

# **Chimney, Wood-stove Safety and 780 CMR 60.00 Chimneys, Fireplaces and Solid Fuel- Burning Appliances Guidelines**



### **Before Installation:**

1. Obtain a Permit: A building permit is mandatory before beginning any installation.
2. Buy a Certified Stove: Purchase a wood stove that is approved by Underwriter's Laboratory (UL) or another recognized testing laboratory.
3. Consult Manufacturer's Instructions: Always follow the specific clearance and installation instructions provided by the stove manufacturer.

### **Installation Requirements**

#### **1. Clearances:**

- a. Maintain a minimum of 36 inches of clearance from the stove to combustible materials (like wooden walls and ceilings).
- b. The hearth must be a non-combustible material and extend at least 36 inches in front of the stove.

#### **2. Chimney & Venting:**

- a. Venting a wood stove through a window is against code.
- b. The chimney must be properly constructed, secured, and have a flue that is adequate for the appliance.
- c. Solid fuel appliances cannot share a common flue with gas or liquid fuel appliances.
- d. Ensure the chimney extends at least 3 feet above the roof line and 2 feet higher than any part of the structure within 10 feet.

### **After Installation**

**Inspection:** The local building inspector must inspect the installation and the chimney before the stove can be used.  
**Carbon Monoxide Detector:** Install a carbon monoxide detector in the living space.

### **Important Safety Tips**

Have the chimney and flue inspected by a qualified professional before first use.  
Keep the chimney clean and free of creosote buildup.  
Burn only dry, well-seasoned wood to minimize creosote.

## **Tips for safe use of wood, coal, and pellet stoves**

**You need a building permit before installing fireplaces, wood, pellet or coal burning stoves. The local building wood stove inspector must inspect new fireplaces, wood, pellet or coal burning stoves before they are used as required by the Massachusetts State Building Code.**

**Allow for at least 36 inches of clearance around the appliance to prevent combustibles from coming into contact with a heat source. This is the 3 foot circle of safety.**

**Solid fuel heating appliances cannot share a common flue with chimney flues used by another solid fuel, fossil fuel, or gas fire appliance.**

**A qualified mason should inspect the chimney and flue before the stove is used and annually. Cracks in the flue or mortar joints can allow flames and heated gases to get into living spaces.**

## **Proper use**

**Most chimney fires occur because of a build-up of creosote, a tarry byproduct of burning wood. Have your chimney flue cleaned before each heating season. Burn only dry, well seasoned, hardwood to reduce creosote accumulation.**

**Don't use flammable liquids to start a fire.**

**Never leave children unattended near the stove.**

**Check that the damper is open before lighting the fire. A close damper will result in an accumulation of smoke and carbon monoxide in the home. Don't close the damper until the fire is out and the embers are cold.**

**Use a fireplace screen to prevent flying sparks and embers from falling out on to the floor.**

**Install and maintain smoke detectors and carbon monoxide alarms to provide protection for your family.**

**To prevent fires, ashes that are cleaned out from the stove or fireplace should be shoveled into a metal bucket with a metal lid and placed outside on the ground away from the building.**

**Install smoke and carbon monoxide alarms to warn of both fire and deadly fumes from a faulty furnace, fireplace, oven flue or other venting problem.**

## 780 CMR 60.00

### CHIMNEYS, FIREPLACES AND SOLID FUEL-BURNING APPLIANCES

#### 780 CMR 6001 MASONRY CHIMNEYS

**6001.1 General.** Masonry chimneys shall be constructed, anchored, supported and reinforced as required in 780 CMR 60.00 and the applicable provisions of 780 CMR 53.00, 54.00 and 56.00. *Chimneys shall be structurally sound, durable, smoke tight and capable of conveying flue gases to the exterior safely.*

**6001.1.1 Support.** Masonry chimneys shall be supported on foundations of solid masonry or concrete at least 12 inches (305 mm) thick and at least six inches (152 mm) beyond each side of the exterior dimensions of the chimney. Footings shall be founded on natural, undisturbed earth below the frostline. In areas not subject to freezing, footings shall be located a minimum of 12 inches (305 mm) below finished grade.

**6001.2 Corbeling.** Masonry chimneys shall not be corbeled more than one-half of the chimney's wall thickness from a wall or foundation, nor shall a chimney be corbeled from a wall or foundation that is less than 12 inches (305 mm) in thickness unless it projects equally on each side of the wall, except that on the second story of a two-story dwelling, corbeling of chimneys on the exterior of the enclosing walls may equal the wall thickness. The projection of a single course shall not exceed one-half the unit height or one-third of the unit bed depth, whichever is less.

**6001.3 Changes in Dimension.** The chimney wall or chimney flue lining shall not change in size or shape within six inches (152 mm) above or below where the chimney passes through floor components, ceiling components or roof components.

**6001.4 Offsets.** Where a masonry chimney is constructed with a fireclay flue liner surrounded by one wythe of masonry, the maximum offset shall be such that the centerline of the flue above the offset does not extend beyond the center of the chimney wall below the offset. Where the chimney offset is supported by masonry below the offset in an approved manner, the maximum offset limitations shall not apply. Each individual corbeled masonry course of the offset shall not exceed the projection limitations specified in 780 CMR 6001.2.

**6001.5 Additional Load.** Chimneys shall not support loads other than their own weight unless they are designed and constructed to support the additional load. Masonry chimneys shall be permitted to be constructed as part of the masonry walls or reinforced concrete walls of the building.

**6001.6 Termination.** Chimneys shall extend at

least two feet (610 mm) higher than any portion of a building within 10 feet (3048 mm), but shall not be less than three feet (914 mm) above the highest point where the chimney passes through the roof.

**6001.6.1 Spark Arrestors.** Where a spark arrestor is installed on a masonry chimney, the spark arrestor shall meet all of the following requirements:

1. The net free area of the arrestor shall not be less than four times the net free area of the outlet of the chimney flue it serves.
2. The arrestor screen shall have heat and corrosion resistance equivalent to 19-gage galvanized steel or 24-gage stainless steel.
3. Openings shall not permit the passage of spheres having a diameter greater than ½ inch (12.7 mm) nor two block the passage of spheres having a diameter less than ⅜ inch (9.5 mm).
4. The spark arrestor shall be accessible for cleaning and the screen or chimney cap shall be removable to allow for cleaning of the chimney flue.

**6001.7 Wall Thickness.** Masonry chimney walls shall be constructed of solid masonry units or hollow masonry units grouted solid with not less than a four-inch (602 mm) nominal thickness.

**6001.8 Flue Lining (Material).** Masonry chimneys shall be lined. The lining material shall be appropriate for the type of appliance connected, according to the terms of the appliance listing and manufacturer's instructions.

**6001.8.1 Residential-type Appliances (General).** Flue lining systems shall comply with one of the following:

1. Clay flue lining complying with the requirements of ASTM C 315 or equivalent.
2. Listed chimney lining systems complying with UL 1777.
3. Factory-built chimneys or chimney units listed for installation within masonry chimneys.
4. Other approved materials that will resist corrosion, erosion, softening, or cracking from flue gases and condensate at temperatures up to 1,800°F (982°C).

