



UL 1370

Underwriters Laboratories Inc. Standard for Safety

Unvented Alcohol Fuel Burning Decorative Appliances



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UL Standard for Safety for Unvented Alcohol Fuel Burning Decorative Appliances, UL 1370

First Edition, Dated July 18, 2011

Summary of Topics

These revisions to ANSI/UL 1370 are being issued to incorporate an editorial correction to the title of the standard which was originally issued on July 18, 2011.

Text that has been changed in any manner or impacted by UL's electronic publishing system 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.

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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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

The following table lists the future effective dates with the corresponding reference.

Future Effective Dates	References
November 30, 2012	Entire Standard



JULY 18, 2011
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ANSI/UL 1370-2011

1

UL 1370

Standard for Unvented Alcohol Fuel Burning Decorative Appliances

Prior to the first edition, the requirements for the products covered by this standard were included in the Outline of Investigation for Unvented Alcohol Fuel Burning Decorative Appliances, SU 1370.

First Edition

July 18, 2011

This ANSI/UL Standard for Safety consists of the First Edition including revisions through July 25, 2011.

The most recent designation of ANSI/UL 1370 as an American National Standard (ANSI) occurred on July 18, 2011. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or effective date information.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

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INTRODUCTION

1 Scope

1.1 These requirements apply to factory built unvented liquid or gelled alcohol based, fuel burning decorative appliances intended to be fixed non-moveable appliances including only the following:

- a) Floor mounted appliances with a minimum width of 36 inches (91.4 cm) and a minimum weight of 100 pounds (45.36 kg); and
- b) Wall-mounted appliances.

These appliances are intended to be decorative in nature and not intended to be utilized as a primary heat source. These appliances are limited to a maximum input rate of 0.25 gallons of fuel per hour (0.95 liters per hour). Fuel oils, kerosene, gasoline, and other non-alcohols are not covered by these requirements.

1.1 effective November 30, 2012

1.2 These products consist of an overall enclosure, burning chamber, and provision for refueling. They are not intended for use in spaces in which flammable vapors or gases may be present. They are not intended to be used as cooking appliances. And, these systems are not intended to be used in conjunction with blower assemblies.

1.2 effective November 30, 2012

1.3 The appliances as covered by these requirements are intended for installation in occupancies where use is permitted by local codes, such as NFPA 1, Uniform Fire Code and NFPA 101, Life Safety Code.

1.3 effective November 30, 2012

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this Standard shall comply with the requirements for that component.

2.1 effective November 30, 2012

2.2 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.

2.2 effective November 30, 2012

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

2.3 effective November 30, 2012

2.4 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.

2.4 effective November 30, 2012

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

3.1 effective November 30, 2012

3.2 Unless indicated otherwise, all voltage and current values mentioned in this Standard are rms.

3.2 effective November 30, 2012

4 Undated References

4.1 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.

4.1 effective November 30, 2012

5 Glossary

5.1 For the purpose of this Standard, the following definitions apply.

5.1 effective November 30, 2012

5.2 ALCOHOL – Any of a series of hydroxyl compounds having the general formula $C_nH_{2n+1}OH$, including ethanol. The fuel may be provided in liquid or gelled form.

5.2 effective November 30, 2012

5.3 COMBUSTIBLE MATERIAL – Material made of or surfaced with wood, compressed paper, plant fibers, plastics, or other material that can ignite and burn, whether flameproofed or not, or whether plastered or unplastered.

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5.3 effective November 30, 2012

5.4 COMBUSTION – The rapid oxidation of fuel accompanied by the production of heat, or heat and light. Complete combustion of a fuel is possible only in the presence of an adequate oxygen supply.

5.4 effective November 30, 2012

5.5 COMBUSTION (BURNING) CHAMBER – The area within the appliance where the fuel is intended to be combusted.

5.5 effective November 30, 2012

5.6 ENCLOSURE – The construction shall surrounds and contains all parts of the appliance, including the combustion chamber and fuel reservoir.

5.6 effective November 30, 2012

5.7 FUEL RESERVOIR – The basin where the fuel is loaded for the purposes of combustion.

5.7 effective November 30, 2012

5.8 NONCOMBUSTIBLE MATERIAL – A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors, when subjected to fire or heat; materials that are reported as passing ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C, shall be considered noncombustible materials.

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5.8 effective November 30, 2012

5.9 READILY ACCESSIBLE – Accessible without the need to open an access door or cover.

5.9 effective November 30, 2012

5.10 UNVENTED DECORATIVE APPLIANCE, FLOOR – A stationary, self-contained, decorative appliance intended to be secured to the flooring and not for duct connection.

5.10 effective November 30, 2012

5.11 UNVENTED DECORATIVE APPLIANCE, WALL – A stationary, self-contained, wall mounted appliance and not for duct connection.

