DOCKETED	
Docket Number:	22-AAER-01
Project Title:	Commercial and Industrial Fans and Blowers
TN #:	242893
Document Title:	Joint AMCA-AHRI-NEEA Comments to Proposed Regulatory Language for T20 Fans
Description:	N/A
Filer:	System
Organization:	Joint AMCA-AHRI-NEEA/Michael Ivanovich
Submitter Role:	Public
Submission Date:	4/29/2022 1:14:36 PM
Docketed Date:	4/29/2022

Comment Received From: Michael Ivanovich
Submitted On: 4/29/2022
Docket Number: 22-AAER-01

Joint AMCA-AHRI-NEEA Comments to Proposed Regulatory Language for T20 Fans

Please find joint comments from AMCA International, AHRI and NEEA.

We thank the CEC for the comment extension, and congratulate the CEC for drafting the first complete regulation for commercial and industrial fans in the United States and for acknowledging the foundational work conducted during the U.S. Department of Energy fan rulemaking and the follow-on work by AMCA and industry stakeholders that developed standards defining fan energy index (FEI) and a regulation-ready test procedure for FEI.

Michael Ivanovich (AMCA); Laura Petrillo-Groh (AHRI); Nicole Dunbar (NEEA)

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-02)

Dear Mr. Galdamez:

Attached to this letter, please find comments to *Proposed Regulatory Language for Title 20. Public Utilities and Energy; Division 2. State Energy Resources Conservation and Development Commission; Chapter 4. Energy Conservation; Article 4. Appliance Efficiency Regulations: Sections 1601 – 1609*, which was published for public comment by the California Energy Commission (CEC) on February 24, 2022, jointly submitted by Air Movement and Control Association (AMCA) International[1]; Air Conditioning, Heating, and Refrigeration Institute[2] (AHRI); and Northwest Energy Efficiency Alliance[3] (NEEA).

AMCA, AHRI, and NEEA congratulate the CEC for drafting the first complete regulation for commercial and industrial fans in the United States and for acknowledging the foundational work conducted during the U.S. Department of Energy fan rulemaking and the follow-on work by AMCA and industry

[1] AMCA International is a not-for-profit association of manufacturers of fans, dampers, louvers, air curtains, and other air-system components for commercial 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.

[2] AHRI represents 323 air-conditioning, heating, and refrigeration equipment manufacturers. In North America, the annual output of the 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.

[3] NEEA is a non-profit organization working to encourage the development and adoption of energy-efficient products, practices, and services. NEEA is a collaboration of 140 utilities and efficiency organizations working together to advance energy efficiency in the Northwest on behalf of more than 13 million consumers. This unique partnership has helped make the Northwest region a national leader in energy efficiency.

stakeholders that developed standards defining fan energy index (FEI) and a regulation-ready test procedure for FEI.

The Joint Commenters also express their appreciation to CEC for extending the review-comment deadline from April 11, 2022, to April 29, 2022. Our comments demonstrate that the extra time was needed to accommodate consensus processes within our organizations and collaboration between our organizations

We look forward to working with CEC and other stakeholders on the succeeding deliberation of comments and the next edition of the proposed language.

The Joint Commenters would be happy to answer any questions regarding these comments at any time.

Warmest regards,

Michael Ivanovich
Senior Director, Global Affairs
AMCA International

Laura Petrillo-Groh, PE
Senior Regulatory Advisor
Air-Conditioning, Heating, and Refrigeration Institute

Nicole Dunbar, PE
Codes and Standards Engineer
Northwest Energy Efficiency Alliance

Joint Comments to: Title 20. Public Utilities and Energy
Division 2. State Energy Resources Conservation and Development Commission
Chapter 4. Energy Conservation
Article 4. Appliance Efficiency Regulations
Sections 1601 – 1609

From Air Movement and Control Association International
Air Conditioning, Refrigeration Institute
and
Northwest Energy Efficiency Alliance

April 29, 2022

GENERAL AMCA COMMENTS

General Comment 1:
All representations of fan energy index (FEI) should be expressed to two decimal places (e.g., 1.0 should be 1.00). AMCA realizes the two-decimal-place representation is specified in neither ANSI/AMCA Standard 214-21, *Test Procedure for Calculating Fan Energy Index (FEI) for Commercial and Industrial Fans and Blowers*, nor its parent standard, ANSI/AMCA Standard 208-18, *Calculation of the Fan Energy Index.* AMCA staff have submitted comments on the matter for both standards, and, thus, in the standards' next review cycle, the two-decimal-place representation will be stipulated.

For further reasoning on this change, in the comments to DOE Docket: EERE-2012-BT-STD-0045, RIN 1904-AE9 (Aug. 6, 2021), AMCA stated it supports the rounding of ceiling-fan-energy-index (CFEI) values to the nearest hundredth. The U.S. Department of Energy (DOE) proposed that CFEI values be rounded to the nearest hundredth in the proposed rule.

General Comment 2:
AMCA asks that CEC admit an interpolation method that is not yet in ANSI/AMCA Standard 214-21 Annex H but was developed for the recently issued in AMCA Publication 211-22, *Certified Ratings Program Product Rating Manual for Fan Air Performance*. For calculating a fan rating based on data from a fan of another size, Annex H allows only calculation of the performance of a larger fan from a test of a smaller fan (i.e., smaller fans can be used to rate larger fans). Publication of ANSI/AMCA Standard 214-21 preceded that of AMCA Publication 211-22 which now has the option of standardized interpolation between two tested sizes.