**6001.8.2 Flue Linings for Specific Appliances.** Flue linings other than these covered in 780 CMR 6001.8.1, intended for use with specific types of appliances, shall comply with 780 CMR 6001.8.3 through 6001.8.6.

**6001.8.3 Gas Appliances.** Flue lining systems for gas appliances shall be in accordance with **248 CMR**.

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**6001.8.4 Pellet Fuel-burning Appliances.** Flue lining and vent systems for use in masonry chimneys with pellet fuel-burning appliances shall be limited to the following:

1. Flue lining systems complying with 780 CMR 6001.8.1.
2. Pellet vents listed for installation within masonry chimneys. (See 780 CMR 6001.8.6 for marking.)

**6001.8.5 Oil-fired Appliances Approved for Use with Type L Vent.** See 527 CMR 4.

**6001.8.6 Notice of Usage.** When a flue is relined with a material not complying with 780 CMR 6001.8.1, the chimney shall be plainly and permanently identified by a label attached to a wall, ceiling or other conspicuous location adjacent to where the connector enters the chimney. The label shall include the following message or equivalent language:

THIS CHIMNEY FLUE IS FOR USE ONLY WITH [TYPE OR CATEGORY OF APPLIANCE] APPLIANCES THAT BURN [TYPE OF FUEL]. DO NOT CONNECT OTHER TYPES OF APPLIANCES.

**6001.9 Flue Lining (Installation).** Flue liners shall be installed in accordance with ASTM C 1283 and extend from a point not less than eight inches (203 mm) below the lowest inlet or, in the case of fireplaces, from the top of the smoke chamber to a point above the enclosing walls. The lining shall be carried up vertically, with a maximum slope no greater than 30 degrees from the vertical.

Fireclay flue liners shall be laid in medium duty refractory mortar conforming to ASTM C 199 with tight mortar joints left smooth on the inside and installed to maintain an air space or insulation not to exceed the thickness of the flue liner separating the flue liners from the interior face of the chimney masonry walls. Flue lining shall be supported on all sides. Only enough mortar shall be placed to make the joint and hold the liners in position.

**6001.9.1 Listed Materials.** Listed materials used as flue linings shall be installed in accordance with the terms of their listings and manufacturer’s instructions.

**6001.9.2 Space around Lining.** The space surrounding a chimney lining system or vent installed within a masonry chimney shall not be used to vent any other appliance.

**Exception:** This shall not prevent the installation of a separate flue lining in accordance with the manufacturer’s installation instructions.

**6001.10 Multiple Flues.** When two or more flues are located in the same chimney, masonry wythes shall be built between adjacent flue linings. The masonry wythes shall be at least four inches (602 mm) thick and bonded into the walls of the chimney.

**Exception:** When venting only one appliance, two flues may adjoin each other in the same chimney with only the flue lining separation between them. The joints of the adjacent flue linings shall be staggered at least four inches (102 mm).

**6001.11 Flue Area (Appliance).** Chimney flues shall not be smaller in area than that of the area of the connector from the appliance [see 780 CMR Tables 6001.11(1) and 6001.11(2)]. The sizing of a chimney flue to which multiple appliance venting systems are connected shall be in accordance with 780 CMR 6805.3.

**780 CMR TABLE 6001 .11(1)  
NET CROSS-SECTIONAL AREA OF  
ROUND FLUE SIZES<sup>a</sup>**

FLUE SIZE, INSIDE DIAMETER (inches)	CROSS-SECTIONAL AREA (square inches)
6	28
7	38
8	50
10	78
10¾	90
12	113
15	176
18	254

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm<sup>2</sup>.  
a. Flue sizes are based on ASTM C 315.

**780 CMR TABLE 6001.11(2)  
NET CROSS-SECTIONAL AREA OF  
SQUARE AND RECTANGULAR FLUE SIZES<sup>a</sup>**

FLUE SIZE, OUTSIDE DIMENSIONS (inches)	CROSS-SECTIONAL AREA (square inches)
4½ x 13	34
7½ x 7½	37
8½ x 8½	47
7½ x 11½	58
8½ x 13	74
7½ x 15½	82
11½ x 11½	91
8½ x 17½	101
13 x 13	122
11½ x 15½	124
13 x 17½	165
15½ x 15½	168
15½ x 19½	214
17½ x 17½	226
19½ x 19½	269
20 x 20	286

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm<sup>2</sup>.  
a. Flue sizes are based on ASTM C 315.

**6001.12 Flue Area (Masonry Fireplace).** Flue sizing for chimneys serving fireplaces shall be in accordance with 780 CMR 6001.12.1 or 780 CMR 6001.12.2.

**6001.12.1 Option 1.** Round chimney flues shall have a minimum net cross-sectional area of at least 1/12 of the fireplace opening. Square chimney

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flues shall have a minimum net cross-sectional area of  $\frac{1}{10}$  of the fireplace opening. Rectangular chimney flues with an aspect ratio less than two to one shall have a minimum net cross-sectional area of  $\frac{1}{10}$  of the fireplace opening. Rectangular chimney flues with an aspect ratio of two to one or more shall have a minimum net cross-sectional area of  $\frac{1}{10}$  of the fireplace opening.

