UL 283

STANDARD FOR SAFETY

Air Fresheners and Deodorizers

UL Standard for Safety for Air Fresheners and Deodorizers, UL 283

Third Edition, Dated June 16, 2015

Summary of Topics

This revision of ANSI/UL 283 dated April 29, 2021 includes the withdrawal and replacement of UL 508C with UL 61800-5-1; 6.5.4.1 and 6.13.4.4

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated February 5, 2021.

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UL 283

Standard for Air Fresheners and Deodorizers

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This ANSI/UL Standard for Safety consists of the Third edition including revisions through April 29, 2021.

The most recent designation of ANSI/UL 283 as an American National Standard (ANSI) occurred on April 29, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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INTRODUCTION

1 Scope

1.1 These requirements cover household and commercial air fresheners and deodorizers, rated 250 volts or less for use in ordinary locations in accordance with the National Electrical Code, ANSI/NFPA 70.

1.2 These requirements cover air fresheners and deodorizers for deodorizing or scenting air, or both, by the dispersal of chemicals, fragrances, or both. Air fresheners and deodorizers employing heating elements, electronic circuits, motor-operated fans (or a combination thereof), and mechanical filters are also covered by these requirements.

1.3 These requirements are intended to evaluate these appliances with respect to the risk of fire, electric shock, injury to persons, and explosiveness of atmosphere. The physiological effects of the operation of these appliances, beneficial or otherwise, are not covered by this Standard. The assigned ratings do not cover other potential risks, including the physiological effects of these appliances, in any form, nor do they indicate the efficiency or effectiveness of the intended uses of these appliances.

1.4 These requirements do not cover insect-repellent dispensers, air sterilizing appliances, air cleaning products, air filters, room ionizers, smoke scrubbers, or ultraviolet filters.

1.5 These requirements do not cover permanently-connected appliances.

1.6 These requirements do not cover direct plug-in appliances with open reservoirs for the addition of either a liquid or a substance that when heated becomes a liquid.

1.7 Direct plug-in air fresheners and deodorizers provided with illumination shall be additionally evaluated to the Standard for Direct Plug-In Nightlights, UL 1786.

1.8 Electric toys are covered by the Standard for Electric Toys, UL 696.

1.9 Electric toy transformers are covered by the Standard for Toy Transformers, UL 697.

2 Units of Measurement

2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

3 Undated References

3.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

4 Glossary

4.1 For the purpose of this Standard, the following definitions apply.

4.2 AIR DEODORIZER – An appliance that is intended to treat the air in a relatively small area by the dispersal of chemicals, fragrances, or both. Some appliances employ a mechanical filter.

4.3 AIR FRESHENER – An appliance that is intended to scent the air in a relatively small area by the dispersal of chemicals, fragrances, or both. Some appliances employ a mechanical filter.

4.4 APPLIANCE COUPLER – A single-outlet, female contact device for attachment to a flexible cord as part of a detachable power-supply cord to be connected to an appliance inlet (motor attachment plug).

4.5 APPLIANCE INLET (Motor Attachment Plug) – A male contact device mounted on an end product appliance to provide an integral blade configuration for the connection of an appliance coupler or cord connector.

4.6 APPLIANCE (FLATIRON) PLUG – An appliance coupler type of device having a cord guard and a slot configuration specified for use with heating or cooking appliances.

4.7 APPRECIABLY DEPLETED – A reduction in total consumable volume of greater than 15 percent during operation of the unit over the entire life of the fragrance a stated by the manufacturer.

4.8 ASKAREL – A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

4.9 AUTOMATICALLY CONTROLLED APPLIANCE – An appliance is considered to be automatically controlled if:

a) The repeated starting of the appliance, beyond one complete predetermined cycle of operation to the point where some form of limit switch opens the circuit, is independent of any manual control;

b) During any single predetermined cycle of operation, the motor is caused to stop and restart one or more times;

c) Upon energizing the appliance, the initial starting of the motor is capable of being intentionally delayed beyond normal, conventional starting; or

d) During any single predetermined cycle of operation, automatic changing of the mechanical load is capable of reducing the motor speed to the degree required to reestablish starting-winding connections to the supply circuit.

