

# WHAT'S HAPPENING IN Your Home?

Your home safety analysis



Disintegrating chimney



Cracked flue tile



Unlined chimney

- Condensation leakage**  
The condensation has migrated through the chimney causing staining damage to home interior and chimney exterior
- Chimney structure disintegrating**  
This has been caused by acidic moisture in the flue.
- Improper chimney draft**  
Caused by flues which are not properly sized for the heating appliance.
- Improper clearance**  
There is not enough clearance to the wood framing of the home.
- Cracked or missing flue tiles**  
This can lead to carbon monoxide leakage and a higher risk of a home chimney fire.
- Unlined or damaged chimney structure**  
This can lead to carbon monoxide leakage and a higher risk to the home from a chimney fire.
- Down-drafting or smoking chimney**  
Caused by the unsteady draft of an improperly lined flue.

# FAQ

## Frequently Asked Questions

### Why is my chimney breaking down?

The primary culprit in chimney breakdown is the acidic moisture that comes from condensed flue gases. This acidic moisture attacks the chimney from the inside.

That is why a chimney may look good on the outside, but the inside can be a totally different story! Years of normal use with hot and cold cycles and seasonal weather conditions all take their toll on a chimney.

### Where does the moisture come from?

Did you know that for every cubic foot of gas burned, two cubic feet of water vapor is created? That is a lot of water! How can this water vapor affect your chimney?

Water vapor always travels up your chimney - it is only when flue gases drop to 120°F that condensation begins. *When water vapor condenses, "rain clouds" form and it literally rains in your chimney!* Countless drops of acidic moisture soak the flue.

This is more of a problem now than it was in the past due to modern, high-efficiency furnaces. High-efficiency furnaces, as their name indicates, extract more heat from a given amount of fuel than conventional furnaces, and less heat is lost up the chimney.

However, since less heat is sent up the chimney, the temperature in the flue is often below 120°F. The acidic "rain" happens frequently, and the flue seldom has a chance to dry out. Herein lies the side effect of high-efficiency furnaces: excessive acidic moisture in the flue. In turn, this acidic moisture wreaks havoc on terra-cotta flues and masonry.

### What is the big deal with a few cracked flues?

It happens thousands of times each year. Damaged chimneys equal disaster. Carbon monoxide quietly leaks unobserved through cracks in the flue lining and into the home. Even small amounts can make you and your family sick. The risk of a chimney fire turning into a house fire is another serious risk. There are two ways that a chimney fire can ignite your home:

1) A chimney fire is like a huge torch, and the flames can escape through cracks in the flue tile and then through cracked mortar in the surrounding brick, and directly set your house on fire.

2) Chimney fires can rage at temperatures upwards of 2000 degrees. This extreme heat can bring structural materials surrounding the chimney to a flash point, and just by heat alone, can ignite materials in your house.

A few cracked flue tiles is serious business!



Damaged flue: Notice the moisture and the missing piece of flue tile.

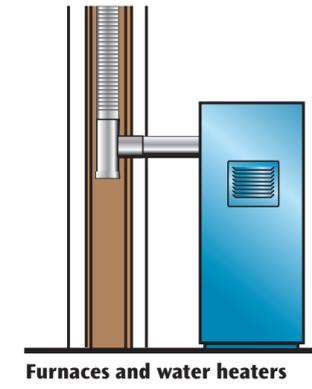


This crack may be small, but it could open as wide as 1/4 inch when the flue is overheated.

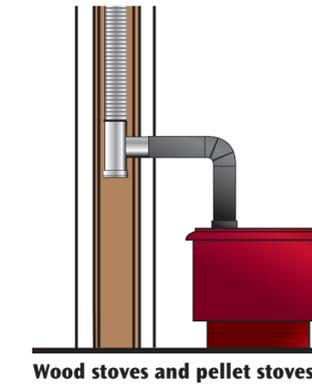


A crack like this can allow deadly gases to leak into the home, and can open the way for a chimney fire to turn into a house fire

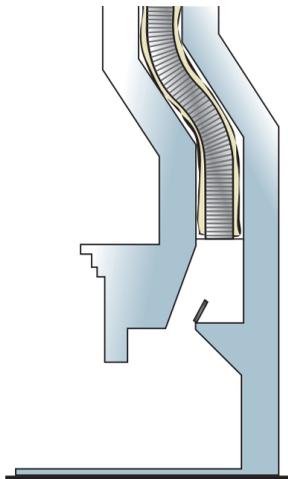
The *Armor Flex™* & *Hybrid™* relining systems are the solution for every chimney.



