

How a new liner can improve your wood-burning system.

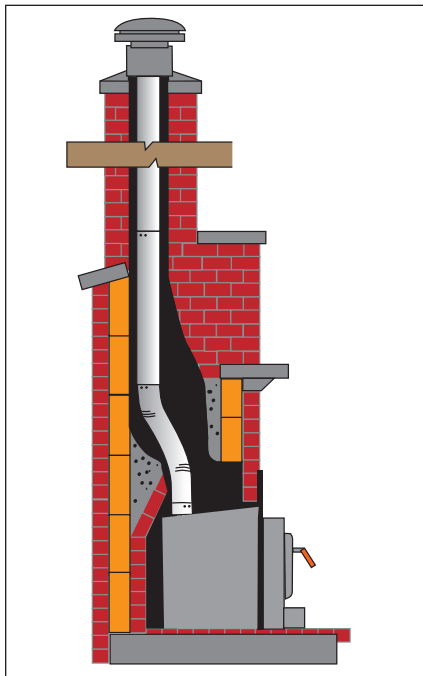
A Buyer's Guide to Chimney Relining

Get answers to these questions:

- What is a chimney liner?
- Why upgrade your chimney with a new liner?
- What are the liner options?
- What is involved in the installation?
- Should you attempt to install your own chimney liner?

What Is a Chimney Liner?

The two main parts of a chimney are the inner liner and the outer shell. The liner forms the passage through which



Relining is common when there is a change of use of the chimney, such as the installation of an insert into an existing fireplace.

the exhaust gases flow. Both metal and masonry liners are used. The other major part of the chimney is the outer shell, which provides structural strength and protection for combustible construction. The outer shell can be made of brick, stone or metal.

The chimney liner has three main functions:

- First, it must **contain the smoke (exhaust)** so it doesn't leak into the chimney structure. The exhaust contains water vapor that can condense as it cools. Evidence of leakage of condensed flue gas shows up as dark stains on the sides of brick and stone chimneys.

- Second, the liner must be able to **withstand the high temperatures** resulting from over-firing or from a chimney fire. All chimney relining systems for use with wood-burning equipment have been tested and listed as being able to withstand high temperatures, including those resulting from chimney fires, at least for short periods.

- Third, the liner must **resist attack by the acids** that are found in wood and coal appliance smoke.

Terra cotta clay is the traditional lining material for masonry chimneys. While clay flue liners are usually able to resist acid attack, they can fail when exposed to high temperatures, and they may permit exhaust and condensation to leak into the chimney structure.

In special cases a stainless steel liner can be installed in an existing metal



Damaged crown and eroded mortar joints should be repaired before relining.



Stains like these are caused by condensation of moisture and creosote from cool flue gases.

chimney to reduce its flue size. Only a qualified professional should attempt this type of installation.

Although masonry chimneys serving coal, oil, gas and propane burners can be relined to reduce heat loss and improve safety and performance, the focus here is mainly on relining for wood-burning equipment.

Why Upgrade Your Chimney with a New Liner?

There are four common reasons to reline an existing chimney:

1. Relining may be needed when there is a **change of use** of the chimney, such as the installation of a smaller, more efficient wood stove, or a fireplace insert, into an existing fireplace. To produce good performance, the flue area should match that of the connected appliance. An 8-by-12-inch clay liner, the most common size found in masonry chimneys, has **more than twice** the cross sectional area of a 6-inch diameter flue, which is the most common



Blanket insulation must be carefully installed.



Flex liners are the most common type, and must be used for relining chimneys with offsets.

size for modern wood stoves. Resizing the chimney flue with a new liner that matches the size of the wood stove flue collar will produce much better performance and improve efficiency.

2. Clay liners can fail because of temperature shock caused by a chimney fire, from attack by acids in flue gases, from freeze-thaw cycles in cold climates, or from general deterioration with aging. The most common signs of failure are cracks in clay liners and displacement of broken pieces. Whatever the reason for failure, relining is a good solution for a chimney in which the brick or stone shell is still in good condition but the liner has failed.

3. Signs of flue gas cooling, such as water condensation, visible staining or rapid creosote formation, are problems that can be corrected by the installation of a new liner, especially one that has insulation around it. Low flue gas temperature results in weak draft, which tends to show up as slow burning, fussy fires that can smoke into the room when the door is opened for loading. If your wood-burning appliance doesn't work well, low flue gas temperature may be the problem. The installation of an insulated chimney liner can be the solution.

4. A routine cleaning or special inspection may reveal a **safety hazard** such as inadequate clearance to combustible material. Although building codes have rules for masonry chimney construction, sometimes they are not followed by builders. A chimney liner with insulation can solve these clearance problems because many liners are tested and listed for zero clearance of the masonry shell to wood and other combustibles. Without this type of insulated liner, a masonry chimney would need up to two inches of clearance all around. Reducing fire risk is a good reason to install a new chimney liner.

What Are the Liner Options?

Stainless steel is by far the most common material used in chimney lining systems. These metal liners have been used successfully for over 25 years and have proven durable. Stainless liners are available in two forms: flexible, made from a strip of corrugated stainless steel, and rigid liners, which are riveted together as they are installed. Both types can be surrounded by insulation in the form of a ceramic fiber blanket or a lightweight cement-like material, subject to the liner manufacturer's instructions.

In fact, the only situation in which insulation is **not** required is if the existing chimney was perfectly built and heat loss from the flue gas is not a concern. Even though insulated liners cost more, most dealers prefer to insulate because of the performance and safety advantages for their customers.

Poured-in-place liners are made of an insulating cement-like material that hardens after installation. The flue passage is created by pumping the material around a former that is removed after the material sets. Poured-in-place liners tend to be costly because of the expensive equipment and training the installers must have, but they can resolve some chimney problems that other liner systems cannot.

What Is Involved in the Installation?

Whatever type of lining system is selected, the first step in installation is a thorough cleaning and inspection of the existing chimney. All creosote deposits must be removed, and any structural problems must be corrected before proceeding. The original clay liners are often removed, especially if they are damaged, and sometimes the top of the chimney needs to be rebuilt. Every chimney is a little different, so your chimney professional can only determine what needs to be done after



The chimney should be cleaned thoroughly before relining.



Installation of the correct top and bottom terminations is critical to performance and safety.

cleaning and inspecting.

After preparing the existing chimney, the new liner is installed according to the manufacturer's instructions, and using only those parts supplied by that manufacturer. Installation can be relatively simple or very difficult, depending on the particular lining system used and the circumstances encountered by the installer.

Should You Attempt to Install Your Own Chimney Liner?

In a word, no. While it might appear simple, correct installation always demands experience, knowledge of the liner product, and special tools and skills. Most new liners should be insulated and, in many existing chimneys, this can mean that the clay tile must be removed to provide space. Even chimney professionals using the right tools find clay liner removal a difficult and sometimes dangerous job. **It is certainly not a job for a handyman.**

Contract with a qualified liner installer. You can identify qualified installers by their credentials. The following agencies provide professional certification that is relevant to chimney relining.

• National Fireplace Institute

<http://nfcertified.org>
(703) 524-8030

• Chimney Safety Institute of America

<http://www.csia.org>
(317) 837-5362

This paper and other useful information can be downloaded from the HPBA web site at www.hpba.org. To order additional copies, call the HPBA at (703) 522-0086

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