

UL 1598A

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Supplemental Requirements for Luminaires for Installation on Marine Vessels

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UL Standard for Safety for Supplemental Requirements for Luminaires for Installation on Marine Vessels,
UL 1598A

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Revisions: This Standard contains revisions through and including August 22, 2002.

Text that has been changed in any manner is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The new and revised requirements are substantially in accordance with UL's Bulletin(s) on this subject dated November 21, 2001. The bulletin(s) is now obsolete and may be discarded.

The revisions dated August 22, 2002 include a reprinted title page (page1) for this Standard.

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

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

Page	Date
1-14	August 22, 2002
A1-A2	August 22, 2002

December 4, 2000
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1

UL 1598A

**Standard for Supplemental Requirements for Luminaires for Installation
on Marine Vessels**

First Edition

December 4, 2000

The most recent designation of ANSI/UL 1598A as an American National Standard occurred on August 6, 2002.

This ANSI/UL Standard for Safety, which consists of the First edition with revisions through August 22, 2002, is under continuous maintenance, whereby each revision is ANSI approved upon publication. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Written comments are to be sent to the UL-RTP Standards Department, 12 Laboratory Dr., Research Triangle Park, NC 27709-3995.

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

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

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CONTENTS

FOREWORD	4
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INTRODUCTION

1 Scope	5
2 Glossary	5
3 General	6
3.1 Components	6
3.2 Units of measurement	6
3.3 Undated references	6

MECHANICAL CONSTRUCTION

4 Corrosion Protection	6
5 Openings	8
6 Joints and Gaskets	8
7 Means for Mounting	8
8 Glass and Lamp Support	9

ELECTRICAL CONSTRUCTION

9 General	9
10 Convenience Receptacles, Switches, and Fuses	9
11 Lampholders	10
12 Wiring and Conductors	10
13 Power Supply Connections	10

TEMPERATURE TEST

14 Normal Temperature Test	11
----------------------------------	----

ENVIRONMENTAL TESTS

15 Drivpage Test	11
16 Moisture Resistance Test	12
17 Mechanical Shock Test	12

MARKINGS

18 Markings	12
-------------------	----

APPENDIX A

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

FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

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

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

INTRODUCTION

1 Scope

1.1 These requirements are supplementary to other applicable requirements in the Standard for Luminaires, UL 1598. References to requirements in UL 1598 are in *italics* for easy identification.

1.1 revised August 22, 2002

1.2 These requirements apply to luminaires for installation on marine vessels utilizing grounded systems in accordance with the United States Coast Guard Electrical Engineering Regulations 46 CFR, Parts 110 – 113, Subchapter J and, insofar as it applies, the National Electrical Code, ANSI/NFPA 70, and the Recommended Practice for Electrical Installations on Shipboard, IEEE 45.

1.3 These requirements do not apply to marine lighting luminaires for use in hazardous locations, as defined in the National Electrical Code, ANSI/NFPA 70, emergency lighting marine luminaires, or low voltage marine luminaires (less than 50 volts) supplied solely by a battery, transformer, converter, or similar power supply source.

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

2 Glossary

2.1 For the purpose of this supplement, the following definitions apply:

2.2 **INSIDE DRIPPROOF-TYPE LUMINAIRE** – A luminaire intended for use on a marine vessel in an inside damp or wet location and subject to oil or water drippage.

2.3 **INSIDE-TYPE LUMINAIRE** – A luminaire intended for use on a marine vessel in an inside dry or damp location.

2.4 **OUTSIDE-TYPE LUMINAIRES** – A luminaire intended for use outside or in other severely wet locations on a marine vessel.

3 General

3.1 Components

3.1.1 Except as indicated in 3.1.2, a component of a product covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components used in the products covered by this Standard.

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.

MECHANICAL CONSTRUCTION

4 Corrosion Protection

4.1 All inside and outside surfaces of cast ferrous metal, sheet metal, or ferrous tubing shall comply with the following requirements:

- a) Inside-type – The corrosion protection means shall comply with the requirements of *Clause 2.6* in the Standard for Luminaires, UL 1598. A luminaire that complies with all of the Inside-Type requirements of this supplement shall be marked in accordance with Table 18.1, Item 1.1.
- b) Inside Dripproof-Type – The corrosion protection means shall comply with the requirements of *Clause 10.4.2* in the Standard for Luminaires, UL 1598. A luminaire that complies with all of the Inside Dripproof-Type requirements of this supplement shall be marked in accordance with Table 18.1, Item 1.2.
- c) Outside-Type (fresh water only) – The corrosion protection means shall comply with the requirements of *Clause 10.4.2* in the Standard for Luminaires, UL 1598. A luminaire that complies with all of the Outside-Type requirements for this supplement and has been evaluated only for fresh water shall be marked in accordance with Table 18.1, Item 1.3.

d) Outside-Type – The corrosion protection means shall comply with the Standard Test Method of Salt Spray (Fog) Testing, ASTM B117 for 200 hours. The material shall not show pitting, cracking, or other deterioration more severe than that resulting from a similar test on passivated AISI type 304 stainless steel. A luminaire that complies with all of the Outside-Type requirements of this supplement shall be marked in accordance with Table 18.1, Item 1.4.

