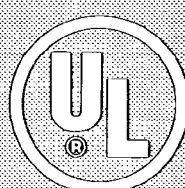


Standard for Safety

UL 791

● Residential Incinerators

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June 29, 1993

Standard for

Residential Incinerators

UL 791, Fourth Edition

Accompanying this transmittal notice is a copy of the fourth edition of UL 791.

THIS EDITION OF THE STANDARD IS NOW IN EFFECT.

Revised and/or additional pages may be issued from time to time.

Subscribers to UL's services in the area covered by this standard will receive these revised and/or additional pages automatically. Others may receive such pages by subscribing to UL's subscription service for revisions. See UL's CATALOG OF STANDARDS FOR SAFETY for a description of the revision subscription service, the cost of the service for this standard, and ordering information.

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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.

INTRODUCTION

1 Scope

1.1 These requirements apply to direct-fed incinerators, including those of the gas and electric ignition types, designed primarily for use in one-and two-family dwellings for the burning of ordinary combustible waste materials and garbage incidental to domestic occupancy and having a firebox or charging compartment of not over 5 cubic feet capacity.

1.2 Incinerators of this type may also be employed in other occupancies including commercial establishments and institutions where the refuse is of a character for which the incinerator is designed and is not excessive in amount. They are not intended for use in spaces in which flammable vapor or gases may be present.

1.3 Incinerators covered by these requirements are the factory-made type not requiring field construction, and are designed for inside use. These requirements do not cover an incinerator that requires the use of a brick or masonry wall, etc., which forms a part of the building structure, or requires masonry work at the site to complete the incineration chamber.

1.4 Requirements for the installation and use of Domestic-Type Incinerators are included in the Standard for Incinerators of the National Fire Protection Association. NFPA No. 8221.

1.5 A product that contains features, characteristics, components, materials, or systems new or different from those in use when the standard was developed, 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 level of safety for the user of the product as originally anticipated by the intent of this standard.

2 Components

2.1 A component of a domestic-type incinerator shall comply with the requirements for that component, except that such requirements may be modified if appropriate for the particular application.

3 Units of Measurement

3.1 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.

4 Glossary

4.1 AIR SHUTTER — An adjustable device for varying the size of the air inlet or inlets.

4.2 APPLIANCE FLUE — The flue passages within the appliance.

4.3 ASH — The solid residue remaining after combustion or incineration has been completed.

4.4 ASH PIT DOOR — A door below the grate level used for removing ash or other noncombustibles from the appliance.

- 4.5 **BAFFLE** – An object placed in an appliance to direct or retard the flow of air or flue gases.
- 4.6 **BASE** – The main supporting frame or structure of an assembly.
- 4.7 **BODY** – The principal structure of the appliance including the supporting frame, and which gives strength and rigidity to the assembly.
- 4.8 **BURNER** – A device for the final conveyance of a fuel or a mixture of fuel and air to the combustion zone.
- 4.9 **BUSHEL** – Dry bushel, 1.24 cubic feet.
- 4.10 **CHIMNEY, FACTORY-BUILT** – Those chimneys of the factory-made type intended for use with gas, liquid, and solid-fuel fired low-heat appliances and domestic-type incinerators. These chimneys may be used also where Type B gas vents are permitted.
- 4.11 **CHIMNEY, MASONRY** – A vertical masonry or reinforced concrete shaft containing one or more flues or vents.
- 4.12 **COMBUSTIBLE CONSTRUCTION** – As pertaining to materials adjacent to or in contact with the incinerator and its flue pipe, shall mean materials made of or surfaced with wood, compressed paper, plant fibers, or other material that will ignite and burn. Such material shall be considered as combustible even though flame-proofed, fire-retardant treated, or plastered. Gypsum or other wallboards that are surfaced with combustible material are classified as combustible.
- 4.13 **CASING** – An enclosure forming the outside of the appliance, no parts of which are likely to be subjected to intense heat.
- 4.14 **COMBUSTION** – As used herein, the rapid oxidation of combustibles (fuel and waste material) accompanied by the production of heat, or heat and light. Complete combustion is possible only in the presence of an adequate supply of oxygen.
- 4.15 **COMBUSTION CHAMBER** – The portion of an incinerator within which incineration occurs.
- 4.16 **CONTROL** – A device designed to regulate the fuel, air, or electrical supply to the controlled equipment. It may be automatic, semiautomatic, or manual.
- 4.17 **DAMPER** – A valve or plate for regulating draft or flow of flue gases. A damper is generally considered as being located on the downstream side of the combustion chamber, usually in a flue passage of the appliance or in the flue pipe.
- 4.18 **DRAFT REGULATOR** – A device which functions to maintain a desired draft in the appliance by automatically reducing the chimney draft to the desired value.
- 4.19 **ELECTRICAL CIRCUITS** –
- a) **HIGH-VOLTAGE CIRCUIT** – A circuit involving a potential of not more than 600 volts and having circuit characteristics in excess of those of a low-voltage circuit.

