Manufactured Fireplaces

by David Frane

Site-built masonry is expensive and takes days or weeks to build, which is why the vast majority of new fireplaces are prefabricated, manufactured units. A typical manufactured fireplace is a double-wall metal box that connects to a metal flue pipe. Most are zero-clearance units, which is another way of saying that they sit directly on the subfloor and can be installed close to or in contact with combustible framing. But most manufacturers suggest leaving 1/2-inch clearance to the back and sides for thermal expansion. Greater clearances are required above the box and around the flue pipe. Fireplaces usually require permits and must be installed to code.

The vast majority of manufactured fireplaces use natural gas, liquid propane (LP), or wood. Wood used to be the traditional favorite, but these days gas models outsell wood by three to one. A few companies have started making electric fireplaces, but those account for only a tiny fraction of overall sales.

Manufactured fireplaces cost several hundred to several thousand dollars uninstalled. Installation varies but is typically $400 to $800 for the firebox and flue. Bringing gas and electrical lines to the fireplace is extra. Even so, an expensive manufactured unit will be cheaper than site-built masonry. Manufactured fireplaces are light, so there's no need for a foundation or special framing. Some models don't require roof penetrations, and most can be installed in a day.

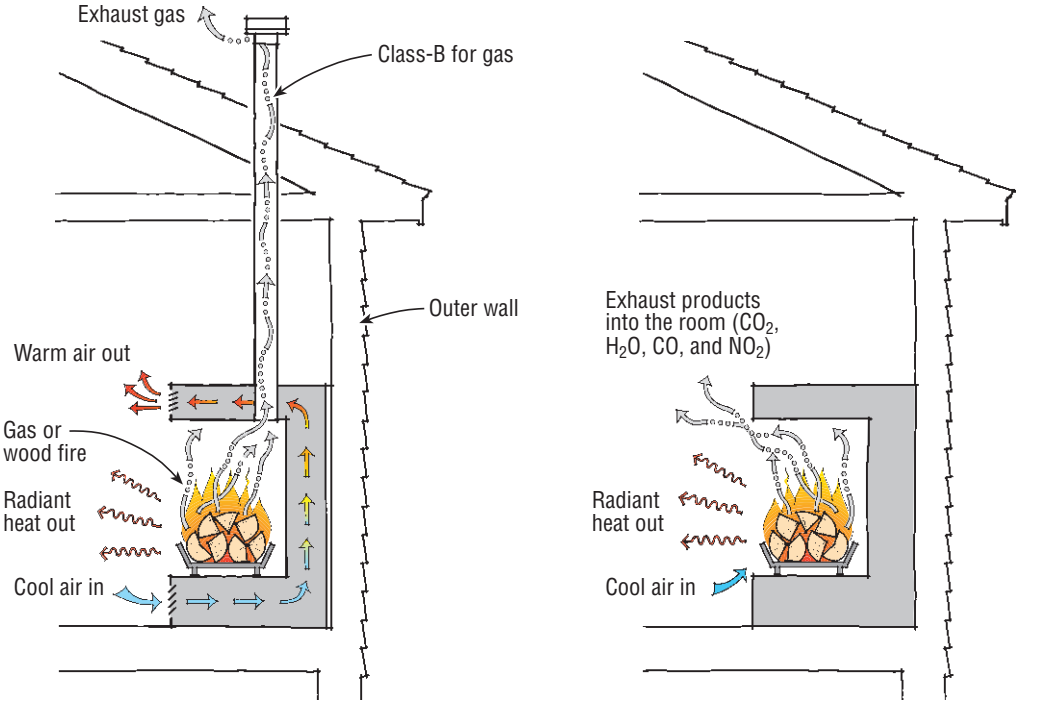
Prefab fireplaces save time and money, fit in tight spaces, and offer a variety of fuel and venting options

Woodburning Fireplaces

People like the aesthetics of burning wood, which is why fireplaces that don't burn it are designed to look as if they do. Woodburning units vent upward through class-A metal flue pipe specifically designed to withstand the high temperature and smoke produced by burning solid fuels.

Because it's impossible to control the rate of burn in an open fireplace, the better woodburning units have tight-fitting doors and an outside air source. That allows you to control combustion by regulating the amount of air that enters the firebox through a vent or pipe to the exterior. On simple fireplaces, it's

B-Vent and Unvented Fireplaces



B-Vent **Unvented**

B-vent and woodburning fireplaces are similar to masonry fireplaces in that they have vertical flues that rely on a natural draft to expel exhaust products. Unvented gas fireplaces release combustion products into the building. Those products are mostly water vapor and carbon dioxide but may include small amounts of carbon monoxide and nitrogen dioxide.

done by manually opening and closing the vent. On more sophisticated models, airflow is automatically controlled by a barometric damper or an electric inducer fan. Burning outside air prevents warm house air from escaping through the chimney.

Gas Burning

Many homeowners like the convenience of gas fireplaces. There's no wood to haul or store and no ashes to deal with. You can turn them on and off with the flick of a switch. Gas fireplaces mimic the look of burning wood by porting gas between ceramic logs. The better ones have glowing embers and surprisingly realistic flame patterns, but the cheap ones look fake.

