

UL 1431

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Personal Hygiene and Health Care Appliances

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Underwriters Laboratories Inc. (UL)
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UL Standard for Safety for Personal Hygiene and Health Care Appliances, UL 1431

Second Edition, Dated November 22, 1996

Revisions: This Standard contains revisions through and including March 26, 2007.

SUMMARY OF TOPICS

This revision to UL 1431 includes the addition of an Exception to 71.1.2 to allow floor mounted air blower type hydromassagers to use SPT-2, NISPT-2, or SVT type power supply cords.

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Text that has been changed in any manner is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The revised requirements are substantially in accordance with UL's Proposal(s) on this subject dated February 2, 2007.

The revisions dated March 26, 2007 include a reprinted title page (page1) for this Standard.

The revisions dated May 23, 2006 editorially replace all references to UL 1020 with the reference to UL 60691.

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if

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4	August 2, 2000
5	October 28, 2003
6-7	August 6, 2004
8	November 22, 1996
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16-16B	August 4, 1998
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18-20B	August 6, 2004
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UL 1431

Standard for Personal Hygiene and Health Care Appliances

First Edition – August, 1984

Second Edition

November 22, 1996

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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 set of revised requirements. 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 <http://csds.ul.com>.

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INTRODUCTION

1 Scope

1.1 These requirements cover household electric products having personal hygienics or health care applications, such as hydromassage units, contact lens disinfectors and cleaners, and toothbrushes, rated at 250 V or less, for use on premises wiring systems in accordance with the National Electrical Code.

1.2 These requirements do not cover professional medical and dental equipment, electrically heated pads, facial units, sun and heat lamps, permanently-installed whirlpool baths, spas and hot tubs, shavers, hair dryers, steam and dry heat cabinets or other equipment or products that are covered by separate, individual requirements separate from this Standard.

1.3 The requirements of this Standard do not consider the complete spectrum of physiological or therapeutic effects, beneficial or otherwise, except where generally recognized limits for conditions where a potential risk of injury to persons are defined.

1.4 *Deleted August 6, 2004*

2 Glossary

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

2.2 ACCESSIBLE PART – A part located so that it can be contacted by a person, either directly or by means of a probe or tool during user servicing, or that is not recessed the required distance behind an opening.

2.3 BASIC INSULATION – The insulation applied to live parts to provide basic protection against electric shock. Basic insulation does not necessarily include insulation used exclusively for functional purposes.

2.4 DOUBLE INSULATION – An insulation system comprised of basic insulation and supplementary insulation, with the two insulations physically separated and so arranged that they are not simultaneously subjected to the same deteriorating influences (temperature, contaminants, and the like) to the same degree. See 2.3, 2.13, and 2.16.

2.5 ENCLOSURE – An external portion of a product that serves to house or support component parts or both.

2.6 ENERGIZED (LIVE) PART – A part energized with respect to some other part or with respect to earth.

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2.7 FIELD-WIRING TERMINAL – Any terminal to which a supply or other wire is to be connected by an installer is a field-wiring terminal. If the wire, to be connected to the terminal, is provided as part of the unit and a pressure terminal, connector, soldering lug, soldered loop, crimped eyelet, or other means for making the connection is factory-assembled to the wire, it is not a field wiring terminal.

2.8 INTERLOCK – A device used to de-energize electrical components or stop moving parts that become exposed when an enclosure is opened or when a cover is removed.

2.9 ISOLATING TRANSFORMER – A transformer of which one or more output windings is electrically separated from the input winding and all other output windings.

2.10 LIMITED ENERGY PRIMARY CIRCUIT – A line voltage circuit that incorporates a limiting impedance in series with the supply circuit so that:

- a) The circuit potential on the load side of the limiting impedance does not exceed 42.4 V peak (the peak voltage of a 30-V sine wave), under normal conditions, and
- b) The maximum energy available at the load side of the limiting impedance circuit is 15 VA under any condition, including abnormal operation.