4.10 CHILD-APPEALING FEATURE – A feature that has entertaining audio or visual effects, or that depicts (logos, decals, art work, etc.) or resembles in physical form or function articles commonly recognized as appealing to or intended for use by children under 5 years of age. This includes, but is not limited to, features that depict or resemble cartoon characters, toys, guns, watches, musical instruments, vehicles, toy animals, food or beverages, or that play musical notes or have flashing lights or other entertaining features.

For features that do not depict or resemble the items listed above, the following additional factors will be considered in determining whether a direct plug-in air freshener or deodorizer has a feature that is commonly recognized as one that is designed or intended primarily to provide visual appeal and attraction to children ages 5 and under:

a) The manufacturer's intent to market the product with visual appeal and attraction to, and with the intent to invite or entice interaction by, children under 5 years of age, as evidenced by a review of any of the following:

1) Product labeling,

2) Product packaging (for example, depictions of the product being used in children's rooms, or being handled directly by children),

3) Advertising materials,

4) Promotional materials,

5) Other materials accompanying the product,

b) The nature of any designs or depictions on the product, or the nature of the design or the shape of a component of the product, based on a consideration of the following:

1) Whether the designs or depictions, or the design or shape of the component, reflects a seasonal or holiday theme commonly recognized as appealing to adults and commonly recognized as being consistent with trends in the marketplace for seasonally-themed merchandise for the home; or

2) Whether the designs or depictions, or the design or shape of the component, reflects an embellishment or motif that is commonly recognized as appealing primarily to children under the age of 5, and not intended for mass appeal to both adults and children.

4.11 COMPONENT – A device or fabricated part of the appliance covered by the scope of a safety standard dedicated to the purpose. When incorporated in an appliance, equipment otherwise typically field installed (e. g. luminaire) is considered to be a component. Unless otherwise specified, materials that compose a device or fabricated part, such as thermoplastic or copper, are not considered components.

4.12 CONSUMABLE – A substance that is depletable, disposable, or both, in any form that remains or transforms through operation into pellets, gel, or liquid, that either functions in conjunction with an accessory that attaches to the appliance (that is, deodorizer or air freshener), or is directly inserted into the appliance.

4.13 CONTAINER – A receptacle in which the consumable is held or carried during use in the appliance.

4.14 CONTROL, AUTOMATIC ACTION – A control in which at least one aspect is non-manual.

4.15 CONTROL, AUXILIARY – A device or assembly of devices that provides a functional utility, is not relied upon as an operational or protective control, and therefore is not relied upon for safety. For example, an efficiency control not relied upon to reduce the risk of electric shock, fire, or injury to persons during normal or abnormal operation of the end product is considered an auxiliary control.

4.16 CONTROL, MANUAL – A device that requires direct human interaction to activate or rest the control.

4.17 CONTROL, OPERATING – A device or assembly of devices, the operation of which starts or regulates the end product during normal operation. For example, a thermostat, the failure of which a thermal cutout/limiter or another layer of protection would mitigate the potential hazard, is considered an operating control. Operating controls are also referred to as “regulating controls".

4.18 CONTROL, PROTECTIVE – A device or assembly of devices, the operation of which is intended to reduce the risk of electric shock, fire or injury to persons during normal and reasonably anticipated abnormal operation of the appliance. For example, a thermal cutout/limiter, or any other control/circuit relied upon for normal and abnormal conditions, is considered a protective control. Protective controls are also referred to as “limiting controls” and “safety controls”.

Note: During the evaluation of the protective control/circuit, the protective functions are verified under normal and single-fault conditions of the control.

4.19 CONTROL, TYPE 1 ACTION – The actuation of an automatic control for which the manufacturing deviation and the drift (tolerance before and after certain conditions) of its operating value, operating time, or operating sequence has not been declared and tested under this standard.

4.20 CONTROL, TYPE 2 ACTION – The actuation of an automatic control for which the manufacturing deviation and the drift (tolerance before and after certain conditions) of its operating value, operating time, or operating sequence have been declared and tested under this standard.