From the contractor's point of view, gas fireplaces are easy to install and will fit in very tight spaces. Some models are shallow enough to fit in a 12-inch space. Building codes frequently permit shallower hearths than those required for woodburning units. Hearths can sometimes be dispensed with altogether when particular models are installed a minimum distance above the floor.

B-vent. The earliest type of gas fireplace is the b-vent, which gets its name from the class-B flue pipe it uses. These naturally vented models resemble woodburning units in that they rely on convection to pull exhaust products up the chimney. Gas logs burn in an open firebox or behind loose-fitting doors with no source of outside air. As a result, a lot of heat and warm room air escape through the flue.

Some people will install a wood fireplace with the idea of converting it to gas later on. Many units are designed with that in mind and come with knockouts for gas lines. While it's easy to go from wood to gas, you can't go from gas to wood unless the fireplace was installed with a class-A flue. The lighter class-B pipe is not designed to withstand the heat and byproducts released by burning wood.

B-vent fireplaces are most popular in warm-weather states where there's little need for auxiliary heat. They're generally safe, but their use is declining because of concerns about indoor air quality. They don't draw well in tight buildings, and that can allow combustion air to get into the house.

Unvented. Unvented gas fireplaces don't have flues, so combustion products are released directly into the room. The gas is burned so completely that using this type of fireplace is said to be as safe as cooking with a gas stove. Manufacturers refer to these appliances as vent-free, and they're popular because they're cheaper and easier to install than comparable vented models. Since there's no flue to install, you can put them in nonstandard locations such as a kitchen peninsula or in the middle of an open room.

Vent-free fireplaces are close to 100% efficient because all the heat stays in the room. However, the exhaust products, mostly CO_2 and water vapor, stay in the room, too (see "Vent-Free Gas Heaters — How Safe?" 7/97). Such fireplaces are normally equipped with an oxygen depletion sensor that turns the unit off if the oxygen level drops below 18%. But many people claim that they can smell or are sensitive to the exhaust products. Even when the appliance works perfectly, it puts a lot of water vapor in the air. So if the house is tight, you can end up with serious mold and condensation problems.

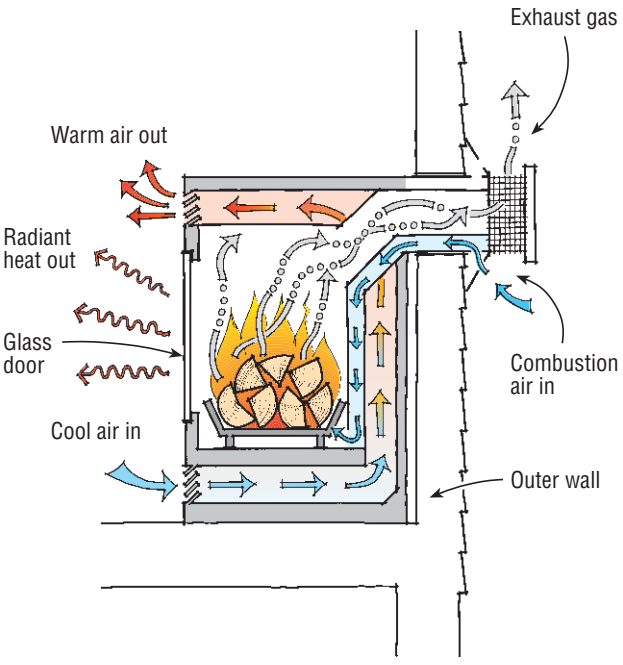
Unvented gas appliances are banned or restricted in many jurisdictions. They're illegal in California and Minnesota. One manufacturer claims to be close to overturning the ban on unvented fireplaces in Massachusetts.

Direct vent. Direct-vent units are the most advanced type of gas-burning fireplace. Combustion takes place inside a sealed chamber. In return for viewing the fire through a fixed piece of glass, the owner gets cleaner indoor air and more heat for the energy dollar. In most installations, combustion air enters and exhaust products exit through pipes that pass horizontally through the wall behind the unit. This makes for an easy installation because there's no need to run a flue through the floors or roof above. And it increases design flexibility by allowing you to put a fixed window over the mantle. Bear in mind that there are restrictions about how close the exhaust vent can be to air intakes and operable windows.

Direct-vent fireplaces can be connected to a wall-mounted thermostat and are frequently available with hand-held remote controls. Some models can be vented up before going out the wall for installation in basements or when there's a reason not to vent straight out. It's also possible to vent through the roof, though that makes for a more difficult and expensive installation.

A direct-vent gas fireplace is highly efficient, which is why it's popular in cold northern states, where people can use the heat. Sometimes this is the only kind of gas fireplace you can install because energy codes have made houses so tight that B-vent units won't

Direct-Vent Fireplace



The flue on a direct-vent fireplace goes through the wall behind the unit but can sometimes be configured to exit through the roof or higher up the wall. Combustion air enters through the outer layer of the flue, while exhaust products exit through the pipe inside.