Believing manufacturers should have access to all tools of AMCA Publication 211-22, AMCA advises CEC to add the new interpolation method to the Title 20 fan regulation. This can be done by referencing the interpolation in AMCA Publication 211-22 and adding the publication citation to the referenced

documents in the standard. Alternatively, the exact language of the interpolation could be added to the regulatory language. For convenience, AMCA provided a copy of AMCA Publication 211-22 with this comment submission.

AMCA believes adding this interpolation will require a small change to the compliance filing parameters, which are addressed in comments on Section 1606 below.

AMCA notes that if this recommendation to add the interpolation method is granted and the way the interpolation will be utilized is by referencing AMCA Publication 211-22, then a reference to AMCA Publication 211-22 will be needed in the appropriate section of Title 20.

AMCA Publication 211-22	Certified Ratings Program Product Rating Manual for Fan Air Performance

SECTION 1601. SCOPE.

Comment 1601.1

In embedding the scope of the regulation with respect to fan sizes and exclusions within the definition of "commercial and industrial fan and blower," CEC veered from the DOE definition of "fans and blowers" contained in a notice of final determination published in the *Federal Register*[1] on Aug. 19, 2021. After reviewing CEC definitions of other regulated products, AMCA concludes that embedding the scope of a regulation within the definition of a regulated product is optional. AMCA recommends that CEC use a separate scoping statement to define the power of fans that are covered and list the exclusions. With DOE appearing to fully intend to complete the fan rulemaking it started in 2021, harmonizing with DOE on the definition of the covered product seems practical.

Similarly, in the commentary within the final determination, DOE rationalizes that fans and blowers are equivalent terms and, thus, can be used interchangeably. DOE also rationalizes that the terms "commercial" and "industrial" do not provide utility, as they are application-based terms with no distinguishing definition. Thus, "commercial and industrial fans and blowers" can be simplified to "fans" or "fans and blowers." Given that the determination is final, AMCA recommends CEC adopt the same practice. Following are relevant excerpts from DoE's final determination:

> *Consistent with DOE's acknowledgement, the Working Group commented that the terms "fan" and "blower" are used interchangeably in the U.S. market and suggested eliminating the term "blower" to avoid potential confusion. (Docket No. EERE-2013-BT-STD-0006; Public Meeting Presentation, No. 106, at p. 47) To the extent that a blower would meet the criteria in the proposed definition, it is a fan. As such, DOE is not considering further a separate definition for "blower."*
>
> *… In this final rule, DOE is no longer including the description "commercial and industrial" with the term "fan", since DOE has determined that this language is redundant, given the statutory definition of "industrial equipment" in 42 U.S.C. 6311(2). In addition, as noted above, comments also raised questions as to whether including "commercial and industrial" would provide more clarity or provoke more uncertainty. The definition of "industrial equipment" explicitly excludes covered products, other than a component of a covered product. (42 U.S.C. 6311(2)(A)(iii)) Therefore, the inclusion of "commercial and industrial" is not necessary to clarify the exclusion of ceiling fans and furnace fans, both covered products defined at 10 CFR 430.2.*

Should CEC accept DOE's rationale and seek consistency with the final determination, the term "commercial and industrial fans and blowers" can be simplified as "fans" throughout the regulation.

AMCA defers to CEC as to how best to integrate this recommendation into the language of Section 1601.

[1] The final determination in the *Federal Register* can be found here: https://www.regulations.gov/document/EERE-2011-BT-DET-0045-0020.

§ 1601. Scope.
[Add the following where CEC determines it best fits.]

Fans shall have a rated fan shaft power greater than or equal to 1 horsepower or, for fans without a rated shaft input power, an electrical input power greater than or equal to 1 kW and a fan output power less than or equal to 150 horsepower.

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

(A) safety fans as defined in Section 1602(d) of this Article,
(B) ceiling fans as defined in 10 CFR 430.2,
(C) circulating fans,
(D) induced-flow fans,
(E) jet fans,
(F) cross-flow fans,
(G) embedded fans as defined in ANSI/AMCA 214-21,
(H) fans mounted in or on motor vehicles or other mobile equipment,
(I) fans that create a vacuum of 30 in. wg or greater,
(J) air-curtain units as defined in Section 1602(d) of this Article.

Comment 1601.2
AMCA notes that, in the proposed regulatory language, under the referenced documents in Section 1601, the words "Air Movement and Control" are missing from the reference to AMCA International.

Number	*Title*
AIR MOVEMENT AND CONTROL	ASSOCIATION INTERNATIONAL, INC (AMCA)

SECTION 1602. DEFINITIONS.

Comment 1602.1
As explained in the comments on scope, AMCA recommends inserting the exact definition of "fan" established by DOE in the final determination so there is a single and legally enforceable definition of "fan" in all U.S. fan regulations. That definition is:

> "Fan" means a rotary bladed machine used to convert electrical or mechanical power to air power, with an energy output limited to 25 kilojoule (kJ)/kilogram (kg) of air. It consists of an impeller, a shaft and bearings and/or driver to support the impeller, as well as a structure or housing. A fan or blower may include a transmission, driver, and/or motor controller.

Comment 1602.2
The AMCA Air Curtain Engineering Committee reviewed the proposed definition of "air curtain unit" and recommends adding "minimum width-to-depth aspect ratio" to distinguish air-curtain units from other products appearing to have a similar use, application, or appearance as follows:

> "Air curtain unit" means equipment ~~providing~~ that produces a directionally controlled stream of air with a minimum width-to-depth aspect ratio of 5:1 and a discharge that is not intended to be connected to unitary ductwork. The controlled stream of air spans ~~moving across~~ the entire height and width of an opening ~~that~~ and reduces the infiltration or transfer of air from one side of the opening to the other and/or inhibits the passage of insects, dust, or debris.

