



2311 Wilson Boulevard Suite 400 Arlington VA 22201 USA
Phone 703 524 8800 | Fax 703 562 1942
www.ahrinet.org

December 9, 2020

VIA Email: WaterHeaters@energystar.gov

Abigail Daken, EPA Manager
ENERGY STAR HVAC Program
U.S. Environmental Protection Agency

RE: Draft 1, Version 4.0 ENERGY STAR Water Heater Product Specification and
Draft 2, Test Method to Validate Demand Response

Dear Ms. Daken:

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) submit the following comments in response to the U.S. Environmental Protection Agency's (EPA) revision of the ENERGY STAR specification for water heaters announced on October 28, 2020. In the announcement, EPA released the first draft of the Version 4.0 ENERGY STAR specification and the second draft Test Method to Validate Demand Response for Residential Water Heaters.

AHRI represents more than 300 manufacturers of air conditioning, heating, commercial refrigeration and water heating equipment. It is an internationally recognized advocate for the HVACR and water heating industries and certifies the performance of many of the products manufactured by its members. In North America, the annual economic activity of the HVACR industry is more than \$286 billion. In the United States alone, our industry, including manufacturers, distributors, contractors, and technicians, employs approximately 1.3 million people.

AHRI 1430 Standard

On September 2, 2020, the AHRI 1430 Standard Working Group commenced and began work on a draft standard for Demand Response for Electric Water Heaters. EPA's proposed changes to the specification follow a similar path to the development of AHRI 1430 Standard. AHRI appreciates the contributions of the EPA and Department of Energy staff and consultants. AHRI encourages EPA and DOE to consider transitioning to the AHRI 1430 Standard once it is completed and published.

Draft 1, Version 4.0 ENERGY STAR Water Heater Product Specification

AHRI members appreciate the efforts of EPA staff and support EPA staff's decision to not make significant changes to Version 4.0 ENERGY STAR Water Heater Product

Specification. AHRI members appreciate the EPA staff recognition that little to no savings can be found in Gas Storage and Instantaneous Water Heaters that would justify raising the current levels for those products. However, we believe that those products play an important role in the energy saving mission of the Energy Star program. Thus far, we do not agree with EPA comment in Section 7C – Future Specification Revisions, where EPA is considering sunsetting those categories of products. We believe that consumer choice is important, and that Energy Star Specifications should include different categories of water heaters from various technologies and fuel types. This will help consumers make an energy efficient decision within those categories.

AHRI recommends that EPA consider a separate product category for other HPWH technologies. As an example, 120-volt HPWHs are new products that the water heating industry is considering and have the potential to provide consumers with a unique choice for electrically-constrained installations. We recommend EPA's ENERGY STAR program consider a separate category for other HPWH technologies. While AHRI does not have a specific UEF to recommend at this time, we believe 120-volt HPWHs cannot meet EPA's proposed efficiency levels for HPWHs. AHRI would be happy to work further with EPA on establishing the proper UEF requirements as more data becomes available from our members.

Draft 2, Test Method to Validate Demand Response for Residential Water Heaters

In reviewing Draft 2, Test Method to Validate Demand Response for Residential Water Heaters, AHRI has the following questions and recommendations.

Test setup

1. Should the tee to the mixing valve on the inlet line be specified? If yes, where? In the letter dated February 20, 2020, AHRI suggested that DOE consider more detailed information, including a test set-up diagram similar to Figure 1 in Appendix E of 10 CFR Part 430 outlining the piping in relation to the outlet temperature measurement. AHRI recommends that the mixing valve inlet tee should be connected to the cold supply pipe just downstream of the T-in (temperature measurement at the inlet) location. This will provide a common cold water supply temperature and pressure to both the tank and mixing valve.
2. AHRI recommends updating Figures 1 and 2 to show the location of the flow meter to be at the inlet. AHRI recommends updating these figures to require direct measurement of mass or volume flow at the inlet side. Where a volumetric flow meter is used on the inlet, AHRI recommends that DOE and EPA follow the *AHRI Operations Manual for Residential Water Heater Certification Program*, which provides a calculation method to determine mass withdrawn from each draw using density and volume measurements.

Reference Standards

With the proposed revision of CTA-2045-A being designated as CTA-2045-B, AHRI encourages EPA and DOE to carefully consider how the standard will be referenced in light of regulations in the States of Washington and Oregon requiring certification to CTA-2045-A. AHRI encourages DOE and EPA to maintain the reference to CTA 2045-A while adding a reference to CTA 2045-B once it is published.

Validation

In EPA's presentation, it was noted that two representative water heaters (50 and 80-gallon) were tested. Slides 29 and 30 present some results including verification of Basic and Advanced load-up tests. EPA is seeking input to refine the test method and has raised a number of questions. AHRI members are willing to individually provide responses to EPA to the questions posed during the presentation. (Reference Slides 27 and 28 in EPA's power point presentation.)

AHRI recommends that EPA perform additional verification tests with the updated test method and include representative water heaters (50 and 80 gallon) with external or integrated mixing valves, when available.

Even though the connected criterion is voluntary, confidence with this new test procedure is necessary and the laboratories should be able to perform this testing with current capabilities and equipment.

We appreciate the opportunity to provide these comments. If you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,

Shannon M. Corcoran
Lead Regulatory Advisor, Heating Technologies
Direct: (703) 293-4864
Email: SCorcoran@ahrinet.org

Attachment: *AHRI Operations Manual for Residential Water Heater Certification Program*