

INSTALLING A STOVECAT RETRO-FIT CATALYST IN AN EXISTING WOOD STOVE

- 1) There are only two catalyst supports used for eliminating wood smoke pollution: (1) the honeycomb structure or (2) the reticulated structure from Healthy Hearth.
- 2) Generally, when starting a cold catalytic wood stove with a honeycomb catalyst, the catalyst is disengaged from the gas stream by pulling on a steel rod. A green light will indicate when the stove gases are above 600F. The catalyst can then be engaged by pushing in the rod. The StoveCAT retro-fit catalyst does not require this same intervention by the homeowner.
- 3) Ceramic or metal honeycomb catalytic components are coated with platinum and/or palladium and/or rhodium. The StoveCAT retro-fit catalyst is treated with a proprietary Platinum Catalyst that will fire below 400F. A honeycomb catalyst must reach a temperature of at least 500°F before it "lights off"!
- 4) The StoveCAT retro-fit catalyst can reduce the ignition temperature of carbon monoxide and hydrocarbons from upward of 1300°F to the 500-700°F range.
- 5) Once the smoke passing through the catalyst reaches that threshold, it will oxidize as long as the combustibles in it are well mixed with a sufficient supply of air / oxygen.
 - a) Oxygen is required in the flue gas in order to maintain catalytic activity.
 - b) Atmospheric oxygen at seal level is approx. 20%.
 - c) The average oxygen content in the flue system of a wood burning stove operated at sea level is approx. 12-15%
 - d) The StoveCAT retro-fit catalyst requires approx. 10-12% oxygen content for efficient operation. 15% is better but the catalyst will fire at 10-12% oxygen content.
 - e) It has been demonstrated that modified provisions for secondary air aren't generally required. Under most burn conditions, there is an adequate oxygen supply remaining in the flue gas to maintain efficient operation of the StoveCAT retro-fit catalyst. In some applications, however, the homeowner should experiment with the air controls on the wood stove to fine-tune the catalytic operation . Each StoveCAT retro-fit catalytic device is equipped with a thermometer to monitor catalytic temperatures.
 - f) With the air control set to a lower position, the StoveCAT retro-fit catalyst can burn slowly and efficiently for up to 24 hours. This long, slow, burn means you're getting the most heat out of each piece of wood. The fire visible through the front window is the result of primary and secondary combustion at work.
 - i. Primary combustion comes from natural burning of the solid wood fuel. This process is usually very inefficient in the closed combustion chamber of the wood burning appliance.
 - ii. Secondary combustion occurs when combustion air is added to the firebox through the air controls. The air controls can be manipulated to manage the performance of the StoveCAT retro-fit catalyst.
 - iii. Tertiary combustion takes place in the catalyst where most of the remaining pollutants (PM, CO, VOC's and PAH) are incinerated before going up the chimney.
- 6) Hotter combustion air (both primary and secondary) means better performance. Well heated primary air encourages efficient primary combustion but added combustion air (secondary air) is vital to maintaining ignition temperature at the catalyst especially during a low burn cycle.
- 7) After it is "lit," the The StoveCAT retro-fit catalyst will produce enough heat to maintain ignition, even though the temperature of the "wood gas" in the flue may drop below 400°F.
- 8) In wood heaters with a honeycomb catalyst, a baffle arrangement is required, diverting flame, residues and fly ash. The StoveCAT retro-fit catalyst does not require a baffle. It will perform in direct flame.
- 9) A bypass valve is mandatory with the use of a honeycomb catalyst. The honeycomb can restrict the natural draft of the stove, particularly when the catalyst isn't lit. For that reason, there must be a valve that allows you to shunt smoke around the catalyst while a new fire gets going and whenever the stove's doors are opened. The design StoveCAT retro-fit device negates the need for a bypass.
- 10) Materials such as wood pellets, wood fuel with more than 20% moisture content, tires, plastics, and treated or painted lumber Should not be burned when StoveCAT retro-fit catalyst is installed.
- 11) More Information is available @ www.healthyhearth.net or email to cleanfireplaces@yahoo.com