

UL781

ADOPTION NOTICE

UL781, "Portable Electric Lighting Units for Use In Hazardous (Classified) Locations," was adopted on October 3, 1994 for use by the Department of Defense (DoD). Proposed changes by DoD activities must be submitted to the DoD Adopting Activity: Commander, Naval Sea Systems Command, SEA 03R42, 2531 Jefferson Davis Highway, Arlington, VA 22242-5160. DoD activities may obtain copies of this standard from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. The private sector and other Government agencies may purchase copies from the Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

Custodians:

Army - ME

Navy - SH

Air Force - 99

Adopting Activity

Navy - SH

FSC 6230

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

February 6, 1997 – UL 781

tr1

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

UL Standard for Safety
for

Portable Electric Lighting Units for Use in Hazardous (Classified) Locations, UL 781

Sixth Edition, Dated July 28, 1993

Revisions: This Standard contains revisions through and including February 6, 1997.

A change is indicated by a note following the affected item. The note is preceded and followed by an asterisk.

The revised requirements are substantially in accordance with UL's Bulletin on this subject dated July 10, 1996. The bulletin is now obsolete and may be discarded.

The revisions dated February 6, 1997 include a reprinted title page (page 1) for this Standard.

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 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 WordPerfect, Envoy, and Standards-on-Diskette. 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 a Standards-on-Diskette only if it is 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.

Standards-on-Diskette purchasers 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 a Standard-on-Diskette on the purchaser's computer system.

If a single-user version Standards-on-Diskette 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. The original distribution diskette should be stored in a safe place.

If a multiple-user version Standards-on-Diskette 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. The number of concurrent users shall not exceed the number of users authorized for the Standards-on-Diskette version. The original distribution diskette should be stored in a safe place.

Standards-on-Diskette 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 a Standards-on-Diskette. Only one copy of the Standard may be printed for each authorized user of a multiple-user version of a Standards-on-Diskette. An employee of an organization purchasing a Standard-on-Diskette can make a copy of the page or pages being viewed for their own fair and/or practical internal use. Because of differences in the computer/software/printer setup used by UL and those of Standards-on-Diskette purchasers, the printed copy obtained by a purchaser may not look exactly like the on-line screen view or the printed Standard.

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, Recognition, and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

Copyright 1997 Underwriters Laboratories Inc.

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

Page	Date
tr1 – tr4	February 6, 1997
1	July 28, 1993 (Reprinted: February 6, 1997)
2	July 5, 1996
3, 4	July 28, 1993
5, 6, 6A, 6B	July 5, 1996
7 – 9	July 28, 1993
10, 11	July 29, 1993
12	July 28, 1993
13	July 29, 1993
14, 15	July 28, 1993
16	May 10, 1994
17	July 28, 1993
18	July 29, 1993
19	February 6, 1997
20	July 29, 1993
21, 22	July 28, 1993
23	July 29, 1993
24	February 2, 1994
24A, 24B	July 5, 1996

No Text on This Page

JULY 28, 1993

(Title Page Reprinted: February 6, 1997)



1

UL 781**Standard for**
**Portable Electric Lighting Units for Use in
Hazardous (Classified) Locations**

The first through fourth editions were titled "Portable Electric Lighting Units for Use in Hazardous Locations, Class I, Groups C and D, and Class II, Group G."

First Edition – August, 1965
Second Edition – September, 1970
Third Edition – July, 1972
Fourth Edition – May, 1978
Fifth Edition – December, 1985

Sixth Edition**July 28, 1993**

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated July 28, 1993. 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 C33.79-1972, July 11, 1972
Approved as ANSI/UL 781-1977, November 9, 1977
Approved as ANSI/UL 781-1985, May 29, 1985
Approved as ANSI/UL 781-1992, July 6, 1992

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.

ISBN 1-55989-297-8

COPYRIGHT © 1978, 1997 UNDERWRITERS LABORATORIES INC.

CONTENTS**FOREWORD****INTRODUCTION**

1 Scope	5
2 General	5
2A Class I, Zone, and Group Equivalency	5
3 Components	6

CONSTRUCTION

4 General	6
5 Lamp Enclosure	6
6 Protection Of Glass Parts	7
7 Joints In Lamp Enclosure	7
8 Holes in Enclosure	10
9 Shaft Openings	10
10 Ballast and Starter	10
11 Seal Between Lamp and Terminal Compartments	10
12 Supply Connections	11
13 Hook and Handle	13
14 Casters and Wheels	13
15 External Metal Parts	13
16 Grounding	13
17 Switches	14
18 Spacings	14
19 Protection Against Corrosion	16
20 Materials Applied to Joint Surfaces	16

