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September 16, 1996

Revision pages for

Standard for

Vending Machines

UL 751, Sixth Edition

Attached to this distribution notice is a revision of the Sixth edition of UL 751.

THESE NEW AND REVISED REQUIREMENTS IN THIS STANDARD ARE NOW IN EFFECT EXCEPT FOR THOSE PARAGRAPHS, SECTIONS, TABLES, FIGURES, AND OTHER ELEMENTS OF THE STANDARD HAVING FUTURE EFFECTIVE DATES AS INDICATED IN THE NOTE FOLLOWING THE AFFECTED ITEM. TO RETAIN THE REQUIREMENTS IN EFFECT UNTIL THESE FUTURE EFFECTIVE DATES, DO NOT DISCARD THE PAGES REPLACED BY THOSE HAVING FUTURE EFFECTIVE DATES UNTIL THOSE DATES.

THE REVISIONS DATED SEPTEMBER 16, 1996 WERE ISSUED TO INCLUDE PAGE 2 WHICH WAS INADVERTENTLY OMITTED FROM THE BACK OF PAGE 1 IN THE AUGUST 5, 1996 REVISION PAGES.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this standard unless the applicant specifically requests that the product be judged under the current requirements. However, should the applicant elect this option, it should be noted that compliance with all the requirements in this standard will be required as a condition of continued Listing and Follow-Up Services after the effective date and understanding of this should be signified in writing.

Revised and/or additional pages may be issued from time to time.

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UL 751

Standard for

Vending Machines

The first, second, and third editions were titled Standard for Safety for Vending and Amusement Machines.

First Edition – December, 1970

Second Edition – April, 1974

Third Edition – May, 1978

Fourth Edition – September, 1985

Fifth Edition – May, 1990

Sixth Edition

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An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the distribution notice that accompanies the latest published set of revision pages.

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**Underwriters Laboratories Inc.®**A not-for-profit organization dedicated to public safety
and committed to quality service**August 5, 1996****Revision pages for****Standard for****Vending Machines****UL 751, Sixth Edition**

Attached to this distribution notice is a revision of the Sixth edition of UL 751.

A CHANGE ON A PAGE DATED AUGUST 5, 1996 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS IN THIS STANDARD ARE NOW IN EFFECT EXCEPT FOR THOSE PARAGRAPHS, SECTIONS, TABLES, FIGURES, AND OTHER ELEMENTS OF THE STANDARD HAVING FUTURE EFFECTIVE DATES AS INDICATED IN THE NOTE FOLLOWING THE AFFECTED ITEM. TO RETAIN THE REQUIREMENTS IN EFFECT UNTIL THESE FUTURE EFFECTIVE DATES, DO NOT DISCARD THE PAGES REPLACED BY THOSE HAVING FUTURE EFFECTIVE DATES UNTIL THOSE DATES.

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The revised requirements are substantially in accordance with UL's Bulletin on this subject dated April 5, 1996. The bulletin is now obsolete and may be discarded.

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Table 43.1
Coating thickness factors

Temperature, degrees		Thickness factors, 0.00001 inches (0.0003 mm) per second	
F	(C)	Cadmium platings	Zinc platings
70	21.1	1.331	0.980
71	21.7	1.340	0.990
72	22.2	1.352	1.000
73	22.8	1.362	1.010
74	23.3	1.372	1.015
75	23.9	1.383	1.025
76	24.4	1.395	1.033
77	25.0	1.405	1.042
78	25.6	1.416	1.050
79	26.1	1.427	1.060
80	26.7	1.438	1.070
81	27.2	1.450	1.080
82	27.8	1.460	1.085
83	28.3	1.470	1.095
84	28.9	1.480	1.100
85	29.4	1.490	1.110
86	30.0	1.501	1.120
87	30.6	1.513	1.130
88	31.1	1.524	1.141
89	31.7	1.534	1.150
90	32.2	1.546	1.160

44 Overload of Switches and Controllers Test

44.1 A switch or other device that controls a motor shall perform acceptably when subjected to an overload test consisting of 50 cycles of operation, making and breaking the locked-rotor current of the motor. There shall be no electrical or mechanical breakdown of the device or undue pitting or burning of the contacts as a result of the overload test and the fuse in the grounding connection shall not open.

Exception: An overload test is not needed for:

- a) *A switch or other device that has been shown to be acceptable for the purpose.*
- b) *A switch or other device interlocked so that it will not have to break the locked-rotor current of the motor.*

44.2 In a test to determine whether a switch or other control device complies with the requirement in 44.1, the vending machine is to be connected to a grounded supply circuit of rated frequency and maximum rated voltage — see 37.1.6 — with the rotor of the motor locked in position. During the test, exposed dead metal parts of the vending machine are to be connected to ground through a 3-ampere plug fuse, and the connection is to be such that any single pole, current-interrupting device will be located in the ungrounded conductor of the supply circuit. If the vending machine is intended for use on direct current, or on direct current as well as alternating current, exposed dead metal parts of the vending machine are to be connected to be positive with respect to a single-pole, current-interrupting, control device. The device is to be operated at a rate of not more than 10 cycles per minute except that a faster rate of operation may be employed if agreeable to those concerned.

45 Flexing of Internal Wiring

45.1 The wiring from the vending machine to components mounted on the door is to be tested by opening the door as far as possible — restraints such as chains are to remain in place — and then closing it for 6,000 cycles of operation. Following this test, the vending machine shall comply with the dielectric voltage-withstand test described in 38.1. The wiring is then to be examined for damage.

46 Strain Relief Test

46.1 The strain-relief means for a flexible cord shall withstand for 1 minute without displacement a direct pull of 35 pounds (156 N) applied to the cord, with the connections within the vending machine disconnected. The strain relief is not acceptable if, at the point of disconnection of the conductors there is such movement of the cord, as to indicate that stress would have resulted on the connections.

46.2 A 35-pound (16-kg) weight is to be suspended from the cord and supported by the vending machine so that the strain-relief means will be stressed from any angle that the construction of the vending machine permits.

47 Accelerated Aging Test of Gaskets

47.1 A gasket of rubber compound that is depended on for protection against rain shall have physical properties as specified in Table 47.1 before and after being tested as described in 47.3.