4.21 CORD CONNECTOR – A female contact device wired on flexible cord for use as an extension from an outlet to make a detachable electrical connection to an attachment plug or, as an appliance coupler, to an equipment inlet.

4.22 DIRECT PLUG-IN APPLIANCE – An appliance that has integral blades for direct insertion into a receptacle rated either 15 or 20 A, 125 V. Some appliances are provided with a polarized, parallel blade receptacle.

4.23 ENCLOSURE – That part of the appliance that:

a) Renders inaccessible all or any parts of the appliance that present a risk of electric shock or injury to persons due to total or partial collapse with a resulting reduction of spacings, loosening or displacement of parts, or serious defects, or

b) Retards propagation of flame initiated by electrical disturbances occurring within, or

c) Both (a) and (b).

4.24 FAN BLADE – A component of an impeller.

4.25 FLASH POINT – The minimum temperature of a liquid at which vapor is evolved in a large enough quantity to form a flammable mixture with air.

4.26 FRAGRANCE – Any consumable that is designed to produce a vapor that has an odor.

4.27 IMPELLER – An assembly of blades about an integral hub.

4.28 LOW VOLTAGE – Not greater than 30 Vrms or 42.4 V peak or 42.4 V dc.

4.29 MOUNTING MEANS – Hardware to mount the appliance to the building structure or to an outlet box.

4.30 OPERATING TEMPERATURE OF THE FRAGRANCE – The maximum temperature measured on the air freshener and deodorizer appliance in an area that is in direct contact with the vapor generated by the product for a liquid fragrance or at the container body in contact with the appliance for a gel pack.

4.31 PORTABLE APPLIANCE – A direct plug-in appliance or an appliance provided with a power-supply cord for connection to the supply circuit, that is capable of being easily moved by hand from place to place.

4.32 RESERVOIR – A vessel that holds the consumable in the appliance. The reservoir is intended to be refilled by the consumer during use of the appliance.

4.33 RISK OF ELECTRIC SHOCK – A risk of electric shock exists at any part when:

a) The potential between the path and earth ground or any other accessible part is more than 30 V rms (42.4 V peak); and

b) The continuous current flow through a 1500 ohm resistor connected across the potential exceeds 0.5 mA.

4.34 SEAL – A component made of elastomers, composite gasket material, flexible cellular material, thermoplastics, and thermoplastic elastomers that exclude or hold within an enclosure consumables that are liquid, solid, or vapor.

4.35 STATIONARY APPLIANCE – A direct plug-in appliance or an appliance provided with a power-supply cord for connection to the supply circuit, that is intended to be fastened in place or located in a dedicated place.

4.36 USER SERVICING – Any form of servicing, such as routine cleaning and replacement of a fuse, lamp, or a consumable, that is performed by personnel other than those trained to maintain the appliance.

CONSTRUCTION

5 General

5.1 An appliance shall employ materials that are intended for the application.

5.2 Thermoplastic material used for a part of an appliance having any dimension (length, width or height) greater than 305 mm (12 in) shall be classified minimum HB.

6 Components

6.1 General

6.1.1 A component of a product covered by this standard shall:

a) Comply with the requirements for that component as indicated in 6.2 – 6.22 or the individual component section;

b) Be used in accordance with its rating(s) established for the intended conditions of use;

c) Be used within its established use limitations or conditions of acceptability;

d) Additionally comply with the applicable requirements of this end product standard; and

e) Not contain mercury.

Note: Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

Exception No. 1: A component of a product covered by this standard is not required to comply with a specific component requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product, or

b) Is superseded by a requirement in this standard, or

c) Is separately investigated when forming part of another component, provided the component is used within its established ratings and limitations.

Exception No. 2: A component complying with a UL component standard other than those cited in 6.2 – 6.22 is acceptable if:

a) The component also complies with the applicable component standard of 6.2 – 6.22 or the individual component section; or

b) The component standard:

1) Is compatible with the ampacity and overcurrent protection requirements NFPA 70, where appropriate;

2) Considers long-term thermal properties of polymeric insulating materials in accordance with the Standard for Polymeric Materials – Long Term Property Evaluations, UL 746B; and

3) Any use limitations of the other component standard is identified and appropriately accommodated in the end use application. For example, a component used in a household application, but intended for industrial use and complying with the relevant component standard may assume user expertise not common in household applications.