5.11 effective November 30, 2012

CONSTRUCTION

6 General

6.1 Assembly

6.1.1 Each unvented decorative appliance shall include all the essential components necessary for its intended function when installed as intended.

6.1.1 effective November 30, 2012

6.1.2 The various parts of an unvented decorative appliance shall be constructed and assembled in accordance with these requirements to provide the strength, rigidity, and durability required.

6.1.2 effective November 30, 2012

6.1.3 The various parts of an unvented decorative appliance shall be assembled or jointed as intended. Soft solder shall not be used on any fuel-handling parts if melting of the solder may allow leakage of fuel. Soft-soldered joints, where acceptable, shall be made mechanically secure before soldering.

6.1.3 effective November 30, 2012

6.1.4 The unvented decorative appliance shall be completely assembled by the manufacturer before shipment from the factory.

Exception No. 1: An unvented decorative appliance that incorporates decorative logs may be shipped with the logs uninstalled.

Exception No. 2: A combustion chamber fuel reservoir that complies with the requirements in 7.5.2 may be furnished without being assembled on the unvented decorative appliance.

Exception No. 3: An unvented decorative appliance that incorporates a guard or grille may be shipped with the guard or grille unassembled, provided the appliance is marked in accordance with 22.2.3(n).

6.1.4 effective November 30, 2012

6.2 Installation of appliance

6.2.1 The unvented decorative appliance shall be installed in a fixed secure position by screws, bolts, or the equivalent to wall studs or floor joints, as applicable.

6.2.1 effective November 30, 2012

6.2.2 Installation instructions shall be provided with the unvented decorative appliance per Section 19, Marking.

6.2.2 effective November 30, 2012

7 Materials

7.1 General

7.1.1 An unvented decorative appliance shall be constructed of materials having the necessary strength and durability to provide intended service of the parts and the assembly. Parts shall not sag, distort, melt, oxidize, or show leakage of fuel during any of the tests specified herein.

7.1.1 effective November 30, 2012

7.2 Fuel confining parts

7.2.1 A fuel-confining part of an unvented decorative appliance or an operating part in contact with the fuel, if malfunction of the part would allow leakage of fuel, risk of fire, or prevent a safety device from functioning, shall have the necessary strength, durability, and resistance to fire to provide intended service of the parts and the assembly. Parts formed from drawn- or machined-brass rod or bar stock shall comply with the 10-Day Moist Ammonia Air Stress Cracking Test, Section 18.

7.2.1 effective November 30, 2012

7.2.2 To comply with the requirements in 7.2.1, a material having a melting point (solidus temperature) of not less than 950°F (510°C) and a tensile strength of not less than 10,000 psi (68.9 MPa) at 400°F (204.4°C) shall be used.

7.2.2 effective November 30, 2012

7.2.3 A material used for gaskets and seals to confine alcohol based fuels shall be compatible with the intended fuel as determined by tests in accordance with Gasket Test, Section 18.

7.2.3 effective November 30, 2012

7.3 Base

7.3.1 The base of an unvented decorative appliance shall be constructed of metal or fabricated of other noncombustible material in a manner that provides equivalent strength and durability.

7.3.1 effective November 30, 2012

7.3.2 All materials used in the base construction shall be provided with corrosion protection.

7.3.2 effective November 30, 2012

7.4 Enclosure

7.4.1 An enclosure shall be provided for the protection of the appliance combustion chamber and fuel reservoir.

7.4.1 effective November 30, 2012

7.4.2 An enclosure shall be made of steel or material of equivalent strength and durability so that it is not likely to be damaged by handling in shipment, installation, and use.

7.4.2 effective November 30, 2012

7.4.3 Sheet metal enclosures shall have a minimum thickness of 0.025 inches (0.635 mm).

7.4.3 effective November 30, 2012

7.4.4 Thermal insulation may be provided in the walls of the enclosure.

7.4.4 effective November 30, 2012

7.5 Combustion chamber and fuel reservoir

7.5.1 The combustion chamber and fuel reservoir shall comply with this section and 7.2.2.

7.5.1 effective November 30, 2012

7.5.2 A combustion chamber and/or fuel reservoir, if furnished as a separate assembly, shall be arranged for attachment to the unvented decorative appliance in the intended position only and in a manner that will establish and maintain the intended position of the combustion chamber fuel reservoir with respect to the appliance.

7.5.2 effective November 30, 2012

7.5.3 The combustion chamber and fuel reservoir shall be designed to limit the amount of fuel loaded into the combustion chamber and have provisions to prevent spillage of fuel onto combustible surfaces. The maximum total fuel volume of all fuel reservoirs and the combustion chamber shall be 1.3 gallons (5 Liters).