4.1 revised August 22, 2002

4.2 All inside and outside surfaces of cast aluminum, sheet aluminum, or aluminum tubing shall comply with the following requirements:

a) Inside-Type or Inside Dripproof-Type – shall comply with the following, as applicable:

1) Unplated Sheet Aluminum – material shall be an alloy of the 5000 series as given in the Standard Specification for Aluminum-Alloy Sheet and Plate, ANSI/ASTM B209.

2) Unplated Cast or Machined Aluminum – material shall be one of the alloys included in Table 4.1.

3) Painted or Plated Aluminum – use of other aluminum alloys is not prohibited when they have an additional coating or plating corrosion protection means which complies with *Clause 10.4.2*, in the Standard for Luminaires, UL 1598.

4) Other unplated aluminum alloys equivalent in corrosion resistance to (1) or (2).

b) Outside-Type – shall comply with the following as applicable:

1) The unplated, plated, or painted aluminum alloy shall have a copper content of 0.4 percent or less; or

2) The unplated, plated, or painted aluminum alloy complies with the test described in 4.1(d).

4.2 revised August 22, 2002

Table 4.1
Aluminum alloys

Sand-cast	Permanent-mold cast	Die-cast	Machined bar and rod stock
353.0	356.0	360.0	5052
356.0	A356.0	A360.0	5056
A356.0	A357.0	A413.0	5456
A443.0	A443.0	C443.0	6061
B443.0	B443.0	518.0	
512.0	512.0		
514.0	535.0		
520.0			
710			

NOTE – These designations conform with those given in the specifications of the ANSI H35.1.

4.3 The use of other corrosion resistant materials such as silver, corrosion-resistant stainless steel, copper, brass, bronze, and copper-nickel alloys do not require any additional corrosion protection.

5 Openings

5.1 There shall be no openings in a luminaire except as indicated in 5.2 and 5.3.

5.2 An Inside-Type surface mounted luminaire shall have no openings in the wireway exposed to the mounting surface.

5.3 An Inside-Type surface mounted luminaire, 660 mm (26 inches) or less in length, shall have not more than two open mounting holes exposed to the mounting surface. Each hole shall be not larger than 6.4 by 12.7 mm (1/4 by 1/2 inch) or 10.2 mm (0.40 inch) in diameter. Each additional 610 mm (24 inches) of length or fraction thereof qualifies the luminaire for two additional mounting holes.

5.4 An Inside-Type recessed luminaire shall have no openings in the wireway that contains uninsulated live parts. A slot or louver located in the recessed portion of the enclosure shall not exceed 9.5 cm² (1-1/2 square inches) in area, and any other ventilating hole provided in the recessed portion of the enclosure shall not be more than 25.4 mm (1.0 inch) in diameter. The total area of ventilating openings shall not be more than 15 percent of the area of the surface in which they are located.

6 Joints and Gaskets

6.1 A seam or joint in a luminaire enclosure, for other than the Inside-Type, shall be provided with a gasket or shall be otherwise constructed to exclude oil or water drippage.

6.2 Gaskets relied upon to exclude oil or water drippage shall comply with the gasket requirements described in *Clause 10.4.5* in the Standard for Luminaires, UL 1598.

6.2 revised August 22, 2002

7 Means for Mounting

7.1 A luminaire shall be provided with a permanent mounting means.

7.2 A luminaire is not required to have a separate mounting means when it is intended to be mounted by holes that are drilled at the shipyard.

7.3 A luminaire that is intended for outlet box mounting shall be provided with the outlet box.

7.4 A pendant mounted luminaire shall be the rigid metal conduit stem-suspended type only.

7.5 A fluorescent luminaire using straight tube lamps shall not be of the pendant mounted type.

8 Glass and Lamp Support

8.1 Glassware shall be securely mounted in a frame or held by a clamp-type fitter.

8.2 Straight tube lamps used in a fluorescent lamp luminaire, other than the 6-watt or 8-watt T-5 types, shall be protected against damage and dropout by means such as louvers, hinged doors, or other devices.

8.3 Straight type lamps used in a fluorescent lamp luminaire having a length of 1.02 m (40 inches) or more shall be provided with supplementary clamps or other means to prevent loose contact or dropout because of vibration.