Table 47.1
Physical properties of gaskets

	Accelerated aging	After accelerated aging
Recovery — Maximum set when 2-inch (50.8-mm) gauge marks are stretched to 5 inches (127 mm), held for 2 minutes and measured 2 minutes after release	1/2 inch (12.7 mm)	—
Elongation — Minimum increase in distance between 2-inch (50.8-mm) gauge marks at break	250 percent 2 to 7 inches (50.8 – 178 mm)	65 percent of original
Tensile Strength — Minimum force at breaking point	850 psi (5860 kPa)	75 percent of original

47.2 A foamed-rubber compound forming a gasket shall not harden or otherwise deteriorate to a degree that will affect its sealing properties after being tested as described in 47.3.

47.3 A gasket is to be placed in an air oven for 70 hours at $100 \pm 2^{\circ}\text{C}$ ($212 \pm 3.6^{\circ}\text{F}$).

47.3 revised August 5, 1996

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Subjects 197 (710, 751, 762)

12 Laboratory Drive
 Research Triangle Park, NC 27709
 April 29, 1996

TO: Electrical Council of Underwriters Laboratories Inc.,
 Fire Council of Underwriters Laboratories Inc.,
 Subscribers to UL's Standards Services for
 Commercial Electric Cooking Appliances,
 Exhaust Hoods for Commercial Cooking Equipment,
 Vending Machines, and
 Ventilating Equipment for Commercial Cooking Appliances

SUBJECT: Adopted Requirements for the Eighth Edition of the Standard for Commercial Electric
 Cooking Appliances, UL 197; ESTABLISHED EFFECTIVE DATE

UL has reviewed all comments received in response to the Subjects 197 (710, 751, 762) bulletin dated May 24, 1994, and has decided to adopt the requirements essentially as proposed except paragraphs SB3.8, SB5.5, SB7.2, SB15.4.2, SB16.1, SB16.1.1, SB16.2, SB16.2.1, SB16.2.2, SB17.6, SB26.2, and SB26.3 are not being adopted at this time. In addition, the Sections SB3 - SB19 have been renumbered SB2 - SB 18 respectively. The text of the adopted requirements is shown in Appendix A. The remainder of the proposed Supplement that is not being adopted at this time will be issued for a separate review in a UL Subject 197 proposal Bulletin.

Questions regarding interpretation of requirements should be directed to the responsible UL Staff. Please see Appendix B of this bulletin regarding designated responsibility for the subject product categories.

ESTABLISHED EFFECTIVE DATES

These new requirements are effective April 29, 1997 as indicated in the small print notes following these requirements.

This bulletin should be kept with your copy of the UL 197 standard until revision pages incorporating these requirements are issued. UL anticipates issuing revision pages by June 1996.

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A P P E N D I X A

ADOPTED REQUIREMENTS AND ESTABLISHED EFFECTIVE DATE FOR THE
EIGHTH EDITION OF THE STANDARD FOR
COMMERCIAL ELECTRIC COOKING APPLIANCES,
UL 197

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SUPPLEMENT SB – COMMERCIAL ELECTRIC COOKING APPLIANCES WITH RECIRCULATING SYSTEMS

INTRODUCTION

SB1 Scope

SB1.1 These requirements cover commercial electric cooking appliances provided with integral recirculating systems (previously referred to as ductless hoods) and nonintegral recirculating systems, both of which are intended for installation in commercial establishments for the preparation of food. These devices incorporate an air filtering system enclosed in a hooded or otherwise contained area intended to capture air from the cooking process area. The hood assembly generally includes a fan, collection hood, or equivalent design feature, air filtering system (consisting of a grease filter with other filters), a fire actuated damper, and a fire extinguishing system unit. An integral recirculating system of a vending machine is also covered by this supplement.

Added SB1.1 effective April 29, 1997

SB1.2 These products are intended for installation in accordance with the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96-1994.

Added SB1.2 effective April 29, 1997

SB1.3 The cooking section of the appliance shall comply with the requirements in Sections 2 – 64, as applicable, except as modified or superseded by the requirements in this Supplement.

Added SB1.3 effective April 29, 1997

CONSTRUCTION

SB2 Fire Extinguishing System Unit

SB2.1 A fire extinguishing system unit shall be provided and shall include all required wiring, piping, and discharge port(s) oriented for proper operation. The recirculating system shall have provisions for the following:

- a) Removal of the fire extinguishing system cylinder assembly and pressurizing cartridge (if provided) for maintenance and recharging, and
- b) External visibility of the pressure gauge to indicate the charge pressure for the stored pressure type extinguishing system units.

Added SB2.1 effective April 29, 1997

SB2.2 In addition to the appliance nozzle(s), there shall be a fire extinguishing nozzle installed immediately before or after the first grease filter, and between the last grease or odor filtration unit and the blower.

Added SB2.2 effective April 29, 1997

SB2.3 In addition to any other fire extinguishing system actuation device, there shall be a fire extinguishing system actuation device installed downstream of any electrostatic precipitator (ESP).

Added SB2.3 effective April 29, 1997

SB2.4 A deep fat fryer that develops a fire within the cabinet and below the vat during the Automatic Operation Fire Test, Section SB16, the Manual Operation Test, Section SB17, or the Fire Containment Test, Section 18, shall be provided with one or more extinguishing nozzles within these areas.

Added SB2.4 effective April 29, 1997

SB2.5 The fire extinguishing system unit shall comply with the applicable requirements of the Standard for Dry Chemical Extinguishing Systems, NFPA 17-1990 or the Standard for Wet Chemical Extinguishing Systems, NFPA 17A-1990 and the requirements specified in the Standard for Pre-Engineered Extinguishing System Units, UL 1254 or applicable requirements for other systems.

Added SB2.5 effective April 29, 1997

SB2.6 The extinguishing system pressure tank or piping shall include a suitable pressure switch or other device located as close to the tank as practical and shall be electrically connected to the appliance so that actuation of the fire extinguishing system will result in immediate shutdown of the cooking appliance heat source and the blower. A recirculating system provided with a different type of interlock (not a pressure switch) to affect shutdown of heating energy to the cooking appliance in the event of leakage or discharge of the extinguishing system will be evaluated for equivalence to a suitably applied pressure switch.

