

UL 1786

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Nightlights

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UL Standard for Safety for Nightlights, UL 1786

Second Edition, Dated July 27, 1995

Revisions: This Standard contains revisions through and including April 16, 2001.

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The following table lists the future effective dates with the corresponding reference.

Future Effective Dates	References
April 16, 2002	Paragraphs 18.2, 29.1, 29.1.1, 29.1.2, and Figure 18.1

The new and revised requirements are substantially in accordance with UL's Bulletin(s) on this subject dated October 27, 2000. The bulletin(s) is now obsolete and may be discarded.

The revisions dated April 16, 2001 include a reprinted title page (page1) for this Standard.

The revisions dated March 17, 1999 were issued to remove the "94" prefix from the flammability classifications. This type of flame classification has become familiar globally, therefore there is no need to retain the "94" designation.

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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.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

the applicant elects 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.

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This Standard consists of pages dated as shown in the following checklist:

Page	Date
1-3.....	April 16, 2001
4.....	March 17, 1999
5-6B.....	April 16, 2001
7-8.....	July 27, 1995
9-10B.....	March 17, 1999
11-21.....	July 27, 1995
22-22B.....	April 16, 2001
23-25.....	July 27, 1995
26.....	April 16, 2001
A1-A2.....	April 16, 2001
SR1-SR2.....	April 16, 2001

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JULY 27, 1995

(Title Page Reprinted: April 16, 2001)

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UL 1786

Standard for Nightlights

Prior to the first edition, the requirements for the products covered by this standard were included in the Standard for Edison-Base Lampholders, UL 496.

First Edition – May, 1988

Second Edition

July 27, 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 set of revised requirements.

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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 which conflict with specific requirements of the Standard cannot be judged to comply with the Standard. A product employing materials or having forms of construction not addressed by this Standard may be examined and tested according to the intent of the requirements and, if found to meet the intent of this Standard, 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.

INTRODUCTION

1 Scope

1.1 These requirements cover nightlights intended to be inserted in a common parallel slot receptacle rated 15 or 20 amperes, 125 volts, and employed in accordance with the National Electrical Code, NFPA 70.

1.2 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

1.2 revised April 16, 2001

2 Components

2.1 Except as indicated in 2.2, 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 used in the products covered by this standard.

2.1 revised April 16, 2001

2.2 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.

2.2 revised April 16, 2001

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

2.3 revised April 16, 2001

2.4 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.

2.4 revised April 16, 2001

2.5 A motion-detecting switch provided as part of a nightlight shall comply with the requirements in the Standard for Nonindustrial Photoelectric Switches for Lighting Controls, UL 773A.

3 General

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

3.1 revised April 16, 2001

CONSTRUCTION

4 Materials

4.1 A nightlight shall employ materials throughout that are acceptable for the application.

4.2 A base or body on which live parts are mounted shall be of:

- a) Phenolic, urea, or cold-molded composition; or
- b) Other insulating material acceptable for the application.

4.3 A polymeric material (including phenolic, urea, and the like) that provides direct or indirect support of live parts shall comply with the applicable requirements for portable equipment in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

4.4 Vulcanized fiber may be used for insulating washers, separators, and barriers, but not as the sole support for live parts.

4.5 A polymeric enclosure shall be of a material having moisture absorptive, flammability, and mechanical strength properties acceptable for the intended purpose in accordance with the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C, and shall retain these properties when exposed to the maximum temperatures of normal use. For use as an enclosure:

- a) Polymeric materials classed V-0, V-1, or V-2 in accordance with the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94, are to be considered as having acceptable flammability properties; and
- b) Molded phenolic and similar thermosetting polymeric materials are to be considered as having acceptable moisture-absorptive and flammability properties.

4.5 revised March 17, 1999

4.6 An adhesive that is relied upon to reduce a risk of electric shock, fire, or injury to persons shall comply with the applicable requirements in the Standard for Polymeric Materials – Use in Electrical Evaluations, UL 746C.

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

Exception: Stainless steel parts need not be so protected.

4.8 A printed wiring board shall comply with the Standard for Printed-Wiring Boards, UL 796. A printed wiring board shall have a minimum flammability class of V2 (as classed by the vertical burning rate test described in the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94).

4.8 revised March 17, 1999

5 Enclosures

5.1 A current-carrying part or a device with an exposed live part shall be contained within an enclosure as specified in 4.5. A part that is intended to be live at any time during the normal maintenance and use of a nightlight is considered to be a live part.

Exception No. 1: Lampholder contacts need not be enclosed if live parts of the lampholder are not accessible with the lamp in place as determined by the requirements for Accessibility of Live Parts, Section 6 and 9.6.1.

Exception No. 2: The blades of a nightlight need not be enclosed.

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5.2 A nightlight shall be constructed so that it is not necessary to open or remove the enclosure during normal maintenance and use.

5.3 An enclosure shall comply with the requirements for Accessibility of Live Parts, Section 6.

6 Accessibility of Live Parts

6.1 Each part or device that is required by Enclosures, Section 5, to be enclosed shall be located or shielded so that it is not accessible to unintentional contact by persons during normal use, including relamping or other user maintenance.

6.2 A live part is considered to be not accessible if a probe as illustrated in Figure 9.3 cannot be made to contact the part. The probe is to be articulated into any configuration and may be rotated or angled to any position before, during, or after inserting into the opening, and the penetration may be to any depth allowed by the opening, including minimal depth combined with maximum articulation. The probe is to be applied in any possible configuration; and, if necessary, the configuration is to be changed after insertion through the opening.

6.3 The probe mentioned in 6.2 and illustrated in Figure 9.3 is to be used as a measuring instrument to judge the accessibility provided by an opening, and not as an instrument to judge the strength of a material; it is to be applied with the minimum force necessary to determine accessibility.

6.4 A part that is removable without the use of a tool shall be removed when determining accessibility in accordance with 6.2.

7 Size and Weight

7.1 When evaluated in accordance with 7.2, a nightlight having integral blades for direct insertion into a receptacle shall comply with the specifications in Table 7.1.

