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Underwriters Laboratories Inc.®

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March 11, 1996

Revision pages for

Standard for

Alcohol and Kerosene Cooking Appliances for Marine Use

UL 1100, First Edition

Attached to this transmittal notice is a revision of the First edition of UL 1100.

A CHANGE ON A PAGE DATED MARCH 11, 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 MERCUROUS NITRATE TEST AND REPLACE IT WITH A 10-DAY MOIST AMMONIA AIR STRESS CRACKING TEST. THE MERCUROUS NITRATE TEST IS BEING ELIMINATED DUE TO THE FACT THAT THE DISPOSAL OF MERCUROUS 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.

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	September 14, 1989 (Reprinted March 11, 1996)
2	—
3	March 11, 1996
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UL 1100

Standard for

**Alcohol and Kerosene Cooking Appliances
for Marine Use**

First Edition

September 14, 1989

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 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, 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 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 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.

6. Operating Controls

6.1 An operating control, including servicing handle, shall be readily accessible from the front face and shall be made of a material that will not be adversely affected when subjected to increased temperatures, as indicated in Table 18.1.

6.2 An operating control valve handle for a burner shall (1) rotate in a clockwise direction to close, (2) be secured so as not to back out due to vibration and shock conditions and other conditions likely to occur, and (3) be provided with a positive means to prevent control and knob removal.

7. Burner Assembly

7.1 A burner and burner generator manifold shall be positioned in the stove frame so that the burner flame cannot be extinguished by cooking utensils placed over the burner.

7.2 An oven burner or other normally concealed burner shall have a convenient means for visually sighting the flame from outside the cooking appliance while in operation.

7.3 A priming trough, if used, shall be secured so that it will maintain a fixed relationship with the burner. The proper liquid level for priming shall be made obvious by the construction of or the marking of the priming trough and shall be specifically covered in the operating instructions. The construction of the priming trough shall be such that the surface area of fuel, the fuel quantity and the positioning of the trough will reduce the likelihood of flare-up during the priming operation. Clearance or other means shall be provided to permit lighting the burner with a 1-1/2 inch (38.1 mm) long match.

7.4 The burner and fuel supply arrangement shall not be affected by pitch or roll conditions so as to twist, slide, or drop out of position while in service. Bubble and wick type burners shall not be used.

8. Fuel Tank Assembly

8.1 All tanks shall be metallic.

8.2 Fuel lines and fittings shall be of the type acceptable for the fuel intended. The fittings shall comply with the Standard for Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service and Marine Use, UL 109, and flexible fuel lines shall comply with the Standard for Marine Flexible Fuel Line Hose, UL 1114.

8.3 All fuel tanks shall be capable of withstanding an internal hydrostatic pressure of 3 psig (21 kPa), as determined in paragraph 15.4, and shall be limited to a capacity of 2 gallons (7.5 L) of fuel.

8.4 A shut-off valve shall comply with the Standard for Marine Manually Operated Shut-Off Valves for Flammable Liquids, UL 1106. Valves not directly connected to the tank spud shall be provided with means for mounting.

8.5 An integral or separate fuel tank shall be constructed of metal or metal alloy resistant to corrosion, (see Section 11). Tank seams and connections shall be welded or brazed.

8.6 An integral or remote tank shall be so located or shielded from the heat generated by the cooking appliance so the internal pressure of the tank will not be adversely affected. A tank shall comply with the Hydrostatic Pressure Test, Section 15.

8.7 A fill opening of a pressure tank shall be provided with a seal tube which limits the liquid capacity of the tank and provides adequate air space. The fill opening shall be at least 1/2 inch (12.7 mm) in diameter. The location of the fill opening shall permit filling with a funnel from a 1 gallon (3.8 L) fuel can without spillage.

8.8 A fill cap shall be constructed so that the pressure in the tank will be released before the cap can be completely removed.

8.9 A pressure tank shall be provided with an acceptable pressure gage and/or relief valve. The relief valve shall be set to operate under a pressure no higher than 60 psi (413 kPa), and be constructed and located so as to not create a risk of injury to persons by the relief of pressure during operation.

9. Gimbaled Units

9.1 Gimbals, if provided, shall comply with the following:

A. The relationship of the vertical center of gravity and gimbal pivot points shall be such that the cooking surface will remain substantially level under any likely conditions of loading and operation in service. If free swing of the cooking appliance is limited, an acceptable means shall be provided to prevent sudden impact against stops.

B. The fuel system of gimbaled units shall allow the cooking appliance to swing freely within the limits of the gimbals without imposing undue strain on flexible fuel lines used with the tanks.

C. Means shall be provided to prevent movement of the cooking appliance within the gimbals when the unit is not in use. A lock pin or similar means is acceptable for this purpose.

10. Electrical Components

10.1 Electric wiring and accessories which are integral parts of a cooking appliance shall comply with the requirements in the Standard for Commercial Electric Cooking Appliances, UL 197.

10.2 If electrical connections are made to gimbaled cooking appliances, these connections shall be made in such a manner as to prevent shorting, chafing, or breaking of electrical conductors. These electrical connections shall not interfere with the movement of the appliance within the gimbals.

11. Protection Against Corrosion

11.1 Iron and steel parts shall be protected against corrosion by enameling, galvanizing, zinc or cadmium plating, or other equivalent means. The composition of metallic alloys for structural parts shall provide corrosion resistance at least equivalent to stainless steel alloy 410.

