UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

APR 13 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Guillaume Thibodeau-Fortin, Eng.
Mechanical Engineer
Stove Builder International Inc.
250, rue De Copenhague
Saint-Augustine-de-Desmaures
Qc G3A 2H3

Dear Mr. Thibodeau,

I am writing in response to your March 21, 2018 letter regarding wood heaters manufactured by Stove Builder International Inc. (SBI). You are requesting to use an alternative test method, using cord wood, as referenced in Section 60.534 (a)(ii) of 40 CFR Part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020 must not discharge into the atmosphere any gases that contain particulate matter in excess of a weighted average of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator and the procedures in Section 60.534 of Subpart AAA. You request to use the procedures and specifications found in the ASTM 3053-17 cord wood test method titled "Standard Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel" in conjunction with ASTM E2515-11 and CSA-B415.1-10.

Stove Builder International Inc. would like to use ASTM E3053-17 to certify your 3.4 Series model line, a room heater covered by Subpart AAA. This room heater has an extra-large firebox volume ($3ft^2$), and you state you have run into a technical issue trying to meet the requirement of the low fire test run. Section 8.6.12 of ASTM E3053-17 states:

> "The test run is complete when the scale indicates the remaining weight of the test fuel load is 0.0 lb (0.00 kg) or less for 30 seconds OR if at least 90% of the test fuel load weight has been consumed and there is no measurable weight loss (<0.1 lb (0.5 kg) or 1.0% of the test fuel load weight, whichever is greater) for at least 30 minutes"

You state you have attempted several approaches to make your heater burn at a rate faster than 1.0% of the test fuel load for 30 minutes at the end of the combustion cycle, and you have not been successful. With 36 pounds of test fuel inside the unit, 1.0% equals 0.36 pounds. This clearly is a measurable weight loss. The platform scale that you use has a sensitivity below 0.1 lb.

You state that when your heater starts to burn at a rate that is below 1.0% of the test fuel load for 30 minutes, you need to stop the test. When you stop the test, you can meet the 8-hour minimum burn time, but cannot meet the 1.5 kg/h (dry basis) of minimum burn rate as specified under Section 8.7.1 of ASTM E3053-17:

> "For the low fire test run, the combustion air control(s) shall be set at the lowest airflow position and must result in a burn duration of at least 8 hours or a minimum burn rate of < 2.54 lb/h (1.15 kg/h) dry basis. The duration of the test is defined as the period of time from the beginning of the load time per section 8.6.5 to the test run completion defined by section 8.6.12. ["*When the 8-hour minimum burn duration criteria is used, the minimum burn rate shall not exceed 3.31 lb/h (1.5 kg/h) dry basis.*"]

You state that your R&D test runs show that your heater is very clean (under 1.0 g/h on the low burn rate) and removing one or two hours of the emission data at the tail end of the combustion cycle does not compromise your emissions target. You state that your heater is still very clean, with emissions below 2.5 g/h; however, you run into technical issue described above which results in an invalid test.

You suggest that lowering the 1.0 %/30-minute minimum weight loss criterion to a 0.5 %/30-minute criterion would help correct the technical issue and take into consideration the 12 lb/ft^3 loading density when burning cord wood. You also believe that the 1.0%/30-minute weight loss criterion was simply carried over from the former crib wood testing procedure where manufacturers used a fuel loading density of 7 lb/ft^3.

You believe that your request for the 0.5%/ 30-minute criterion will help many manufacturers adopt cord wood testing for both large and small fireboxes. You also state that your goal was not to add extra time to the testing in order to fall below the 2.5 g/h emissions limit, but to meet the technical requirements of ASTM E3053-17 test method. The requested criterion above would be used with the ASTM E2515-11 to measure particulate concentrations and CSA B415.1-10 to measure efficiencies and CO emission rates.

You also requested that the above-mentioned alternative method be broadly approved for all wood heaters manufactured by Stove Builder International (SBI) subject to the requirements of Subpart AAA, from the approval date of this request, until such time that Subpart AAA is revised or replaced to require a different cord wood certification method providing all requirements of Subpart AAA, Section 60.533 are met.

With the caveats listed below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 to meet the 2020 cord wood compliance option of 40 CFR 60, Subpart AAA. We also approve the use of ASTM 3053-17 for all wood heaters manufactured by Stove Builder International (SBI) until such time as EPA revises the Subpart AAA the cord wood test method requirements. As required in Subpart AAA, subject to subpart AAA, Section 60.534 (d), the manufacturer or approved test lab must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run and as per Section 60.534 (e) of Subpart AAA, the manufacturer must have the approved test laboratory measure the efficiency, heat output and carbon monoxide emissions of the tested wood heater using Canadian Standards Administration (CSA) Method B415.1-10. For particulate matter emission concentrations ASTM 2515-11 should be used; four-inch filters are also acceptable to use.

The following changes to ASTM E3053-17 "Standard Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel" must be followed:

1. Cold bed conditions prior to loading test fuel. The coal bed shall be a level plane without valleys or ridges for all test runs in the high, low, and medium burn rate categories.

2. If the end of test requirement of 1% of fuel load weight at the low load testing level shows your lowest combustion setting to exceed the "no greater than 1.5 kg/hr" low load definition in Section 8.7.1, you may conduct two consecutive tests at the low load setting following the low load procedures of Sections 8.6.12 and 8.7.1. If each of these two test runs demonstrate compliance with the emissions standard, but fail to meet the criteria for a low-load test as outlined in Section 8.7.1 resulting in an average burn rate above 1.5 kg/hr, you may conduct a third test at the low load setting using 0.5% of the test fuel load weight as the end of test criteria in section 8.6.12 instead of 1% and use the results of this test as your low load test results for compliance with the rule.

The following changes to ASTM E2515-11 "Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel" must be followed:

1. The filter temperature must be maintained between 80 and 90 degrees F during testing.

2. Filters must be weighed in pairs to reduce weighing error propagation. See ASTM E2515-11, Section 10.2.1 Analytical Procedure.

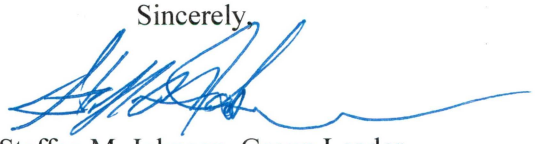
3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm or 110 mm.

4. Only one point is allowed outside the +/- 10% proportionality range per test run.

It is reasonable that this alternative test method approval be broadly applicable to certification testing of all wood heaters of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-127 on our website at http://www3.epa.gov/ttn/emc/approalt.html for use by other interested parties. This alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

Please include this approval in your certification test report. If you have additional questions regarding these decisions, please contact Michael Toney of my staff at (919) 541-5247.

Sincerely,



Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Michael Toney, EPA/AQAD (E143-02)
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