Furnaces and water heaters

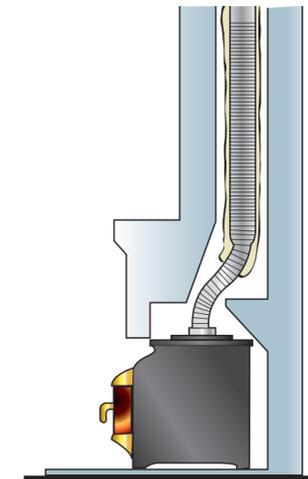


Wood stoves and pellet stoves



Fireplaces

Armor Flex™ & Hybrid™ liners are highly flexible pipes that can fit around the twists and turns of masonry chimneys.



Fireplace inserts

Armor Flex™ & Hybrid™ liners can be custom shaped to fit through tight damper spaces that exist in fireplace inserts. Wood and coal installations require insulation.



There is always at least

# One Good Reason

to do something about  
chimney safety.



# The Problem: dangerous chimneys



This chimney may look fine on the outside, but what about the inside?

## Home Safety

Your chimney has a big responsibility. It carries toxic gas out of your home, and while doing its job, it must withstand constant attack by acid, creosote and extreme temperatures for years on end.

These conditions cause chimney damage and deterioration, and when that happens, your family's safety is in question. The risks of carbon monoxide poisoning and house fires become very real.

## Outside vs. Inside

Look at the picture on the left. Most people would not see anything wrong with this chimney.

But there is more to the story. On the inside, the chimney could be seriously damaged, and not be up to safety regulations.

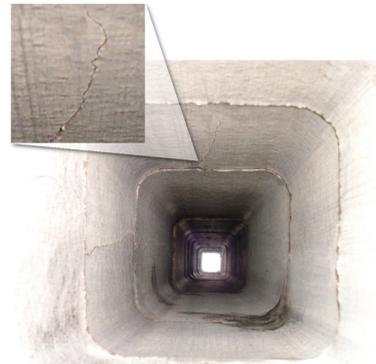
## Old vs. New

Old-fashioned chimneys were not designed to vent modern heating appliances

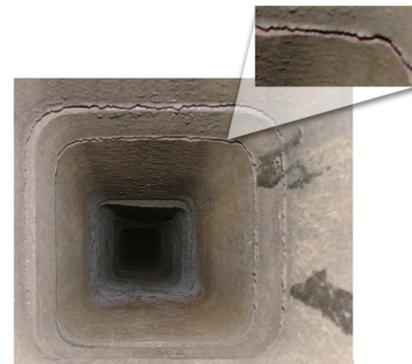
Besides, no chimney lasts forever.



Read more to find out about what is going on in your chimney.



Furnace Flue



Fireplace Flue

Because of the hostile environment, the inside of both flues of this chimney have deteriorated. Notice the cracked flue tiles (left) and the deteriorated joints and/or misaligned flues (right). According to code, both flues should be relined.

