

## Standard Information

**Standard Number:** UL 751

**Standard Name:** Vending Machines

**Standard Edition and Issue Date:** 8<sup>th</sup> Edition Revised July 20, 2012

**Date of Revision:** November 21, 2014

**Date of Previous Revision to Standard:** 8<sup>th</sup> Edition Revised August 17, 2012

## Effective Date of New/Revised Requirements

**Effective Date (see Schedule below):** **December 31, 2015**

## Impact, Overview, Fees 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requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.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** (Specific details of new/revised requirements are found in table below):

- Addition and revision of capacitor requirements to allow for compliance with alternative capacitor requirements in the standard for fixed capacitors for use in electronic equipment, UL 60384-14.
- Revisions to stand-alone solar photovoltaic vending machines requirements for machines not intended to be connected to an electrical production and distribution network.
- Addition of new temperature measurement requirements intended to obtain consistent temperature measurements during testing.
- Addition of requirements to address vending machines intended to be installed within motor-fuel dispensing facilities.

**Schedule:** So that shipping of products with Listing Marks will not be interrupted, an **approximate** schedule has been established to ensure Listing Reports are found compliant by Effective Date:

- April 30, 2015 = 8 Month Report Review – Intertek will review all Reports. Update if compliance is verified or issue Findings Letter/Quote for any re-evaluations needed
- June 30, 2015 = 6 Month Quote Cut-off – Quotes returned for necessary re-evaluations
- November 30, 2015 = 30 Day Warning – Client advised of all non-compliant Reports to be Suspended
- **December 31, 2015** = Effective Date – ATM Suspended for all non-compliant Reports

**Fees:** An initial review of Listing Report (s) will be covered by a direct billing project and will be invoiced at not more than \$1000 per report.

### 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.*

## Description of New/Revised Technical Requirements

Clause	Verdict	Comment	NC#
27	Info	<b>Capacitors</b>	
27.1		<p>A capacitor connected across the line, such as a capacitor for radio-interference elimination or power-factor correction, shall 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, which supersedes UL 1414.</p> <p>If any product employing a capacitor that is evaluated to UL 1414 will need to additionally be evaluated to the newly added clause: 27.3.</p>	
27.3		<p><i>New clause added;</i></p> <p>In reference to 27.1, if a capacitor complies 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, it shall have specifications as follows:</p> <p>a) Operating voltage – Not less than 110 percent of the vending machine rated voltage.</p> <p>b) For capacitors connected across the line (phase-to-phase) – Subclass X1 (<math>\leq 4.0</math> kV) or X2 (<math>\leq 2.5</math> kV) for impulse voltage (based on minimum Overvoltage Category of II).</p> <p>c) For capacitors connected from line to ground – Subclass Y1 or Y2 for any vending machines having a rated voltage not exceeding 500 volts; or as an alternate, subclass Y4 if a vending machine has a rated voltage not exceeding 150 volts.</p> <p>d) Upper category temperature – Based on the maximum capacitor surface temperature measured during the Temperature Test, Section 55, but not less than 185°F (85°C).</p> <p>e) Lower category temperature – Based on the minimum surface temperature for which the capacitor has been designed to operate when installed within a vending machine as intended, but not greater than 14°F (-10°C).</p> <p>f) Duration of the Damp-Heat Steady-State Test – Not less than 21 days.</p> <p>g) Passive flammability category B or C. As an alternate, a polymeric capacitor case shall have a V-0 flame rating as described in the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94.</p>	

# Standards Update Notice (SUN)

Issued: April 03, 2015

Clause	Verdict	Comment	NC#
39	Info	<b>Solar Photovoltaic (PV) Systems</b>	
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined-out</del> below.</i>	
39.3		<p>A vending machine with PV modules or cells shall be provided with a factory installed ground-fault circuit-interrupter (GFCI) that complies with the Standard for Ground-Fault Circuit-Interrupters, UL 943. If the vending machine is:</p> <p>a) Cord-connected, the GFCI shall comply with 16.1.5 – 16.1.6;</p> <p>b) Intended for permanent connection to the source of electrical supply <u>or is a stand-alone solar PV system</u>, the GFCI shall be in the circuit supplying power from the PV modules or cells and shall:</p> <ol style="list-style-type: none"> <li>1) Automatically disconnect the ungrounded conductors of the faulted circuit; or</li> <li>2) Enable the inverter or charge controller fed by the faulted circuit to automatically cease supplying power to the output circuits.</li> </ol>	
45	Info	<b>Grounding</b>	
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined-out</del> below.</i>	
45.2		<p><u>Except as specified in 45.3 and 45.4</u>, all exposed dead metal parts and all dead metal parts within the enclosure that are exposed to contact by the user, route person, or service person and that may become energized shall be reliably connected to <u>one of the following</u>:</p> <p>a) The equipment-grounding terminal or lead of a:</p> <ol style="list-style-type: none"> <li>1) Permanently installed vending machine; or</li> <li>2) <u>Vending machine with a stand-alone solar PV system.</u></li> </ol> <p>b) The equipment-grounding conductor of the cord of a cord-connected vending machine.</p>	

