MORRISON PRODUCTS, INC.

Manufacturers of Fans and Blowers

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Ms. Abigail Daken
United States Environmental Protection Agency
ENERGY STAR HVAC Program

September 30, 2010

Re: Comments on Proposed Draft 1 Version 3.0 ENERGY STAR Furnace Specification

Dear Ms. Daken,

Morrison Products, Inc. is a manufacturer of air moving products supplying blowers and fan products to manufacturers of air-conditioning and heating equipment. Morrison supplies fans to 200+ companies producing residential and commercial air conditioning equipment that is manufactured and sold in North America. We have three U.S. manufacturing facilities, regionally located, with over 300 employees and one Mexican facility supplying Mexican, Central and South American customers with 40 employees.

Our representative, Mr. Gregory Wagner participated in the Standard development process of the draft CSA Standard C823 titled "Performance Standard for Air Handlers in Residential Space Conditioning Systems" over the past couple of years. The following comments are consistent with ones presented to CSA and DOE with regard to their proposed adoption of the standard.

General Comment

Before the detailed comments a general one is offered. "Furnace fans" are part of complex systems that involve not just the HVAC equipment but the entire installed system. Focusing on components of the system, rather than the system itself, may result in optimal components but leads to suboptimal systems. While we recognize the management of the entire installed base would be a bit unwieldy, we believe the best approach is to consider at a minimum the black box approach for the system of equipment. Components like fans are used to perform work internal to the equipment (heat transfer, filtration and air movement through the equipment) that can vary depending on the size, quality, performance, reliability and cost aspects of the rest of the system. Restricting options of components unnecessarily constrains designers of the systems and will stifle innovation in the long term, resulting in less energy saving breakthroughs. For this reason, we strongly suggest the EPA consider using a combined energy descriptor for the entire system. Maximum energy savings comes from informed decisions on the entire system energy consumption and not from a component within.

Summary and Alternate Option

Fans used in furnaces have a function to perform in the unit (heat transfer) as well as operate outside the unit. The entire heat exchanger and furnace fan are designed to operate as one and fan performance from design to design varies. Operating furnaces at different design airflows can give differing energy usage information that may not be comparable between manufacturers. Further, optimized components do not always lead to optimized systems and energy usage could increase under some circumstances. Fan testing and rating of fans for efficiency separated from

the intended function of the entire system has the potential to be misleading. The use of CSA C823 is problematic for a number of reasons that are detailed below but the essence is that the standard is much to cumbersome to be useful to consumers or agencies to use to rate furnace fans for performance and drive activity that will lead to meaningful energy savings. It would impose great deal of reporting and testing burdens while generating little useful data. The many AECR numbers would be too confusing to consumers. Finally, in C823, poor installation practices with high static pressures are part of the rating process and thus the standard would be legitimizing bad practice that would result in more installations with greater energy use. Poor installation practice should not be codified.

An alternate option we suggest the EPA consider for generating energy savings through the ENERGY STAR program would be to award the designation to systems that have two-stage (or more) operation. Two-stage operation will result in energy savings in several ways:

1. Longer run times at lower input will have greater furnace efficiency.
2. Lower heat energy delivery results in lower flow rates required by the fan system and lower energy.
3. Lower flow rates through ducts means lower external static pressure required (proportional to the flow reduction squared).
4. Lower flow and pressure combined results in lower fan energy (proportional to the product of the two or to the proportion reduction cubed).

C823 Comments

C823 is still in the proposal stage and out for review. The objections below have been submitted by Morrison Products.

1. Section 4.2 of Standard C823 defines the use Annual Electrical Energy Consumption (AECR) as a rating for regulating fans used in heating and cooling appliances. AECR appropriateness as a measure is questionable for the following reasons:
    - Climate - The heating and cooling load hours differ significantly across regions due to climate differences.
    - Personal Choices/Needs - Usage patterns vary due to personal choice of ventilation, level of filtration and temperature set point.
    - Installation – Variation of installations including restrictive duct work, register adjustment, indoor air quality equipment and oversized equipment.

2. Standard C823 has reporting templates in Annex A and Annex B that require appliance manufacturers to report multiple AECR values for various appliance types, thereby creating a possibility of wide range of AECR values for the same product. Further, AECR depends on components that are matched with the air moving appliance to comprise a useful system. Installers and consumers may find it difficult to effectively use the C823 standard to make informed choices because of the technical complexity associated with the ratings prescribed in Section 4 of Standard C823.

3. Standard C823 does not clearly indicate how the heating and cooling speeds are selected in order to determine AECR, especially in variable speed applications. Section 8.2, Full load heating mode, is inconsistent with the Annex A which lists AECR values for

Recommended Practice and Common Practice. Recommended Practice and Common Practice system load curves are not specified in the body of the standard.

4. Standard C823 introduces the new terms "Recommended Practice" and "Common Practice". By testing and rating systems operating at performance levels defined for "Common Practice", the standard would ultimately condone poor system installation. It is assumed that more effective use of energy and corresponding energy savings are part of the purposes of Standard C823. Therefore, the Standard should not legitimize any poor practice that increases energy use. Instead, the standard should only focus on recommended practices that encourage energy conservation.

5. Standard C823 would have manufacturers report static pressure at rating points outside the manufacturer's recommended ranges. This requirement may lead to improper installation practices and higher electrical energy consumption.

6. Annex B, Consolidated Reporting Template, provides an example where the System Configuration Performance column describes cooling modes in "tons". A furnace or air handler by themselves only provides air flow. "Tons" is a measure of cooling capacity related to a system that is only determined by the additional specification of the evaporator and condenser units. A conversion factor is needed to convert airflow to tons for cooling mode rating points.

7. Reporting of systems' performance only in rated airflow will not permit comparison between testing and actual usage. Airflow capacity required for heating and cooling varies from manufacturer to manufacturer and model to model. AECR will not give actual usage information nor necessarily supply useful decision making information to the consumer for their application.

8. Focus on component performance verses total unit performance may result in optimized components but suboptimal systems. This approach may lead to lower overall gains in efficiency and stifle innovation.

If you have any questions or wish to discuss this further, please do not hesitate to call me at (216) 486-4000.

Sincerely,

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