Added SB2.6 effective April 29, 1997

SB2.7 The switch described in SB2.6 shall be one rated a minimum of 6000 cycles.

Added SB2.7 effective April 29, 1997

SB2.8 A means for manual actuation of the fire extinguishing system unit shall be provided in an area where it is readily accessible in the event of a fire in the appliance. Such means shall be mechanical and shall not rely on electrical power for actuation. See SB28.1 for the requirements covering the installation of such means.

Exception: A primary electrical means for manual actuation may be used if a battery backup system is provided. The battery backup system shall be provided with a visible means to indicate the condition of the battery. The battery backup system shall incorporate means to restrict the operation of the cooking appliance if the battery voltage drops below the minimum operating voltage of the backup system.

Added SB2.8 effective April 29, 1997

SB2.9 If the manual actuator described in SB2.8 is located on the appliance, the torque created by the actuation of the device shall not cause the unit to topple or move with the appliance at an angle of 10 degrees from the vertical.

Added SB2.9 effective April 29, 1997

SB3 Fire Actuated Damper Assemblies

SB3.1 A fire actuated damper shall be provided as part of the recirculating system, and it shall comply with all of the following requirements:

- a) A fire actuated damper shall be installed at the exhaust outlet of the system. The damper shall be constructed of at least the same gauge as the hood.
- b) A fire actuated damper assembly employing replacement parts, such as fusible links, shall be accessible without the use of special tools.
- c) The load on a fusible link used in a fire actuated damper assembly shall be in accordance with the intended use of the fusible link.

d) A spring and a bearing used in the assembly of a fire actuated damper shall be of material having strength and resistance to atmospheric corrosion equivalent to an alloy containing not less than 85 percent copper or Type 302 or 430 stainless steel. In addition, a spring shall be of a material having spring properties equivalent to stainless steel conforming to Specification for Chromium-Nickel Stainless and Heat Resisting Steel Spring Wire, ASTM A313-87.

e) The materials used in the fire actuated damper assembly shall comply with SB5.1. The combination of metals used in the assembly of a damper shall not cause galvanic action that may impair the function of any part of the assembly.

Exception: The materials used for the dampers need not comply with SB5.1 if the damper complies with the Standard for Fire Dampers, UL 555.

Added SB3.1 effective April 29, 1997

SB4 Hood Assembly

SB4.1 Openings in the grease-air stream enclosure provided for passage of extinguishing system unit piping to the nozzle(s) or for passage of electrical conduit shall be provided with fittings that comply with either the Fire Containment Test, Section SB18, or the Fire and Leakage Test of Fittings, Nonwelded Seams, Doors and Panels Used in Grease-Air Stream Enclosures, Section SB23, with no evidence of the passage of flame or grease vapor through or around the fitting.

Added SB4.1 effective April 29, 1997

SB4.2 The grease-air stream enclosure shall have a liquid tight continuous external weld.

Exception: External seams and joints made with a fastening means other than a liquid tight continuous weld may be employed in hoods that have been subjected to the Fire Containment Test, Section SB18, with no evidence of the passage of smoke, flame, or vapor through the joint.

Added SB4.2 effective April 29, 1997

SB4.3 Gasket and sealant materials used in an exhaust hood, a damper assembly, and fittings for hood penetrations, that may be exposed to cooking smoke and vapor shall be subjected to Gasket and Sealant, Physical and Immersion Tests, Section SB22.

Exception: Sealants used for aesthetics and/or cleaning purposes need not comply with this requirement.

Added SB4.3 effective April 29, 1997

SB4.4 All closure panels that may be opened or removed and encompass airflow sections shall have interlocks that shall de-energize the heat source for the cooking appliance if the panels are not in place and fully sealed.

Added SB4.4 effective April 29, 1997

SB5 Hood Materials

SB5.1 The hood and other parts of an exhaust hood that serve to confine or convey the exhaust products, including dampers and structural parts, shall be made of materials equivalent in strength and fire resistance to Type 302 or 430 stainless steel not less than 0.037 inch (0.94 mm) or steel not less than 0.043 inch (1.09 mm) thick. Internal ferrous metal parts of the hood shall be made of one of the 300 or 400 series of stainless steel or provided with corrosion protection.

Added SB5.1 effective April 29, 1997

SB6 Hood Air Flow

SB6.1 A manually resettable device(s) rated at 6,000 cycles or an automatically resettable device(s) rated at 100,000 cycles, and for use as a safety interlock that is covered by the Standard for Limit Controls, UL 353, shall be provided after the last filter component to restrict operation of the cooking appliance, if air flow through the hood drops 25 percent below the system's normal operating flow or 10 percent below the lower air flow limit, whichever is lower. When an automatically resettable device(s) is used, it shall be part of a manually resettable circuit.

Added SB6.1 effective April 29, 1997

SB6.2 The minimum air flow to capture smoke and grease laden air shall be equal to or less than the lower air flow limit.

Added SB6.2 effective April 29, 1997

SB7 Air Filters

SB7.1 Electrostatic precipitator

SB7.1.1 If the hood section includes an electrostatic precipitator (ESP), it shall comply with the Standard for Electrostatic Air Cleaners, UL 867.

Added SB7.1.1 effective April 29, 1997

SB7.1.2 The power supply for an ESP shall be one in which the voltage falls off as the current draw of a short increases such as a ferro-resonant type transformer.

Added SB7.1.2 effective April 29, 1997

SB7.1.3 An appliance that utilizes an ESP shall include a sensor to verify the ESP performance is as designed or deactivate the heating portion of the cooking appliance, with no interruption of the power to exceed 2 minutes (loss of power for more than 2 minutes shall deactivate the heating portion of the cooking appliance). This shall be a manual reset device or circuit.

Added SB7.1.3 effective April 29, 1997

SB7.2 Interlocks

SB7.2.1 Interlocks shall be used on all air filters, including electrostatic precipitators, to determine if the air filters are in place and positioned as intended. If the air filter is not in place or positioned as intended, the interlock shall de-energize the heat source for the cooking appliance.