2.11 LOW VOLTAGE CIRCUIT – A circuit involving an open circuit potential of not more than 42.4 V peak (the peak voltage of a 30-V sine wave) supplied by a primary battery, by a standard Class 2 transformer, or by a combination of a transformer and fixed impedance that, as a unit, complies with all performance requirements for Class 2 transformers.

2.12 OPERATOR (USER) SERVICING – Any form of servicing that might be performed by personnel other than qualified service personnel. Some examples are:

- a) The attachment of accessories by means of attachment plugs and receptacles or by means of other separable connectors not involving disassembly or use of tools.
- b) Resetting of circuit breakers or replacement of fuses, and lamps that are accessible without the use of tools.
- c) Routine operating adjustments necessary to adapt the product for its different intended functions.
- d) Routine cleaning and changing of filters.

2.13 REINFORCED INSULATION – Improved basic insulation with such mechanical and electrical qualities that it, in itself, provides the same degree of protection against electric shock as double insulation.

2.14 SAFETY CIRCUIT – Any circuit, either in the primary or secondary, that is relied upon to reduce the risk of fire, electric shock, or unintentional contact with moving parts, for example, an interlock circuit is considered to be a safety circuit.

2.15 SECONDARY CIRCUITS – Secondary circuits are those circuits supplied from transformer output windings that are electrically separated from the input windings.

2.16 SUPPLEMENTARY (PROTECTING) INSULATION – An independent insulation provided in addition to the basic insulation to protect against electrical shock in case of mechanical rupture or electrical breakdown of the basic insulation.

2.17 HYDROMASSAGE UNITS – For the purpose of this Standard, hydromassage units are considered to be two types:

Water Pump Type – A unit that agitates the bath water by having its moving parts in direct contact with the water, is considered to be of the water pump type.

Air Blower Type – A unit that agitates the bath water by means of air that is generated by the unit, and whose moving parts do not come in contact with the water, is considered to be of the air blower type.

3 Components

3.1 Except as indicted in 3.2, a component of a product covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components generally used in the products covered by this standard.

3.1 revised August 2, 2000

3.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

3.2 revised August 2, 2000

3.3 A component shall be used in accordance with its rating established for the intended conditions of use.

3.3 revised August 2, 2000

3.4 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.

3.4 revised August 2, 2000

4 Units of Measurement

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

4.2 revised August 2, 2000

5 References

5.1 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.

6 General

6.1 Requirements in this Standard apply generally to all personal hygiene and health care products and are supplemented by requirements for specific products. Throughout these requirements, the term "product" is used broadly to refer to any personal hygiene and health care product and its associated control assembly.

CONSTRUCTION

7 General

7.1 A container for liquid intended for use with the product, and supplied as part of the product, shall comply with applicable construction requirements.

8 Frame and Enclosure

8.1 The frame and enclosure of a product shall have the strength and rigidity necessary to resist the abuses likely to be encountered during intended service. The degree of resistance inherent in the product shall preclude total or partial collapse with the attendant reduction of spacings, loosening or displacement of parts, and other conditions which alone or in combination constitute an increase in the risk of fire, electric shock, or injury to persons.

8.2 A risk of fire is considered to exist at a component part or assembly if an investigation shows that the supply for such part or assembly is capable of delivering a power of more than 15 W into an external resistor connected between the point in question and any return to the power supply.

8.3 A risk of electric shock is considered to exist at parts accessible only to the user or operator during intended use or user servicing if the voltage exceeds 42.4 V peak (the peak voltage of a 30-V sine wave) and the available current exceeds the leakage current levels specified in Leakage Current Test, Section 43.

8.4 Among the factors taken into consideration in determining the acceptability of an enclosure are its:

- a) Physical strength,
- b) Resistance to impact,
- c) Moisture absorptive properties,
- d) Combustibility,
- e) Resistance to corrosion, and
- f) Resistance to distortion at temperatures to which the enclosure may be subjected under conditions of normal or abnormal use.

For a nonmetallic enclosure, all of these factors are considered with respect to thermal aging.