Table 7.1
Size and weight specifications for nightlights

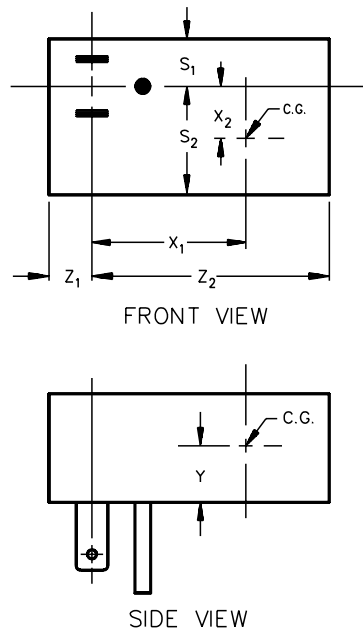
Algebraic quantity	Maximum acceptable value	
W	28 ozf	(0.79 N)
WY/Z	48 ozf	(1.36 N)
WY/S	48 ozf	(1.36 N)
WX	80 ozf-in.	(0.56 N·m)

In this table the variables are defined as follows:
W = is the weight of the nightlight in ozf (N) and is considered to be a force equal to the nightlight mass of oz (kg) as measured on a scale or balance.
Y = is the distance, in inches (mm), illustrated in Figure 7.1.
Z = is the shorter distance, in inches (mm), of Z₁ or Z₂ illustrated in Figure 7.1.
S = is the shorter distance, in inches (mm), of S₁ or S₂ illustrated in Figure 7.1.
X = is the longer distance, in inches (mm), of X₁ or X₂ illustrated in Figure 7.1.

7.2 The limits specified in Table 7.1 shall be determined as follows:

- a) A directly-mounted accessory is to be in place.
- b) A removable part is to be in place.
- c) A mounting tab is not to be included in the measurement of linear dimensions for the purpose of determining moments unless:
 - 1) There is no deformation of the tab and enclosure after being subjected to the impact described in Impact Test, Section 20; and
 - 2) For a polymeric-enclosed nightlight having an integral tab, there is no distortion at temperatures to which the polymeric material may be subjected under conditions of normal and abnormal use as determined by subjecting the nightlight to the Mold Stress-Relief Distortion Test, Section 17.

Figure 7.1
Dimensions of a nightlight



C.G. = Center of Gravity

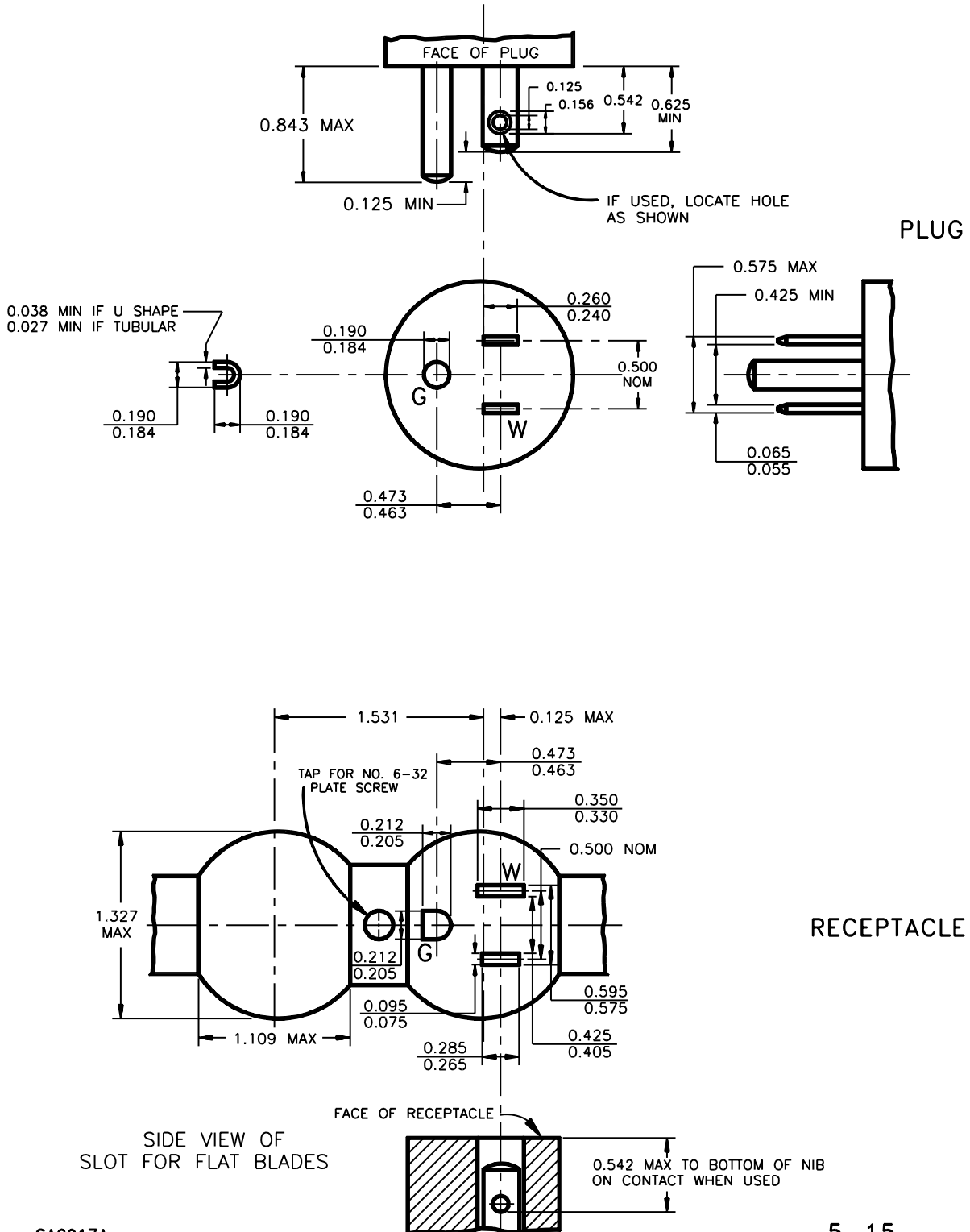
CP100A

7.3 When the integral blades are inserted into a parallel-blade duplex receptacle, no part of the nightlight, including a mounting tab, shall interfere with full insertion of an attachment plug into the adjacent receptacle. See Figure 7.2.

Exception: A nightlight need not comply with this requirement if it covers the adjacent receptacle completely.

