

UL 141

Garment Finishing Appliances

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

Underwriters Laboratories Inc. (UL)
333 Pfingsten Road
Northbrook, IL 60062-2096

UL Standard for Safety for Garment Finishing Appliances, UL 141

Eighth Edition, Dated June 8, 2007

Summary of Topics

The Eighth Edition of the Standard for Garment Finishing Appliances, UL 141 has been issued to reflect the latest ANSI approval date and to incorporate the proposals dated March 2, 2007.

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

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 approved text of this ANSI/UL Standard.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: <http://ulstandardsinfo.net/ulforeword.html>

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

UL's Standards for Safety are copyrighted by UL. Neither a printed copy of a Standard, nor the distribution diskette for a Standard-on-Diskette and the file for the Standard on the distribution diskette should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

Revisions of UL Standards for Safety are issued from time to time. A UL Standard for Safety is current only if it incorporates the most recently adopted revisions.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

UL will attempt to answer support requests concerning electronic versions of its Standards. However, this support service is offered on a reasonable efforts basis only, and UL may not be able to resolve every support request. UL supports the electronic versions of its Standards only if they are used under the conditions and operating systems for which it is intended. UL's support policies may change from time-to-time without notification.

UL reserves the right to change the format, presentation, file types and formats, delivery methods and formats, and the like of both its printed and electronic Standards without prior notice.

Purchasers of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgement (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

If a single-user version electronic Standard was purchased, one copy of this Standard may be stored on the hard disk of a single personal computer, or on a single LAN file-server or the permanent storage device of a multiple-user computer in such a manner that this Standard may only be accessed by one user at a time and for which there is no possibility of multiple concurrent access.

If a multiple-user version electronic Standard was purchased, one copy of the Standard may be stored on a single LAN file-server, or on the permanent storage device of a multiple-user computer, or on an Intranet server. The number of concurrent users shall not exceed the number of users authorized.

Electronic Standards are intended for on-line use, such as for viewing the requirements of a Standard, conducting a word search, and the like. Only one copy of the Standard may be printed from each single-user version of an electronic Standard. Only one copy of the Standard may be printed for each authorized user of a multiple-user version of an electronic Standard. Because of differences in the computer/software/printer setup used by UL and those of electronic Standards purchasers, the printed copy obtained by a purchaser may not look exactly like the on-line screen view or the printed Standard.

An employee of an organization purchasing a UL Standard can make a copy of the page or pages being viewed for their own fair and/or practical internal use.

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.

Copyright © 2007 Underwriters Laboratories Inc.

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

Page	Date
1-70	June 8, 2007
A1-A2	June 8, 2007

UL COPYRIGHTED MATERIAL -

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

JUNE 8, 2007



ANSI/UL 141-2007

1

UL 141

Standard for Garment Finishing Appliances

First Edition – June, 1936
Second Edition – June, 1940
Third Edition – April, 1954
Fourth Edition – May, 1973
Fifth Edition – April, 1985
Sixth Edition – November, 1991
Seventh Edition – February, 1996

Eighth Edition

June 8, 2007

The most recent designation of ANSI/UL 141 as an American National Standard (ANSI) occurred on June 6, 2007. The ANSI approval for this standard does not include the Cover Page, Transmittal Pages, Title Page, or Appendix A.

This ANSI/UL Standard for Safety, which consists of the Eighth Edition is under continuous maintenance, whereby each revision is ANSI approved upon publication.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

COPYRIGHT © 1996, 2007 UNDERWRITERS LABORATORIES INC.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

No Text on This Page

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

CONTENTS

INTRODUCTION

1 Scope	6
2 Glossary	6
3 General	6
3.1 Components	6
3.2 Units of measurement	7
3.3 Undated references	7

CONSTRUCTION

4 General	7
5 Enclosure	7
6 Handles	11
7 Provision for Mounting	11
8 Mechanical Assembly	12
9 Protection Against Corrosion	13
10 Accessibility of Uninsulated Live Parts	13
11 Supply Connections	16
11.1 Permanently connected appliance	16
11.2 Cord-connected appliances	19
12 Grounding	25
13 Current-Carrying Parts	26
14 Internal Wiring	26
14.1 General	26
14.2 Protection of wiring	27
14.3 Splices and connections	27
15 Heating Elements	28
16 Electrical Insulation	28
17 Thermal Insulation	29
18 Capacitors	29
19 Lampholders	30
20 Motors	30
20.1 General	30
20.2 Overload protection	31
21 Overcurrent Protective Devices	32
22 Receptacles	33
23 Switches and Controls	33
24 Spacings	34

