

INSTALLATION

House fires occur when stoves are improperly installed or carelessly operated. Most fires are caused when combustibles are too close to a hot stove, by escape of hot gases or flames through a crack in a chimney, by conduction of heat from a chimney into combustible materials, or by sparks or coals escaping from a stove.

Some states recommend that you consult the local building official and fire marshal and notify your insurance agent before installing a stove. The National Fire Protection Association (NFPA) has developed standards that are the basis for many local building codes. For maximum safety locate a stove or heater at least 36 inches from woodwork, other combustible materials or furniture. A stove pipe should not be closer than 18 inches to the ceiling.

Floor Protection

The material used to protect the floor should extend 6 to 12 inches beyond the stove on three sides and 18 inches beyond the side where the wood is added.

All floors on which stoves are set, except concrete, must be protected from both heat of the fire and hot coals falling out when fuel is added. Metal with asbestos backing and asbestos millboard are non-combustible materials used for floor protection. Slate, brick, marble chips and colored pebbles can also be used; but, unless they are mortared in place with no gaps, metal or asbestos millboard must be installed between them and a wood floor. A two inch layer of sand or ashes, or bricks laid in the bottom of the stove help prevent overheating of combustible flooring.

The air space between the bottom of the stove and the floor covering is important; stoves should be on legs at

Table 3. Minimum Clearances from Combustible Walls and Ceilings*

Type of Protection	Stove Type		Stove Pipe
	Radiant	Circulating	
None	36"	12"	18"
1/4" Asbestos Millboard, spaced out 1"	18"	6"	12"
28 gage sheet metal, spaced out 1"	12"	4"	9"
28 gage sheet metal on 1/8" asbestos millboard, spaced out 1"	12"	4"	9"

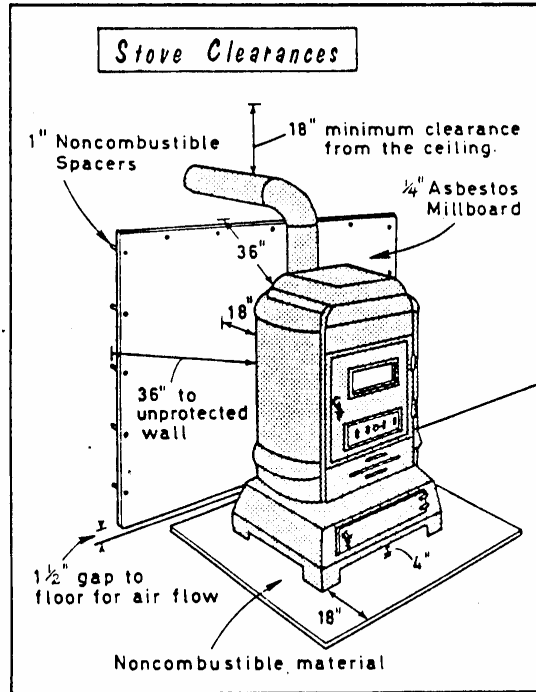
*From National Fire Protection Association No. 89M, 1971.

Wall Protection

The recommended clearances can be reduced considerably if combustible walls and ceilings are protected with asbestos millboard or 28 gauge sheet metal spaced out 1 inch from the combustible wall. The spacers should be constructed from a non-combustible material. Provide a 1 inch air gap at the bottom of the asbestos millboard or metal panel. Air circulating behind the panel will cool the panel and the wall.

Brick or stone provide little or no protection for a combustible wall because they are good conductors of heat.

Asbestos millboard is a different material from asbestos cement board.