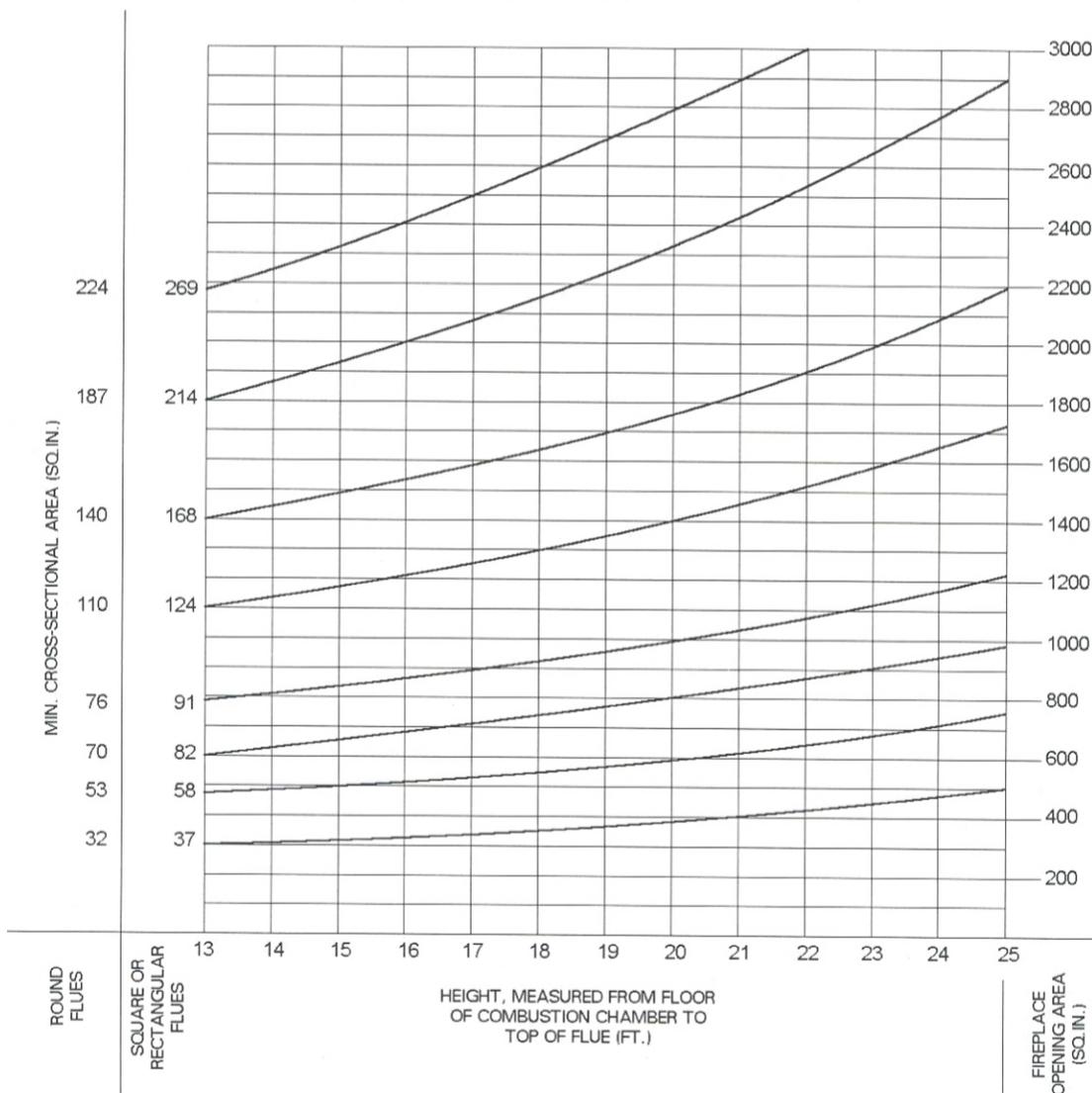
**6001.12.2 Option 2.** The minimum net cross-sectional area of the chimney flue shall be determined in accordance with 780 CMR Figure 6001.12.2. A flue size providing at least the equivalent net cross-sectional area shall be used. Cross-sectional areas of clay flue linings are provided in 780 CMR Tables 6001.11(1) and 6001.11(2) or as provided by the manufacturer or as measured in the field. The height of the chimney shall be measured from the firebox floor to the top of the chimney flue.

**6001.13 Inlet.** Inlets to masonry chimneys shall enter from the side. Inlets shall have a thimble of fireclay, rigid refractory material or metal that will prevent the connector from pulling out of the inlet or from extending beyond the wall of the liner.

**6001.14 Masonry Chimney Cleanout Openings.** Cleanout openings shall be provided within six inches (152 mm) of the base of each flue within every masonry chimney. The upper edge of the cleanout shall be located at least six inches (152 mm) below the lowest chimney inlet opening. The height of the opening shall be at least six inches (152 mm). The cleanout shall be provided with a noncombustible cover.

**Exception:** Chimney flues serving masonry fireplaces where cleaning is possible through the fireplace opening.

**780 CMR FIGURE 6001.12.2  
FLUE SIZES FOR MASONRY CHIMNEYS**



For SI: 1 foot = 304.8 mm, 1 square inch - 645.16 mm<sup>2</sup>.

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**6001.15 Chimney Clearances.** Any portion of a masonry chimney located in the interior of the building or within the exterior wall of the building shall have a minimum air space clearance to combustibles of two inches (51 mm). Chimneys located entirely outside the exterior walls of the building, including chimneys that pass through the soffit or cornice, shall have a minimum air space clearance of one inch (25.4 mm). The air space shall not be filled, except to provide fire blocking in accordance with 780 CMR 6001.16.

**Exceptions:**

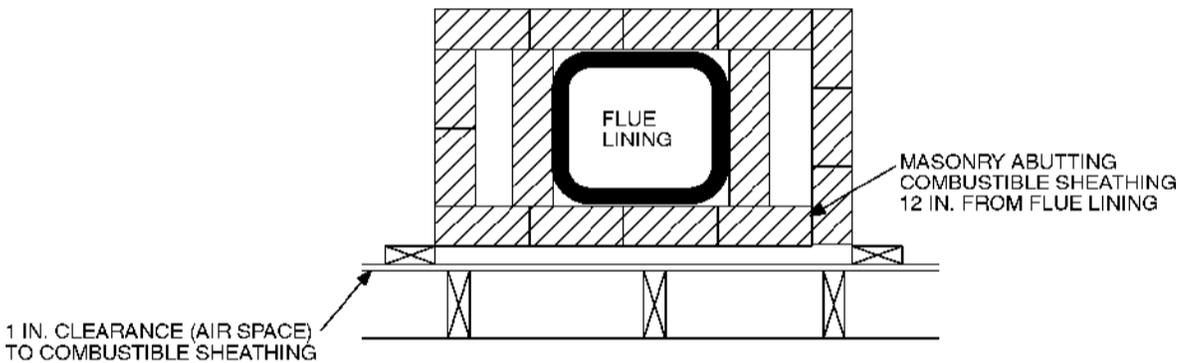
1. Masonry chimneys equipped with a chimney lining system listed and labeled for use in chimneys in contact with combustibles in accordance with UL 1777 and installed in accordance with the manufacturer's installation instructions are permitted to have combustible material in contact with their exterior surfaces.
2. When masonry chimneys are constructed as part of masonry or concrete walls, combustible materials shall not be in contact with the masonry or concrete wall less than 12 inches (306 mm) from the inside surface of the nearest flue lining.
3. Exposed combustible trim and the edges of sheathing materials, such as wood siding and

flooring, shall be permitted to abut the masonry chimney side walls, in accordance with Figure 6001.15 provided such combustible trim or sheathing is a minimum of 12 inches (306 mm) from the inside surface of the nearest flue lining. Combustible material and trim shall not overlap the corners of the chimney by more than one inch (25.4 mm).

**6001.16 Chimney Fireblocking.** All spaces between chimneys and floors and ceilings through which chimneys pass shall be fireblocked with noncombustible material securely fastened in place. The fireblocking of spaces between chimneys and wood joists, beams or headers shall be to a depth of one inch (25.4 mm) and shall only be placed on strips of metal or metal lath laid across the spaces between combustible material and the chimney.

