DOCKETED	
Docket Number:	22-AAER-01
Project Title:	Commercial and Industrial Fans and Blowers
TN #:	242891
Document Title:	Laura Petrillo-Groh on behalf of AHRI and AMCA Comments - Joint AHRI and AMCA Comments on CEC CIFB NOPA - 45 Day Language
Description:	N/A
Filer:	System
Organization:	Laura Petrillo-Groh on behalf of AHRI and AMCA
Submitter Role:	Public
Submission Date:	4/29/2022 1:31:09 PM
Docketed Date:	4/29/2022

Comment Received From: Laura Petrillo-Groh on behalf of AHRI and AMCA
Submitted On: 4/29/2022
Docket Number: 22-AAER-01

Joint AHRI and AMCA Comments on CEC CIFB NOPA - 45 Day Language

Additional submitted attachment is included below.

April 29, 2022

Mr. Alejandro Galdamez, PE
Commissioner
California Energy Commission
Docket Unit
Re: Docket No. 22-AAER-01
715 P Street, MS-1
Sacramento, CA 95814-5512

(submitted electronically to Docket 22-AAER-01)

Re: Notice of Proposed Action Regarding 2022 Appliance Efficiency Rulemaking for Commercial and Industrial Fans and Blowers, Docket No. 22-AAER-01

Dear Mr. Galdamez:

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) and Air Movement and Control Association (AMCA) International, collectively referred to as the "Joint Commenters," respectfully submit the following comments to the California Energy Commission (CEC) on its Notice of Proposed Action (NOPA) for Commercial and Industrial Fans and Blowers, Docket No. 22-AAER-01, published on February 25, 2022.

AHRI represents 323 air-conditioning, heating, and refrigeration equipment manufacturers. In North America, the annual output of the heating, ventilating, air-conditioning, and refrigeration (HVACR) and water heating industry is worth more than $44 billion. In the United States, the industry supports 1.3 million jobs and $256 billion in economic activity annually.

AMCA International is a not-for-profit association of manufacturers of fans, dampers, louvers, air curtains, and other air-system components for commercial heating, ventilation, and air-conditioning (HVAC), industrial-process, and power-generation applications. With programs such as certified ratings, laboratory testing and accreditation, industry education, and international-standards development, AMCA lives by its mission to advance the knowledge of air systems and uphold industry integrity on behalf of its approximately 400 member companies worldwide.

Original equipment manufacturers (OEMs) represented by AHRI and AMCA are interested in the energy conservation standards and scope of product coverage for regulated components to the extent that the rulemaking burdens an OEM's ability to manufacture its products. AHRI and AHAM appreciate CEC's careful consideration of the perspective of the end-purchasers and users of commercial and industrial fans, as presented in this NOPA.

Clarification on Replacement Fans

Problematic regulation of one component product can have ramifications to other components. AMCA and AHRI, along with the Northwest Energy Efficiency Alliance (NEEA). We fully support the comments and would like to raise one additional concern on the matter: Replacement fans in HVACR and water heating equipment also warrant a scope exemption.

HVACR and water-heating equipment is built, tested, and certified as a completed design that is reliant on a specific set of components. Changing these components in turn changes the performance of the equipment. In many cases, such as supply-air fans with air flow through gas fired heat exchangers, hot-water, coils or electric resistance units, a variety of safety standards in addition to performance standards are affected. The testing of all legacy equipment because of a fan change will be cost- and resource-prohibitive. If a replacement fan is not compliant then, in most cases, an unsafe, engineered-to-fit substitution would be required. The costs, risks, and time required to retest the HVACR and water-heating equipment would all be prohibitive. Testing would also be impractical if the HVACR and water heating equipment is out of production. Manufacturers would be forced to rebuild an out-of-production unit solely for the purpose of testing a new fan. There may be instances in such part substitution makes sense, but that is not a reasonable basis for a broad, minimum standard.

