SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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ELECTRICAL

Valid To: September 30, 2016 Certificate Number: 1136.04

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electrical tests:

Tests:	**Test Method(s)[1, 2]:**
Dielectric Breakdown Voltage and Dielectric Strength Test	UL 746A (Section 21); CAN/CSA C22.2 No.0.17 (Section 6.2); IEC 60950-1 (Sections 2.10.5.1, 4.3.8, 4.3.10, 5.2, 5.2.2, 5.3.4, and 5.3.9.2); EN 60950-1 (Sections 2.10.5.1, 4.3.8, 4.3.10, 5.2, 5.2.2, 5.3.4, and 5.3.9.2); UL 60950-1 (Sections 2.10.5.1, 4.3.8, 4.3.10, 5.2, 5.2.2, 5.3.4, and 5.3.9.2); CAN/CSA C22.2 No.60950-1 (Sections 2.10.5.1, 4.3.8, 4.3.10, 5.2, 5.2.2, 5.3.4, and 5.3.9.2); IEC 61010-1 (Sections 6.8.3.1 and 6.8.3.2); EN 61010-1 (Sections 6.8.3.1 and 6.8.3.2); UL 61010-1 (Sections 6.8.3.1 and 6.8.3.2); CAN/CSA-C22.2 No.61010-1 (Sections 6.8.3.1 and 6.8.3.2); ASTM D149; IEC 60243-1; JIS K6911; C 2110-1, -2, -3
Comparative Tracking Index Test	UL 746A (Section 24); CAN/CSA C22.2 No.0.17 (Section 6.5); ASTM D3638; IEC 60112

Tests:	**Test Method(s) [1, 2]:**
High Voltage, Low Current, Dry Arc Resistance Test	UL 746A (Section 23); ASTM D495; JIS K6911; CAN/CSA C22.2 No.0.17 (Section 6.4)
Volume/Surface Resistivity	UL 746A (Section 22); ASTM D257; JIS C5016; JIS K6911; JIS C6481; JIS C6471; IEC 60093; CAN/CSA C22.2 No. 17 (Section 6.3)
1000 Cycle Temperature Limiter Test	IEC 60950-1, Annex K.4 (Section 1.5.3); EN 60950-1, Annex K.4 (Section 1.5.3); UL 60950-1, Annex K.4 (Section 1.5.3); CAN/CSA C22.2 No.60950-1, Annex K.4 (Section 1.5.3)
200 Cycle Thermal Cut-Out Test	IEC 60950-1, Annex K.5 (Sections 1.5.3 and 4.5.2); EN 60950-1, Annex K.5 (Sections 1.5.3 and 4.5.2); UL 60950-1, Annex K.5 (Sections 1.5.3 and 4.5.2); CAN/CSA C22.2 No.60950-1, Annex K.5 (Sections 1.5.3 and 4.5.2)
200 Cycle Thermostat Test	IEC 60950-1, Annex K.2 (Section 1.5.3); EN 60950-1, Annex K.2 (Section 1.5.3); UL 60950-1, Annex K.2 (Section 1.5.3); CAN/CSA C22.2 No.60950-1, Annex K.2 (Section 1.5.3)
10000 Cycle Thermostat Endurance Test	IEC 60950-1, Annex K.3 (Section 1.5.3); EN 60950-1, Annex K.3 (Section 1.5.3); UL 60950-1, Annex K.3 (Section 1.5.3); CAN/CSA C22.2 60950-1, Annex K.3 (Section 1.5.3)
Input Test/Single-Phase	IEC 60950-1 (Section 1.6.2); EN 60950-1 (Section 1.6.2); UL 60950-1 (Section 1.6.2); CAN/CSA C22.2 No.60950-1 (Section 1.6.2); IEC 61010-1 (Section 5.1.3); EN 61010-1 (Section 5.1.3); UL 61010-1 (Section 5.1.3); CAN/CSA-C22.2 No.61010-1 (Section 5.1.3)