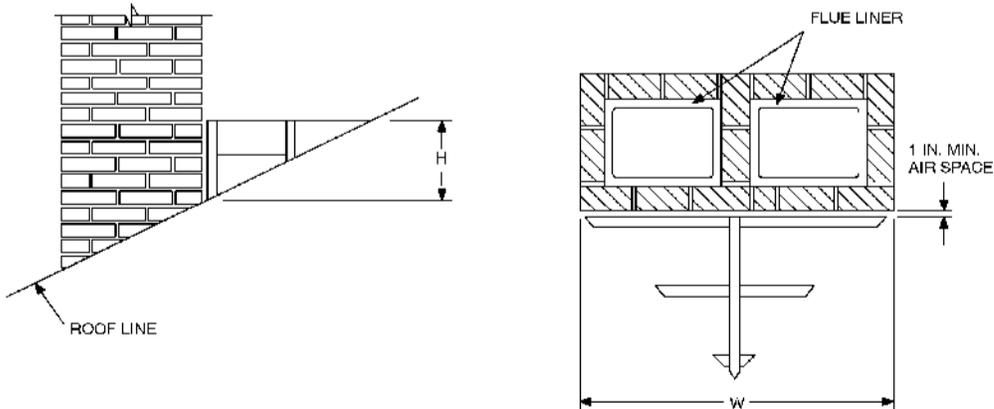
**6001.17 Chimney Crickets.** Chimneys shall be provided with crickets when the dimension parallel to the ridgeline is greater than 30 inches (762 mm) and does not intersect the ridgeline. The intersection of the cricket and the chimney shall be flashed and counterflashed in the same manner as normal roof-chimney intersections. Crickets shall be constructed in compliance with 780 CMR Figure 6001.17 and 780 CMR Table 6001.17.

**780 CMR FIGURE 6001.15  
CLEARANCE FROM COMBUSTIBLES**



For SI: 1 inch = 25.4 mm.

**780 CMR FIGURE 6001.17  
CHIMNEY CRICKET CHIMNEYS AND FIREPLACES**



For SI: 1 inch = 25.4 mm.

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**780 CMR TABLE 6001.17  
CRICKET DIMENSIONS**

ROOF SLOPE	H
12 - 12	½ of W
8 - 12	⅓ of W
6 - 12	¼ of W
4 - 12	⅙ of W
3 - 12	⅛ of W

**780 CMR 6002 FACTORY-BUILT  
CHIMNEYS**

**6002.1 Listing.** Factory-built chimneys shall be listed and labeled and shall be installed and terminated in accordance with the manufacturer's installation instructions.

**6002.2 Decorative Shrouds.** Decorative shrouds shall not be installed at the termination of factory-built chimneys except where such shrouds are listed and labeled for use with the specific factory-built chimney system and installed in accordance with the manufacturer's installation instructions.

**6002.3 Solid Fuel Appliances.** Factory-built chimneys for use with solid fuel-burning appliances shall comply with the Type HT requirements of UL 103.

**Exception:** Chimneys for use with fireplace stoves listed only to UL 737 shall comply with the requirements of UL 103.

**6002.4 Factory-built Fireplaces.** Chimneys for use with factory-built fireplaces shall comply with the requirements of UL 127.

**6002.5 Support.** Where factory-built chimneys are supported by structural members, such as joists and rafters, such members shall be designed to support the additional load.

**6002.6 Medium-heat Appliances.** Factory-built chimneys for medium-heat appliances producing flue gases having a temperature above 1,000°F (538°C), measured at the entrance to the chimney shall comply with UL 959.

**780 CMR 6003 MASONRY FIREPLACES**

**6003.1 General.** Masonry fireplaces shall be constructed in accordance with 780 CMR 6003 and the applicable provisions of 780 CMR 53.00 and 54.00.

**6003.2 Footings and Foundations.** Footings for masonry fireplaces and their chimneys shall be constructed of concrete or solid masonry at least 12 inches (305 mm) thick and shall extend at least six inches (152 mm) beyond the face of the fireplace or foundation wall on all sides. Footings shall be founded on natural, undisturbed earth or engineered fill below frost depth. In areas not subjected to freezing, footings shall be at least 12 inches (305 mm) below finished grade.

**6003.2.1 Ash Dump Cleanout.** Cleanout openings located within foundation walls below fireboxes, when provided, shall be equipped with ferrous metal or masonry doors and frames constructed to remain tightly closed except when in use. Cleanouts shall be accessible and located so that ash removal will not create a hazard to combustible materials.

**6003.3 Firebox Walls.** Masonry fireboxes shall be constructed of solid masonry units, hollow masonry units grouted solid, stone or concrete. When a lining of firebrick at least two inches (51 mm) in thickness or other approved lining is provided, the minimum thickness of back and side walls shall each be eight inches (203 mm) of solid masonry, including the lining. The width of joints between firebricks shall not be greater than ¼ inch (6.4 mm). When no lining is provided, the total minimum thickness of back and side walls shall be ten inches (254 mm) of solid masonry. Firebrick shall conform to ASTM C 27 or C 1261 and shall be laid with medium duty refractory mortar conforming to ASTM C 199.

**6003.3.1 Steel Fireplace Units.** Steel fireplace units are permitted to be installed with solid masonry to form a masonry fireplace when installed either according to the requirements of their listing or according to the requirements of 780 CMR 6003. Steel fireplace units incorporating a steel firebox lining, shall be constructed with steel not less than ¼ inch (6.4mm) in thickness, and an air circulating chamber which is ducted to the interior of the building. The firebox lining shall be encased with solid masonry to provide a total thickness at the back and sides of not less than eight inches (203 mm), of which not less than four inches (102 mm) shall be of solid masonry or concrete. Circulating air ducts employed with steel fireplace units shall be constructed of metal or masonry.

**6003.4 Firebox Dimensions.** The firebox of a concrete or masonry fireplace shall have a minimum depth of 20 inches (508 mm). The throat shall not be less than eight inches (203 mm) above the fireplace opening. The throat opening shall not be less than four inches (102 mm) in depth. The cross-sectional area of the passageway above the firebox, including the throat, damper and smoke chamber, shall not be less than the cross-sectional area of the flue.

**Exception:** Rumford fireplaces shall be permitted provided that the depth of the fireplace is at least 12 inches (305 mm) and at least ⅓ of the width of the fireplace opening, that the throat is at least 12 inches (305 mm) above the lintel and is at least ⅓ the cross-sectional area of the fireplace opening.

**6003.5 Lintel and Throat.** Masonry over a fireplace opening shall be supported by a lintel of

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noncombustible material. The minimum required bearing length on each end of the fireplace opening shall be four inches (102 mm). The fireplace throat or damper shall be located a minimum of eight inches (203 mm) above the lintel.

**6003.5.1 Damper.** Masonry fireplaces shall be

equipped with a ferrous metal damper located at least eight inches (203 mm) above the top of the fireplace opening. Dampers shall be installed in the fireplace or the chimney venting the fireplace, and shall be operable from the room containing the fireplace.