PROTECTION AGAINST INJURY TO PERSONS

25 General	35
26 Parts Subject to Pressure	36
27 Pressure Relief Devices	38

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

PERFORMANCE

28	General	39
29	Leakage Current Test	39
30	Test of Insulation Resistance and Leakage Current as a Result of Moisture	42
31	Input Test	43
32	Temperature Test	43
32.1	General	43
32.2	Maximum normal load	47
32.3	Appliances with thermostatically-controlled heated ironing surfaces	48
32.4	Appliances with nonthermostatically-controlled heated ironing surfaces	48
32.5	Parts near handle	49
33	Dielectric Voltage-Withstand Test	50
34	Mechanical Endurance Test	51
35	Abnormal Operation Test	51
35.1	General	51
35.2	Water droplet test	52
35.3	Dual voltage appliances	52
35.4	Overfill test	53
35.5	Components	53
36	Tests on Switches and Control Devices	54
36.1	Overload	54
36.2	Endurance	55
37	Strain Relief Test	55
38	Polymeric Material Tests	56
38.1	General	56
38.2	Mold-stress evaluation	56
38.3	Flame resistance	57
38.4	Mechanical abuse test	57
39	Test of Physical Properties of a Liquid Container, Seal, or Diaphragm	58
40	Permanence of Marking	59
40.2	Oven-aging test	59
40.3	Immersion test	60
40.4	Standard-atmosphere test	60
40.5	Unusual-condition exposure test	60

MANUFACTURING AND PRODUCTION TESTS

41	Dielectric Voltage-Withstand Test	60
42	Grounding Continuity Test	62

RATING

43	Details	62
----	---------------	----

MARKING

44	Details	62
44.1	General	62
44.2	Dual voltage appliances	64
45	Instruction Manual	64

UL COPYRIGHTED MATERIAL –

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

ELECTRODE-TYPE GARMENT FINISHING APPLIANCES

46 Scope	66
47 General	66
48 Construction	66
49 Normal Temperature Test	67
50 Abnormal Operation Test	67
51 Leakage Current Test	68
52 Disassembly and Reassembly Test	69
53 Markings	69
54 Operating Instructions	69

APPENDIX A

Standards for Components.....	A1
-------------------------------	----

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM
UL COPYRIGHTED MATERIAL -

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

INTRODUCTION

1 Scope

1.1 These requirements cover electric garment finishing appliances rated 250 V or less for household and commercial use, in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements do not apply to flatirons, dry-cleaning machines, laundry equipment, revolving clothes racks, or other appliances covered by individual requirements that are separate from this standard.

2 Glossary

2.1 For the purpose of these requirements, the following definitions apply.

2.2 HAND-SUPPORTED APPLIANCE – An appliance that is physically supported by the hand of the user during the performance of its intended functions. Reference is to be made to the instruction manual of the appliance in establishing the intended electrically operated functions of the appliance.

2.3 HARD WATER SOLUTION – A solution that consists of distilled water and sodium chloride (NaCl) with a resistivity of 1000 Ω -cm. The resistivity is adjusted by the amount of sodium chloride added.

2.4 LINE-VOLTAGE CIRCUIT – A circuit involving a potential of not more than 250 V and having circuit characteristics in excess of those of a low-voltage circuit.

2.5 LOW-VOLTAGE CIRCUIT – A circuit involving a peak open-circuit potential of not more than 42.4 V supplied by a primary battery, by a Class 2 transformer, or by a combination of a transformer and a fixed impedance that, as a unit, complies with all performance requirements for a Class 2 transformer. A circuit derived from a line-voltage circuit by connecting a resistance in series with the supply circuit as a means of limiting the voltage and current, is not considered to be a low-voltage circuit.

2.6 REMOTELY CONTROLLED APPLIANCE – An appliance that is not within sight of the operator at the starting device.

3 General

3.1 Components

3.1.1 Except as indicated in 3.1.2, a component of an appliance 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 appliance covered by this standard.

3.1.2 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

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

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

3.2 Units of measurement

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

3.3 Undated references

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

CONSTRUCTION

4 General

4.1 An appliance shall employ materials found by investigation to be acceptable for the intended application.

5 Enclosure

5.1 An appliance shall be provided with an enclosure that will house all electrical parts other than the power-supply cord or the terminal pins.

