

**OTHER
RECOGNIZED
DOCUMENT**

ULC/ORD-C627.1-2008

UNVENTED ETHYL ALCOHOL FUEL BURNING DECORATIVE APPLIANCES



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**UNVENTED ETHYL ALCOHOL FUEL BURNING
DECORATIVE APPLIANCES**

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FOREWORD

Certification organizations are periodically requested to promptly provide certification services for devices, constructions, materials and systems where Canadian recognized standards do not currently exist or are not entirely applicable. Accordingly, the certification organization utilizes its experience, existing specifications and requirements in related areas, together with assistance from its advisory councils to develop and prepare Other Recognized Documents (ORD's) for use in conducting the necessary tests and evaluation investigation.

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REFERENCE PUBLICATIONS

The documents shown below are referenced in the text of this Other Recognized Document (ORD). Unless otherwise stated elsewhere in this ORD such reference shall be considered to indicate the edition and/or revisions available at the date on which it was approved.

Document Published by the American Society for Testing and Materials
100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 USA
Telephone: (610) 832-9585 Fax: (610) 832-9555 www.astm.org

- ASTM A653/A653M-07 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- ASTM A463/A463-06. The Standard Specification for Steel sheet, Aluminum-Coated, by the Hot-Dip Process

Document Published by Canadian Standards Association
5060 Spectrum Way, Suite 100, Mississauga, Ontario L4W 5N6 CANADA
Telephone: (416) 747-4000 Fax: (416) 747-2473
www.csa.ca

- C22.2 NO. 0.15-01 (R2006), Adhesive Labels

Document Published by Health Canada,
Ottawa Ontario, 1-866-662-0666 www.laws.justice.gc.ca or http://hc-sc.gc.ca/cps-spc/legislation/acts-lois/index_e.html

- Hazardous Products Act (R.S., 1985, c. H-3)
- Consumer Chemicals and Containers Regulations, 2001 (SOR/2001-269)

Document Published by the Institute for Research in Construction, National Research Council Canada
1200 Montreal Road, Bldg M20, Ottawa Ontario, K1A 0R6 Canada 1-800-672-7990 or 613-993-2463
Fax 613-952-7673 www.nrc.gc.ca/virtualstore

- National Building Code of Canada, 2005
- National Fire Code of Canada, 2005

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- UL 969, Standard for Marking and Labelling Systems

UNVENTED ETHYL ALCOHOL FUEL BURNING DECORATIVE APPLIANCES

PREFACE

This is the First Edition of the Other Recognized Document for Unvented Ethyl Alcohol Fuel Burning Decorative Appliances , ULC/ORD-C627.1-2008.

All values for measurement are stated in SI and may be followed by yard poundage equivalents in parentheses. The first value is a soft conversion of the units in parenthesis. The first stated value is the requirement.



1. SCOPE

- 1.1 These requirements apply to Factory-built Decorative Unvented Appliances that are intended to be fixed/non-movable and that use *Ethyl Alcohol (Ethanol)* in liquid or gel form as the fuel. These appliances are intended to be decorative in nature and limited to a maximum output of 10,000 BTU/hour. Appliances that use fuel oils, kerosene, gasoline, and other non-*alcohols* are not covered by these requirements. The *Ethyl Alcohol* fuels for use with these products are required to meet the Health Canada Consumer Chemicals and Containers Regulations 2001 and the EcoLogo program requirements.

NOTE: EcoLogo is North America's most widely recognized and respected certification of environmental leadership. Launched by the Canadian federal government in 1988, EcoLogo has grown to serve buyers and sellers of green products throughout the United States and Canada, and around the world. On the EcoLogo website, you'll find information on how to participate and lists of EcoLogo-certified products. The EcoLogo program is managed by TerraChoice Environmental Marketing Inc. EcoLogo's website is www.ecologo.org

- 1.2 These appliances consist of an overall enclosure, burning chamber, and provision for refueling. They are not intended for use in spaces in which flammable vapours or gases may be present. They are not intended to be used as cooking or heating appliances. These appliances are not intended to be used in conjunction with blower assemblies.
- 1.3 These products shall NOT be installed in a Bathroom or a Room where Sleeping Accommodation is provided
- 1.4 The appliances as covered by these requirements are intended for installation in accordance with local regulations and in the absence of such regulations in accordance with the current editions of the National Building Code of Canada and the National Fire Code of Canada.

2. GLOSSARY

NOTE: Terms used in this standard that are in *italic* print are defined as follows:

ALCOHOL – Any of a series of hydroxyl (Hydroxyl ['OH'] means a chemical group in which oxygen and hydrogen are bonded and acts as a single entity) compounds having the general formula $C_nH_{2n+1}OH$, including ethanol. The fuel may be provided in liquid or gelled form.

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.

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.

COMBUSTION CHAMBER – An enclosure in which *combustion*, especially of a fuel or propellant, is initiated and controlled.

ETHYL ALCOHOL (ETHANOL) – A monohydric compound having the general formula of C_2H_5OH . The fuel may be provided in liquid or gelled form.

FUEL RESERVOIR – A chamber or receptacle for holding fuel.

GEL – A Continuous solid network enveloped in a continuous liquid phase, where the solid phase occupies less than 10 % (volume) of the material.

NONCOMBUSTIBLE MATERIAL – Material which is not capable of being ignited and burned, such as materials consisting entirely of, or a combination of, steel, iron, brick, tile, concrete, slate, asbestos, glass and plaster.

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

UNVENTED DECORATIVE APPLIANCE – a decorative appliance insert for installation in an existing masonry or factory-built appliance constructed and installed in accordance with the applicable local code requirements or a stand alone floor mounted or a self contained, wall mounted, *unvented decorative appliance* that is not intended for heating or cooking and is not intended for duct connection.

