



UL 1005

Underwriters Laboratories Inc.
Standard for Safety

Electric Flatirons



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UL Standard for Safety for Electric Flatirons, UL 1005

Fourth Edition, Dated July 2, 2002

Summary of Topics

These revisions to ANSI/UL 1005 are being issued to address the editorial maintenance of UL Standards for Safety. These revisions are considered to be non-substantive and not subject to UL's STP process.

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. 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.

A reference to UL 60730-1 and/or a Part 2 standard from that series has been added to this standard. The addition of this reference provides an alternate standard for investigating components currently covered by UL 873 until October 19, 2016. This added reference will facilitate the use of components that have been investigated to the UL 60730 series. Such components have been determined to fulfill the requirements of the legacy standards.

UL 60730-1 (4th Edition) becomes effective on October 19, 2016. All components that were previously investigated to the requirements in UL 873 will have to comply with the requirements in either UL 60730-1 and/or a Part 2 standard from that series in order to maintain UL Listing or Recognition, as appropriate. UL 873 legacy control standard will be withdrawn on October 19, 2016.

This is intended to provide end product manufacturers with sufficient time to a) address the impact of the standards changes during normal design changes over the intervening years, b) submit any modified products for investigation, and c) implement any necessary changes in production.

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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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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This ANSI/UL Standard for Safety consists of the Fourth Edition including revisions through June 25, 2010.

The most recent designation of ANSI/UL 1005 as an American National Standard (ANSI) occurred on January 28, 2004. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or effective date information.

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INTRODUCTION

1 Scope

1.1 These requirements cover household electric flatirons and cordless flatirons rated 250 V or less and commercial electric flatirons rated 600 V or less, to be employed in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements do not cover ironing machines, ironing presses, or other garment finishing appliances that are covered by the Standard for Garment Finishing Appliances, UL 141.

2 Glossary

2.1 For the purpose of this standard the following definitions apply.

2.2 AUTOMATIC FLATIRON – A flatiron having some form of automatic temperature control, usually a thermostatic control, that operates automatically within predetermined temperature limits to open and close the circuit through the heating element.

2.3 CORDLESS FLATIRON – A flatiron intended to be operated while it is disconnected from the power supply.

3 Components

3.1 Except as indicated 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 products covered by this standard.

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.

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

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.

4 Units of Measurement

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

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.

CONSTRUCTION

6 General

6.1 A flatiron shall employ materials found by investigation to be acceptable for the application.

7 Frame and Enclosure

7.1 A flatiron shall be provided with an enclosure that will house all electrical parts other than the power-supply cord or the terminal pins.

7.2 A flatiron shall be formed and assembled so that it will have the strength and rigidity necessary to resist the abuses to which it may be subjected, without increasing the risk of fire, electric shock, or injury to persons due to total or partial collapse with resulting reduction of spacings, loosening or displacement of parts, or other serious defects.

7.3 An enclosure, an opening, a frame, a guard, a knob, a handle, or the like shall not be sufficiently sharp to cause a risk of injury in maintenance or use of a flatiron or user maintenance of a modular flatiron.

7.4 Among the factors to be taken into consideration when an enclosure is investigated for acceptability are its:

- a) Mechanical 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 to be considered with respect to thermal aging.

7.5 In addition to being considered with reference to factors as mentioned in 7.4, an enclosure of sheet metal shall be investigated with respect to size and shape, thickness of metal, and acceptability for the application, considering the intended use of a flatiron.