Comment 1602.3
AMCA recommends modifying the definition of "centrifugal unhoused fan" to account for the fact that fan arrays do not always have partition walls separating individual fans:

> "Centrifugal unhoused fan" means a fan with a centrifugal or mix-flow impeller in which airflow enters through a panel and discharges into free space. Inlets and outlets are not ducted. This fan type also includes fans designed for use in fan arrays that may or may not have partition walls separating fans from one another.

Because the definition of centrifugal unhoused fan in Title 20 is similar to the one in ANSI/AMCA Standard 214-21, AMCA staff will suggest the change be made during the next revision of ANSI/AMCA Standard 214.

Comment 1602.4
AMCA notes the need for an editorial correction under the definition of "Power roof ventilator (PRV)":

> "Power roof ventilator (PRV)" or "power wall ventilator (PWV)" means a fan with an internal driver and a housing to prevent precipitation from entering the building. It has a base designed to fit over a ~~rood~~ roof or wall opening, usually by means of a roof curb.

Comment 1602.5

The definition of "safety fan" used by CEC was developed about four years ago in response to the draft staff report and has been a source of contention for much longer. Since the 2018 report, the thinking of AMCA members has evolved. As a result, AMCA recommends the draft regulatory language be revised as follows:

> "Safety fan" means:
>
> (1) a fan that is designed and marketed to operate ~~only~~ at or above 482 degrees Fahrenheit (250 degrees Celsius);
> (2) a reversible axial fan in cylindrical housing that is designed and marketed for use in ducted tunnel ventilation that will reverse operations under emergency ventilation conditions;
> (3) a fan bearing an Underwriter Laboratories or Electric Testing Laboratories listing for "Power Ventilators for Smoke Control Systems";
> (4) ~~an open discharge exhaust fan with integral discharge nozzles which develop or maintain a minimum discharge velocity of 3000 FPM~~ a laboratory exhaust fan;
> ~~(5) a fan constructed in accordance with AMCA type A or B spark resistant construction as defined in ANSI/AMCA Standard 99-16 Standards Handbook;~~
> (~~6~~5) a fan ~~designed and marketed~~ for use in explosive atmospheres ~~and~~ tested and marked according to ~~EN 13463-1:2001 Non-electrical Equipment for Potentially Explosive Atmospheres~~ EN ISO Standard 80079-36:2016, Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements; or
> (~~7~~6) an electric-motor-driven Positive Pressure Ventilator as defined in ANSI/AMCA Standard 240-22~~15~~ Laboratory Methods of Testing Positive Pressure Ventilators for Aerodynamic Performance Rating.

The rationale for removing the word "only" from Item 1 is that fans designed to operate at elevated temperatures—as referenced by this definition—are designed to operate at a wide variety of temperatures during the normal operating cycle. For example, in oven systems, a fan must be able to operate at or above 482 degrees Fahrenheit because the system is expected to operate at or above that temperature for at least part of its operating cycle. During non-heat segments of the operating cycle, it is common for the fan to operate well below the high-temperature design requirement. Consequently, AMCA requests the word "only" be removed from the definition.

The rationale for changing Item 4 is that AMCA believes the proposed regulatory language is vague and open-ended and was intended to describe a "laboratory exhaust fan" without naming it. The 3,000-fpm discharge velocity with integral discharge nozzles appears to reference similar verbiage in ANSI/AIHA Z9.5, *Laboratory Ventilation*, and recommended exhaust velocities for safely exhausting contaminants without re-entrainment. It seems that laboratory exhaust fans would be considered safety fans regardless of exhaust velocity for the simple fact they service laboratories requiring numerous safety protocols for the protection of occupants and the surrounding area. AMCA, thus, believes the proposed regulatory language and supporting information indicate laboratory exhaust fans should be excluded and proposes using the term "laboratory exhaust fan." Additionally, AMCA recommends adding the ANSI/AMCA Standard 214-21 definition:

> "Laboratory exhaust fan" means a fan designed and marketed specifically for exhausting contaminated air vertically away from a building using a high-velocity discharge.

The rationale for removing Item 5 is that AMCA recognizes the spark-resistant-construction types defined in ANSI/AMCA Standard 99-16, *Standards Handbook*, are not consistent industry standards. exempting spark-resistant fans also is somewhat of a loophole in that a fan should be able to be designed to different types of spark-resistant construction with no impact on performance. For these reasons, AMCA recommends striking this item along with the ANSI/AMCA Standard 99-16 mention in the referenced-documents portion of this section.

~~ANSI/AMCA Standard 99-16~~ ~~Standards Handbook~~

AMCA's comment on CEC's proposed Item 6 (AMCA's Item 5) is as follows: The reference to UNE-EN 13463-1:2001, *Non-electrical equipment for use in potentially explosive atmospheres - Part 1: Basic method and requirements*, no longer is valid. The 2001 edition was replaced with the 2009 edition, and, later, the EN 13463 series of standards was replaced with a series of EN ISO 80079 standards. UNE-EN 13463-1 essentially was replaced with BS EN ISO 80079-36:2016, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements*. Additionally, AMCA found that BS EN 14986:2017, *Design of fans working in potentially explosive atmospheres*, seems to have the most relevant information about the characteristics of explosion-proof fans; however, that standard refers to BS EN ISO 80079-36:2016 for the correct way to mark explosion-proof fans. Because the proposed CEC definition of safety fans is concerned with marking only explosion-proof fans, BS EN ISO 80079-36:2016 is the correct citation.

