

**Underwriters Laboratories Inc.®**A not-for-profit organization dedicated to public safety
and committed to quality service**February 28, 1996****Revision pages for****Standard for****Marine Through-Hull Fittings and Sea-Valves****UL 1121, Fourth Edition**

Attached to this transmittal notice is a revision of the Fourth edition of UL 1121.

A CHANGE ON A PAGE DATED FEBRUARY 28, 1996 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THIS REVISION IS CONSIDERED NON-SUBSTANTIVE AND IS BEING ISSUED TO ELIMINATE THE MERCUROSUS NITRATE TEST AND REPLACE IT WITH A 10-DAY MOIST AMMONIA AIR STRESS CRACKING TEST. THE MERCUROSUS NITRATE TEST IS BEING ELIMINATED DUE TO THE FACT THAT THE DISPOSAL OF MERCUROSUS NITRATE COATED MATERIAL IS INCREASINGLY DIFFICULT. THE 10-DAY MOIST AMMONIA AIR STRESS CRACKING TEST IS AN EQUIVALENT TEST. THE 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 1121-1988.

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 13, 1988 (Reprinted February 28, 1996)
2	—
3	February 28, 1996
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12	August 21, 1990

JULY 13, 1988
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UL 1121

Standard for

Marine Through-Hull Fittings and Sea-Valves

First Edition — September, 1972

Second Edition — July, 1973

Third Edition — October, 1979

Fourth Edition

July 13, 1988

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated July 13, 1988. 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 Z254.1-1973, March 20, 1973
Approved as ANSI/UL 1121-1979, August 29, 1979
Approved as ANSI/UL 1121-1988, March 3, 1988

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.

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FOREWORD

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

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

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

D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgement 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.

7. Materials

7.1 The components of a through-hull fitting or sea-valve shall be formed of galvanically compatible materials having the strength and resistance to corrosion necessary to withstand intended and abnormal use to which they are likely to be subjected.

7.2 With reference to paragraph 7.1:

A. Intended use includes:

1. Exposure to the various fuels, fluids, and compounds used on boats.
2. Exposure to varying temperatures.
3. Exposure to salt water erosion, varying from conditions of sustained stagnation to conditions of turbulence at maximum hull speeds.

B. Abnormal use include:

1. Improper dry-docking, and the like.
2. Running aground.

7.3 A part made of drawn brass or machined from brass rod containing more than 15 percent zinc shall be subjected to the 10-Day Moist Ammonia-Air Stress Cracking Test, Section 17A.

Paragraph 7.3 revised February 28, 1996

13.2 The test assembly is to be subjected to variable frequency vibration in each of three rectilinear axes (horizontal, vertical, and lateral) for 4 hours in each plane (total 12 hours), at a peak-to-peak amplitude of 0.030 ± 0.001 inch (0.76 ± 0.03 mm). The frequency of vibration is to be continuously varied, at a uniform rate, from 10 to 60 to 10 hertz every 4 minutes.

13.3 For this test, peak-to-peak amplitude is defined as the maximum displacement of sinusoidal motion of the vibration table in one complete cycle.

14. Shock Test

14.1 A through-hull fitting or sea-valve shall withstand 5000 shock impacts without development of mechanical malfunction or leakage.

14.2 The test assembly is to be mounted on a shock machine and subjected to 5000 shock impacts having a 10 g (98 m/s^2) acceleration and a 20–25 millisecond duration, as measured at the base of the one-half wave shock envelope.

15. Abrasion and Rough Usage Test (Through-Hull Fittings)

15.1 A through-hull fitting shall withstand exposure to conditions of abrasion and rough usage without development of mechanical malfunction.

15.2 The test assembly is to be driven through a 6-inch (150-mm) depth of clean, dry sand at a velocity of approximately 14 feet per second (4.3 m/s) over a distance of approximately 2 feet (0.6 m) for a total of 10,000 passes.

16. Operation Test (Sea-Valves)

16.1 A sea-valve shall withstand the test conditions specified in paragraphs 16.2 – 16.4 without mechanical malfunction, or the development of leakage in excess of 2 gallons (7.57 L) of water per 24 hours.

16.2 A sample of the valve is to be mounted with a through-hull fitting on a simulated hull section in accordance with the manufacturer's installation instructions, and the assembly secured to a test chamber capable of maintaining a controlled hydrostatic head on the external opening of the through-hull fitting.

16.3 The chamber is to be filled with water and purged of all air. The pressure in the chamber then is to be raised to 10 psig (69 kPa) and the sample subjected to 25 complete cycles of operation from the fully open to fully closed positions.

16.4 Upon completion of the 25 operating cycles, the chamber pressure is to be lowered to atmospheric pressure, the sample is to be opened, and a mixture of marsh grass and broken clam shells, or equivalent material, is to be inserted through the opening of the through-hull fitting. The sample then is to be closed. This procedure is to be repeated for a total of five times. The sample then is to be tested for leakage.