**780 CMR TABLE 6003.1  
SUMMARY OF REQUIREMENTS FOR MASONRY FIREPLACES AND CHIMNEYS**

ITEM	LETTER <sup>a</sup>	REQUIREMENTS
Hearth slab thickness	A	4"
Hearth extension (each side of opening)	B	8" fireplace opening < 6 square foot 12" fireplace opening = 6 square foot
Hearth extension (front of opening)	C	16" fireplace opening < 6 square foot 20" fireplace opening = 6 square foot
Hearth slab reinforcing	D	Reinforced to carry its own weight and all imposed loads.
Thickness of wall of firebox	E	10" solid brick or 8" where a firebrick lining is used. Joints in firebrick ¼" maximum
Distance from top of opening to throat	F	8"
Smoke chamber wall thickness Unlined walls	G	6" 8"
Chimney Vertical reinforcing <sup>b</sup> ( <i>For seismic consideration</i> )	H	<i>Currently not required in Massachusetts</i>
Horizontal reinforcing ( <i>For seismic consideration</i> )	J	<i>Currently not required in Massachusetts</i>
Bond beams	K	No specified requirements
Fireplace lintel	L	Noncombustible material.
Chimney walls with flue lining	M	Solid masonry units or hollow masonry units grouted solid with at least 4 inch nominal thickness.
<b><i>Walls with unlined flue</i></b>	<b><i>N</i></b>	<b><i>8" solid masonry.</i></b>
Distances between adjacent flues	<i>N</i>	See 780 CMR 6001.60.
Effective flue area (based on area of fireplace opening)	P	See 780 CMR 6001.12.
Clearances: Combustible material Mantel and trim Above roof	R	See 780 CMR 6001.15 and 6003.12. See 780 CMR 6001.13. 3' at roofline and 2' at 10'.
Anchorage <sup>b</sup> Strap Number Embedment into chimney Fasten to Bolts	S	<i>Currently not required in Massachusetts</i>
Footing Thickness Width	T	12" min. 6" each side of fireplace wall.

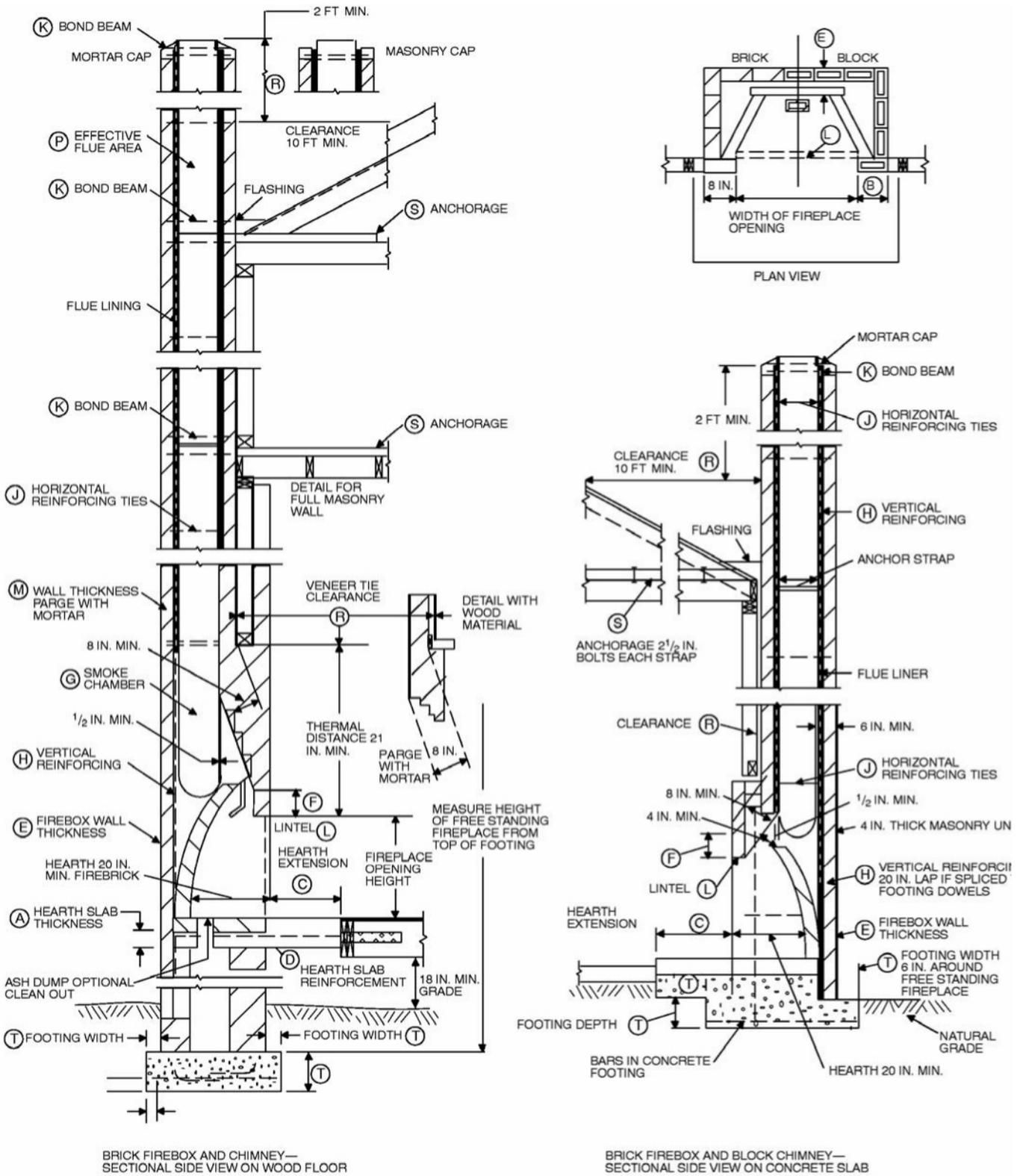
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.

NOTE: This table provides a summary of major requirements for the construction of masonry chimneys and fireplaces. Letter references are to 780 CMR Figure 6003.1, which shows examples of typical construction. This table does not cover all requirements, nor does it cover all aspects of the indicated requirements. For the actual mandatory requirements of the code, see the indicated section of text.

a. The letters refer to 780 CMR Figure 6003.1.

b. Currently not required in Massachusetts

**780 CMR FIGURE 6003.1  
FIREPLACE AND CHIMNEY DETAILS**



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

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**6003.6 Smoke Chamber.** Smoke chamber walls shall be constructed of solid masonry units, hollow masonry units grouted solid, stone or concrete. Corbelling of masonry units shall not leave unit cores exposed to the inside of the smoke chamber. When a lining of firebrick at least two inches (51 mm) thick, or a lining of vitrified clay at least  $\frac{5}{8}$  inch (15.9 mm) thick, is provided, the total minimum thickness of front, back and side walls shall be six inches (152 mm) of solid masonry, including the lining. Firebrick shall conform to ASTM C 27 or C 1261 and shall be laid with medium duty refractory mortar conforming to ASTM C 199. Where no lining is provided, the total minimum thickness of front, back and side walls shall be eight inches (203 mm) of solid masonry. When the inside surface of the smoke chamber is formed by corbeled masonry, the inside surface shall be parged smooth.

**6003.6.1 Smoke Chamber Dimensions.** The inside height of the smoke chamber from the fireplace throat to the beginning of the flue shall not be greater than the inside width of the fireplace opening. The inside surface of the smoke chamber shall not be inclined more than 45 degrees (0.39 rad) from vertical when prefabricated smoke chamber linings are used or when the smoke chamber walls are rolled or sloped rather than corbeled. When the inside surface of the smoke chamber is formed by corbeled masonry, the walls shall not be corbeled more than 30 degrees (0.26 rad) from vertical.