PERFORMANCE

21 Temperature Test	16
22 Thermal Shock Test	17
23 Explosion Tests	17
24 Hydrostatic Pressure Test	18
25 Grain-Dust Penetration Test	19
26 Accelerated Aging Test of Bushing	19
27 Thread-Wear Test	20
28 Strain-Relief Test	20
29 Rough-Usage Test	20
30 Drop Test	21
31 Impact Test	21
32 Overturning Test	21
33 Stability Test	21
34 Resistance Test	22

24.2 The hydrostatic test pressure for an enclosure of a lighting unit with venting sections is to be based on the maximum explosion pressure obtained with 75 percent of the vented section sealed when this series of explosion tests is required by 23.4.

24.3 The hydrostatic pressure is to be gradually increased until the required internal pressure is reached. Gaskets or equivalent means may be employed to prevent leakage of water during application of pressure.

24.3 revised July 29, 1993

25 Grain-Dust Penetration Test

25.1 A lighting unit for use in Class II, Groups F and G locations shall be exposed to circulating dust-air atmospheres to determine whether or not the unit is dust-tight. During this test, there shall be no entrance of dust into the lamp enclosure or the terminal enclosure, if constructed as described in 12.2.2.1.

25.2 Grain dust that has passed through a USA Standard 150-micron (100-mesh) wire cloth complying with the dimensional requirements in the Standard Specification for Wire-Cloth Sieves for Testing Purposes, ASTM E11-87, is to be used.

25.3 The lighting unit is to be installed in a test chamber of a size sufficient to prevent other than normal heating and to enable free circulation of dust-air atmospheres around the unit. The test chamber is to be provided with a cover and with dust-air inlet and outlet connections. The unit is to be operated intermittently at maximum rated wattage and voltage while exposed to the grain dust-air atmosphere that is produced by auxiliary apparatus and introduced into the test chamber. The test is to be continued for at least 6 cycles of heating and cooling (lamp on and off) covering at least 30 hours while the device is continuously exposed to the circulating grain dust-air atmospheres.

25.4 The test is to be conducted at an ambient temperature of 10 – 40°C (50 – 104°F) and a relative humidity of 40 – 60 percent.

25.4 added July 29, 1993

26 Accelerated Aging Test of Bushing

26.1 A molded-rubber bushing provided at the cord entrance to the terminal enclosure shall not have a change in hardness of more than five Type A durometer units as a result of exposure in an air oven for 70 hours at 100°C ±2°C (212°F ±3.6°F).

26.1 revised February 6, 1997

26.2 When possible, the complete molded-rubber bushing is to be tested. The hardness of the rubber is to be determined as the average of five readings with a gauge, such as a Rex hardness gauge or Shore durometer. The bushing is then to be exposed in an air oven for 70 hours at 100°C ±2°C (212°F ±3.6°F).

26.2 revised February 6, 1997

26.3 **Deleted February 6, 1997**

26.4 The bushing or specimen is to be removed from the oven and then cooled at room temperature for at least 4 hours. The hardness is to be determined again as the average of five readings. The difference between the original average hardness reading and the average reading taken after exposure in an air oven is the change in hardness.

26.4 revised February 6, 1997

27 Thread-Wear Test

27.1 A threaded joint between a metal and a nonmetallic part of the lamp and terminal enclosures that may be disturbed during intended maintenance or use of the lighting unit shall not show appreciable wear of threads on the nonmetallic part, and shall freely engage with a close fit, after 1000 cycles of assembly and disassembly.

28 Strain-Relief Test

28.1 The strain relief at the point of supply cord entry into the terminal enclosure of the lighting unit and a transformer or ballast enclosure marked in accordance with 36.6 (b) shall be subjected to the strain-relief test described in 28.2 and 28.3. As a result of the test, there shall not be:

- a) A displacement of 3/32 inch (2.4 mm) or more of the conductors, conductor insulation, or outer jacket of the flexible cord;
- b) Any damage to the cord insulation, such as a cut, rip, or tear; or
- c) Any damage to the portable lighting unit that could adversely affect compliance with the requirements in this standard.

28.1 revised July 29, 1993

28.2 The portable lighting unit is to be tested with each size of Type S, SO, ST, or STO flexible cord as marked on the unit in accordance with 36.5. The cord is to be cut cleanly at a right angle to its major axis and installed in the enclosure under test so that the end of the jacket is located in its intended position as if the conductors were to be connected to the terminals. However, there is to be no stripping of insulation and no connection to terminals. The flush position of conductor, insulation, fillers, and jacket is intended to provide an indicating means of cord displacement after application of the test force.

