

Healthy Hearth LLC

Comments from the Manufacturer of the StoveCAT ECD:

The emissions testing conducted by Omni Test of the StoveCAT Emission Control Device concluded that a Non-EPA Certified wood heater retrofitted with a StoveCAT ECD, would burn much cleaner with PM and PAH reductions of 80%, VOC reductions of 74% and CO emission reductions over 60%. However, even with very high percentage reductions in criteria pollutants, the final PM emissions with the StoveCAT installed were higher than the current EPA standard of 4.5 g/hr.

However, there were so many exceptions taken to the standards governing the test environment that the final numbers were much higher than they would have been had the Method 28 and 5G Standards been followed. Some notable exceptions to the Method 28 and 5G Standards are as follows:

- Due to the nature of the stoves used in the test, which have poor heat transfer efficiency, stack gas temperatures were much higher than those typically encountered during 5G-3 testing. As a result of these high stack temperatures, the dilution tunnel flow rate needed to be increased in order to keep tunnel temperatures and filter temperatures manageable.
- Equation 5G-4, emissions adjustment factor was not used. All emissions rates reported are the raw unadjusted values. *The adjustment factor changes emission values in a non-linear manner, which would have the effect of distorting the results of any emission reduction evaluations.*
- Fuel moisture requirements specified in section 7.1.2 were ignored as required by the test plan to perform tests with higher moisture fuel
- Test fuel loading densities were not strictly adhered to as specified in section 8.8.4. All fuel loads were identical with respect to the number and mix of 2x4s and 4x4s, as well as test fuel length. These parameters were established using test loads in the moisture range specified in section 7.1.2. The majority of the higher moisture tests loads were well over the specified loading density, as **they contained as much as an extra 3 lbs. of water** when compared to a fuel load in the proper moisture range.
- Sampling was not done isokinetically in accordance with 6.6.1. This test method is written for tests done on stacks that have flow rates which are more or less constant for the duration of the test. For a batch load process such as a wood stove, flow rates are too variable from test to test and minute to minute to maintain isokinetic flow. Instead of using a hooked nozzle, the sample was withdrawn from the stack from a probe at 90 degrees the flow of stack gases, to negate any effects of stagnation, and the sample rate was kept constant throughout the test run.

Conclusion: The fact that the wood moisture content for most of this testing was artificially increased to the 30-40% range by soaking the dimensional lumber fuel cribs in water for 48 hours prior to testing caused some problems for the catalytic StoveCAT. Due to the high moisture content, the data for g/kg of PM was essentially double the 5G standard of AP-42 value of 15.3 g/kg (5H equivalent), which corresponds to roughly 12.3 g/kg (5G equivalent).