

NFPA®

211

**Standard for Chimneys,
Fireplaces, Vents, and Solid
Fuel–Burning Appliances**

2019



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NFPA® 211

Standard for

Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances

2019 Edition

This edition of NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*, was prepared by the Technical Committee on Chimneys, Fireplaces, and Venting Systems for Heat-Producing Appliances. It was issued by the Standards Council on July 26, 2018, with an effective date of August 15, 2018, and supersedes all previous editions.

This edition of NFPA 211 was approved as an American National Standard on August 15, 2018.

Origin and Development of NFPA 211

In 1906, the NFPA Committee on Chimneys and Flues presented its first report. In 1914, under the jurisdiction of the then Committee on Field Practice, recommendations on chimneys and flues were prepared as Chapter VII of the *Field Practice Manual*, presented in 1914, and adopted in 1915. In 1926, the Association adopted the Chimney Construction Ordinance of the National Board of Fire Underwriters. In 1944, the Association adopted Article XI of the 1943 edition of the *Building Code of the National Board of Fire Underwriters* to supersede the former chimney ordinance. That action was taken by the Board of Directors in the name of the Association on the recommendation of the Committee on Field Practice.

In 1948, the subject of chimneys and flues was transferred to the Committee on Building Construction. In 1950, the Association adopted Article X of the 1949 *National Building Code of the National Board of Fire Underwriters* to supersede the 1944 standard, on the recommendation of the Committee on Building Construction and action by the Board of Directors.

In 1955, the subject of chimneys and flues was transferred to the newly appointed Committee on Chimneys and Heating Equipment. NFPA 211 was revised in 1957 to make the text consistent with the provisions on the same subject appearing in the *National Building Code of the National Board of Fire Underwriters*. NFPA 211 was revised in 1961 and completely rewritten in 1964. The 1964 edition included requirements for chimney connectors, which were previously covered in NFPA 212 and was withdrawn at that point. Since 1964, revised editions of the standard were adopted by the Association in 1966, 1968, 1970, 1971, 1972, and 1977. In 1969, new text was added to cover the subject of spark arresters, previously covered in NFPA 213, which was withdrawn.

In 1980, the scope of NFPA 211 was expanded to include solid-fuel appliances, and in the 1984 edition, major revisions were made to many sections, including important tables and graphs.

The 1988 edition included revisions to wall pass-through systems, including a new Table 5.7, which showed four chimney connector systems. A complete revision to Table 5.5(b) and changes to upgrade test requirements for factory-built chimneys were included.

The 1992 edition included new figures to show fireplace clearance requirements and other construction details, new requirements for combustion air ducts for fireplaces, and a new maintenance chapter that addressed inspection, cleaning, and repair of chimneys, vents, and fireplaces. Definitions for *vent* and *chimney* were revised in the 1996 edition, and the chimney and vent selection charts were moved from Chapter 1 to a new Chapter 2. The new Chapter 2 included new figures to aid in the selection of chimney types.

The 2000 edition included new material that addressed mechanical draft systems, carbon monoxide detection and alarms, and sizing of masonry chimneys. A new chapter, Chapter 11, was added to give detailed direction for the inspection of existing chimneys.

The 2003 edition included a major editorial revision to comply with the *Manual of Style for NFPA Technical Committee Documents*. There were also technical changes in the requirements for the flue cross-sectional area and solid fuel–burning appliance connections to masonry fireplaces.

The 2006 edition of the standard included new structural and foundation requirements for chimneys and fireplaces, requirements for the effective area of the chimney connector, and requirements for firebox and fireplace construction and sizing, as well as minor editorial changes.

The 2010 edition of the standard included extensive revisions to definitions, deleting those not used in the standard, and clarifying many definitions. Terminology for gas appliances was made consistent with NFPA 54, *National Fuel Gas Code*, by substituting *appliance* for *gas utilization appliance*. New minimum requirements for opening for rain caps and spacing of electrical wire from dryer vents were added.

In the 2013 edition, masonry heaters were relocated to a new chapter, and requirements addressing clearance from masonry heaters to combustibles were added. In addition, the 2013 edition included a new prohibition on the use of a duct wrap system to provide enclosure of a factory-built chimney.

Added to the 2016 edition were provisions for a physical barrier for insulation installed close to a chimney, metal clips to provide structural support, and maximum duct run lengths to harmonize NFPA 211 with other standards. The 2016 edition also included requirements for masonry fireplace accessories installation.

The 2019 edition includes updated references such as product listings. In addition, installation of decorative shrouds at the termination of a factory-built chimney are permitted per the standard requirements.

Technical Committee on Chimneys, Fireplaces, and Venting Systems for Heat-Producing Appliances

Dale W. Feb, *Chair*

Fireplace Investigation, Research & Education Service, CA [SE]

James P. Brewer, Magic Sweep Corporation, VA [IM]

Rep. National Chimney Sweep Guild

Randy Brooks, Brooks Chimney Sweeping, CA [IM]

Jonathan E. Cross, D.J. Cross, Inc., PA [IM]

Rick Curkeet, Intertek Testing Services, WI [RT]

Nicholas A. Dawe, Cobb County Fire Marshal's Office, GA [E]

Michael DeBlasio, M. DeBlasio, Inc., MA [IM]

Royal Edwards, Seffner, FL [SE]

Larry Grogan, AHPBA RMHPBA, MT [SE]

Robert D. Harper, Hearthman Specialties, PA [SE]

Leo Herrmann, Leo Herrmann Fireplace Inc., PA [SE]

Dale D. Hersey, State of Maine, ME [E]

Vickie Hodges, State Farm Insurance Companies, IL [I]

Chris Hurst, Van-Packer Company, IL [M]

Marek Kulik, Technical Standards and Safety Authority, Canada [E]

Timothy McNulty, RM Manifold Group Inc., dba U.S. Draft Company, TX [M]

Todd Metzger, Schaefer Engineering Inc., MO [SE]

Anthony R. O'Neill, Boothbay Harbor, ME [C]

Harold L. Ornstein, EFI Global, Inc., MD [SE]

Keith Page, Selkirk/Hart & Cooley, Inc., MI [M]

Brian Peck, Travelers Indemnity Company, CT [I]

Thomas A. Pierce, Pierce Fire Investigations, CA [SE]

Robert A. Priesing, Havelock's Chimney & Venting, Inc., NC [IM]

Shaun Ray, Metal-Fab, Inc., KS [M]

Rep. Air-Conditioning, Heating, & Refrigeration Institute

Robert A. Rucker, CMS Industries, Inc., NY [M]

Michael L. Savage, Sr., Marion County Building Safety, FL [E]

Paul B. Stegmeir, Faribault, MN [SE]

Thomas Stroud, Hearth, Patio & Barbecue Association, WA [M]

Rep. Hearth, Patio, and Barbecue Association

Richard Vlahos, National Fireplace Institute, VA [SE]

Rep. Hearth Patio & Barbecue Education Foundation (HPBEF)

Robert J. Zimmerman, Jr., UL LLC, IL [RT]

Alternates

Shailesh Bulsara, UL LLC, IL [RT]

(Alt. to Robert J. Zimmerman, Jr.)

Jason Woodruff, FireTech, CA [SE]

(Alt. to Dale W. Feb)

Brian Ziegler, Intertek, WI [RT]

(Alt. to Rick Curkeet)

Nonvoting

Janet Buyer, U.S. Consumer Product Safety Commission, MD [C]

Rep. U.S. Consumer Product Safety Commission

Lisa Hartman, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on fire safety for the construction, installation, and use of chimneys, fireplaces, vents, venting systems, and solid fuel-burning appliances. It also shall be responsible for documents on clearances of heat-producing appliances from combustible materials and terms relating to chimneys, vents, and heat-producing appliances.