8.5 A polymeric enclosure shall comply with the applicable requirements in Section 4, Enclosures – General, in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C. A polymeric enclosure used in the construction of cord connected equipment that is fixed or permanently installed to the building structure, such as plumbing, shall have a flammability rating of 5VA in accordance with UL 746C.

8.5 revised August 6, 2004

8.6 The minimum thickness of a metal enclosure shall be as indicated in Table 8.1.

8.7 An electrical part of the product shall be so located or enclosed that protection against unintentional contact with any uninsulated live part and internal wiring will be provided.

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8.8 A live part of a limited energy primary circuit is considered to require the same degree of protection against unintentional contact as is required of a live part of a line voltage circuit.

8.9 In connection with the requirements in 8.7, a part of the outer enclosure that may be removed without the use of a tool – to provide for the attachment of accessories, to allow access to means for making operating adjustment, or for another reason – is to be disregarded. It will not be assumed that the part in question affords protection against risk of electric shock.

8.10 In the enclosure of a product, an opening that a 1 inch (25.4 mm) diameter rod will not enter is acceptable if a probe as illustrated in Figure 8.1 cannot be made to touch any part that involves a risk of electric shock to earth ground when inserted through the opening.

Table 8.1
Minimum acceptable thicknesses of enclosure material

Metal	At small, flat, unreinforced surfaces and at surfaces that are reinforced by curving, ribbing and the like or are otherwise of a shape and/or size to provide physical strength		At surfaces to which a wiring system is to be connected in the field		At relatively large unreinforced flat surfaces	
	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
Die-cast	3/64	1.2	–	–	5/64	2.0
Cast malleable iron	1/16	1.6	–	–	3/32	2.4
Other cast metal	3/32	2.4	–	–	1/8	3.2
Uncoated sheet steel	0.026 ^a	0.66 ^a	0.032	0.81	0.026	0.66
Galvanized sheet steel	0.029 ^a	0.74 ^a	0.034	0.86	0.029	0.74
Nonferrous sheet metal	0.036 ^a	0.91 ^a	0.045	1.14	0.036	0.91
^a Thinner sheet metal may be employed if found to be acceptable when the enclosure is evaluated under considerations such as those mentioned in 8.4.						

[illegible]

8.11 With respect to the application of the requirement of 8.10, the probe may be articulated into any configuration and may be rotated or angled to any position before, during, or after insertion into the opening, and the penetration may be to any depth allowed by the opening size, including minimal depth combined with maximal articulation.

8.12 An opening that has a minor dimension of 1 inch (25.4 mm) or more, in an enclosure, as illustrated in Figure 8.2, is acceptable if, within the enclosure, there is no uninsulated live part or film-coated wire, that involves a risk of electric shock, less than, R distance from the inside edge of the perimeter of the opening and X distance from the plane of the opening. T equals the enclosure thickness, R equals X minus T, and X equals five times the diameter of the largest round rod that can be inserted through the opening but not less than 6-1/16 inches (154 mm). In evaluating an opening, any barrier located within the volume is to be ignored unless it intersects the boundaries of the volume in a continuous, closed line.

8.13 Insulated brush caps do not require additional enclosure.

8.14 The enclosure of a remotely or automatically controlled product shall not permit molten metal, burning insulation, flaming particles, or the like from falling on combustible materials, including the surface upon which the product is supported.

8.15 A product is automatically controlled under any one or more of the following conditions:

- a) If the repeated starting of the product, 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) If, during any single predetermined cycle of operation, the motor is caused to stop and restart.
- c) If, upon energizing the product, the initial starting of the motor may be intentionally delayed beyond conventional starting.
- d) If, during any single predetermined cycle of operation, automatic changing of the mechanical load may reduce the motor speed sufficiently to reestablish starting-winding connections to the supply circuit.