**6003.7 Hearth and Hearth Extension.** Masonry fireplace hearths and hearth extensions shall be constructed of concrete or masonry, supported by noncombustible materials, and reinforced to carry their own weight and all imposed loads. No combustible material shall remain against the underside of hearths and hearth extensions after construction.

**6003.7.1 Hearth Thickness.** The minimum thickness of fireplace hearths shall be four inches (102 mm).

**6003.7.2 Hearth Extension Thickness.** The minimum thickness of hearth extensions shall be two inches (51 mm).

**Exception:** When the bottom of the firebox opening is raised at least eight inches (203 mm) above the top of the hearth extension, a hearth extension of not less than  $\frac{3}{8}$ -inch-thick (9.5 mm) brick, concrete, stone, tile or other approved noncombustible material is permitted.

**6003.8 Hearth Extension Dimensions.** Hearth extensions shall extend at least 16 inches (406 mm) in front of and at least eight inches (203 mm) beyond

each side of the fireplace opening. Where the fireplace opening is six square feet (0.557 m<sup>2</sup>) or larger, the hearth extension shall extend at least 20 inches (508 mm) in front of and at least 12 inches (305 mm) beyond each side of the fireplace opening.

**6003.9 Fireplace Clearance.** All wood beams, joists, studs and other combustible material shall have a clearance of not less than two inches (51 mm) from the front faces and sides of masonry fireplaces and not less than four inches (102 mm) from the back faces of masonry fireplaces. The air space shall not be filled, except to provide fire blocking in accordance with 780 CMR 6003.13.

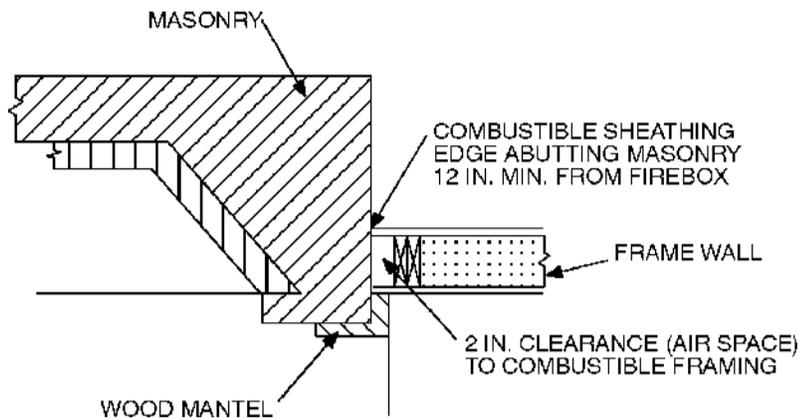
**Exceptions:**

1. Masonry fireplaces listed and labeled for use in contact with combustibles in accordance with UL 127 and installed in accordance with the manufacturer's installation instructions are permitted to have combustible material in contact with their exterior surfaces.
2. When masonry fireplaces are part of masonry or concrete walls, combustible materials shall not be in contact with the masonry or concrete walls less than 12 inches (305 mm) from the inside surface of the nearest firebox lining.
3. Exposed combustible trim and the edges of sheathing materials such as wood siding, flooring and drywall shall be permitted to abut the masonry fireplace side walls and hearth extension in accordance with 780 CMR Figure 6003.12, provided such combustible trim or sheathing is a minimum of 12 inches (305 mm) from the inside surface of the nearest firebox lining.
4. Exposed combustible mantels or trim may be placed directly on the masonry fireplace front surrounding the fireplace opening providing such combustible materials shall not be placed within six inches (152 mm) of a fireplace opening. Combustible material within 12 inches (306 mm) of the fireplace opening shall not project more than  $\frac{1}{8}$  inch (3.2 mm) for each one-inch (25.4 mm) distance from such an opening.

**6003.10 Mantel and Trim.** Woodwork or other combustible materials shall not be placed within six inches (152 mm) of a fire-place opening. Combustible material within 12 inches (305 mm) of the fireplace opening shall not project more than  $\frac{1}{8}$  inch (3.2 mm) for each one-inch (25.4 mm) distance from such opening (*see 780 CMR Figure 6003.2*).

**6003.11 Fireplace Fireblocking.** Fireplace fireblocking shall comply with the provisions of 780 CMR 5602.8.

**780 CMR FIGURE 6003.2  
CLEARANCE FROM COMBUSTIBLES**



For SI: 1 inch = 25.4 mm.

### **780 CMR 6004 FACTORY-BUILT FIREPLACES**

**6004.1 General.** Factory-built fireplaces shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Factory-built fireplaces shall be tested in accordance with UL 127.

**6004.2 Hearth Extensions.** Hearth extensions of approved factory-built fireplaces shall be installed in accordance with the listing of the fireplace. The hearth extension shall be readily distinguishable from the surrounding floor area.

**6004.3 Decorative Shrouds.** Decorative shrouds shall not be installed at the termination of chimneys for factory-built fireplaces except where such shrouds are listed and labeled for use with the specific factory-built fireplace system and installed in accordance with the manufacturer's installation instructions.

**6004.4 Unvented Gas Log Heaters.** An unvented gas log heater shall not be installed in a factory-built fireplace unless *acceptable in accordance with the requirements of M.G.L. c. 148, § 25A, 527 CMR 30, the heater manufacturer's requirements and otherwise the fireplace system has been specifically tested, listed and labeled for such use in accordance with UL 127.*

### **780 CMR 6005 EXTERIOR AIR SUPPLY**

**6005.1 Exterior Air.** Factory-built or masonry fireplaces covered in 780 CMR 60.00 shall 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.

**6005.1.1 Factory-built Fireplaces.** Exterior combustion air ducts for factory-built fireplaces shall be a listed component of the fireplace and shall be installed according to the fireplace manufacturer's instructions.

**6005.1.2 Masonry Fireplaces.** Listed combustion air ducts for masonry fireplaces shall be installed according to the terms of their listing and manufacturer's instructions.

**6005.2 Exterior Air Intake.** The exterior air intake shall be capable of providing all combustion air from the exterior of the dwelling or from spaces within the dwelling ventilated with outside air such as no mechanically ventilated crawl or attic spaces. The exterior air intake shall not be located within the garage or basement of the dwelling nor shall the air intake be located at an elevation higher than the firebox. The exterior air intake shall be covered with a corrosion-resistant screen of ¼-inch (6.4 mm) mesh.

**6005.3 Clearance.** Unlisted combustion air ducts shall be installed with a minimum one-inch (25.4 mm) clearance to combustibles for all parts of the duct within five feet (1524 mm) of the duct outlet.

**6005.4 Passageway.** The combustion air passageway shall be a minimum of six square inches (3870 mm<sup>2</sup>) and not more than 55 square inches (0.035 m<sup>2</sup>), except that combustion air systems for listed fireplaces shall be constructed according to the fireplace manufacturer's instructions.