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NFPA 211

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Burning Appliances

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1 Scope. This standard applies to the design, installation, maintenance, and inspection of all chimneys, fireplaces, venting systems, and solid fuel-burning appliances.

1.2 Purpose.

1.2.1 The primary concern of this standard is the removal of waste gases; the reduction of fire hazards associated with the construction and installation of chimneys, fireplaces, and venting systems for residential, commercial, and industrial appliances; and the installation of solid fuel-burning appliances.

1.2.2 This standard provides minimum construction and installation requirements for chimneys and vents suitable for use with fuel-burning appliances.

1.3 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued.

1.3.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.3.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.3.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction and only where it is clearly evident that a reasonable degree of safety is provided.

1.4 Equivalency.

1.4.1 General. Nothing in this standard shall prohibit methods of construction, materials, and designs not specifically prescribed in this standard where equivalent alternatives are approved by the authority having jurisdiction.

1.4.2 Approval of Alternatives. Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this standard.

1.4.3 Tests.

1.4.3.1 Whenever the authority having jurisdiction determines that there is insufficient evidence of proof of equivalency with the prescribed requirements of this standard, the authority having jurisdiction shall be authorized to require tests showing proof of equivalency.

1.4.3.2 Tests required by the authority having jurisdiction shall be provided at no expense to the jurisdiction.

1.4.3.3 Tests shall be conducted as specified in this standard or, where test methods are not specified in this standard, they shall be conducted as required by the authority having jurisdiction.

1.4.4 Approval. The authority having jurisdiction shall determine whether the proposed alternative methods of construction, materials, and designs are at least equivalent to the prescribed requirements of this standard.

1.5 Dimensions. Where used to describe building construction components, all minimum dimensions specified in this standard are actual unless otherwise stated. Nominal dimensions shall be permitted to vary from their specified dimensions by no more than ½ in. (12.7 mm).

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2016 edition.

NFPA 54, *National Fuel Gas Code*, 2018 edition.

NFPA 72®, *National Fire Alarm and Signaling Code*®, 2019 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 2019 edition.

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*, 2018 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2017 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2018 edition.

2.3 Other Publications.

▲ **2.3.1 ASHRAE Publications.** ASHRAE, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

ASHRAE Handbook: HVAC Systems and Equipment, 2012.

2.3.2 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM C27, *Standard Classification of Fireclay and High-Alumina Refractory Brick*, 1998, reapproved 2013.

ASTM C199, *Standard Test Method for Pier Test for Refractory Mortars*, 1984, reapproved 2011.

ASTM C315, *Standard Specification for Clay Flue Liners and Chimney Pots*, 2007, reapproved 2011.

ASTM C476, *Standard Specification for Grout for Masonry*, 2010.

ASTM C1261, *Standard Specification for Firebox Brick for Residential Fireplaces*, 2013.

ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*, 2016.

ASTM E1602, *Standard Guide for Construction of Solid Fuel Burning Masonry Heaters*, 2003 (2010).

▲ **2.3.3 UL Publications.** Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 103, *Standard for Factory-Built Chimneys for Residential Type and Building Heating Appliances*, revised 2012.

ANSI/UL 127, *Standard for Factory-Built Fireplaces*, 2011, revised 2015.

UL 378, *Standard for Draft Equipment*, 2006, revised 2013.

UL 959, *Standard for Medium Heat Appliance Factory-Built Chimneys*, 2010, revised 2014.

UL 2561, *Standard for 1400 Degree Fahrenheit Factory-Built Chimneys*, 2016.

2.3.4 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2016 edition.

NFPA 54, *National Fuel Gas Code*, 2018 edition.

NFPA 85, *Boiler and Combustion Systems Hazards Code*, 2019 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2018 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

■ **3.2.7 Standard.** An NFPA Standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase

“standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1* Accessible (for Inspections). Capable of being exposed for inspection, maintenance, or repair without damage to the chimney or building structure or finish, but which may require the removal of doors, panels, or coverings using commonly available tools.

3.3.1.1* Readily Accessible (for Inspections). Exposed, or capable of being exposed, for operation, inspection, maintenance, or repair without the use of tools to open or remove doors, panels, or coverings.

3.3.2 Accessory. Supplementary part or device added to an appliance to make it more useful, versatile, attractive, and so forth.

3.3.2.1* Factory-Built Fireplace Accessories. Accessories intended for field installation into or attachment to factory-built fireplaces.

3.3.2.2* Masonry Fireplace Accessories. Accessories intended for field installation into or attachment to masonry fireplaces.

3.3.3 Air.

3.3.3.1 Combustion Air. The air necessary to provide for the complete combustion of fuel and usually consisting of primary air, secondary air, and excess air.

3.3.4 Appliance. Any device that utilizes a fuel to produce light, heat, power, refrigeration, or air conditioning.

3.3.4.1 Counter Appliance (Gas). Appliances such as gas-operated coffee brewers and coffee urns and any appurtenant water-heating equipment, food and dish warmers, hot plates, and griddles.

3.3.4.2* Direct Vent Appliance. A system consisting of an appliance, combustion air and flue gas connections between the appliance and the outside atmosphere, and a vent cap supplied by the manufacturer, and constructed so that all air for combustion is obtained from the outside atmosphere and all flue gases are discharged to the outside atmosphere.

3.3.4.3 Fuel-Burning Appliance.

3.3.4.3.1 Pellet Fuel-Burning Appliance. A closed combustion pellet vent or chimney-connected solid pellet fuel-burning appliance incorporating a fuel-feed control mechanism.

3.3.4.3.2 Solid Fuel-Burning Appliance. A chimney-connected device that burns solid fuel designed for purposes of heating, cooking, or both.

3.3.4.4 Heating Appliance.

3.3.4.4.1 Attic-Type Heating Appliance. A heating appliance designed specifically for installation in an attic or in a space with low headroom that normally is unoccupied.

3.3.4.4.2 Building Heating Appliance. See 3.3.4.8, Nonresidential, Low-Heat Appliance.

3.3.4.4.3 Residential-Type Heating Appliance. Fuel-burning appliances, not including high-pressure steam boilers, that are mainly used in residences but that might be used in other buildings, and that do not produce continuous flue gas temperatures exceeding 1000°F (538°C).

3.3.4.5 Heat-Producing Appliance. An appliance that produces heat by utilizing electric energy or by burning fuel.

3.3.4.6 Nonresidential Appliance, 1400°F. A commercial, industrial, or institutional appliance needing a chimney capable of withstanding a continuous flue gas temperature not exceeding 1400°F (760°C).

3.3.4.7 Nonresidential, High-Heat Appliance. A commercial, industrial, or institutional appliance needing a chimney capable of withstanding a continuous flue gas temperature exceeding 1800°F (982°C).

3.3.4.8 Nonresidential, Low-Heat Appliance. A commercial, industrial, or institutional appliance needing a chimney capable of withstanding a continuous flue gas temperature not exceeding 1000°F (538°C).

3.3.4.9 Nonresidential, Medium-Heat Appliance. A commercial, industrial, or institutional appliance needing a chimney capable of withstanding a continuous flue gas temperature not exceeding 1800°F (982°C).

3.3.4.10 Vented Appliance. An indirect-fired appliance provided with a flue collar to accommodate a venting system for conveying flue gases to the outside atmosphere.

3.3.5 Appliance Casing (or Jacket). An enclosure forming the outside of the appliance.

3.3.6 Appliance Categories. See 3.3.80, Gas Appliance Categories.

3.3.7 Appliance Flue. See 3.3.73.1.

3.3.8 Ash. The solid residue that remains after combustion is complete.

3.3.9 Ash Receptacle Door. A door below the grade level providing access to the ash receptacle.

3.3.10 Attic-Type Heating Appliance. See 3.3.4.4.1.

3.3.11 Automatic Electric Igniter. A device for fuel burners designed to utilize electric energy for ignition of a fuel-air mixture at the burner.

