



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF  
AIR QUALITY PLANNING  
AND STANDARDS

Mr. Daryl Lamppa  
Lamppa Manufacturing, Inc.  
512 S. 3<sup>rd</sup> Street  
Tower, MN 55790

Dear Mr. Lamppa:

We are writing in response to your letter dated July 24, 2017, in which you have requested an alternative test method to use in demonstrating that your Vapor-Fire 100 wood-fired furnace can meet federal standards for wood-fired forced-air furnaces. In your request, you state that your Vapor-Fire 100 furnace is subject to 40 CFR part 60, Subpart QQQQ, Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces (Subpart QQQQ). The Measurement Technology Group in the Office of Air Quality Planning and Standards, as the delegated authority, must make the determination on any major alternatives to test methods and procedures required under 40 CFR parts 59, 60, 61, 63, and 65.

In particular, you seek to demonstrate that the Vapor-Fire 100 forced-air furnace complies with the 2020, Step 2 emission limit for particulate matter of 0.15 pounds per million Btu (lb/MMBtu) heat output per individual burn rate as set forth in section 60.5474(b)(6) of Subpart QQQQ. To conduct this demonstration, Subpart QQQQ requires use of Canadian Standards Association (CSA) Method B415.1-10 to measure the heat output and particulate matter emission rate using the four burn rate categories ( $\leq 15$  percent, 16-24 percent, 25-50 percent, and Rated Heat Output) specified in EPA Method 28 WHH (40 CFR part 60, Appendix A) as stated in section 60.5476(e) of Subpart QQQQ.

You explain that because of the design of the Vapor-Fire 100 furnace, it cannot, due to its computerized draft controls, be operated at the  $\leq 15$  percent burn rate required by Subpart QQQQ and Method 28 WHH. You have submitted data to the agency showing that the low setting on your Vapor-Fire 100 resulted in burn rates of 11,181 and 9,332 Btu/hr heat output, which is approximately 27-32 percent of the estimated maximum burn rate of 35,000 Btu/hr. In addition, you note that the Vapor-Fire 100 has a feature that constrains the minimum draft, which does not allow for demonstration of a "stopped combustion condition" as specified by CSA Method 415.1-10 for the case when a furnace cannot meet the  $\leq 15$  percent burn rate.

Because the Vapor-Fire 100 furnace (1) cannot operate at a burn rate less than 15 percent and (2) does not allow for demonstration of a "stopped combustion condition," you are requesting approval of an alternative test method that would allow use of the four actual heat output (burn) rate categories presented in section 7.2.1 in CSA Method B415.1-10 ( $< 35$  percent of the maximum heat output, between 35 percent and 53 percent of the maximum heat output, between

53 percent and 76 percent of the maximum heat output, and 100 percent of the maximum heat output) as an alternative to the burn rates categories required under Subpart QQQQ. Section 7.2.1.1 of CSA Method B415.1-10 states that these burn rate categories are designed for furnaces with thermostatic or heat demand controls.

We have reviewed the alternative testing procedures you have proposed for use in certifying your Vapor-Fire 100 furnace as well as the applicable testing requirements of Subpart QQQQ. With this letter, we approve your proposed alternative testing procedure to demonstrate compliance for the Vapor-Fire 100 wood-fired forced-air furnace manufactured by Lamppa Manufacturing in Tower, MN, based on the following considerations:

- The Vapor-Fire 100 forced-air furnace design does not allow operation at a burn rate less than 15 percent.
- The Vapor-Fire 100 forced-air furnace design has a feature that constrains the minimum draft which in turn does not allow for demonstration of a "stopped combustion condition" as per section 7.1.4.3 of CSA Method B415.1-10.
- The Vapor-Fire 100 forced-air furnace design incorporates a low setting on its controller which is the lowest heat output (Btu/hr) setting available to the user and corresponds to the lowest burn rate to be evaluated during certification testing; this is consistent with 40 CFR part 60, Subpart QQQQ, section 60.5476, which states "*The burn rate for the low burn category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.*"

This approval is predicated on the caveats listed below:

- You must utilize this alternative test method for compliance testing of the Vapor-Fire 100 wood-fired forced-air furnace until such time as you receive approval from the EPA Administrator's delegated authority to use another test method.
- This alternative test method is specific to the Vapor-Fire 100 model and may not be used for any other model forced-air furnace without prior approval by this office.
- This alternate test method does not provide you relief from the requirements of section 60.5476 other than the burn rate category requirements of section 60.5476(e).
- A copy of this approval letter must be included in the report for each testing program where this alternative test method is applied.

If you should have any questions or require further information regarding this approval, you may contact Robin Segall of my staff at 919-541-0893 or [segall.rob@epa.gov](mailto:segall.rob@epa.gov).

Sincerely,



Steffan M. Johnson, Group Leader  
Measurement Technology Group