8.4 With reference to 8.3, a spring-loaded end-feed lampholder for single-pin or recessed-bicontact lamps complies with this requirement.

ELECTRICAL CONSTRUCTION

9 General

9.1 All electrical components shall comply with the environmental requirements of this Standard as follows:

a) Inside-Type luminaires shall comply with the damp location requirements of the UL 1598 Standard.

b) Inside Dripproof-type and Outside-Type luminaires shall comply with the wet location requirements of the UL 1598 Standard, except as modified in 15.1 and 15.2.

9.2 Thermal protection specified in *Clause 8.5* in the Standard for Luminaires, UL 1598, is not required for recessed luminaires. |

9.2 revised August 22, 2002 |

10 Convenience Receptacles, Switches, and Fuses

10.1 A lampholder or switch of the pull-chain type shall not be provided. |

10.1 revised August 22, 2002 |

10.2 A receptacle shall not be provided, except for Inside-Type wall mounted luminaires.

10.3 A fuse shall not be provided in a luminaire, except as protection internal to a ballast.

11 Lampholders

11.1 A porcelain part of a lampholder shall not be rigidly mounted unless a silicone rubber gasket, or equivalent, at least 1.27 mm (0.05 inch) thick is provided between the porcelain and mounting means. The gasket material shall have a relative thermal index (RTI) at least equal to the maximum lampholder temperature obtained during the Normal Temperature Test of Section 14.

Exception: The gasket is not required when the lampholder assembly does not show any signs of damage that impairs normal operation when subjected to the Mechanical Shock Test of Section 17.

11.2 A luminaire shall not rely upon the screw shell of a lampholder as a means of support for the luminaire.

12 Wiring and Conductors

12.1 All luminaire wiring and conductors shall be stranded.

12.2 Solid conductors meet the intent of the 12.1 requirement when ballast leads do not exceed 127 mm (5 inches) in length.

13 Power Supply Connections

13.1 A luminaire shall be provided with an outlet box or shall have an opening for the connection of marine-type cable.

Exception: A luminaire is not required to be provided with an outlet box or an opening for connection of marine-type cable when the luminaire is:

- a) Intended for cable connections and shipyard drilling and installation;*
- b) Cord-equipped adjustable type, such as a outdoor-type flood light; or*
- c) Cord-equipped and provided with an attachment plug such as a desk lamp or a pendant mounted cargo light.*

13.2 The opening for marine-type cable shall comply with the conduit opening dimensions of *Clause 3.15.2* in the Standard for Luminaires, UL 1598. Unless the luminaire is Indoor-Type, the openings shall be threaded.

13.2 revised August 22, 2002

13.3 Cord connected luminaires shall have flexible cord of at least the hard usage type.

13.4 A luminaire shall not be used as a connection box for a circuit other than the branch circuit supplying the luminaire.

TEMPERATURE TEST

14 Normal Temperature Test

14.1 A surface mounted luminaire shall comply with the temperature test requirements for surface-mounted luminaires specified in *Clause 11, Normal temperature tests* in the Standard for Luminaires, UL 1598, with the exception that the test ceiling for ceiling mounted luminaires is not required to be filled with insulation.

14.1 revised August 22, 2002

14.2 A recessed mounted luminaire shall comply with the Type Non-IC normal temperature test requirements for recessed luminaires specified in *Clause 11, Normal temperature tests* in the Standard for Luminaires, UL 1598. Abnormal temperature tests are not required.

14.2 revised August 22, 2002

14.3 Marked supply wire ratings shall not exceed 110°C (230°F).

ENVIRONMENTAL TESTS

15 Drippage Test

15.1 An Inside Dripproof-Type luminaire shall be subjected to the test described in 15.3. No water shall contact wiring devices or lamps after exposure to the drippage for 1 hour.

15.2 An alternative to the Drippage Test is the Rain Test described in *Clause 13.5.2* in the Standard for Luminaires, UL 1598.

15.2 revised August 22, 2002

15.3 To determine whether a luminaire complies with the requirement in 15.1, it is to be tested as follows. A glass globe or a plastic panel not provided with a gasket is to be removed for the test. With the top of wire entrances sealed, the luminaire is to be mounted directly beneath a shower head, as described in 15.4, vertically oriented. The water pressure is to be such that the area of water drippage covers the entire cross section of the luminaire or, in the case of a fluorescent lamp luminaire, the entire width of the luminaire. When the luminaire is provided with means for adjustment of position, it is to be adjusted as far from the vertical position as allowed by the construction. With the adjustment complete, the luminaire, including the portion that is normally vertical, is to be tilted to make the normally vertical part 15 degrees from the vertical. The direction of tilt and adjustment is to provide the maximum exposure of lamps and wiring devices. The test is also to be conducted with the luminaire in any more-upright position when required.