17. Leakage Test (Sea-Valves)

17.1 There shall be no evidence of leakage at the points of connection of a sea-valve when the device is installed and connected in accordance with the manufacturer's installation instructions and subjected to an aerostatic pressure of 50 psig (345 kPa) for 1 minute.

17.2 The pressure source is to be connected to the inlet of the sample and the outlet of the sample is to be provided with a 5-foot (1.5-m) length of pipe or hose that is capped or otherwise blocked at its free end.

17A. 10-Day Moist Ammonia Air Stress Cracking Test

17A.1. After being tested as described in 17A.2 – 17A.5, a brass part containing more than 15 percent zinc shall show no evidence of cracking or delamination when examined using 25X magnification.

Paragraph 17A.1 added February 28, 1996

17A.2 The sample is to be subjected to the mechanical stresses normally imposed on or within the part as the result of intended assembly with other components of the through-hull fitting or sea-valve, or with tubing or piping. Such stresses are to be applied to the sample prior to and remain effective during the test. Samples with threads, intended to be used for installing the product in the field, are to have the threads engaged and tightened to the torque specified in Table 17A.1. Teflon tape or pipe compound are not to be used on the threads.

Paragraph 17A.2 added February 28, 1996

TABLE 17A.1
TORQUE REQUIREMENTS FOR THREADED
CONNECTIONS

Nominal Thread Size, Inches	Torque	
	Pound-Inches (N · m)	
1	1200	(135.6)
1-1/4	1450	(163.8)
1-1/2	1550	(175.1)
2	1650	(186.4)
2-1/2	1750	(197.7)
3	1800	(203.4)

Table 17A.1 added February 28, 1996

17A.3 Female pipe-threaded ends are to be engaged with extra strong brass plugs, fittings, or pipe. Threaded parts are to be tightened to the degree normally found acceptable to produce a leak-tight assembly.

Paragraph 17A.3 added February 28, 1996

17A.4 Three samples are to be degreased and then continuously exposed in a set position for ten days to a moist ammonia-air mixture maintained in a glass chamber approximately 12 by 12 by 12 inches (305 by 305 by 305 mm) having a glass cover.

Paragraph 17A.4 added February 28, 1996

17A.5 Approximately 600 ml of aqueous ammonia having a specific gravity of 0.94 is to be maintained at the bottom of the glass chamber below the samples. The samples are to be positioned 1-1/2 inches (38.1 mm) above the aqueous ammonia solution and supported by an inert tray. The moist ammonia air mixture in the chamber is to be maintained at atmospheric pressure with the temperature constant at approximately 93°F (34°C).

Paragraph 17A.5 added February 28, 1996

18. Mercurous-Nitrate Immersion Test

Section 18 deleted February 28, 1996

18A. Static Load Test

18A.1 There shall be no evidence of physical failure of a simulated installation of an assembly of a thru-hull fitting and seacock, when a 500 pound (227 kg) load is applied to the end of the hose or pipe fitting used to connect the seacock to the boat system. The assembly is to be made in accordance with the manufacturer's instructions and the test load is to be held for a period of 30 seconds.

Added paragraph 18A.1 effective September 1, 1991

18A.2 A combination seacock/thru-hull fitting is to be tested in the as-received condition. A seacock marked for use with a specific thru-hull fitting is to be tested with that fitting. A thru-hull fitting marked for use with a specific seacock is to be tested with that seacock. If the seacock (or fitting) is marked for use with both nonmetallic and metallic thru-hull fittings (or seacocks), the test is to be conducted using the weakest material. A seacock not marked for use with a specific thru-hull fitting(s) is to be tested with a bronze fitting and a thru-hull fitting not marked for use with a specific seacock(s) is to be tested with a bronze seacock. A test conducted on a sample of the smallest seacock of a series of seacoaks, or the longest thru-hull fitting of a series of thru-hull fittings, of the same design is to be accepted as representing the series, providing the constructions are basically identical and the wall thicknesses are directly proportionate to the sizes. If, because of changes in wall thickness or differences in construction, the smallest seacock or longest fitting may not be the weakest assembly, tests on individual sizes may be necessary.

Added paragraph 18A.2 effective September 1, 1991

18A.3 For the test, the thru-hull fitting/seacock assembly is to be installed in accordance with the manufacturer's instructions using a fiberglass reinforced plastic simulated hull section not less than 3/8-inch (9.5 mm) thick and a white oak backing block not less than 1-1/2 (38.1 mm) inches thick. The test hull thickness is not to be more than 1/2 the total length of the thru-hull fitting (for example, if the thru-hull fitting is 4 inches long, the test hull is not to be thicker than 2 inches). If the thru-hull fitting is less than 3-3/4 inches (95 mm) long, the thickness of the test hull is to be reduced proportionately so that it is not more than 1/2 the length of the fitting.

Added paragraph 18A.3 effective September 1, 1991

18A.4 The hull test section in which the seacock assembly is mounted is to be secured to a rigid test fixture so that a 500 pound (227 kg) dead weight load can be applied to the seacock assembly. The load is to be applied in accordance with paragraph 18A.5 through a straight hose fitting, so that the load is applied 90 degrees to the axis through the bore of the thru-hull fitting and valve.