6.1.2 A component that is also intended to perform other functions, such as over current protection, ground-fault circuit-interruption, surge suppression, any other similar functions, or any combination thereof, shall comply additionally with the requirements of the applicable UL standard(s) that cover devices that provide those functions.

Exception: Where these other functions are not required for the application and not identified as part of markings, instructions, or packaging for the appliance, the additional component standard(s) need not be applied.

6.1.3 A component not anticipated by the requirements of this standard, not specifically covered by the component standards of 6.2 – 6.22 or individual component sections and that involves a potential risk of electric shock, fire, or personal injury, shall be additionally investigated in accordance with the applicable UL standard, and shall comply with 6.1.1 (b) – (d).

6.1.4 With regard to a component being additionally investigated, reference to construction and performance requirements in another UL end product standard is appropriate where that standard anticipates normal and abnormal use conditions consistent with the application of this Standard.

6.2 Attachment plugs, receptacles, connectors, and terminals

6.2.1 Attachment plugs, receptacles, appliance couplers, appliance inlets (motor attachment plugs), and appliance (flatiron) plugs, shall comply with the Standard for Attachment Plugs and Receptacles, UL 498. See 6.2.8.

Exception: Attachment plugs and appliance couplers integral to cord sets or power supply cords are covered under the requirements of UL 817 and need not comply with UL 498.

6.2.2 Quick-connect terminals, both connectors and tabs, for use with one or two 22 – 10 AWG copper conductors, having nominal widths of 2.8, 3.2, 4.8, 5.2, and 6.3 mm (0.110, 0.125, 0.187, 0.205, and 0.250 in), intended for internal wiring connections in appliances, or for the field termination of conductors to the appliance, shall comply with the Standard for Electrical Quick-Connect Terminals, UL 310.

Exception: Other sizes of quick-connect terminals shall be investigated with respect to crimp pull out, insertion-withdrawal, temperature rise, and all tests shall be conducted in accordance with UL 310.

6.2.3 Single and multipole connectors for use in data, signal, control and power applications within and between electrical equipment, and that are intended for factory assembly to copper or copper alloy conductors, or for factory assembly to printed wiring boards, shall comply with the Standard for Component Connectors for Use in Data, Signal, Control and Power Applications, UL 1977. See 6.2.8.

6.2.4 Wire connectors shall comply with the Standard for Wire Connectors, UL 486A-486B.

6.2.5 Splicing wire connectors shall comply with the Standard for Splicing Wire Connectors, UL 486C.

6.2.6 Wiring terminals for use with all alloys of copper, aluminum, or copper-clad aluminum conductors, shall comply with the Standard for Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors, UL 486E.

6.2.7 Terminal blocks shall comply with the Standard for Terminal Blocks, UL 1059.

6.2.8 Female devices (such as receptacles, appliance couplers, and connectors) that are intended, or that may be used, to interrupt current in the end product, shall be suitably rated for current interruption of the specific type of load, when evaluated with its mating plug or connector. For example, an appliance coupler that can be used to interrupt the current of a motor load shall have a suitable horsepower rating when tested with its mating plug.

6.3 Batteries and battery chargers

6.3.1 A lithium ion (Li-On) single cell battery shall comply with the requirements for secondary lithium cells in the Standard for Lithium Batteries, UL 1642. A lithium ion multiple cell battery, and a lithium ion battery pack, shall comply with the applicable requirements for secondary lithium cells or battery packs in the Standard for Household and Commercial Batteries, UL 2054.

6.3.2 Rechargeable nickel cadmium (Ni-Cad) cells and battery packs shall comply with the applicable construction and performance requirements of this end product standard.

6.3.3 Rechargeable nickel metal-hydride (Ni-MH) battery cells and packs shall comply with construction and performance requirements of this end product standard, or the applicable requirements for secondary cells or battery packs in the Standard for Household and Commercial Batteries, UL 2054.

