



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELEMENT MATERIALS TECHNOLOGY BURTON
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ELECTRICAL (EMC)

Valid to: May 31, 2024

Certificate Number: 1123.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility tests and electronics testing using the parameters and methods listed below:

On the following products or types of products:

Automotive, Aerospace, Military and Electrical/Electronic/Mechanical components and assemblies.

<u>Test Technology:</u>	<u>Test Specification/Method(s):</u>
<u>EMC Tests</u>	
Radiated RF Emissions	CISPR 25 <i>Section 6.5 ALSE Method only</i> CISPR 25:2008 <i>Section 6.4 ALSE Method only</i> CISPR 25:2002 <i>Section 6.4 ALSE Method only</i>
Conducted RF Emissions	CISPR 25 <i>Section 6.3 and 6.4</i> CISPR 25:2008 <i>Section 6.2 and 6.3</i> CISPR 25:2002 <i>Section 6.2 and 6.3</i>
Bulk Current Injection (BCI)	ISO 11452-4 <i>Section 8.3.1.2, Substitution Method (BCI) only</i> ISO 11452-4 (2011) <i>Section 8.3.1.2, Substitution Method (BCI) only</i>
Absorber-Lined Shielded Enclosure (ALSE) RI	ISO 11452-2 <i>Frequency range limited to 200 MHz – 3.6 GHz</i> ISO 11452-2 (2004) <i>Frequency range limited to 200 MHz – 3.6 GHz</i>
Radiated Immunity – Portable Transmitters	ISO 11452-9 <i>Using Annex B, Section B.2 Antenna only</i> ISO 11452-9 (2012) <i>Using Annex B, Section B.2 Antenna only</i>
Reverberation Radiated Immunity Mode Tuned	ISO/IEC 61000-4-21 <i>Annex D only, Modified OEM method;</i> ISO 11452-11 (2019)

<u>Test Technology:</u>	<u>Test Specification/Method(s):</u>
	ISO 11452-11 ISO 11452-11 (2010)
Conducted Transient Emissions	ISO 7637-2 <i>Conducted Transient Emissions</i> ISO 7637-2 (2004) <i>Conducted Transient Emissions</i>
Conducted Transient Immunity – Power/Supply Lines	ISO 7637-2 <i>Conducted Transient Immunity</i> ISO 7637-2 <i>Conducted Transient Immunity(2004)</i> (Pulses 1, 2a, 2b, 3a, 3b, 4, 5a, 5b); ISO 7637-2 <i>Conducted Transient Immunity(2011)</i> (Pulses 1, 2a, 2b, 3a, 3b); ISO 16750-2 <i>Conducted Immunity</i> (Pulses 4, 5a, 5b)
Conducted Transient Immunity – Other than Power/Supply Lines	ISO 7637-3 <i>Capacitive Coupling Clamp (CCC)</i> <i>Direct Capacitor Coupling (DCC)</i> <i>Inductive Coupling Clamp (ICC)</i>
Radiated Immunity – Magnetic Fields (Loop)	ISO 11452-8 <i>Section 3.4.5 Radiating loop;</i> GM (2015/2019) RI Magnetic Fields L2 ISO 11452-8 (2007) <i>Section 3.4.5 Radiating loop;</i> GM (2015/2019) RI Magnetic Fields L2
Electrostatic Discharge (ESD)	ISO 10605 <i>Excluding Section 6, Vehicle Tests;</i> ISO 10605 (2001), <i>Excluding Section 6, Vehicle Tests;</i> ISO 10605 (2008) <i>Excluding Section 10, Vehicle Tests, Including Annex F – Field Coupled</i>
Electrostatic Discharge (ESD) – Airbag Inflator Assemblies	ISO 12097-3, <i>Sections 7.1 ESD and 7.2 EMC;</i> AK-LV 03 Issue 2005-05 ISO 12097-3 (2002), <i>Sections 7.1 ESD and 7.2 EMC;</i> AK-LV 03 Issue 2005-05
<u>Electrical Tests Based on GMW 3172:</u> - Jump Start - Reverse Polarity - Over Voltage - State Change Waveform Characterization - Ground Path Inductance Sensitivity - Power Supply Interruptions - Battery Voltage Dropout - Intermittent Short Circuit to Battery/Ground - Continuous Short Circuit to Battery/Ground - Parasitic Current - Sinusoidal Superimposed Voltage - Pulsed Superimposed Voltage - Power Offset - Ground Offset - Open Circuit Single Line - Open Circuit Multiple Lines - Overload – Fuse Protected Circuits	GMW 3172 ²
<u>Electrical Tests Based on GMW 3172 (cont.):</u>	

<u>Test Technology:</u>	<u>Test Specification/Method(s):</u>
<ul style="list-style-type: none"> - Overload – All Circuits - Crank Pulse Capability and Durability - Switched Battery Line - Multiple Power and Multiple Ground Short - Circuit Including Pass Through - Fretting Corrosion Degradation 	GMW 3172 ²
<u>Electrical Tests Based on MIL-STD 202:</u> <ul style="list-style-type: none"> - Dielectric Withstanding Voltage - Insulation Resistance - DC Resistance - Resistance Temperature Characteristic 	MIL-STD-202G, Method 301 MIL-STD-202G, Method 302 MIL-STD-202G, Method 303 MIL-STD-202G, Method 304
<u>Electrical Tests Based on USCAR-2:</u> <ul style="list-style-type: none"> - Dry Circuit Resistance - Voltage Drop - Insulation Resistance 	USCAR-2 USCAR-2 USCAR-2

<u>Test Type</u>	<u>Test Parameters</u>
Voltage	
AC – Measure ¹	1 μ V to 400 V @ 1 Hz to 250 MHz
AC – Generate ¹	1 mV to 10 V @ 1 Hz to 80 MHz
DC – Measure ¹	1 mV to 1,000 V
DC – Generate ¹	1 mV to 1,000 V
Current	
AC/DC Current – Measure ¹	10 μ A to 400 A
DC Current – Generate ¹	10 μ A to 600 A
Resistance	
Measure ¹	100 $\mu\Omega$ to 2.0 x 10 ¹⁰ Ω
Generate ¹	100 $\mu\Omega$ to 1.6 x 10 ¹⁰ Ω
Dielectric Testing	
AC ¹	(100 to 4,000) V
DC ¹	(100 to 1,100) V
Frequency	
Measure ¹	1 Hz to 250 MHz
Generate ¹	1 Hz to 80 MHz
Capacitance¹	0.1 pF to 10 mF
Resistivity¹	1 x 10 ⁶ Ω m to 1 x 10 ¹⁰ Ω m

¹Also using customer specified methods directly related to the types of tests and parameters listed.

² 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 including but not limited to GMW 3172 (2008, 2010, 2012, 2015, 2018)²



Accredited Laboratory

A2LA has accredited

ELEMENT MATERIALS TECHNOLOGY BURTON

Burton, MI

for technical competence in the field of

Electrical 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 3rd day of May 2022.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1123.02
Valid to May 31, 2024
Revised September 22, 2023

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