

# Fireplaces, Proper Ventilation for New Wood-Burning Fireplaces - Code Compliance Brief

## Overview:

The intent of this brief is to provide additional information about fireplaces<sup>1</sup> to help ensure that the measure will be accepted as being in compliance with the code. Providing notes for code officials on how to plan review and conduct field inspections can help builders or remodelers with proposed designs and provide jurisdictional officials with information for acceptance. Providing the same information to all interested parties (e.g., code officials, builders, designers, etc.) is expected to result in increased compliance and fewer innovations being questioned at the time of plan review and/or field inspection.

Over a considerable amount of time, the code provisions for fireplaces have gone from none requirements such as gasketed doors in the 2009 International Energy Conservation Code (IECC), to tight-fitting flue dampers in the 2012 IECC, to tight-fitting flue dampers or doors and testing and listing requirements for the doors in the 2015 IECC. The intent of this brief is to cover the new requirements for new wood-burning fireplaces regarding doors, dampers, and *combustion air*<sup>2</sup> and proper ventilation.

<sup>1</sup>"Fireplace" is defined in the 2015 IRC as an assembly consisting of a hearth and fire chamber of noncombustible material and provided with a chimney, for use with solid fuels. "Factory-built fireplace" is defined as a listed and labeled fireplace and chimney system composed of factory-made components, and assembled in the field in accordance with manufacturer's instructions and the conditions of the listing. "Masonry-built fireplace" is defined as a field-constructed fireplace composed of solid masonry units, bricks, stones or concrete.

<sup>2</sup>"Combustion air" is defined, in the context of the code, as referring to rapid oxidation of fuel accompanied by the production of heat or heat and light.

## Plan Review:

Per the **2015 IECC/International Residential Code (IRC), Section R103.3/R106.3, Examination of documents**. The code/building official must examine, or cause to be examined, construction documents for code compliance.

This section lists the applicable code requirements followed by details helpful for plan review regarding the provisions to meet the requirements for "new wood-burning fireplaces."

- **2015 IECC/IRC, Section R402.4.2/N1102.4.2 Fireplaces**. New wood-burning *fireplaces* must have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factory-built *fireplaces* listed and labeled in accordance with UL<sup>3</sup> 127 (Standard for Factory Built Fireplaces), the doors must be tested and listed for the *fireplace*. Where using tight-fitting doors on masonry *fireplaces*, the doors must be listed and labeled in accordance with UL 907 (Standard for Fireplace Accessories).
- **2015 IRC, Section R1004.5 Gasketed Fireplace Doors**. A gasketed *fireplace* door should not be installed on a factory-built *fireplace* except where the fireplace system has been specifically tested, listed, and labeled for such use in accordance with UL 127.
- **2012 IECC/IRC, Section R402.4.2/1102.4.2 Fireplaces**. This code requires that new wood-burning *fireplaces* must have tight-fitting flue dampers and outdoor combustion air.
- **2009 IECC/IRC, Section 402.4.3/N1102.4.3 Fireplaces**. This code requires that new wood-burning fireplaces must have gasketed doors and outdoor combustion air.
- **Construction Documentation**. Review the construction documents for the details describing the *fireplace* construction design including exterior air supply.
  - **2015 IECC/IRC, Section R103.2/N1101.5 Information on Construction Documents**. Construction documents should include:
    - *Fireplace* door specifications
    - Exterior air supply specifications

## Combustion Air

New wood-burning *fireplaces* must be directly vented to the outside regardless of whether the *fireplace* is masonry or factory built. Review and confirm that the construction documents and/or manufacturer's specifications have a dedicated *combustion* air inlet. Ensure that a *fireplace* located in conditioned space is vented to the outdoors and supplied with adequate combustion and ventilation air according to the manufacturer's installation instructions.