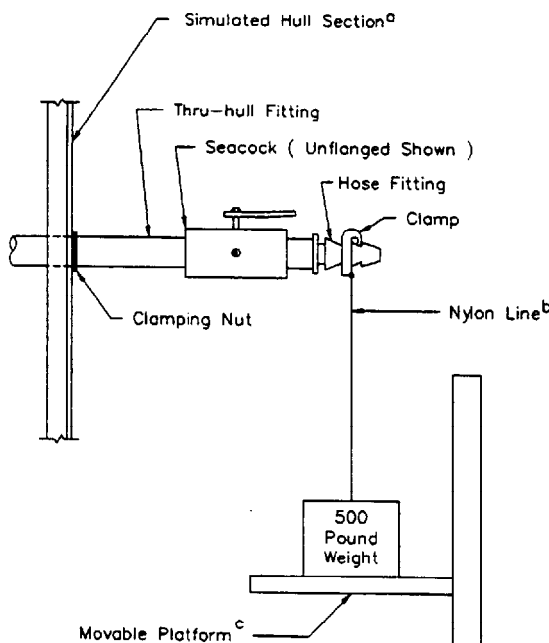
Added paragraph 18A.4 effective September 1, 1991

18A.5 A clamp is to be attached to the hose fitting which is part of or attached to the seacock. The clamp is to be attached to a 500 pound (227 kg) dead weight load through a length of 5/16 inch (7.9 mm) diameter nylon line — breaking strength about 2800 pounds (12.45 kN) — at least 1 foot (305 mm) long. The 500 pound dead weight is to be positioned on a platform which can be lowered at a controlled rate of 12 inches per minute until the load is clear.

Added paragraph 18A.5 effective September 1, 1991

FIGURE 18A.1

STATIC LOAD TEST ASSEMBLY



S3602

^aThe simulated hull section is to be rigidly secured and be as described in paragraph 18A.3.

^bThe nylon line is to be as described in paragraph 18A.5.

^cThe platform is to be as described in paragraph 18A.5.

Added Figure 18A.1 effective September 1, 1991

18B. Resistance to Ultraviolet Weathering Test

18B.1 A polymeric material used in the external flange of a thru-hull fitting shall retain at least 70 percent of its original tensile strength after being subjected to the light and water exposure conditioning specified in paragraph 18B.3.

Paragraph 18B.1 added August 21, 1990

18B.2 Five specimens of the polymeric material in the as-received condition and five specimens that have been conditioned as described in paragraph 18B.3 are to be tested as specified in the Standard Test Method for Tensile Properties of Plastics, ANSI/ASTM D638—1987, and the tensile strength recorded. The tensile strengths of the conditioned specimens are then to be compared to those of the as-received specimens.

Paragraph 18B.2 added August 21, 1990

18B.3 The five specimens that are to be conditioned are to be subjected to 720 hours of light and water exposure in accordance with Method I of the Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With or Without Water for Exposure of Nonmetallic Materials, ASTM G23—81, using apparatus designated Type D or DH in ASTM G23—81. During each operating cycle of 120 minutes, the specimens are to be exposed to light alone for 102 minutes and to light and water for 18 minutes.

Paragraph 18B.3 added August 21, 1990

MARKING

19. General

19.1 Each through-hull fitting and sea-valve shall be legibly marked with the name, trademark, or other symbol identifying the manufacturer or private labeler and a distinctive model number, catalog designation, or the equivalent.

19.2 If a manufacturer produces a through-hull fitting or sea-valve at more than one factory, each through-hull fitting or sea-valve shall have a distinctive marking to identify it as the product of a particular factory.



Underwriters Laboratories Inc.®

An independent, not-for-profit organization testing for public safety

August 21, 1990

Revision pages for

STANDARD FOR

MARINE THROUGH-HULL FITTINGS AND SEA-VALVES

UL 1121, FOURTH EDITION

Attached to this transmittal notice is a revision of the fourth edition of UL 1121.

A CHANGE IN REQUIREMENTS IS INDICATED BY A VERTICAL LINE IN THE MARGIN ON PAGES DATED AUGUST 21, 1990. EDITORIAL CHANGES ARE NOT SO MARKED.

THESE NEW AND REVISED REQUIREMENTS ARE NOW IN EFFECT EXCEPT FOR PARAGRAPHS 5.1 AND 6.2 AND SECTION 18A, WHICH BECOME EFFECTIVE SEPTEMBER 1, 1991 AS INDICATED IN THE SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM. TO RETAIN THE REQUIREMENTS IN EFFECT UNTIL SEPTEMBER 1, 1991, DO NOT DISCARD THE PREVIOUS PAGES CONTAINING THE REQUIREMENTS SPECIFIED ABOVE UNTIL THIS FUTURE EFFECTIVE DATE.

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

The new and revised requirements are substantially in accordance with UL's bulletin on this subject dated February 21, 1989. The bulletin is now obsolete and may be discarded.

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 1121-1988.

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 check list:

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(11)