28.3 The lighting unit, and transformer or ballast enclosure, if provided, is to be mounted in a fixed position and a direct pull is to be applied to the external extension of the cord. The strain relief at each point of supply cord entry into an enclosure shall withstand a direct pull of:

- a) For the lighting unit terminal enclosure, 90 pounds-force (400 N) for 1 minute, and
- b) For a transformer or ballast enclosure, 30 pounds-force (133 N) for 1 minute.

28.3 revised July 29, 1993

29 Rough-Usage Test

29.1 The lamp and terminal enclosures and the cord clamp of a lighting unit not provided with a base or stand shall not be impaired nor shall threaded engagements be loosened during the rough-usage test described in 29.2.

29.2 The lighting unit is to be suspended in a vertical position, with the cord clamp up, by a short loop formed from a heavy solid wire. The power-supply cord is to be removed from the lighting unit and one end of the wire loop is to be connected to the lighting unit at its cord clamp. The other end of the wire loop is to be extended

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

UL Standard for Safety
for

Portable Electric Lighting Units for Use in Hazardous (Classified) Locations, UL 781

Sixth Edition, Dated July 28, 1993

Revisions: This Standard contains revisions through and including July 5, 1996.

A change is indicated by a note following the affected item. The note is preceded and followed by an asterisk.

The new requirements are substantially in accordance with UL's Bulletin on this subject dated March 15, 1996. The bulletin is now obsolete and may be discarded.

The revisions dated July 5, 1996 include a reprinted title page (page 1) for this Standard.

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 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 WordPerfect, Envoy, and Standards-on-Diskette. 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 a Standards-on-Diskette only if it is 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.

Standards-on-Diskette purchasers 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 a Standard-on-Diskette on the purchaser's computer system.

If a single-user version Standards-on-Diskette 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. The original distribution diskette should be stored in a safe place.

If a multiple-user version Standards-on-Diskette 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. The number of concurrent users shall not exceed the number of users authorized for the Standards-on-Diskette version. The original distribution diskette should be stored in a safe place.

Standards-on-Diskette 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 a Standards-on-Diskette. Only one copy of the Standard may be printed for each authorized user of a multiple-user version of a Standards-on-Diskette. An employee of an organization purchasing a Standard-on-Diskette can make a copy of the page or pages being viewed for their own fair and/or practical internal use. Because of differences in the computer/software/printer setup used by UL and those of Standards-on-Diskette purchasers, the printed copy obtained by a purchaser may not look exactly like the on-line screen view or the printed Standard.

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, Recognition, and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

Copyright 1996 Underwriters Laboratories Inc.

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

Page	Date
tr1 – tr4	July 5, 1996
1	July 28, 1993 (Reprinted: July 5, 1996)
2	July 5, 1996
3, 4	July 28, 1993
5, 6, 6A, 6B	July 5, 1996
7 – 9	July 28, 1993
10, 11	July 29, 1993
12	July 28, 1993
13	July 29, 1993
14, 15	July 28, 1993
16	May 10, 1994
17	July 28, 1993
18 – 20	July 29, 1993
21, 22	July 28, 1993
23	July 29, 1993
24	February 2, 1994
24A, 24B	July 5, 1996

No Text on This Page

JULY 28, 1993

(Title Page Reprinted: July 5, 1996)



1

UL 781

Standard for

**Portable Electric Lighting Units for Use in
Hazardous (Classified) Locations**

The first through fourth editions were titled "Portable Electric Lighting Units for Use in Hazardous Locations, Class I, Groups C and D, and Class II, Group G."

First Edition – August, 1965
Second Edition – September, 1970
Third Edition – July, 1972
Fourth Edition – May, 1978
Fifth Edition – December, 1985

Sixth Edition

July 28, 1993

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated July 28, 1993. 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 C33.79-1972, July 11, 1972
Approved as ANSI/UL 781-1977, November 9, 1977
Approved as ANSI/UL 781-1985, May 29, 1985
Approved as ANSI/UL 781-1992, July 6, 1992

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.

ISBN 1-55989-297-8

COPYRIGHT © 1978, 1996 UNDERWRITERS LABORATORIES INC.

