 39 – Test Method for Static Minimum Bending Radius for Coaxial Trunk, Feeder and Distribution Cables;  
ANSI/SCTE 51 – Test Method for Determining Drop Cable Braid Coverage;  
ANSI/SCTE 59 – Test Method for Drop Cable Center Conductor Bond to Dielectric;  
ANSI/SCTE 60 – Test Method for Interface Moisture Migration Double Ended;  
ANSI/SCTE 61 – Test Method for Jacket Web Separation;  
ANSI/SCTE 69 – Test Method for Moisture Inhibitor Corrosion Resistance;

ANSI/SCTE 73 – Test Method for Insertion Force of Connector to Drop Cable Interface;  
ANSI/SCTE 88 – Test Method for Polyethylene Jacket Longitudinal Shrinkage;  
ANSI/SCTE 98 – Test Method for Withstand Tightening Torque – “F” Male;  
ANSI/SCTE 99 – Test Method for Axial Pull Connector/Drop Cable;  
ANSI/SCTE 143 – Test Method for Salt Spray;  
ANSI/SCTE 149 – Test Method for Withstanding Tightening Torque – “F” Female;  
ANSI/SCTE 166 – Flexure Method for Drop Cable Connection;  
ANSI/SCTE 191 – Test Method for Axial Pull Force, Female “F” port

Industries served: Telecommunications, Aerospace, Defense, and Electronics

Note: this lab is capable of performing current and older versions of MIL-STD-810 (versions B through G) and RTCA/DO-160 (versions B through G) for the methods listed above. The methods listed above on this Scope are accredited. The following test method is a guideline utilized to perform the above fungus test: ***MIL-HBK-454B, Guideline 4.***

<sup>1</sup>Also using customer specific test methods utilizing any combination of test equipment parameters listed above.





## Accredited Laboratory

A2LA has accredited

# ELEMENT MATERIALS TECHNOLOGY MINNEAPOLIS LLC

Minneapolis, MN

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 13<sup>th</sup> day of August 2019.

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

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 1719.01  
Valid to August 31, 2021

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