UL 1193

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Marine Filters and Strainers for Nonflammable Liquids

Underwriters Laboratories Inc. (UL)
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UL Standard for Safety for Marine Filters and Strainers for Nonflammable Liquids, UL 1193

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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.

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

UL 1193

Standard for Marine Filters and Strainers for Nonflammable Liquids

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Second Edition

November 19, 1998

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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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 employing materials or having forms of construction which conflict with specific requirements of the Standard cannot be judged to comply with the Standard. A product employing materials or having forms of construction not addressed by this Standard may be examined and tested according to the intent of the requirements and, if found to meet the intent of this Standard, 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 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 cover marine filters and strainers that are intended to separate foreign material, such as sand, fine gravel, and seaweed, from the seawater intake for marine engines or other equipment using seawater.

1.2 The marine filters and strainers covered by these requirements are intended for installation in accordance with the applicable requirements of the U. S. Coast Guard or the American Boat and Yacht Council, Inc., or both.

1.3 These requirements do not cover filters, strainers, or separators intended for use with flammable liquids.

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, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard cannot be judged to comply with this standard. Where considered appropriate, revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

2 Units of Measurement

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.

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.

4 Glossary

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

4.2 FILTER – A device incorporating any form of filtering element intended to permit the passage of water, and prevent the passage of particles larger than a value less than 1/32 inch (0.8 mm).

4.3 STRAINER – A device incorporating a screen or sieve intended to permit the passage of water, and prevent the passage of particles larger than a value greater than 1/32 inch (0.8 mm).

CONSTRUCTION

5 General

5.1 A copy of the installation and operating instructions that accompany each device as produced, or equivalent information, is to be furnished with, and used as a guide in the examination and testing of, the device.

6 Assembly

6.1 A filter or strainer shall include all of the components necessary for the intended function and installation of the device.

6.2 A device shall be constructed to withstand the stresses likely to be encountered in use.

6.3 The construction of a device shall facilitate cleaning even under adverse conditions of use, such as in an engine space with minimal lighting. See Disassembly Reassembly Test, Section 9.

6.4 A filtering or straining element shall permit the removal of all foreign matter, including sediment and dirt, without depositing the foreign matter in the outlet of the device, when the element is removed for cleaning.

6.5 A device, the filtering or straining element of which is intended to be cleanable or replaceable, shall permit removal of the element without the disconnection of piping.

6.6 When installed in accordance with the manufacturer's instructions, a device shall be provided with means to retain all seals and gaskets in their position during servicing.

6.7 Pipe threads shall be in accordance with the Standard for Pipe Threads, General Purpose (Inch), Revision and Redesignation of ASME/ANSI B2.1-1968 (R1992), ASME/ANSI B1.20.1, 1983.

6.8 A clean-out or drain opening shall be closed by a standard pipe plug or cap, or a threaded shouldered plug. The plug shall not create a galvanic cell with the housing that unacceptably accelerates corrosion.

6.9 An edge of an exposed part of a device shall not be sufficiently sharp to constitute a risk of injury to persons during installation or servicing of the device.

6.10 A device shall be constructed so that its disassembly and reassembly are accomplished by means of ordinary tools, such as a crescent wrench, screwdriver, or spanner wrench, or tools that are provided with the device.

6.11 The installation and application of a gasketed or sealed joint shall not result in misalignment of, or damage to, the gasket or seal. The gasket or seal shall not incorporate splits or joints and shall be of a composition acceptable for the intended use (see Physical Properties of Synthetic Rubber and Elastomeric Parts, Section 18).

6.12 A gasket or ″O″ ring shall be retained by the body or cover when the part is removed.

7 Materials

7.1 A plant-fiber gasket shall not be used where deterioration of the gasket results in external leakage.

7.2 A plant-fiber gasket shall be not more than 1/32 inch (0.8 mm) thick.

7.3 A part other than a gasket or seal shall be of a material that is inherently resistant to corrosion. A device having parts composed of materials that are not known to provide corrosion resistance, de-zincification resistance, and galvanic compatibility with other components is to be subjected to the Salt Spray Exposure Test, Section 17.

