

# Masonry Chimneys

Using an existing masonry chimney is the obvious first choice for venting a wood stove. Many homes are built with traditional masonry fireplaces or freestanding masonry chimneys. The convenience of an existing chimney can make for an installation that is quick and simple. But chimneys need to be inspected closely to be sure the installation will be safe and perform to your expectations. In this article, we review the components of a masonry chimney that should be checked to ensure safe and effective installation. We also discuss solutions for chimneys that do not meet these standards.

## 1. Checking Out An Existing Chimney

Making use of an existing chimney can be a safe and convenient way to vent a wood stove. However, an out-of-use or abandoned chimney may not be up to code or suitable for use with a high-efficiency wood burning appliance. Even a chimney that has been in use for years may have flaws that make it unsafe for use now. This doesn't necessarily mean that the chimney in your home can't be used. It just means that all chimneys should be inspected by a professional and needed repairs should be made before you hook up your stove. Even chimneys in newer homes should be inspected for soundness and proper clearances to combustibles. A good source for finding a chimney professional in your area is the Chimney Safety Institute of America. This trade organization keeps a "searchable" list of certified chimney sweeps on their website, [www.csia.org](http://www.csia.org).

### What Makes A Chimney Safe?

The National Fire Protection code has identified certain requirements for masonry chimney safety:

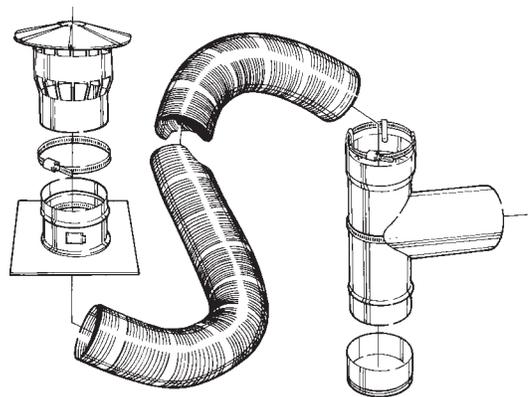
- Chimneys should have a fireclay flue liner 5/8 " thick
- There should be a 1/2" air space between the flue liner and the inside face of the chimney walls
- The mortar joints on the inside surface of the flue tiles should be smooth
- There should be a crown of concrete or non-water soluble refractory cement sloping away from the chimney and sealed with a flexible material
- The chimneys walls should be no less than 4" nominal thickness
- The chimney should have a cap to keep out moisture, birds, or other pests
- Interior chimneys should have a minimum 2" clearance to combustible materials
- Exterior chimneys should have a minimum 1" clearance to combustible materials

In addition to making sure the chimney meets all of the safety specifications, it is important to evaluate how well your chimney will perform with your new stove. For that, you need to consider the height of the chimney and the size of the flue. In general, a chimney should be at least 14' high to provide adequate draft for a wood burning stove. Taller chimneys typically produce greater draft and increased performance. However, a chimney that is too tall can produce excessive draft and require an additional damper in the flue pipe.

The flue is the opening in the chimney that allows for the passage of exhaust. Flues come in all shapes and sizes. Fireplace flues can be as large as 12" x 12". Other flues can be a simple 6" or 8" round. The flue size is important because it helps determine how much draft your chimney will have, thus how well your stove will perform. Picture water flowing in a stream. When the stream bed is narrow, the water flows quickly. If the stream bed becomes wider, the water slows down. The same thing happens to smoke as it flows through a chimney. An oversized flue allows the smoke to slow down and condense inside the chimney - resulting in water, creosote, and sluggish draft. (See the article [What Makes A Good Chimney](#)).

## 2. The Re-Line Solution

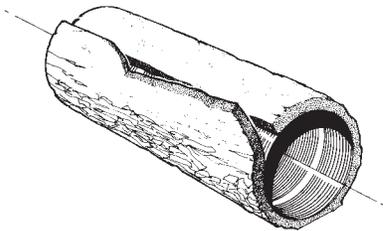
If your masonry chimney doesn't meet the safety or sizing requirements described above, it can still be used. In many cases, chimneys can be re-lined fairly easily and inexpensively (\$475 to \$650 for materials), and doing so will improve your chimney to a completely safe and reliable condition. The most popular type for wood stove use is a flexible stainless steel liner that runs up the entire length of the chimney. These liners are tested to UL Standard 1777 and should only be used in a chimney with at least a 4" thickness of masonry all around the liner. They are not meant for use in a combustible chase.



