

Adjustable Hood.



Photo courtesy of Clear Skies Unlimited

# History Lesson: The Masonry Fireplace

The masonry fireplace has been the backdrop for holiday celebrations, weddings and romantic winter evenings. However, that could change as events unfold that could put an end to the wood burning masonry fireplace as we know it.

# AS

**THE SAYING GOES, "IN THE BEGINNING, THERE WAS FIRE," AND FOR THE NEXT FIVE THOUSAND YEARS,** the wood fire became a central theme of family life. The ancient fire pit began as a simple hole in the ground, where the tribe would gather around a wood burning fire in the evening. As mankind became a little more inventive, the fire pit was reinforced with mud and rock. Then, ancient man moved indoors and more elaborate wood burning designs were developed. Indoor air quality became an issue, so a hole in the roof was added to allow the wood smoke to properly vent to the outdoors. This was man's first attempt at fireplace venting and indoor air quality.

BY DAVE KELLY



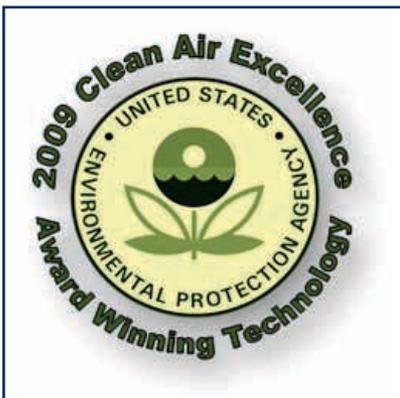
Fireplace Cover.

It wasn't until 1678, when Prince Rupert installed an elevated grate in his fireplace, that the airflow and venting system of the fireplace was dramatically improved. In 1795, Count Rumford established proper construction techniques and dimensions for masonry fireplaces. The Rumford Fireplace design is still the basic foundation for the modern masonry fireplace. During the next 200 years, tens of millions of masonry fireplaces were constructed across this country.

The wood burning masonry fireplace has a long and storied history. In the 1930s, millions of Americans gathered around their crackling fireplaces to listen to President Roosevelt and his famous "Fireside Chats." Over the years, the masonry fireplace has been the backdrop for holiday celebrations, weddings and romantic winter evenings. However, things are about to change. More history is currently unfolding that could literally put an end to the wood burning masonry fireplace as we know it.

According to U.S. Environmental Protection Agency (EPA), wood smoke emissions currently are one of the most significant health risks in the United States. While stricter regulatory standards for wood burning fireplaces have helped to reduce particulate emissions, 20 million unregulated wood burning masonry fireplaces still exist that continue to pollute the air we breathe. According to the EPA, these 20 million fireplaces are producing thousands of tons of deadly particulates annually.

Unfortunately, unlike hundred-foot-high industrial smoke stacks, wood burning fireplace emissions are released at elevations about 15 feet above local

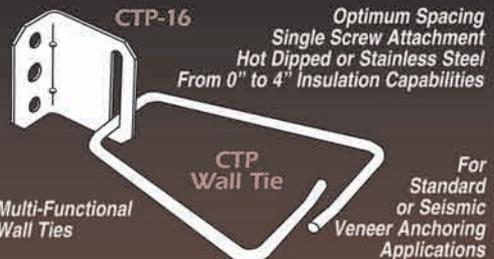


# INNOVATIVE MASONRY ANCHORING SOLUTIONS

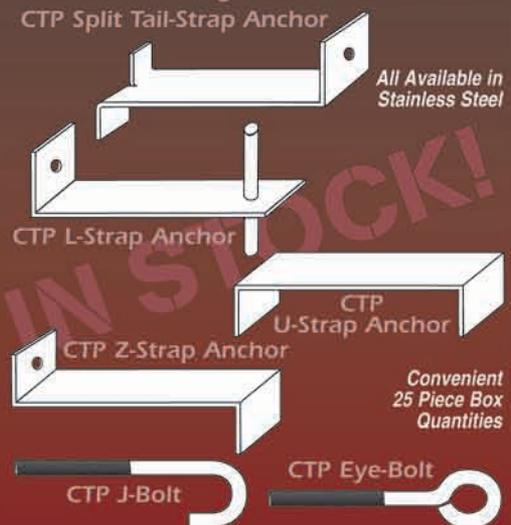
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area ground levels, which makes avoiding exposing local residents to the hazardous pollutants in wood smoke difficult.

