



Suite 600, 1901 North Moore Street  
Arlington, VA 22209 USA  
Phone: (703) 522-0086 • Fax: (703) 522-0548  
www.hpba.org [hpbamail@hpba.org](mailto:hpbamail@hpba.org)

November 28, 2011

Ms. Brenda Edwards  
U. S. Department of Energy  
Building Technologies Program  
Mailstop EE-2J  
1000 Independence Avenue, S. W.  
Washington, D.C. 20585-0121

**Docket Number: EERE-2011-BT-TP-0042**  
**RIN 1904-AC53**

Dear Ms. Edwards,

The Hearth, Patio & Barbecue Association (HPBA) appreciates this opportunity to comment on the Department of Energy's October 12, 2011 Request for Information (RFI) regarding DOE's test procedures for Direct Heating Equipment (DHE). 76 Fed. Reg. 63211 (October 12, 2011). HPBA is an international trade association first established in 1980 to represent and promote the interests of the hearth products industry in North America. The association includes manufacturers, retailers, distributors, manufacturers' representatives, service and installation firms and other companies and individuals – all having business interests in and related to the hearth, patio and barbecue products industries. HPBA's members manufacture, import, distribute, sell, service and represent products that include factory-built fireplaces, gas log sets, inserts and accessories; wood, pellet, coal, gas and electric stoves; barbecues, grills, smokers and accessories; and patio furniture and accessories.

HPBA's comments relate specifically to the applicability of DOE's annual fuel utilization efficiency (AFUE) test method<sup>1</sup> to "vented hearth heaters" as defined by DOE's recent final rule addressing such products.<sup>2</sup> These comments will not address issues peculiar to vented gas log sets, since DOE has already acknowledged that the AFUE method is not mechanically applicable to those products.<sup>3</sup> However, the following comments with respect to decorative vented gas hearth products are equally valid with respect to decorative gas fireplaces and vented gas log sets, and should be understood to apply to both.

### **Comments**

These comments address two key points:

First, DOE cannot reasonably use a single efficiency test method for all "vented hearth heaters," because DOE has defined that term to include two categories of products that are so different in function and use that a single test method cannot be reasonably designed to measure the

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<sup>1</sup> 10 C.F.R. Part 430, Subpart B, Appendix O.

<sup>2</sup> 76 Fed. Reg. 71836, EERE-2001-BT-STD-0047 (November 18, 2011).

<sup>3</sup> 76 Fed. Reg. at 71837.

efficiency of both in accordance with the requirements of 42 U.S.C. §6293(b)(3). In particular, the AFUE test method is not applicable to decorative hearth products and cannot reasonably – or lawfully – be applied to them. HPBA has addressed this point extensively in previously-submitted comments, and is accordingly attaching those comments and incorporating them in this submission as Appendix A.

Second, the AFUE method should be modified even with respect to its application to heater-rated hearth products; i.e., products certified to the ANSI/CSA Z21.88 standard. This is an issue that HPBA believes requires significantly more study and attention than it has received to date.

### **1. The AFUE method cannot be applied to decorative vented gas hearth products.**

The RFI indicates that DOE is “interested in whether the test procedure for vented heating equipment is being applied uniformly for vented hearth heaters.” The answer is no. As detailed in prior comment incorporated herein as Appendix A, the AFUE method cannot reasonably be applied to decorative vented gas hearth products. There are two irreducible problems in this regard:

First, a measure of heating efficiency can only be used to measure the efficiency of products that are actually heating appliances. By definition, decorative hearth products serve a decorative function that is not improved – and in many cases would be compromised – by high heat output or increased heating efficiency. In many cases, there may be an inverse relationship between heating efficiency and aesthetics – the desired performance characteristics of decorative hearth products. It would therefore be incorrect – and indeed contrary to law – to measure the "efficiency" of such products by reference to heat.