5.2 An appliance 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.

5.3 The following factors shall be considered when determining the acceptability of magnesium and nonmetallic enclosure materials. For a nonmetallic enclosure, all of these factors are considered with respect to thermal aging. The enclosure materials shall be resistant to:

- a) Mechanical damage,
- b) Impact,
- c) Moisture-absorption,
- d) Combustion,
- e) Corrosion, and
- f) Distortion at temperatures to which the material may be subjected under conditions of normal or abnormal use.

5.4 In addition to being considered with reference to factors as mentioned in 5.3, an enclosure of sheet metal shall be judged with respect to size and shape, thickness of metal, and acceptability for the application, considering the intended use of the appliance.

5.5 For unreinforced, flat surfaces in general, cast metal shall not be less than 1/8-in (3.2-mm) thick, except that malleable iron may be not less than 3/32 in (2.4 mm) and die-cast metal may be not less than 5/64-in (2.0-mm) thick. Corresponding thicknesses of not less than 3/32, 1/16 (1.6 mm), and 3/64 in (1.2 mm), respectively, may be acceptable if the surface under consideration is curved, ribbed, or otherwise reinforced, or if the shape or size, or both, of the surface is such that the necessary mechanical strength is provided.

5.6 An enclosure of sheet metal shall be judged with respect to its size and shape, the thickness of metal, and the application, considering the intended use of the complete appliance. The use of sheet steel less than 0.026-in (0.66-mm) thick if uncoated or 0.029-in (0.74-mm) thick if galvanized, or of nonferrous sheet metal less than 0.036-in (0.91-mm) thick, is not acceptable except at relatively small areas or for surfaces that are curved or otherwise reinforced.

5.7 Sheet metal to which a wiring system is to be connected in the field shall not be less than 0.032-in (0.81-mm) thick if uncoated steel, not be less than 0.034-in (0.86-mm) thick if galvanized steel, and not be less than 0.045-in (1.14-mm) thick if nonferrous.

5.8 The enclosure of a remotely controlled appliance shall prevent molten metal, burning insulation, flaming particles, or the like from falling on combustible materials, including the surface upon which the appliance is supported.

5.9 The requirement in 5.8 will necessitate that a switch, a relay, a solenoid, or the like be individually and completely enclosed, except for terminals, unless it can be shown that malfunction of the component would not result in a risk of fire, or there are no openings in the bottom of the appliance enclosure. It will also necessitate the use of a barrier of noncombustible material:

a) Under a motor unless:

- 1) The structural parts of the motor or of the appliance provide the equivalent of such a barrier;
- 2) The protection provided with the motor is such that no burning insulation or molten material falls to the surface that supports the appliance when the motor is energized under each of the following fault conditions:
 - i) Open main winding;
 - ii) Open starting winding;
 - iii) Starting switch short-circuited; and
 - iv) Capacitor of permanent-split capacitor motor short circuited. — the short-circuit is to be applied before the motor is energized, and the rotor is to be locked;

3) The motor is provided with a thermal motor protector – a protective device that is sensitive to temperature and current – that will prevent the temperature of the motor windings from exceeding 125°C (257°F) under the maximum load under which the motor will run without causing the protector to cycle and from exceeding 150°C (302°F) with the rotor of the motor locked; or

4) The motor complies with the requirements in the Standard for Overheating Protection for Motors, UL 2111, and the temperature of the motor winding will not exceed 150°C (302°F) during the first 72 h of operation with the rotor of the motor locked.

b) Under wiring, unless it complies with the VW-1 flame test.

5.10 The barrier mentioned in 5.9 shall be horizontal, and shall be located and have an area at least as illustrated in Figure 5.1. Openings for drainage, ventilation, and the like may be employed in the barrier, provided such openings will not permit molten metal, burning insulation, or the like to fall on combustible material.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM
UL COPYRIGHTED MATERIAL –