Figure 7.2
Parallel-blade duplex receptacle

Figure 7.2 revised March 17, 1999

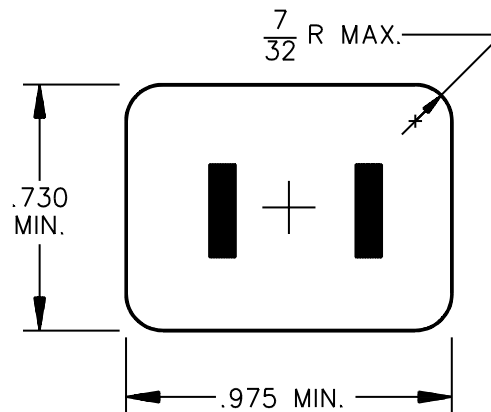


8 Face Size

8.1 The face of a nightlight that contains the parallel blades shall have dimensions equal to or greater than those indicated in Figure 8.1.

Exception: A device may employ a smaller face size if the probe shown in Figure 8.2 does not make contact with the line blades when applied around the circumference of the device face. The "z" dimension is to be applied against the outside edge of the device face with the "y" dimension perpendicular to the blades.

**Figure 8.1
Nightlight plug face dimensions**



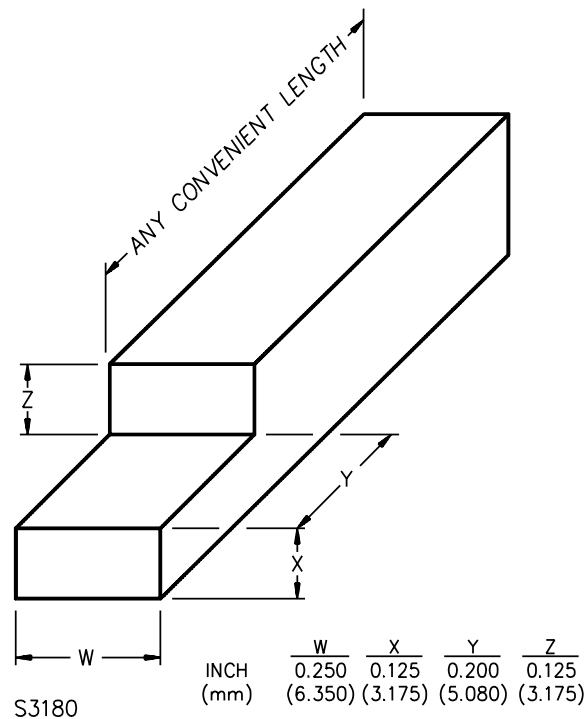
BLADES CENTERED

SA1945

Inch	7/32	0.730	0.975
(mm)	(5.6)	(18.54)	(24.76)

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Figure 8.2
Minimum face size probe



9 Live Parts

9.1 General

9.1.1 Iron or steel, plain or plated, shall not be used for parts that are depended upon to carry current, except that stainless steel may be employed for a part not subject to arcing.

Exception: Unplated iron or steel alloys may be used for leads that are integrally manufactured as part of a neon lamp.

9.1.2 A live part shall be secured by means other than friction so that it cannot be turned relative to the surface on which it is mounted.

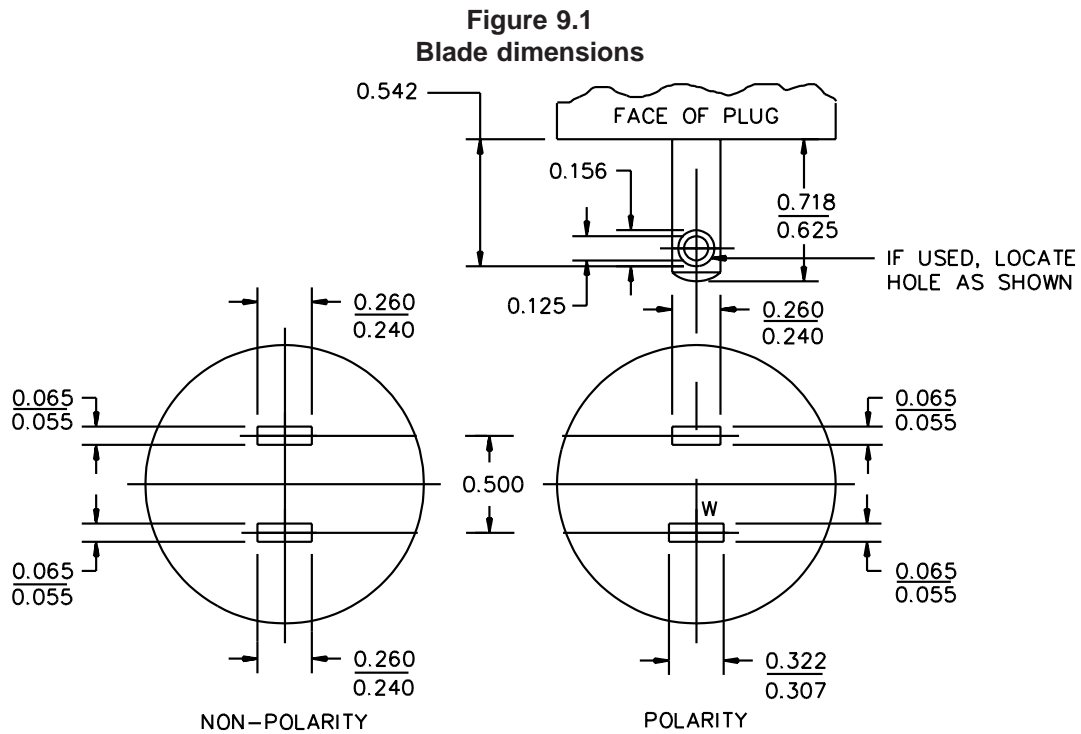
9.2 Blades

9.2.1 Blades shall:

- a) Be of copper, copper alloy, or aluminum; and
- b) Have dimensions complying with Figure 9.1 or 9.2.

A nightlight employing a screwshell shall have polarized blades. Aluminum blades shall have a temper (hardness) designation of H32 or harder in accordance with the American Society for Metals (ASM).

Exception: A candelabra-base or smaller nightlight need not have polarized blades if its construction complies with the Exception to 9.6.1.