Second, the AFUE method – besides measuring the wrong performance parameter for decorative products – fails to measure any parameter in a way that is reasonable with respect to decorative hearth products. By statute, an efficiency test method must be "reasonably designed to produce test results which measure the energy efficiency, energy use . . . or estimated annual operating cost of a covered product during a representative average use cycle or period of use."<sup>4</sup> The AFUE test method produces test results "reasonably designed" to measure the efficiency of products during an "average use cycle or period of use" that is "representative" only of utilitarian heating appliances that are used strictly in response to heating needs. In particular, the AFUE method calculates efficiency on the assumption that the tested product is in operation for more than 1,400 hours per year, being turned on-and-off – as well as up and down – strictly in response to heating needs. This "average use cycle or period of use" is conspicuously not "representative" with respect to decorative gas hearth products, which are used for different purposes and in a completely different way than the kind of heating appliances for which the AFUE method was designed. In particular, decorative gas hearth products are typically operated for considerably less than 100 hours per year and are operated for aesthetic enjoyment rather than being turned up and down in response to heating needs. This is the straight-forward technical problem that renders the AFUE method inapplicable to decorative gas hearth products: even if heat were an appropriate parameter to measure, the AFUE method would not – for decorative products – provide a reasonable means to measure that parameter.

In addition to these issues, it should be noted that the mechanical inapplicability of the AFUE method is not limited to gas log sets. There are also requirements in the AFUE methodology that require temperature to be measured in areas that are not found on many decorative gas

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<sup>4</sup> 42 U.S.C. §6293(b)(3).

fireplaces. For example, the AFUE method requires temperatures to be measured at the outlet of heated air ducts, and many decorative appliances have no such ducts.

## **2. The AFUE method is not directly applicable to heater-rated vented gas hearth products.**

As already indicated, the AFUE method cannot reasonably be applied to decorative hearth products at all. In addition, the method is not directly applicable even with respect to gas hearth heating appliances.

Gas hearth heating appliances are certified to the ANSI/CSA Z21.88 standard. When this standard was developed – a process in which DOE directly participated – it was expressly designed to cover the gas hearth products that would ultimately be subject to DOE heating efficiency standards. However, these ANSI CSA Z21.88 products are significantly different from the conventional heating appliances for which the AFUE method was developed; as a result, test laboratories and manufacturers have struggled for years to apply the AFUE method to hearth heating appliances. Indeed, there are several direct conflicts between the ANSI/CSA Z21.88 standard and the AFUE method as it currently exists. The comments that follow present specific issues that must be addressed in order to apply the AFUE method to ANSI Z21.88-certified products. In each case, the issue is stated, followed by the current language of the AFUE method and then by conflicting language from the ANSI Z21.88 standard (with the relevant text underlined). The reason to address this issue is simple: these products are safety tested to the ANSI/CSA Z21.88 safety standard, and cannot be operated in a different way without negating that certification. To the extent the AFUE method specifies different operating parameters, it therefore requires testing under operational conditions that are not representative of actual product use as 42 U.S.C. §6293(b)(2) requires.

- A. **Issue: Carbon Deposits.** Carbon deposits are prohibited in the AFUE test procedure, but they are permitted in ANSI Z21.88. HPBA believes that the AFUE test procedure should be conformed to the language of the ANSI standard to eliminate the conflict between the test method and the ANSI Z21.88 standard, because the product can meet the ANSI standard and not be allowed under the AFUE.

### **AFUE 2.4: Burner Adjustments**

**Section 2.4.1. Gas Burner Adjustments.** Adjust the burners of gas fueled vented heaters to their maximum Btu ratings at the test pressure specified in section 2.3 of this appendix. Correct the burner volumetric flow rate to 60° F (15.6° C) and 30 inches of mercury barometric pressure, set the fuel flow rate to obtain a heat rate of within  $\pm 2$  percent of the hourly Btu rating specified by the manufacturer as measured after 15 minutes of operation starting with all parts of the vented heater at room temperature. Set the primary air shutters in accordance with the manufacturer's recommendations to give a good flame at this adjustment. Do not allow the deposit of carbon during any test specified herein. If a vent limiting means is provided on a gas pressure regulator, have it in place during all tests.