Tests:	**Test Method(s)[1, 2]:**
Input Test/Polyphase	IEC 60950-1 (Section 1.6.2); EN 60950-1 (Section 1.6.2); UL 60950-1 (Section 1.6.2); CAN/CSA C22.2 No.60950-1 (Section 1.6.2); IEC 61010-1 (Section 5.1.3); EN 61010-1 (Section 5.1.3); UL 61010-1 (Section 5.1.3); CAN/CSA C22.2 No.61010-1 (Section 5.1.3)
Access to Energized Parts Test (Finger Test)	IEC 61010-1 (Section 6.2); EN 61010-1 (Section 6.2); UL 61010-1 (Section 6.2); CAN/CSA C22.2 No.61010-1 (Section 6.2); IEC 60950-1 (Section 2.1.1.1); EN 60950-1 (Section 2.1.1.1); UL 60950-1 (Section 2.1.1.1); CAN/CSA C22.2 No.60950-1 (Section 2.1.1.1)
Energy Hazard Measurements	IEC 60950-1 (Sections 2.1.1.5 and 2.1.2); EN 60950-1 (Sections 2.1.1.5 and 2.1.2); UL 60950-1 (Sections 2.1.1.5 and 2.1.2); CAN/CSA C22.2 No.60950-1 (Sections 2.1.1.5 and 2.1.2)
Capacitance Discharge Test	IEC 60950-1 (Section 2.1.1.7); EN 60950-1 (Section 2.1.1.7); UL 60950-1 (Section 2.1.1.7); CAN/CSA C22.2 60950-1 (Section 2.1.1.7); IEC 61010-1 (Section 6.6.2); EN 61010-1 (Section 6.6.2); UL 61010-1 (Section 6.6.2); CAN/CSA-C22.2 No.61010-1 (Section 6.6.2)
SELV Reliability Test	IEC 60950-1 (Sections 2.2.2, 2.2.3, and 2.2.4); EN 60950-1 (Sections 2.2.2, 2.2.3, and 2.2.4); UL 60950-1 (Sections 2.2.2, 2.2.3, and 2.2.4); CAN/CSA C22.2 No.60950-1 (Sections 2.2.2, 2.2.3, and 2.2.4); IEC 61010-1 (Sections 6.3.1 and 6.3.2); EN 61010-1 (Sections 6.3.1 and 6.3.2); UL 61010-1 (Sections 6.3.1 and 6.3.2); CAN/CSA-C22.2 No.61010-1 (Sections 6.3.1 and 6.3.2)
Limited Current Circuit Measurements	IEC 60950-1 (Sections 2.4.1 and 2.4.2); EN 60950-1 (Sections 2.4.1 and 2.4.2); UL 60950-1 (Sections 2.4.1 and 2.4.2); CAN/CSA C22.2 No.60950-1 (Sections 2.4.1 and 2.4.2)

Tests:	**Test Method(s)[1, 2]:**
Limited Power Source Measurements	IEC 60950-1 (Section 2.5); EN 60950-1 (Section 2.5); UL 60950-1 (Section 2.5); CAN/CSA C22.2 No.60950-1 (Section 2.5); IEC 61010-1 (Section 9.4); EN 61010-1 (Section 9.4); UL 61010-1 (Section 9.4); CAN/CSA C22.2 No.61010-1 (Section 9.4)
Earthing Test	IEC 60950-1 (Sections 2.6.3.4 and 2.6.1); EN 60950-1 (Sections 2.6.3.4 and 2.6.1); UL 60950-1 (Sections 2.6.3.4 and 2.6.1); CAN/CSA C22.2 No.60950-1 (Sections 2.6.3.4 and 2.6.1); IEC 61010-1 (Sections 6.5.2.4 and 6.5.2.5); EN 61010-1 (Sections 6.5.2.4 and 6.5.2.5); UL 61010-1 (Sections 6.5.2.4 and 6.5.2.5); CAN/CSA C22.2 No.61010-1 (Sections 6.5.2.4 and 6.5.2.5)
Torque Test	IEC 61010-1 (Sections 6.5.2.3 and 6.10.2.2); EN 61010-1 (Sections 6.5.2.3 and 6.10.2.2); UL 61010-1 (Sections 6.5.2.3 and 6.10.2.2); CAN/CSA C22.2 No.61010-1 (Sections 6.5.2.3 and 6.10.2.2)
Safety Interlock Shock and Energy Test	IEC 60950-1 (Section 2.8.2); EN 60950-1 (Section 2.8.2); UL 60950-1 (Section 2.8.2); CAN/CSA C22.2 No.60950-1 (Section 2.8.2)
Switches and Relays in Interlock Systems (Overload Test, Endurance Test, Electric Strength Test)	IEC 61010-1 (Section 15); EN 61010-1 (Section 15); UL 61010-1 (Section 15); CAN/CSA C22.2 No.61010-1 (Section 15); IEC 60950-1 (Section 2.8.7); EN 60950-1 (Section 2.8.7); UL 60950-1 (Section 2.8.7); CAN/CSA C22.2 No.60950-1 (Section 2.8.7)
Determination of Working Voltage	IEC 60950-1 (Section 2.10.2); EN 60950-1 (Section 2.10.2); UL 60950-1 (Section 2.10.2); CAN/CSA C22.2 No.60950-1 (Section 2.10.2)