The rationale for changing CEC's proposed Item 7 (AMCA's Item 6) is that an updated version of ANSI/AMCA Standard 240, *Laboratory Methods of Testing Positive Pressure Ventilators for Aerodynamic Performance Rating*, should be released in 2022, and AMCA believes it is best practice to refer to updated standards whenever possible. Additionally, to provide clarity regarding what "positive pressure ventilators" are, AMCA proposes adding the definition from ANSI/AMCA Standard 240-22:

> <u>"Positive pressure ventilator (PPV)" means a portable fan that can be positioned relative to an opening of an enclosure and cause it to be positively pressurized by discharge air velocity. It is principally used by firefighters to mitigate the effect of smoke and is also used to assist in inflating hot air balloons.</u>

SECTION 1604. TEST METHODS FOR SPECIFIC APPLIANCES.

Comment 1604.1

AMCA notes that this section references Section 1608(c)(1). AMCA asks CEC to amend 1608(c)(1) language requiring manufacturers to provide test reports when requested by the Commission to make "calculation reports" permissible as well, because the subject fan has a rating calculated in accordance with Annex E of ANSI/AMCA Standard 214. AMCA is unsure precisely how to word this change in regulatory language, but the intent of the proposed change in the language shown below is to allow calculation reports as applicable to how a fan was rated. Also, given that the Code of Federal Regulations (CFR) Section 429.144 gives manufacturers 30 days to respond to a "request of records" for a covered product, AMCA requests that CEC align its records-request provision with the CFR. Given the surge in Department of Energy (DOE) activity on its commercial/industrial fan rulemaking, it seems very likely that DOE will publish a federal test procedure before California's regulation takes effect. In this light, for fans, CEC alignment on records requests with CFR 429.124 seems reasonable. Additionally, most AMCA members that make fans are small companies. CEC's requirement for a 5-day response to the Executive Director's (ED) request for information regarding a potential non-compliance issue is not reasonable for general business evaluation, especially for small companies. First, the problem reporting needs to be received and funneled to the appropriate authority for evaluation. If any in the chain are out for vacation or otherwise occupied, a delay could happen. Then the authority would need to review the ED's report to ensure it is clear and understood. Subsequently, a review of the appropriate documents for the subject product would begin. For some companies, the fan products offered number in the thousands and some cases, the hundred thousand range, the quantity records are enormous. But even for small companies, the information then would need to be retrieved, reviewed, and processed for presentation to the ED's office in an official manner. Five-day response is not a reasonable timeframe for an official response, and we would strongly recommend the 30-day response time that the CFR provides to ensure the response has the quality necessary for a serious inquiry. If this were a problem of safety where there are life and death issues, then a rapid response would be more expected and reasonable.

Relevant excerpt from Section 1608(c)(1):

If the Executive Director includes with the request information that, in his or her opinion, constitutes substantial evidence that the appliance or the manufacturer is not in compliance with an applicable provision of this Article, or that the energy or water performance of the appliance is not as certified under section 1606(a)(3)(C) of this Article or is not as required by an applicable standard in section 1605.1, 1605.2, or 1605.3 of this Article, then the manufacturer shall provide a copy of the applicable test report to the Executive Director within ~~5 days~~ 30 days of the manufacturer's receipt of the request. If the subject product has ratings calculated from interpolations allowed by Section 1604, rather than ratings calculated from test data, a report documenting the calculations leading to the rating may be provided in lieu of a test report.

For informational convenience: Code of Federal Regulations: § 429.144 Records request.

(a) DOE must have reasonable belief a violation has occurred to request records specific to an on-going investigation of a violation of central air conditioner regional standards.

(b) Upon request, the manufacturer, private labeler, distributor, dealer, or contractor must provide to DOE the relevant records within 30 calendar days of the request.

(1) DOE, at its discretion, may grant additional time for records production if the party from whom records have been requested has made a good faith effort to produce records.

(2) To request additional time, the party from whom records have been requested must produce all records gathered in 30 days and provide to DOE a written explanation of the need for additional time with the requested date for completing the production of records.

Comment 1604.2

AMCA advises that the following editorial corrections to the referenced-documents portion of this section are needed:

Number	*Title*
…[… ~~(ANSI)~~	AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)"]

SECTION 1606. FILING BY MANUFACTURERS; LISTING OF APPLIANCES IN MAEDbS.

Comment 1606.1
AMCA requests changes to the table defining compliance filing parameters as specified below. Rationale is provided for each proposed change.

(AMCA-comment summary table below—note that the first two columns of the table in the regulatory language were removed for brevity.)

Required Information	Permissible Answers	Rationale
Fan type	Centrifugal housed, centrifugal inline, centrifugal unhoused, centrifugal PRV supply, centrifugal PRV exhaust, axial inline, axial PRV, inline mixed-flow, power roof/wall ventilators, axial panel, radial housed	(No change)
Fan impeller diameter (in.)		(No change)
Fan model number		This item is missing from the proposed regulatory language and is expected to be required. AMCA considers this to be the most important piece of information to identify a given fan product from another.
Motor model number (if fan is certified with a motor)		(No change)
Transmission	Direct, V-belt, synchronous-belt, flexible coupling, none	(No change)
Controller model number (if fan is certified with a controller)		(No change)
Maximum fan speed (RPM) at FEI = ≥ 1.00		To be clear, AMCA proposes replacing the "equal" sign (=) with "greater than or equal" sign (≥). This change is for alignment with ANSI/AMCA Standard 214-21 Annex H. If a fan's maximum speed is limited by the capacity of the installed motor or the structural strength of the fan's mechanical components, then the fan may reach its maximum pressure or its maximum airflow without FEI dropping as low as 1.00. The three duty points

