SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELECTRIC APPLICATIONS INCORPORATED
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ELECTRICAL

Valid To: October 31, 2025 Certificate Number: 4365.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on the following types of products**:** Batteries, including but not limited to: lithium ion, lead-acid and NiMH at the cell, module, and pack levels. Energy storage devices of various capacities, configurations and chemistries, including batteries and capacitors.

Test Technology:	**Test Method(s) [1,2]:**
Rated Capacity Test TS-001 Current, Voltage and Temperature Range of Equipment Utilized	USDoE Vehicle Technologies Program Battery Test Manual for 12 Volt Start/Stop Vehicles, INL/EXT-12-26503, 2015; INL/EXT-12-26503; USABC Battery Test Manual for Electric Vehicles, 2015; USABC Battery Test Manual for Electric Vehicles; RTCA DO 293 Minimum Operational Performance Standards (MOPS) for Nickle-Cadmium, Nickle Metal-Hydride and Lead-Acid Batteries; Section 2.2 Electrical Requirements and Test Procedures, Section 2.3 Rapid Discharge Capacity, 2009; RTCA DO 293, Section 2.2 and 2.3; GR-3150 General Requirements for Secondary Non-Aqueous Lithium Batteries, 2015; GR-3150 General Requirements for Secondary Non-Aqueous Lithium Batteries; Society of Automotive Engineers Standard J537, Storage Batteries, 2016; Society of Automotive Engineers Standard J537, Storage Batteries; IEC 60896-21, Part 21 IEC 60896-11 Stationary Lead-acid batters Part 11: Vented Types General Requirements and methods of test
Constant Power Discharge Test TS-002 Current, Voltage and Temperature Range of Equipment Utilized	IEC 60896-22 Stationary lead-acid batteries – Part 22: Valve regulated types – requirements, 2004; IEC 60896-22

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Test Technology:	**Test Method(s) [1,2]:**
Constant Power Discharge Test TS-002 Current, Voltage and Temperature Range of Equipment Utilized *(Continued)*	USDoE Vehicle Technologies Program Battery Test Manual For 12 Volt Start/Stop Vehicles, INL/EXT-12-26503, 2015; USABC Battery Test Manual for Electric Vehicles, 2015; USABC Battery Test Manual for Electric Vehicles
HPPC Test TS-003 Current, Voltage and Temperature Range of Equipment Utilized	USDoE Vehicle Technologies Program Battery Test Manual For 12 Volt Start/Stop Vehicles, INL/EXT-12-26503, 2015; INL/EXT-12-26503; USABC Battery Test Manual for Electric Vehicles, 2015; USABC Battery Test Manual for Electric Vehicles
Self-Discharge Test TS-004 Current, Voltage and Temperature Range of Equipment Utilized	USDoE Vehicle Technologies Program Battery Test Manual For 12 Volt Start/Stop Vehicles, INL/EXT-12-26503, 2015; INL/EXT-12-26503; GR-3150 General Requirements for Secondary Non-Aqueous Lithium Batteries, 2015; GR-3150
Cold Cranking Test TS-005 Current, Voltage and Temperature Range of Equipment Utilized	USDoE Vehicle Technologies Program Battery Test Manual For 12 Volt Start/Stop Vehicles, INL/EXT12-26503, 2015; INL/EXT-12-26503; USABC Battery Test Manual for Electric Vehicles, 2015; USABC Battery Test Manual for Electric Vehicles; Society of Automotive Engineers Standard J537, Storage Batteries, 2016; Society of Automotive Engineers Standard J537, Storage Batteries; BCIS-04 Storage Battery Specifications For Starting, Lighting And Ignition Types, 2016; BCIS-04
Thermal Performance Test TS-006 Current, Voltage and Temperature Range of Equipment Utilized	USDoE Vehicle Technologies Program Battery Test Manual For 12 Volt Start/Stop Vehicles, INL/EXT12-26503, 2015; INL/EXT-12-26503
Cycle Life Test TS-007 Current, Voltage and Temperature Range of Equipment Utilized	USDoE Vehicle Technologies Program Battery Test Manual For 12 Volt Start/Stop Vehicles, INL/EXT12-26503, 2015; INL/EXT-12-26503; USABC Battery Test Manual for Electric Vehicles, 2015; IEC 61427-2 Secondary cells and batteries USABC Battery Test Manual for Electric Vehicles; for photovoltaic energy systems (PVES) – General requirements and methods of test, 2015