## The Fireplace's Flue

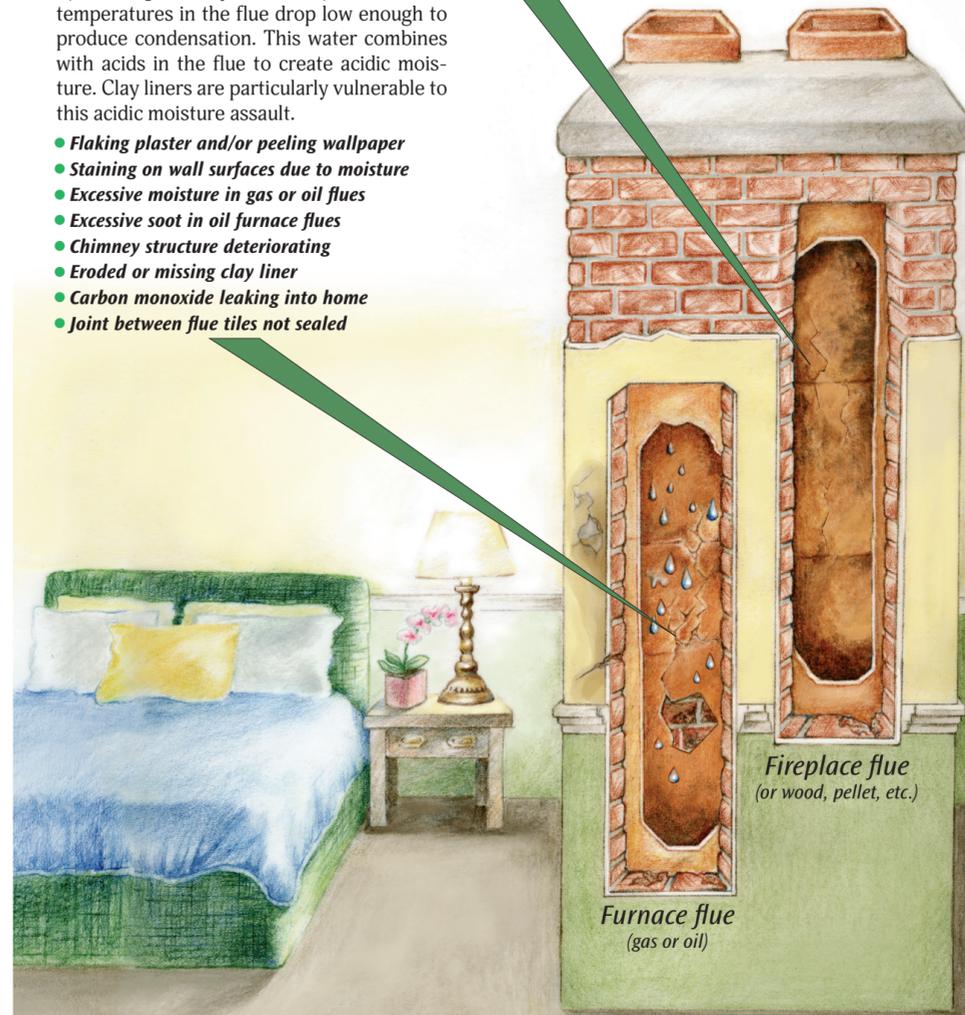
This flue is servicing a fireplace, wood stove, pellet stove or other solid fuel appliance. It may have undergone a chimney fire, or have been connected to an improperly vented appliance, mis-used wood stove, or exposed to excessive moisture. A damaged flue brings the dangers of fire and carbon monoxide poisoning.

- Cracked or missing tiles
- Eroded brick and mortar
- Excessive or glazed creosote.
- Joint between flue tiles not sealed
- Flue tiles not aligned properly
- Improper chimney draft

## The Furnace's Flue

High-efficiency furnaces do not waste energy by sending heat up a chimney. As a result, temperatures in the flue drop low enough to produce condensation. This water combines with acids in the flue to create acidic moisture. Clay liners are particularly vulnerable to this acidic moisture assault.

- Flaking plaster and/or peeling wallpaper
- Staining on wall surfaces due to moisture
- Excessive moisture in gas or oil flues
- Excessive soot in oil furnace flues
- Chimney structure deteriorating
- Eroded or missing clay liner
- Carbon monoxide leaking into home
- Joint between flue tiles not sealed



(For demonstration purposes, illustrations show most possible symptoms of a damaged chimney. Your chimney may not have every symptom, and still need attention.)