6.3.4 Primary batteries (non-rechargeable) that comply with the relevant UL standard and 6.1 are considered to fulfill the requirements of this Standard.

6.3.5 A Class 2 battery charger shall comply with one of the following:

a) The Standard for Class 2 Power Units, UL 1310; or

b) The Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1, with an output marked "Class 2", or that complies with the limited power source (LPS) requirements and is marked "LPS".

6.3.6 A non-Class 2 battery charger shall comply with one of the following:

a) The Standard for Power Units Other Than Class 2, UL 1012; or

b) The Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1.

6.4 Capacitors and filters

6.4.1 The component requirements for a capacitor are not specified. A capacitor complying with the Standard for Capacitors, UL 810, is considered to fulfill the requirements of 16.1.

6.4.2 Electromagnetic interference filters with integral enclosures that comply with the Standard for Electromagnetic Interference Filters, UL 1283, are considered to fulfill the requirements of 16.1.

6.5 Controls

6.5.1 General

6.5.1.1 Auxiliary controls shall be evaluated using the applicable requirements of this end product standard and the parameters in Section 24, Controls – End Product Test Parameters.

6.5.1.2 Operating (regulating) controls shall be evaluated using the applicable component standard requirements specified in 6.5.2 – 6.5.7, and if applicable, the parameters in Section 24, Controls – End Product Test Parameters, unless otherwise specified in this end product standard.

6.5.1.3 Operating controls that rely upon software for the normal operation of the end product where deviation or drift of the control may result in a hazard, such as a speed control unexpectedly changing its output, shall comply with:

a) The Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991; and the Standard for Software in Programmable Components, UL 1998; or

b) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

6.5.1.4 Protective (limiting) controls shall be evaluated using the applicable component standard requirements specified in 6.5.2 – 6.5.7, and if applicable, the parameters in Section 24, Controls – End Product Test Parameters, unless otherwise specified in this end product standard.

6.5.1.5 Solid-state protective controls that do not rely upon software as a protective component shall comply with:

a) The Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991; or

b) The Standard for Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements, UL 60730-1, except 11.2 h) (Controls using software).

6.5.1.6 Protective controls that rely upon software as a protective component shall comply with:

a) The Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991; and the Standard for Software in Programmable Components, UL 1998; or

b) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

6.5.1.7 An electronic, non-protective control that is simple in design need only be subjected to the applicable requirements of this end-product standard. A control that does not include an integrated circuit or microprocessor, but does consist of a discrete switching device, capacitors, transistors, and resistors, is considered simple in design. See Section 48, Abnormal Operation Test.

6.5.2 Electromechanical and electronic controls

6.5.2.1 A control, other than as specified in 6.5.3 – 6.5.7, shall comply with:

a) The Standard for Solid-State Controls for Appliances, UL 244A; or

b) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873; or

c) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

6.5.3 Liquid level controls

6.5.3.1 A liquid level control shall comply with:

a) The Standard for Solid-State Controls for Appliances, UL 244A; or

b) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873; or

c) The Standard for Industrial Control Equipment, UL 508; or

d) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1; and

1) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Automatic Electrical Water Level Controls of the Float Type for Household and Similar Applications, UL 60730-2-16A; or

2) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Automatic Electrical Water and Air Flow Sensing Controls, Including Mechanical Requirements, UL 60730-2-18.

6.5.4 Motor and speed controls

6.5.4.1 A control used to start, stop, regulate or control the speed of a motor shall comply with:

a) The Standard for Solid-State Controls for Appliances, UL 244A; or

b) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873; or

c) The Standard for Industrial Control Equipment, UL 508; or

d) The Standard for Adjustable Speed Electrical Power Drive Systems – Part 5-1: Safety Requirements – Electrical, Thermal and Energy, UL 61800-5-1; or

e) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

6.5.5 Pressure controls

6.5.5.1 A pressure control shall comply with one of the following:

a) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873; or

b) The Standard for Industrial Control Equipment, UL 508; or

c) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1; and the Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Automatic Electrical Pressure Sensing Controls Including Mechanical Requirements, UL 60730-2-6.