**6005.5 Outlet.** The exterior air outlet is permitted to be located in the back or sides of the firebox chamber or within 24 inches (610 mm) of the firebox opening on or near the floor. The outlet shall be closeable and designed to prevent burning material from dropping into concealed combustible spaces.

### **780 CMR 6006 MASONRY HEATERS**

**6006.1 Installation.** A masonry heater shall be installed according to one of the following:

1. The terms of its listing; or
2. ASTM E 1602.

## THE MASSACHUSETTS STATE BUILDING CODE

**780 CMR 6007 SOLID FUEL-BURNING APPLIANCES**

**6007.1 Solid Fuel-fired Appliances, General.** *Solid fuel-fired appliances employed for comfort heating include, but are not limited to, room heaters and stoves, fireplace inserts, furnaces and boilers; additionally, the fuel for such appliances includes, but is not limited to wood and wood pellets, coal and various other solid fuels such as nut shells and corn, etc. Solid fuel-burning appliances shall be tested and listed by approved agencies and installed, operated and maintained in accordance with such listing, the manufacturers' requirements and otherwise conform to the requirements of 780 CMR 6007*

**Notes:**

1. *No solid fuel-burning appliance shall be installed in Massachusetts unless such appliance conforms to all applicable requirements of 780 CMR 6007, including the testing and listing of all clearances to combustibles and identification of required floor protection.*
2. *In the absence of explicit requirements of 780 CMR 6007, the applicable requirements of NFPA 211, as listed in Appendix A, shall apply.*

**6007.1.1 Listing Standards, Room Heaters, Stoves and Fireplace Inserts.** *Room heaters, stoves and fireplace stoves (inserts), employed for comfort heating shall be listed and tested to UL 1482 and/or ANSI/UL 737 as found in Appendix A and as applicable; all such appliances shall bear labeling as required in 780 CMR 6007.2 or 6007.3, as applicable.*

**6007.1.2 Listing Standards, All Pellet Fueled Solid Fuel-burning Appliances.** *All pellet solid fuel-burning appliances sold for use in Massachusetts shall be tested and listed to ASTM E 1509 as found in Appendix A and shall bear such labeling as required in 780 CMR 6007.2.*

**6007.2 Solid Fuel-burning Appliance Labeling (Not Central Heating Appliances).** *Every solid fuel-burning appliance utilized for comfort heating shall bear a permanent and legible factory-applied label supplied to the manufacturer and controlled by an approved testing agency; such label shall contain the following information:*

1. *Manufacturer's name and trademark;*
2. *Model and/or identification number of the appliance;*
3. *Type(s) of fuel(s) approved;*
4. *Testing laboratory's name or trademark and location;*
5. *Date tested;*
6. *Clearances to combustibles:*
  - (a) *Above top*
  - (b) *From front*

(c) *From back*

(d) *From sides*

7. *Floor protection;*
8. *National test (listing) standard(s); and*
9. *Label serial number.*

**6007.3 Solid Fuel-burning Central Heating Appliance Labeling.** *Every solid fuel-burning boiler or warm air furnace shall bear a permanent and legible factory-applied label supplied to the manufacturer and controlled by an approved testing agency; such label shall contain the following information:*

1. *Manufacturer's name and trademark;*
2. *Model and/or identification number of the appliance;*
3. *Type(s) of fuel(s) approved;*
4. *Testing laboratory's name or trademark and location;*
5. *Date tested;*
6. *Clearances to combustibles:*
  - (a) *Above top*
  - (b) *From front*
  - (c) *From back*
  - (d) *From sides*
7. *Floor protection, if applicable;*
8. *National test standard(s);*
9. *Label serial number;*
10. *Type of appliance (boiler or warm air furnace);*
11. *Every boiler, pressure vessel or pressure relief device must be stamped in accordance with the requirements of the ASME Boiler and Pressure Vessel Code. ASME stamping shall also be required for boilers, pressure vessels and pressure relief devices produced outside the United State of America. Where required by the ASME Boiler and Pressure Vessel Code, ASME stamping may be affixed directly to the appliance in lieu of on the data plate.*

**6007.4 Hazardous Locations.** *Solid fuel-burning appliances shall not be installed in hazardous locations (any location considered to be a fire hazard for flammable vapors, dust, combustible fibers or other highly combustible substances).*

*Exception: Solid fuel-fired appliances listed for such locations.*

**6007.5 Air for Combustion and Ventilation.** *Solid fuel-burning appliances shall be installed in a location and manner to assure satisfactory combustion of fuel, proper chimney draft and maintenance of safe operating temperatures. Combustion air may be obtained from interior spaces when the interior space containing the appliance has a volume, in cubic feet equal to  $\frac{1}{20}$  of the output Btu rating of all fuel-burning appliances in the space. When buildings are so tight as to preclude adequate infiltration, provisions shall be made to introduce outside air for combustion and ventilation.*

## CHIMNEYS, FIREPLACES AND SOLID FUEL-BURNING APPLIANCES

**6007.6 Chimney Connection.** *All solid fuel-burning appliances shall be connected to chimneys in accordance with their listing, the manufacturer's requirements and the requirements of 780 CMR 60.00, as applicable.*

*Exception: Solid fuel-burning appliances listed for exhaust vent termination other than through a chimney shall be vented in accordance with the manufacturer's requirements.*

**6007.6.1 Chimney Connector Clearance to Combustibles – Solid Fuel-burning Appliances Only.** *Refer to 780 CMR Table 6007.6.1.*

780 CMR TABLE 6007.6.1<sup>1,2</sup>  
CHIMNEY AND/OR VENT CONNECTOR  
CLEARANCES TO COMBUSTIBLE  
MATERIALS/SOLID FUEL-BURNING  
APPLIANCES ONLY

DESCRIPTION OF APPLIANCE	CONNECTOR TYPE	MINIMUM CLEARANCE (in)	MINIMUM CLEARANCE (mm)
Residential-type appliances	Single-wall metal pipe connector	18	457
Residential-type appliances	Type L vent piping connector	9	229
Low-heat appliances boilers, furnaces, water heaters	Single-wall metal pipe connector	18	457
Medium-heat appliances	Single-wall metal pipe connector	36	914
High-heat appliances	Masonry or metal connector	Note 3	Note 3

1. For greater detail and guidance, refer to NFPA 211, Section 6-5.
2. For chimney connectors tested and listed for other clearances to combustibles, such tested, listed clearances shall apply.
3. Clearances shall be based on engineering calculations and good engineering practice. Refer to NFPA 211, Section 6-5. **6007.7 Chimney flue size.** *For solid fuel-burning comfort heating appliances for one- and two-family use, the cross-sectional area of the flue shall not be less than the cross-sectional area of the appliance flue collar. The cross-sectional area of the flue shall not be more than three times the cross-sectional area of the flue collar of the appliance.*

**6007.8 Connection to Masonry Fireplaces.** *A solid fuel-burning appliance such as a stove or fireplace insert shall be permitted to use a masonry fireplace flue where the following conditions are met:*