7.4 A brass fitting shall have less than 15 percent zinc content or include inhibitors to attain equivalent resistance to de-zincification (see 10-Day Moist Ammonia Air Stress Cracking Test, Section 19).

PERFORMANCE

8 General

8.1 Samples of a filter or strainer are to be subjected to the applicable tests described in Sections 9 – 18. The same sample is to be used in each of the tests described in Sections 9 – 15.

9 Disassembly-Reassembly Test

9.1 Parts of a filter or strainer shall not be damaged when the device is disassembled and then reassembled a total of 25 times. At least one disassembly-reassembly operation is to be conducted under simulated adverse conditions, such as in an engine space whose dimensions provide the minimum clearance recommended by the manufacturer [or 6 inches (150 mm) larger top-to-bottom and side-to-side than the device when no minimum clearances are specified] and with minimal lighting (approximately 60 lumens). During each reassembly, hand tightened threaded parts are to be tightened with a torque of approximately 40 pounds-inches (4.5 N·m).

10 Vibration Test

10.1 A filter or strainer shall withstand 12 hours of vibration (24 hours for a device intended to be mounted directly on an engine) without leakage or cracking, displacement, breakage, or damage of components to the extent that the device does not operate as intended.

10.2 The device is to be completely filled with water and secured to a test fixture in its intended operating position in accordance with the manufacturer's installation instructions. One-foot lengths of the size of piping or tubing intended for connection to the strainer are to be attached, without support, to the inlet and outlet ports of the device. The pipe ends are to be capped or sealed to prevent leakage of the water.

10.3 The assembly (sample, piping or tubing, and test fixture) is to be subjected to a variable frequency test in each of three rectilinear axes (horizontal, lateral and vertical) for 4 hours (8 hours for a device intended to be mounted directly on an engine) in each plane at a peak-to-peak amplitude of 0.030 ±0.001 inch (0.76 ±0.003 mm). The frequency of vibration is to be continuously varied, at a uniform rate, from 10 to 60 to 10 cycles per second every 4 minutes.

10.4 At the conclusion of the test, the sample is to be disassembled and examined for compliance with the requirements of 10.1.

11 Shock Test

11.1 A filter or strainer shall withstand 5000 shock impacts without leakage or cracking, displacement, breakage, or damage of components to the extent that the device does not operate as intended.

11.2 The sample, assembled as specified in 10.2, is to be mounted on a shock machine and the assembly (sample, piping or tubing, and test fixture) subjected to 5000 shock impacts, each having an acceleration of 10 g [322 feet per second per second (98 m/s^2)] and a duration of 20 – 25 milliseconds as measured at the base of the half-sine shock envelope.

11.3 At the conclusion of the test, the sample is to be disassembled and examined for compliance with the requirements of 11.1.

12 Cold- Temperature Test

12.1 When tested as specified in 12.2 and 12.3, a filter or strainer shall not crack or develop a condition that impairs its intended operation.

12.2 The dry sample is to be placed in a chamber maintained at minus 30 ±3°C (minus 22 ±5°F) for 24 hours.

12.3 Immediately following the cold temperature exposure, the sample is to be clamped to a shock machine test surface and subjected to 25 impacts, each having an acceleration of 10 g [322 feet per second per second (98 m/s^2)] and a duration of 20 – 25 milliseconds. The shock impacts are to be started within 30 seconds after removal from the cold chamber. When transfer cannot be made in the specified time, the sample is to be wrapped in insulating material to prevent a temperature rise in excess of 5°C (9°F) before the initial impact.

12.4 At the conclusion of the test, the sample is to be disassembled and examined for compliance with the requirements of 12.1.

13 Hydrostatic-Pressure Test

13.1 A filter or strainer shall withstand for 1 hour without leaking, cracking, breaking, or deforming, an internal hydrostatic pressure of 25 psig (172.4 kPa) or twice its rated pressure, whichever is greater. For the test, the sample is to be assembled and connected into a system of piping in a manner permitting the removal of air from the sample.