SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

ELEMENT MATERIALS TECHNOLOGY DETROIT - WARREN 11 MILE[1]
27485 George Merrelli Drive
Warren, MI 48092
Scott Stephen Karrer Phone: 586 754 9000 ext. 32900
Email: Stephen.karrer@element.com

ELECTRICAL

Valid To: March 31, 2019 Certificate Number: 0038.03

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location above ***as well as the two satellite laboratory locations listed below*** to perform the following tests:

METHOD	TEST
ASTM D149	Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials
ASTM D257	DC Resistance or Conductance of Insulating Materials
Chrysler PF 9590 (Sections 2.5.4, 2.5.5 2.6.3.3d, 2.6.4, 2.6.5 2.6.6.7c, 2.6.7.3c)	Automotive Electrical Device Connection Systems
DOE/ID-11069	Ineel Battery Test Manual for Test: Static Capacity, Hybrid Pulse Power Characterization, Self Discharge, Cold Cranking, Thermal Performance, Efficiency, Operating Set Point Stability, Cycle Life, Calendar Life, Reference Performance, Impedance Spectrum Testing
DOE/NE-ID-11173 on Mechanical Scope	FreedomCAR Ultracapacitor Test Manual
GMN 3148TP Sections 2.3.1.9, 2.3.1.11, 4.3.11	**Lamps – Component Laboratory Tests**
GMN 8020TP Section 4.3.1.2.3 *(except photometrics)*	Lamps – Development and Validation Test Procedures

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8398 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

METHOD	TEST
GMW 3172 (Sections 8.2 and 9.2 only)	Specification for Electrical/Electronic Component Analytical/Development/Validation (A/D/V) Procedures for Conformance to Vehicle Environmental, Reliability, and Performance Requirements
John Deere JDQ 201 Table #2, 24, 26, 29	Testing of Electronic and Electrical Devices – Environmental and Mechanical Loads
John Deere JDQ 202: Section JDQ 202A Section JDQ 202B Section JDQ 202C Section JDQ 202D Section JDQ 202H Section JDQ 202S Section JDQ 202U Section JDQ 202W Section JDQ 202Y Section JDQ 202Z	Testing of Electronic and Electrical Devices – Electrical Transient and Steady-State Loads
SAE J560 Sections 6.1.1, 6.1.2	Primary and Auxiliary Seven Conductor Electrical Connector for Truck-Trailer Jumper Cable
SAE J1798	Rating of Electric Vehicle Battery Modules
SAE J2288	Life Cycle Testing of Electric Vehicle Modules
SAE J2464 Sections 4.4.5.2, 4.5.1, 4.5.2, 4.5.3, 4.5.4	Passive Propagation Resistance, Short Circuit, Overcharge, Over-Discharge, Separator Shutdown Integrity *Testing only to safety device limits on full battery modules* *Or battery packs equipped with integrated safety devices.*
Nissan 26010NDS00, Section 3-6-21 *(except photometrics)*	Front Lamp
USABC Sections 1-9, 11, 12, 14	Electrochemical Storage System Abuse Test Procedure Manual – Test for the following: Short Circuit, Partial Short Circuit, Overcharge, Over-Discharge, AC Exposure Testing

Parameter	Range	Test Method
Voltage –		
AC – Measure[2]	100 µV to 40 kV	ASTM D149
AC – Generate[2]	100 mV to 10 V @ 1Hz to 30 MHz, 10V to 40V @ 1 Hz to 1.3 MHz 3 V to 40 kV, (50 to 60) Hz (3 to 300) V, (45 to 1,000) Hz	ASTM D149
DC – Measure[2]	1 µV to 15 kV	GMW 3172, Sections 8.2 and 9.2
DC – Generate[2]	100 µV to 1.5 kV	GMW 3172, Sections 8.2 and 9.2
Resistance[2]	100 µOhms to 1.6 x 10^{16} Ohms	GMW 3431
Resistivity[2]	1 x 10^{6} Ohms to 1.6 x 10^{16} Ohms	ASTM D257
Frequency [2]	1 Hz to 1 gHz, Measure 1 Hz to 30 MHz, Generate	GMW 3172, Sections 8.2 and 9.2
Dielectric Testing[2] –		
DC	100 V to 15 kV	ASTM D149
AC	100 V to 40 kV	
Inductance[2]	100 µH to 1000 H	DOE NE-ID-11173 FreedomCAR Ultracapacitor Test Manual
Capacitance[2]	100 pF to 10 mF	DOE NE-ID-11173 FreedomCAR Ultracapacitor Test Manual

On the following products and components: motors, alternators, generators, controllers, starters; coils, inductors, transformers; connectors, relays, switches, solenoids, resistors, capacitors, cables, feeders; conductive materials; printed circuits; batteries (hybrid and lithium/ion); exterior/interior lighting components.

[1]*The laboratory is accredited for the test methods listed above. The accredited test methods are used in determining compliance with any material specifications included on this Scope; however, the inclusion of these material specifications on this Scope does not confer laboratory accreditation to the material specifications. Inclusion of these material specifications on this Scope also does not confer accreditation for every method embedded within the specification. Only the methods listed above on this Scope are accredited.*

[2]Also using customer specific test methods utilizing any combination of test equipment parameters and ranges listed above.

Satellite Location: 25440 Sherwood Center Line, MI 48015

Test Method	Test Specification
UL Subject 2271 Sections 23-29	Outline of Investigation for Batteries for Use in Light Electric Vehicle (LEV) Applications
UL 1642, Sections 10, 11, 12	Safety for Lithium Batteries
UL Subject 2580 Sections 13-21	Outline of Investigation for Batteries for use in Electric Vehicles
UL 2054, Sections 9-13b	Safety for Household and Commercial Batteries

Satellite Location: 14610 jib Street, Plymouth, MI 48170

ASTM D149	Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials

Accredited Laboratory

A2LA has accredited

ELEMENT MATERIALS TECHNOLOGY DETROIT – WARREN 11 MILE

Warren, MI

for technical competence in the field of

Electrical 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 8 January 2009*).

Presented this 17th day of March 2017.

Senior Director, Accreditation Services
For the Accreditation Council
Certificate Number 0038.01
Valid to March 31, 2019
Revised December 31, 2018

For the tests or types of tests to which this accreditation applies, please refer to the laboratory's «field» Scope of Accreditation.