7.6 Cast- and sheet-metal portions of an enclosure shall not be thinner than specified in Table 7.1.

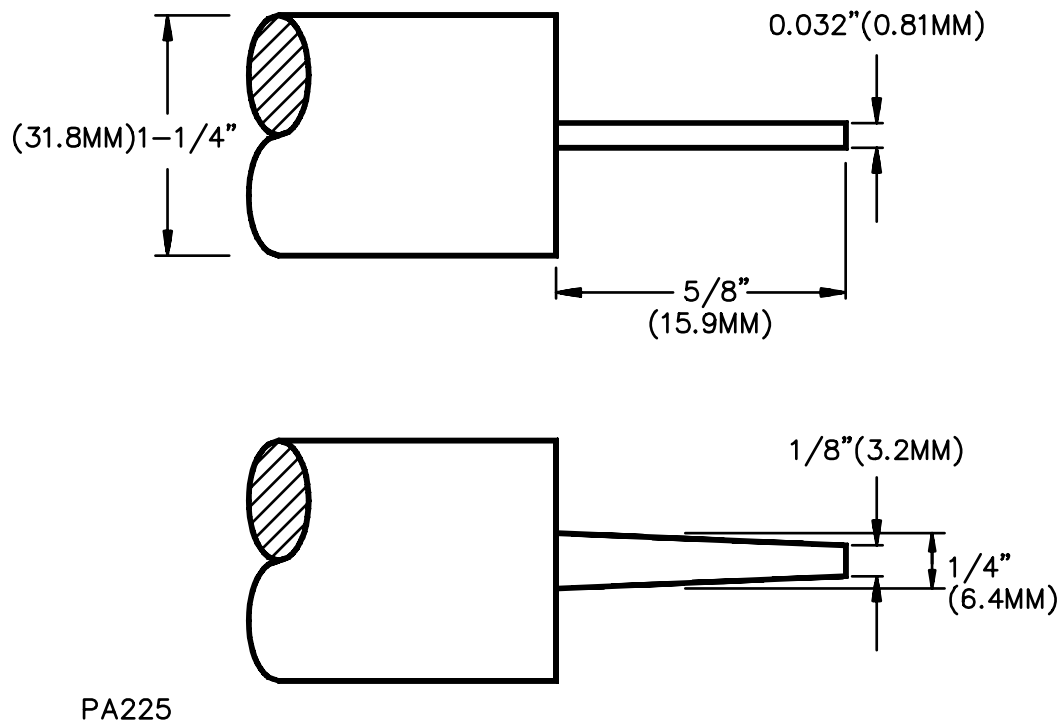
Exception: An enclosure may be thinner if it is found to be acceptable when investigated by considerations such as those mentioned in 7.4 and 7.5.

Table 7.1
Thickness of enclosure metal

Metal	Minimum thickness, in (mm)			
	At surfaces other than those to which a wiring system is to be connected in the field		At surfaces to which a wiring system is to be connected in the field	
Die-cast metal	3/64	(1.2)	—	—
Cast malleable iron	1/16	(1.6)	—	—
Other cast metal	3/32	(2.4)	—	—
Uncoated sheet steel	0.026	(0.66)	0.032	(0.81)
Zinc-coated sheet steel	0.029	(0.74)	0.034	(0.86)
Nonferrous sheet metal	0.036	(0.91)	0.045	(1.14)

7.7 An opening in the enclosure of a flatiron located within 1 in (25.4 mm) of the soleplate surface is acceptable if the probe illustrated in Figure 7.1, when inserted point first, cannot be made to touch any uninsulated live part.

