Standards Update Notice (SUN)

Issued: April 25, 2017

Standard Information

Standard Number: UL 1951
Standard Name: Electric Plumbing Accessories
Standard Edition and Issue Date: 2nd Edition Dated July 22, 2011
Date of Revision: February 21, 2017
Date of Previous Revision of Standard: 2nd Edition Dated October 7, 2016

Effective Date of New/Revised Requirements

Effective Date: **April 19, 2018**

Impact, Overview, and Action Required

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revised requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.

Overview of Changes:

- Update requirements for capacitors
- Update requirements for Switch-Mode Power Supplies
- Update requirements for switches
- Add specifications for Safety Critical Functions
- Revise requirements for electronic circuits

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

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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.

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Description of New/Revised Technical Requirements

Clause	Verdict	Comment
--	--	***Update requirements for capacitors***
5.4	Info	**Capacitors and filters**
5.4.3		*Additions to existing requirements are underlined below.* A capacitor connected across the line or between line and ground (such as a capacitor for radio-interference elimination) shall be suitable for the voltage involved and comply with the Standard for Fixed Capacitors for Use in Electronic Equipment – Part 14: Sectional Specification: Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains, UL 60384-14. They shall be rated for the intended application, including operating voltage, subclass, Upper and Lower Temperature rating. The duration of the damp-heat test shall be 21 days for indoor use appliances and 56 days for appliances permanently installed outdoors.
5.4.3.1		*New clause added;* X1 capacitors are generally used in circuits of permanently connected appliances. However, if the appliance is provided with a separate surge protective device that limits the impulse voltage to ≤ 2.5KV, an X2 capacitor is permitted.
5.4.3.2		*New clause added;* Y1 capacitors are used in circuits where the prevention of electric shock is afforded solely by the isolation provided by the capacitor. Two Y2 capacitors connected in series is considered to provide the same level of protection as one Y1 capacitor.
5.4.3.3		*New clause added;* Y2 capacitors are used where the prevention of electric shock is provided by the combination of the capacitor and earth ground for circuits operating at voltages ≥150V and ≤300V.
5.4.3.4		*New clause added;* Y4 capacitors are used where the prevention of electric shock is provided by the combination of the capacitor and earth ground for circuits operating at voltages ≤150V.
--	--	***Update requirements for Switch-Mode Power Supplies***
5.22		*New section added;* **Thermistors**

Clause	Verdict	Comment
5.22.1		Thermistors shall comply with the Standard for Thermistor-Type Devices, UL 1434. The thermistors shall be suitable for the application at the specified electrical and thermal ratings.
5.22.2		A temperature sensing positive temperature coefficient (PTC) or a negative temperature coefficient (NTC) thermistor, that is part of a circuit that manages a Safety Critical Function shall comply with: a) The Standard for Automatic Electrical Controls – Part 1: General Requirements, UL 60730-1; and the Standard for Automatic Electrical Controls for Household and Similar Use – Part 2-9: Particular Requirements for Temperature Sensing Controls, UL 60730-2-9, with Annex J; or b) The Standard for Thermistor-Type Devices, UL 1434.
26B		*New section added;* **Switch Mode Power Supplies**
26B.1		**Bridging components – switch mode power supplies**
26B.1.1		Components connected between the primary and secondary circuits of an isolating device such as a switching transformer or between primary and secondary earth reference points shall be evaluated to provide the specified level of isolation for the application under normal and abnormal (single component fault) conditions.
26B.1.2		An optical isolator that is relied upon to provide feedback between primary and secondary circuits of a switch mode power supply shall comply with the Standard for Optical Isolators, UL 1577. It shall have a minimum isolation voltage of 1500V.
26B.1.3		A capacitor connected between primary and accessible secondary circuits shall comply with Capacitors, Section 21. This shall consist of a single Class Y1 capacitor or two Class Y2 capacitors connected in series.
26B.2		**Transformer insulation system**
26B.2.1		Insulation used within a transformer of switch mode power supply shall comply with the Standard for Systems of Insulating Materials, UL 1446, for the specified temperature class of the insulation system or the Standard for Single- and Multi-Layer Insulated Winding Wire, UL 2353.
53.3		*New section added;* **Switch mode power supplies**
53.3.1		Overload tests
53.3.1.1		Each output winding, or section of a tapped winding, is overloaded in turn, one at a time, while the other windings are kept loaded or unloaded, whichever load conditions of normal use is the least favorable.

Clause	Verdict	Comment
53.3.1.2		Overloading is carried out by connecting a variable resistor (or an electronic load) across the power supply output. The resistor is adjusted as quickly as possible and readjusted, if necessary, after 1 minute to maintain the applicable overload. No further readjustments are then permitted.
53.3.1.3		For this test, any protective devices such as a fuse, manual reset circuit protector, thermal protector, etc. is allowed to remain in the circuit.
53.3.1.4		If overcurrent protection is provided by an overcurrent protection device, the overload test current is the maximum current which the overcurrent protection device is just capable of passing for 1 hr. If this value cannot be derived from the specification, it is to be established by test.
53.3.1.5		If no overcurrent protection is provided, the maximum overload is the maximum power output obtainable from the power supply.
53.3.1.6		In case of voltage foldback, the overload is to be slowly increased to the point which causes the output voltage to collapse. The overload is then established at the point where the output voltage recovered and held for the duration of the test.
53.3.1.7		The duration of the test is to be for 7 hour or until ultimate results are reached. At the conclusion of the test, there shall be no charring or burning of electrical insulation, no opening of any protective device or any circuit component.
53.3.2		Simulation of faults (Component abnormals)
53.3.2.1		The component faults specified in 38.2 shall include components on both the primary and secondary side of the transformer.
--	--	***Update requirements for switches***
5.17	Info	**Switches**
5.17.1		*Deletions are shown ~~lined out~~ below.* Switches shall comply with one of the following, as applicable: ~~a) The Standard for Special-Use Switches, UL 1054;~~ b) The Standard for Switches for Appliances – Part 1: General Requirements, UL 61058-1; c) The Standard for General-Use Snap Switches, UL 20; d) The Standard for Nonindustrial Photoelectric Switches for Lighting Control, UL 773A. *Exception: Switching devices that comply with the appropriate UL standard for specialty applications (e.g. transfer switch equipment), industrial use (e.g. contactors, relays, auxiliary devices), or are integral to another component (e.g. switched lampholder) is not required to comply with this requirement.*
5.17.5		*New clause added;* Switches that comply with Standard for Switches for Appliances – Part 1: General Requirements, UL 61058-1, shall be rated as specified in 5.17.6 – 5.17.8.