AHRI recommends that CEC clearly exempt fan blades, impellers, wheels, and other components used to repair/replace fans in existing HVACR and water heating equipment by modifying the proposed definition of "Commercial and industrial fan and blower" in Title 20, CCR Section 1602, Definitions, shown as highlighted and underlined, below:

… [skipping main body of "Commercial and industrial fan and blower"]

(1) Commercial and industrial fans and blowers do not include:

… [skipping proposed (A) through (F)]
(G)embedded fans as defined in ANSI/AMCA 214-21, including embedded fans sold for replacement purposes;
… [skipping proposed (H) through (J)]

Although our belief is that while CEC did not intend to target replacement fans with this proposal, we are very concerned that significant impacts will result if no changes are made to the regulatory text. CEC acknowledges in Chapter 3 of the Staff Report that:

> Embedded fans are exempt from the proposed regulations because the fan is either manufactured by an OEM who embeds the fan in a piece of equipment where the main function is something other than the movement of air, or because it is

manufactured for the purpose of being embedded into an appliance after market.[1] (Emphasis added.)

We understand this as CEC recognizing that replacement embedded fans must also be clearly exempted from this proposed regulation. It cannot be overstated that there would be significant safety issues if one tried to replace a fan in a product with seismic certification or gas or electric heat with a different fan. This would void all safety listings based on safety standards and the warranty.

Verification and Enforcement Clarifications

We understand this as CEC recognizing that replacement embedded fans must also be clearly exempted from this proposed regulation. It cannot be overstated that there would be significant safety issues if one tried to replace a fan in a product with seismic certification or gas or electric heat with a different fan. This would void all safety listings based on safety standards and the warranty.

AMCA and AHRI would also like to propose changes regarding the subject of post-certification surveillance—specifically, the results of a post-certification test compared to published data developed from a previous test.

As referenced in the proposed regulatory language, ANSI/AMCA Standard 214-21, *Test Procedure for Calculating Fan Energy Index (FEI) for Commercial and Industrial Fans and Blowers*, provides a method of calculating the FEI metric and developing ratings from those test values.

For background, a test requires a series of measurements resulting in data sets called determinations. A determination consists of volumetric flow rate, fan pressure, fan air density, input power, and speed. The results of a fan test are presented as plots. Test results typically are "corrected" (converted) to a similar density for comparison across determinations using equations from physics commonly referred to as the "fan laws." Converting determinations to the same density communicates the other components (flow, pressure, power) in an equivalent manner and enables comparison.

With some fan motors, it is common for the speed to change significantly across the fan curve. Fans in these cases typically are tested in a wire-to-air manner. For a non-wire-to-air test, determinations typically are corrected to a single speed value using the fan laws. This allows the highest degree of comparison across determinations and allows data to be plotted on an industry-standard flow-pressure plot. Additional information (e.g., speed) is not required for the determinations.

When a different fan is tested for comparison to ratings developed from the original test, the test determinations are not likely to match identically, even though all the

[1] CEC Staff Report, Docket 22AAER-01, TN# 241951, Page 8.

determinations may be compliant when FEI is calculated. The primary reason for this challenge is that, for two determinations to be compared, their flow and pressure need to be identical. With matching flow and pressure values, corresponding FEI values can be compared directly.

Despite his or her best efforts, the individual conducting a test is unlikely to be able to match both flow and pressure because the fans will have slight manufacturing differences that result in slight variances in performance.

This point is well-illustrated in figures 10.1 and 10.2 of AMCA Publication 211-22, *Certified Ratings Program Product Rating Manual for Fan Air Performance*, which are reproduced below. A detailed explanation of a performance test passing within tolerance is explained in Section 10 of AMCA Publication 211-22. A PDF copy of AMCA Publication 211-22, which is available at no cost to the public at www.amca.org/store, is provided with these comments.