7.5.3 effective November 30, 2012

7.5.4 The thickness of uncoated sheet steel used in the combustion chamber and fuel reservoir construction shall not be less than 0.042 inch (1.07 mm). A preservative shall be applied to uncoated surfaces to prevent rusting prior to use.

7.5.4 effective November 30, 2012

7.5.5 The wall thickness of aluminum-coated steel, galvanized steel, terne sheet, and corrosion-resistant sheet metal shall be not less than 0.016 inch (0.41 mm) uncoated. Coated sheet shall be of prime finish, that is, free from blisters, flux, and uncoated spots visible to the unaided eye.

7.5.5 effective November 30, 2012

7.5.6 Zinc coating on sheet steel shall not be less than Grade G90. Galvanized steel conforming to The Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, ASTM A653, certified as such by the steel mill, as evidenced by a marking on each bundle or roll, ordinarily conforms to the above.

7.5.6 effective November 30, 2012

7.5.7 The coating of aluminum-coated steel sheet shall not be less than T1 40, (120 g/m²) of sheet conforming to The Standard Specification for Steel sheet, Aluminum Coated, by the Hot Dip Process, ASTM A463.

7.5.7 effective November 30, 2012

7.5.8 A joint of a combustion chamber and/or fuel reservoir shall be locked-seamed, brazed, welded, or otherwise made mechanically secure. A joint not continuously brazed or welded shall be thoroughly sweated with solder or the equivalent, see 6.1.3. Brazing or welding of coated sheets less than 0.042 inch (1.07 mm) thick shall not damage the coating of surfaces in contact with the fuel when the combustion chamber fuel reservoir is full. All connections shall be made through solid threaded bosses or fittings mechanically secured to the combustion chamber and/or fuel reservoir.

7.5.8 effective November 30, 2012

7.6 Piping, tubing and fittings

7.6.1 Pipe and fittings shall be standard full-weight wrought iron or steel, or iron-pipe size brass or copper pipe. Unions, if used, shall be the ground-joint type or the equivalent.

7.6.1 effective November 30, 2012

7.6.2 Steel tubing of the seamless, brazed, or welded type shall be not less than 0.236 in. (6.00 mm) outside diameter and shall have a wall thickness not less than that shown in Table 7.1.

7.6.2 effective November 30, 2012

Table 7.1
Wall thickness – steel tubing

Table 7.1 effective November 30, 2012

Outside diameter, in. (mm)	Wall thickness, in. (mm)
0.236 (6.00)	0.029 (0.71)
5/16 (7.94)	0.028 (0.71)
3/8 (9.53)	0.028 (0.71)
1/2 (12.7)	0.028 (0.71)
5/8 (15.88)	0.035 (0.89)
3/4 (19.05)	0.035 (0.89)

7.6.3 Steel tubing used for confinement of liquid fuel or refilling the appliance shall be constructed of corrosion resistant material such as stainless steel or shall be plated, dipped, coated, or otherwise treated to resist external corrosion.

7.6.3 effective November 30, 2012

7.6.4 Seamless drawn aluminum or copper tubing employed in the fabrication of factory assembled equipment shall be not less than 1/4 in. (6.35 mm) outside diameter and shall have a wall thickness not less than that shown in Table 7.2

7.6.4 effective November 30, 2012

Table 7.2
Wall thickness – aluminum and copper tubing

Table 7.2 effective November 30, 2012

Outside diameter, in. (mm)	Wall thickness, in. (mm)
1/4 (6.35)	0.029 (0.74)
5/16 (7.94)	0.029 (0.74)
3/8 (9.53)	0.032 (0.81)
7/16 (11.11)	0.032 (0.81)
1/2 (12.70)	0.035 (0.89)
9/16 (14.29)	0.038 (0.96)
5/8 (15.88)	0.038 (0.96)
3/4 (19.05)	0.045 (1.14)

7.6.5 Tubing connections shall be made by means of compression or flare type fittings with steel or brass nuts.

7.6.5 effective November 30, 2012

7.6.6 Flexible metal hose, if used, shall be of a type acceptable for the purpose and be used in a manner that it is not likely to be damaged.

7.6.6 effective November 30, 2012

8 Controls

8.1 Oxygen depletion safety shutoff systems

8.1.1 Each unvented decorative appliance shall be equipped with an oxygen depletion sensitive (ODS) safety shutoff system.

Exception: If the unvented decorative appliance successfully passes the Combustion Tests by the maximum fuel capacity condition instead of the oxygen depletion level of 15.1 percent, as outlined in Combustion Tests, Section 13, an oxygen depletion safety shutoff system is optional.