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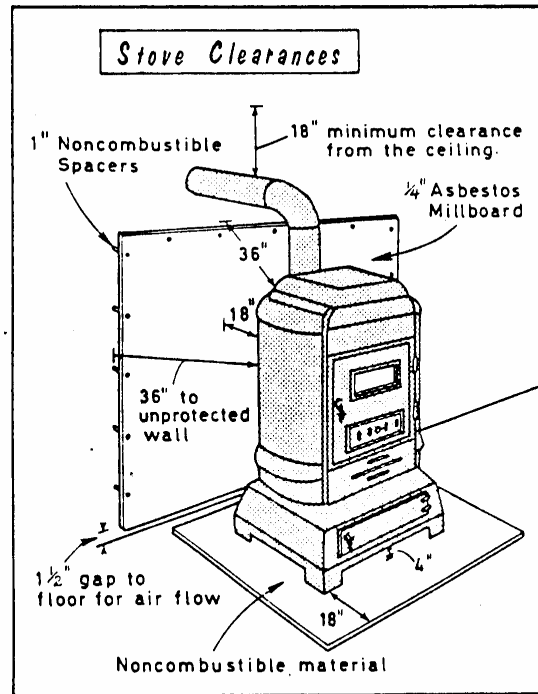
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least 4 inches high. Eight to ten inch legs provide more air space and less heat will be transferred from the stove to the floor. Be certain that both floor and wall protection extend far enough for adequate protection when a stove or Franklin type fireplace is set on a hearth or inside a stone or brick fireplace.

Stove Pipe

The stove or smoke pipe used to connect the outlet of the firebox to the chimney is sold in 24 inch lengths. Building codes require stove pipe to be 24 gauge or thicker; higher gauge numbers indicate thinner metal. The diameter of the stove pipe used should be the same diameter as the firebox outlet. Most wood stoves use either a 6 or 8 inch smoke pipe. Using stove pipe that is smaller in diameter than the firebox outlet will reduce combustion efficiency and possibly cause improper draft.

Most stove installations should have a damper either built into the stove or in the pipe near the stove to control draft and loss of volatile gases. Check the recommendation of the stove manufacturer.

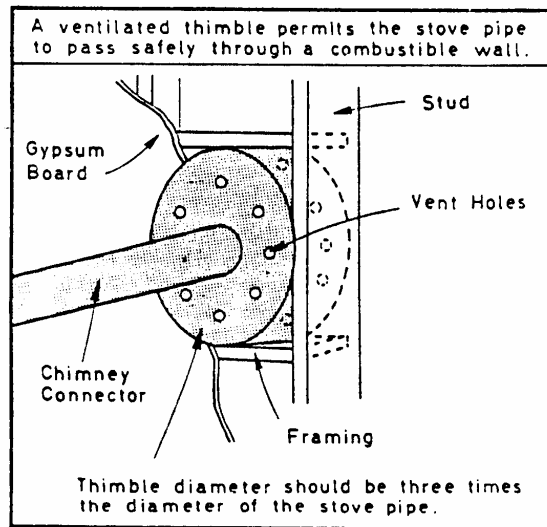
Stove pipes should be as short and as straight as possible. They should enter the chimney higher than the outlet of the stove firebox. The maximum length of the pipe should be less than ten feet.

Avoid horizontal runs. Instead, use 45° angles to create an upward slope in the flue connector pipe. Try to have no more than one right angle turn between the stove and chimney.

Running a stove pipe out a window and up the outside wall of the house is a dangerous practice. Wood burners sometimes recommend long spans of single thickness stove pipe as a heating device. This idea had some merit when used with inefficient stoves where much of the heat went up the pipe. Airtight stoves, however, are more efficient and this practice may cause rapid creosote buildup.

Long stove pipes and those with restrictions should be cleaned frequently to prevent creosote buildup and possible chimney fires.

Where a smoke pipe must pass through a wall, provide an opening with at least 6" of clearance from all wood framing and protect it with a double wall ventilated thimble. A thimble about two inches larger than the pipe is used for the installation of a flue for a gas furnace and is not adequate for a wood stove installation. The entire length of the smoke pipe must be easily inspected, firmly fastened at the joints and kept free of all combustible materials.



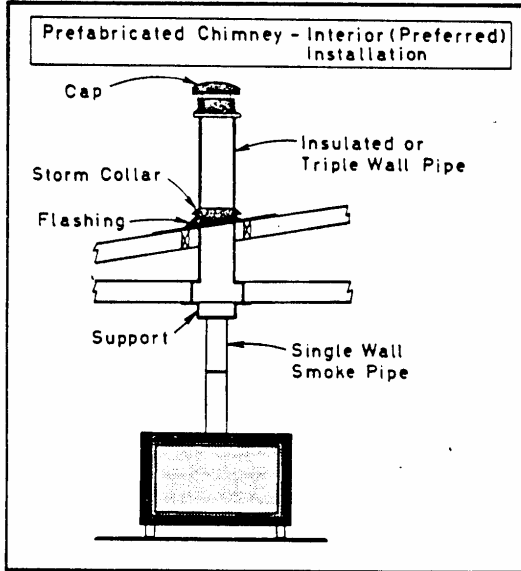
Chimneys

The chimney has two main purposes: to create a draft and to evacuate the gases of combustion. It also discharges some of the heat generated by the fire. The higher the chimney or the larger its cross sectional area, the greater the flow capacity. However, chimney area is more important in effecting capacity than chimney height.