*The Forever Flex Liner Kit includes a stainless steel cap, top plate, flexible liner, and a tee with removable cap.*

The advantage to re-lining is improvement in both safety and performance. The flexible liners have been tested to the same high-temperature standards as Class A prefabricated chimneys and can be purchased in sizes that match the flue collar on the stove. A flexible liner is also easy to clean and maintain. They are sold as a kit, and include a tee (for connection to stovepipe), a top flashing to seal the opening of the chimney, and a cap. They are a listed system, which means that no components can be substituted unless approved by the manufacturer.

If your chimney is unlined, or the liner is in poor condition, you will need to wrap the flexible stainless steel liner in a special insulation. The insulation, which is made specifically for the liner, provides for zero clearance from the chimney's masonry exterior to combustibles. It will also assure proper draft for the best performance of a high-efficiency wood stove.



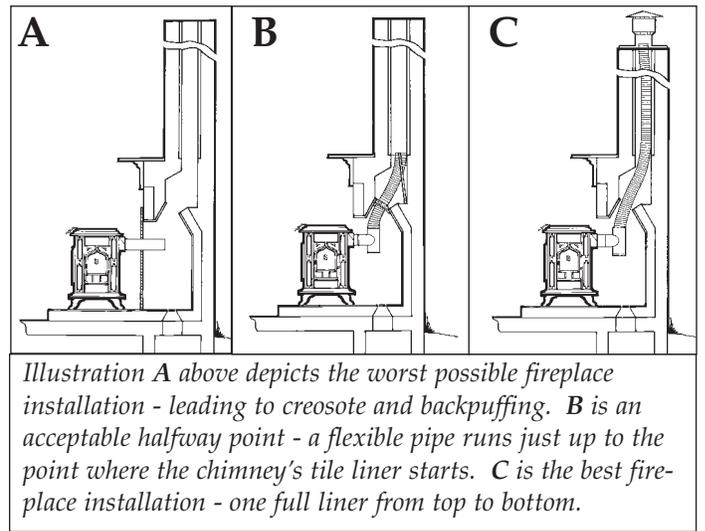
*An insulating blanket is available to wrap around the stainless steel liner. The insulation is required for chimneys with no liner or liner in poor condition.*

Woodstock Soapstone carries the Forever Flex brand liner. This is a high quality system that comes with a limited lifetime warranty. These can be installed by a professional, but you can do it yourself if you are mechanically inclined and don't mind working on a rooftop or scaffolding. The Forever Flex Liner kit comes with complete instructions, but we have outlined the basic method here in order to help you decide if installing the kit is a job you'd like to tackle yourself.

## A. Fireplace Installations

Installing a woodstove in front of a fireplace is one of the most common installation scenarios we hear about. Fireplaces are typically located in a central part of the house or in a common area, and an existing hearth and chimney make a natural choice for a wood stove installation. Plus, you will be replacing an energy-wasting fireplace with an energy-producing wood stove.

There are a few things to be aware of for this type of installation. For example, it is not acceptable to simply run a pipe from the stove into the fireplace and leave it at that. This type of installation is against the fire code, it will soot up your fireplace with creosote, and you won't get the draft you need to run the stove properly.



Fire codes requires a "positive connection" from the stove to the bottom of the chimney above the damper. This means that stovepipe, usually the flexible pipe that we just described, must run from the stove through the fireplace and up beyond the damper, preferably to the top of the chimney. The connection between stove and chimney must be such that the chimney can only draw air through the stove to assure proper draft and flow. The "positive connection" means that there are no leaks in the system that would allow the chimney to draw air from the room, rather than the stove.

Flex liner kits are available that extend only from the stove up to the bottom of the existing flue liner above the fireplace damper, but we discourage their use. The area around this type of kit must be tightly sealed at the damper, or chimney draft will be reduced and stove performance will suffer. They are more difficult to install and cleaning the chimney around them is also difficult.