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- **2015 IRC, Section R1006.1 Exterior Air.** Factory-built or masonry fireplaces should be equipped with an exterior air supply to assure proper fuel combustion unless the room is mechanically ventilated and controlled so that the indoor pressure is neutral or positive.
  - **R1006.1.1 Factory-built fireplaces.** Exterior combustion air ducts for factory-built fireplaces should be a listed component of the fireplace and should be installed according to the fireplace manufacturer's instructions.
  - **R1006.1.2 Masonry fireplaces.** Listed combustion air ducts for masonry fireplaces should be installed according to the terms of their listing and the manufacturer's instructions.
- **2015 IRC, Section R1006.2 Exterior air intake.** The exterior air intake should be capable of supplying all combustion air from the exterior of the dwelling or from spaces within the dwelling ventilated with outside air such as non-mechanically ventilated crawl or attic spaces. The exterior air intake should not be located within the garage or basement of the dwelling nor should the air intake be located at an elevation higher than the firebox. The exterior air intake should be covered with a corrosion-resistant screen of ¼-inch (6-millimeter) mesh.
- **2015 IRC, Section R1006.3 Clearance.** Unlisted combustion air ducts should be installed with a minimum 1-inch (25-millimeter) clearance to combustibles for all parts of the duct within 5 feet (1524 millimeters) of the duct outlet.
- **2015 IRC, Section R1006.4 Passageway.** The combustion air passageway should be a minimum of 6 square inches (3870 square millimeters) and not more than 55 square inches (0.035 square meters), except that combustion air systems for listed fireplaces be constructed according to the fireplace manufacturer's instructions.
- **2015 IRC, Section R1006.5 Outlet.** Locating the exterior air outlet in the back or sides of the firebox chamber or within 24 inches (610 millimeters) of the firebox opening on or near the floor is permitted. The outlet should be closable and designed to prevent burning material from dropping into concealed combustible spaces.

<sup>3</sup>UL (Underwriters Laboratory) is a global independent safety science company that certifies, validates, tests, inspects, audits, advises, and trains.

#### Field Inspection:

Per the **2015 IECC, Section R104, Inspections**, construction or work for which a permit is required is subject to inspection. Construction or work is to remain accessible and exposed for inspection purposes until approved. Required inspections include footing and foundation, framing and rough-in work, plumbing rough-in, mechanical rough-in, and final inspection.

Per the **2015 IRC, Section R109, Inspections**, the wording is somewhat different in that for onsite construction, from time to time the building official, upon notification from the permit holder or his agent, can make or cause to be made any necessary inspections. Further details are provided for inspections regarding foundation, plumbing, mechanical, gas and electrical, floodplain, frame and masonry, and final inspection. Any additional inspections are at the discretion of the building official.

This section provides details for inspecting to the specific provisions for "*new wood-burning fireplaces*" where one or more specific type of inspection per the IECC or IRC may be necessary to confirm compliance.

- Confirm that the *fireplace* is installed per manufacturer's installation instructions and/or approved construction documents.
- Confirm that the *fireplace* door has been installed properly per the approved construction documents and/or manufacturer's installation instructions and is tight-fitting.
- Confirm that *combustion air* duct(s) have been installed per approved manufacturer's installation instructions or, for unlisted ducts, confirm that ducts are installed with a minimum 1-inch clearance to combustibles for all parts of the duct within 5 feet (1524 millimeters) of the duct outlet per the approved construction documents.
- Confirm that the air passageway is constructed per the approved manufacturer's installation instructions or, for unlisted fireplaces, a minimum of 6 square inches (3870 square millimeters) and not more than 55 square inches (0.035 square meters) per the approved construction documents.
- Confirm that the exterior air intake is installed per the approved manufacturer's installation instructions and/or construction documents and covered with a corrosion-resistant screen of ¼-inch (6-millimeter) mesh.
- Confirm that the location of the exterior air outlet is either on the back or sides of the firebox chamber or within 24 inches (610 millimeters) of the firebox opening on or near the floor and is closable per the approved construction documents.

#### Technical Validation(s):

Underwriter Laboratories, UL 127, Standard for Factory-Built Fireplaces, <http://ulstandards.ul.com/standard/?id=127> [1]

Underwriter Laboratories, UL 907, Standard for Fireplace Accessories, <http://ulstandards.ul.com/standard/?id=907> [2]