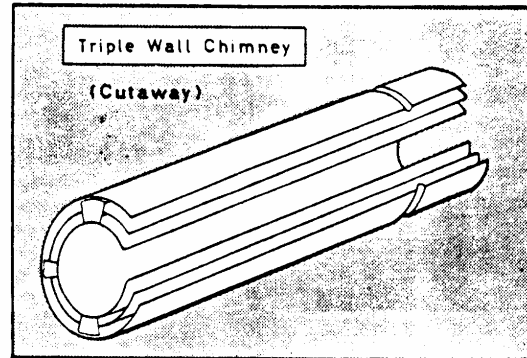
Prefabricated Chimneys

Prefabricated chimneys are easier to erect than masonry ones. Tests at the National Bureau of Standards have shown that metal and masonry chimneys differ little with respect to draft when used under similar conditions. A key point is that metal prefabricated chimneys must be UL listed as ALL FUEL chimneys. Do not use the UL listed "Vent" as it is not insulated or ventilated enough for wood or coal burning. The standard sections are 18" and 30" long and are available in a variety of inside diameter sizes. The sections lock together and no screws or special tools are needed for assembly.

There are two types of metal prefabricated chimneys, an insulated chimney and a triple wall chimney. Insulated prefabricated chimneys are made of a stainless steel outer casing, one inch of insulation and a stainless steel inner liner.



Triple wall chimneys are constructed so that outside air passes down between the outer walls of the triple wall chimney and up along the interior wall. This movement of air cools the chimney.



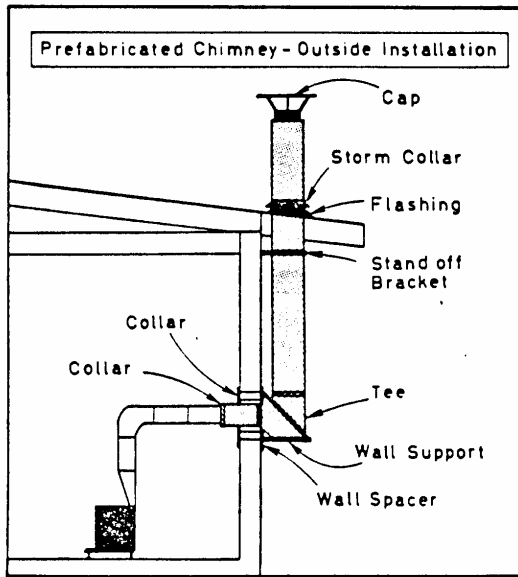
Masonry Chimneys

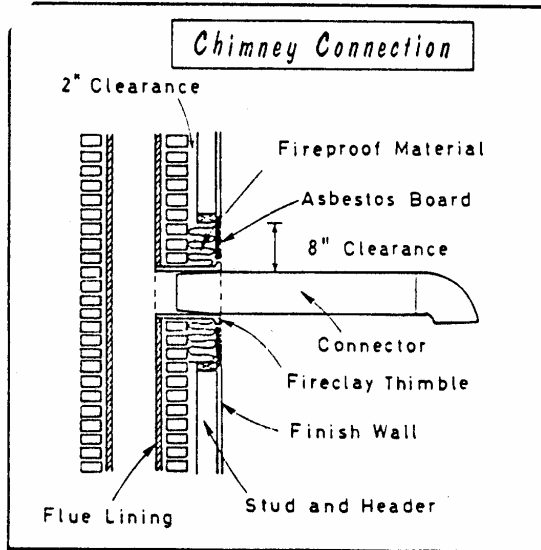
The material cost for masonry chimneys is much less per foot of length than the steel prefabricated chimneys, but much more labor is required for construction.