1. There is a connector that extends from the appliance to the flue liner;
2. The cross-sectional area of the flue is no more than three times the cross-sectional area of the flue collar of the appliance but never less

*than the appliance exhaust collar cross-sectional area;*

3. *If the appliance vents directly through the chimney wall above the smoke chamber of the fireplace, there shall be a noncombustible seal below the entry point of the connector, sealing the fireplace from the appliance;*

4. *The installation shall be such that the chimney system can be inspected and cleaned; and*

5. *Means shall be provided to prevent dilution of combustion products in the chimney flue with air from the habitable space.*

**6007.9 Mounting (Placing) of Residential Solid Fuel-burning Appliances.** *Residential type solid fuel-burning appliances shall be tested and listed by approved agencies and such appliances, when mounted (placed) on combustible or noncombustible materials, shall be installed in accordance with their listing and the manufacturer's requirements.*

*Exceptions: See NFPA 211, Section 9-5.1.1.1 (all such exceptions pertain to placing of such appliances on well supported concrete bases, concrete slabs, properly stabilized, noncombustible soils or on approved, noncombustible assemblies of two hour fire resistance with floors constructed of noncombustible materials).*

**6007.10 Floor Protection.** *Floor protection shall satisfy all listing requirements.*

**6007.10.1 Floor Protectors–Definition.** *Floor protectors are noncombustible surfacing applied to the combustible or noncombustible floor area underneath and extending in front, to the sides and to the rear of a heat producing appliance. For purposes of 780 CMR 6007.9, floor protectors must be noncombustible and have the necessary thermal conductivity to satisfy the appliance tested/listing floor protection requirements.*

*Notes:*

1. Refer to Appendix W (780 CMR 120.W) for information on floor protector thermal conductivity calculations
2. Various "hearth rugs," "mats," "tile board," "hearth board" and similar products sold as floor protectors may be noncombustible but may not satisfy thermal conductivity requirements to comply with 780 CMR 6007 and manufacturer's requirements.

780 CMR TABLE 6007.11<sup>1,2,3</sup>**STANDARD CLEARANCES TO COMBUSTIBLES FOR SOLID FUEL-BURNING APPLIANCES**

APPLIANCE TYPE	CLEARANCE ABOVE TOP OF APPLIANCE (inches)	CLEARANCE FROM FRONT OF APPLIANCE (inches)	CLEARANCE FROM BACK OF APPLIANCE (inches)	CLEARANCE FROM SIDES OF APPLIANCE (inches)
Room heaters; fireplace stoves; combination	36	36	36	36

For SI: 1 inch = 25.4 mm.

1. For reduced clearance requirements, see 780 CMR 6007.11.1
2. Adequate clearance for maintenance and cleaning shall be provided.
3. Provisions for solid fuel storage—solid fuel shall not be stored any closer than 36 inches from the sides, front or back of the solid fuel-burning appliance.

**6007.11 Appliance Clearances.** Solid fuel-burning appliances shall be installed in accordance with the manufacturer's tested, listed clearances (also see 780 CMR 6007.14.1 for used solid fuel-burning appliance clearance requirements).

**6007.11.1 Clearance Reductions.** Tested, listed clearances to combustibles shall only be permitted to be reduced in accordance with the requirements of NFPA 211, Sections 9-6.1 and 9-6.2.

*Note that an engineered protection system is required to achieve a reduced clearance installation except when appliances are installed in rooms that are large in comparison to the size of the appliance (see NFPA 211, Section 9-6.1).*

**6007.12 Supply Ducts.** When a solid fuel-burning appliance utilizes supply ducts such ducts conveying heated air shall be fabricated of noncombustible materials.

*Exception: Combustible ducts specifically tested and listed for such purpose.*

**6007.12.1 Supply Duct Clearance to Combustibles.** Supply ducts conveying heated air shall have a clearance to combustibles of not less than 12 inches (305 mm) for the first ten feet (3048 mm) of distance from the appliance plenum/bonnet.

*Exception: Ducts specifically tested and listed for such purpose.*

**6007.13 Multiple Flue Connections.** A solid fuel-burning appliance and a fossil fuel-burning appliance shall not be vented into a common flue of a masonry chimney unless such common connection is allowed by 248 CMR or 527 CMR as applicable and otherwise by 780 CMR 6007 generally. If allowed, the common flue shall be of such size to serve all appliances connected if such appliances were operated simultaneously.

*Note that 248 CMR and 527 CMR are enforced by gas inspectors and the heads of fire departments, respectively.*

**6007.13.1 Multiple Flue Connections Not Allowed with Solid Fuel Appliances.** A solid fuel-burning appliance shall not share a common flue with a working fireplace nor with

another solid fuel-burning appliance.

**6007.14 Used Solid Fuel-burning Appliances – Installation Inspection.** Used solid fuel-burning appliances that predate the listing requirements set forth in this code may be utilized but the installation of such appliances shall otherwise conform to the requirements of 780 CMR 60.00, as applicable and such installations shall be inspected by the building official (or fire official in such towns that utilize the fire official for such inspection purposes).

**6007.14.1 Used Solid Fuel-burning Appliance Clearances to Combustibles.** In the absence of tested, listed clearances and floor protection requirements, used solid fuel-burning appliances shall be required to be installed in accordance with the clearances of 780 CMR 6007.11. Floor protection requirements shall be evaluated by engineering methods or otherwise four inches (102 mm) of millboard having a thermal conductivity of:

$$k = 0.84 \text{ (Btu) (inch)/(foot}^2\text{) (hour) (}^\circ\text{F)}$$

or an equivalent noncombustible floor protector of the same overall thermal conductivity shall be required (also see 780 CMR 6007.10.1).

**Exceptions:**

1. If tested, listed clearances and/or floor protection requirements are documentable for the specific used appliance being installed, then such clearances and/or floor protection may be utilized.
2. If known tested, listed clearances are greater than those of 780 CMR 6007.11, then such clearances must be maintained.
3. If existing floor protection can be demonstrated to have been adequate for previous installations of said used solid fuel-burning appliances, then such previously utilized floor protection shall be allowed. If calculations demonstrate that the existing floor protection has a thermal conductivity lower than that set by 780 CMR 6007.14.1 and adequacy has otherwise been demonstrated, then the existing floor protection must be maintained.

**780 CMR 6008 FIREPLACE STOVES**

**6008.1 General.** *Fireplace stoves shall be listed, labeled and installed in accordance with the terms of the listing. Fireplace stoves shall be tested in accordance with UL 737.*

**6008.2 Hearth Extensions.** *Hearth extensions for fireplace stoves shall be installed in accordance with the listing of the fireplace stove. The supporting structure for a hearth extension for a*

*fireplace stove shall be at the same level as the supporting structure for the fireplace unit. The hearth extension shall be readily distinguishable from the surrounding floor area.*

**780 CMR 6009 MASONRY HEATERS**

**6009.1 General.** *Masonry heaters shall be constructed in accordance with 780 CMR 6006.*

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