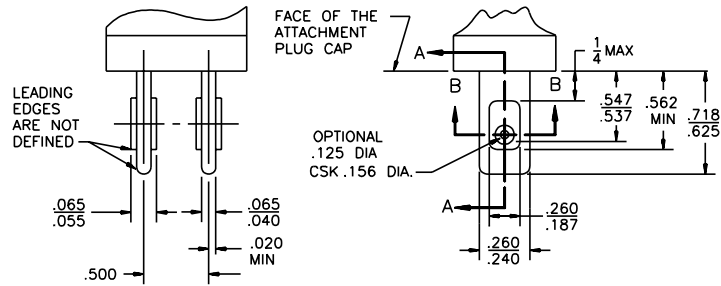
SA0013C

9.3 Screw Shells

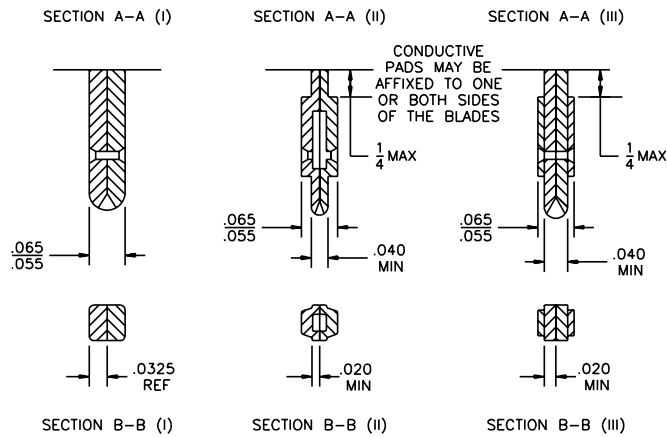
9.3.1 The conductive material of a screw shell shall:

- a) Be of copper, copper alloy, brass, aluminum, aluminum alloy, or other metal, such as stainless steel, that has been investigated and determined to be acceptable for the purpose;
- b) Be connected to the wide, polarized blade of the nightlight; and
- c) Comply with the applicable requirements in the Standard for Edison-Base Lampholders, UL 496.

Figure 9.2
Folded blade construction



SOME POSSIBLE BLADE VARIATIONS WITHIN THE TOLERANCE SPECIFIED



SC0529

English (inch)	Metric (mm rounded to 0.1 mm)
0.02	0.5
0.0325	0.8
0.04	1
0.055	1.4
0.065	1.6
0.125	3.2
0.156	4
0.187	4.7
0.24	6.1
0.25	6.3
0.26	6.6
0.5	12.7
0.537	13.6
0.547	13.9
0.562	14.3
0.625	15.9
0.718	18.2

9.3.2 A nightlight shall provide threads or their mechanical equivalent that engage at least two full threads of a common lamp base and provide electrical contact therewith while the lamp is fully seated. A screw shell shall be made go and no-go when tested by means of gauges made in accordance with Electric Lamp Bases (Partial Revision and Consolidation of ANSI C81.10-1976, C81.20-1976, C81.30-1976, C81.40-1976 and C81.50-1976), ANSI C81.61-1990.

Exception: Fewer than two threads may be engaged if the nightlight has been specifically investigated and found acceptable.

9.3.3 A skeleton type of construction is acceptable although it does not provide electrical contact through 360 degrees, since it does give, within the limitations of its construction, electrical contact through two turns of its threaded body. Such a construction generally consists of one or more narrow strips of metal secured to a molded, threaded body of insulating material. The strip generally extends the length of, and conforms in shape to, the molded threads.

9.4 Switching mechanism

9.4.1 A single-pole switching mechanism on a nightlight shall interrupt the electrical connection to the center contact of a nightlight employing a screwshell.

9.4.2 When a manual switching mechanism is operated as in actual service, the rate of motion of the contactor shall not be subject to control by the operator at the point of break.

9.5 Actuator

9.5.1 An actuator (the part that drives the switch mechanism into action) that is a live part shall not be provided with a live stem.

9.5.2 An actuating member (that part of the actuating mechanism that extends outside the body and is exposed to contact by the user) made of metal shall be insulated from live parts. An actuating member made of insulating material shall comply with the requirements in Section 15.

9.6 Lamp cavity

9.6.1 The depth of the lamp cavity of a screwshell nightlight shall comply with Table 9.1, measured from the plane of the depressed center contact to the plane of the rim:

- a) Of the insulating lining; or
- b) Of the nightlight body if it is of insulating material.

Exception: The maximum-depth requirement in Table 9.1 does not apply if the insulating-material outer shell is flared and extends beyond the specified limit to provide protection against contact with live parts by the probe depicted in Figure 9.3 with the lamp in place.

Table 9.1
Depth of lamp cavity

Trade size of lampholder	Depth of lamp cavity, inch (mm)			
	Minimum		Maximum	
Medium	15/16	(23.8)	1	(25.4)
Intermediate	25/32	(19.8)	27/32	(21.4)
Candelabra	5/8	(15.9)	11/16	(17.5)
Miniature	15/32	(11.9)	17/32	(13.5)

9.7 Spacings

9.7.1 There shall be a through air or over surface spacing of not less than 3/64 inch (1.2 mm) between uninsulated live parts of opposite polarity and between an uninsulated live part and a dead metal part that is exposed to contact by persons when the nightlight is installed in the intended manner.

Exception: This requirement does not apply at the body of a neon light if, when the leads are short-circuited at the base of the light, the series resistor does not operate in excess of its nominal rating.

9.7.2 The dead metal mentioned in 9.7.1 includes a metal surface (such as a metal receptacle face plate) on which the nightlight may be mounted in the intended manner. A dead metal screw head, rivet, or the like is not to be considered exposed to contact by persons after the nightlight is installed if the dead metal is not accessible using the probe shown in Figure 9.3.

9.7.3 In measuring a spacing, an isolated dead metal part interposed between:

- a) Live parts of opposite polarity; or
- b) A live part and an exposed dead metal part;

is to be considered as reducing the spacing by an amount equal to the dimension of the isolated dead metal part in the direction of the measurement.

9.8 Splices and connections

9.8.1 Each splice and connection shall be mechanically secure and shall provide reliable electrical contact.

9.8.2 An electrical connection shall be soldered, welded, crimped, or otherwise securely connected. A soldered connection shall be mechanically secure before soldering if breaking or loosening the connection may result in a risk of fire or electric shock.