## Chimney Fires

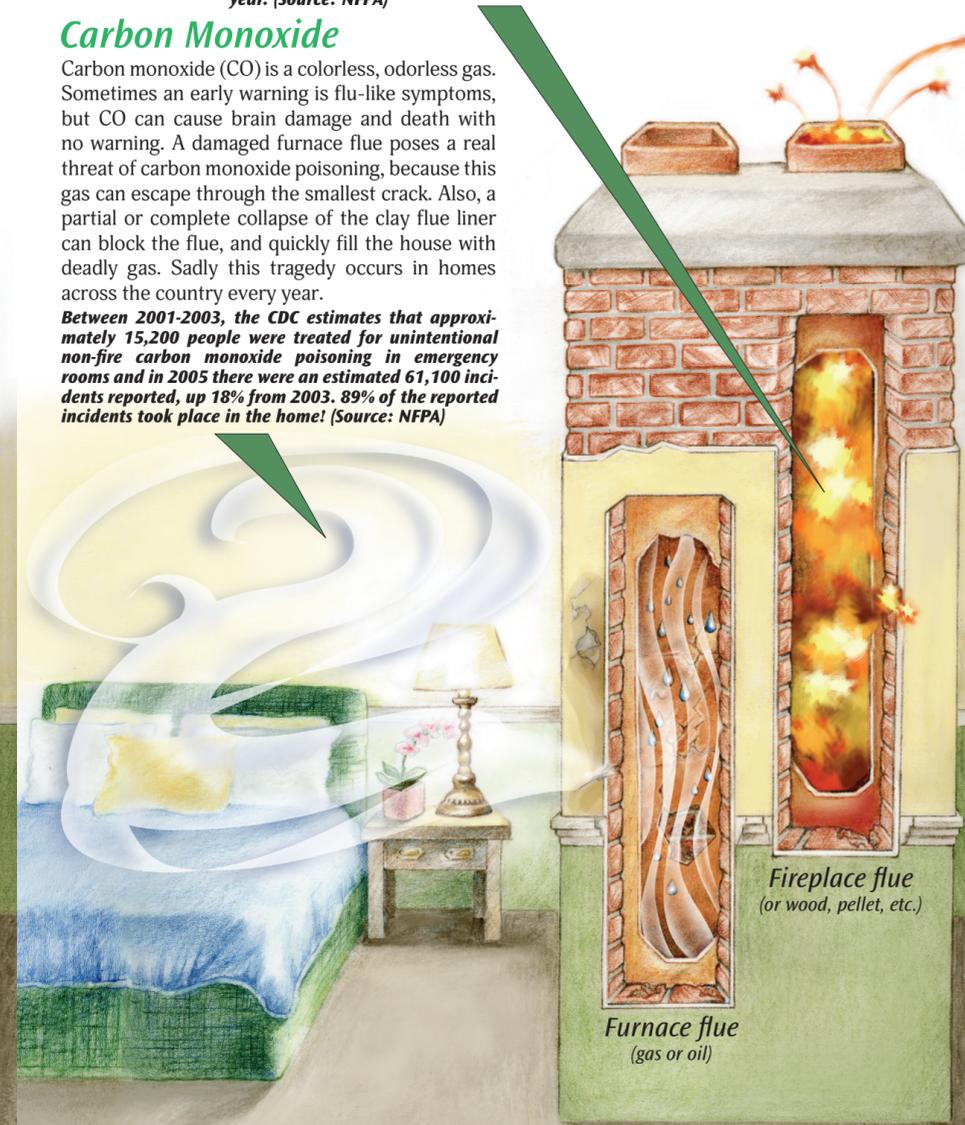
Chimney fires happen when creosote builds up in the flue and ignites. These fires can rage at temperatures up to 2000 degrees and roar just inches away from your home. The intense heat alone can bring surrounding materials to the flash point, and ignite your home. Also, sparks from the fire can find their way through small cracks in the liner and quickly turn a chimney fire into a house fire.

**Creosote is estimated to be involved in 14,720 (or 22%) home heating fires per year, and it is estimated to result in 4 deaths, 24 injuries and \$33 million in property damage per year. (Source: NFPA)**

## Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas. Sometimes an early warning is flu-like symptoms, but CO can cause brain damage and death with no warning. A damaged furnace flue poses a real threat of carbon monoxide poisoning, because this gas can escape through the smallest crack. Also, a partial or complete collapse of the clay flue liner can block the flue, and quickly fill the house with deadly gas. Sadly this tragedy occurs in homes across the country every year.

**Between 2001-2003, the CDC estimates that approximately 15,200 people were treated for unintentional non-fire carbon monoxide poisoning in emergency rooms and in 2005 there were an estimated 61,100 incidents reported, up 18% from 2003. 89% of the reported incidents took place in the home! (Source: NFPA)**



# The Armor Flex™ and/or Hybrid™ Solution

Armor Flex™ & Hybrid™ are All-Fuel liners that are the ideal choice, especially when it comes to handling heavy creosote situations. These are manufactured from a stainless steel alloy that is designed with a tight, corrugated seam that minimizes creosote build up. Its heavy durable structure withstands the effects of repeated cleanings. Armor Flex™ & Hybrid™ are the ultimate in heavy flex liners.

Armor Flex™ & Hybrid™ chimney liners are an excellent solution to the problems that plague most chimneys. Modern stainless steel walls provide an airtight and watertight barrier that seals in gases and creosote.

The Armor Flex™ & Hybrid™ liners are made of 100% 304L or 316L stainless steel. High quality stainless steel is an alloy made to withstand the acidic moisture and extreme temperature fluctuations inside your chimney. Armor Flex™ & Hybrid™ liners will even contain a chimney fire!

Underwriters Laboratories (UL) tested Armor Flex™ & Hybrid™, and has awarded its seal of approval. UL has declared that the Armor Flex™ & Hybrid™ systems exceed standards for chimney safety and can even withstand a 2100 degree chimney fire and still maintain structural integrity.

Armor Flex™ & Hybrid™ liners carry the exclusive Forever Warranty™, the first warranty in the business that is transferable to the next homeowner. No fine print in *this* warranty, just peace of mind.

(Certain installations require the use of insulation. Consult your professional to determine if your installation requires that the liner be insulated.)