3.3.12 Automatically Operated Damper. See 3.3.52.1.

3.3.13 Barometric Draft Regulator. A device built into a fuel-burning appliance, or made a part of a chimney connector or vent connector, that functions to reduce excessive draft through an appliance to a desired value by admitting ambient air into the appliance chimney, chimney connector, vent, or vent connector.

3.3.14 Boiler. A closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof by the application of heat from combustible fuels in a self-contained or attached furnace. [85, 2019]

3.3.14.1 Combination-Fuel Boiler. A single boiler unit designed to burn more than one type of fuel (gas, oil, or solid), either separately or simultaneously, using either separate or common combustion chambers and flues.

3.3.14.2 High-Pressure Boiler. A boiler for generating steam at gauge pressures in excess of 15 psi (103 kPa), or for heating water to a temperature in excess of 250°F (121°C) or at a gauge pressure in excess of 160 psi (gauge pressure of 1103 kPa).

3.3.14.3 Low-Pressure Boiler. A boiler for generating steam at gauge pressures not in excess of 15 psi (gauge pressure of 103 kPa) or for furnishing water at a maximum temperature of 250°F (121°C) at a maximum gauge pressure of 160 psi (gauge pressure of 1100 kPa). [31, 2016]

3.3.14.4 Supplementary Boiler. A boiler, designed to burn one type of fuel (gas, oil, or solid), that is intended for supplementing a boiler burning another type of fuel (gas, oil, or solid) by means of a common heat transfer medium.

3.3.15 Bond. Where referring to bricklaying and masonry chimneys, that connection between brick, stone, or other masonry units formed by lapping them upon one another in carrying up the work, thereby forming an inseparable mass.

3.3.16 Breeching. The conduit conveying flue gas from the appliance to the chimney.

3.3.17 Btu. Abbreviation for British thermal unit. The quantity of heat needed to raise the temperature of 1 pound of water 1°F.

3.3.18 Building Heating Appliances. See 3.3.4.8, Nonresidential, Low-Heat Appliance.

3.3.19 Cap.

3.3.19.1 Chimney Cap. A protective covering or housing for the top of a chimney intended to prevent the entry of rain, snow, animals, and birds, and to prevent downdrafts.

3.3.19.2 Vent Cap. A protective covering or housing attached to the vent termination, intended for preventing downdrafts and the entry of rain, snow, and animals.

3.3.20 Central Warm-Air, Forced-Air, Attic-Type Furnace. See 3.3.79.1.

3.3.21 Central Warm-Air, Forced-Air, Downflow-Type Furnace. See 3.3.79.2.

3.3.22 Central Warm-Air, Forced-Air, Horizontal-Type Furnace. See 3.3.79.3.

3.3.23 Central Warm-Air, Forced-Air, Upflow-Type Furnace. See 3.3.79.4.

3.3.24 Central Warm-Air, Forced-Air-Type Furnace. See 3.3.79.5.

3.3.25 Central Warm-Air Furnace. See 3.3.79.6.

3.3.26 Central Warm-Air, Gravity-Type Furnace. See 3.3.79.7.

3.3.27 Central Warm-Air, Gravity-Type Furnace with Booster Fan. See 3.3.79.8.

3.3.28 Central Warm-Air, Gravity-Type Furnace with Integral Fan. See 3.3.79.9.

3.3.29 Chimney. A structure containing one or more vertical or nearly vertical passageways for conveying flue gases to the outside atmosphere. [See also 3.3.142.1, *Gas Vent*; 3.3.142, *Vent*; and 3.3.131.2, *Venting System (Flue Gases)*.]

3.3.29.1 Building Heating Appliance-Type Chimney.

3.3.29.1.1 Factory-Built, Building Heating Appliance-Type Chimney. A heating appliance chimney suitable for continuous use at 1000°F (538°C), composed of listed, factory-built components, designed for open, nonenclosed use at specified minimum clearances to combustibles, and assembled in accordance with the terms of the listing to form the completed chimney.

△ **3.3.29.1.2 Factory-Built, Residential-Type and Building Heating Appliance-Type Chimney.** A chimney suitable for use at 1000°F (538°C), which complies with the 10-minute 1700°F (927°C) temperature test of UL 103, *Standard for Factory-Built Chimneys for Residential Type and Building Heating Appliances*, and is composed of listed, factory-built components that might be fully enclosed in combustible, residential-type construction, and that is assembled in accordance with the terms of the listing to form a completed chimney.

△ **3.3.29.1.3* Type HT Factory-Built, Residential-Type and/or Building Heating Appliance-Type Chimney.** A residential type and building heating appliance chimney suitable for use at 1000°F (538°C), which complies with the optional 10-minute 2100°F (1149°C) temperature test of UL 103, *Standard for Factory-Built Chimneys for Residential Type and Building Heating Appliances*. Such chimneys are labeled as Type HT and are required for certain solid fuel-fired applications.

3.3.29.2 Factory-Built, 1400°F-Type Chimney. A chimney suitable for continuous use at 1400°F (760°C), composed of listed, factory-built components, intended for open, nonenclosed use at specified minimum clearances to combustibles and for use in noncombustible locations, and assembled in accordance with the terms of the listing to form the completed chimney.

3.3.29.3 Factory-Built, Medium-Heat Appliance-Type Chimney. A chimney used with appliances that produce maximum flue gas temperatures of 1800°F (982°C), composed of listed, factory-built components, suitable for open, nonenclosed use at specified minimum clearances to combustibles, and assembled in accordance with the terms of the listing to form the completed chimney.

3.3.29.4 Factory-Built, Positive Pressure Capable Chimney. A residential-type or building heating appliance chimney, or both, listed for use in positive internal pressure applications.

3.3.29.5 Masonry Chimney. A field-constructed chimney of solid masonry units, bricks, stones, listed masonry chimney units, or reinforced Portland cement concrete, lined with suitable chimney flue liners. [54, 2018]

3.3.29.6 Unlisted Metal (Smokestack) Chimney. A manufactured or field-constructed chimney intended only for nonresidential applications having one or more metal walls, or made of metal with a refractory lining, and that is capable of withstanding the flue gas conditions of its use.

3.3.30 Chimney Cap. See 3.3.19.1.

3.3.31 Chimney Connector. See 3.3.48.1.

3.3.32 Chimney Connector-Type Heat Reclaimer. A heat exchanger intended to be installed in a chimney connector between a heating appliance and the chimney to transfer heat from the flue gases through metal to air or water.

3.3.33 Chimney Flue. See 3.3.73.2.

3.3.34 Chimney Flue Base (Base of Flue). The lowest point of a flue within a chimney.

3.3.35 Chute-Fed Incinerator (Class IIA). See 3.3.91.1.

3.3.36 Circulating Room Heater. See 3.3.88.2.1.

3.3.37 Cleanout Opening. An opening or hole in a chimney, usually located near its base, designed to allow access to the flue for purposes of removing ash, creosote, soot, and other extraneous matter that becomes trapped.

3.3.38 Clearance. The distance between a heat-producing appliance, chimney, chimney connector, vent, vent connector, or plenum and other surfaces.

3.3.39 Clothes Dryer. A device used to dry wet laundry by means of heat derived from the combustion of fuel or from electric heating elements.

3.3.39.1 Type 1 Clothes Dryer. A factory-built, mass-produced dryer, primarily used in a family living environment. It might or might not be coin-operated for public use and usually is the smallest unit both physically and in function.