Added SB7.2.1 effective April 29, 1997

SB8 Odor Filters

SB8.1 If an odor filter is used, it shall have an interlock that disconnects the heat source for the cooking appliance if the filter is not in place or positioned as intended.

Added SB8.1 effective April 29, 1997

SB9 Grease Filters

SB9.1 A grease filter complying with the Standard for Grease Filters for Exhaust Ducts, UL 1046, shall be included as the first filter (in the direction of the air flow), and all grease captured shall drain into a container that does not have more than a 1 quart (0.95 l) capacity. Mesh filters shall not be used as a grease filter.

Added SB9.1 effective April 29, 1997

SB9.2 An interlock shall be used on the grease filter to determine if the grease filter is in place and positioned as intended. If the grease filter is not in place or positioned as intended, the interlock shall de-energize the heating section of the cooking appliance.

Added SB9.2 effective April 29, 1997

SB9.3 The grease filter shall be installed at an angle not less than 45 degrees from the horizontal and shall be tight-fitting.

Exception: If no grease drips off from the grease filters on the cooking appliance(s) during the Capture Test, Section SB13, the grease filter need not comply with this requirement.

Added SB9.3 effective April 29, 1997

SB10 Internal Wiring

SB10.1 The internal wiring of an exhaust hood shall not be routed in or through the exhaust plenum (area of hood behind the grease filter and containing other filters).

Exception No. 1: Wiring enclosed in rigid or flexible metal conduit need not comply with this requirement.

Exception No. 2: Wiring material routed in suitable conduit and that is connected to a limited energy circuit as defined in 27.2 of this standard and which is not a part of a safety circuit need not comply with this requirement.

Added SB10.1 effective April 29, 1997

SB11 Blower Motors and Other Electrical Components

SB11.1 Blower motors and other electrical components shall not be located in the air stream.

Exception: Totally enclosed motors and other electrical components enclosed in a manner equivalent to a totally enclosed motor need not comply with this requirement.

Added SB11.1 effective April 29, 1997

SB12 Power Supply Connections

SB12.1 The appliance shall be connected to the electrical power supply in accordance with the National Electrical Code, ANSI/NFPA 70-1993.

Added SB12.1 effective April 29, 1997

PERFORMANCE

SB13 Capture Test

SB13.1 The tests described in SB13.2 – SB13.5 shall be conducted while the unit is located in a draft free room and is operating at the lower air flow limit.

Added SB13.1 effective April 29, 1997

SB13.2 During cooking for maximum grease emission potential with food product determined in SB14.1.2, the cooking area will be observed for the presence of visible smoke and grease-laden air and the hood assembly shall completely capture all of the emission as determined by observation.

Added SB13.2 effective April 29, 1997

SB13.3 Vegetable frying oil shall be used to cook the frozen, unbreaded fries intended for use in a deep fat fryer or other appliance where cooking oil is commonly added to the process. For griddles, broilers, and other appliances intended to cook meat, meat cakes as specified in the Standard for Exhaust Hoods for Commercial Cooking Equipment, UL 710, shall be used. The cooking appliance surface temperature will be maximum as recommended in the manufacturer's instructions. The sample test arrangement may be provided if necessary with an observation window located in the test sample's plenum or air duct to permit the observation of flow within the sample.

Added SB13.3 effective April 29, 1997

SB13.4 If the device and cooking process restricts visibility due to the lack of cooking smoke and grease-laden air observed, a smoke generator may be used and positioned in the cooking area to establish a more visible means for conducting this test. Care in selecting the intensity of the smoke generator shall be exercised to reduce the risk of simulating a cooking process emission greater than is feasible considering the product design and its constraints.

Added SB13.4 effective April 29, 1997

SB13.5 During the test, there shall be no visible emission of smoke and grease-laden air from the air discharge port or any other part or joint in the hood assembly.

Added SB13.5 effective April 29, 1997

SB14 Emission Test

SB14.1 General

SB14.1.1 The tests described in SB14.1.2 – SB14.6.2 shall be conducted while the unit is operating at the lower air flow limit.

Added SB14.1.1 effective April 29, 1997

SB14.1.2 The type of product shall be meat cakes as specified in the Standard for Commercial Cooking Equipment, UL 710, for appliances such as griddles, broilers, and others intended to cook meat, or frozen, unbreaded fries for fryers, or specific products to be cooked by other appliances such as donut fryers. The amount of food product to be cooked shall be the maximum product capacity for the appliance.

Added SB14.1.2 effective April 29, 1997

SB14.1.3 Vegetable frying oil shall be used to cook the food load of a deep fat fryer.

Added SB14.1.3 effective April 29, 1997

SB14.1.4 The grease-laden effluent discharged at the exhaust outlet of the system shall be measured as described below which was derived from the U. S. Environmental Protection Agency (EPA) Test Method 202, Determination of Condensable Particulate Emissions From Stationary Sources - 1991.

Added SB14.1.4 effective April 29, 1997

SB14.1.5 The grease-laden effluent at the exhaust outlet of the system shall not exceed an average of 5.0 mg/m³ of exhausted air sampled at a maximum product capacity over a continuous 8 hour test cooking period.

Added SB14.1.5 effective April 29, 1997

SB14.2 Test apparatus

SB14.2.1 The sampling train is to consist of the following:

- a) A stainless steel probe nozzle with a sharp tapered leading edge. The size is to be suitable for isokinetic sampling.
- b) A glass mat filter without an organic binder.
- c) A stainless steel filter holder.
- d) A glass or teflon lined probe extension equipped with a heating system.
- e) A type S stainless steel pitot tube suitable for use with a manometer assembly.
- f) A temperature sensor which is to be attached to either the pitot tube or to the probe extension.

Added SB14.2.1 effective April 29, 1997

SB14.2.2 A system of four impingers, in an ice bath, shall be connected to the probe extension. Both the first and second impingers shall be of the Greensburg-Smith design with the standard tip.

Added SB14.2.2 effective April 29, 1997

SB14.2.3 A meter system shall consist of a vacuum gauge, leak free pump, thermometers, and a dry gas meter.