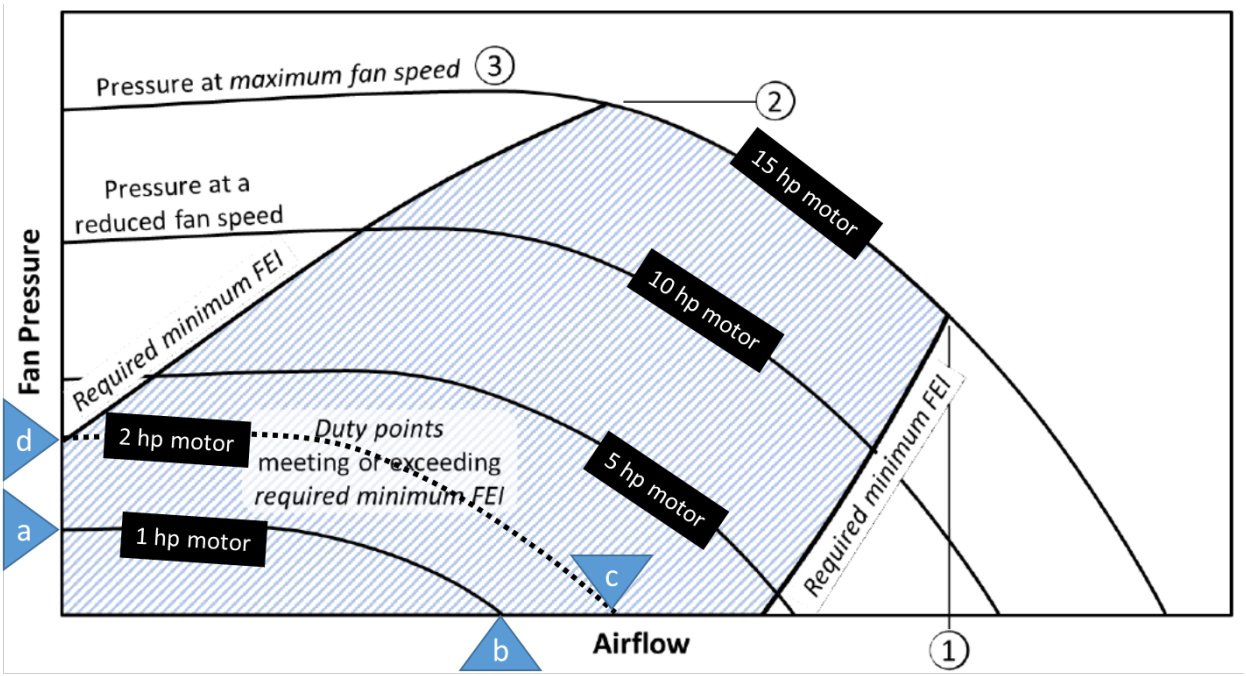
		describing the boundary for compliant operation, therefore, are defined as maximum fan pressure, maximum speed, and maximum airflow at FEI greater than or equal to 1.00. For further explanation, refer to Comment 1606.2 below.
Maximum pressure (inches water gauge) at FEI = ≥ 1.00		To be clear, AMCA proposes replacing the "equal" sign (=) with "greater than or equal" sign (≥). Please see the explanation for maximum fan speed (RPM) at FEI ≥ 1.00 in the cell above.
Maximum ~~compliant~~ air flow (SCFM) at FEI = ≥ 1.00		To be clear, AMCA proposes replacing the "equal" sign (=) with "greater than or equal" sign (≥). Please see the explanation for maximum fan speed (RPM) at FEI ≥ 1.00 in the cell above.
FEP_{act}	Tested, calculated	No change, but AMCA requests clarification from CEC on what the permissible answers "tested" and "calculated" mean.
Associated Series Tested Fan Model Number(s) (if calculated)	Fan product line and model, (N/A if tested)	AMCA recommends changing this field to allow for multiple inputs to support the ANSI/AMCA Standard 211-22 Annex H interpolation method as referenced in AMCA General Comment 2.
Alternative Brand and Brand model numbers		AMCA recommends adding this field because manufacturers often sell identical products under different brand names and with different brand model names/numbers. This would allow manufacturers to include alternate brand names and brand model names/numbers in the same database entry, bringing simplicity and transparency to the database.
Method of FEP_{act} determination	Section 6.1, 6.2, 6.3, 6.4, or 6.5 of the test method	(No change)
~~FEP_{ref} at FEI=1.0~~	~~Reference fan electrical power (kW)~~	AMCA recommends removing FEP_{ref} and FEP_{act} from the table because, for FEP_{ref} at FEI = 1.00, there is a range of operating conditions where FEI = 1.00 (i.e., a curve) that can exist. A single value of FEP_{ref} is not specified. Similarly, for FEP_{act} at FEI = 1.00, there is a range of operating conditions where FEI = 1.00 (again, a curve) that can exist. A single value of FEP_{act} is not specified. For further

		explanation, refer to comment 1606.3 below.
~~FEP_{act} at FEI=1.0~~	~~Actual fan electrical power (kW)~~	Please see the explanation in the cell above.

Comment 1606.2

The illustration below is derived from ANSI/AMCA Standard 214-21 Figure H.3. A certain fan is outfitted with motors of five different sizes: 1 hp, 2 hp, 5 hp, 10 hp, and 15 hp.