3.3.39.2 Type 2 Clothes Dryer. A factory-built, mass-produced dryer used in a commercial business. It might or might not be operated by the public or a hired attendant. It might or might not be coin-operated and is not designed for use in an individual family living environment. It can be small, medium, or large in size.

3.3.40 Combination Room Heater/Fireplace Stove. See 3.3.70.1.

3.3.41 Combination-Fuel Boiler. See 3.3.14.1.

3.3.42 Combination-Fuel Furnace. See 3.3.79.10.

3.3.43 Combustible Material. See 3.3.100.1.

3.3.44 Combustion. A chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light in the form of either a glow or flame. [5000, 2018]

3.3.45 Combustion Air. See 3.3.3.1.

3.3.46 Combustion Products. Constituents resulting from the combustion of a fuel with the oxygen of the air, including the inert but excluding excess air. [54, 2018]

3.3.47 Commercial-Industrial-Type Incinerator (Classes III, IV, V, VI, and VII). See 3.3.91.2.

3.3.48 Connector.

3.3.48.1 Chimney Connector. The pipe that connects a fuel-burning appliance to a chimney.

3.3.48.2 Vent Connector. The pipe that connects a fuel-burning appliance to a gas vent or Type L vent.

3.3.49 Corbel. Units of masonry projecting from or projecting upward and outward from the face of a wall or chimney in courses to form a support or ledge for a beam, rafter, or other member.

3.3.50 Counter Appliance (Gas). See 3.3.4.1.

3.3.51* Crown. A sloped covering for the top of a masonry chimney that is designed to shed water away from the flue liner and the chimney and to allow expansion and movement of the flue liner.

3.3.52 Damper. A valve or plate for controlling draft or the flow of gases, including air.

3.3.52.1 Automatically Operated Damper. A damper operated by an automatic control.

3.3.52.2 Flue Gas Damper. A damper located on the downstream side of the combustion chamber of a fuel-burning appliance, usually in a flue passage of the appliance or in the chimney or vent connector.

3.3.52.3 Manually Operated Damper. An adjustable damper manually set and locked in the desired position.

3.3.53 Decorative Shroud. A partial enclosure for aesthetic purposes that is installed at the termination of a venting system that surrounds or conceals the chimney or vent cap.

3.3.54 Dilution Flue. See 3.3.73.3.

3.3.55 Direct Vent Appliance. See 3.3.4.2.

3.3.56 Draft. A pressure difference that causes gases or air to flow through a chimney, vent, flue, or appliance. [54, 2018]

3.3.56.1* Mechanical Draft. Draft produced by a fan or an air or steam jet.

3.3.56.2 Natural Draft. Draft produced by the difference in the weight of a column of flue gases within a chimney or vent system and a corresponding column of air of equal dimension outside the chimney or venting system. [31, 2016]

3.3.57 Draft Hood. A nonadjustable device built into an appliance, or made a part of the vent connector from an appliance, that is designed to (1) provide for the ready escape of the flue gases from the appliance in the event of no draft, back-draft, or stoppage beyond the draft hood, (2) prevent a back-draft from entering the appliance, and (3) neutralize the effect of stack action of the chimney or gas vent upon the operation of the appliance. [54, 2018]

3.3.58 Duct Furnace. See 3.3.79.11.

3.3.59 Engineered Venting or Chimney System. See 3.3.131.1.

3.3.60 Factory-Built, 1400°F-Type Chimney. See 3.3.29.2.

3.3.61 Factory-Built, Building Heating Appliance-Type Chimney. See 3.3.29.1.1.

3.3.62 Factory-Built Fireplace. See 3.3.68.1.

3.3.63 Factory-Built, Medium-Heat Appliance-Type Chimney. See 3.3.29.3.

3.3.64 Factory-Built, Positive Pressure Capable Chimney. See 3.3.29.4.

3.3.65 Factory-Built, Residential-Type and Building Heating Appliance-Type Chimney. See 3.3.29.1.2.

3.3.66 Fan. A blower or exhauster assembly comprising blades or runners and housings or casings.

3.3.67 Fan-Type Floor Furnace. See 3.3.79.12.1.

3.3.68 Fireplace. A hearth, fire chamber, or similarly prepared area and a chimney.

3.3.68.1 Factory-Built Fireplace. A fireplace composed of listed, factory-built components assembled in accordance with the terms of the listing.

3.3.68.2 Masonry Fireplace. A hearth and fire chamber of solid masonry units, such as bricks, stones, listed masonry units, or reinforced concrete, provided with a suitable chimney.

3.3.69 Fireplace Insert. A factory-built, field-installed product consisting of a firebox assembly designed to be installed within or partially within the fire chamber of a fireplace that uses the fireplace flue to vent the products of combustion.

3.3.70 Fireplace Stove. A freestanding, chimney-connected, solid fuel-burning appliance that is designed to be operated with the fire chamber either open or closed.

3.3.70.1 Combination Room Heater/Fireplace Stove. A chimney-connected, solid fuel-burning room heater that is designed to be operated with the fire chamber either open or closed.

3.3.71 Floor Furnace. See 3.3.79.12.

3.3.72 Floor Protector. A noncombustible surfacing applied to the floor area underneath and extending in front, to the sides, and to the rear of a heat-producing appliance.

3.3.73 Flue. The general term for a passage through which gases are conveyed from the combustion chamber to the outer air.

3.3.73.1 Appliance Flue. The flue passage within an appliance.

3.3.73.2 Chimney Flue. The passage in a chimney for conveying the flue gases to the outside atmosphere.

3.3.73.3 Dilution Flue. A passage designed to effect the dilution of flue gases with air before discharge from an appliance.

3.3.74 Flue Collar. That portion of an appliance designed for attachment of a chimney or vent connector or a draft hood.

3.3.75 Flue Gas Damper. See 3.3.52.2.

3.3.76 Flue Gases. See 3.3.82.1.

3.3.77 Flue-Fed Incinerator (Class II). See 3.3.91.3.

3.3.78 Fuel. A material used to produce heat or power by burning.

3.3.78.1 Pellet Fuel. A solid processed fuel of specified size and composition capable of being fed to the appliance combustion system at a controlled rate.

3.3.78.2 Solid Fuel. Wood, coal, and other similar organic materials and any combination of them.

3.3.79 Furnace.

3.3.79.1 Central Warm-Air, Forced-Air, Attic-Type Furnace. A forced-air-type furnace designed specifically for installation in an attic or in a space with low headroom that is normally occupied.

3.3.79.2 Central Warm-Air, Forced-Air, Downflow-Type Furnace. A forced-air-type furnace designed with airflow essentially in a vertical path, discharging air at or near the bottom of the furnace.

3.3.79.3 Central Warm-Air, Forced-Air, Horizontal-Type Furnace. A forced-air-type furnace designed with airflow through the furnace, essentially in a horizontal path.

3.3.79.4 Central Warm-Air, Forced-Air, Upflow-Type Furnace. A forced-air-type furnace designed with airflow essentially in a vertical path, discharging air at or near the top of the furnace.

3.3.79.5 Central Warm-Air, Forced-Air-Type Furnace. A central furnace equipped with a blower that provides the primary means for the circulation of air.

3.3.79.6 Central Warm-Air Furnace. A self-contained indirect-fired or electrically heated appliance designed to supply heated air through ducts to spaces remote from or adjacent to the appliance location.

3.3.79.7 Central Warm-Air, Gravity-Type Furnace. A central furnace depending primarily on circulation of air by gravity.

3.3.79.8 Central Warm-Air, Gravity-Type Furnace with Booster Fan. A central furnace equipped with a booster fan that does not materially restrict free circulation of air by gravity flow when such a fan is not in operation.

3.3.79.9 Central Warm-Air, Gravity-Type Furnace with Integral Fan. A central furnace equipped with a fan as an integral part of its construction and operable on gravity systems only. The fan is used only to overcome the internal resistance to airflow.