6.5.6 Temperature controls

6.5.6.1 A temperature control shall comply with:

a) The Standard for Solid-State Controls for Appliances, UL 244A; or

b) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873; or

c) The Standard for Industrial Control Equipment, UL 508; or

d) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1; and the Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Temperature Sensing Controls, UL 60730-2-9.

6.5.7 Timer controls

6.5.7.1 A timer control shall comply with:

a) The Standard for Solid-State Controls for Appliances, UL 244A; or

b) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1; and the Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches, UL 60730-2-7.

6.6 Cords, cables, and internal wiring

6.6.1 A cord set or power supply cord shall comply with the Standard for Cord Sets and Power-Supply Cords, UL 817.

6.6.2 Flexible cords and cables shall comply with the Standard for Flexible Cords and Cables, UL 62. Flexible cord and cables are considered to fulfill this requirement when preassembled in a cord set or power supply cord complying with the Standard for Cord Sets and Power-Supply Cords, UL 817.

6.6.3 Internal wiring composed of insulated conductors shall comply with the Standard for Appliance Wiring Material, UL 758.

Exception No. 1: Insulated conductors need not comply with UL 758 if they comply with one of the following:

a) The Standard for Thermoset-Insulated Wires and Cables, UL 44;

b) The Standard for Thermoplastic-Insulated Wires and Cables, UL 83;

c) The Standard for Fixture Wire, UL 66; or

d) The appropriate UL standard (s) for other insulated conductor types specified in Chapter 3 (Wiring Methods and Materials) of NFPA 70.

Exception No. 2: Insulated conductors for specialty applications (e.g. data processing or communications) and located in a low-voltage circuit not involving the risk of fire or personal injury need not comply with UL 758.

6.7 Film-coated wire (magnet wire)

6.7.1 The component requirements for film coated wire and Class 105 (A) insulation systems are not specified.

6.7.2 Film coated wire in intimate combination with one or more insulators, and incorporated in an insulation system rated Class 120 (E) or higher, shall comply with the magnet wire requirements in the Standard for Systems of Insulating Materials – General, UL 1446.

6.8 Gaskets and seals

6.8.1 Gaskets and seals that comply with the Standard for Gaskets and Seals, UL 157, are considered to fulfill the requirements of 9.2 and 62.

6.9 Heaters and heating elements

6.9.1 Electric resistance heating elements shall comply with the construction requirements of:

a) The Standard for Electric Heating Appliances, UL 499; or

b) The Standard for Sheathed Heating Elements, UL 1030.

Exception: Heating wire (e.g. rope heater) that complies with the Standard for Appliance Wiring Material, UL 758, and the requirements of this end product standard are considered to fulfill this requirement.

6.9.2 Thermistor-type heaters (e. g. PTC and NTC heaters) shall comply with the Standard for Thermistor-Type Devices, UL 1434.

6.10 Insulation systems

6.10.1 Materials used in a Class 105 (A) insulation system shall comply with Section 33, Insulation Systems.

6.10.2 Materials used in an insulation system that operates above Class 105 (A) temperatures shall comply with the Standard for Systems of Insulating Materials – General, UL 1446.

6.10.3 All insulation systems employing integral ground insulation shall comply with the requirements specified in the Standard for Systems of Insulating Materials – General, UL 1446.

6.11 Light sources and associated components

6.11.1 Lampholders and indicating lamps shall comply with the Standard for Lampholders, UL 496.

Exception: Lampholders forming part of a luminaire that complies with an appropriate UL luminaire standard are considered to fulfill this requirement.

6.11.2 Lighting ballasts shall comply with:

a) The Standard for Fluorescent-Lamp Ballasts, UL 935; or

b) The Standard for High-Intensity-Discharge Lamp Ballasts, UL 1029.

Exception No. 1: Ballasts forming part of a luminaire that complies with an appropriate UL luminaire standard are considered to fulfill this requirement.

Exception No. 2: Ballasts for other light sources shall comply with the appropriate UL standard(s).

6.11.3 Light emitting diode (LED) light sources shall comply with the Standard for Light Emitting Diode (LED) Equipment For Use In Lighting Products, UL 8750.

