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Docket Number:	17-AAER-06
Project Title:	Commercial and Industrial Fans & Blowers
TN #:	221240
Document Title:	Morrison Products, Inc. Comments On Title 20 Phase II Pre-Rulemaking - Commercial and Industrial Fans & Blowers
Description:	N/A
Filer:	System
Organization:	Morrison Products, Inc.
Submitter Role:	Public
Submission Date:	9/19/2017 2:17:04 PM
Docketed Date:	9/19/2017

Comment Received From: Morrison Products, Inc.
Submitted On: 9/19/2017
Docket Number: 17-AAER-06

On Title 20 Phase II Pre-Rulemaking - Commercial and Industrial Fans & Blowers

Additional submitted attachment is included below.

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California Energy Commission
Docket Unit, MS-4
Re: Docket No. 17-AAER-06
1516 Ninth Street
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September 18, 2017

Re: Morrison Products Proposal – Title 20 Phase II Pre-Rulemaking – Commercial and Industrial Fans & Blowers *[Docket No. 17-AAER-06]*

Dear CEC Staff:
The attached proposal is submitted in response to the California Energy Commission (CEC) Phase II Pre-Rulemaking Invitation to Submit Proposals notice issued on July 18, 2017 and meeting held on August 1, 2017, regarding minimum efficiency standards for commercial and industrial fans into California's Appliance Efficiency Standards in Title 20 of the California Code of Regulations, Sections 1601 through 1609.

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 70 employees.

General Background

This request for proposal for a regulation regarding Commercial and Industrial Fans and Blowers is similar to the regulatory efforts at the United States Department of Energy (DOE). The regulatory efforts at DOE, while ongoing, are at appoint where some preliminary work is completed and resulted in an agreed upon term sheet from interested parties based on ASRAC rules. (Morrison Products was one of the members of the ASRAC Working Group.) The efforts at DOE were of a potentially good start but have some significant issues that were not fully understood or incompletely evaluated to date. The following are specific items from the DOE analysis that should be part of any consideration if the CEC is contemplating using DOE's third NODA as a starting point. (Note a copy of the full response from Morrison to DOE is attached for more detail.)

1. Fans are often part of the appliance or system in which they are installed. As such their performance is affected by parts of the system and the opposite is true, the systems

performance is affected by the fan. This integration of designs has the simple effect of making it very difficult to compare fan level performance with system level for embedded fans. To accurately compare, one really needs to test the system. If a system is being tested, then the regulation should be on the system as opposed to the fan only.

2. Input data for the DOE analysis came from AMCA's database of blowers. As such, this data has some problems for use in a regulatory evaluation. (AMCA as a trade association has a long and admirable history creating standards for commercial use and level, reliable trade of fans so that buyers and sellers could be assured of performance but that is different than regulation.)
    a. Some of the data is certified and some not. Certification has a higher level of confidence but still a greater level of uncertainty than is typically required by regulatory bodies. See AMCA standards for acceptance criteria.
    b. AMCA's performance test standard (AMCA 210/ASHRAE 51) does not have a required speed of test. Legacy test data used by DOE could be at any speed of test and not at the speed of test agreed at the DOE meetings and incorporated into the term sheet. This is important for speed of test affects the efficiency measured for any fluid turbomachinery and thus reported levels of compliance.
    c. All fan data is reported as "typical" and as such is representative of nominal designs. It does not take into account measurement uncertainty or manufacturers' uncertainty. All the legacy data used by DOE is per this practice. The regulatory scenario contemplated by DOE would have a minimum energy value at a given operating point. The tolerance for going from nominal to minimum is not accounted for in the analysis.
    d. DOE suggested selection of an equivalent fan could be within 20% and still be acceptable. That tolerance is not realistic and off by more than an order of magnitude in real applications. (Note if one could just reduce all fans performance by 20%, then the corresponding pressure reduction would be big and the energy use drops by nearly 50%! That would be a great thing, if only it were possible.)
    e. Selection of fans within 2" on diameter was claimed to equivalent by DOE. First, fan impeller diameter is only one part of the equation. Many go into housings and a 2" diameter change would require at least 4" extra for the housing. Four inches of change is of consequence and not possible in the majority of applications. Therefore in most cases, total unit redesign would be necessary.
3. Cost of change is woefully under counted in DOE's NODA. This can be seen in the virtually flat cost shown in all the fan categories. The cost picture does not include the ever increasing cost of engineering of "better" and more fans, tooling changes, additional tooling, manufacturing changes, shorter production runs, equipment development and testing, compliance cost and the installation cost problem for potentially bigger appliances. A full end to and analysis of cost is needed.

Proposal

We support the general proposal outlined by AHRI and submitted today. Key factor in the reason for our support include embedded fans in HVAC products should be outside the scope of this potential regulation as their energy has been accounted for in system regulation of the HVAC equipment through Titles 20 and 24. The energy consumed by these fans has been under regulation and has constraints on the amount consumed by product and application. Additional regulation would be redundant, would add cost and not provide value to the state or its citizens. This is true for virtually all HVAC appliances for they have either product efficiency standards that include fan energy or building code standards that include product performance for all buildings and repairs in California.

Fans in products per Title 20 that have regulated energy consumption as part of their system performance will not see energy savings but a shift in where the energy is consumed in an appliance. For example, and air-conditioning system must comply with an overall efficiency requirement that includes fan performance. Improving the fan energy use will result in an offset in other component energy use or reduction in system efficiency so that a minimally compliant system will be available for sale at the lowest cost point. Component regulation does not lead to pareto optimal outcomes but rather distortions that lead to suboptimal systems developed by artificially constrained designers.

Fans in other HVAC appliances are subject to Title 24 fan power limitations and system installed performance limitations. Those fans should be outside the scope as they have energy consumption included in the California plans at the best possible point – the point of application. There is no doubt about the intended use, performance or energy consumption as that is measured as installed. Use of compliant products operating as designed is assured.

Stand-alone fans, as represented by fans outside of an appliance, can be measured per a fan standard, ACMA 210/ASHRAE 51, and can have a regulation considered for ones to be installed in Commercial and Industrial applications. A rating system (AMCA's FEP/FEI type of system may be good) could be implemented for fans that fall outside of already existing regulations (Title 20 and 24) to ensure fans not already regulated have a level field. Fully developing the appropriate test procedure and regulatory scheme will take further review as outlined above and should be part of the on-going proceedings and public meetings to review options with all interested parties.

We are appreciative of the opportunity to participate in this rulemaking process. We want help create sensible solutions that drive systems to better energy efficiency in a cost effective manner so that solutions are adopted.

If you have any questions or wish to discuss this further, please do not hesitate to contact me.

Sincerely,

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Enclosure:
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