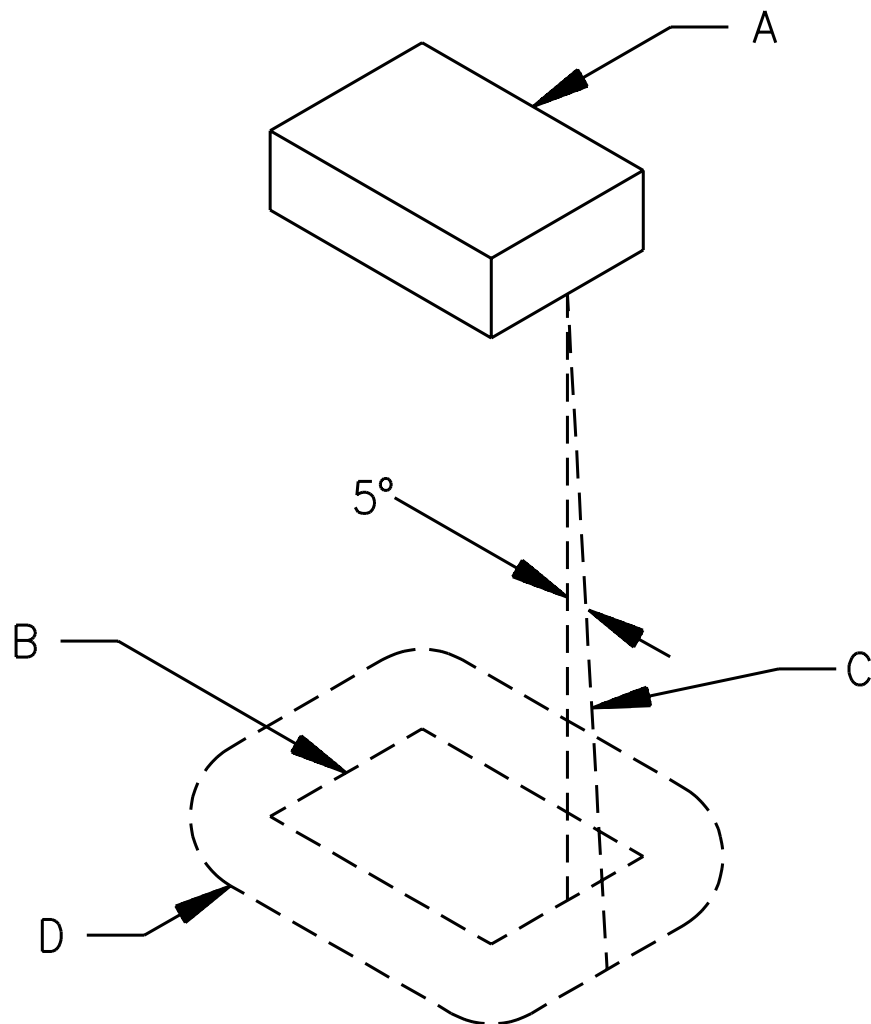
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

Figure 5.1
Location and extent of barrier



SA0604-1

NOTES –

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

B – Projection of outline of component on horizontal plane.

C – Inclined line that traces out minimum area of barrier. The line is always (1) tangent to the component, (2) 5° from the vertical, and (3) so oriented that the area traced out on a horizontal plane is maximum.

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

UL COPYRIGHTED MATERIAL –

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

5.11 A component of an appliance that is likely to need inspection, replacement, cleaning, or other servicing shall be as accessible as practicable, without:

- a) Using a special tool – a tool available only to service personnel – or
- b) Moving the appliance after installation as intended.

5.12 A door or a cover of an enclosure that provides access to any overload-protective device that requires resetting or renewal shall be hinged or equivalently attached.

5.13 Means shall be provided for holding the door or cover over a fuseholder in a closed position, and the door or cover shall be tight-fitting.

5.14 The bulb and capillary tube of a thermostat shall be protected against mechanical damage if such damage of the tube or bulb may result in a risk of fire.

6 Handles

6.1 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.

6.2 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.

6.3 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 release. This will usually require that the release mechanism not be associated with the gripping area of the handle.

7 Provision for Mounting

7.1 The enclosure of an appliance that is intended for permanent connection to the power supply shall be provided with means for mechanical mounting as intended, if applicable, and shall be furnished with any necessary fittings such as brackets, hangers, or the like.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM
UL COPYRIGHTED MATERIAL –

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

8 Mechanical Assembly

8.1 An appliance shall be assembled so that it will not be adversely affected by the vibration of normal operation. Brush caps shall be tightly threaded or otherwise protected against loosening.

8.2 A switch other than a through-cord switch, a lampholder, a motor-attachment plug, and similar components shall be mounted securely, and shall be prevented from turning or shifting. See 8.4.