Added SB14.2.3 effective April 29, 1997

SB14.2.4 A barometer shall be used.

Added SB14.2.4 effective April 29, 1997

SB14.3 Sampling procedure

SB14.3.1 The preliminary set-up shall be constructed as follows:

- a) Construct a stack out of duct sheet metal which is to be used for sampling.
 - b) Each of the first three impingers is to be filled with 100 ml deionized distilled water. The fourth impinger is to be filled with silica gel. The weight of each impinger is to be determined and recorded.
 - c) Assemble the train^a.
 - d) A pre-test leak check is to be conducted.
 - e) Calibrate the system.
- ^a The use of silicone grease is prohibited.

Added SB14.3.1 effective April 29, 1997

SB14.3.2 The sampling location shall be located at least eight stack diameters downstream and two stack diameters upstream from any flow disturbance. After this criteria is met and a circular stack is used, a minimum of eight traverse points are to be used.

Added SB14.3.2 effective April 29, 1997

SB14.3.3 A post-test leak check shall be conducted.

Added SB14.3.3 effective April 29, 1997

SB14.4 Sample handling

SB14.4.1 The glass-filter is to be removed using a pair of forceps and placed in a clean petri dish. The dish is to be sealed and labeled "sample bottle number one".

Added SB14.4.1 effective April 29, 1997

SB14.4.2 A sample of the acetone of the same volume that will be used to rinse-out the nozzle and probe is to be placed into a clean sample bottle, sealed, and labeled "sample bottle number two". The level of the liquid in the sample bottle is to be recorded.

Added SB14.4.2 effective April 29, 1997

SB14.4.3 The inside of the nozzle and probe is to be rinsed with acetone taking care to collect all the rinse material in a clean sample bottle. The sample bottle is to be sealed, labeled "sample bottle number three", and the level of the liquid in the bottle is to be recorded.

Added SB14.4.3 effective April 29, 1997

SB14.4.4 The liquid in the first three impingers is to be measured and the total volume is to be recorded which will be compared to the original volume. The liquid is to be quantitatively transferred to a clean sample bottle.

Added SB14.4.4 effective April 29, 1997

SB14.4.5 Each impinger and the connecting glassware including the probe extension is to be rinsed twice with water. The rinse water is to be collected and added to the same sample bottle. The sample bottle is to be sealed, labeled "sample bottle number four," and the level of the liquid in the bottle is to be recorded.

Added SB14.4.5 effective April 29, 1997

SB14.4.6 The rinses described in SB14.4.5 is to be followed with two rinses of methylene chloride (MeCl_2). The rinses are to be recovered in a clean sample bottle. The sample bottle is to be sealed, labeled "sample bottle number five" and the level of the liquid in the bottle is to be recorded.

Added SB14.4.6 effective April 29, 1997

SB14.4.7 A volume of water approximately equivalent to the volume of water used in SB14.4.5 and a volume of MeCl_2 approximately equivalent to the volume of MeCl_2 used in SB14.4.6 is to be placed in two clean sample bottles. The sample bottles are to be sealed, labeled "sample bottle number six" and "sample bottle number seven" respectively, and the level of the liquid in the bottles is to be recorded.

Added SB14.4.7 effective April 29, 1997

SB14.4.8 The fourth impinger containing the silica gel is to be emptied into a capped, sealed sample bottle and labeled "sample bottle number eight".

Added SB14.4.8 effective April 29, 1997

SB14.5 Analysis

SB14.5.1 The liquid level of all the sample bottles is to be measured.

Added SB14.5.1 effective April 29, 1997

SB14.5.2 The filter from sample bottle number one is to be removed and dried to constant weight by means of a desiccator or an oven. The weight of the filter is to be recorded.

Added SB14.5.2 effective April 29, 1997

SB14.5.3 The volume of sample bottle number two is to be determined. The liquid is then to be transferred to a beaker and evaporated to dryness. The volume of the liquid and the final weight of the condensable matter are to be recorded.

Added SB14.5.3 effective April 29, 1997

SB14.5.4 The volume of sample bottle number three is to be determined. The liquid is then to be transferred to a beaker and evaporated to dryness. The volume of the liquid and the final weight of the condensable matter are to be recorded.

Added SB14.5.4 effective April 29, 1997

SB14.5.5 The volumes of sample bottles number four and five are to be measured.

Added SB14.5.5 effective April 29, 1997

SB14.5.6 Sample bottles number four and five are to be combined. The organic phase is to be mixed, separated, and then repeated with two MeCl_2 washes.

Added SB14.5.6 effective April 29, 1997

SB14.5.7 The organic extracts obtained from the procedure in SB14.5.6 are to be placed in a beaker and evaporated to a constant weight. The final weight is to be recorded.

Added SB14.5.7 effective April 29, 1997

SB14.5.8 The inorganic phase is to be placed in a beaker and evaporated to dryness. The final weight is to be recorded.

Added SB14.5.8 effective April 29, 1997

SB14.5.9 The volumes of sample bottles number six and seven are to be determined. Sample bottles six and seven are to be analyzed according to SB14.5.8 and SB14.5.7 respectively.

Added SB14.5.9 effective April 29, 1997

SB14.5.10 The weight of sample bottle number eight (impinger and silica gel) is to be recorded.

Added SB14.5.10 effective April 29, 1997

SB14.6 Results

SB14.6.1 The average captured condensable particulate matter shall not exceed $3.1 \times 10^{-7} \text{ lb/ft}^3$ (5.0 mg/m^3).

Added SB14.6.1 effective April 29, 1997

SB14.6.2 During the test, temperatures of the air flow and of various surfaces considered to be thermally hot during the cooking operation are to be measured. These temperatures shall not exceed 475°F (246°C).

Added SB14.6.2 effective April 29, 1997

SB14.6.3 Tests conducted on pressure fryers shall include operation of the sample in an open fryer mode with the access door remaining open during the test. If normal operation of the product in a pressure operating mode indicates this mode to be worse case in terms of visible emission, the test shall be conducted in both modes of operation.