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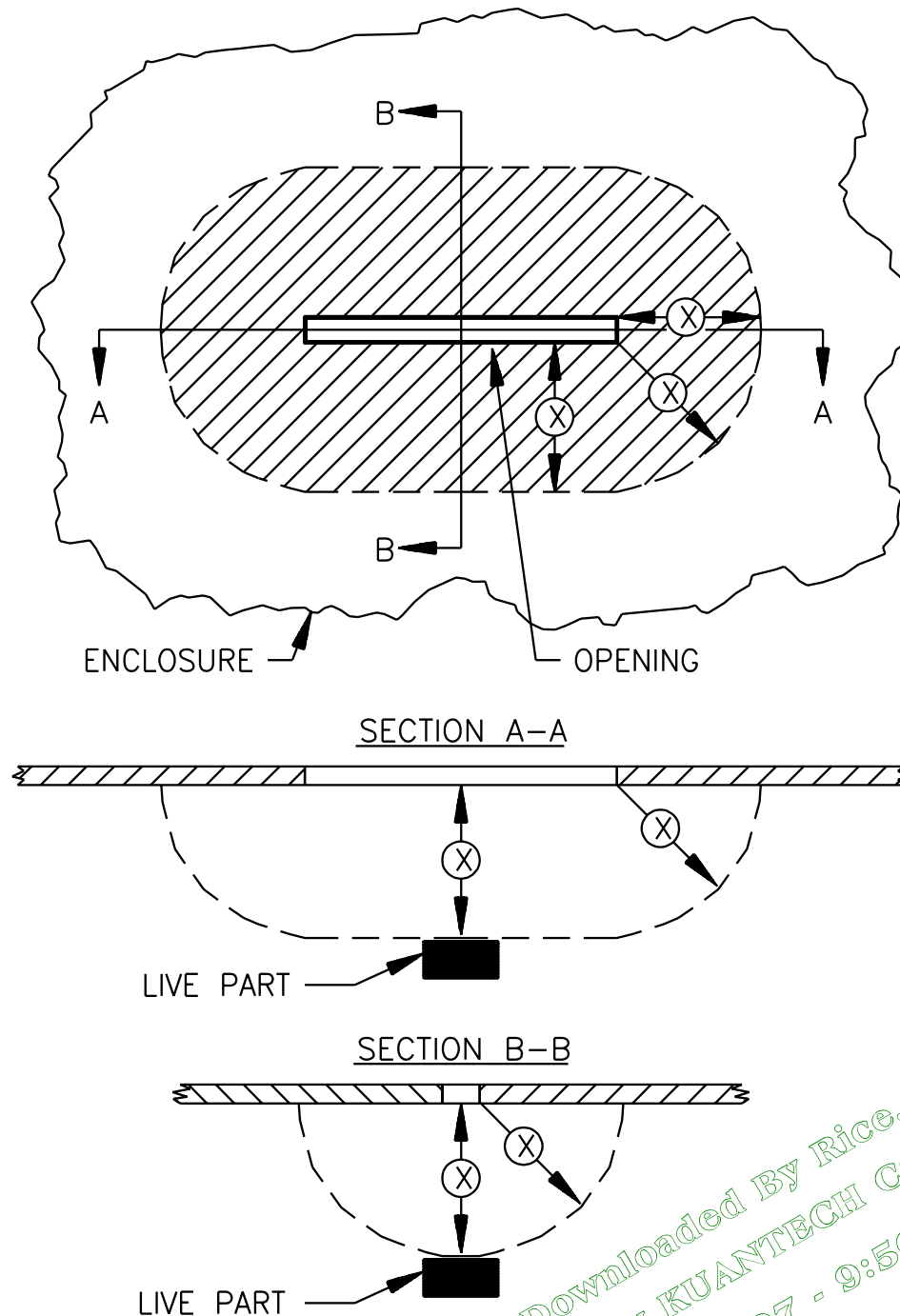
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Figure 8.2
Opening in enclosure



EC100A

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8.16 The requirement in 8.14 will necessitate the use of a barrier of material that is resistant to combustion:

a) Under a motor unless:

- 1) The structural parts of the motor or of the product provide the equivalent of such a barrier;
- 2) The protection provided with the motor is such that no burning insulation or molten material falls to the surface that supports the product when the motor is energized under each of the following fault conditions:
 - i) Main winding opened,
 - ii) Starting winding opened,
 - iii) Starting switch short circuited, and
 - iv) For a permanent split capacitor motor, the capacitor short circuited (the short circuit is to be applied before the motor is energized, and the rotor is to be locked) or
- 3) The motor is provided with a thermal motor protector (a protective device that is sensitive to temperature and current) that will keep the temperature of the motor windings from becoming more than 125°C (257°F) under the maximum load under which the motor will run without causing the protector to cycle, and from becoming more than 150°C (302°F) with the rotor of the motor locked.

b) Under wiring, unless it is neoprene- or thermoplastic-insulated.