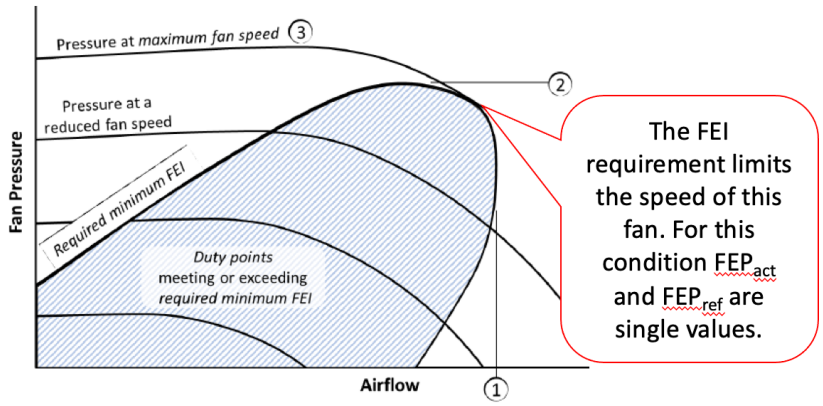
- All duty points of the fan with the 1-hp motor have an FEI higher than 1.00, even at shutoff (Duty Point a) and wide open (Duty Point b).
- For the fan with the 2-hp motor, only the shutoff Duty Point (d) has an FEI of exactly 1.00.



Definition of duty points with 15 hp motor	
1	Maximum airflow at FEI=1.00
2	Maximum pressure at FEI=1.00
3	Maximum fan speed at FEI≥1.00

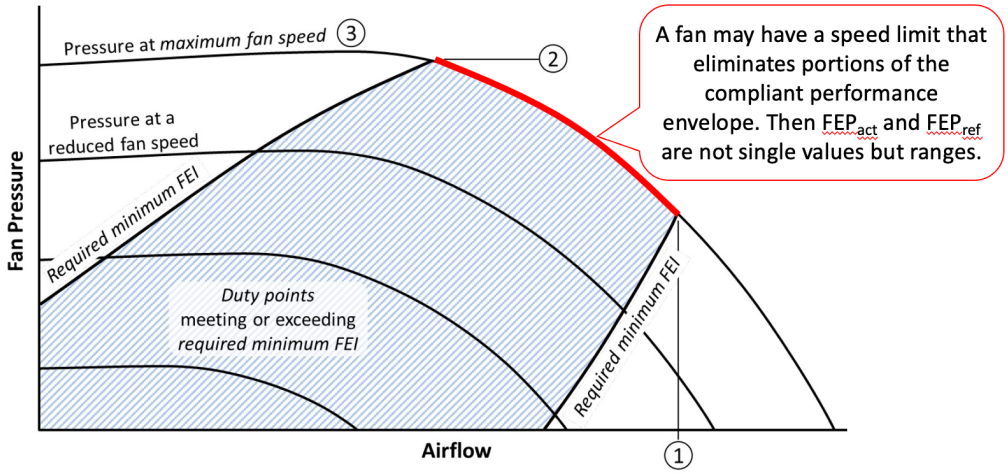
Comment 1606.3

Regarding the removal of FEP_{ref} and FEP_{act} at FEI=1.0 in the table above, the conditions are shown in the figures H.2 and H.4 taken from ANSI/AMCA Standard 214-21 Annex H and marked up below.



Definition of points	
1 -	Maximum airflow
2 -	Maximum pressure
3 -	Maximum fan speed
Note: These three points meet or exceed required minimum FEI	

Figure H.2 — Fans Offered for Sale Over a Continuous Range of Speeds Limited by Required Minimum FEI



Definition of points	
1 -	Maximum airflow
2 -	Maximum pressure
3 -	Maximum fan speed
Note: These three points meet or exceed required minimum FEI	

Figure H.3 — Fans Offered for Sale Over a Continuous Range of Speeds Limited by Reasons Other than the Required Minimum FEI (e.g., maximum structural speed)

SECTION 1607. MARKING OF APPLIANCES.

In what it believes is the clearest approach to commenting on this section, AMCA provides proposed changes to the regulatory language, followed by comments in support of the proposed changes.

RECOMMENDED CHANGES TO SECTION 1607. MARKING OF APPLIANCES.

§ 1607. Marking of Appliances.

[skipping (a) through (d)(15)]

(16) Commercial and Industrial Fans and Blowers. Each commercial and industrial fan and blower shall be marked with a legible and permanently fixed label, which may be in tabular form (as shown below):

(A) The label shall include the following information:

~~1. manufacturer name;~~

~~2~~1. brand name or brand code;

~~3~~2. model number;

~~4~~3. (serial number) or (date of manufacture or manufacturer date code);

~~5~~4. ~~FEP$_{ref}$ at FEI=1.0;~~

~~6~~5. maximum air flow (SCFM) at FEI ≥ 1.00;

~~7~~6. maximum fan speed (RPM) at FEI ≥ 1.00; and

~~8~~7. maximum fan pressure (inches water gauge) at FEI ≥ 1.00.

~~9.~~

(B) ~~No marketing or catalog information shall provide performance data for any duty point where the FEI is less than 1.0. Performance data provided to consumers shall be provided only for the operation of the fan where the FEI is equal or greater than 1.0.~~ Manufacturers shall clearly distinguish noncompliant fan selections from compliant fan selections in verbiage and/or graphics in printed or electronic catalogs and in search results and outputs associated with software for fan sizing, selection, or procurement online or installed on computers. Manufacturers, distributors, and retailers shall refrain from shipping noncompliant fans for installation in California regardless of where the buyer is located.

Comment 1607.1
Regarding striking the 'manufacturer name' – AMCA believes that providing the manufacturer name is not necessary when the brand name or brand code, along with the model number and the other labeling information listed, are provided. AMCA recommends this change because manufacturers often sell identical product under multiple brand names and with different brand model names/numbers. The brand name or brand code and the model number sufficiently identifies the product for the consumer, while simplifying the labeling requirement for the manufacturer.