Figure 7.1
Probe

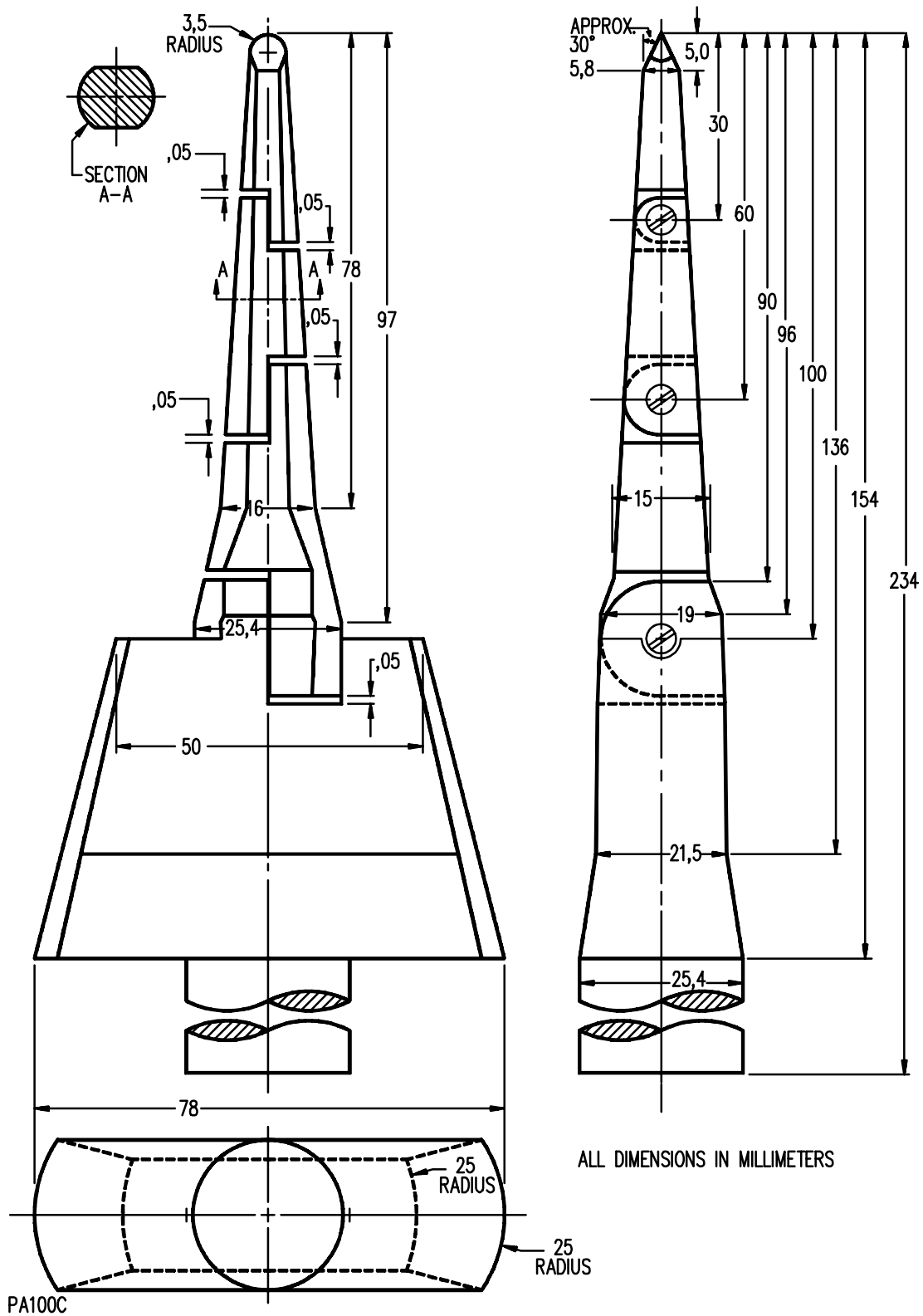


PA225

7.8 An opening in an enclosure other than as mentioned in 7.7 shall not permit contact with live parts by the probe illustrated in Figure 7.2, when applied as described in 7.9.

7.9 With reference to 7.8 the probe illustrated in Figure 7.2 is to be applied in any possible configuration and to any depth that the size of an opening will permit. The probe is to be rotated or angled to any possible position before, during, and after insertion through the opening; and, if necessary, the configuration is to be changed after the probe has been inserted through the opening.

Figure 7.2
Accessibility Probe



8 Mechanical Assembly

8.1 An uninsulated live part and a component such as a switch, a lampholder, an attachment-plug receptacle, a plug-type connector, or the like shall be securely mounted and prevented from turning or shifting in position if such motion may result in:

- a) A reduction of spacings below the minimum acceptable values specified in Section 18, Spacings, or
- b) Stress on the conductors of the component, or
- c) Both (a) and (b).

8.2 A properly applied lock washer is acceptable as a means to reduce the likelihood of turning of a stem-mounted switch.

8.3 Friction between surfaces is not acceptable as a means to reduce the likelihood of shifting or turning of live parts, but a properly applied lock washer is acceptable.

Exception: A lock washer is not required for securely riveted, integral parts of a stack-type thermostat.

8.4 Rigid connection of a thermostat with a solid wire or a bus bar is acceptable to reduce the likelihood of shifting or turning if the thermostat is otherwise securely mounted.

8.5 In a flatiron of modular design, a module that is likely to need inspection, replacement, or cleaning, by the user and that is intended to be manually operated or adjusted or periodically serviced shall be readily accessible without the use of a tool available only to service personnel. See 47.3.

9 Stands

9.1 A flatiron shall be provided with a stand on which it may be placed when not in use.

9.2 The stand may be a separate device or it may be a stand attached to the appliance, such as a heel rest.

10 Handles

10.1 A handle that may be folded for storage or for traveling convenience shall be provided with a means to lock the handle in the normal operating position.

10.2 A handle that automatically locks when it is raised to the operating position shall make an audible sound when moved into the locked position.

10.3 The means to actuate a mechanism that requires a positive motion by the operator to lock the handle in the operating position shall be evident.

10.4 A positive motion by the operator shall be required to release the locking mechanism to fold the handle. The release mechanism shall be designed and located so as to reduce the possibility of unintentional tripping. This will usually require that the release mechanism not be associated with the gripping area of the handle.