Exception: A printed wiring board connection need not be mechanically secure if an automatic soldering operation is employed.

9.8.3 A lead is considered to be mechanically secure if it is:

- a) Wrapped at least halfway (180 degrees) around a terminal;
- b) Provided with at least one right angle bend when passed through an eyelet or opening; or
- c) Twisted with other conductors.

PERFORMANCE

10 General

10.1 The performance of a nightlight is to be investigated by means of the applicable tests described in Sections 11 – 25. The tests are to be conducted on each of six nightlights, except as follows:

- a) One nightlight each is to be used for the Temperature Test, Section 12, the Blanketing Test, Section 13, the Overlamping Test, Section 14, the Mold Stress-Relief Distortion Test, Section 17, the Overvoltage Test, Section 22, and the Dielectric Voltage-Withstand Test, Section 23;
- b) Three nightlights are to be used for the Impact Test, Section 20; and
- c) One nightlight per each imposed condition is to be used for the Component Breakdown Test, Section 24.

The sequence of testing is not specific; however, tests that are to be conducted on the same set of nightlights are to be conducted in the order they appear in the standard.

10.2 Unless otherwise specified, all electrical tests of a nightlight employing a non-replaceable lamp are to be conducted at a test voltage of 120 ± 2 volts.

10.3 Unless otherwise specified, all electrical tests of a nightlight employing a replaceable lamp are to be conducted:

- a) Using a lamp that has been determined to consume its rated wattage at 120 ± 2 volts, when operated independently in a lampholder intended for use with the lamp; and
- b) At a test voltage within the range of 120 ± 2 volts, at the value closest to the voltage that is required for the lamp to consume its rated wattage.

11 Tests on Switching Mechanism

11.1 A nightlight provided with a manual switching mechanism shall perform acceptably when subjected to the overload and endurance tests as described in 11.5 and 11.6. The same samples shall undergo both tests. There shall be no electrical or mechanical malfunction of the mechanism nor pitting or burning of the contacts to the extent of affecting the intended switching operation.

Exception: This requirement does not apply to a nightlight employing a nonreplaceable neon lamp.

11.2 For the overload and endurance tests, electrical supply connections are to be made to the parallel blades, and the load is to be connected by means of a plug or the equivalent to the screw shell and center contact of the nightlight.

11.3 The overload and endurance tests are to be conducted with the nightlight connected to an Edison three-wire, 125-volt dc circuit with grounded neutral; except that a nightlight rated ac only is to be tested on a grounded neutral 60 hertz, 120-volt ac source and a tungsten load. Exposed dead metal parts, such as the cap, shell, actuator, and the like are to be grounded. A single-pole mechanism on the nightlight is to be connected in the ungrounded conductor (negative on dc circuit).

11.4 A switching mechanism is not to be adjusted, lubricated, or otherwise conditioned either before or during the overload or endurance test.

Exception: This requirement does not apply to a manufacturer's regular production practice of lubricating a nightlight after it has been completely assembled.

11.5 Each sample is to be mounted and connected so that end-use conditions are represented. It is to be operated manually by means of its actuating member and subjected to 50 cycles of operation, making and breaking a resistive load that results in 150 percent of rated current or wattage, at a rate of 1 second "on" and 9 seconds "off". For convenience, the load may consist of two of the intended tungsten filaments connected in parallel, in which case the test cycle is to be 1 second "on" and 59 seconds "off".

11.6 Each sample is to be mounted and connected as described in 11.5 and operated by its actuating member either manually or by a machine for 6000 cycles of operation. Each sample tested with a resistive load is to make 10 times the rated current or wattage of the nightlight and break the rated current or wattage. Each test cycle is to be 1 second "on" and 9 seconds "off". A switching mechanism may be operated faster than 10 cycles per minute if agreeable to those concerned. For convenience, a rated tungsten filament lamp load may be used, in which case the test cycle is to be 1 second "on" and 59 seconds "off".

12 Temperature Test

12.1 A nightlight, when tested as described in 12.2 – 12.8, shall not attain a temperature at any point sufficiently high to constitute a risk of fire, to damage any materials used in the nightlight, or to exceed the temperatures specified in Table 12.1.

Table 12.1
Maximum acceptable temperature

Materials and components	°C	°F
Any exposed surface, including lamp if no shade is provided	90	194
Polymeric materials	a	a
Components	b	b
Blades	55	131
^a Polymeric material shall comply with its recognized temperature rating. See 4.3, 4.5, and 15.1. ^b A component (for example, a printed circuit board, wiring, and the like) shall comply with the temperature limits for which the component was investigated. See Components, Section 2.		

12.2 The nightlight is to be:

- a) Installed in a position representing the most severe temperature condition; and
- b) Operated continuously, as intended, until temperatures become constant.

12.3 Temperature measurements are to be obtained by thermocouples consisting of No. 28 – 32 AWG (0.08 – 0.03 mm²) iron and constantan wires. Thermocouples consisting of No. 30 AWG (0.05 mm²) wires with a potentiometer type of indicating instrument are to be used whenever referee temperature measurements by thermocouples are necessary. The thermocouple wire is to conform with the requirements for special thermocouples as listed in the table of limits of error of thermocouples in Temperature-Measurement Thermocouples, ANSI/ISA MC96.1-1982.

12.4 The temperatures specified in Table 12.1 are based on an assumed test ambient temperature of 25°C (77°F). A test may be conducted at an ambient temperature within the range of 10 – 40°C (50 – 104°F).

12.5 During a test conducted at an ambient temperature of 25°C (77°F), an observed temperature shall not exceed the required value specified in Table 12.1.

12.6 If a test is conducted at an ambient temperature other than 25°C (77°F), an observed temperature is to be corrected as described in 12.7. A corrected temperature shall not exceed the required value specified in Table 12.1.

12.7 An observed temperature is to be corrected by addition if the ambient temperature is lower than 25°C (77°F) or subtraction if the ambient temperature is higher than 25°C of the difference between 25°C and the test ambient temperature.

12.8 If a corrected temperature exceeds the required value specified in Table 12.1, at the request of those concerned, the test may be repeated at an ambient temperature closer to 25°C (77°F).