3.3.79.10 Combination-Fuel Furnace. A single furnace unit designed to burn more than one type of fuel (gas, oil, or solid), either separately or simultaneously, using either separate or common combustion chambers and flues.

3.3.79.11 Duct Furnace. A central furnace designed for installation in a duct of an air distribution system to supply warm air for heating and that depends on a blower not furnished as part of the furnace for air circulation.

3.3.79.12 Floor Furnace. A self-contained indirect-fired or electrically heated furnace designed to be suspended from the floor of the space to be heated. A fuel-burning floor furnace is designed to take air for combustion from outside the space being heated and is provided with means for observing the flame and lighting the appliance from such space.

3.3.79.12.1 Fan-Type Floor Furnace. A floor furnace equipped with a blower that provides the primary means for circulation of air.

3.3.79.12.2 Gravity-Type Floor Furnace. A floor furnace depending primarily on circulation of air by gravity. This classification also includes floor furnaces equipped with booster-type fans that do not materially restrict free circulation of air by gravity flow when such fans are not in operation.

3.3.79.13 Supplementary Furnace. A furnace designed to burn one type of fuel (gas, oil, or solid) that is intended for supplementing a central warm-air furnace burning another type of fuel (gas, oil, or solid) by means of a common warm-air supply plenum.

3.3.80* Gas Appliance Categories. Vented gas appliances are classified for venting purposes into four categories as follows: (1) Category I — An appliance that operates with a non-positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent; (2) Category II — An appliance that operates with a non-positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the vent; (3) Category III — An appliance that operates with a positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent; (4) Category IV — An appliance that operates with a positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the vent.

3.3.81 Gas Vent. See 3.3.142.1.

3.3.82 Gases.

3.3.82.1 Flue Gases. Combustion products from fuel-burning appliances along with excess air.

3.3.82.2 Vent Gases. Products of combustion from fuel-burning appliances along with excess air, plus any dilution air in the venting system above a draft hood or draft regulator.

3.3.83 Gravity-Type Floor Furnace. See 3.3.79.12.2.

3.3.84 Header. Where referring to chimneys, a beam set at right angles to floor or roof joists to provide support and framing around the opening.

3.3.85 Hearth. The floor area within the fire chamber of a fireplace or a fireplace stove.

3.3.86 Hearth Extension. The noncombustible surfacing applied to the floor area extending in front of and at the sides of the hearth opening of a fireplace or a fireplace stove; also where applied to the floor area beneath a fireplace stove or beneath an elevated overhanging fireplace hearth.

3.3.87 Heat Exchanger. A chamber in which heat resulting directly from the combustion of fuel, or heat from a medium such as air, water, or steam, is transferred through the walls of the chamber to air passing through the exchanger; or a chamber in which heat from electric resistors is transferred to the air.

3.3.88 Heater.

3.3.88.1 Masonry Heater. A vented heating system of predominantly masonry construction having a mass of at least 1760 lb (800 kg) excluding the chimney and masonry heater base.

3.3.88.2 Room Heater. A heating appliance intended for installation in the space being heated and not intended for duct connection.

3.3.88.2.1 Circulating Room Heater. A room heater with an outer jacket surrounding the heat exchanger, arranged with openings at top and bottom so that air circulates between the heat exchanger and the outer jacket. Room heaters that

have openings in an outer jacket to allow some direct radiation from the heat exchanger are classified as a radiant type.

3.3.88.2.2 Radiant Room Heater. A room heater designed to transfer heat primarily by direct radiation.

3.3.88.2.3 Solid Fuel Room Heater. A chimney-connected, solid fuel-burning room heater that is designed to be operated with the fire chamber closed.

3.3.88.3 Unit Heater. A self-contained heating appliance that is intended for the heating of the space in which it is installed. A unit heater can be an indirect-fired fuel-burning appliance or might utilize steam, hot water, or electricity.

3.3.88.4 Water Heater. A fuel-burning appliance for heating water to a temperature not more than 200°F (93°C).

3.3.89 Heat-Producing Appliance. See 3.3.4.5.

3.3.90 High-Pressure Boiler. See 3.3.14.2.

3.3.91 Incinerator. An appliance or combustion chamber for the reduction, by burning, of rubbish, garbage, and other wastes.

3.3.91.1 Chute-Fed Incinerator (Class IIA). An incinerator designed specifically to be fed refuse from one or more floors above the incinerator directly into the incinerator by a separate chute constructed with a positive means to avoid penetration by smoke or fumes and connected directly over the primary combustion chamber. The incinerator is built with a primary and a secondary combustion chamber and a settling chamber. It can include a flue gas washer or scrubber. A separate chimney serves to convey the combustion gases to the outdoors. This class of incinerator is suitable for Type 1 and Type 2 wastes. It generally is used in residential and institutional buildings, including apartments, clubs, dormitories, churches, schools, and other occupancies where Type 1 and Type 2 wastes are to be incinerated.

3.3.91.2 Commercial-Industrial-Type Incinerator (Classes III, IV, V, VI, and VII). An incinerator having a charging capacity in excess of 5 ft³ (0.14 m³) and suitable for a variety of wastes as follows: (1) Class III — Waste Type 0, Type 1, or Type 2; (2) Class IV — Waste Type 3; (3) Class V — Waste Types 0–4 (municipal incinerators); (4) Class VI — Waste Type 4; (5) Class VII — Waste Types 5 and 6.

3.3.91.3 Flue-Fed Incinerator (Class II). An incinerator served by a single chimney flue that serves also as the charging chute, where refuse is fed directly to the incinerator through this chimney flue from one or more floors above the incinerator. This class of incinerator is suitable for Type 1 and Type 2 waste materials and garbage incidental to residential occupancy in single-family and multifamily buildings. This class of incinerator is generally used in residential and institutional buildings, including apartments, clubs, dormitories, churches, schools, and other occupancies where Type 1 and Type 2 wastes are to be incinerated.

3.3.91.4 Residential-Type Incinerator. An incinerator for the burning of ordinary combustible waste material and garbage (Type 2 waste) incidental to residential occupancy and having a firebox or charging compartment not greater than 5 ft³ (0.14 m³) in capacity. Residential-type incinerators can be self-contained, factory-built units that do not necessitate field construction, or can be of a built-in type designed to be

encased in masonry or installed in a masonry wall or chimney.

3.3.92 Low-Pressure Boiler. See 3.3.14.3.

3.3.93 Mantel. A shelf or facing ornament above a fireplace opening.

3.3.94 Manually Operated Damper. See 3.3.52.3.

3.3.95 Manufacturer. The person or persons, company, firm, corporation, partnership, or other organization responsible for turning raw materials or components into a finished product.

3.3.96 Masonry Chimney. See 3.3.29.5.

3.3.97 Masonry Fireplace. See 3.3.68.2.

3.3.98 Masonry Fireplace Lintel. The horizontal, noncombustible member, usually of masonry or steel, spanning the opening of a masonry fireplace to support the load above.

3.3.99 Masonry Heater. See 3.3.88.1.

3.3.100 Material.

3.3.100.1 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.

3.3.100.2 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 E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*, shall be considered noncombustible materials.

3.3.101 Mechanical Draft. See 3.3.56.1.

3.3.102 Natural Draft. See 3.3.56.2.

3.3.103 Noncombustible Material. See 3.3.100.2.

3.3.104 Nonresidential Appliance, 1400°F. See 3.3.4.6.

3.3.105 Nonresidential, High-Heat Appliance. See 3.3.4.7.

3.3.106 Nonresidential, Low-Heat Appliance. See 3.3.4.8.

3.3.107 Nonresidential, Medium-Heat Appliance. See 3.3.4.9.

3.3.108 Pellet Fuel. See 3.3.78.1.

3.3.109 Pellet Fuel-Burning Appliance. See 3.3.4.3.1.

3.3.110 Pellet Vent. See 3.3.142.2.

3.3.111 Qualified Agency. Any individual, firm, corporation, or company that, either in person or through a representative, is engaged in and is responsible for the connection, venting, installation, inspection, repair, or servicing of heat-producing appliances and who is experienced in such work, is familiar with all precautions required, and has complied with all the requirements of the AHJ.