11 Protection Against Corrosion

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

Exception No. 1: A sheet-steel surface within a dry flatiron where oxidation is not likely to be accelerated due to exposure to air and moisture or other oxidizing influences – thickness of metal and temperature also being factors – may not be required to be protected against corrosion.

Exception No. 2: Cast-iron parts need not be protected against corrosion.

11.2 Deterioration of the plating or other finish due to aging shall not result in any condition that will adversely affect the operation of the flatiron.

12 Supply Connections

12.1 Permanently connected flatirons

12.1.1 General

12.1.1.1 A commercial flatiron may be cord-connected in accordance with 12.2.1.1 – 12.2.3.3 or shall be provided with wiring terminals or leads for the connection of conductors of a wiring system that would be acceptable for the flatiron.

12.1.1.2 A terminal box or compartment in which power-supply connections to a permanently connected flatiron are to be made shall be located so that these connections may be readily inspected after the flatiron is installed as intended.

12.1.1.3 A terminal compartment intended for the connection of a supply raceway shall be attached to the flatiron so that it cannot turn.

12.1.1.4 A permanently connected flatiron employing a cord reel shall comply with the requirements in the Standard for Cord Reels, UL 355.

12.1.2 Wiring terminals and leads

12.1.2.1 Wiring terminals or leads provided on an automatic flatiron intended for permanent connection to the power supply shall be acceptable for the connection of conductors having an ampacity that is not less than the current rating of the appliance. A nonautomatic flatiron shall be provided with wiring terminals or leads having an ampacity of not less than 125 percent of the current rating of the flatiron.

12.1.2.2 A wiring terminal shall be provided 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 (5.3 mm²) or smaller conductor if upturned lugs or the equivalent are provided to hold the wire in position.

12.1.2.3 A wiring terminal shall be prevented from turning or shifting in position by means other than friction between surfaces. This may be accomplished by:

- a) Two screws or rivets,
- b) Square shoulders or mortises,
- c) A dowel pin, lug or offset,
- d) A connecting strap or clip fitted into an adjacent part, or
- e) Some other equivalent method.

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

Exception No. 1: A No. 8 screw may be used at a terminal intended only for the connection of a 14 AWG (2.1 mm²) conductor.

Exception No. 2: A No. 6 screw may be used for the connection of a 16 AWG (1.3 mm²) or 18 AWG (0.82 mm²) control-circuit conductor.

12.1.2.5 A wire-binding screw shall thread into metal.

12.1.2.6 For a terminal plate tapped for a wire-binding screw:

- a) The metal shall not be less than 0.050 in (1.27 mm) thick.
- b) Each tapped hole shall have two or more full threads in the metal, which may be extruded if necessary to provide the threads.

Exception: A plate not less than 0.030 in (0.76 mm) thick is acceptable provided the tapped threads have equivalent mechanical strength.

12.1.2.7 Upturned lugs or a cupped washer shall be capable of retaining a conductor of the size mentioned in 12.1.2.1 but not smaller than 14 AWG (2.1 mm²), under the head of the screw or the washer.

12.1.2.8 A flatiron intended for connection to a grounded power supply and employing a lampholder, a single-pole switch, or a single-pole automatic control shall have one terminal or lead identified as described in 12.1.2.9 or 12.1.2.10, for connection of the grounded conductor of the supply circuit. The terminal or lead intended to be grounded shall be the one that is connected to screw shells of lampholders, and to which are connected no single-pole switches or single-pole automatic controls.

12.1.2.9 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 proper identification of that terminal shall be clearly shown in some other manner, such as on an attached wiring diagram.

12.1.2.10 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.

12.1.2.10 revised February 18, 2004

12.1.2.11 The free length of a lead inside an outlet box or wiring compartment shall be 6 in (152 mm) or more if the lead is intended for field connection to an external circuit.

Exception: A lead may be less than 6 in (152 mm) long if it is evident that the use of a longer lead might result in a risk of fire or electric shock.

12.1.3 Equipment-grounding conductor

12.1.3.1 A wiring terminal or lead shall be provided for field connection of an equipment-grounding conductor.

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

12.1.3.3 A wire-binding screw intended for the connection of an equipment-grounding conductor shall have a green-colored head that is hexagonal, slotted, or both. A pressure wire connector intended for connection of such a conductor shall be plainly identified, such as by being marked "G," "GND," "GR," "Ground," "Grounding," or the like, or by a marking on an attached wiring diagram.