15.4 The showerhead of 15.3 shall be as shown in *Figure 16.17.2* in the Standard for Luminaires, UL 1598.

15.4 revised August 22, 2002

16 Moisture Resistance Test

16.1 An Outside-Type luminaire shall be subjected to a moisture resistance test. Water shall not enter the compartment that houses wiring, wiring devices, or lamps under any condition of exposure other than submersion.

16.2 To determine whether an enclosure complies with the requirement in 16.1, a complete luminaire is to be mounted as in actual service with any factory-threaded conduit holes plugged, and a solid stream of water from a nozzle not less than 25.4 mm (1 inch) in diameter and under a pressure of 103 kPa (15 pounds per square inch) at the nozzle is to be directed at the enclosure from a distance of 3.05 m (10 feet) for 5 minutes.

16.3 At the end of the test, any water on the exterior of the enclosure is to be removed with a cloth and the enclosure then opened and examined for any evidence of leakage.

17 Mechanical Shock Test

17.1 A sample of a porcelain lampholder assembly not provided with a gasket shall not show any signs of physical damage that impairs normal operation, damages mountings, displaces components, or reduces electrical spacings when subjected to the test outlined in 17.2.

17.2 One sample of the lampholder assembly is to be mounted as intended to a rigid test luminaire and fitted with a lamp of the maximum rated wattage. The test luminaire is then to be subjected to 5000 shock impacts, each having a 25 g peak acceleration and a 20 – 25 millisecond duration, as measured at the base of the half-sine shock envelope. The test assembly is then to be inspected for signs of damage.

MARKINGS

18 Markings

18.1 All luminaires shall be marked in accordance with the Standard for Luminaires, UL 1598, and as described in this section. The markings in Table 18.1 shall be permanent and visible during installation.

18.1 revised August 22, 2002

Table 18.1
List of required markings

Table 18.1 added August 22, 2002

Item	Installation instructions	Text	Format	Reference
1.1	INSIDE TYPE	VERBATIM	S16-L2	4.1(a)
1.2	INSIDE DRIPPROOF TYPE	VERBATIM	S16-L2	4.1(b)
1.3	OUTSIDE TYPE (FRESH WATER)	VERBATIM	S16-L2	4.1(c)
1.4	OUTSIDE TYPE or OUTSIDE TYPE (SALT WATER)	VERBATIM	S16-L2	4.1(d)
Note: See UL 1598, Standard for Luminaires Table 17.1.2 for format minimum size designation height and typeface.				
Note: See UL 1598, Standard for Luminaires Table 17.1.3 for format location designation for marking.				

18.2 Deleted August 22, 2002

18.3 Deleted August 22, 2002

18.4 Deleted August 22, 2002

18.5 Deleted August 22, 2002

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APPENDIX A

Standards for Components

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

Title of Standard – UL Standard Designation

Attachment Plugs and Receptacles – UL 498
Ballasts, High-Intensity Discharge Lamp – UL 1029
Cables, Nonmetallic-Sheathed – UL 719
Capacitors – UL 810
Connectors, Splicing Wire – UL 486C
Cord Sets and Power-Supply Cords – UL 817
Fittings for Cable and Conduit – UL 514B
Flammability of Plastic Materials for Parts in Devices and Appliances, Tests for – UL 94
Fluorescent-Lamp Ballasts – UL 935
Insulating Tape, Polyvinyl Chloride, Polyethylene, and Rubber – UL 510
Lampholders, Edison-Base – UL 496
Lampholders, Starters, and Starter Holders for Fluorescent Lamps – UL 542
Marking and Labeling Systems – UL 969
Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers – UL 514C
Polymeric Materials – Fabricated Parts – UL 746D
Polymeric Materials – Short Term Property Evaluations – UL 746A
Polymeric Materials – Use in Electrical Equipment Evaluations – UL 746C
Raceways and Fittings, Surface Metal – UL 5
Switches, General-Use Snap – UL 20
Switches, Special-Use – UL 1054
Temperature-Indicating and -Regulating Equipment – UL 873
Terminal Blocks – UL 1059
Test for Surface Burning Characteristics of Building Materials – UL 723
Transformers, Specialty – UL 506
Tubing, Electrical Metallic – UL 797
Tubing, Extruded Insulating – UL 224
Tubing for Electric Wiring, Flexible Nonmetallic – UL 3
Wire Connectors and Soldering Lugs for Use With Copper Conductors – UL 486A
Wire, Flexible Cord and Fixture – UL 62
Wires, Cables, and Flexible Cords, Electrical – UL 1581
Wires and Cables, Rubber-Insulated – UL 44
Wires and Cables, Thermoplastic-Insulated – UL 83

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