Exception No. 1: A switch need not be prevented from turning if all four of the following conditions are met:

- a) The switch is a plunger or other type that does not tend to rotate when operated – a toggle switch is considered to be subject to forces that tend to rotate the switch during normal operation of the switch;*
- b) The means of mounting the switch makes it unlikely that operation of the switch will loosen it;*
- c) Spacings are not reduced below the minimum acceptable values if the switch does rotate; and*
- d) Normal operation of the switch is by mechanical means rather than direct contact by persons.*

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

8.3 An uninsulated live part shall be secured to the base or mounting surface so that it will be prevented from turning or shifting in position if such movement may result in a reduction of spacings below the minimum acceptable values specified in Spacings, Section 24.

8.4 The means for preventing the turning mentioned in 8.2 and 8.3 is to consist of more than friction between surfaces – for example, a properly applied lock washer is an acceptable means for preventing a small stem-mounted switch or other device having a single-hole mounting means from turning.

8.5 A cord-connected appliance that may be laid on combustible material shall be provided with a stand upon which it may be placed when not in use, unless the temperatures attained by the appliance during the Temperature Test, Section 32, do not exceed the surface temperatures specified in Table 32.1.

8.6 The stand required by 8.5 may be a separate device or integral to the appliance.

9 Protection Against Corrosion

9.1 An iron or steel part shall be protected against corrosion by painting, galvanizing, plating, or other equivalent means, if corrosion of the unprotected part would be likely to result in the risk of fire, electric shock, or injury to persons.

Exception No. 1: A sheet-steel surface within an appliance need not be protected against corrosion if 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 considered.

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

Exception No. 3: A sheath employed on a heating element operating in air and a terminal part attached directly to a heating element need not be protected against corrosion.

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

10 Accessibility of Uninsulated Live Parts

10.1 Electrical parts of an appliance shall be located or enclosed so that protection against unintentional contact with uninsulated live parts will be provided. Insulated brush caps are not required to be additionally enclosed.

10.2 During the examination of an appliance in connection with the requirements in 10.1, a part of the outer enclosure that may be removed, without the use of tools, by the user of the appliance to permit the attachment of accessories, to allow access to means for making operating adjustments, or for another reason is to be disregarded – that is, it will not be assumed that the part in question affords protection against electric shock.

10.3 An opening anywhere in the enclosure of a hand-supported appliance or in any portion of an appliance hand-held in normal use is acceptable if a probe as illustrated in Figure 10.1, when inserted point first as far as possible into the opening, does not enter the opening for a distance of more than 1/8 in (3.2 mm) and does not touch any uninsulated live part or film-coated wire.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM
UL COPYRIGHTED MATERIAL –

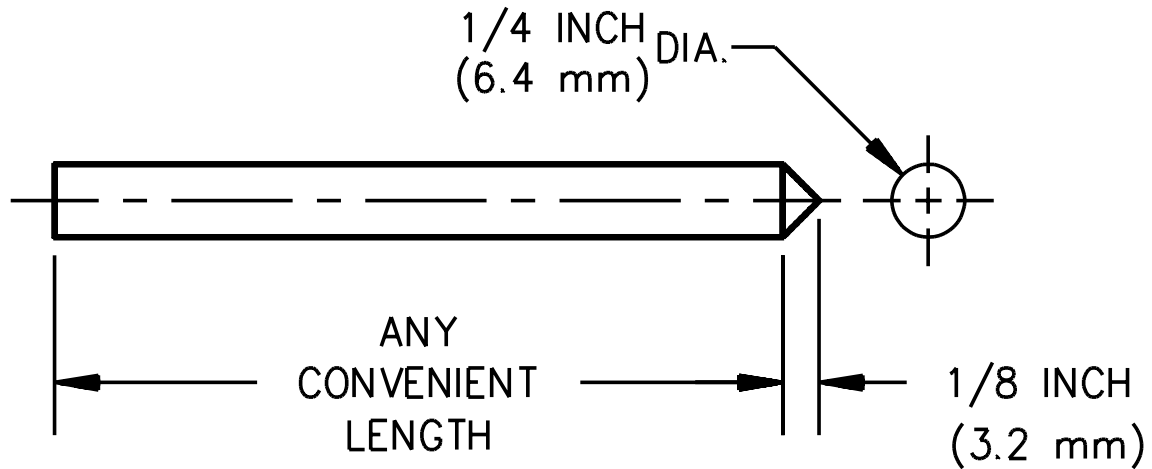
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

Figure 10.1
Probe for hand-supported enclosure



PA190

10.4 In the enclosure of an appliance other than as described in 10.3:

a) An opening that will not permit entrance of a 3/4-in (19.1-mm) diameter rod is acceptable if:

- 1) A probe as illustrated in Figure 10.2 cannot be made to touch any uninsulated live part when inserted through the opening, and
- 2) A probe as illustrated in Figure 10.3 cannot be made to touch film-coated wire when inserted through the opening.

b) An opening that will permit entrance of a 3/4-in diameter rod is acceptable under the conditions described in 10.5 and illustrated in Figure 10.4.

