STANDARDS UPDATE NOTICE (SUN)
ISSUED: April 7, 2025

STANDARD INFORMATION

Standard: UL 9741
Standard ID: Electric Vehicle Power Export Equipment (EVPE) [UL 9741:2023 Ed.1]
Previous Standard ID: Outline of Investigation for Electric Vehicle Power Export Equipment (EVPE) [UL SUBJECT 9741:2021 Ed.2]

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **September 29, 2027**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard. Reports not updated to this version by the effective date above will be withdrawn.

Note: The 1st edition of UL 9741 is harmonized with the 1st edition of CSA C22.2 No. 348.

Overview of Changes:

- Update to the Scope of the standard
- Update to communications with other products
- Revisions to enclosure requirements
- New requirements for internal wiring
- New requirements for bus bars
- New requirements for utility grid interaction
- Revised requirements for multiple tests
- Updated marking requirements

Specific details of new/revised requirements are found in table below

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		Additions to existing requirements are underlined and deletions are shown ~~lined out~~ below.
1	Info	**Scope**
1.1		The requirements of this standard apply to off-board unidirectional and bidirectional equipment rated 1000 Vac and 1500 Vdc or less, that transfers electrical energy between an electric vehicle and off board loads as well as operating in parallel with an electric power system, such as the electric utility grid, using a permanently attached vehicle connector. Equipment that has optional bidirectional functionality serves as both Electric Vehicle Power Export Equipment (EVPE) and electric vehicle supply equipment (EVSE). The products to which these requirements apply are intended to be installed in accordance with the National Electrical Code, NFPA 70, and CSA C22.1, Canadian Electrical Code, Part I.
1.2		***New clause added;*** The requirements of this standard are intended to apply to equipment for indoor or outdoor use.
1.3		***New clause added;*** The requirements for equipment without power export functionality are contained in the Standard for Electric Vehicle Supply Equipment, NMX-J-677 ANCE/CSA C22.2 No. 280/UL 2594 or the Standard for DC Charging Equipment for Electric Vehicles, NMX-J-817 ANCE/CSA C22.2 No. 346/UL 2202.
1.4		Some configurations of equipment to which the requirements of this Standard apply have functionality as described below: a) The equipment can be supplied by DC power from the vehicle and acts as a standalone piece of equipment provided with a converter and provides AC and/or DC power to AC and/or DC receptacles for the connection to external loads; c) The equipment can be supplied by DC power from the vehicle and is provided with a converter that is permanently connected to the premise and provides AC or DC power to loads that are not interconnected (electrically connected) to the grid connected part of the premise wiring system; e) The equipment can be supplied by DC power from the vehicle and is provided with an inverter that is permanently connected to the premise, and provides AC power to premise wiring systems through a transfer switch;

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		i) The equipment can be supplied by DC power from the vehicle and the equipment is provided with a grid-tie inverter for converting to AC power and is permanently connected to the premise wiring system, with capability to operate in parallel with the AREA EPS but not islanding (no back-up during grid outage); j) The equipment can be supplied by AC power from the vehicle and is provided with optional voltage conditioning equipment and is permanently connected to the premise wiring system, with capability to operate in parallel with the AREA EPS but not islanding (no back-up during grid outage); k) The equipment can be supplied by DC power from the vehicle and the equipment is provided with a grid-tie inverter for converting to AC power and is permanently connected to the premise wiring system, with capability to operate in parallel with the AREA EPS with islanding (back-up during grid outage); l) The equipment can be supplied by AC power from the vehicle and is provided with optional voltage conditioning equipment and is permanently connected to the premise wiring system, with capability to operate in parallel with the AREA EPS with islanding (back-up during grid outage); m) The equipment can be supplied by DC power from the vehicle to other inverter/converter/power conditioning equipment that is grid interactive with capability to operate in parallel with the AREA EPS for supplying AC power to the grid, and for other special purpose requirements; and n) The equipment can be supplied by AC power from the vehicle and is permanently connected to the premise wiring system and uses EV on-board interactive inverters that meet SAE J3072 performance requirements including communications protocols appropriate for the EV-EVPE equipment interface and that operates in parallel with the AREA EPS.
	Info	**CONSTRUCTION**
6	Info	**General**
6.5		***New clause added;*** Equipment covered by this standard may communicate with other equipment and systems via standardized communications protocols such as but not limited to IEEE 2030.5 and IEEE 1815, Sunspec Modbus.
6.6		***New clause added;*** Connections to the EVPE may include but are not limited to: EV, EPS and alternative energy sources including but not limited to photovoltaic, wind turbine, fuel cell, and energy storage.
7	Info	**Frame and Enclosure**
7.4	Info	**Sheet metal enclosures**
7.4.2		With reference to 7.4.1, sheet metal of a lesser thickness than shown in Table 7.2 and Table 7.3 is possible where the end-product enclosure complies with the ~~Compression Test in UL 1741~~. Comparative deflection test (enclosure) in CSA C22.2 No. 94.1/UL 50.