13 Blanketing Test

13.1 A nightlight employing an Edison-base lampholder shall not cause:

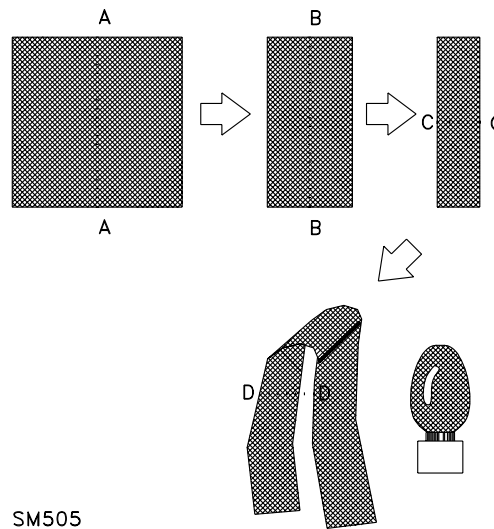
- a) Blanket material or tissue paper to glow or flame;
- b) A reduction of electrical spacings;
- c) Accessibility of live parts using the probe illustrated in Figure 9.3; or,
- d) Interference with the normal operation or relamping when the nightlight is tested as described in 13.2 – 13.6 in an ambient temperature of 25 ±5°C (77 ±9°F).

13.2 The nightlight is to be installed on a receptacle positioned on a vertical wall. The receptacle slots are to be either horizontal or vertical so that the nightlight is oriented with the lamp axis closest to vertical while the shell is downward. A shade on the nightlight that is removable without the use of tools or equivalent means is to be removed. The nightlight is to be in the "on" condition.

13.3 A vertical, rectangular wood surface covered with two layers of tissue paper is to be positioned parallel to the wall in front of the nightlight. The surface is to contact the part of the nightlight that extends farthest from the wall (such as the lamp, the switch actuator, a nonremovable shade). The dimensions of the surface are to be a width of 1 foot (305 mm) by a height extending from the floor to at least 6 inches (150 mm) above the installed nightlight.

13.4 A piece of flannel blanket material or terry cloth material is to be folded so that four thicknesses are draped over and in contact with the nightlight as shown in Figure 13.1. The material is to be sized so that at least 1 foot (305 mm) of the material extends downward along each side of the nightlight.

Figure 13.1
Blanketing test set-up



The unfolded material is to be approximately 16 by 36 inches (0.4 by 0.9 m). The material is to be folded in half 3 times in succession at lines A-A, B-B, and C-C. The resulting folded material is to be 8 thicknesses of the material, and is to measure approximately 4 by 18 inches (0.1 by 0.45 m). Tack the folded portion together at D-D to form a pocket over the nightlight.

13.5 The nightlight is to be operated continuously for 7 hours or until glowing of the blanket or tissue paper occurs.

13.6 The test is to be repeated, except the lamp axis is to be as close to horizontal as the two receptacle positions will permit.

13.7 The blanket material for this test is 100 percent unbleached cotton flannelette sheet blanket and is generally available in the 80-by-108 inch (2-by-2.7 m) size, or 100 percent cotton terry cloth having a density of at least 9 ounces per square yard (310 g/m²).

14 Overlamping Test

14.1 A nightlight intended for use with a replaceable lamp rated less than 10 watts shall not emit flame or molten metal or cause risk of fire or electric shock when operated continuously with a 10 watt lamp until ultimate results are observed. In most cases, continuous operation for 7 hours is necessary to determine the ultimate results. Live parts shall remain inaccessible to the probe illustrated in Figure 9.3 and the spacings required by 9.7.1 – 9.7.3 shall be maintained following this test.

15 Test on Actuating Members

15.1 A nightlight having an actuating member of insulating material is to be exposed to a temperature of 10°C (18°F) greater than that attained on the member during the temperature test. The actuating member shall not soften or deform to the extent that the electrical spacings are reduced below those required in 9.7.1. Following the exposure, the actuating member is to be made to operate the nightlight for 25 cycles at 6 – 10 cycles per minute. The member shall not be damaged by the operations.

15.2 Each sample is to be subjected to the specified temperature until the insulating material under consideration is thoroughly heated (1 hour in a constant temperature oven usually is sufficient). The actuating member is then to be operated manually as in actual service at no electrical load (as by turning the key or by pressing the buttons of a push-type mechanism). The actuating member is not to be operated more violently than would be the case in intended service. The test is to be conducted immediately after each individual sample is removed from the oven.

16 Blade Security Test

16.1 The blades of a nightlight shall withstand a pull of 20 pounds-force (89 N) for 2 minutes without displacement of more than 1/32 inch (0.8 mm).

16.2 The nightlight body is to be supported on a horizontal steel plate with the blades projecting downward through a single circular hole having the smallest diameter that will permit them to pass through it. A 20 pound-force (89 N) pull is to be applied, for 2 minutes, to each blade alone and to the two blades together. The pull is to be gradually applied in the downward direction.

16.3 The blade pull test is to be repeated after the mold stress-relief distortion test.

16.4 Live parts shall remain inaccessible to the probe illustrated in Figure 9.3 and the spacings required by 9.7.1 – 9.7.3 shall be maintained after the nightlight has been tested as described in 16.5 and 16.6. Relampable nightlights are to be probed with a lamp installed. External deformation of the plug blades is acceptable.

16.5 A nightlight is to be rigidly supported in the blades-up position. The nightlight is to be positioned so as not to restrict possible displacement of the plug blades or breakage of the enclosure. Each blade, in turn, is to be individually subjected to a force of 30 pounds (133 N) applied gradually along the longitudinal axis of the blade in a direction towards the plug face. The 30 pounds-force is to be maintained for a period of 1 minute.

16.6 Six new samples are to be tested as described in 16.5 except that both blades, in combination, are to be subjected to a single applied force of 40 pounds (178 N) for a period of 1 minute.

Exception: If agreeable to those concerned, the same six samples used for the test described in 16.5 may be used for this test.

17 Mold Stress-Relief Distortion Test

17.1 A nightlight shall not be cracked, warped, or distorted as a result of aging as described in 17.2; and there shall be no:

- a) Reduction of electrical spacings;
- b) Accessibility of live parts using the probe illustrated in Figure 9.3; or
- c) Interference with the normal operation or relamping.

Exception: This test is not required on a nightlight employing metal or rigid thermosetting enclosure materials.

