

NO. OF PAGES

9

341

**Underwriters Laboratories Inc.®**A not-for-profit organization dedicated to public safety
and committed to quality service**June 24, 1996****Revision pages for****Standard for****Portable Sun/Heat Lamps****UL 482, Seventh Edition**

Attached to this distribution notice is a revision of the Seventh edition of UL 482.

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

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

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

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the text of this ANSI/UL Standard.

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

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

Page	Date
1	May 26, 1994 (Reprinted June 24, 1996)
2 – 5	May 26, 1994
6	June 24, 1996
7 – 20	May 26, 1994
21 – 23	June 24, 1996
24 – 27, A1	May 26, 1994

MAY 26, 1994

(Title Page Reprinted: June 24, 1996)



1

UL 482

Standard for

Portable Sun/Heat Lamps

The First and the Second editions were titled Standard for Therapeutic Lamps.

First Edition – May, 1957
Second Edition – May, 1973
Third Edition – August, 1974
Fourth Edition – October, 1975
Fifth Edition – April, 1981
Sixth Edition – July, 1987

Seventh Edition

May 26, 1994

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated May 26, 1994 and June 24, 1996. These pages should not be discarded when revised or additional pages are issued if it is desired to retain the ANSI approved text.

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

Approved as ANSI/UL 482-1980, September 25, 1980
Approved as ANSI/UL 482-1987, April 17, 1987
Approved as ANSI/UL 482-1996, March 22, 1996

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

ISBN 1-55989-616-7

COPYRIGHT © 1975, 1996 UNDERWRITERS LABORATORIES INC.

CONTENTS**FOREWORD****INTRODUCTION**

1 Scope	5
2 Components	5
3 Units of Measurement	6
4 References	6

CONSTRUCTION

5 General	6
6 Frame and Enclosure	6
7 Mechanical Assembly	7
8 Corrosion Protection	7
9 Electrical Potentials	9
10 Cords and Plugs	9
11 Bushings	10
12 Internal Wiring	10
13 Insulating Materials	11
14 Lampholders	11
15 Switches and Interlocks	11
16 Timers	12
17 Protective Eyewear	12
18 Spacings	13
19 Grounding	13

PERFORMANCE

20 General	13
21 Leakage Current Test	14
22 Input Test	15
23 Irradiance Ratio Test	16
24 Temperature Test — Normal Operation	16
25 Endurance Test	20
26 Temperature Test — Abnormal Operation	20
27 Strain Relief Test	21
28 Adhesion of Labels Test	21
29 Dielectric Voltage-Withstand Test	22

MANUFACTURING AND PRODUCTION-LINE TESTS

30 Production-Line Dielectric Voltage-Withstand Test	23
31 Production-Line Grounding Continuity Test	24

INTRODUCTION

1 Scope

1.1 This standard covers sun lamps, heat lamps and combination sun and heat lamps rated at not more than 125 V. A sun lamp is intended for production of ultraviolet radiation for skin tanning. A heat lamp is intended for production of infrared radiation. A combination sun and heat lamp is intended for production of both ultraviolet and infrared radiation. In the text of this standard, the term sun/heat lamp is intended to cover all types.

1.2 This standard covers portable sun/heat lamps intended for use by nontechnically qualified persons in homes, sports facilities, health spas and similar establishments and intended for connection to a power-supply circuit by a flexible cord for use in accordance with the National Electrical Code.

1.3 This standard does not cover lamps intended primarily to provide illumination (although some visible radiation may be produced during the operation of a sun/heat lamp).

1.4 This standard does not cover sun or heat lamps intended for professional use. Professional use lamps are those for use by technically qualified persons in hospitals, nursing homes, medical care centers, clinics, medical offices, laboratories, and similar establishments for therapeutic purposes. The therapeutic lamps are covered by the requirements for medical and dental equipment.

1.5 Ultraviolet lamps intended for high intensity, short duration – 2 minute maximum first exposure time for most sensitive skin – operation will be subject to an appropriate investigation for any additional requirements as are applicable to a lamp with this feature.

1.6 This standard does not cover bulbs alone but complete appliances.

1.7 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, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable 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 cannot be judged to comply with this Standard. Where considered appropriate, revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this Standard.