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7.12	Info	**Outdoor use enclosures**
7.12.1		***New clause added;*** Enclosures for equipment intended to be used outdoors shall be rated a minimum of Type 3R in accordance with CSA C22.2 No. 94.2/UL 50E. Additionally, the enclosure shall comply with the Sprinkler Test in Section 78.
14	Info	**Supply Connections**
14.4	Info	**Identification**
14.4.1		A unit rated a) 120 volts, 2-wire; b) 120/240 volts, single-phase, 3-wire; c) 208Y/120 volts, two-phase, 3-wire; d) 208Y/120 volts, three-phase, 4-wire; e) 480Y/277 or 600Y/347 volts, three-phase, 4-wire in which the neutral is used as a circuit conductor; f) 240/120 volts, three-phase, 4-wire in which the midpoint on one phase is used as a circuit conductor; or g) 240 or 480 volts, three-phase, 3-wire, corner-grounded delta.
20	Info	Internal Wiring
20.2		***New section added;*** **Protection of wiring** Internal wiring shall not be accessible when judged in accordance with: See standard for details.
21	info	**Current-Carrying Parts**
21.1		***New section added;*** **General** A current-carrying part shall be of silver, copper, a copper-base alloy, stainless steel, aluminum, or the equivalent except for the materials in 21.1.2. See standard for details.
21.2	Info	**Bus bars**
21.2.1		***New clause added;*** Each bus bar shall be plated at each joint with tin, silver, or nickel. A welded or brazed joint, or a copper bus bar with current at the joint of 600 A or less, is not required to be plated. A bus bar provided with an oxide inhibiting compound over the joint surfaces is not required to be plated when the compound is in accordance with 21.3.2.

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21.2.2		***New clause added;*** Other coatings used for aluminum bus bars are allowed when evaluated for the application in accordance with the requirements for current-carrying parts described in Impact Test, Section 73.
29		***New section added;*** **AC receptacles for qualified maintenance personnel or for internal EVPE use** AC service receptacles shall be located to prevent public access. Each receptacle intended for general use shall be rated at 15 or 20 amperes, 125 or 250 volts. Each general or special use receptacle shall be of the grounding type and shall comply with: See standard for details.
30	Info	**Overcurrent Protection**
30.1	Info	**General**
30.1.2		***New clause added;*** With reference to the requirement in 30.1.1, a control-circuit fuse does not require renewal as an intended function when the fuse and the load are contained within the same enclosure.
48	Info	**Utility Grid Interaction**
48.2	Info	**Utility grid interactive inverter**
48.2.2		***New clause added;*** Within this standard, the term utility grid interactive products refers to complete or modular equipment that are subassemblies of complete utility grid interactive products. These modular products, when connected in accordance with the manufacturer instructions, form a utility grid interactive product or system and shall comply with the requirements in this standard.
48.2.3		***New clause added;*** Larger EVPE and/or additional grid interactive features or functions will have more requirements and may include connection to interactive products or subassemblies of utility grid interactive products that may be enabled in accordance with local utility interconnection protection requirements, or both.

CLAUSE	VERDICT	COMMENT
	Info	**PERFORMANCE**
51	Info	**General**
51.1		A representative sample of a unit is to be subjected to the tests described in Sections 49 – 78. The input and output ports of the EVPE unit shall be connected as specified in 51.1 – 51.6 during these tests. Overcurrent protection for those ports shall be connected in accordance with the instructions provided with the unit and in accordance with the markings on the unit.
51.2		***New clause added;*** Unless otherwise specified, the unit shall be energized from a supply that simulates the current voltage characteristics and time response of the input source. Where the results of a test could be affected by the voltage versus current characteristics and short circuit current capability of the supply, the source shall be adjusted to the maximum rated input voltage of the DUT. The current capability of the test source, measured at the DUT terminals, shall be equal to or greater than the rated maximum input short-circuit current of the DUT. The output of a utility-interactive EVPE device shall be connected to a supply voltage as specified in Table 51.1.
51.4		***New clause added;*** When a simulated utility source is required for a test, the impedance of the simulated utility source for a utility-interactive EVPE device shall be less than 5 percent of the EVPE device's output impedance where the EVPE device's output impedance is equal to the EVPE device's rated output voltage divided by the EVPE device's rated output current.
51.5		***New clause added;*** When a simulated utility source is required for a test, the actual utility is able to be used for the simulated utility.
51.6		***New clause added;*** The equipment under test provided with, or intended for use with, specific defined input source(s) that cannot provide the input power range described in the test procedure, shall be tested within the limitations of the specified or supplied input source. Under these circumstances, the test may be performed with the actual utility source or a simulated source. Test results shall only be applicable to the combination of the equipment under test and the specified source(s), and this limitation is to be noted in the test results.