Clause	Verdict	Comment
5.17.6		*New clause added;* Power switches shall be rated as follows: a) For a voltage not less than the standard rated voltage of the circuit or power supply to which they are connected; b) For a current not less than the rated current of the appliance; c) For Continuous Duty; d) With respect to load: 1) Switches for motor-operated appliances: for resistance and motor load if the switch would encounter this load in normal use; or 2) Switches may be regarded as switches for a declared specific load and may be classified based upon the load conditions encountered in the appliance under normal load. e) For ac if the appliance is rated for ac; f) For dc if the appliance is rated for dc.
5.17.7		*New clause added;* Ratings and load classifications for switches other than power switches shall be based on the conditions encountered in the appliance under normal load.
5.17.8		*New clause added;* Switches shall also be rated with respect to endurance as follows: a) Power switches: 6000 cycles; b) Power switches provided with series electronics shall be subject to an additional 1000 cycles of operation with the electronics bypassed; c) Switches other than power switches, such as speed selector switches, that may be switched under electrical load: 1000 cycles; d) The following non-power switches are not required to be rated for endurance: 1) Switches not intended for operation without electrical load, and which can be operated only with the aid of a tool or are interlocked so that they cannot be operated under electrical load; or 2) Switches for 20 mA load as classified in the Standard for Switches for Appliances – Part 1: General Requirements, UL 61058-1.

<table>
<tr><th>Clause</th><th>Verdict</th><th>Comment</th></tr>
<tr><td>--</td><td>--</td><td>Add specifications for Safety Critical Functions</td></tr>
<tr><td>5A</td><td></td><td>New section added;

Safety Critical Functions</td></tr>
<tr><td>5A.1</td><td></td><td>Any function involved in the control, protection, and monitoring of safety-related attributes of a unit whereby a loss/malfunction of its functionality would represent an unacceptable risk of fire, electric shock, or casualty hazards would be considered a Safety Critical Function.</td></tr>
<tr><td>5A.2</td><td></td><td>Electronic circuits that manage a Safety Critical Function (SCF) shall be:

a) Reliable as defined as being able to maintain the SCF in the event of single defined component faults and
b) Not susceptible to electromagnetic environmental stresses encountered in the anticipated environments of the appliance.</td></tr>
<tr><td>5A.3</td><td></td><td>Functions specified in the table represent the common safety critical circuit functions of typical appliances under the scope of this standard. It is not intended to represent all possible Safety Critical Functions. Any function involved in the control, protection, and monitoring of safety-related attributes of a unit whereby a loss/malfunction of its functionality would represent an unacceptable risk of fire, electric shock, or casualty hazards would be considered a Safety Critical Function.</td></tr>
<tr><td>Table 5A.1</td><td></td><td>Safety Critical Functions

<table>
<tr><th>Function</th><th>Hazard</th><th>Location of parameters and tests</th></tr>
<tr><td>Motor running overload protection</td><td>Risk of fire or electric shock</td><td>19.2</td></tr>
<tr><td>Motor locked rotor protection</td><td>Risk of fire or electric shock</td><td>19.2</td></tr>
<tr><td>Motor short circuit protection</td><td>Risk of fire or electric shock</td><td>19.2</td></tr>
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<tr><td></td><td></td><td></td></tr>
<tr><td>--</td><td>--</td><td>Revise requirements for electronic circuits</td></tr>
<tr><td>24.1.1</td><td></td><td>Additions to existing requirements are underlined and deletions are shown ~~lined out~~ below.

~~All secondary circuits shall be judged under the requirements for primary secondary circuits unless they comply with 24.1.2– 24.1.5 or the requirements in 24.2 for Electronic Circuits Evaluated to the UL 60335-1 Based Requirements.~~Circuits on the line side of isolation components shall comply with the requirements in 24.2 for Electronic Circuits Evaluated to the UL 60335-1 Based Requirements.</td></tr>
</table>

Clause	Verdict	Comment
24.1.2	info	*Additions to existing requirements are underlined and deletions are shown ~~lined out~~ below.* ~~Components, wiring, printed wiring assemblies, insulating material, and so forth, and associated circuitry that are employed in Class 2 circuits as described in the definition of low-voltage circuits or that complies with 24.1.4 and 24.1.5 need not be investigated provided that the Class 2 circuit does not perform a safety related function, that is, it is not a safety circuit.~~ All secondary circuits shall be judged under the requirements for primary circuits unless they comply with 24.1.3 – 24.1.6 or the requirements in 24.2 for Electronic Circuits Evaluated to the UL 60335-1 Based Requirements.
24.2 53.4	Info	Added as an additional option for evaluating secondary circuits
		CUSTOMERS PLEASE NOTE: This Table and column "Verdict" can be used in determining how your current or future production is or will be in compliance with new/revised requirements.