Test Technology:	**Test Method(s) [1,2]:**
Cycle Life Test TS-007 Current, Voltage and Temperature Range of Equipment Utilized	IEC 61427-2; IEC 60254-1 Lead Acid Traction Batteries, 2005; IEC 60254-1; Test of Heavy-Duty Storage Batteries (Lead-Acid Type Only), 2018; SAE J2185 General Requirements for Secondary Non-Aqueous Lithium Batteries, 2015; GR-3150; SAE J240 Life Test for Automotive Storage Batteries, 2012; SAE J240; IEC 60896-22 Stationary lead-acid batteries – Part 22: Valve regulated types – requirements, 2004; IEC 60896-22
Accelerated Float Life TS-008 Current, Voltage and Temperature Range of Equipment Utilized	IEC 60896-21 Stationary lead-acid batteries – Part 21: Valve regulated types– methods of test, 2004; IEC 60896-21
Ground Short Propensity Test TS-009 Current, Voltage and Temperature Range of Equipment Utilized	IEC 60896-21 Stationary lead-acid batteries – Part 21: Valve regulated types –methods of test, 2004; IEC 60896-21; IEC 60896-22 Stationary lead-acid batteries – Part 22: Valve regulated types – requirements, 2004; IEC 60896-22
Peak Power Test TS-010 Current, Voltage and Temperature Range of Equipment Utilized	USABC Battery Test Manual for Electric Vehicles, 2015; USABC Battery Test Manual for Electric Vehicles
Fast Rate Charge Test TS-011 Current, Voltage and Temperature Range of Equipment Utilized	USABC Battery Test Manual for Electric Vehicles, 2015; USABC Battery Test Manual for Electric Vehicles
Calendar Life Test TS-012 Current, Voltage and Temperature Range of Equipment Utilized	USDoE Vehicle Technologies Program Battery Test Manual For 12 Volt Start/Stop Vehicles, INL/EXT-12-26503, 2015; INL/EXT-12-26503
Water Consumption Test TS-013 Current, Voltage and Temperature Range of Equipment Utilized	EN50342-1 Lead-acid starter batteries Part 1: General Requirements and Methods of Test, 2015; EN50342-1
Dynamic Charge Acceptance Test TS-014 Current, Voltage and Temperature Range of Equipment Utilized	EN50342-6 Lead-acid starter batteries Part 6: Batteries for Micro-Cycle Applications, 2015; EN50342-6
Short Circuit Test TS-015 Current, Voltage and Temperature Range of Equipment Utilized	UN Manual of Tests and Criteria – Section 38.3: Lithium Metal and Lithium-Ion Batteries Test T.5 External Short Circuit, 2019;

Test Technology:	**Test Method(s) [1,2]:**
Short Circuit Test TS-015 Current, Voltage and Temperature Range of Equipment Utilized (Cont.)	UN Manual of Tests and Criteria – Section 38.3: Lithium Metal and Lithium-Ion Batteries Test T.5 External Short Circuit; IEC 60896-21 Stationary lead-acid batteries – Part 21: Valve regulated types –methods of test, 2004; IEC 60896-21; IEC 60896-22 Stationary lead-acid batteries – Part 22: Valve regulated types – requirements, 2004; IEC 60896-22

[1]Also using customer specified test methods directly related to the types of testing above that fall within the following test parameters and ranges:

Current, Voltage, and Temperature Range of Equipment Utilized

Parameter	**Range:**
VDC – Measure	(0 to 750) V
VDC – Source	(0 to 750) V
ADC – Measure	(-1000 to 1000) A
ADC – Source	(-1000 to 1000) A
Power – Source	(-300 to 300) kW
Temperature	(-60 to 120) °C

[2]When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*

Accredited Laboratory

A2LA has accredited

ELECTRIC APPLICATIONS INCORPORATED

Phoenix, AZ

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 13th day of October 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4365.01
Valid to October 31, 2025
Revised January 29, 2024

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