Document Was Downloaded By Rice, Shi SHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM
UL COPYRIGHTED MATERIAL -

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

Figure 10.2
Probe for uninsulated live part

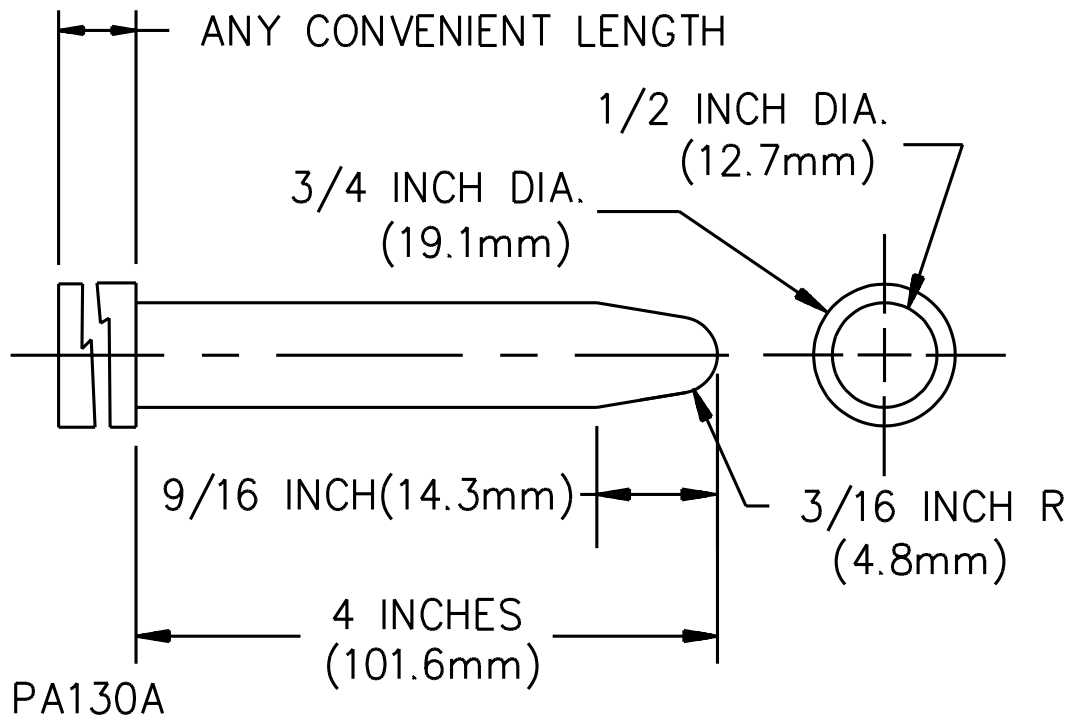
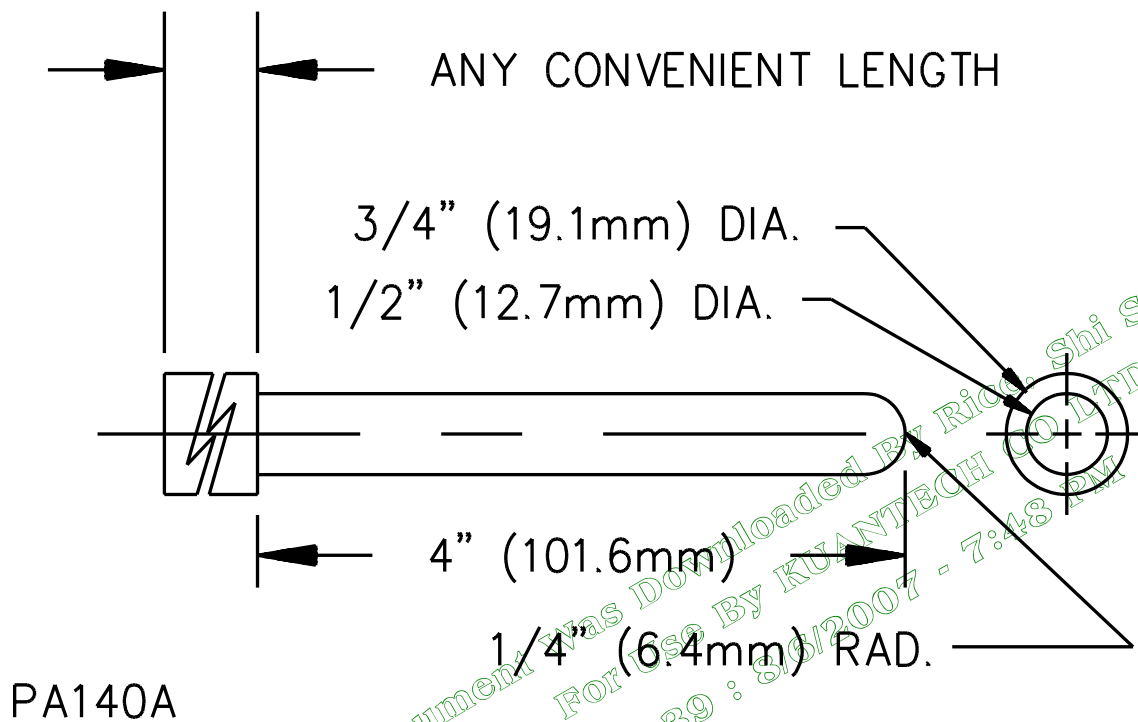