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 generally used in the products covered by this standard.

2.2 A component need not comply with a specific requirement that:

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

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

2.4 Specific components are recognized as being 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 for which they have been recognized.

3 Units of Measurement

3.1 If a value for measurements is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

3.2 Unless indicated otherwise all voltage and current values mentioned in this standard are root-mean-square (rms).

4 References

4.1 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

5 General

5.1 Portable sun lamps are subject to the Radiation Control for Health and Safety Act of 1968, and the Federal Food, Drug and Cosmetic Act, as amended by the Safe Medical Act of 1990 and the Medical Device Amendments of 1992.

5.1 revised June 24, 1996

6 Frame and Enclosure

6.1 A sun/heat lamp shall be so formed and assembled that it will have the strength and rigidity necessary to resist the abuses to which it is likely to be subjected without increasing its 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.

6.2 A sun/heat lamp shall have an enclosure of metal or of noncombustible, nonabsorptive insulating material such as glass, marble, phenolic composition, or of a material determined to be acceptable for the application.

6.3 Among the factors taken into consideration when determining the acceptability of a nonmetallic enclosure are:

- a) The mechanical strength,
- b) Resistance to impact,
- c) Moisture-absorptive properties,
- d) Combustibility and resistance to ignition from electrical sources,
- e) Dielectric strength, insulation resistance, and resistance to arc tracking, and

26.11 When operated under such abnormal conditions, a lamp is considered to involve a risk of fire if there is any emission of flame or molten metal or if operation of the lamp results in the glowing or flaming of combustible material upon which it may be placed.

26.12 A heat lamp with reference to the abnormal tests will generally require continuous operation for 7 or 8 hours in order to determine that the ultimate result has been observed. Any timer contacts are to be shorted during the abnormal tests.

26.13 A sun lamp with reference to the abnormal tests will generally require continuous operation for 7 or 8 hours in order to determine that the ultimate result has been observed. The timer contacts are to be shorted during the abnormal tests.

Exception: If the timer has been tested and found to operate acceptably for 100,000 cycles of mechanical and electrical operation following the procedure in 25.1 and 25.2, a sun lamp is first to be brought up to constant temperature before introducing the abnormal condition. The timer is then to be set at 10 minutes and the abnormal condition introduced.

26.14 If a sun/heat lamp employs one or more semiconductors, transistors, or similar components, a risk of fire, electric shock, or injury to persons condition shall not develop when the circuit between any two terminals of any such component is short circuited or is opened at any terminal. If an electrolytic capacitor is employed a risk of fire, electric shock, or injury to persons condition shall not develop when the capacitor is shorted. Only one simulated fault condition is to be imposed at one time.

27 Strain Relief Test

27.1 The power-supply cord of a sun/heat lamp and any external cord connected to primary circuitry shall be capable of withstanding a straight pull of 35 lbf (156 N) applied between the cord and the sun/heat lamp for 1 minute.

Revised 27.1 effective April 3, 1995

27.2 The 35 lbf (156 N) pull is to be applied by suspending a 35 lb (15.9 kg) weight from the cord with the force applied in a direction normal to the plane of the cord-entry hole, with all cord conductors severed immediately adjacent to the terminals or splices. If there is movement of the cord more than 1/16 inch (1.6 mm) at the point where the connections are severed, the strain relief is not acceptable.

Revised 27.2 effective April 3, 1995

27.3 Strain relief shall be provided so that a pull exerted on the flexible cord will not be transmitted directly to binding-screw terminals of the attachment plug. The assembly shall be capable of withstanding a straight pull of 30 lbf (133 N) applied between the cord and the plug.

27.4 With the attachment plug securely held by the blades, the pull is to be applied for 1 minute to the flexible cord, in a direction perpendicular to the plane of the cord-entry hole. The results of the test are not acceptable if any cord conductor is detached from its terminal in the plug.

28 Adhesion of Labels Test

28.1 To determine if a pressure sensitive label or a label secured by cement or adhesive is of a permanent nature, representative samples that have been subjected to the tests outlined in 28.2 – 28.5 shall meet the following conditions:

- a) Each label shall demonstrate good adhesion and the edges shall not be curled.

b) The label shall resist defacement or removal as demonstrated by scraping across the test panel with a flat metal blade 1/32 inch (0.8 mm) thick, held at a right angle to the test panel.

c) The printing shall be legible and shall not be defaced by rubbing with thumb or finger pressure.