Tests:	**Test Method(s) [1, 2]:**
Internal Space Clearance Test	IEC 61010-1 (Section 6.7); EN 61010-1 (Section 6.7); UL 61010-1 (Section 6.7); CAN/CSA C22.2 No.61010-1 (Section 6.7); IEC 60950-1 (Sections 2.10.3, 4.2.2, 4.2.3, and 2.10.4); EN 60950-1 (Sections 2.10.3, 4.2.2, 4.2.3, and 2.10.4); UL 60950-1 (Sections 2.10.3, 4.2.2, 4.2.3, and 2.10.4); CAN/CSA C22.2 No.60950-1 (Section 2.10.3, 2.10.4 4.2.2, and 4.2.3)
Direct Plug-In Test	IEC 60950-1 (Section 4.3.6); EN 60950-1 (Section 4.3.6); UL 60950-1 (Section 4.3.6); CAN/CSA C22.2 60950-1 (Section 4.3.6)
Touch Current Test (Single Phase/Polyphase: TN/TT System)	IEC 60950-1 (Section 5.1, Annex D); EN 60950-1 (Section 5.1, Annex D); UL 60950-1 (Section 5.1, Annex D); CAN/CSA C22.2 No.60950-1 (Section 5.1, Annex D); IEC 61010-1 (Section 6.3); EN 61010-1 (Section 6.3); UL 61010-1 (Section 6.3); CAN/CSA C22.2 No.61010-1 (Section 6.3)
Transformer Abnormal Operation Test	IEC 60950-1 (Section 5.3.3, Annex C.1); EN 60950-1 (Section 5.3.3, Annex C.1); UL 60950-1 (Section 5.3.3, Annex C.1); CAN/CSA C22.2 No.60950-1; (Section 5.3.3, Annex C.1)
Power Supply Output Short-Circuit/Overload Test	IEC 60950-1 (Section 5.3.7); EN 60950-1 (Section 5.3.7); UL 60950-1 (Section 5.3.7); CAN/CSA C22.2 No.60950-1 (Section 5.3.7)
Unattended Equipment Test	IEC 60950-1 (Section 5.3.8); EN 60950-1 (Section 5.3.8); UL 60950-1 (Section 5.3.8); CAN/CSA C22.2 No.60950-1 (Section 5.3.8)
Running Overload Test	IEC 60950-1 (Annex B.4); EN 60950-1 (Annex B.4); UL 60950-1 (Annex B.4); CAN/CSA C22.2 No.60950-1 (Annex B.4)