11.2 Metal combinations shall be galvanically compatible.

11.3 A material not known to provide acceptable resistance to corrosion, dezincification resistance, and galvanic compatibility between parts shall be subjected to the Salt Spray Corrosion Test, Section 21.

11.4 A brass fitting of a fuel system shall have less than 15 percent zinc content. If the zinc-content exceeds 15 percent, the fitting shall comply with the 10-Day Moist Ammonia Air Stress Cracking Test, Section 20A.

Paragraph 11.4 revised March 11, 1996

PERFORMANCE

12. General

12.1 The same sample of a cooking appliance shall be used for each test specified in Sections 13—21.

12.2 If non-integral tanks and valves are supplied as part of the cooking appliance, they shall be subjected to all of the applicable tests.

13. Vibration Test

13.1 A cooking appliance shall function as intended without increasing the risk of uncontrolled flame or injury to persons following the vibration conditioning specified in paragraphs 13.2 and 13.3. Also the burner control valves shall not vibrate to an open position.

Exception: A cooking appliance marked in accordance with the requirement in paragraph 23.4 need not be subjected to the Vibration Test.

Adjacent Surfaces

18.10 The temperature rise on surfaces such as the boat structure, counter tops, enclosing cabinets and adjacent appliances shall not exceed 65°C (117°F).

19. Tests on Gimbal Mounted Appliances

19.1 There shall be no leakage, no cracks in the fuel lines or stress transmitted to any electrical wiring following the test specified in paragraph 19.2.

19.2 The cooking appliance is to be installed on a rocking surface in accordance with the manufacturer's instructions. The rocking surface is to operate between 5 and 20 cycles per minute for a total of 30,000 cycles in a free swing through the maximum arc allowed by the installation (not to exceed 20 degrees roll or 5 degrees pitch). The cooking appliance is to operate for approximately 1/2 hour.

20. Mercurous-Nitrate-Immersion Test

Section 20 deleted March 11, 1996

20A. 10-Day Moist Ammonia Air Stress Cracking Test

20A.1 After being tested as described in 20A.2 — 20A.4, a brass part containing more than 15 percent zinc shall show no evidence of cracking or delamination when examined using 25X magnification.

Paragraph 20A.1 added March 11, 1996

20A.2 Each test sample is to be subjected to the physical stresses normally imposed on or within a part as the result of assembly with other components. Such stresses are to be applied to the sample prior to and be 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 20A.1. Teflon tape or pipe compound are not to be used on the threads.

Paragraph 20A.2 added March 11, 1996

TABLE 20A.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 20A.1 added March 11, 1996

20A.3 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 20A.3 added March 11, 1996

20A.4 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 20A.4 added March 11, 1996

21. Salt-Spray Corrosion Test

21.1 A metallic part including its mounting brackets, if not known to provide an acceptable level of resistance to corrosion, shall not deteriorate to the extent that (1) it cannot perform its intended function or (2) ignition sources are exposed when it is subjected to salt spray as specified in paragraph 21.2. See Protection Against Corrosion, paragraph 11.3.

21.2 The sample is to be supported and exposed to salt spray (fog) as specified in the Standard Method of Salt-Spray (Fog) Testing, ASTM B117 — 73(1979). The duration of the exposure is to be 720 hours.

MANUFACTURING AND PRODUCTION TESTS

22. Leakage Test

22.1 Each fuel tank shall withstand the application of a test pressure of at least twice the designed working pressure without leakage or deformation.

22.2 If pressure gages or other type equipment would not allow this test, equivalent test procedures may be used.

MARKING

23. General

23.1 A cooking appliance shall be permanently and legibly marked with the following information. The markings shall be in a contrasting color, finish, or equivalent, in letters at least 3/64 inch (1.2 mm) high:

- A. Manufacturer's or private labeler's name or identifying symbol,
- B. Model, type, or catalog designation,
- C. Date of manufacture (may be in code),
- D. Electrical rating in volts, frequency, and amperes, if applicable,
- E. The type of fuel, and
- F. "CAUTION" and the following, or equivalent; "Risk of Fire. Read instructions before operating."

23.2 An operating control shall be marked to indicate the direction to turn it off.

23.3 If a manufacturer produces cooking appliances at more than one factory, each such assembly shall have a distinctive marking to identify it as the product of a particular factory.

23.4 A cooking appliance not shown to comply with the requirements of the Vibration Test, Section 13, or the Shock Test, Section 14, shall be permanently marked, where readily visible after installation, with the following or the equivalent: "For Use On Vessels Over 20 Meters In Length."

OPERATING AND INSTALLATION INSTRUCTIONS

24. General

24.1 The manufacturer shall provide instructions with each cooking appliance that will provide for proper installation in accordance with all applicable standards of the American Boat and Yacht Council (ABYC) and National Fire Protection Association (NFPA).

- A. Necessary clearances and method of mounting the cooking appliance.
- B. The proper method of connecting the cooking appliance to the fuel supply system, including maximum operating pressure for which the cooking appliance is designed.
- C. Details on checking the fuel system for leaks.
- D. Where applicable, details covering the proper method of making electrical connections including size of supply conductor and recommended overcurrent protection.
- E. Complete maintenance information.
- F. A statement of the maximum air consumption of the appliance in cubic feet per minute (liters per second).

24.2 A clearly worded permanent type placard, giving complete operating instructions, shall be provided with each cooking appliance. This placard should be a type that can be mounted adjacent to the cooking appliance for ready reference.