b) **LOW-VOLTAGE CIRCUIT** — A circuit involving a potential of not more than 30 volts and supplied by a primary battery or by a standard Class 2 transformer or other suitable transforming device, or by a suitable combination of transformer and fixed impedance having output characteristics in compliance with what is required for a Class 2 transformer.

A circuit derived from a source of supply classified as a high-voltage circuit, by connecting resistance in series with the supply circuit as a means of limiting the voltage and current, is not considered to be a low-voltage circuit as described in item b of this paragraph.

c) **SAFETY CONTROL CIRCUIT** — A circuit involving one or more safety controls, in which failure due to grounding, opening, or shorting of any part of the circuit can cause unsafe operation of the controlled equipment or can introduce a direct fire or life hazard.

4.20 **FLUE** — A conduit or passageway, vertical or nearly so, for conveying flue gases to the outer air.

4.21 **FLUE COLLAR** — That portion of an appliance designed for attachment of the flue pipe.

4.22 **FLUE GASES** — Combustion products and excess air.

4.23 **FLUE PIPE** — The conduit connecting the incinerator with the chimney.

4.24 **INCINERATOR** — An appliance used to reduce refuse material to ash and which is of the factory-made sold and installed as a package.

4.25 **LINING** — Those interior surfaces of an incinerator which are exposed to waste material during use of the appliance.

4.26 **MANIFOLD** — The conduit of an appliance which supplies gas to the individual burners.

4.27 **MIXER** — The combination of mixer head, mixer throat, and mixer tube for a gas burner.

4.28 **ORIFICE** — The opening in a cap, spud, or other device whereby the flow of gas is limited and through which the gas is discharged to a burner.

4.29 **ORIFICE CAP (HOOD)** — A movable fitting having an orifice which permits adjustment of the flow of gas by the changing of its position with respect to a fixed needle or other device.

4.30 **ORIFICE SPUD** — A removable plug or cap containing an orifice and which permits adjustment of the flow of gas either by substitution of a spud with a different sized orifice or by the motion of a needle with respect to it.

4.31 **PILOT** — A small flame which is utilized to ignite the fuel at the main burner or burners.

4.32 **PILOT, AUTOMATIC** — Consists of an automatic pilot device and pilot burner securely assembled in fixed functional relationship.

4.33 **PILOT DEVICE, AUTOMATIC** — A device employed with gas-burning equipment which will either automatically shut off the gas supply to the burner being served, or automatically actuate electrically or otherwise a gas-shutoff device when the pilot flame is extinguished. The pilot burner may or may not be constructed integrally with the device.

4.34 **PORT** — Any opening in a burner head through which fuel or an air-fuel mixture is discharged for ignition.

4.35 **PRIMARY AIR** — The air introduced into a burner and which mixes with the fuel before it reaches the ignition zone.

