



Avoiding A Chimney Fire

By: Greg R. Wayman, Certified Real Estate Inspector

Ever crawl inside a fireplace and look up past the damper? Or climb up on your roof and look down the flue? There are some telltale signs that are easily identifiable that indicate you should hire a professional chimney sweep. For instance, if opening the damper leaves your face covered in soot, if you can run your pinky finger through the mortar and it falls out like sand, if you can pull bricks out above the roofline and re-align them like Lego® blocks, if you have charred wood in the attic touching the chimney...all of these are serious issues. Don't laugh. As dangerous as these signs are, home inspectors see these issues too regularly.

In 1998, there were 18,300 residential fires in the United States originating in chimneys, fireplaces and solid fuel appliances, according to the United States Consumer Product Safety Commission. These fires resulted in 160 personal injuries, 40 deaths and \$158.2 million in property damage.

Chimneys exist to contain caustic flue gases and exhaust them onward and upward into the atmosphere. The condition of the firebox, smoke chamber, and flue are crucial to ensuring a safe home. Below are a few indicators that you have a problem and need to hire a professional:

Unlined Chimney

The National Bureau of Standards tested masonry chimneys in the 1940's and again in the 1980's. They concluded that unlined chimneys are extremely unsafe due to the fact that they allow heat to travel through brick very fast. Wood touching the unlined chimney caught fire within only 3 ½ hours of testing. Because of these eye-opening results, they abandoned any future testing on unlined chimneys and recommended that all chimneys be lined.

Missing/Cracked Chimney Cap

If rain or snow can penetrate into the flue, then the liner is subject to extreme changes in temperature. Picture the high heat of the lined walls from the flue gases mixing with cold rain or snow entering from above. The end results are poor drafting that cools down the flue gases too quickly, significant amounts of creosote build-up, acidic flue gases eating away the mortar holding the inside of the liner together, and cracking of clay or concrete and rusting of metal. Exposed over multiple extreme changes, the chimney flue is guaranteed to fail leading to a chimney fire.

Cracked Tiles

As viewed from the rooftop or from the firebox, any signs of cracked tiles indicate the chimney system has a breach. Cracked tiles are a result of extreme temperature changes, usually stemming from one of two sources: the chimney cap issue mentioned above or there was a previous chimney fire that luckily did not burn your house down. Note: chimney sweeps have hi-tech cameras they run the full-length of your flue that can view every inch of the inside.

Missing/Deteriorated Mortar

(Pertaining to brick and concrete block chimneys with clay liners) A clay liner is only as good as its mortar joints. There are three areas to look for this problem: the roof, the smoke chamber (above your firebox), & the attic. If mortar joints are missing or the mortar is deteriorated, then you know you have a serious fire hazard. In the smoke chamber, if a mortar joint is missing, then the wall running parallel to your chimney may be the preferred path of your flue gases. Likewise, the same logic can apply to any missing or deteriorated mortar all the way to the top. My favorite area to check is the section of chimney visible in the attic. This is usually about the height where the flue gases swirl & churn if there is poor drafting or extreme changes in temperature. When flue gases linger, they eat away at the liner and mortar. If the symptoms are bad enough, you will actually be able to slide a screwdriver or

sometimes even your finger through the mortar. You will also see blackish/brown creosote residue that has leached through the mortar and run down the outside of the chimney. All of which are fires waiting to happen! The solution on many of these significantly deteriorated flue liners is to install a metal liner inside the clay liner.

Creosote Build-up

Creosote ignites at 451 degrees F. Wood stoves, wood or gas fireplaces, or gas log sets should burn efficiently between 250 – 500 degrees F. A hot fire around 900 degrees F or a small spark from any of the above could ignite the built-up creosote and turn your chimney into a blazing inferno. Chimney fires with heavy creosote build-up can easily reach temperatures in excess of 2,000 degrees F. Fires at this extreme crack liners and easily engulf your home into uncontrollable flames.

Rotted Wood Touching The Chimney

The more times wood is heated, the lower its ignition temperature becomes. Add to that moisture from a roof leak usually due to inadequate flashing at the chimney or high humidity levels in the attic due to poor ventilation and rotted wood drops the ignition temperature even faster. With the right combination, the ignition temperature of wood touching a chimney can be lower than that of a piece of paper!

Previous Chimney Fires in Stainless Steel Liners

Not all chimney fires are noticed. Some burn themselves out, but the damage left behind is something you can't ignore. Chimney fires inside metal liners heat the metal up to temperatures the metal was not designed to handle. Once those temperatures are reached one time, the entire UL listed metal flue liner is breached. Solution: replace the entire flue lining! The one true test if a fire has occurred in a stainless steel flue liner is if a magnet sticks to it. Stainless steel does not attract magnets. Stainless steel that has reached extreme temperatures and has had its metal composition changed does attract.

Professional home inspectors look for these issues with chimneys everyday. However, even the best inspector will admit that their knowledge on chimneys is limiting compared to that of a Certified Chimney Sweep. For more information, visit Chimney Safety Institute of America's website at www.csia.org or The National Chimney Sweep Guild's website at www.ncsg.org.

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