Harmful wood smoke leaving the firebox through the chimney system doesn't mean that your lungs are safe. Studies reveal that most homes in North America exchange inside and outside air at least once every several hours, providing a pathway for what's in the air outside to get inside, con-



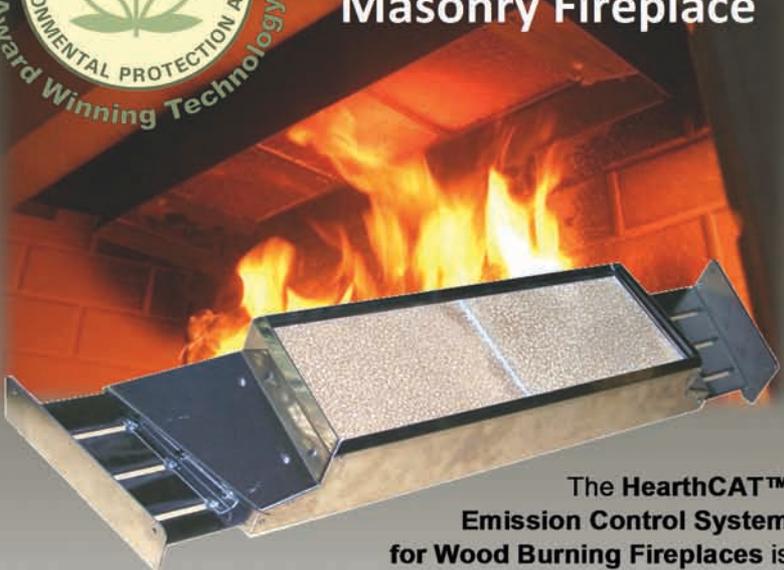
HearthCAT Installed in Isokern Fireplace.



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## Low Emissions Masonry Fireplace



The **HearthCAT™**  
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a revolutionary catalytic technology that reduces wood smoke pollution up to 90%. The **HearthCAT™** was recently awarded the prestigious Clean Air Excellence Award by the US Environmental Protection Agency (US EPA).

The **HearthCAT™** is now available for masonry fireplace new construction and wood burning fireplace retro-fit programs nationwide. The technology can be completely installed in less than an hour, doesn't require any power or maintenance and is affordable to the masonry contractor and the homeowner. Contact **Whitacre Greer** for information about the **HearthCAT™**.

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taminating indoor air quality with harmful particulates, carbon monoxide and Volatile Organic Compounds (VOCs).

Restricting the use and even banning the open-hearth wood burning fireplace is viewed by air quality regulators as a quick fix for air pollution nationwide. To address the wood burning fireplace problem, the EPA is revising the Federal New Source Performance Standard (NSPS) to include wood burning fireplaces. The Federal Clean Air Act requires the EPA to establish federal emission standards for source categories, like wood burning fireplaces, which cause or contribute significantly to air pollution. These standards are intended to promote the use of the Best Available Control Technology (BACT), weighing the cost of the technology against the projected air quality, health and environmental improvements derived from the technology.

The EPA has created a test and certification program for every type of appliance that burns wood, including wood stoves, wood boilers and, of course, wood burning fireplaces. The ASTM and EPA, working with the Hearth Patio and Barbecue Association, established a Performance Specification for wood burning fireplaces. ASTM E-2558 has been accepted as the industry standard for particulate emissions testing of wood burning fireplaces.

It is expected that by 2012, all wood burning fireplaces will be required to meet the new NSPS projected @ 5.1 grams of particulates for each kilogram of wood burned (g/kg) or even lower. If this plan is implemented by the EPA and a fireplace doesn't meet this new standard, it legally can't be installed or operated. Mason contractors across the country should be paying close attention.

EPA readily admits that, although there are technological solutions for most wood

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Using a caulk gun, the mortar is applied in strips no greater than 1/8-inch, with multiple 1/8-inch layers for larger joints as needed. Once dry, stoke a low fire, up to 212 degrees Fahrenheit, for one to four hours to assure adequate drying and set time. Once the product is dry, stoke the firebox temperature to 500 degrees Fahrenheit for an additional one to four hours before routine usage.

