



UL 641

STANDARD FOR SAFETY

Type L Low-Temperature Venting Systems

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UL Standard for Safety for Type L Low-Temperature Venting Systems, UL 641

Eighth Edition, Dated September 21, 2010

Summary of Topics

This revision of ANSI/UL 641 is being issued to update the title page to reflect reaffirmation of ANSI approval.

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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1

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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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CONTENTS

INTRODUCTION

1 Scope	5
2 Components	5
3 Units of Measurement	6
4 Glossary	6

CONSTRUCTION

5 Materials	6
6 Assembly	8
7 Caps	9
8 Firestop-Spacers	9
9 Fittings	9
10 Joints	9
11 Radiation Shields	10
12 Roof Assemblies	10
13 Roof Jacks	10
14 Sizes	11
15 Support Assembly	11

PERFORMANCE

16 General	11
17 Test Installation	12
17.1 General	12
17.2 Test structure	18
18 Temperature Measurement	18
19 Temperature Test – 570°F (299°C) Flue Gases	22
20 Temperature Test – 1700°F (927°C) Flue Gases	24
21 Draft Loss Test	24
22 Support Test	25
23 Strength Test	25
23.1 General	25
23.2 Impact test	25
23.3 Longitudinal force test	27
24 Wind Load Test	27
25 Rain Test	28
26 Crushing Test of Nonmetallic Flue-Gas Conduit	31
27 Resistance to Action of Acids Test of Nonmetallic Flue-Gas Conduit	32
28 Freezing and Thawing Test of Water-Absorptive Nonmetallic Materials	32
29 Cemented Joint Test of Flue-Gas Conduit	33
30 Sulfuric Acid Extraction Test for Porcelain-Coated Steel Used for Flue-Gas Conduit	33

MARKINGS

31 Marking	34
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INSTRUCTIONS

32 Installation Instructions	35
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INTRODUCTION

1 Scope

1.1 These requirements cover factory-built vent piping and fittings constructed to provide venting systems for use with gas and liquid fuel-burning appliances that exhaust low-temperature flue gases and that are approved for use with Type L venting systems.

1.2 Requirements for the installation and use of Type L low-temperature venting systems are included in the Standard for Chimneys, Fireplaces, Vents, and Solid-Fuel Burning Appliances, NFPA 211, and codes such as the BOCA Basic/National Mechanical Code, the Standard Mechanical Code, and the Uniform Mechanical Code.

1.3 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 or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the 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 does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

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.

2.2 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.

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

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.

3 Units of Measurement

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

4 Glossary

4.1 For the purpose of this standard, the following definitions apply.

4.2 **COMBUSTIBLE MATERIAL** – Material made of or surfaced with wood, compressed paper, plant fibers, or other material that ignites and burns, as applied to materials adjacent to or in contact with heat-producing appliances, chimney connectors and vent connectors, steam and hot water pipes, and warm air ducts. Such material shall be identified as combustible even though flameproofed, fire-retardant treated, or plastered.

4.3 **NONCOMBUSTIBLE MATERIAL** – A material that, in the form in which it is used and under the conditions anticipated, does not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat.

4.4 **TYPE L VENTING SYSTEM** – A passageway, vertical or nearly so, used for conveying flue gases from oil and gas appliances or their vent connectors to the outside atmosphere.

CONSTRUCTION

5 Materials

5.1 A venting system part shall be made of noncombustible corrosion-resistant materials. Metals shall not be used in combinations at any location within the assembly that causes detrimental galvanic action.

5.2 The minimum thickness of sheet metal, including any coatings, shall be as specified in Table 5.1.

Table 5.1
Minimum metal thickness

Metal	Inch	(mm)
Aluminum alloys (1100, 3003)	0.016	(0.41)
Steel (uncoated or painted)	0.042	(1.07)
Galvanized steel (G-90 coating class)	0.018	(0.46)
Aluminum-coated steel Type T1-40 (regular) [0.40 ounce per square foot (0.12 kg/m ²)]	0.018	(0.46)
Stainless steel	0.012	(0.30)

5.3 Aluminum alloys containing more than 1.0 percent magnesium shall not be used when the reflectivity of the material is employed to reduce the risk of fire.

5.4 A flue-gas conveying conduit shall be of cast refractory or clay tile [minimum thickness 0.400 inch (10.2 mm)], porcelain-coated steel-base metal [minimum thickness 0.026 inch (0.66 mm)], or Series 300 or Types 430 and 446 stainless steels [minimum thickness 0.012 inch (0.30 mm)]. Cast refractory, clay tile, and porcelain-coated steel shall comply with the requirements specified in Section 26, Crushing Test of Nonmetallic Flue-Gas Conduit; Section 27, Resistance to Action of Acids Test of Nonmetallic Flue-Gas Conduit; Section 28, Freezing and Thawing Test of Water-Absorptive Nonmetallic Materials; and Section

29, Cemented Joint Test of Flue-Gas Conduit. Flue-gas conveying conduit of porcelain-coated steel shall also comply with the requirements specified in Section 30, Sulfuric Acid Extraction Test for Porcelain-Coated Steel Used for Flue-Gas Conduit.