Masonry chimneys act as large heat sinks to radiate warmth into the room after the stove cools — if it is inside the house and not on an outside wall. An inside chimney absorbs heat from the fire or stove and radiates it back into the living space.

Install the stove pipe so it enters the masonry chimney horizontally. It should be installed flush with and not extend into the flue lining. The wall at the chimney connection must be protected in one of the following ways:

1. If no thimble is used the stove pipe must be securely fastened to the chimney with a high temperature cement. Combustible material within 18" of the pipe must be removed. For a 6" diameter pipe, this requires a 6" + 2 x 18" = 42" diameter hole in a combustible wall. The hole may be closed in or covered with non-combustible materials such as masonry, asbestos millboard, or sheet metal.
2. Use a metal thimble or a burned fire-clay thimble and surround it with at least 8" of fireproofing material such as fiberglass insulation or brick. Cover the opening with non-combustible materials such as asbestos millboard or metal. A small gap should be left between the thimble and the covering material to allow either the house or chimney to settle slightly and not crack the thimble. The gap can be covered with a stove pipe flange.
3. Install an insulated ALL FUEL chimney pipe as a thimble. Then only a 2" clearance between the chimney and combustible materials is required. Cover the gap between the wall and the stove pipe with a stove pipe flange.





Two or More Connections to One Chimney

National Fire Protection Association Standards state that a stove chimney connector is not permitted to be connected to a flue serving a fireplace—a fireplace must have its own individual flue. Franklin stoves have an open front and should be treated as fireplaces in this respect.

Room heaters, cook stoves, etc., should not be connected to a common flue. The reason is that flue gases and sparks may pass from one flue opening into another. Besides, multiple connections sometimes result in unsatisfactory operation.

If two or more stoves, such as a room heater and a cook stove, are connected to the same chimney flue, despite the recommendations against doing so, the connections must enter the chimney at different elevations. A common flue must, of course, be of sufficient size to provide an adequate draft for all the stoves connected to it.

Chimney Caps

A chimney cap is sometimes used to help prevent down drafts where the chimney's top is subject to wind turbulence caused by roof shape, trees, terrain, or other buildings and to keep out rain and snow. Any cap adds resistance to the system and reduces the draft. Mechanical turbines, revolving ventilators and other mechanical devices are subject to failure from creosote buildup and

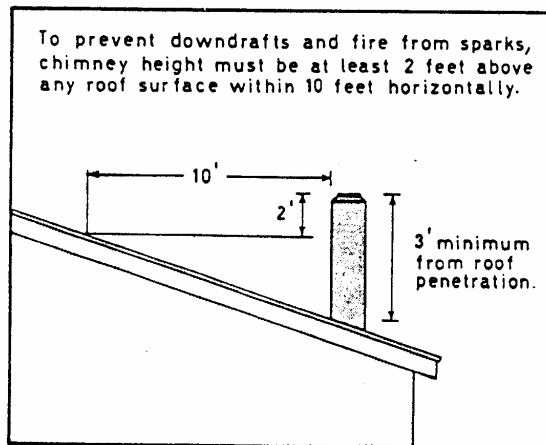
weather. Often the disadvantages outweigh advantages and caps are not used.

If a cap is necessary, a removable flat disk cap is simple and slows gas flow very little. Welded wire fabric is sometimes placed over the chimney to keep out birds and small animals.

Chimney Height

A chimney should extend at least three feet above flat roofs. On pitched roofs, chimneys should be two feet higher than any point within ten feet, to prevent down drafts caused by wind being deflected from the roof.

The flue lining of a masonry chimney is extended four inches above the top course of brick or stone and the top of the chimney capped with cement mortar. The mortar is two inches thick at the outside edges of the chimney and sloped up to the flue lining to direct air currents upward at the top of the flue and to drain water from the top of the chimney.



Smoky Fires

One of the most common problems of wood stove installations is smoky fires. Smoke may come into the room through the openings in the stove or the fire may not burn properly because it lacks an adequate draft. Six main causes and cures are:

(1) **Wet wood.** Green or wet firewood causes smoke problems as much of the heat of the fire is used to dry the wood. The cure is to keep a hot fire going and to use seasoned dry wood. If green or wet wood must be burned, split it finer and mix it with dry wood. Soft wood may cause smoky fires because of the resin in the wood.