12.1.3.4 A wire-binding screw or pressure wire connector intended for the connection of an equipment-grounding conductor shall be located inside the terminal compartment so that it is unlikely that it will be removed during servicing of the flatiron.

12.1.3.5 A terminal solely for connection of an equipment-grounding conductor shall be capable of securing a conductor of the size required for the appliance.

12.2 Cord-connected flatirons

12.2.1 General

12.2.1.1 A flatiron intended to be connected to the power-supply circuit by means of a flexible cord shall be provided with an attached flexible cord and an attachment plug for connection to the supply circuit, or shall have male pin terminals that accommodate a cord set intended to be used with the flatiron.

12.2.1.2 A cord-connected flatiron employing a cord reel shall comply with the requirements in the Standard for Cord Reels, UL 355.

12.2.1.3 A supply cord shall be Type HPD, HPN, HS, HSJ, HSJO, HSO, or an equivalent heater cord.

12.2.1.4 The length of an attached cord or a separate cord set shall not be greater than 12 ft (3.66 m) and not less than:

- a) 6 ft (1.88 m) for a commercial flatiron, and
- b) 8 ft (2.44 m) for a household flatiron.

12.2.1.5 The length of the power supply cord is to be measured from the point where the cord enters the appliance to the face of the attachment plug. The length of a cord set is to be measured from the face of the flatiron or appliance plug to the face of the attachment plug.

12.2.1.6 The current and voltage rating of the cord and the fitting of an attached flexible cord or a separate cord set provided with a flatiron shall not be less than that of the flatiron. A 20-A plug is acceptable for a commercial flatiron rated not more than 4000 W at 240 V.

12.2.1.7 The attachment plug of the power supply cord of an appliance provided with a 15- or 20-A rated general-use receptacle shall be of the 3-wire grounding type. The attachment plug of the power supply cord of an appliance shall be of the polarized or grounding type if provided with:

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

12.2.1.8 If a 3-wire grounding-type attachment plug or a 2-wire polarized attachment plug is provided, the attachment plug connections shall comply with Figure 12.1.

12.2.1.9 The conductor of the power supply cord that is intended to be grounded shall have the following items connected to it:

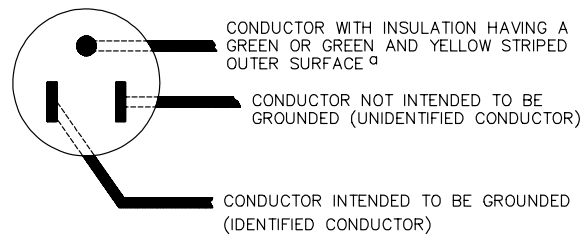
- a) The screw shell of an Edison-base lampholder, and
- b) The terminal or lead of a receptacle intended to be grounded.

12.2.1.10 If a dual voltage flatiron is provided with an adapter for connection to an alternate supply source, the adapter shall comply with the applicable requirements in the Standard for Attachment Plugs and Receptacles, UL 498.

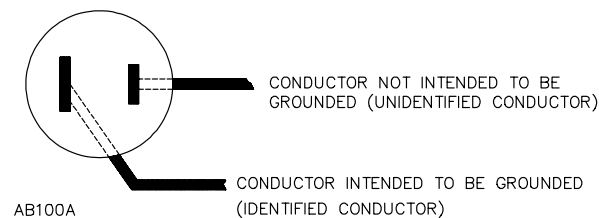
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Figure 12.1
Connection to attachment plug

CONNECTIONS OF CORD CONDUCTORS TO GROUNDING – TYPE ATTACHMENT PLUG (FACE OF PLUG REPRESENTED)



CONNECTIONS OF CORD CONDUCTORS TO POLARIZED ATTACHMENT PLUG (FACE OF PLUG REPRESENTED)



^a In the above illustration, the blade to which the green conductor is connected may have a U-shaped or circular cross section.

12.2.2 Cord guard

12.2.2.1 To reduce sharp bending of the cord at the inlet and to protect the cord from sharp edges or burrs, a flatiron with an attached flexible cord shall be provided with a cord guard.

12.2.2.2 The cord guard shall be held securely in place in the assembled flatiron. The diameter of a spring guard shall accommodate the cord without restriction or unnecessary looseness. A smooth metal grommet or a bushing is acceptable at the free end of a spring guard if it is held securely in place. The guard shall be flexible to conform to the motion of the cord in service without producing a sharp bend at or near the point of attachment to the flatiron.