Figure 10.3
Probe for film-coated wire



UL COPYRIGHTED MATERIAL -

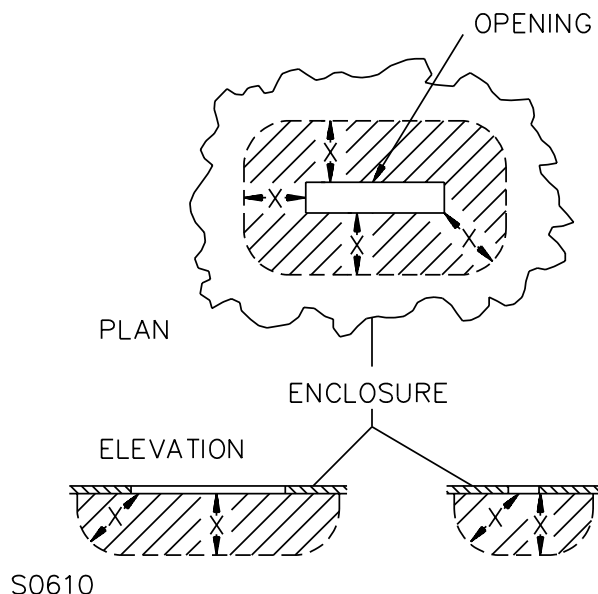
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

Figure 10.4
Opening in enclosure



NOTE – Proportions exaggerated for clarity.

10.5 The opening illustrated in Figure 10.4 is acceptable if, within the enclosure, there is no uninsulated live part or film-coated wire less than X distance from the perimeter of the opening, as well as within the volume generated by projecting the perimeter distance X normal to its plane. X equals five times the diameter of the largest round rod that can be inserted through the opening, but not less than 4 in (102 mm). In evaluating an opening, any barrier located within the volume usually is ignored unless it intersects the boundaries of the volume in a continuous, closed line.

11 Supply Connections

11.1 Permanently connected appliance

11.1.1 General

11.1.1.1 Except as noted in 14.1.2, an appliance intended for permanent connection to the power supply shall have provision for connection of one of the wiring systems that would be acceptable for the appliance.

11.1.1.2 A stationary appliance may be acceptable if provided with not more than 8 ft (2.44 m) of Type S, SO, ST, or STO cord and an attachment plug for supply connection. The investigation of such a feature is to include consideration of the intended use of the appliance and the necessity of having it readily detachable from its source of supply by means of a plug.

UL COPYRIGHTED MATERIAL –

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

11.1.2 Terminal compartment

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

11.1.2.2 A terminal compartment intended for connection of a supply raceway shall be attached to the appliance so as to be prevented from turning.

11.1.3 Wiring terminals and leads

11.1.3.1 A permanently connected appliance shall be provided with wiring terminals for the connection of conductors having an ampacity acceptable for the appliance; or the appliance shall be provided with leads for such connection.

11.1.3.2 A field-wiring terminal is considered to be a terminal to which a wire may be connected in the field, unless the wire and a means of making the connection – a pressure terminal connector, soldering lug, soldered loop, crimped eyelet, or the like – that is factory-assembled to the wire are provided as a part of the appliance.