4.36 **READILY ACCESSIBLE** — Capable of being reached easily and quickly for operation, adjustment, and inspection.

4.37 **REGULATOR, GAS-PRESSURE** — A device for controlling and maintaining a uniform gas-supply pressure.

4.38 **SECONDARY AIR** — The air externally supplied to the flame at or beyond the point of ignition.

4.39 **SMOKE PIPE** — See 4.23, Flue Pipe.

4.40 **VALVE CONTROL** — An automatically or manually operated device consisting essentially of a valve for controlling the fuel supply to a burner.

a) **METERING (REGULATING) VALVE** — A control valve for regulating burner input.

b) **SAFETY SHUTOFF VALVE** — An automatic control valve of the on and off type, without any bypass to the burner, that is actuated by a safety control or by an emergency device.

4.41 **VALVE MANUAL MAIN SHUTOFF** — A manually operated valve for the purpose of completely turning on or shutting off the fuel supply to a burner except to a gas pilot which is provided with an independent shutoff valve.

5 Installation and Operating Instructions

5.1 A copy of the installation and operating instructions intended to accompany each domestic-type incinerator or component, or equivalent information, is to be used as a guide in the examination and test of the domestic-type incinerator or component. For this purpose a printed edition is not required.

5.2 The instructions should include such directions and information as deemed by the manufacturer to be adequate for attaining proper and safe installation, maintenance, and use of the incinerator.

CONSTRUCTION

6 Assembly

6.1 An incinerator shall be a complete, factory-made, self-contained, free-standing unit not requiring field construction for its installation.

6.2 Each incinerator shall include all the essential components necessary for its normal function when installed as intended.

6.3 The various parts shall be constructed and assembled in accordance with these requirements in a manner to insure strength, rigidity, and durability.

- 6.4 Parts of an incinerator shall not crack, warp, or sustain other damage likely to permit passage of flame or emission of gases or sparks to the exterior when tested in accordance with these requirements.
- 6.5 An incinerator shall be constructed to avoid the fouling or clogging of an ignition assembly by ashes or drippings.
- 6.6 An incinerator shall be designed to prevent flames, gases, burning particles, or sparks being expelled into the room.
- 6.7 An incinerator shall be so constructed that glowing or heated particles cannot fall to the floor even when the ash pan is removed.
- 6.8 The casing of an incinerator for installation on combustible flooring shall completely close the bottom or be constructed to provide a solid partition below the combustion-chamber ash compartment assembly. The ash compartment assembly is considered to include the floor of the ash compartment.
- 6.9 Openings in the casing above the solid bottom or partition required by 6.8 shall be at least 1/2 inch above such bottom or partition and at least 2 inches above the floor level.
- 6.10 Unless the space underneath the bottom or partition required by 6.8 is totally enclosed by the casing and floor, or the incinerator is on not more than four legs which are not more than 2 inches wide on any side, so as to provide a clear space not less than 4 inches high above the floor beneath the incinerator, the temperature on such bottom or partition shall not exceed 90°F (32.2°C) above room temperature when the incinerator is tested in accordance with these requirements.
- 6.11 Electrical devices, fittings, piping, safety controls, tubing, valves, and similar components employed in the assembly of an incinerator shall conform to the requirements for the product.
- 6.12 Screws used to attach parts which are detached for normal care of the appliance shall be capable of holding upon the application of the torque indicated in Table 6.1 after removal and replacement.

Table 6.1
Maximum torque requirements for screws

Screw size	Torque, pound-inches
No. 8	20
No. 10	25
1/4 inch	100
5/16 inch	200
3/8 inch	350
7/16 inch	550
1/2 inch	800
9/16 inch	1200

7 Enclosure

- 7.1 An incinerator shall be constructed of suitable materials of sufficient strength and durability to ensure safe and reliable service of the parts and of the assembly for an extended period of service.