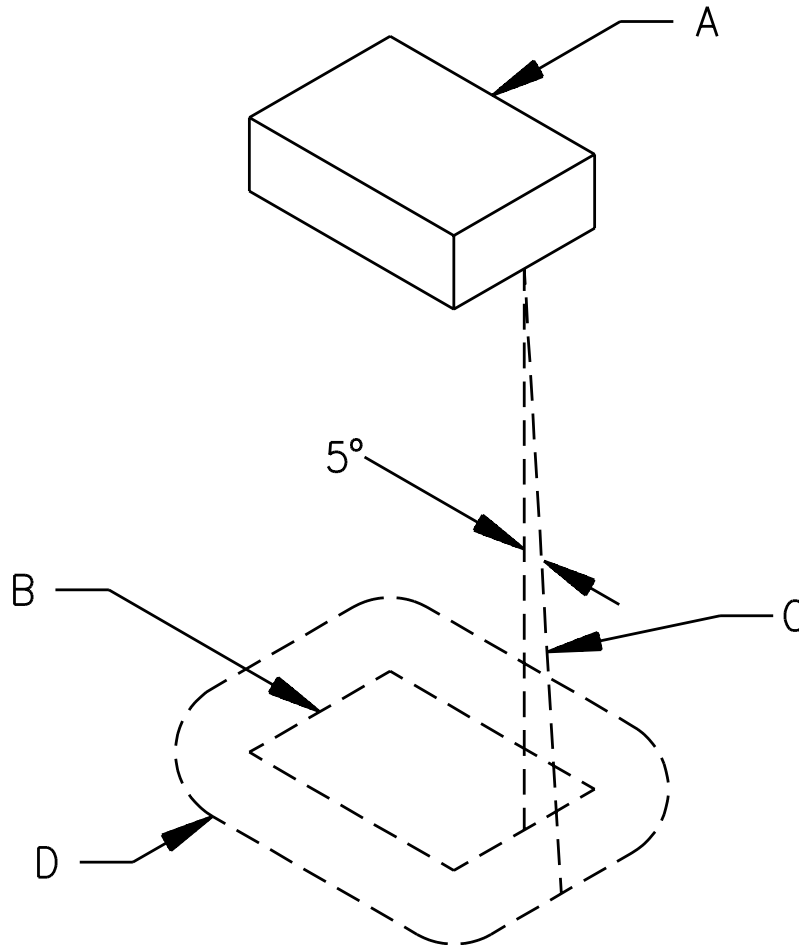
It will also necessitate that a switch, relay, solenoid, or the like be individually and completely enclosed unless there is no opening in the bottom of the product enclosure, or it can be shown that malfunction of the component would not result in a risk of fire.

Exception: Terminals of a switch, relay, solenoid or the like need not be individually and completely enclosed.

8.17 The barrier mentioned in 8.16 shall be horizontal, shall be located as indicated in Figure 8.3, and shall not have an area less than that described in that illustration. An opening for drainage, ventilation, and the like may be employed in the barrier, provided that such an opening would not permit molten metal, burning insulation, or the like to fall on combustible material.

Figure 8.3
Location and extent of barrier

Figure 8.3 revised August 4, 1998



SA0604-1

A – Region to be shielded by barrier. This will consist of the entire component if it is not otherwise shielded and will consist of the unshielded portion of a component that is partially shielded by the component enclosure or equivalent.

B – Projection of outline of component on horizontal plane.

C – Inclined line that traces out minimum area of barrier. The line is always:

- 1) Tangent to the component,
- 2) 5 degrees from the vertical, and
- 3) Oriented so that the area traced out on a horizontal plane is maximum.