3.3.112 Radiant Room Heater. See 3.3.88.2.2.

3.3.113 Readily Accessible. See 3.3.1.1.

3.3.114 Residential-Type Heating Appliance. See 3.3.4.4.3.

3.3.115 Residential-Type Incinerator. See 3.3.91.4.

3.3.116 Roof Jack. A factory-built assembly for conveying flue gases through a roof and that includes a flue gas passageway, an insulating means, flashing, and a cap.

3.3.117 Room Heater. See 3.3.88.2.

3.3.118 Smoke Chamber. The transitional area from the damper opening to the beginning of the flue liner in a fireplace system.

3.3.119 Smoke Test. A procedure for ascertaining the tightness of a chimney and for detecting any cracks in a masonry chimney flue or deterioration or breaks in the integrity of a metal chimney flue, and that involves igniting a smoke bomb or building a smoky fire in a fireplace or solid fuel-burning appliance, covering the chimney termination, and checking for smoke escape through the chimney walls.

3.3.120 Solid Fuel. See 3.3.78.2.

3.3.121 Solid Fuel Room Heater. See 3.3.88.2.3.

3.3.122 Solid Fuel-Burning Appliance. See 3.3.4.3.2.

3.3.123 Solid Masonry Construction. A bonded assembly of stones or solid masonry units.

3.3.124 Solid Masonry Unit. A masonry unit whose net cross-sectional area in every plane parallel to the bearing surface is 75 percent or more of its gross cross-sectional area measured in the same plane.

3.3.125 Spark Arresters. Screening material or a screening device attached to a chimney termination to prevent the passage of sparks and brands to the outside atmosphere.

3.3.126 Special Gas Vent. See 3.3.142.1.1.

3.3.127 Splay. See 3.3.150, Wash.

3.3.128 Steel Fireplace Unit. A unit consisting of a steel firebox and an air chamber adjacent to the sides and rear of the firebox, used to construct a masonry fireplace. The unit usually has ducts to circulate air to and heated air from the air chamber to the living space.

3.3.129 Supplementary Boiler. See 3.3.14.4.

3.3.130 Supplementary Furnace. See 3.3.79.13.

3.3.131 System.

3.3.131.1* Engineered Venting or Chimney System. A system that has been sized and configured in accordance with approved engineering methods.

3.3.131.2 Venting System (Flue Gases). A continuous, open passageway from the flue collar or draft hood of a fuel-burning appliance to the outside atmosphere for the purpose of removing flue gases.

3.3.132 Thimble. A fixed or removable ring, tube, or lining usually located in the hole where the chimney connector or vent connector passes through a wall or enters a chimney or vent.

3.3.133 Trimmer. Where referring to chimneys, the longer floor or roof framing member around a rectangular opening into which the end of a header is joined.

3.3.134 Type 1 Clothes Dryer. See 3.3.39.1.

3.3.135 Type 2 Clothes Dryer. See 3.3.39.2.

3.3.136 Type B Gas Vent. See 3.3.142.1.2.

3.3.137 Type BW Gas Vent. See 3.3.142.1.3.

3.3.138 Type HT Factory-Built, Residential-Type and/or Building Heating Appliance-Type Chimney. See 3.3.29.1.3.

3.3.139 Type L Vent. See 3.3.142.3.

3.3.140 Unit Heater. See 3.3.88.3.

3.3.141 Unlisted Metal (Smokestack) Chimney. See 3.3.29.6.

3.3.142* Vent. A flue gas-conveying system intended for use only with certain gas-, liquid-, or pellet fuel-fired appliances that do not produce flue gas outlet temperatures higher than a value specified in the listing vent standards.

3.3.142.1 Gas Vent. A passageway composed of listed factory-built components assembled in accordance with the manufacturer's installation instructions for conveying vent gases from appliances or their vent connectors to the outdoors. [54, 2018]

3.3.142.1.1 Special Gas Vent. A gas vent for venting listed Category II, III, and IV gas appliances.

3.3.142.1.2 Type B Gas Vent. A vent for venting listed gas appliances with draft hoods and other Category I appliances listed for use with Type B gas vents. [54, 2018]

3.3.142.1.3 Type BW Gas Vent. A vertical or nearly vertical gas vent for venting listed gas-fired vented wall furnaces.

3.3.142.2 Pellet Vent. A venting system composed of listed, factory-built components assembled in accordance with the manufacturer's instructions for conveying flue gases from a listed pellet fuel-burning appliance to the outside atmosphere.

3.3.142.3 Type L Vent. A vertical or nearly vertical vent composed of listed factory-built components assembled in accordance with the terms of a listing for conveying flue gases from oil and gas appliances or their vent connectors to the outside atmosphere.

3.3.143 Vent Cap. See 3.3.19.2.

3.3.144 Vent Connector. See 3.3.48.2.

3.3.145 Vent Gases. See 3.3.82.2.

3.3.146 Vented Appliance. See 3.3.4.10.

3.3.147 Venting. Removal of combustion products as well as noxious or toxic fumes to the outside atmosphere.

3.3.148 Venting System (Flue Gases). See 3.3.131.2.

3.3.149 Wall Protector (Shield). Noncombustible surfacing applied to a wall area for the purpose of reducing the clearance between the wall and a heat-producing appliance.

3.3.150 Wash. A slight slope or beveled edge on the top surface of a chimney designed to shed water away from the flue liner; also called a *splay*.

3.3.151 Water Heater. See 3.3.88.4.

3.3.152 Wythe. Where referring to masonry chimneys, a course, a thickness, or a continuous vertical section of masonry separating flues in a chimney.

Chapter 4 General Requirements

4.1* Sizing and Draft.

4.1.1 Minimum Performance. A chimney or vent shall be so designed and constructed to develop a flow sufficient to remove completely all flue or vent gases to the outside atmosphere.

4.1.1.1 Chimneys or vents shall be evaluated to ensure proper performance with respect to draft, creosote buildup, and condensation.

4.1.1.2 The venting system shall satisfy the draft requirements of the connected appliance(s) in accordance with the manufacturers' instructions or approved methods.

4.1.2 Mechanical Draft Systems. A listed mechanical draft system of either forced or induced draft design shall be permitted to be used to increase draft or capacity.

4.1.2.1 Where a mechanical draft system is installed, provision shall be made to prevent the flow of fuel to an automatically fired appliance(s) when that system is not operating.

4.1.2.2 The operation of a mechanical draft system shall not adversely affect the performance or safety of, or cause spillage of combustion products from, other combustion equipment operating within the same building.

4.1.2.3 Proper performance and safety of other combustion equipment shall be verified by testing prior to the mechanical draft system being put into service.

4.1.2.4 Such testing shall include operation of the mechanical draft system together with other exhaust equipment likely to operate simultaneously.

4.1.2.5 Mechanical draft systems of either forced or induced draft serving manually fired appliances shall be one of the following:

- (1) A mechanical draft system that is an integral part of a listed appliance
- (2) A system that serves any solid-fuel cooking appliance as addressed in NFPA 96
- (3)* An engineered mechanical draft system that includes the following provisions:
 - (a) Line voltage devices, when installed, shall be provided with a battery backup system, and the following detection and warning devices shall be installed:
 - i. A device that produces an audible and visible warning upon failure of the mechanical draft system. The device shall be activated by loss of the electrical power supply or by operational failure of the mechanical draft system at any time while the mechanical draft system is switched on. The device shall be installed in the same room as the appliance served by the mechanical draft system.