Added SB14.6.3 effective April 29, 1997

SB15 Damper Tests

SB15.1 General - *Reserved*

SB15.2 Cycling test - *Reserved*

SB15.3 Closure test

15.3.1 With the unit operating at its maximum air flow and the damper's actuating device disabled, the damper is to be manually operated. The damper shall fully close as intended. This operation is to be conducted a total of three times.

Added SB15.3.1 effective April 29, 1997

SB16 Automatic Operation Fire Test

SB16.1 When tested as described in SB16.2 – SB16.6, the extinguishing system unit shall detect and suppress the fire. The sample shall be monitored after actuation in accordance with the requirements described in the Standard for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas, UL 300, to verify that re-ignition will not occur. When tested in accordance with SB16.6, the extinguishing system unit shall comply with UL 300 for extinguishment splash test and cooking temperature splash test.

Added SB16.1 effective April 29, 1997

SB16.2 If a fryer employs a removable cover that is used while the heater is energized, the following fire tests are to be conducted with the removable cover positioned to cause the worst case. The product shall be marked in accordance with SB25.2(d). The tests on a pressure fryer are to be conducted with its cover open during the test. If a pressure fryer can be operated with its cover partially open or closed (but not latched), the fire tests shall also be conducted in these modes of operation.

Added SB16.2 effective April 29, 1997

SB16.3 The ignition shall be accomplished by defeating all temperature controls in the cooking appliance section in order to self-ignite the grease or cooking oil. For deep fat fryers, this will generally occur when the cooking oil reaches a temperature in excess of 600°F (315.6°C). In each case, the hood air passageways and filters shall be coated with lard prior to this testing. The lard shall be applied with a density of 0.3 pound per square foot (1.5 kg/m²) or at the lesser density required to permit sufficient air flow to restrict the lower air flow control from functioning.

Added SB16.3 effective April 29, 1997

SB16.4 The extinguisher cylinder is to be pressurized to simulate the minimum storage temperature for the automatic operation fire test condition. The extinguishing system unit is to be allowed to operate automatically and the time between auto-ignition and unit actuation is to be determined.

Added SB16.4 effective April 29, 1997

SB16.5 The extinguisher cylinder is to be pressurized to simulate the minimum storage temperature for the extended operation fire test condition. The extinguishing system unit is to be actuated after a preburn of the time recorded for unit actuation during the automatic operation test plus 30 seconds.

Added SB16.5 effective April 29, 1997

SB16.6 After each fire test, the appliance shall comply with the Dielectric-Voltage Withstand Test, Section 42.

Added SB16.6 effective April 29, 1997

SB17 Manual Operation Test

SB17.1 When an extinguishing system employs an electrical means for manual actuation, it shall be tested in accordance with SB17.2. The extinguishing system shall actuate when the electrical means for manual actuation is powered from the battery backup system.

Added SB17.1 effective April 29, 1997

SB17.2 For this test, the extinguishing system shall be operated by the battery backup system with the primary electrical means for actuation bypassed. The battery voltage shall be at the minimum voltage level specified by the manufacturer and the extinguishing system is checked for proper operation when the electrical means for the manual actuation system is operated.

Added SB17.2 effective April 29, 1997

SB18 Fire Containment Test

SB18.1 During the automatic and extended operation fire test conditions in SB16.4 and SB16.5, the flaming generated in the cooking area and any flame that occurs in the filtering area, shall be contained within the hood or the periphery of the appliance bound by the hood and the cooking area including openings in the grease-air stream enclosure provided for passage of extinguishing system unit piping or for passage of electrical conduit that are provided with fittings. If the appliance is intended for use in combustible surroundings and for permanent connection to the electrical source of supply, the appliance shall be installed within a combustible alcove as described in 45.3.1 – 45.3.3 of this Standard at the manufacturer's designated minimum clearance(s). If the appliance is intended for use in non-combustible surroundings only, the appliance need not be installed within a combustible alcove.

Added SB18.1 effective April 29, 1997

SB18.2 The surface temperature of a combustible alcove shall not exceed 175°F (79°C) rise during the test.

Added SB18.2 effective April 29, 1997

SB18.3 During fire extinguishment, the flaming may momentarily escape the hood, cooking area, or both. However, the duration of this flaming shall not exceed 1 second.

Exception: Recirculating systems that correspond with SB18.5 need not comply with this requirement.

Added SB18.3 effective April 29, 1997

SB18.4 *Reserved*

SB18.5 Recirculating systems that comply with both of the following may exceed the flaming requirement specified in SB18.3:

- a) Recirculating systems that are permanently attached to the building structure, marked in accordance with SB25.5, and provided with the installation instructions in accordance with SB32.1, and

b) Those recirculating systems in which the fire containment test is conducted with cotton pads placed around the appliance so that the cotton pads do not ignite when:

- 1) Placed on the ceiling located at the height specified by the manufacturer as marked on the product in accordance with SB25.5, and
- 2) Located away from the appliance at various heights at a clearance distance specified by the manufacturer as marked on the product in accordance with SB25.5.

Added SB18.5 effective April 29, 1997

SB18.6 The cotton pads shall consist of new undyed fibers without any mixture of artificial fibers and shall be free from thread, leaf, and shell fiber dust. The pads shall be 4 inches by 4 inches (10 cm by 10 cm) approximately 0.8 inches (2 cm) thick and weighing between 0.10 ounces and 0.14 ounces (3 and 4 grams). They shall be oven dried prior to the test. The pads shall be attached by means of noncombustible wire or clips.

Added SB18.6 effective April 29, 1997

SB19 Abnormal Flare Up, Fire, and Burn Out Tests

Reserved

SB20 Electrical Tests

SB20.1 The electrical and other test requirements specified in this standard shall apply to the hood assembly as well as to the cooking section of the device except where modified in this supplement.

Added SB20.1 effective April 29, 1997

SB20.2 The temperature at the heat responsive element during the Normal Operation Test, Section 45, shall not exceed the applicable requirements of the Standard for Heat Responsive Links for Fire-Protection Service, UL 33, and the Standard for Automatic Sprinklers for Fire-Protection Service, UL 199. The temperature of the air at the extinguisher unit is to be monitored during the Normal Operation Test. The temperature shall not exceed the maximum storage temperature for the extinguishing system unit.