TEMCO

In a direct-vent fireplace, gas logs burn in a sealed chamber behind a fixed glass panel. Hearth extensions are optional on many gas units.

draw and there's not enough air exchange to dilute the combustion products from unvented gas appliances.

Heat Output

In some parts of the country, people want to get heat out of their fireplaces. In others, fireplaces are used to produce atmosphere rather than heat, which is why you see them in places like Phoenix, Miami, and Hugh Hefner's penthouse. The problem is that it's not hard to overheat a room. One solution is to make the fire smaller by using less wood or turning down the gas. But past a certain point the fire's so small it's not worth looking at. Most gas-burning units have high and low settings. In addition, some of the higher-end direct-vent units have bypass dampers that shunt excess heat outside. It wastes gas, but is better than running the air conditioner and fireplace at the same time.

This gas unit from Heat-N-Glo does not have a metal firebox. Instead, the firebox is made from cast ceramic fiber, which is a good insulator and looks like real masonry.

FMI

Manufactured woodburning fireplaces have low installation clearances but must meet the same requirements for hearths and surround clearances as site-built masonry.

A better option is to move excess heat to other parts of the building. Many high-end units can be connected to an auxiliary heat duct or tied into the existing duct system. Manufacturers are pushing the idea of using fireplaces to zone heat areas like family rooms. This would allow homeowners to lower the furnace setting and use the fireplace to space-heat the room they're in. The more efficient gas fireplaces are rated as heating appliances and can be used to heat additions that are hard to tie into the existing system or when the existing furnace is at capacity.

Heat output varies quite a bit from model to model, so be sure to choose one that fits the client's heating needs. Woodburning units are available with outputs between 10,000 and 80,000 Btus. Gas fireplaces range between 15,000 and 60,000 Btus. An unvented gas log set puts out between 10,000 and 40,000 Btus.

Environmental Regulations

In some states and localities it's illegal to install a fireplace that does not meet EPA emissions standards. This is true of Colorado, Washington, Oregon, and much of California. Gas fireplaces burn clean, so they aren't subject to EPA testing. But the emissions from woodburning fireplaces vary widely from model to model.

In practice, these regulations have made woodburning masonry fireplaces all but illegal. That's because it's hard to ensure that a site-built unit is identical to the one that underwent emissions testing in a lab. One company, Firespaces Inc., has gained limited approval for a site-built masonry system that maintains uniformity by supplying the mason with templates and premanufactured parts. The installed cost of this system is on par with other site-built masonry, however. The most cost-effective option is to buy a manufactured unit that meets the emissions standard.

Initially, the only way to meet the EPA standard was to buy a fireplace with a catalytic converter. The converter is a honeycombed ceramic block that uses rare metals to accelerate the combustion of escaping gas. But converters have a limited lifespan, are expensive to replace, and can be ruined by burning things like colored paper. A faulty converter may not sound like a problem, but believe it or not some towns have "smoke cops" who go around testing chimney emissions. Fail the test and you have to fix the fireplace and pay a fine.

A more popular option is to buy a unit that has secondary burning. Such a unit works by injecting superheated air into the top of the firebox, where it re-ignites

unburned combustion products. Sounds simple, but it's expensive to engineer a fireplace with the precise geometry and airflow it takes to make this work.

Efficiency. As you'd expect, the cheapest fireplaces are generally the least efficient. Some lack insulation, and that allows heat to escape through the housing. Others haven't got doors or an outside air source, so room heat goes up the chimney. Radiant models are the least expensive, but circulating models are better because room air can pick up heat as it flows through the housing. Basic circulating fireplaces rely on convection to move the air, while high-end models push it through with thermostatically controlled fans.

Efficiency is important when the fireplace is used for heat. Direct-vent gas models are 60% to 90% efficient. B-vent fireplaces are more like 45%. Gas logs are about 5% efficient if you put them in an existing masonry fireplace, but they're close to 100% when unvented. The least efficient manufactured wood units aren't much better than conventional masonry fireplaces, which are between –10% and 10% efficient. But the better ones are between 50% and 70%. By way of comparison, older gas furnaces are around 60% efficient.

Quality

Quality has more to do with features and design than with the actual construction of the unit. Many companies produce a low-end line of fireplaces aimed at the spec builder. These stripped-down "builder's boxes" sell for as little as $200 and are not much more than a fireproof box and chimney. The inside of the firebox is painted metal. Glass doors cost extra.

The better fireplaces have some kind of firebrick lining. On gas models, the lining's for looks and consists of inch-thick cast panels that sit inside the metal firebox. Some panels look like real masonry, but gaps at inside corners give them away. Firebrick serves a purpose in hotter-burning wood models by protecting the metal firebox from overheating. Some wood units have thin cast inserts, while others take full-thickness bricks.

Some of Heat-N-Glo's gas models use a single-piece ceramic fiber firebox instead of the usual lined metal box. That allows for a more seamless transition between decorative hearth facings and the inside of the unit.

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In a B-vent fireplace, gas logs are burned in an open firebox or behind loose-fitting doors. Exhaust products escape through a vertical flue.

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Sources of Supply

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