17.2 The nightlight is to be placed in a full draft circulating-air oven maintained at a uniform temperature of 10°C (18°F) higher than the maximum temperature of the enclosure material measured under normal operating conditions, but not less than 70°C (158°F) and is to remain there for 7 hours. After returning to room temperature, the nightlight is to be investigated in accordance with 17.1. See 16.3.

18 Cap Pull Test

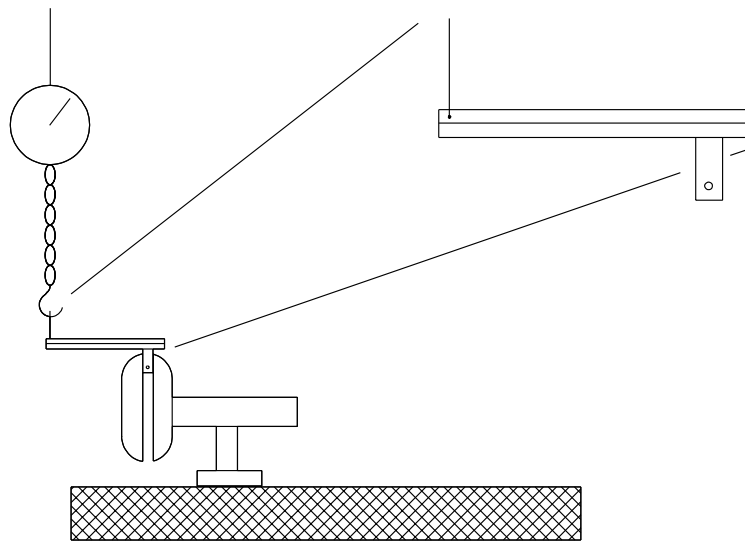
18.1 The body of a nightlight not employing a replaceable bulb shall withstand a pull of 20 pounds-force (89 N) for 1 minute without coming apart or separating from the blades.

18.2 The nightlight, complete with any face plates or decorative accessories, is to be rigidly supported by the blades. A 20 pounds-force (89 N) is to be applied to the front half of the assembly or enclosure or to the face plate or accessory, as far from the blades as possible, such that the most adverse condition is tested. The force is to be applied for 1 minute in a direction most likely to result in a separation of the two halves of the enclosure, or a separation of the face plate or accessory from the base unit, as demonstrated in Figure 18.1.

Revised 18.2 effective April 16, 2002

Figure 18.1
Example of a cap pull test set-up

Added Figure 18.1 effective April 16, 2002



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19 Lamp Cavity Separation Test

19.1 A nightlight employing a replaceable bulb shall withstand a pull of 20 pounds-force (89 N), as specified in 19.2, for a period of 1 minute without coming apart.

19.2 The nightlight is to be supported by rigidly securing the blades to a rigid structure by any convenient means that does not distort the blades or body. The body is not to be restricted or supported so as to prevent an unhinging separation of the halves. The 20 pounds-force (89 N) is to be gradually applied in a direction tending to separate the assembly means. The force is to be applied to the body half that does not support the blades, at a point between the two outermost threads of the lamp cavity.

20 Impact Test

20.1 The enclosure of a nightlight shall withstand an impact of 2.5 foot-pounds (3.4 J) without reducing required spacings or causing live parts to become accessible to the probe illustrated in Figure 9.3. Breakage of the lamp is acceptable.

20.2 Samples of the nightlight, with lamp, are to be installed as intended and subjected to the ball impact test conducted in accordance with the Standard for Polymeric Materials— Use in Electrical Equipment Evaluations, UL 746C, except an impact of 2.5 foot-pounds (3.4 J) is to be used.

21 Limited Short-Circuit Test

21.1 A nightlight provided with a screwshell and an electronic switching mechanism is to be tested as described in 21.2. There shall be no glowing or flaming or fire in the cotton and a 3-ampere fuse connected between all exposed dead metal parts and the neutral conductor shall not be opened.

21.2 Samples of the nightlight are to be individually tested. Each is to be fitted with a shorted lamp (glass broken and filaments twisted together), covered with untreated surgical cotton, and connected to a 120-volt ac circuit capable of delivering 1000 amperes. A 30-ampere nonrenewable cartridge fuse is to be wired in series with the input, and any dead metal is to be wired through a 3-ampere fuse to ground. The lamp filaments are to be isolated from the cotton. Three samples are to be energized by a circuit switch, such as a wall switch, with the photocell covered and three by causing the photocell to operate by turning off the room lights. Opening of the 30-ampere fuse as a result of this test is acceptable.

22 Overvoltage Test

22.1 A nightlight employing a lampholder having a screw shell, a replaceable lamp, and an electronic switching mechanism shall withstand 110 percent of the rated voltage without resulting in a risk of fire or electric shock.

22.2 The nightlight is to be enclosed in a single layer of tissue paper and connected and operated as intended until ultimate results are achieved or for 7 hours, whichever is less.

23 Dielectric Voltage-Withstand Test

23.1 A nightlight shall withstand for 1 minute without breakdown the application of a 60 hertz essentially sinusoidal potential of 1000 volts between live parts and any accessible dead metal parts that are likely to become energized.

Exception: A nightlight that has no metal parts accessible to the probe illustrated in Figure 9.3 need not be subjected to this test.

24 Component Breakdown Test

24.1 A nightlight is to be operated with a component such as an electrolytic capacitor, a diode, or other solid-state component short- or open-circuited, as applicable. As a result of such operation, there shall be no emission of flame or molten metal, nor ignition of cotton loosely draped over or totally around a nightlight; and a 3-ampere fuse connected between all exposed dead-metal parts of the nightlight and the neutral conductor shall not open.

Exception: The test is not required

a) If circuit analysis indicates that no other component or portion of the circuit will be overloaded as a result of the assumed open- or short-circuiting of a component

b) On power semiconductor devices if equivalent short-circuit testing is conducted during previous evaluation of the device; or

c) For a component complying with requirements applicable to the component. See Components, Section 2.

25 Folded Blade Compression Test

25.1 Embossed folded blades made from unformed metal stock thickness of less than 0.0275 inch (0.699 mm) shall withstand a 5 pound (22.2 N) compressive force applied for a period of 1 minute to the center of the blade by means of a 0.125 inch (3.18 mm) diameter circular rod. The formed blade shall not be compressed to a thickness less than 0.055 inch (1.39 mm).