The resulting question, thus, is how can one compare the determinations of a test to those of a previous test? AMCA proposes using the compliance mechanism in AMCA Publication 211-22, specifically Section 10, "Check Tests."

AMCA Publication 211-22 recently was updated to include several AMCA members' recommendations for data accuracy and validity using the ANSI/AMCA Standard 210/ASHRAE Standard 51, *Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating*, test procedure. The test tolerances identified in AMCA Publication 211-22 are a simple yet powerful means of accounting for manufacturing and test uncertainties.

AMCA recommends the addition of a provision referencing AMCA Publication 211-22 Section 10 to provide a mechanism for making a determination regarding a tested product's performance in accord with the performance certified by the manufacturer but defers to CEC regarding the best way and the best place in California regulatory language to incorporate this change.

From AMCA Publication 211-22 Figures 10.1 and 10.2

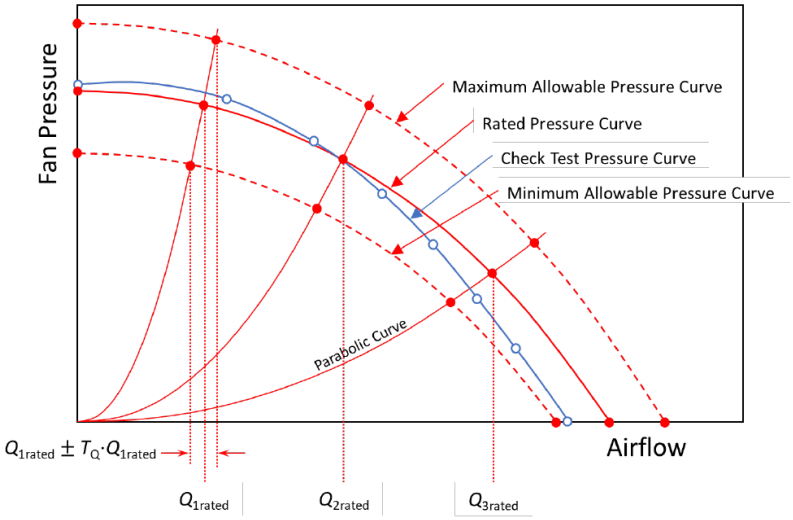

Figure 10.1 — Application of Airflow Tolerance

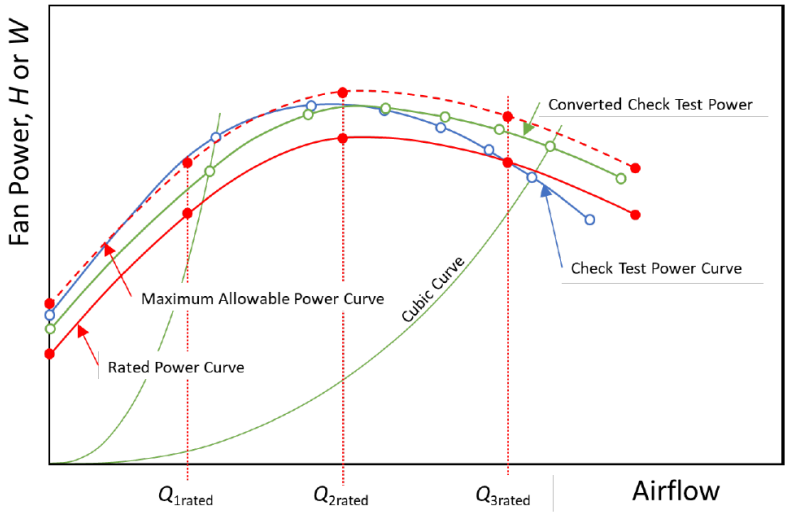

Figure 10.2 - Application of Power Tolerance

We appreciate the opportunity to submit these comments on CEC's NOPA for Commercial and Industrial Fans and would be grateful to discuss these matters in more detail should you so request.

Respectfully submitted,

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