D – Location (horizontal) and minimum area for barrier. The area is that included inside the line of intersection traced out by the inclined line C and the horizontal plane of the barrier.

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8.18 The door or cover of an enclosure shall be provided with means for holding it in place in the closed position.

8.19 The door or cover of an enclosure shall be hinged or attached in an equivalent manner if it gives access to any overload protective device, the functioning of which requires renewal, or if it is necessary to open the cover in connection with the intended operation of the protective device. Such a door or cover shall be provided with a latch or the equivalent, and shall be tight-fitting or shall overlap the surface of the enclosure around the opening.

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9 Mechanical Assembly

9.1 The assembly of a product that involves a motor or other vibrating unit shall be such that the product will not be affected adversely by the vibration of intended operation. Brush caps shall be tightly threaded or otherwise so constructed as to keep them from loosening.

9.2 A switch, a lampholder, a receptacle, a motor-attachment plug, or similar component shall be mounted securely, and shall be kept from turning.

Exception No. 1: The requirement that a switch be kept from turning can be waived if all four of the following conditions are met:

- a) The switch is of the plunger or other type that does not tend to rotate when operated — a toggle switch is considered to be subject to forces that tend to turn the switch during intended operation of the switch.*
- b) The means of mounting the switch is such that the operation of the switch is unlikely to result in the switch becoming loosened.*
- c) The spacings are not reduced below the minimum acceptable values if the switch does rotate.*
- d) Intended operation of the switch is by mechanical means rather than by direct contact by persons.*

Exception No. 2: A lampholder of the type in which the lamp cannot be replaced, such as a neon pilot or indicator light in which the lamp is sealed in by a nonremovable jewel, need not be kept from turning if the rotation cannot reduce spacings below the minimum acceptable values.

9.3 The means to keep a device from turning mentioned in 9.2 is to include more than friction between surfaces. For example, a lockwasher, properly applied, is acceptable as a means to prevent turning of a device having a single-hole mounting means.

9.4 Positive means shall be provided to keep parts of a product from turning with respect to each other if such turning would result in reduction of spacings, twisting of wires, and the like.

10 Protection Against Corrosion

10.1 Iron and steel parts shall be protected against corrosion by painting, galvanizing, plating, or other equivalent means if the degradation of such unprotected parts would be likely to result in a risk of fire, electric shock or injury to persons.

Exception No. 1: In certain instances in which the oxidation of iron or steel due to the exposure of the metal to air and moisture is not likely to be appreciable — thickness of metal and temperature also being factors — surfaces of sheet steel within an enclosure may not be required to be protected against corrosion. The requirement does not apply to bearings, laminations, or minor parts of iron or steel, such as washers, screws, and the like.

Exception No. 2: Cast-iron parts are not required to be protected against corrosion.

Exception No. 3: The sheath of a heating element operating in air and terminal parts attached directly to the heating element need not be protected against corrosion. The sheath of an immersion type heating element shall be of a metal resistant to corrosion resulting from the liquid in which the element is intended to be immersed.

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10.2 A container for liquid shall be protected against the possible corrosive effect of the liquid intended to be used in the container.

11 Supply Connections

11.1 Permanently connected products

11.1.1 General

11.1.1.1 A permanently connected product – a product intended for permanent connection to the power supply – shall have provision for connection to the wiring systems that, in accordance with the National Electrical Code, ANSI/NFPA No. 70, would be acceptable for the product.

11.1.1.2 A product intended for permanent attachment to the building structure, water or steam supply, drains, and the like shall be provided with a means for permanent connection to the branch-circuit supply.

11.1.1.3 A product that is not actually moved or easily moved in intended use, but which is not obviously intended to be permanently connected, may be acceptable if provided with the shortest feasible length of Type SJE, SJT, SJO, or equivalent cord and an attachment plug for supply connection. The investigation of such feature will include consideration of the utility of the product and the necessity of having it readily detachable from its source of supply by means of the plug.