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53	Info	**Input and Output Power Characteristics**
53.2	Info	**Units that charge batteries**
53.2.2		A unit shall be tested with: a) A resistive-capacitive (rc) load having capacitance of 200,000 microfarads and a parallel resistance adjusted to draw rated output current; b) A battery supplemented with a resistive load bank; c) A battery as specified by the manufacturer; or d) An electronic load configured as a battery simulator.
57	Info	**Abnormal Tests**
57.1	Info	**General**
57.1.8		***New clause added;*** The unit equipment grounding conductor shall be connected to the unit's ground terminal(s) using the minimum rated conductor size and type in accordance with 19.11. Note: This conductor size should be the same size required in the unit's installation instructions.
57.8	Info	**Electrolytic capacitor fault test**
57.8.1		For a unit having dc electrolytic storage capacitors operating above 60 vdc, the fault test described in 57.8.2 shall be conducted. This requirement does not apply to a capacitor that meets the requirements below: a) Complies with the requirements in UL 810; and b) The capacitor shall have an available fault current rating of 10,000 amperes or a lower value where a circuit analysis indicates that because of a series impedance, the lower value is applicable.
73	Info	**Impact Test**
73.2		A unit shall be subjected to the impact test described in 73.1 with or without any attachment specified by the manufacturer so as to result in the most severe test. One sample of a metallic enclosure shall be tested. Three samples of a nonmetallic enclosure shall be tested in accordance with the conditioning outlined in 73.3 and 73.4.
73.3		When the part under test is made of polymeric material, the impact test shall be first conducted on a sample in the as-received condition. The test shall then be repeated on a different sample that has been cooled to room temperature after being conditioned for 7 hours in an air oven operating at 10 °C (18 °F) higher than the maximum operating temperature of the material, and not less than 70 °C (158 °F). The test shall then be repeated on a different sample that has been conditioned in a cold chamber at minus 30 ±2 °C (minus 22 ±4 °F) for 24 hours. The impact test shall be performed immediately after removing the sample from the

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		cold chamber. Gloves shall be worn when handling the conditioned sample to minimum heat transfer. While being conditioned, either in the oven or the cold chamber, a part shall be supported in the same way it is supported on the unit.
73.5		After the impact test, any openings resulting from the test shall comply with the accessibility requirements described in Protection of Users – Accessibility of Uninsulated Live Parts, Film Coated Wire, and Moving Parts, Section 8. Additionally, there shall be no cracks, holes, or other damage in the enclosure that would compromise environmental integrity. If validation is necessary, the environmental testing of 7.12 shall be repeated.
74	Info	**Drop Test**
74.2		With reference to 74.1, each sample shall be dropped three times from a height of 0.9 m (3 feet) to strike a concrete surface in the positions favorable to producing adverse results. One sample of a metallic enclosure shall be tested. Three samples of a nonmetallic enclosure shall be tested in accordance with the conditioning outlined in 74.3.
74.3		***New clause added;*** When the part under test is made of polymeric material, the drop test shall be first conducted on a sample in the as-received condition. The test shall then be repeated on a different sample that has been cooled to room temperature after being conditioned for 7 hours in an air oven operating at 10 °C (18 °F) higher than the maximum operating temperature of the material, and not less than 70 °C (158 °F). The test shall then be repeated on a different sample that has been conditioned in a cold chamber at minus 30 ±2 °C (minus 22 ±4 °F) for 24 hours. The drop test shall be performed immediately after removing the sample from the cold chamber. Gloves shall be worn when handling the conditioned sample to minimum heat transfer. While being conditioned, either in the oven or the cold chamber, a part shall be supported in the same manner in which it is supported on the unit.
74.4		Immediately following the test, the unit shall be: a) Subjected to the Dielectric Voltage Withstand Test of Section 55. The potentials shall be applied between the input/output circuits and grounded or dead metal parts; b) Examined for exposure of live parts of internal wiring; c) Examined for reduction of spacings below the minimum specified in Spacings, Section 23; and d) Examined for cracks, holes, and other damage in the enclosure that would compromise environmental integrity. If validation is necessary, the environmental testing of 7.12 shall be repeated.

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78		***New section added;*** **Sprinkler Tests** Before a sprinkler test is performed, the unit shall be fitted with the intended supply connection means as described in the unit's installation instructions. See standard for details.
81	Info	**Source Transfer Test**
81.1		***New clause added;*** Installations where there is capability to transfer from EVPE to a grid supply shall also comply with Section 82, Utility Grid Interactive Functionality Type Testing.
	Info	**MARKINGS**
85	Info	**Details**
85.2	Info	**Content**
85.2.13		A multiple-voltage unit for permanent connection to the branch circuit supply shall be marked to indicate the particular voltage for which it is set when shipped from the factory. The marking shall be in the form of a paper tag or any other nonpermanent material. A unit that may be adjusted for multiple wiring/power systems configurations of branch circuit supply shall be marked to indicate the particular configuration for which it is set when shipped from the factory. The marking shall be in the form of a paper tag or any other nonpermanent material. The manual shall also include corresponding instructions for setting the desired configuration.