11.1.3.3 An appliance equipped with terminals or leads for field connection of power-supply conductors shall be provided with a terminal or lead that is located in the field-wiring area for connection of an equipment-grounding conductor. See 11.1.3.4 and 11.1.3.5.

11.1.3.4 A lead intended for field connection of an equipment-grounding conductor shall not be smaller than the wire to which it is to be connected in accordance with the National Electrical Code, ANSI/NFPA 70.

11.1.3.5 A terminal intended solely for connection of an equipment-grounding conductor shall be capable of securing a conductor of the size acceptable for the application, in accordance with the National Electrical Code, ANSI/NFPA 70.

11.1.3.6 A wiring terminal shall be provided with an acceptable pressure terminal connector securely fastened in place— for example, firmly bolted, or held by a screw.

Exception No. 1: A soldering lug may be used.

Exception No. 2: 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 place.

11.1.3.7 A wiring terminal shall be prevented from turning.

11.1.3.8 The free length of a lead inside an outlet box or wiring compartment shall be 6 in (150 mm) or more if the lead is intended for field connection to an external circuit.

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

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

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 or 18 AWG (1.3 or 0.82 mm²) conductor. See 11.1.3.10.

11.1.3.10 According to the National Electrical Code, ANSI/NFPA 70, 14 AWG (2.1 mm²) is the smallest conductor that may be used for branch-circuit wiring, and, therefore, is the smallest conductor that may be anticipated at a terminal for connection of a power-supply wire.

11.1.3.11 A wire-binding screw shall thread into metal.

11.1.3.12 A terminal plate tapped for a wire-binding screw shall be of metal not less than 0.050-in (1.27-mm) thick and shall not have less than two full threads in the metal.

Exception: An alloy plate may be not less than 0.030-in (0.76-mm) thick if the tapped threads have equivalent mechanical strength.

11.1.3.13 A terminal plate formed from stock having the thickness specified in 11.1.3.12 may have the metal extruded at the tapped hole to provide two full threads for the binding screw.

11.1.3.14 Upturned lugs or a cupped washer shall be capable of retaining a supply conductor of the size specified in 11.1.3.1 under the head of the screw or washer.

11.1.4 Identified terminals and leads

11.1.4.1 A permanently connected appliance rated 125 or 125/250 V (3-wire) or less and employing a lampholder of the Edison-screw-shell type, or a single-pole switch or overcurrent-protective device other than an automatic control without a marked off position, shall have one terminal or lead identified for the connection of the grounded conductor of the supply circuit.

11.1.4.2 A terminal intended for the connection of a grounded supply conductor shall be of or plated with metal that is 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.

11.1.4.3 A lead intended for the connection of a grounded power-supply conductor shall be finished white or gray color and shall be readily distinguishable from the other leads.

Document Was Downloaded By Rice, Shi CHIMISHENG
For Use By KUANTECH CO LTD
12039 : 8/6/2007 - 7:48 PM
UL COPYRIGHTED MATERIAL -

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub

11.2 Cord-connected appliances

11.2.1 Cords and plugs

11.2.1.1 A cord-connected appliance shall be provided with an attached flexible cord and an attachment plug for connection to the power supply or shall have male pin terminals that accommodate a cord set intended for use with the appliance.

11.2.1.2 Except as noted in 11.2.1.3, a supply cord shall be Type HSJ or heavier duty heater cord.

11.2.1.3 A supply cord on an appliance that does not employ any heating elements, or does not attain surface temperatures that exceed 121°C (250°F) during the Temperature Test, Section 32, may be:

- a) Type SJ, SJO, SJT, SPT-2, or the equivalent for a household appliance, or
- b) Type S, SJ, SJO, SJT, SO, ST, STO, or the equivalent for a commercial appliance.

11.2.1.4 The length of a supply cord for a hand-supported appliance shall not be less than 8 ft (2.4 m). For all other types of appliances, the length of the supply cord shall not be less than 6 ft (1.8 m).

11.2.1.5 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.

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

11.2.1.7 If a dual voltage appliance 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.

11.2.1.8 Supplementary insulation, if employed on a supply cord, shall not:

- a) Extend more than 1/2 in (13 mm) outside the appliance unless additional mechanical protection is provided,
- b) Adversely affect the means for providing strain relief, or
- c) Fray or unravel.

11.2.1.9 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 provided with a manually operated, line-connected, single-pole switch for appliance on/off operation, or an Edison-base lampholder shall be of the polarized or grounding type.

UL COPYRIGHTED MATERIAL -

NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM



Documents

Document Sharing Hub