11.1.1.4 The location of a terminal or splice compartment in which power supply connections to a permanently connected product are to be made shall be such that these connections may be readily inspected after the product is installed as intended.

11.1.1.5 The compartment mentioned in 11.1.1.6 shall be so located that during conduit connections thereto, internal wiring and electrical components are not exposed to physical abuse or strain.

11.1.1.5 revised August 2, 2000

11.1.1.6 A terminal compartment intended for connection to a supply raceway shall be attached to the product so that it will not turn with respect thereto.

11.1.1.7 A compartment or part of an enclosure that contains field wiring splices other than low-voltage circuits (see 2.11) shall not be provided with ventilating openings.

11.1.2 Wiring terminals

11.1.2.1 A product intended for permanent electrical connection to the power supply shall be provided with wiring terminals or leads for the connection of conductors having an ampacity not less than 125 percent of the current rating of the product when the load is continuous (3 hours or more) and not less than the current rating of the product when the load will be intermittent.

11.1.2.2 A wiring terminal shall be provided with a soldering lug or with a pressure wire connector securely fastened in place, for example, firmly bolted or held by a screw.

Exception: A wire binding screw may be employed at a wiring terminal intended to accommodate a 10 AWG (5.26 mm²) or smaller conductor if upturned lugs or the equivalent are provided to hold the wire in position.

11.1.2.2 revised August 6, 2004

11.1.2.3 A wiring terminal shall be kept from turning or shifting in position by means other than friction between surfaces. This is to be accomplished by two screws or rivets, by square shoulders or mortices, by a dowel pin, lug or offset, by a connecting strap or clip fitted into an adjacent part, or by an equivalent method.

11.1.2.4 A wire-binding screw at a wiring terminal shall not be smaller than No. 10.

Exception: A No. 8 screw may be used at a terminal intended only for the connection of a 14, 16, or 18 AWG (2.08, 1.31, or 0.82 mm²) conductor, and a No. 6 screw may be used for the connection of a 6 AWG or 18 AWG control-circuit conductor.

11.1.2.4 revised August 6, 2004

11.1.2.5 A terminal plate tapped for a wire-binding screw shall be of metal not less than 0.050 inch (1.27 mm) thick. There shall be two or more full threads in the metal, which may be extruded if necessary to provide the threads.

Exception: A plate less than 0.050 inch thick, but not less than 0.030 inch (0.76 mm) thick is acceptable if the tapped threads have acceptable mechanical strength.

11.1.2.6 Upturned lugs or a cupped washer shall be capable of retaining a conductor of the size mentioned in 11.1.2.1, but not smaller than 14 AWG (2.08 mm²), under the head of the screw or the washer.

11.1.2.6 revised August 6, 2004

11.1.2.7 A wire binding screw shall thread into metal.

11.1.2.8 A terminal intended for the connection of a grounded circuit conductor shall be made of or plated with a metal substantially white in color and shall be readily distinguishable from the other terminals, or identification of that terminal shall be clearly shown in some other manner, such as on an attached wiring diagram.

11.1.2.9 A lead intended for the connection of a grounded circuit conductor shall be finished to show a white or gray color and shall be readily distinguishable from the other leads.

11.1.2.9 revised August 6, 2004

11.1.2.10 The free length of a lead inside an outlet box or wiring compartment shall be 6 inches (152.4 mm) or more if the lead is intended for field connection to an external circuit.

Exception: A lead may be less than 6 inches in length if it is evident that the use of a longer lead might result in a risk of fire, electric shock or injury to persons.

11.1.2.11 The surface of an insulated lead intended solely for the connection of an equipment-grounding conductor shall be green in color with or without one or more yellow stripes, and no other lead in the field wiring area shall be so identified.

11.1.2.12 A wire binding screw intended for the connection of an equipment grounding conductor shall have a green colored head that is hexagonal shaped, slotted, or both. A pressure wire connector intended for connection of such a conductor shall be plainly identified as such by being marked "G," "GR," "GND," "Grounding" or the like or by a marking on the wiring diagram provided on the product. The wire binding screw or pressure wire connector shall be so located that it is unlikely to be removed during the normal servicing of the product other than the grounding conductor.