Comment 1607.2
AMCA recommends adding "or manufacturer date code" to "date of manufacture" as an option to serial number. The format of dates of manufacture varies by manufacturer. Additionally, manufacturers often use date codes or integrate dates of manufacture into product serial numbers. "Date of manufacture" by itself is unclear. Allowing all forms of dating would improve clarity and ease compliance for the manufacturer. The current language is unclear regarding what formatting is acceptable and whether date codes are permitted. In combination with model number, either of these two values preclude the necessity of serial number

Comment 1607.3
AMCA recommends removing proposed Item 6 (FEP_{ref} at FEI = 1.0). FEP_{ref} is determined by ANSI/AMCA Standard 208 as a function of the selected flow and pressure. FEP_{ref} does not depend on the selected fan. The value of FEP_{ref} equals that of FEP_{act} if FEI equals 1.00.

Comment 1607.4
For clarity concerning proposed items 7-9, AMCA proposes replacing "=" with "≥". This change is for alignment with ANSI/AMCA Standard 214-21 Annex H. If a fan's maximum speed is limited by the capacity of the installed motor or by the structural strength of the fan's mechanical components, then the fan may reach its maximum pressure or its maximum airflow without FEI dropping as low as 1.00. The three duty points describing the boundary for compliant operation, therefore, are defined as maximum fan pressure, maximum speed, and maximum airflow at FEI greater than or equal to 1.00.

For further explanation and an illustration of this concept, refer to Comment 1606.2 above.

Comment 1607.5
AMCA notes generally that, while the CEC staff report details the requirement of more than one label, AMCA has confirmed with CEC staff that the information is outdated and that, for the proposed regulatory language, only one "permanent" label is needed, as described in Section 1607, Marking of Appliances.

Comment 1607.6
For illustrative purposes, Appendix 1 to these comments shows examples of nameplates currently used in industry practice and compares mockups of the CEC-proposed parameters and AMCA-proposed parameters for a nameplate. Regarding "permanent" labels, AMCA asks: Can manufacturers supplement their standard nameplate (Appendix 1.1) with a sticker with the remaining parameters required by CEC, or must manufacturers have all required marking data on a single metal nameplate or sticker?

Comment 1607.7
The proposed language in Part (B) prohibiting disclosure of fan-performance data for duty points where FEI is less than 1 needs to be reconsidered. As stated in the 2018 joint comments on the draft staff report:

> *Many fan suppliers also have selection software, which allows a user to input a design flow and pressure, and the software returns a list of potential selections. Today, the operating points shown in catalogs and the fan selections returned by software are typically limited only by the surge region and the fan's maximum speed (which is dependent on the structural integrity of the fan impeller). However, under the Energy Commission's proposed standards, the compliant operating range of a given fan will likely be smaller than the currently-advertised operating range. In order for the proposed standards to be effectively implemented, it is important that there be requirements regarding all fan performance representations in order to help ensure that purchasers are selecting fans that meet the standard at the design point.*
>
> *For all fan performance representations, we recommend that a supplier must clearly distinguish performance that meets the California standards and performance that does not.*

The proposed regulatory language goes much further to prohibit disclosure than it does to distinguish between compliant and non-compliant. The final draft of the staff report did not provide justification for the additional stringency. Because the comments did not anticipate higher-than-recommended stringency, there was little context as to why "distinguishing" would be preferred over "prohibiting." AMCA, thus, asks that the following rationale be considered toward softening the requirement.

ANSI/AMCA Standard 214 Figure H.1 illustrates performance of a fan which meets the required minimum FEI with only a portion of its fan curve. Depending on the fan model and speed, the portion of the fan curve could be large or it could be small. If the portion is small and the rest of the fan curve is not shown, it is impossible to judge where on the fan curve the portion lies.

An engineer typically expects to see an entire fan curve, even if the fan is offered for sale only in the portion above the required minimum FEI. The ability to see an entire fan curve allows an engineer to answer some important questions about the selection of a fan:

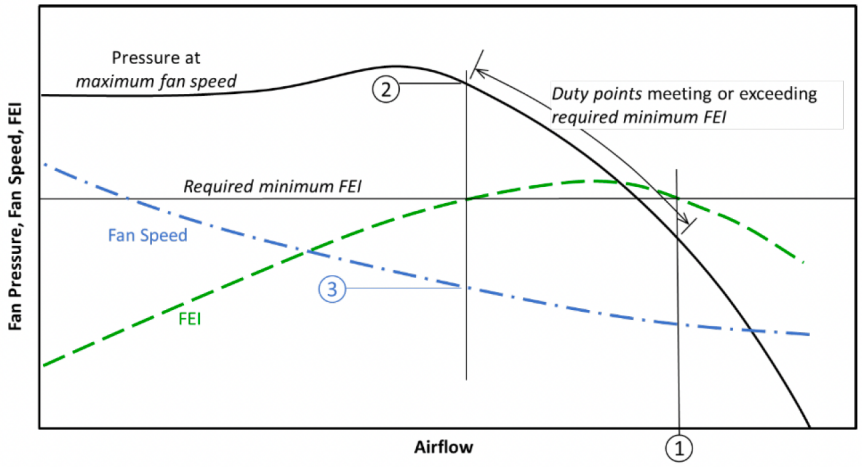
1. What is the maximum pressure the fan develops at shutoff (zero airflow)?
    - Determining the maximum design pressure of a damper.
    - Determining the maximum design pressure of the duct.

2. How close is the design operating point to the stall point?

    - If the installed operating pressure is greater than the design operating pressure, the fan could shift operation into stall, resulting in increased sound, unstable operation, or even catastrophic failure of the fan.