28.1 revised June 24, 1996

28.2 For each of the two types of conditioning mentioned in 28.3 and 28.5, three samples of the label are to be applied to the same test surface as anticipated in the intended application. The labels are to be applied to the test surface not less than 24 hours prior to testing.

28.3 Three samples of the labels are to be evaluated as received.

28.4 Evaluation of samples at the end of the test as indicated in 28.5 is to be made:

- a) Immediately following removal from the test medium, and
- b) After exposure to room temperature for 24 hours following removal from the test medium.

28.5 Three samples of the labels under test are to be placed in a full-draft circulating-air oven maintained at the temperature indicated in Table 28.1 for 240 hours.

Table 28.1
Oven temperature

Maximum normal operating temperature of surface of applied label		Air oven test temperature	
°C	°F	°C	°F
60 or less	140 or less	87	189
80	176	105	221
100	212	121	250
125	257	150	302
150	302	180	356

29 Dielectric Voltage-Withstand Test

29.1 A sun/heat lamp shall be capable of withstanding without breakdown for 1 minute the application of a 60 Hz essentially sinusoidal potential between live parts and dead metal parts, with the lamp at the temperature attained in use. For a circuit that operates at a voltage of 250 V or less the potential shall be 1000 V; for a circuit that operates at a voltage of more than 250 V the test potential shall be 1000 V plus twice the operating voltage of that circuit. If the lamp uses a 2-winding transformer, it shall also be capable of withstanding without breakdown for 1 minute the application of a 60 Hz essentially sinusoidal potential of 1000 V plus twice the higher operating voltage of the two windings, between primary and secondary circuits.

29.2 To determine compliance with the requirement of 29.1, a sun/heat lamp is to be tested by a 500 VA or larger capacity transformer, whose output voltage is essentially sinusoidal and can be varied. The applied potential is to be increased from zero until the required test value is reached, and is to be held at that level for 1 minute. The increase in the applied potential is to be at a uniform rate and as rapid as is consistent with its value being correctly indicated by a voltmeter.

MANUFACTURING AND PRODUCTION-LINE TESTS

30 Production-Line Dielectric Voltage-Withstand Test

30.1 Each appliance shall withstand without electrical breakdown, as a routine production-line test, the application of a potential at a frequency within the range of 40 – 70 Hz, between live parts and dead metal parts. The test potential shall be:

- a) 1200 V applied for 1 second or
- b) 1000 V applied for 1 minute.

30.2 The appliance may be in a heated or unheated condition for the test.

30.3 The test shall be conducted when the appliance is complete (fully assembled). It is not intended that the appliance be unwired, modified or disassembled for the test.

Exception No. 1: Parts such as snap covers or friction-fit knobs that would interfere with 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 appliance.

30.4 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 manual reset device to restore the equipment after electrical breakdown, or an automatic reject feature of any unacceptable unit.

30.5 If the output of the test equipment transformer is less than 500 VA, the equipment shall include a voltmeter in the output circuit that directly indicates the test potential.

30.6 If the output of the test equipment transformer is 500 VA or larger, the test potential may be indicated by:

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

When a marking is used without an indicating voltmeter, the equipment shall include a positive means, such as an indicator lamp, to indicate that the manual-reset switch has been reset following a dielectric breakdown.

30.7 Test equipment, other than that described in 30.4 – 30.6, may be used if found to accomplish the intended factory control.

30.8 During the test, enough of the primary switching components shall be in the on position so that all primary circuitry will be stressed. Both sides of the primary circuit of the appliance are to be connected together and to one terminal of the test equipment, and the second test-equipment terminal is to be connected to the accessible dead metal.

30.8 revised June 24, 1996

31 Production-Line Grounding Continuity Test

31.1 Each appliance that has a power-supply cord having a grounding conductor shall be tested, as a routine production-line test, to determine grounding continuity between the grounding blade of the attachment plug and the accessible dead metal of the appliance that is likely to become energized.

31.2 Only a single test need be made if the accessible metal selected is conductively connected by construction to all other accessible metal.