## B. Freestanding Chimney Installations

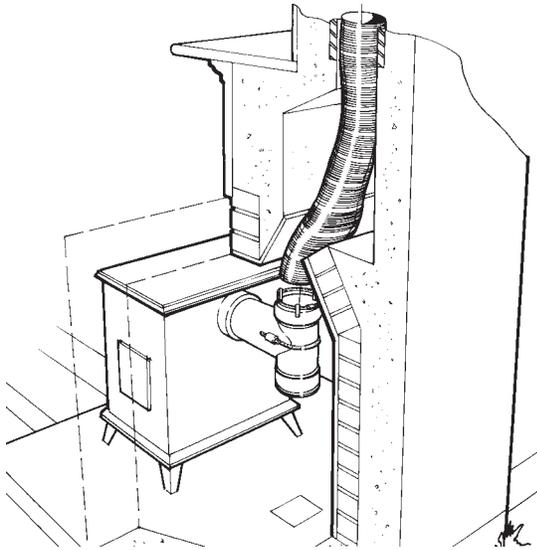
If you have a chimney in your home that once served another wood stove or other type of heating unit it may have a breach, or a hole, to accept stovepipe. If the chimney is in good shape, appropriately sized, and not being used to vent any other appliance, you may be able to use it as is. Connecting a stove to an existing chimney is as simple as running pipe from the stove to the chimney opening, or thimble.

If the chimney is already lined with a fireclay flue it will probably have a fireclay or steel thimble. A thimble can be either directly behind the stove (allowing for  $\frac{1}{4}$ " rise for each foot of connector pipe) or anywhere in the chimney above the stove. Three or four feet above the stove is typical. Stove pipe should penetrate into the thimble to depth of at least  $1\frac{1}{2}$ ". An adapter may be necessary if the thimble size does not match the stove's flue size.

If your chimney is not lined, you will have to install an approved liner. Again, our recommendation for cost and ease of installation is a flexible stainless steel liner. If you are working with an unlined chimney, chances are pretty good that it won't have an approved thimble. The snout of the tee on the Flex Liner will serve this purpose.

### 3. Installing A Liner Kit

Before you order your liner kit, you will need to collect a few measurements: the height of the chimney from top to where the stove will be located, the size of the flue (best measured from the top of the chimney), and (for fireplace installations) the size of the damper in the top of your fireplace. Many dampers are narrow, usually a width of 4 1/2". If your damper is less than the 6 or 7" diameter of the liner, you will either need to remove the damper and part of its frame or order your liner kit with the end "ovalized". Forever Flex can "ovalize" the last four feet of the liner to help it fit through the damper frame. The kits come in lengths of 20', 25', 30', etc. You will want to order a long enough kit to give you about a foot of extra liner. The extra foot of liner allows for some bending within the chimney and gives you a small margin of error.



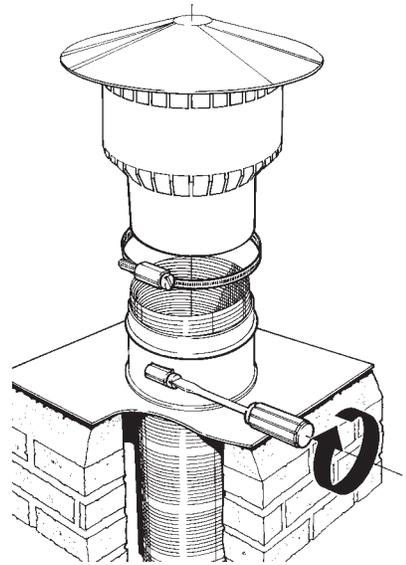
*The last four feet of the liner can be "ovalized" in order to fit through a narrow damper. The end will have to be squeezed back into round in order to connect to the tee.*

If the existing chimney is not lined or is cracked, you should wrap the liner with the insulating blanket according to the directions that come with the kit. You can now install the liner from the top of the chimney. It's a good idea to attach a pulling chain or rope to the bottom of the liner so a helper can grab it from inside to help pull it down and guide it through the damper opening. Do not force the liner into a chimney. Although it's acceptable for the liner to touch the chimney sides when in use, it may snag on mortar joints or obstructions and damage the liner.