CONTENTS**FOREWORD****INTRODUCTION**

1 Scope	5
2 General	5
2A Class I, Zone, and Group Equivalency	5
3 Components	6

CONSTRUCTION

4 General	6
5 Lamp Enclosure	6
6 Protection Of Glass Parts	7
7 Joints In Lamp Enclosure	7
8 Holes in Enclosure	10
9 Shaft Openings	10
10 Ballast and Starter	10
11 Seal Between Lamp and Terminal Compartments	10
12 Supply Connections	11
13 Hook and Handle	13
14 Casters and Wheels	13
15 External Metal Parts	13
16 Grounding	13
17 Switches	14
18 Spacings	14
19 Protection Against Corrosion	16
20 Materials Applied to Joint Surfaces	16

PERFORMANCE

21 Temperature Test	16
22 Thermal Shock Test	17
23 Explosion Tests	17
24 Hydrostatic Pressure Test	18
25 Grain-Dust Penetration Test	19
26 Accelerated Aging Test of Bushing	19
27 Thread-Wear Test	20
28 Strain-Relief Test	20
29 Rough-Usage Test	20
30 Drop Test	21
31 Impact Test	21
32 Overturning Test	21
33 Stability Test	21
34 Resistance Test	22

INTRODUCTION

1 Scope

1.1 These requirements cover portable electric lighting units for indoor use in hazardous (classified) locations, Class I, Division 1, Groups C and D, and Class II, Division 1, Groups F and G, in accordance with the National Electrical Code, NFPA 70.

1.1.1 These requirements also cover explosion-proof electrical equipment for use in Class I, Zone 1, Groups IIA, IIB, and IIC hazardous (classified) locations.

1.1.1 added July 5, 1996

1.2 These requirements cover portable lighting units for use only under the following atmospheric conditions:

- a) A minimum ambient temperature of minus 25°C (minus 13°F),
- b) An oxygen concentration not greater than 21 percent by volume, and
- c) A nominal barometric pressure of one atmosphere.

1.3 A product that contains features, characteristics, components, materials, or systems new or different from those in use when the standard was developed, 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 level of safety for the user of the product as originally anticipated by the intent of this standard.

2 General

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

2.2 A portable lighting unit shall also comply with the applicable requirements for a similar device for use in ordinary locations.

2.3 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.

2A Class I, Zone, and Group Equivalency

2A.1 Class I, Zone 1, Group IIA

2A.1.1 Explosion-proof electrical equipment intended to be marked in accordance with 36.17 shall comply with all the requirements for explosion-proof electrical equipment for use in Class I, Group D hazardous (classified) locations.

2A.1.1 added July 5, 1996

2A.2 Class I, Zone 1, Group IIB

2A.2.1 Explosion-proof electrical equipment intended to be marked in accordance with 36.18 shall comply with all the requirements for explosion-proof electrical equipment for use in Class I, Group C hazardous (classified) locations.

2A.2.1 added July 5, 1996

2A.3 Class I, Zone 1, Group IIB plus Hydrogen

2A.3.1 Explosion-proof electrical equipment intended to be marked in accordance with 36.19 shall comply with all the requirements for explosion-proof electrical equipment for use in Class I, Group B hazardous (classified) locations.

2A.3.1 added July 5, 1996

2A.4 Class I, Zone 1, Group IIC

2A.4.1 Explosion-proof electrical equipment intended to be marked in accordance with 36.20 shall comply with all the requirements for explosion-proof electrical equipment for use in both Class I, Group A and Class I, Group B hazardous (classified) locations.

2A.4.1 added July 5, 1996

3 Components

3.1 Except as indicated in 3.2, a component of a product covered by this standard shall comply with the requirements for that component.

3.2 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.

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

3.4 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.

CONSTRUCTION

4 General

4.1 Unless constructed as specified in 12.2.1.1 or 12.2.2.1, a portable lighting unit shall have a lamp compartment sealed from a terminal compartment enclosing the provision for connection of a 3-conductor cord. A portable lighting unit shall be of the hand-held type or shall be mounted on a movable base or stand with or without casters or wheels.

4.1 revised February 2, 1994

5 Lamp Enclosure

5.1 Unless as specified in 5.4 and 5.5, a lamp enclosure, other than a light-transmitting part, shall be made of iron, steel, copper, brass, bronze, aluminum, or an alloy containing not less than 80 percent aluminum. A metal such as zinc, magnesium, or their alloys, shall not be used.

5.2 A cast-metal part shall not be less than 1/8 inch (3.2 mm) thick.

5.3 A light-transmission section of a lamp enclosure shall be glass.

5.4 A nonmetallic material forming a part of a lamp enclosure shall be sufficiently strong and rigid to resist the abuses likely to be encountered during intended use.

5.5 Among the factors that are to be taken into consideration when determining the acceptability of a nonmetallic material are:

- a) Mechanical strength,
- b) Resistance to impact,
- c) Moisture-absorptive properties,
- d) Resistance to fungus,
- e) Combustibility,
- f) Resistance to repeated explosions,
- g) Resistance to solvents as covered by the hazardous location group or groups under consideration,
- h) Resistance to accumulation of electrostatic charges, and
- i) Resistance to distortion at temperatures to which the enclosure may be subjected under conditions of normal or abnormal use.