QUIKRETE Fireplace Mortar, sold in 10-ounce tubes, retails for about \$5. For more information, visit [www.quikrete.com](http://www.quikrete.com).



fired appliances, including low mass fireplaces (factory built), a technological solution for wood burning masonry fireplaces hasn't been created to meet the projected Phase 2 emissions limit of the EPA New Source Performance Standard, until now.

### Addressing the challenge

CLEAR SKIES UNLIMITED began working on a solution to the problem of wood burning fireplace pollution more than 10 years ago. Knowing that the EPA would eventually regulate wood burning fireplaces nationwide, the company began a research-and-development effort that involved years of emissions testing on every conceivable fireplace type, design and configuration, with special emphasis on the open-hearth masonry fireplace.

The goal was to design, develop and test a totally passive emission control device for wood burning fireplaces that was easily installed, affordable to the consumer and acceptable to the EPA for wood burning fireplace retro-fit installations across the United States. The goal was accomplished and all expectations exceeded with the development of the HearthCAT Fireplace Technology.

The HearthCAT Emission Control Technology is a patented catalytic system designed especially for wood burning fireplaces. It is positioned directly above the fireplace grate and mechanically attached to the walls of the firebox. The HearthCAT Hood captures the smoke and particulates, while most of the dilution air bypasses the hood and travels up the primary flue system. The HearthCAT System provides secondary ignition for the combustibles before they leave the firebox as harmful pollution. The direct flame on the catalytic surface actually cleans the catalytic system. This is the only passive technology available for reducing wood burning fireplace emissions. No gas or power is required, and there are no moving parts.

For four consecutive years, *Hearth & Home* Magazine had issued the Vesta Challenge to hearth product manufacturers for the creation of a low-emission, wood burning fireplace retrofit technology. For the first three years, the challenge was not met. Again in 2009, *Hearth & Home* challenged the hearth industry to develop a retro-fit technology that would dramatically reduce particulate emissions in wood-burning fireplaces without creating any smoke spillage or adversely affecting indoor air quality. In March 2009, Clear Skies Unlimited met the Vesta Challenge with their HearthCAT Fireplace Technology. The technology was unanimously voted as the winner of the Vesta Challenge, and Clear Skies was presented with the Vesta Challenge Award by Gil Wood from the EPA.



Hood with Handle.

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In May 2010, the EPA officially recognized Clear Skies Unlimited at its annual EPA Clean Air Excellence Awards Ceremony in Washington, D.C., by awarding its 2009 Clean Air Excellence Award for dedication to excellence in achieving clean air through new technology development. Clear Skies won the award based on the projected impact that the revolutionary HearthCAT Wood Burning Fireplace Emission Control Technology would have on future wood burning fireplace emissions nationwide.

Clear Skies Unlimited Inc. is a New Mexico small business, specializing in innovative catalytic solutions for the most challenging air quality problems. The Clear Skies wood burning fireplace technology reduces particulate emissions in wood burning fireplaces by as much as 90 percent. The HearthCAT System has reduced PM2.5 in Isokern Modular Masonry Fireplaces to 2.9 g/kg, well below the EPA fireplace program Phase 2 emissions level of 5.1 g/kg.

The HearthCAT-equipped Isokern Fireplaces are the only clean-burning masonry fireplaces currently qualified under the



Craig Sparling and Lance Grace of Clear Skies with Gina McCarthy of the EPA.

EPA Fireplace Program. The HearthCAT also has been successfully tested and qualified in FMI factory-built fireplaces. The HearthCAT-equipped FMI Craftsman 36 is the most affordable of any of the EPA Phase II Qualified Wood Burning Fireplaces, and the HearthCAT™-equipped FMI Georgian 50 is the “World’s Cleanest Burning 50” fireplace.

HearthCAT technology is thought to have unlimited potential, since it can be used in new construction or fireplace retro-fits, and in both open-hearth masonry and low-mass fireplaces. The HearthCAT is now approved for installation across the country, including most of the major air districts in California.

Clear Skies is distributing the HearthCAT System for masonry fireplace construction through the Whitacre Greer Co. in Alliance, Ohio. The masonry fireplace industry should be making plans now to address the regulations proposed by the EPA, before the masonry fireplace literally becomes a thing of the past. **IMAS**

*Dave Kelly is VP of sales and marketing with Clear Skies Unlimited.*

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