- ii. A smoke detector and alarm installed and maintained in accordance with *NFPA 72*. The detector shall be installed in the same room as the appliance served by the mechanical draft system.
 - iii. A listed carbon monoxide warning device installed in accordance with the manufacturer's instructions.
- (b) The mechanical draft system shall be listed in accordance with UL 378, *Standard for Draft Equipment*, for use with the type of appliance and range of chimney service appropriate for the application. The mechanical draft system shall not cause or permit blockage of the flue or electrical hazard after exposure to a chimney fire or over-fire conditions. The mechanical draft system shall be installed in accordance with the terms of the listing and the manufacturer's instructions.
- (c) The mechanical draft system shall be sized to maintain draft within the range specified by the appliance manufacturer.

4.1.3 Natural Draft Sizing. Chimneys serving incinerators or other process equipment where the combustion process cannot be stopped completely by fuel shutoff alone shall be sized for natural draft conditions.

4.1.3.1 Where air pollution control devices or other devices in the chimney system require a mechanical draft system, the chimney system shall be so arranged that, upon a power failure, the natural draft chimney alone can satisfactorily remove the products of combustion until the combustible material is completely consumed.

4.1.4 Forced/Induced Draft Systems. Forced draft systems and all portions of induced draft systems under positive pressure during operation shall be designed and installed to be gastight or to prevent the leakage of combustion products into a building.

4.1.5 Natural Draft Vent Connectors. Vent connectors serving appliances vented by natural draft shall not be connected into any portion of mechanical draft systems operating under positive pressure.

4.2 Termination (Height). Chimneys and vents shall terminate above the roof level in accordance with the requirements of this standard and as illustrated in Figure 4.2(a) and Figure 4.2(b).

4.2.1 Masonry chimneys shall extend above the highest point at which they pass through the roof of a building by at least the distance specified in Table 7.2, Column VI, and shall also extend at least the specified distance above any portion of any structure within the specified proximity (measured horizontally from the vertical chimney line) in Table 7.2, Column VII.

4.2.2 Natural draft chimneys and vents shall not terminate at an elevation less than 5 ft (1.53 m) above the flue collar or the highest connected draft hood outlet.

Exception: As provided in Section 10.7.

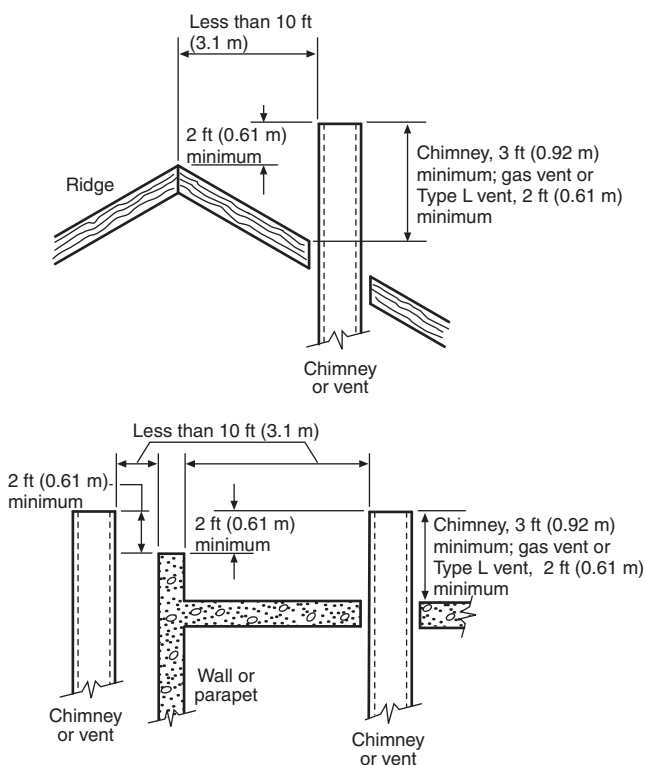


FIGURE 4.2(a) Chimney or Vent Termination Less Than 10 ft (3.1 m) from Ridge, Wall, or Parapet.

4.3 Enclosure.

4.3.1 General. Interior residential chimneys shall be enclosed where they extend through closets, storage areas, or habitable spaces where the surface of the chimney could come into contact with persons or combustible materials.

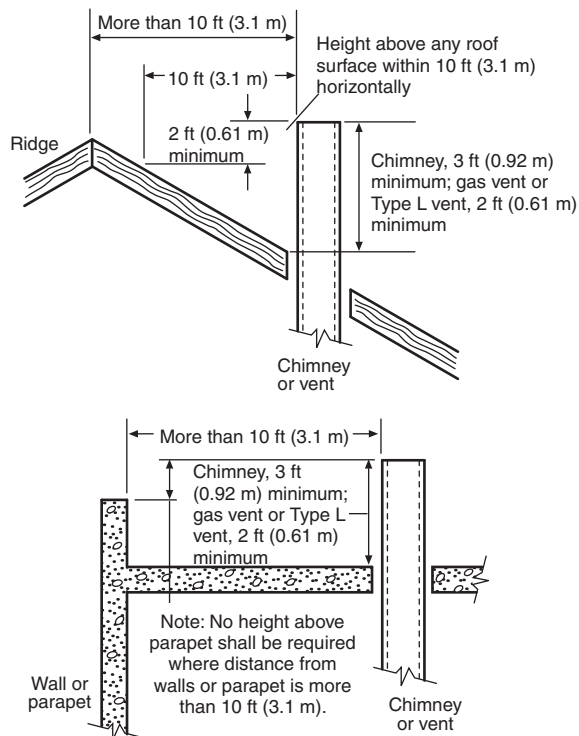
4.3.2 Clearance. The space between the chimney and the enclosure shall be at least the minimum air space clearance specified in this standard (*see Table 7.2*) or the clearance specified in the manufacturer's instructions for listed chimneys.

4.4 Venting Systems in Ducts.

4.4.1 Circulating Air Ducts and Plenums. No portion of a venting system shall extend into or pass through a dedicated circulating air duct or plenum.

4.4.2 Above-Ceiling Spaces. Where a venting system passes through a space above a ceiling used as a return air plenum, it shall be installed according to one of the following methods:

- (1) With joints within the above-ceiling return air plenum sealed airtight in a manner approved by the manufacturer of the venting system
- (2) As a listed positive-pressure venting system
- (3) Non-airtight venting system installed with no joints or fittings located within the above-ceiling return air plenum



Chapter 5 Selection of Chimney and Vent Types

5.1 Chimney Types.

5.1.1 Selection. Chimney selection shall be limited to three basic chimney types: factory-built, masonry, and unlisted metal [see Figure 5.1.1(a) through Figure 5.1.1(c)].

5.1.2 Application. Each basic chimney type is defined in Chapter 3, and the application of each is determined by Table 5.2.2.1, with specific construction or installation requirements in Chapters 6, 7, and 8.