### **ANSI Z21.88.2.3: Test Pressure Burner Adjustments**

**Section 2.3.4.** Burners shall be adjusted to their Btu input ratings at normal inlet test pressure, unless otherwise specified herein. After the appliance has been operated for 15 minutes, starting with all parts of the appliance at room temperature, the burner adjustments shall be within 0 to + 5 percent of the manufacturer's specified hourly Btu input rating. When primary air control is provided, it shall be set to the manufacturer's specified opening and neither burner ratings nor primary air adjustments shall be changed during a series of tests on any one test gas, unless otherwise specified. All carbon deposits formed during any of the tests specified herein shall not be removed during the remainder of the tests and shall not interfere with the compliance to the requirements of this standard.

**B. Issue: Air Discharge Temperature.** The AFUE test procedure restricts the air discharge temperature to a maximum of 130°F above room temperature, while ANSI Z21.88 contains three provisions allowing an air discharge temperature of between 250°F and 280°F above room temperature. Only remote duct discharge temperatures are restricted to 130°F, but this is an irrelevant restriction for heater-rated hearth products (which do not use remote ducts). If applied, the restriction in the AFUE test procedure would serve only to penalize heater-rated hearth products. HPBA believes that the AFUE test procedure should be conformed to the language of the ANSI standard to eliminate the conflict between the test method and the ANSI Z21.88 standard.

#### **AFUE 2.5: Circulating Air Adjustments**

##### **2.5.1. Forced Air Vented Wall Furnaces (including direct vent systems).**

During tests, maintain the air flow through the heater as specified by the manufacturer and operate the vented heater with the outlet air temperature between 80 °F and 130 °F above room temperature. If adjustable air discharge registers are provided, adjust them so as to provide the maximum possible air restriction. Measure air discharge temperature as specified in section 2.14 of ANSI Z21.49 –1975.

#### **ANSI Z21.88.2.22: Temperature at Discharge Opening.**

**Section 2.22.1.** A primary temperature limit control, when provided, shall act to shut off the gas supply to the main burner(s) when or before the average temperature of the discharged air reaches 250°F (121°C).

**Section 2.22.3.** On a room heater not equipped with a temperature limit control, the average discharge air temperature shall not exceed 280°F (155.5°C) above room temperature.

##### **Section 2.22.4. Duct Discharge Temperature.**

a. When tested at normal test pressure, heating ducts shall not discharge air at an average temperature in excess of 130°F (72.2°C) above the inlet air temperature. When air circulating fireplace heaters equipped with booster fans shall not discharge air at an average temperature in excess of 130°F (72.2°C) above the inlet air temperature

with the fan in operation. With the fan off, the average outlet air temperature shall not exceed 180°F (100°C) above the inlet air temperature.

b. The primary temperature limit control shall act to shut off the gas supply to the main burner(s) when or before the average temperature of the discharge air reaches 250°F (121°C).

**An additional technical problem with the AFUE method involves the input level at which testing is to be conducted.** Section 3.1 of the AFUE method requires that manually controlled heaters that can operate over a range of energy input rates generally be tested at 50% of their rated maximum input rate. This generally would not be representative of the actual use of vented hearth heating appliances, and in many cases such products are not designed to operate or literally cannot be operated at 50% of their maximum input rate. Forcing the appliance to operate at 50% of their maximum input rate for testing purposes would result in efficiency readings that are not representative of normal operation.

### **Conclusion**

HPBA urges DOE to recognize that the AFUE method is properly applicable only to products that are actually heating appliances operated strictly in response to heating needs. This is not a matter of opinion; it is an accurate description of the technical basis for the AFUE method and the nature of the test results it provides. This method is inherently inapplicable to decorative hearth products.

The AFUE test requirements should be revised to apply to vented hearth heating appliances. Efficiency testing under conditions that plainly are not representative of actual product use is technically invalid and could only yield results that are unfair to manufacturers and misleading to consumers.

HBPA appreciates the opportunity to provide comment on these important issues.

Sincerely yours,

A handwritten signature in blue ink that reads "W. Allan Cagnoli".

W. Allan Cagnoli  
Director of Government Affairs