3. What is the maximum power the fan develops at the design speed?

    - Some fan types (forward-curved wheels, radial wheels, high-pitched axial fans) have their peak power at free air (zero pressure), which typically has a low FEI value. Motors often are selected at the maximum power on a fan curve.



Definition of points	
1 -	Maximum airflow
2 -	Maximum pressure
3 -	Maximum fan speed
Note: These three points meet or exceed required minimum FEI	

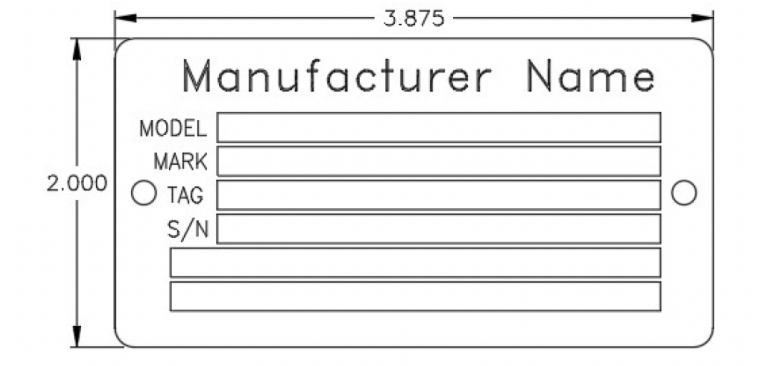
Figure H.1 — Fans Offered for Sale Only at Discrete Speeds (example shown has significant variation of speed with load)

Appendix 1 – Comparison of nameplates showing CEC-proposed nameplate and AMCA-proposed nameplate

The following images show current common manufacturer labels, current California Title 20 requirements, and requirements proposed by AMCA members. Dimensions (in inches) are provided for relative comparison of required label size.

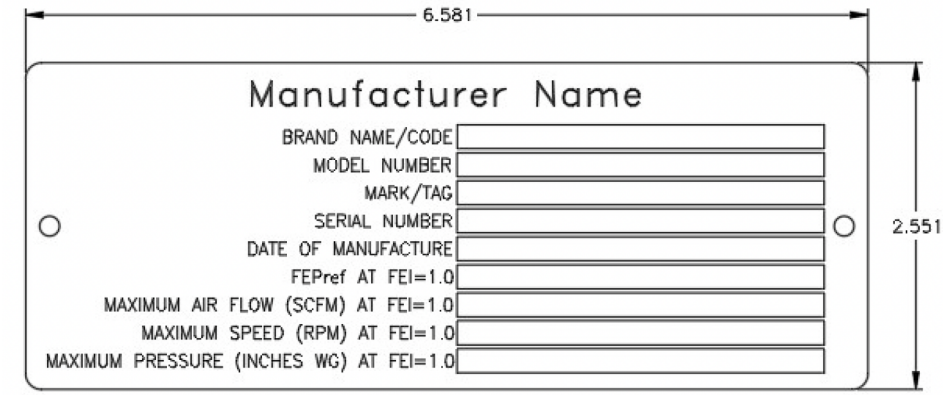
Appendix 1.1: Current Labeling Practice

The label below is representative of what commonly is used by manufacturers. Manufacturer date codes often are incorporated into the serial number or on the serial-number line. The unassigned lines on the label could be used for customer-specific information.



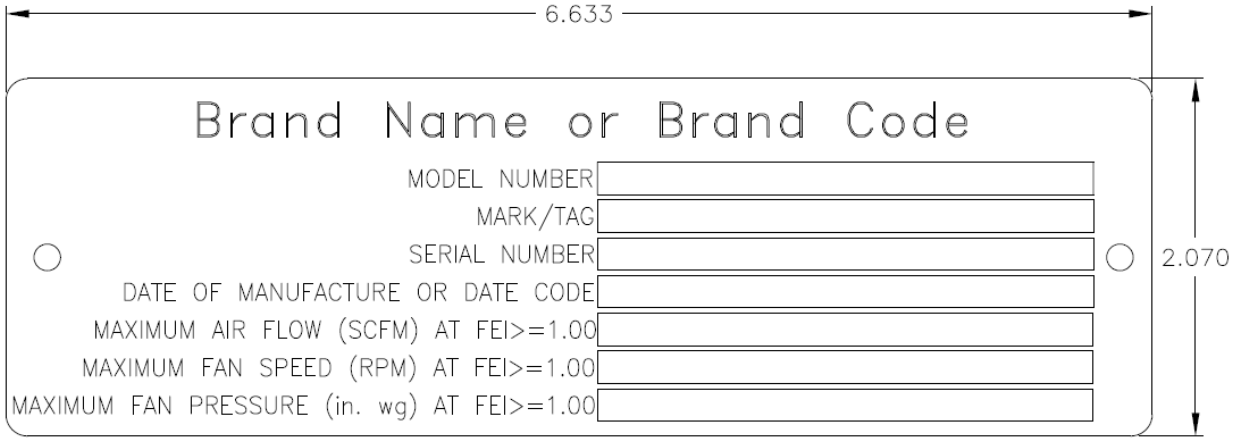
Appendix 1.2: Current California Title 20 Proposal

The label below is based on labeling requirements in the current proposed draft of California Title 20.



Appendix 1.3: AMCA Proposal

The label below is based on labeling requirements proposed by AMCA members. Date code could be incorporated into the serial-number line.



The following photographs show examples of nameplates on fans sold in the market today.


LISTED
IMPORTANT
IMPORTANT
GREENHECK
MODEL
MARK
SMART
AIR
PERFORMANCE