Added SB20.2 effective April 29, 1997

SB21 Ozone Test

SB21.1 Equipment provided with electrostatic precipitators shall be tested for peak and time weighted average ozone levels.

Added SB21.1 effective April 29, 1997

SB21.2 The equipment is to be tested in the worst case with respect to ozone generation using new or clean filters. The test is to be conducted using all filters operational which generate ozone and by omitting those filters which are optional that reduce the overall output of ozone during the equipment operation.

Added SB21.2 effective April 29, 1997

SB21.3 The test is to be conducted in a 1000 ft³ (28.3 m³) closed room for a period of 8 h continuous operation. The maximum ozone levels permitted are 0.1 ppm time weighted average with a maximum peak concentration of 0.3 ppm.

Added SB21.3 effective April 29, 1997

SB22 Gasket and Sealant, Physical and Immersion Tests

SB22.1 Tensile strength and elongation

SB22.1.1 The tensile strength and elongation of gaskets and seals used in the construction of exhaust hood, fittings, and accessories for use with hoods shall not decrease by more than 50 percent of their original tensile strength and elongation after being subjected to the exposures described in SB22.2.2 and SB22.2.3. The part shall show no apparent deterioration, such as cracking, hardening, softening, melting, or damage after these exposures.

Added SB22.1.1 effective April 29, 1997

SB22.1.2 The average volume change of gaskets and seals used in the construction of exhaust hood, fittings, and accessories for use with exhaust hoods shall be in the range of minus 1 to plus 50 percent after being subjected to the exposures specified in SB22.3.1.

Added SB22.1.2 effective April 29, 1997

SB22.1.3 For tensile strength and ultimate elongation determination, nine specimens are to be prepared. The test procedures are to be as outlined in the section covering the tensile strength and ultimate elongation test in the Standard for Gaskets and Seals, UL 157.

Added SB22.1.3 effective April 29, 1997

SB22.2 Aging and immersion

SB22.2.1 If the size or shape of the gasket or seal is such that tensile strength and elongation specimens cannot be obtained from the part, the complete part, or a section from the part, the gasket or the seal is to be subjected to the aging and immersion exposures specified in SB22.2.2 and SB22.2.3.

Added SB22.2.1 effective April 29, 1997

SB22.2.2 Three specimens are to be subjected to air oven aging at $277 \pm 1.8^\circ\text{F}$ ($136 \pm 1^\circ\text{C}$) for seven days. The test procedures are to be as outlined in the section covering the accelerated air oven aging test in the Standard for Gaskets and Seals, UL 157.

Added SB22.2.2 effective April 29, 1997

SB22.2.3 Three specimens are to be immersed for 70 hours in lard and three specimens are to be immersed in corn oil at $277 \pm 1.8^\circ\text{F}$ ($136 \pm 1^\circ\text{C}$). The test procedures are to be as outline in the section covering the immersion test and the method for tensile strength and elongation tests in the Standard for Gaskets and Seals, UL 157.

Added SB22.2.3 effective April 29, 1997

SB22.3 Volume change

SB22.3.1 Three specimens from the gaskets or seals are to be immersed for 70 hours in lard and three specimens are to be immersed in corn oil at $277 \pm 1.8^\circ\text{F}$ ($136 \pm 1^\circ\text{C}$). The test procedures are to be as outlined in the section covering the immersion test, method for volume change in the Standard for Gaskets and Seals, UL 157.

Added SB22.3.1 effective April 29, 1997

SB23 Fire and Leakage Test of Fittings, Nonwelded Seams, Doors and Panels Used in Grease-Air Stream Enclosures

SB23.1 When a fitting is tested as specified in SB23.2 – SB23.4, there shall be no propagation of grease vapor or flame through or around the fitting.

Added SB23.1 effective April 29, 1997

SB23.2 Two representative samples of the fitting shall be installed in a 20 by 20 inch (508 by 508 mm), 0.064 inch (1.63 mm) thick stainless steel plate in accordance with the manufacturer's specifications. The plate and fittings shall then be evenly coated with grease on the fire exposed side (bottom) to obtain a loading of 0.3 pound per square foot (1.5 kg/m²).

Added SB23.2 effective April 29, 1997

SB23.3 The plate containing the test samples is to be positioned horizontally (grease side down) 18 inches (457 mm) above a metal container holding three pints (1.4 L) of grease. The container is to measure approximately 13 inches (330 mm) in diameter by 8-1/2 inches (216 mm) deep and having an evaporating surface at the liquid level of approximately 130 square inches (839 cm²). This container is to be placed on a heat source capable of heating the grease to 600°F (315°C). The preheated grease is then ignited.

Added SB23.3 effective April 29, 1997

SB23.4 The test is continued until all of the grease has burned and the container is dry.

Added SB23.4 effective April 29, 1997

MARKING

SB24 Fire Extinguishing System Unit Container

SB24.1 The fire extinguishing system unit container shall be provided with a permanent marking, including all required information as specified in the Standard for Dry Chemical Extinguishing Systems, NFPA 17-1990, or the Standard for Wet Chemical Extinguishing Systems, NFPA 17A-1990, and the applicable requirements for pre-engineered fire extinguishing systems from UL 1254, the Standard for Pre-Engineered Extinguishing System Units..

Added SB24.1 effective April 29, 1997

SB25 Product

SB25.1 A product designed for permanent connection to the electrical source of supply and intended for use near combustible surfaces shall be permanently marked with the minimum required clearance distances to adjacent combustible materials. See SB19.1. If the product is intended for cord and plug connection to the electrical source or is not tested in a combustible alcove at a designated minimum clearance, the product shall be marked "Intended for Use in Noncombustible Surroundings Only." This marking shall be readily visible and shall have the minimum dimensions specified in SB25.6.

Added SB25.1 effective April 29, 1997

SB25.2 The product shall be permanently marked with:

- a) The location where each filter is to be installed.
- b) Any instructions needed to properly mount the filters.
- c) The maintenance frequency of the filters.
- d) If the product is provided with a removable cover to be used during the cooking process, the product shall be marked when and how it is to be used. If the product is provided with a cover to be used when the heater is not energized, the cover shall be permanently marked "Not for use when preheating, idling, or cooking."