3. CONSTRUCTION

3.1 ASSEMBLY

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

3.1.2 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.

3.1.3 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.

3.1.4 The *unvented decorative appliance* may be factory-assembled in its entirety by the manufacturer before shipment from the factory or may be site-assembled, in which case a complete instructions must accompany the unassembled appliance.

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 Clause 3.7.2 may be furnished without being assembled on the *unvented decorative appliance* (Clause 7.2.3 A).

Exception No. 3: An *unvented decorative appliance* that incorporates a guard or grille or screen may be shipped with the guard or grille or screen unassembled, provided the *unvented decorative appliance* is marked in accordance with Clause 7.2.3 P.

3.2 INSTALLATION OF APPLIANCE

- 3.2.1 The *unvented decorative appliance* shall be installed in a fixed secure position by screws, bolts, or other acceptable means of fastening to wall studs or floor joints, or in a non-permanent position by anti-tip devices, as applicable.
- 3.2.2 Installation instructions shall be provided with the *unvented decorative appliance* in accordance with Section 7, Installation and Operating Instructions.

3.3 MATERIALS

- 3.3.1 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.

3.4 FUEL CONFINING PARTS

- 3.4.1 A fuel-confining part of an *unvented decorative appliance* or an operating part in contact with the fuel, whose malfunction would allow leakage of fuel, risk of fire, or prevent a safety device from functioning, shall be made of materials meeting the criteria set in Clause 3.4.2. Parts formed from drawn- or machined-brass rod or bar stock shall comply with the 10-Day Moist Ammonia Air Stress Cracking Test in Subsection 4.10, 10-Day Moist Ammonia Air Stress Cracking Test.
- 3.4.2 To comply with the requirements in clause 3.4.1, a fuel confining part or a part that comes into contact with fuel shall be made of material having a melting point (solidus temperature) of not less than 510 °C (950 °F) and a tensile strength of not less than 68.9 Mpa (10,000 psi) at 204.4 °C (400 °F).
- 3.4.3 A material used for the gaskets and seals to confine *alcohol* based fuels shall be compatible with the intended fuel as determined by tests in accordance with Subsection 4.11, Gasket Test.

3.5 BASE

- 3.5.1 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.

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

3.6 ENCLOSURE

- 3.6.1 The 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
- 3.6.2 Sheet metal enclosures shall have a minimum thickness of 0.635 mm (0.025 in).

3.7 COMBUSTION CHAMBER AND FUEL RESERVOIR

- 3.7.1 The *combustion chamber* and *fuel reservoir* shall comply with Clause 3.4.2.
- 3.7.2 A *combustion chamber/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 *unvented decorative appliance*.
- 3.7.3 The *combustion chamber/fuel reservoir* shall be designed to limit the amount of fuel loaded into the *combustion chamber* and have provisions to prevent spillage of fuel. The maximum combined total fuel volume of all *fuel reservoirs* and the *combustion chamber* is to be 5 Litres (1.3 gallons).
- 3.7.4 The thickness of uncoated sheet steel used in the *combustion chamber* construction and *fuel reservoir* shall not be less than 1.07 mm (0.042 in). A preservative shall be applied to uncoated surfaces to prevent rusting prior to use.
- 3.7.5 The wall thickness of aluminum-coated steel, galvanized steel, terne sheet, and corrosion-resistant sheet metal shall be not less than 0.41 mm (0.016 in) uncoated. Coated sheet shall be of prime finish, that is, free from blisters, flux, and uncoated spots visible to the unaided eye.
- 3.7.6 Zinc coating on sheet steel shall not be less than Grade G90.

NOTE: Galvanized steel conforming to the standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, ASTM A653/A653M, certified as such by the steel mill, as evidenced by a marking on each bundle or roll, ordinarily conforms to the above.

- 3.7.7 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/A463M.

- 3.7.8 A joint of a *combustion chamber* and *fuel reservoir* shall be lock-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 Clause 3.1.3. Brazing or welding of coated sheets less than 1.07 mm (0.042 in) 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 *fuel reservoir*.

3.8 PIPING, TUBING AND FITTINGS

- 3.8.1 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.
- 3.8.2 Steel tubing of the seamless, brazed, or welded type shall be not less than 6.35 mm (1/4 in) outside diameter and shall have a wall thickness not less than that shown in the following table:

WALL THICKNESS	STEEL TUBING
<u>Outside Diameter, mm (in)</u>	<u>Wall Thickness, mm (in)</u>
6.35 (1/4)	0.71 (0.028)
7.94 (5/16)	0.71 (0.028)
9.53 (3/8)	0.71 (0.028)
12.7 (1/2)	0.71 (0.028)
15.88 (5/8)	0.89 (0.035)
19.05 (3/4)	0.89 (0.035)

- 3.8.3 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.
- 3.8.4 Seamless drawn aluminum or copper tubing employed in the fabrication of factory assembled equipment shall be not less than 6.35 mm (1/4 in) outside diameter and shall have a wall thickness not less than that shown in the following table:

WALL THICKNESS	ALUMINUM AND COPPER TUBING
<u>Outside Diameter, mm (in)</u>	<u>Wall Thickness, mm (in)</u>
6.35 (1/4)	0.74 (0.029)
7.94 (5/16)	0.74 (0.029)
9.53 (3/8)	0.81 (0.032)
11.11 (7/16)	0.81 (0.032)
12.70 (1/2)	0.89 (0.035)
14.19 (9/16)	0.96 (0.038)
15.88 (5/8)	0.96 (0.038)
19.05 (3/4)	1.14 (0.045)

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