MANUFACTURING AND PRODUCTION TEST

26 Dielectric Voltage-Withstand Test

26.1 Each nightlight shall withstand without electrical breakdown, as a routine production-line test, the application of a 40 – 70 hertz potential of 1000 volts for 60 seconds or 1200 volts for 1 second between the primary wiring, including connected components, and:

- a) Accessible dead metal parts that are likely to become energized; and
- b) Accessible low-voltage metal parts, including terminals.

Exception: This test is not required if there are no exposed dead metal parts accessible to the probe illustrated in Figure 9.3.

26.2 The test is to be conducted when the nightlight is complete – fully assembled – and with the primary switch in the “on” position. It is not intended that the nightlight be unwired, modified, or disassembled for the test.

Exception No. 1: A part such as a snap cover or friction-fit knob that would interfere with the performance of the test need not be in place

Exception No. 2: The test may be performed before final assembly if the test represents that for the completed nightlight.

Exception No. 3: The test may be conducted before a solid-state component that can be damaged by the dielectric potential is electrically connected. However, a random sampling of each day's production is to be tested at the potential specified in 26.1, but the circuitry may be rearranged for the test to reduce the likelihood of solid-state-component damage while retaining representative dielectric stress on the circuit.

26.3 The test equipment shall include a transformer having an essentially sinusoidal output, a means of indicating the test potential, an audible or visual indicator of electrical breakdown, and either a manually reset device to restore the equipment after electrical breakdown or an automatic reject feature of any unacceptable unit.

26.4 If the output of the test equipment transformer is less than 500 volt-amperes, the equipment shall include a voltmeter in the output circuit to directly indicate the test potential.

26.5 If the output of the test equipment transformer is 500 volt-amperes or larger, the test potential may be indicated by:

- a) A voltmeter in the primary circuit or in a tertiary winding circuit;
- b) A selector switch marked to indicate the test potential; or
- c) A marking in a readily visible location to indicate the test potential of equipment having a single test potential output.

If marking is used without an indicating voltmeter, the equipment shall include a positive means, such as a power-on lamp to indicate that the manually reset switch has been reset following a tripout.

26.6 Test equipment other than that described in 26.3 – 26.5 may be used if found to accomplish the intended factory control.

26.7 During the test, both sides of the primary circuit of the nightlight are to be connected together to one terminal of the test equipment; the second test equipment terminal is to be connected to the accessible dead metal.

RATING

27 General

27.1 A nightlight shall be rated in volts and either amperes or watts and may be rated ac only.

MARKING

28 General

28.1 A nightlight shall be legibly and permanently marked with:

- a) The manufacturer's name, trade name, or trademark, or any other descriptive marking by which the organization responsible for the product may be identified;
- b) A distinctive catalog number or the equivalent; and
- c) The electrical ratings.

Exception: The catalog number or the equivalent need not be marked on the nightlight if it appears on the smallest unit shipping carton or other container in which the nightlight is packaged

28.2 If a manufacturer produces or assembles night-lights at more than one factory, each finished nightlight shall have a distinctive marking by which it can be identified as the product of a particular factory.

28.3 If the shade of a nightlight is removable and will allow installation of more than one type of lamp, the nightlight shall be provided with a lamp replacement marking indicating wattage, such as "____ W max." and, if applicable, lamp type or shape.

29 Cautionary

29.1 A nightlight shall be marked on the smallest packaged unit, or on a sheet that is visible at the point of sale from within the packaged unit, with the following:

- a) The word "CAUTION"; and
- b) The following, or equivalent, statements: "Risk of electric shock. This product is not a toy and is not intended for use by children. For adult use only."

Exception: The signal word "CAUTION" is able to be replaced by the word "WARNING" at the manufacturer's discretion.

Revised 29.1 effective April 16, 2002

29.1.1 The cautionary marking of 29.1 shall be in letters minimum 1/16 inch (1.6 mm) high on a contrasting background. The cautionary marking shall be separated from all other markings by a single line, minimum 1/16 inch wide, that completely encloses the marking. The marking shall be visible at the point of purchase while the product is enclosed within, or secured to the packaging.

Added 29.1.1 effective April 16, 2002

29.1.2 The packaging material attached to or provided with a nightlight shall not display any of the following:

- a) Pictures or sketches showing the nightlight used in a nursery or child's room;
- b) A statement indicating that the product is suitable for use in a child's room or in a nursery; or
- c) A statement indicating that the product is suitable for use by a child.

Added 29.1.2 effective April 16, 2002

29.2 A nightlight having a mounting tab shall be marked – on the nightlight, a marking tag, or an instruction sheet packed with the unit – with the word "IMPORTANT " and the following mounting instructions or the equivalent:

- a) "To reduce the risk of electric shock , disconnect power to the receptacle before installing or removing the unit. When removing receptacle cover screw, cover may fall across plug pins or receptacle may become displaced;"
- b) "Use only with duplex receptacle having center screw;" and
- c) "Secure unit in place by receptacle cover screw."

APPENDIX A

Standards for Components

Standards under which components of the products covered by this standard are evaluated include the following:

Title of Standard – UL Standard Designation

Attachment Plugs and Receptacles – UL 498

Lampholders, Edison-Base – UL 496

Marking and Labeling Systems – UL 969

Plastic Materials for Parts in Devices and Appliances, Tests for Flammability of – UL 94

Polymeric Materials – Use in Electrical Equipment Evaluations – UL 746C

Printed Wiring Boards – UL 796

Switches for Lighting Controls, Nonindustrial Photoelectric – UL 773A

Switches, General-Use, Snap – UL 20

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**Superseded requirements for
the Standard for
Nightlights**

UL 1786, Second Edition

The requirements shown are the current requirements that have been superseded by requirements in revisions issued for this Standard. To retain the current requirements, do not discard the following requirements until the future effective dates are reached.

18.2 The top or front half of the body is to be rigidly supported by any convenient means . A weight that provides 20 pounds-force (89 N) is to be supported from the two attachment blades by means of a yoke for 1 minute.

29.1 A nightlight shall be marked on the smallest packaged unit shipping carton with the word "WARNING" or "CAUTION" and the following or equivalent statements: "Risk of electric shock. This product is not a toy. For adult use only."

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