- e) If battery backup is provided, the product shall be marked in the battery compartment with the battery type, size, rating and to replace the battery only with the same type.

This marking shall be readily visible and shall have the minimum dimensions specified in SB25.6.

Added SB25.2 effective April 29, 1997

SB25.3 A cooking appliance provided with an integral recirculating system shall be permanently marked with its kilowatt rating. This marking shall be readily visible and shall have the minimum dimensions specified in SB25.6.

Added SB25.3 effective April 29, 1997

SB25.4 A nonintegral recirculating system shall be permanently marked stating a reference to the types and quantities of cooking appliances to be used, their maximum kilowatt ratings, any restrictions in appliance installation below the hood, and the maximum volume, surface areas, or both of the cooking cavity, and maximum operating temperature for each cooking appliance covered.

Added SB25.4 effective April 29, 1997

SB25.5 The recirculating systems intended to be permanently attached to the building structure and which comply with SB18.4 shall be permanently marked with the following or the equivalent:

- a) "To Be Permanently Attached To The Building Structure,"
- b) "CAUTION: Keep Combustible Materials, Products, And Fixtures At Least ^a Inches From This Device," and
- c) "Ceiling Height Shall Be No Less Than ^a Inches."

^a These distances are values determined in the test in accordance with SB18.4. The marking shall be readily visible and shall have the minimum dimensions specified in SB25.6.

Added SB25.5 effective April 29, 1997

SB25.6 With respect to SB25.1 – SB25.5, "readily visible" means visible from a point 5 feet (1.5 m) above the floor and between 1 and 4 feet (0.3 and 1.2 m) away from the front surface of the unit when the unit is placed in the intended use location. The marking shall be in letters not less than 1/8 inch (3.2 mm) in height and shall be of a permanent type and in a color that contrasts with that of the background.

Added SB25.6 effective April 29, 1997

INSTRUCTIONS

SB26 Use and Maintenance

SB26.1 Manufacturer's instructions shall be provided with each product indicating that its use and maintenance is to be in accordance with the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96-1994.

Added SB26.1 effective April 29, 1997

SB27 Fire Extinguishing System Unit Maintenance

SB27.1 The instructions provided with the product shall include information regarding maintenance of the fire extinguishing system unit as outlined in the Standard for Dry Chemical Extinguishing Systems, NFPA 17-1990 or the Standard for Wet Chemical Extinguishing Systems, NFPA 17A-1990, and applicable requirements covering pre-engineered fire extinguishing systems.

Added SB27.1 effective April 29, 1997

SB28 Manual Actuation Of Fire Extinguishing System Unit

SB28.1 The instructions provided with the product shall include information for providing the manual actuation of the fire extinguishing system unit. The manual actuation device shall be readily accessible, in a path of exit or egress and shall be clearly identified. Installation of the manual actuation device shall comply with the applicable installation standards and codes.

Added SB28.1 effective April 29, 1997

SB29 Installation Instructions

SB29.1 The instructions shall indicate that the installation is to be in accordance with the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96-1994.

Added SB29.1 effective April 29, 1997

SB30 Permanently Attached Hoods

SB30.1 The instructions for permanently attached hoods shall:

- a) Indicate that they are to be permanently attached to the building structure, and
- b) Specify that the minimum ceiling height in the area where these hoods are installed is not to be less than that determined suitable in SB18.4.

Added SB30.1 effective April 29, 1997

APPENDIX B

DESIGNATED RESPONSIBILITY FOR UL PRODUCT CATEGORY KNKG, COMMERCIAL ELECTRIC COOKING APPLIANCES WITH INTEGRAL DUCTLESS HOODS

The individuals shown in the following table are involved with the investigation of products covered under the subject category. The Primary Designated Engineer (**shown in UPPERCASE letters**) coordinates the establishment and uniform interpretation of UL requirements applicable to the product category. The Designated Engineers (**shown in lowercase letters**) work with the Primary Designated Engineer to interpret requirements and maintain standards.

Should you have questions regarding the interpretation of the requirements adopted in this bulletin or any adopted requirements that affect your product, you are encouraged to contact the individual at the office to which you normally submit your products.

The IAC Chairman for the subject category is Don Grob at UL's Northbrook office. The IAC Chairman oversees the significant interpretations made by the Primary Designated Engineer and arbitrates any differences regarding interpretation of UL requirements.

CCN	Office/Subsidiary	Responsible Engineer	Extension
KNKG	Melville	Thomas Paolino	22969
	Northbrook	DAN RESTELLI	42089
	RTP	Carl Radcliffe	11678
	Santa Clara	Daniel Matts	32176



Underwriters Laboratories Inc.®

An independent, not-for-profit organization testing for public safety

April 24, 1996

Revision pages for

Standard for

Vending Machines

UL 751, Sixth Edition

Attached to this transmittal notice is a revision of the Sixth edition of UL 751.

A CHANGE ON A PAGE DATED APRIL 24, 1996 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS ARE NOW IN EFFECT.

The new and revised requirements are substantially in accordance with UL's bulletin on this subject dated August 29, 1995. The bulletin is now obsolete and may be discarded.

Revised and/or additional pages may be issued from time to time.

With the inclusion of the accompanying material, the standard consists of pages dated as shown in the following checklist:

Page	Date
1	June 28, 1995(Reprinted: April 24, 1996)
2, 3	April 24, 1996
4	June 28, 1995
5, 6, 6A	April 24, 1996
7 - 23	June 28, 1995
24 - 26, 26A, 26B	April 24, 1996
27 - 39	June 28, 1995
40 - 42, 42A	April 24, 1996
43 - 49	June 28, 1995
50 - 52	April 24, 1996
53 - 55, A1	June 28, 1995

JUNE 28, 1995

(Title Page Reprinted: April 24, 1996)

1

UL 751

Standard for

Vending Machines

The first, second, and third editions were titled Standard for Safety for Vending and Amusement Machines.

First Edition – December, 1970

Second Edition – April, 1974

Third Edition – May, 1978

Fourth Edition – September, 1985

Fifth Edition – May, 1990

Sixth Edition

June 28, 1995

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest published set of revision pages.

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FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.