5.5 Other parts subject to contact by flue-gases or flue-gas air mixtures at locations beyond the terminus of the flue-gas-conveying conduit, or subject to condensation, shall be of stainless steel Series 300 or Types 430 and 446 or the equivalent.

5.6 An outer casing or other structural part:

- a) Whose deterioration or corrosion causes the venting system to collapse or otherwise increase the risk of injury to persons;
- b) That adjoins firestopping material; or
- c) Is subject to condensation;

shall be of stainless steel, galvanized steel, or aluminum-coated steel. Galvanized steel or aluminum-coated steel shall comply with the requirements of 5.7. Stainless steel shall comply with 5.2.

Exception No. 1: This requirement does not apply to the flue-gas conveying conduit. See 5.4.

Exception No. 2: This requirement does not apply to parts subject to contact by flue-gases or flue-gas air mixtures at or beyond the terminus of the flue-gas conveying conduit. See 5.5.

5.7 Galvanized steel used for outer casings, structural parts, firestopping or other components or subassemblies shall have a zinc coating complying with the coating designation G90 (former coating class 1.25 commercial) in Weight (Mass) of Coating Requirements table in of the Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, ASTM A653, with not less than 40 percent of the zinc on any side, based on the minimum single spot test in the ASTM designation. The weight of zinc coating shall be established in accordance with the Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings, ANSI/ASTM A90. Aluminum-coated steel shall be of Type T1-40 (regular) [0.40 ounce per square foot (0.12 kg/m²)].

5.8 A painted part made of steel not less than 0.053 inch (1.35 mm) thick, or of cast iron not less than 0.125 inch (3.18 mm) thick, and for use only in the interior of buildings, is determined to have corrosion resistance equivalent to that required by 5.6. Paint coatings shall remain intact at the maximum temperatures obtained on the part during the tests specified in these requirements.

5.9 Except for binder materials, thermal insulation material shall be noncombustible.

5.10 Thermal insulation as employed shall be in accordance with the following conditions when the system is tested in accordance with these requirements:

- a) The products resulting from the combustion or volatilization of any combustible binder shall be discharged to the chimney terminus outside of the building;
- b) The insulating material shall remain in its intended position;
- c) The thermal conductivity of the insulating material shall not be increased; or
- d) The thermal insulation shall not show evidence of softening, melting, or other evidence of malfunction or deterioration.

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5.11 Thermal insulation shall not come into contact with products of combustion.

5.12 Thermal insulation that is not self-supporting shall be applied to solid surfaces so that the insulation does not sag. An adhesive or cement used to attach such material shall retain its adhesive qualities at any temperature the adhesive attains when tested in accordance with these requirements and at 0°F (minus 18°C).

5.13 A water-absorbing insulating material shall not be subject to wetting by condensation or rain when installed as intended.

6 Assembly

6.1 A venting system shall consist of all the essential parts required for the intended installation of a complete system for venting. Each part of the assembly shall be constructed for ready attachment of one to the other without requiring alteration by the installer, such as by cutting, threading, drilling, welding, or similar tasks.

Exception: An assembly or component part intended to be cut to length or to be fitted by the installer shall not be provided unless means are furnished for joining any altered part to a companion part or assembly. All fasteners required to complete the assembly shall be provided with the product by the manufacturer. Drilling shall not occur unless:

- a) The drilling operation does not weaken the assembly or penetrate into the flue liner; and*
- b) The size of the required drill bit is specified and the instructions clearly describe the locations to be drilled, such as by the use of drawings, descriptions, or templates.*

6.2 Two or more parts or subassemblies that bear a definite relationship to each other in the intended application shall:

- a) Be arranged and constructed to permit them to be incorporated into the complete assembly without alteration or alignment and only in the correct relationship with each other; or
- b) Be assembled and shipped from the factory as one unit.

6.3 Each part, such as a vent-pipe section or length, elbow, coupling, or tee, shall be completely assembled by the manufacturer at the factory.

6.4 The venting system shall be capable of attachment to chimney connectors having diameters of integral inches.

6.5 The construction of a vent part shall not void the firestopping required between spaces of a building when the part is installed in accordance with the manufacturer's instructions.

6.6 The annulus between any two walls of a multiple-wall vent-pipe section or vent-pipe fitting shall be not less than 1/4 inch (6.4 mm) in width.