

Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy
Natural Resources Defense Council

September 23, 2022

Mr. Jeremy Domm
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies Office, EE-2J
1000 Independence Avenue SW
Washington, DC 20585

RE: Docket Number EERE-2021-BT-TP-0021: Test Procedures for Fans and Blowers

Dear Mr. Domm:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), American Council for an Energy-Efficient Economy (ACEEE), and the Natural Resources Defense Council (NRDC) on the notice of proposed rulemaking (NOPR) for test procedures for fans and blowers. 87 Fed. Reg. 44194 (July 25, 2022). We appreciate the opportunity to provide input to the Department.

We are pleased that DOE has advanced this important rulemaking by publishing the fan and blowers test procedure NOPR, and we are generally supportive of the Department's proposals. We continue to support the development of a fan efficiency metric and regulatory framework that drives better fan selections, but we encourage DOE to consider how this goal can be achieved while accommodating the potential need for manufacturers to show certain non-compliant operating points. Additionally, we support DOE's proposal regarding embedded fans. We also support the inclusion of air circulating fans (ACFs) within the scope of the test procedure, use of FEI as the metric for ACFs, and testing variable- and multi-speed ACFs at multiple speeds. Finally, we support testing fans that meet the definition of two fan types, such as axial panel fan/ACFs or power roof ventilator (PRV) exhaust/supply fans, as both types.

We encourage DOE to explore options to drive improved fan selection while accommodating the potential need for manufacturers to show additional published information. The general idea regarding potential standards for fans, dating back to the Fans and Blowers Working Group, has been to drive energy savings through improved fan selections. The original framework for improving fan selection was to limit the range of operating points, as shown in manufacturer literature and selection software, only to compliant operating points (e.g., FEI > 1). We understand that manufacturers have more recently raised concerns regarding the need to show certain non-compliant operating points for safety reasons. We therefore encourage DOE to explore options for a regulatory framework for fans that would drive better fan selections while accommodating the potential need for additional published information. For example, DOE could consider the feasibility of limiting fan selections returned in manufacturer selection software to those that are compliant at the specified operating point while allowing manufacturers to show certain non-compliant operating points (e.g., in the high pressure, low airflow operating range) for those compliant fan selections.

We support DOE’s proposal regarding embedded fans. Generally, fans can be sold as standalone products or they may be embedded within a piece of equipment that requires the fan to operate. In the NOPR, DOE defines “exclusively embedded” fans¹ and excludes various types of exclusively embedded fans consistent with the Working Group recommendations.² These exclusions, summarized in Table III-8 of the NOPR, essentially apply only to embedded fans in regulated equipment for which the DOE metric captures the energy consumption of the fan.³ We support this approach to help ensure that inefficient fans are not embedded into products whose energy use is not captured by a DOE efficiency metric.

We support including ACFs within the test procedure scope. ACFs are distinguishable from other fan types in that they have no provisions for connection to ducting and thus do not operate against static pressure. DOE is proposing to adopt definitions for various ACF categories⁴ and a test procedure that are generally consistent with those being considered in the ongoing AMCA 230 update.⁵ We support inclusion of ACFs so that published efficiency information for these products is based on a standardized test procedure and to allow DOE to consider future potential energy conservation standards.

We support DOE’s proposal to use FEI as the metric for ACFs. A fan’s FEI at a given operating point is a dimensionless number expressed as the fan electrical input power (FEP) of a reference fan (e.g., a minimally compliant model) divided by the actual fan’s FEP at the same operating point.⁶ We understand that FEI is both representative of energy usage and straightforward for purchasers to interpret. For example, a FEI of 1.1 represents about a 10% reduction in energy usage in comparison to an FEI of 1. Importantly, FEI accounts for inherent efficiency differences between fans of the same diameter that deliver different airflows. Using FEI for ACFs would also provide consistency with the other non-ACF fan categories included within the scope of the proposed test procedure.

We support testing variable- and multi-speed ACFs at multiple, discrete speeds. DOE is tentatively proposing to test variable- and multi-speed ACFs at discrete speeds (e.g., 20%, 40%, 60%, 80%, and 100% of maximum speed) as specified in AMCA 230-15; the overall FEI rating of a variable-/multi-speed ACF would be based on a weighted average of the FEI determined at each discrete test speed.⁷ We agree with DOE that testing and rating multi-speed fans at a range of speeds will better inform purchasers about fan efficiency across a range of operating speeds. We are also concerned that testing multi-speed ACFs only at high speed could result in lower ratings relative to single speed fans due to additional control losses. In other words, while a multi-speed fan may save energy in real-world applications, a rating only at high speed could make it appear less efficient than a comparable single speed fan. Thus, we support DOE’s proposal to test variable-/multi-speed fans at multiple speeds.

We support DOE’s proposal that fans meeting the definition of both axial panel fans and ACFs be tested as both. Some manufacturers offer the same fan model with different mounting configurations.

¹“A fan or blower that is manufactured and incorporated into a product or equipment manufactured by the same manufacturer and that is exclusively distributed in commerce embedded in another product or equipment.”

²EERE-2013-BT-STD-0006-0179, pp. 2-4. www.regulations.gov/document/EERE-2013-BT-STD-0006-0179

³87 Fed. Reg. 44203-44208.

⁴Unhoused air circulating fan head (ACFH), housed air circulating axial panel fan, box fan, cylindrical air circulating fan, and housed centrifugal air circulator.

⁵87 Fed. Reg. 44214-44217.

⁶M. Ivanovich, M. Stevens, & M. Wolf. Two New Metrics for Fan System Efficiency: Fan Energy Index and Fan Electrical Power, www.amca.org/assets/resources/public/pdf/EEMODS-2017-Paper.pdf

⁷87 Fed. Reg. 44227.

For example, housed ACFs may also be sold with brackets for mounting through a wall or ceiling for use as an exhaust fan. Thus, DOE is proposing that fans that meet both the definition of an axial panel fan and the definition of an ACF be tested according to both AMCA 210 (i.e., consistent with non-ACF fans/blowers) and AMCA 230 (i.e., consistent with ACFs).⁸ We support this proposal as it would reduce the potential for a loophole wherein a less efficient fan could be sold with different mounting configurations as a means of being subject to a less stringent standard.

We support DOE's proposal for PRVs requiring that models capable of operating as both supply and exhaust fans be tested as both. AMCA 214-21 specifies different test configurations for PRVs that supply air to a building compared to those that exhaust air from a building. In the NOPR, DOE is proposing that PRVs that can operate as both supply and exhaust fans be tested as both.⁹ We support this proposal as it would help ensure that PRVs are tested and rated in all configurations in which they may be installed.

Thank you for considering these comments.

Sincerely,



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⁸87 Fed. Reg. 44235.

⁹87 Fed. Reg. 44224.