11.1.2.13 A terminal solely for connection of an equipment grounding conductor shall be capable of securing a conductor of the correct size for that purpose. A quick-connect terminal or a solder lug shall not be used for the grounding terminal.

11.2 Cord- and plug-connected products

11.2.1 Cords and plugs

11.2.1.1 A product intended for cord connection shall be provided with 6 – 8 feet (1.83 – 2.44 m) of flexible cord and an attachment plug for connection to the supply circuit. The cord length is measured from the point of cord entry into the enclosure, or into the wiring device at the product end of the cord, to the face of the attachment-plug.

Exception: Cord length may vary for certain types of products, as specified in Table 11.1.

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Table 11.1
Cord lengths for specific conditions

Type of product	Cord length feet (m)	
	Minimum	Maximum
Product supported by hand, table top, or counter top	4 (1.22)	8 (2.44)
Any product having a jacketed cord	a	not specified
Product secured in place such as toilet seat assemblies	2 (0.61)	4 (1.22)
^a As specified elsewhere in this table or in 11.2.1.1.		

11.2.1.2 The flexible cord:

- a) May be permanently attached to the product, or
- b) For other than a hand supported product, may be in the form of a detachable power supply cord with means for connection to the product.

11.2.1.3 The ampacity of the cord, and of the plug, shall not be less than the current rating of the product. Such components shall be rated for use at a voltage equal to the rated voltage of the product.

11.2.1.4 The flexible cord shall be of a type indicated in Table 11.2 or shall have properties such that it will be at least equally as serviceable for the particular application.

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Table 11.2
Acceptable types of cord and applicable limitations on their use

Product on which the cord is to be used	Cords acceptable where temperature higher than 121°C (250°F) are attained on any surface the cord can touch	Cords acceptable where 121°C (250°F) or lower temperatures are attained on any surface the cord can touch
Contact Lens Disinfector and similar table top (counter top) products	HPN, HSJ, HSJO	SP-2, SPE-2, SPT-2, SV, SVE, SVO, SVT, SVTO, SJ, SJE, SJO, SJT, SJTO, SP-1 ^a , SPE-1 ^a , SPT-1 ^a
Charger Units for battery operated toothbrushes, and the like; Denture Cleaners and Oral Irrigation Products		SPE-1, SP-1, SPT-1
Toothbrushes		TP or TPT (maximum 50 W), SP-1, SJE-1 or SPT-1, XT (parallel 2-conductor construction required)
Oxygen Enrichers and similar Floor Mounted Devices		SJ, SJE, SJO, SJT, SJTO
Toilet Seat Assemblies		SVE, SVO, SVT, SVTO, SJ, SJE, SJO, SJT, SJTO

^a Acceptable on table-supported products weighing 1/2 lb (0.023 kg) or less.

11.2.1.5 Type SPT-2, SVT, or other flexible cord at least as serviceable may be used for connecting a pendant-type on-off switch, a temperature control or both to a table- or floor-supported product.

11.2.1.5.1 The attachment plug of the power supply cord of an appliance provided with:

- a) A manually operated, line-connected, single pole switch for appliance on-off operation or
- b) An Edison-base lampholder,

shall be of the polarized or grounding type.

Added 11.2.1.5.1 effective August 2, 2001

11.2.1.6 If a 3-wire grounding-type or a 2-wire polarized attachment plug is provided, the circuit conductors in the flexible cord shall be connected to the plug and to the wiring in the product so that any of the following devices used in the primary circuit shall be connected in an ungrounded side of the line: the center contact of the Edison-base lampholder, a single pole switch, an automatic control with a marked off position, a single fuseholder, and any other single-pole overcurrent protective device.

Revised 11.2.1.6 effective August 2, 2001

11.2.1.6.1 If a 3-wire grounding-type attachment plug or a 2-wire polarized attachment plug is provided, the attachment plug connection shall comply with Figure 11.1 and the polarity identification of the flexible cord shall comply with Table 11.3.

Added 11.2.1.6.1 effective August 2, 2001