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Clause	Verdict	Comment	NC#
45.3		<p>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</p> <p><del>Uninsulated metal parts of a cabinet, an electrical enclosure, a motor frame and mounting brackets, a controller mounting bracket, a capacitor, and other electrical components, interconnecting tubing and piping, a valve, a plumbing accessory, and the like shall be bonded for grounding if they may be contacted by the user, route person, or service person.</del></p> <p><u>In reference to 45.2(a)(2), a vending machine with a stand-alone solar PV system shall have provision for permanent connection to a grounding means and the equipment grounding connection requirements in 17.2 – 17.4 shall be applied except that the vending machine is not required to have a permanent connection to a grounding means or an equipment grounding connection if the vending machine is marked as specified in 74.2.18.</u></p>	
45.12		<p>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</p> <p><del>In a permanently connected vending machine,</del> The size of a conductor or strap employed to bond an electrical enclosure or a motor frame <u>for a:</u></p> <p>a) <u>Permanently connected vending machine</u> shall be based on the rating of the branch circuit overcurrent device to which the equipment will be connected. <del>The size of the conductor or strap shall be not less than the applicable value stated in Table 45.1.</del></p> <p>b) <u>Stand-alone solar PV system vending machine having provision for a permanent connection to a grounding means, shall be based on the rating of the overcurrent protective device required in accordance with 39.4.</u></p> <p><del>Exception No. 1: A smaller conductor may be used if the bonding conductor and connections comply with the requirement in 60.1.</del></p> <p><del>Exception No. 2: A bonding conductor for a component or electrical enclosure need not be larger than the conductors supplying power to the component or components within the enclosure.</del></p>	
45.12.1		<p><i>New clause added;</i></p> <p>Except as specified in 45.12.2, the size of the bonding conductor or strap required by 45.12 shall not be less than the applicable value stated in Table 45.1.</p>	
45.12.2		<p><i>New clause added;</i></p> <p>A bonding conductor or strap not complying with 45.12 or 45.12.1 shall:</p> <p>a) Comply with the Bonding Connection Test in 60.1; or</p> <p>b) Not be smaller than the conductors supplying power to the component or components within the vending machine enclosure.</p>	

# Standards Update Notice (SUN)

Issued: April 03, 2015

Clause	Verdict	Comment	NC#
45.12.3		<i>New clause added;</i>  In reference to 45.12.2(a), if the Bonding Connection Test, Section 60 is conducted, the components to be tested shall include any connections that may be provided as part of the bonding conductor or strap.	
52A	Info	<i>New Section added;</i>  <b>PERFORMANCE (General)</b>	
52A.1		Except as specified in 52A.2, during any test in which temperatures are measured, temperatures shall be monitored until maximum temperatures are attained. Thermal equilibrium is to be considered to exist when three successive readings indicate the same or decreasing temperatures. Readings shall be taken at the end of not less than three consecutive periods, the duration of each period being not less than 5 minutes.	
52A.2		In reference to 52A.1, if temperatures on the component being monitored cycle between higher and lower temperatures due to the component cycling as part of the test (for example a load cycling on and off due to operation of a protective device), equilibrium is to be considered obtained when three successive peak temperatures indicate the same or decreasing temperatures.	
52A.3		In reference to 52A.1 and 52A.2, the recorded temperature shall be the highest of the three readings.	
74	Info	<b>MARKING</b>	
74.2.18		<i>New clause added;</i>  A vending machine with a stand-alone solar PV system that does not have provision for a permanent connection to a grounding means shall be permanently marked near each junction box, in which ungrounded circuits may be exposed while servicing the equipment, with the following or equivalent wording:  "Warning – Electrical Shock Hazard. The conductors of this photovoltaic system are ungrounded and may be energized."	
SUPPLEMENT SA		<i>New section added;</i>  <b>REQUIREMENTS FOR VENDING MACHINES INTENDED FOR INSTALLATION WITHIN MOTOR FUEL DISPENSING FACILITIES</b>  This new section includes new construction requirements, performance test requirements, markings, and instructions for vending machines intended for installation within motor fuel dispensing facilities (see standard for section details).	
		<b>CUSTOMERS PLEASE NOTE:</b> 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.	