31.3 Any indicating device (an ohmmeter, a battery-and-buzzer combination, or the like) may be used to determine compliance with the grounding continuity requirement in 31.1.

RATINGS

32 General

32.1 A sun/heat lamp shall be rated in amperes (A) or watts (W), and in volts (V). The rating shall include the frequency (Hz), if necessary, due to relay coils, transformers, or other components.

MARKINGS

33 Specifics

33.1 A heat lamp shall be legibly and permanently marked where it will be plainly visible with:

- a) The manufacturer's name, trademark, or trade name;
- b) The date or other dating period of manufacture not exceeding any three consecutive months;
- c) The catalog number or the equivalent; and
- d) The electrical rating.

A lamp intended for use on alternating current only or on direct current only shall be so marked.

Exception No. 1: The manufacturer's identification may be in a traceable code when the heat lamp is identified by the brand or trademark of a private labeler.

Exception No. 2: The date of manufacture may be abbreviated or in a nationally accepted conventional code, or in a code affirmed by the manufacturer. A date code repetition time cycle shall not be less than 10 years.

33.2 A sun lamp or a combination sun and heat lamp shall be legibly and permanently marked where it will be plainly visible with:

- a) The full name and address of the manufacturer, or if the product is sold under a name other than the manufacturer, the full name and address of the organization responsible for the product may be used;
- b) The month and year of manufacture without abbreviation, with the year shown as a four digit number as follows — "Manufactured: (insert month and year of manufacture)";
- c) The catalog number or the equivalent; and

UL 482

ISBN 1-55989-616-7

Portable Sun/Heat Lamps



Northbrook, Illinois • (708) 272-8800
Melville, New York • (516) 271-6200
Santa Clara, California • (408) 985-2400
Research Triangle Park,
North Carolina • (919) 549-1400



Underwriters Laboratories Inc.®

Underwriters Laboratories Inc., founded in 1894, is chartered as a not-for-profit organization without capital stock, under the laws of the State of Delaware, to establish, maintain, and operate laboratories for the examination and testing of devices, systems and materials to determine their relation to hazards to life and property, and to ascertain, define and publish standards, classifications and specifications for materials, devices, products, equipment, constructions, methods, and systems affecting such hazards.

UL Standards for Safety are developed under a procedure which provides for participation and comment from the affected public as well as industry. The procedure takes into consideration a survey of known existing standards and the needs and opinions of a wide variety of interests concerned with the subject matter of the standard. Thus manufacturers, consumers, individuals associated with consumer-oriented organizations, academicians, government officials, industrial and commercial users, inspection authorities, insurance interests and others provide input to UL in the formulating of UL Standards for Safety, to keep them consonant with social and technological advances.

A not-for-profit organization
dedicated to public safety and
committed to quality service



Underwriters Laboratories Inc.®

A not-for-profit organization dedicated to public safety
and committed to quality service

May 26, 1994

Standard for

Portable Sun/Heat Lamps

UL 482, Seventh Edition

Accompanying this transmittal notice is a copy of the Seventh edition of UL 482.

A CHANGE IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM.

THIS EDITION OF THE STANDARD IS NOW IN EFFECT EXCEPT FOR PARAGRAPHS 9.1, 10.5, 10.6, 10.7, 15.3, 15.4, 27.1, and 27.2, WHICH BECOME EFFECTIVE APRIL 3, 1995 AS INDICATED IN THE SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEMS.

THE CURRENT REQUIREMENTS IN EFFECT FOR THE REQUIREMENTS HAVING FUTURE EFFECTIVE DATES ARE LOCATED IN THE BACK OF THE STANDARD.

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

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

MAY 26, 1994

1

UL 482

Standard for

Portable Sun/Heat Lamps

The First and the Second editions were titled Standard for Therapeutic Lamps.

First Edition – May, 1957
Second Edition – May, 1973
Third Edition – August, 1974
Fourth Edition – October, 1975
Fifth Edition – April, 1981
Sixth Edition – July, 1987

Seventh Edition

May 26, 1994

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

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

ISBN 1-55989-616-7

COPYRIGHT © 1975, 1994 UNDERWRITERS LABORATORIES INC.