*It is easiest to pass the liner down from the top of the chimney. Position a helper inside at the fireplace or thimble to help guide the liner into final position.*

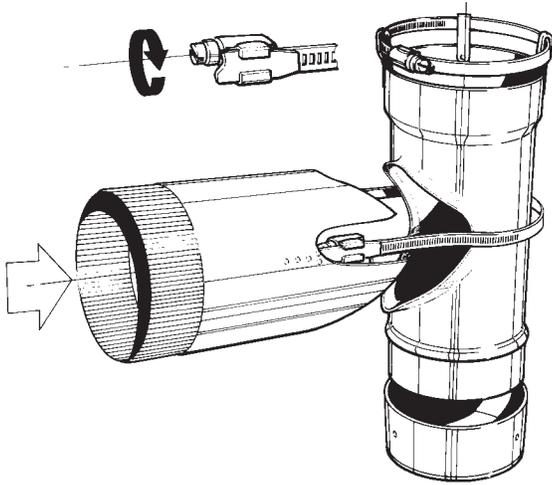
Once the liner is in place you should trim the top of the liner to four inches above the crown. Run a heavy bead of silicone caulk around the chimney crown or top of flue tile. Place the top plate over the liner and press it firmly down onto the caulk. Tighten the hose clamp on the top plate to the liner using a 5/16" nut driver. Set the cap on top and use the hose clamp to secure it in place.



*The top plate both seals off the top of the chimney and provides the support for the stainless steel liner. The cap ensures rain, snow, and small animals stay out of the chimney system.*

Inside the fireplace, you will now attach the tee to the end of the liner. If your liner was ovalized in order to fit through a narrow damper, you will have to squeeze the liner back into round in order to fit the end into the tee. The easiest way to do this is with a belt or strap or with a rubber mallet. Once it is round, use a 5/16" nut driver to attach the tee body to the flex liner with the hose clamp provided. You can now finish the bottom termination by attaching the snout to the tee, again by using the 5/16" nut driver to secure the locking band. A piece of stovepipe of the appropriate length finishes the installation by connect-

ing the stove's flue collar to the snout of the tee. Use the self-tapping screws provided with your stove pipe to secure the connection. The end of the tee's snout should fit inside the stovepipe so that any creosote or condensation stays in the pipe. The stovepipe should have a slight rise of  $\frac{1}{4}$ " per foot for proper flow of exhaust.



*The snout and the body of the tee are two individual pieces. The snout is packed inside of the tee body when the kit is shipped. The locking band is adjusted from inside the snout in order to provide access to the hardware when the snout is protruding through a thimble.*

The installation for a freestanding chimney is the same as for the fireplace installation described above. The only difference is that you will not be threading the liner through a damper. For installations where you will be connecting to the tee through a thimble, you should attach the tee body to the end of the liner before you pass the liner down from the top of the chimney.

Next, you will install the liner from the top, again with a helper guiding from below. The liner and tee body should extend down to the thimble opening. Push the locking clamp for the snout through the breach in the chimney so the tee body can be pulled down through it. You will then reach through the inside of the snout to tighten the clamp with the nut driver. The nut is conveniently located inside the snout for ease of access. When the nut is tightened, the snout and tee body make a secure seal. The snout will extend out through the chimney wall and the elbow or pipe from the stove can be attached with three self-tapping screws. The snout should be mortared into place.

Once all the connections are made it's a good idea to test the draft by lighting a crumpled piece of newspaper in the stove. If the paper burns fast and the smoke goes up the liner, pat yourself on the back for a job well done. You are now ready to fire up the stove and enjoy the cozy warmth of a soapstone stove knowing that your chimney is in ship shape.

If you have questions about whether or not your masonry chimney can be used for venting a woodstove, want more detail on stainless steel liner kits, or have any other questions about woodstove installation, just let us know. Our customer service team members are all NFI Certified Woodstove Specialists and have had years of experience helping customers plan and install stoves. We are available by phone at 800-866-4344 from 9-5 ET, Monday through Saturday. You can also reach us via email: [info@woodstove.com](mailto:info@woodstove.com). Or if you are in the New England area, feel free to swing by our factory and showroom in West Lebanon, NH. We'll give you a factory tour and help you determine the best installation for your stove!