5.2 Chimney or Vent Selection.

5.2.1 General. The selection of a chimney or vent shall be based on the following:

- (1) Type of appliance connected thereto
- (2) Fuel used by the appliance

- (3) Temperature of the flue gases at the appliance outlet
- (4) Pressure within the chimney or vent

5.2.2 Chimneys.

5.2.2.1 The chimney type shall be selected according to Table 5.2.2.1.

5.2.2.2 Unlisted metal chimneys shall not be installed in one- and two-family dwellings.

5.2.3 Vents.

5.2.3.1 A vent shall be used only where appliances are listed for use with a vent.

5.2.3.2 The vent type shall be selected according to Table 5.2.3.2.

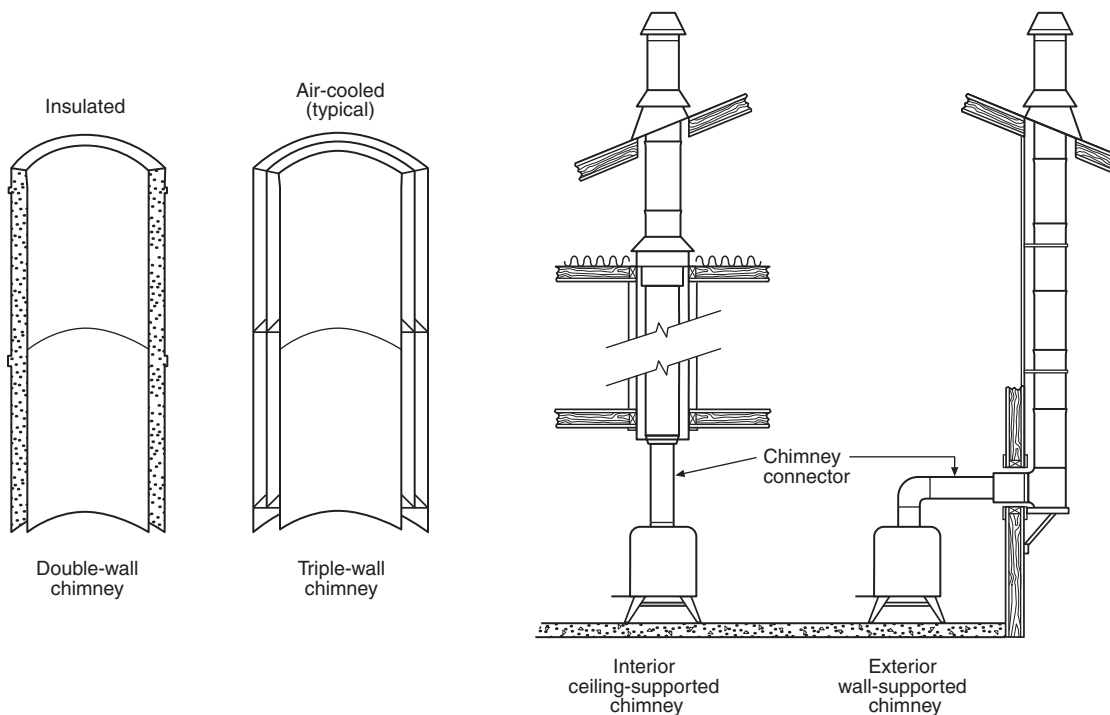


FIGURE 5.1.1(a) Typical Factory-Built Chimney Installation in a Single-Family Residence.

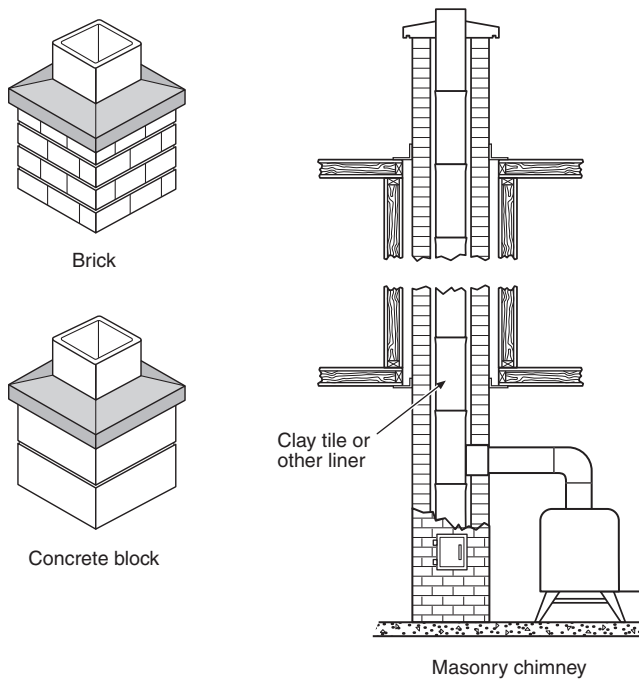


FIGURE 5.1.1(b) Masonry Chimney.

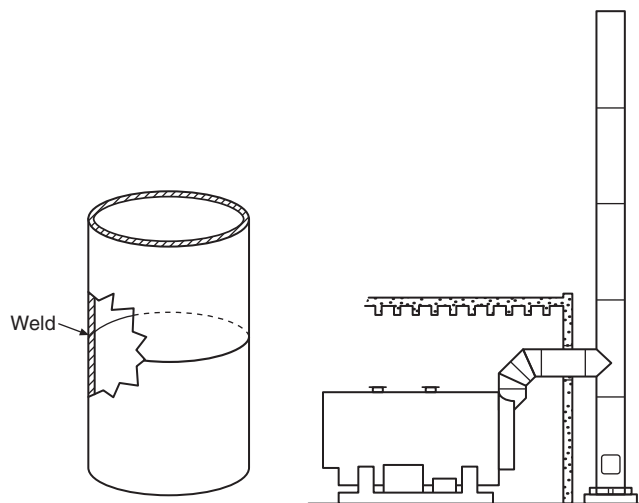


FIGURE 5.1.1(c) Typical Unlisted Metal Chimney Installation in a Commercial or Industrial Application.

Table 5.2.2.1 Chimney Selection Based on Appliance Type and Flue Gas Temperature

Column I	Column II	Column III	Column IV	Column V
Types of Appliances to Be Used with Each Chimney Type				
Residential-type gas, liquid, and solid fuel-burning applications such as: All appliances shown in Column I of Table 5.2.3.2 Dual-fuel furnaces Fireplace inserts Fireplace stoves Fireplace stove room heaters Freestanding fireplaces Boilers Masonry fireplaces Pellet fuel-burning appliances ^a Ranges Residential incinerators Room heaters Stoves	All appliances shown in Column I Boilers operating at not over 1000°F (538°C) flue gas temperature Low-heat nonresidential appliances Building heating appliance	All appliances shown in Columns I and II 1400°F (760°C) nonresidential appliances	All appliances shown in Columns I, II, and III Medium-heat nonresidential appliances	All appliances shown in Columns I, II, III, and IV High-heat nonresidential appliances
Chimney Type Based on Maximum Continuous Appliance Outlet Flue Gas Temperature Under Normal Operating Conditions				
1000°F (538°C)	1000°F (538°C)	1400°F (760°C)	1800°F (982°C)	>1800°F (>982°C)
Factory-built residential-type and building heating appliance ^b (see Chapter 6)	Factory-built residential-type and building heating appliance ^b (see Chapter 6) Factory-built building heating appliance ^b (see Chapter 6)	Factory-built 1400°F (760°C) (see Chapter 6)	Factory-built medium-heat appliance (see Chapter 6)	Engineered high-heat type (see Section 6.2 and A.3.3.131.1)
Masonry, residential type (see Chapter 7)	Masonry, low-heat type (see Chapter 7) Unlisted metal low-heat type ^c (see Chapter 8)	Masonry, low-heat type (see Chapter 7) Unlisted metal 1400°F (760°C) type ^c (see Chapter 8)	Masonry, medium-heat type (see Chapter 7) Unlisted metal medium-heat type ^c (see Chapter 8)	Masonry, high-heat type (see Chapter 7) Unlisted metal high-heat type ^c (see Chapter 8)

^aSee also Table 5.2.3.2, Column VI.^bSee 6.1.3 for requirements for factory-built chimneys used with wood-burning appliances in one- and two-family dwellings.^cSee 8.1.1 for single-wall chimneys or unlisted metal chimneys for prohibition inside or outside one- and two-family dwellings.