Tests:	**Test Method(s) [1, 2]:**
Locked-Rotor Overload Test and Endurance Test	IEC 60950-1 (Annex B.5 and B.8); EN 60950-1 (Annex B.5 and B.8); UL 60950-1 (Annex B.5 and B.8); CAN/CSA C22.2 No.60950-1 (Annex B.5 and B.8); IEC 61010-1 (Section 14.2); EN 61010-1 (Section 14.2); UL 61010-1 (Section 14.2); CAN/CSA-C22.2 No.61010-1 (Section 14.2)
Secondary Motor Running Overload Test for DC Motors	IEC 60950-1 (Annex B.6); EN 60950-1 (Annex B.6); UL 60950-1 (Annex B.6); CAN/CSA C22.2 No.60950-1 (Annex B.6)
Locked-Rotor Overload Test for DC Motors in Secondary Circuits	IEC 61010-1 (Section 14.2.1); EN 61010-1 (Section 14.2.1); UL 61010-1 (Section 14.2.1); CAN/CSA C22.2 No.61010-1 (Section 14.2.1); IEC 60950-1 (Annex B.7); EN 60950-1 (Annex B.7); UL 60950-1 (Annex B.7); CAN/CSA C22.2 No.60950-1 (Annex B.7)
Phase Disconnect Test	IEC 60950-1 (Annex B.9); EN 60950-1 (Annex B.9); UL 60950-1 (Annex B.9); CAN/CSA C22.2 No.60950-1 (Annex B.9)
Test for Series Motors	IEC 60950-1 (Annex B.10); EN 60950-1 (Annex B.10); UL 60950-1 (Annex B.10); CAN/CSA C22.2 No.60950-1 (Annex B.10)
Temperature Rise	IEC 60950-1 (Sections 4.5.1, 1.4.12, and 1.4.13); EN 60950-1 (Sections 4.5.1, 1.4.12, and 1.4.13); UL 60950-1 (Sections 4.5.1, 1.4.12, and 1.4.13); CAN/CSA C22.2 No.60950-1 (Sections 4.5.1, 1.4.12, and 1.4.13); IEC 61010-1 (Sections 10.1 and 10.4); EN 61010-1 (Sections 10.1 and 10.4); UL 61010-1 (Sections 10.1 and 10.4); CAN/CSA C22.2 No.61010-1 (Sections 10.1 and 10.4)

Tests:	**Test Method(s)[1, 2]:**
Testing performed on Photovoltaic Modules	
Maximum Power Determination	IEC 61215 (Section 10.2); IEC 61646 (Section 10.2)
Ground Continuity	IEC 61730-2 (MST 13); UL 1703 (Section 25)
Impulse Voltage Test	IEC 61730-2 (MST 11)
Dielectric Withstand Test	IEC 61730-2 (MST 16)
Wet Leakage Current Test	IEC 61730-2 (MST 17); IEC 61215 (Section 10.3); IEC 61646 (Section 10.15); IEC 61215 (Section 10.15); UL 746C (Sections 25 and 57); UL 1703 (Section 26); UL 1703 (Section 27)
Reverse Current Overload	IEC 61730-2 (MST 26); UL 1703 (Section 28)
Partial Discharge Test	IEC 61730-2 (MST 15); IEC 60664-1 (Section 6.1.3.5, Annex D)
UV-Xenon Arc Exposure Test	ASTM G155; ISO 4892-2; IEC 61730 (Sections 5.2.c, 5.2.d, and 5.4.3); IEC 61646 (Section 10.3)
Inclined Plane Tracking Test	IEC 61730-1 (Section 5.3.c), 60587; ASTM D2303; UL 746A (Section 26)
Measurement of Total Luminous Flux	JIS C7801 (Section 7); JIS C8152-2 (Section 7); JIS C8159-2 (Section 11.1)
Measurement of Light Source Colour and Colour Rendering Index	JIS C7801 (Section 9); JIS C8152-2 (Section 8); JIS C8159-2 (Sections 11.3 and 11.4)

[1] When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is required to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*.

[2] UL 60950-1, IEC 60950-1, CSA C22 No. 60950-1, EN60950-1 base requirements are nearly identical, section numbers relate to all four editions, unless otherwise indicated. For example, North American Annex NAE is specifically included for Battery Circuits on this scope. Included in the product safety activities are visual observations and similar activities for markings and other characteristics.

On the following materials and products: Adhesives and Sealants; Ceramics; Films and Packaging; Leather; Packaging and Containers; Paper, Paperboard and Pulp; Plastics and Polymers; Rubber and Rubber Products; Textiles; Information Technology Equipment (ITE); Photovoltaic Modules; Printed Wiring Board; Magnet Wire; Varnish; Industrial Laminate; and Wire Positioning Devices.

Accredited Laboratory

A2LA has accredited

CHEMITOX, INC.,
YAMANASHI FACILITY

Yamanashi-ken, Japan

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 23rd day of September 2014.

Senior Director of Quality and Communications
For the Accreditation Council
Certificate Number 1136.04
Valid to September 30, 2016
Revised August 30, 2016

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