8.1.1 effective November 30, 2012

8.1.2 The ODS shall act to extinguish the combustion chamber flame when the oxygen in the surrounding atmosphere is depleted to the percent concentration specified by the manufacturer, but not lower than 18.0 percent.

8.1.2 effective November 30, 2012

8.1.3 The ODS shall not incorporate field adjustment means capable of changing the set point at which the system acts to shut off the combustion chamber flame.

8.1.3 effective November 30, 2012

8.2 External manual shutoff devices

8.2.1 An unvented decorative appliance shall be equipped with an external manual-shutoff device to extinguish the burner flame. The device shall be operable by a motion in one direction, such as pushing a button or pulling a lever.

8.2.1 effective November 30, 2012

8.2.2 The external manual shutoff device shall be visible and readily accessible while the appliance is in operation.

8.2.2 effective November 30, 2012

PERFORMANCE

9 General

9.1 An unvented decorative appliance shall comply with the applicable requirements when tested as described herein in an ambient of $75.0 \pm 9.0^{\circ}\text{F}$ ($23.9 \pm 5.0^{\circ}\text{C}$) or as noted in the individual test. An appliance of a type not described specifically herein shall be tested in accordance with the intent of these requirements.

9.1 effective November 30, 2012

9.2 The performance of an unvented decorative appliance shall be evaluated upon the basis of operation tests conducted on the appliance. Appliances of each size and type, or a sufficient number of sizes and types to be representative of the entire range of sizes and types involved, are to be subjected to all or part of the tests prescribed herein. If optional features affecting performance are furnished, an unvented decorative appliance shall be tested with each such optional equipment.

9.2 effective November 30, 2012

9.3 An unvented decorative appliance, when tested in accordance with these requirements, shall operate free from excessive carbonization or other phenomena that may increase the risk of fire or explosion. See 13.8.

9.3 effective November 30, 2012

9.4 If any indications are observed during the tests prescribed in this Standard, that an unvented decorative appliance will not continue to comply with the requirements in intended usage, supplementary tests shall be conducted, as deemed necessary by the certifying organization, to determine compliance.

9.4 effective November 30, 2012

9.5 Wherever use of cheesecloth is specified for use in a test (see Sections 14, Operation Tests and 15, Temperature Tests) bleached cheesecloth shall be used as specified in 9.6.

9.5 effective November 30, 2012

9.6 Bleached cheesecloth shall be 36 inches (910 mm) wide, running 14 –15 yards per pound (28 – 30 m/kg), and having what is known to the trade as a count of 32 x 28; that is, for any square inch, 32 threads in one direction and 28 threads in the other direction (for any square centimeter, 13 threads in one direction and 11 threads in the other direction).

9.6 effective November 30, 2012

10 Instrumentation

10.1 Temperature measurement

10.1.1 Temperatures of other than metal surfaces are to be measured using either Type K (chromel-alumel) or Type J (iron-constantan) thermocouples of wire not larger than 24 AWG (0.21 mm²).

10.1.1 effective November 30, 2012

10.1.2 Temperatures of metal surfaces other than handles and electrical components are to be measured using Type J (iron-constantan) or Type K (chromel-alumel) of 18 AWG (0.82 mm) to 24 AWG (0.21 mm²).

10.1.2 effective November 30, 2012

10.1.3 The thermocouple wire insulation shall have a temperature use rating higher than the temperatures to which it is subjected during these tests.

10.1.3 effective November 30, 2012

10.1.4 The wiring methods for thermocouple circuitry, including junctions, terminals, switches, plugs, and jacks are to be designed and constructed to provide independent continuous routing of both thermocouple leads to the recording equipment.

10.1.4 effective November 30, 2012

10.1.5 The ambient temperature of a zone shall be determined by a thermocouple located centrally within a vertically oriented 6 inch (152 mm) length of 2 inch steel pipe, aluminum painted, and open at both ends.

10.1.5 effective November 30, 2012

10.1.6 Ambient temperatures are to be determined by shielded thermocouples located relative to parts of the unvented decorative appliance and test structure.

10.1.6 effective November 30, 2012

10.1.7 The ambient temperature in Figure 10.2 shall be determined by use of a shielded thermocouple located 6 inches (152 mm) away from the side wall, 7 feet (2.1 m) from the back wall, and 4 feet (1.2 m) above the floor.

10.1.7 effective November 30, 2012

10.1.8 The measurements of temperature rises on the fire chamber and on the enclosures and test structure are to be referenced to the recorded ambient temperature determined as indicated in 10.1.7.

10.1.8 effective November 30, 2012

10.1.9 Thermocouples are to be attached to metal surfaces by screws, rivets, silver soldering, brazing, or welding of the tip to the metal surface. See Figure 10.1.

10.1.9 effective November 30, 2012