All of these factors are to be considered with respect to thermal aging.

No Text on This Page

36.17 Equipment that has been investigated and found to comply with the requirements for Class I, Group D locations may additionally or alternatively be marked Class I, Zone 1, Group IIA.

36.17 added July 5, 1996

36.18 Equipment that has been investigated and found to comply with the requirements for Class I, Group C locations may additionally or alternatively be marked Class I, Zone 1, Group IIB.

36.18 added July 5, 1996

36.19 Equipment that has been investigated and found to comply with the requirements for Class I, Group B locations may additionally or alternatively be marked Class I, Zone 1, Group IIB plus Hydrogen.

36.19 added July 5, 1996

36.20 Equipment that has been investigated and found to comply with the requirements for both Class I, Group A, and Class I, Group B locations may additionally or alternatively be marked Class I, Zone 1, Group IIC.

36.20 added July 5, 1996

36.21 Equipment marked Group IIB may also be marked Group IIA.

36.21 added July 5, 1996

36.22 Equipment marked Group IIC may also be marked Group IIA, Group IIB, or both Group IIA and Group IIB.

36.22 added July 5, 1996

No Text on This Page

**Underwriters Laboratories Inc.®**A not-for-profit organization dedicated to public safety
and committed to quality service**May 10, 1994****Revision pages for****Standard for****Portable Electric Lighting Units For Use In Hazardous (Classified) Locations****UL 781, Sixth Edition**

Attached to this transmittal notice is a revision of the Sixth edition of UL 781.

A CHANGE ON A PAGE DATED MAY 10, 1994 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE REVISED REQUIREMENTS ARE NOW IN EFFECT.

Attention is directed to the note on the title page of this standard outlining the procedure to be followed to retain the approved text of ANSI/UL 781-1992.

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	July 28, 1993 (Reprinted: May 10, 1994)
2 – 5	July 28, 1993
6	February 2, 1994
7 – 9	July 28, 1993
10, 11	July 29, 1993
12	July 28, 1993
13	July 29, 1993
14, 15	July 28, 1993
16	May 10, 1994
17	July 28, 1993
18 – 20	July 29, 1993
21, 22	July 28, 1993
23	July 29, 1993
24	February 2, 1994

**Documents**

Document Sharing Hub

JULY 28, 1993
(Title Page Reprinted: May 10, 1994)



1

UL 781

Standard for

**Portable Electric Lighting Units for Use in
Hazardous (Classified) Locations**

First Edition – August, 1965
Second Edition – September, 1970
Third Edition – July, 1972
Fourth Edition – May, 1978
Fifth Edition – December, 1985

The first through fourth editions were titled "Portable Electric Lighting Units for Use in Hazardous Locations, Class I, Groups C and D, and Class II, Group G."

Sixth Edition

July 28, 1993

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated July 28, 1993. 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 C33.79-1972, July 11, 1972
Approved as ANSI/UL 781-1977, November 9, 1977
Approved as ANSI/UL 781-1985, May 29, 1985
Approved as ANSI/UL 781-1992, July 6, 1992

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 1-55989-297-8

COPYRIGHT © 1978, 1994 UNDERWRITERS LABORATORIES INC.



Documents

Document Sharing Hub

CONTENTS**FOREWORD****INTRODUCTION**

1 Scope	5
2 General	5
3 Components	5

CONSTRUCTION

4 General	6
5 Lamp Enclosure	6
6 Protection of Glass Parts	7
7 Joints in Lamp Enclosure	7
8 Holes in Enclosure	10
9 Shaft Openings	10
10 Ballast and Starter	10
11 Seal Between Lamp and Terminal Compartments	10
12 Supply Connections	11
13 Hook and Handle	13
14 Casters and Wheels	13
15 External Metal Parts	13
16 Grounding	13
17 Switches	14
18 Spacings	14
19 Protection Against Corrosion	16
20 Materials Applied to Joint Surfaces	16

PERFORMANCE

21 Temperature Test	16
22 Thermal Shock Test	17
23 Explosion Tests	17
24 Hydrostatic Pressure Test	18
25 Grain-Dust Penetration Test	19
26 Accelerated Aging Test of Bushing	19
27 Thread-Wear Test	20
28 Strain-Relief Test	20
29 Rough-Usage Test	20
30 Drop Test	21
31 Impact Test	21
32 Overturning Test	21
33 Stability Test	21
34 Resistance Test	22