Exception No. 1: LED light sources forming part of a luminaire that complies with an appropriate UL luminaire standard are considered to fulfill this requirement.

Exception No. 2: Individual LED light sources mounted on printed wiring boards and intended for indicating purposes need not comply with UL 8750, but shall comply with the applicable requirements of this end product standard.

6.12 Marking and labeling systems

6.12.1 A marking and labeling system shall comply with the Standard for Marking and Labeling Systems, UL 969 under the specified environmental conditions.

Exception: A marking or labeling system that complies with Section 50, Permanence of Marking Test, of this standard is considered to fulfill the requirement.

6.13 Motors and motor overload protection

6.13.1 General

6.13.1.1 General-purpose type motors having a NEMA frame size shall comply with the requirements specified in 6.13.2. This includes fractional HP motors rated up to 1 HP (typically NEMA frame sizes 42, 48, or 56), and integral HP motors rated 1 HP and greater (typically NEMA frame sizes 140 – 449T).

6.13.1.2 Motors not enclosed, or partially enclosed, by the end product enclosure shall comply with the requirements specified in 6.13.2.

6.13.1.3 Component type motors completely enclosed within the end product enclosure shall comply with the requirements specified in 6.13.2 or 6.13.3.

6.13.1.4 Motors located in a low voltage circuit are evaluated for the risk of fire and personal injury in accordance with the applicable requirements of this end product standard.

6.13.1.5 Low voltage component fans that comply with the Standard for Electric Fans, UL 507, are considered to fulfill the requirements of Section 20, Motors.

6.13.2 General-purpose type motors

6.13.2.1 A general-purpose type motor shall comply with the Standard for Rotating Electrical Machines – General Requirements, UL 1004-1.

6.13.3 Component type motors

6.13.3.1 Component type motors shall comply with either 6.13.3.2 or 6.13.3.3.

6.13.3.2 The motor shall comply with the Standard for Rotating Electrical Machines – General Requirements, UL 1004-1 except as noted in Table 6.1.

Table 6.1
Superseded requirements

UL 1004-1 Exempted Requirement	Superseded by UL 283 Requirements
Current and Horsepower Relation, Section 6	20.3.4
Cord-Connected Motors, Section 15	11.1
Factory Wiring Terminals and Leads, Section 17	Section 14
Electrical Insulation, Section 22	Section 13
Non-Metallic Functional Parts, Section 28	Sections 7, 13, 20
Solid-State Controls, 7.2	Section 6.5
Non-metallic enclosure thermal aging, 9.1.4	7.2.8
Motor enclosure, 9.2 – 9.4	Section 7
Grounding, Sections 10 and 11	Section 17
Ventilation Openings, Section 12: only applicable where the openings are on surfaces considered to be the appliance enclosure	7.2.8
Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts, Section 13	Section 10
Protection Against Corrosion, Section 14	Section 9
Available fault current ratings for motor start and running capacitors, Clause 26.6: not applicable for cord and plug connected appliances.	Section 16
Switch, Section 27 is not applicable to centrifugal starting switches	Section 23
With the exception of Sections 35 and 40 (Resilient Elastomer Mounting and Electrolytic Capacitor Tests, respectively), the performance tests of UL 1004-1 are not applicable	All applicable performance tests.
Only the following marking requirements specified in 43.1 of UL 1004-1 are applicable: manufacturer's name or identification; rated voltage; rated frequency; number of phases if greater than 1; and multi-speed motors, other than a shaded-pole or a permanent-split-capacitor motor, shall be marked with the amperes and horsepower at each speed	72.1

6.13.3.3 The motor shall comply with the applicable component requirements in Section 6, the following construction requirements, and the applicable performance requirements (when tested in conjunction with the end product), of this end product standard:

a) Protection against corrosion, Section 9;

b) Insulating Material, Section 13;

c) Internal wiring, Section 14;

d) Capacitors, Section 16;

e) Grounding, Section 17;

f) Motors, Section 20;

g) Spacings, Section 25.

6.13.4 Motor overload protection

6.13.4.1 Thermal protection devices integral with the motor shall comply with: