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AMCA Comments to CEC T20 proposed language changes for fans & blowers

Additional submitted attachment is included below.

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The International Authority on Air System Components Since 1917

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January 5, 2024

California Energy Commission

Docket Number: 22-AAER-04
Project Title: 2022 Amendments to the Appliance Efficiency Regulations
RE: TN# 253264; Document Title: Proposed Regulatory Language for Title 20 Update

Dear California Energy Commission:

On behalf of Air Movement and Control Association International (AMCA), please accept the comments attached to this letter as AMCA's public comments on the proposed regulatory language pertaining to commercial and industrial fans and blowers (CIFB).

AMCA commends the Commission for seeking to harmonize the Title 20 regulation for CIFB finalized in November 2022 with the final-rule test procedure for CIFB published by the U.S. Department of Energy (DOE) on May 1, 2023, and amended on Aug. 20, 2023.

AMCA is concerned the proposed language's "possible answers" for FEP_{act} in Table X do not include the reference to alternative efficiency-determination methods (AEDM) included in Footnote 3 of Title 20 Section 1604d Table D-3. As proposed, the possible answers are limited to 10 CFR Section 431.174 (Appendix A to Subpart J of Part 431) Table 1 (10 CFR Table 1) of the DOE test procedure.

Ten (10) CFR Table 1 references sections of ANSI/AMCA Standard 214, *Test Procedure for Calculating Fan Energy Index (FEI) for Commercial and Industrial Fans and Blowers*, manufacturers can use to calculate fan energy index (FEI). The DOE excluded the sections of ANSI/AMCA Standard 214 for fans tested without drives. As a result, manufacturers must include drives when testing fans or use an AEDM for FEP_{act}.

Given the reference to AEDM in Table D-3 of the proposed language, AMCA believes it is the intent of the CEC to allow AEDM for FEP_{act} for fans tested without drives. For clarity, AMCA proposes that AEDM be included in Table X as a possible answer for how FEP_{act} is calculated.

Thank you and best wishes.

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AMCA Comment to:
CEC Title 20, Section 1606. Filing by Manufactures; Listing of Appliances in the MAEDbS
Table X (per 22-AAER-04 submitted 11/20/2023 by CEC)

This comment concerns the bottom of the Table X excerpt (i.e., the last entry requirement for FEP_{act}) in Figure 1 below.

Table X Continued - Data Submittal Requirements

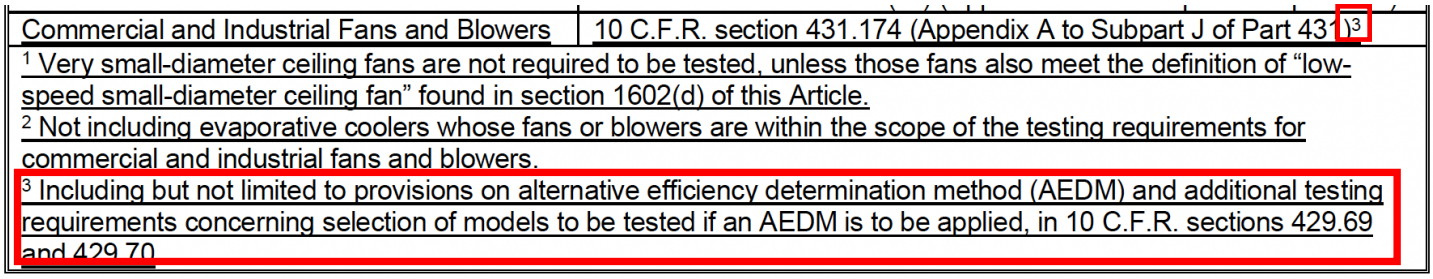
	Appliance	*Required Information*	*~~Permissible~~ Possible Answers*
D	Commercial and Industrial Fans and Blowers manufactured on or after ~~November 16, 2023~~ April 29, 2024	Fan type	Centrifugal housed, centrifugal inline, centrifugal unhoused, centrifugal PRV supply, centrifugal PRV exhaust, axial inline, axial PRV, inline mixed-flow, power roof/wall ventilators, axial panel, radial housed
		Fan impeller diameter (in.)	
		Type of Motor (if fans sold with a motor)	None, Single-phase induction, Polyphase induction, Synchronous DC (including ECM), Permanent magnet AC, or Other
		Motor nameplate horsepower (if fan sold with an induction motor) (hp)	
		Pressure type	S = Static pressure T = Total pressure
		Transmission type (if fan is sold with a transmission)	Direct, V-belt, synchronous-belt, flexible coupling, none
		Type of Controller (if fan sold with controller)	None, Variable frequency drive, or Other
		Maximum fan speed (RPM)	
		Airflow at maximum fan speed (CFM)	
		Pressure at maximum fan speed (inches water gauge)	
		FEP_{act} at maximum fan speed (kW)	
		FEP_{ref} at maximum fan speed (kW)	
		Maximum pressure (inches water gauge)	
		Airflow at maximum pressure (CFM)	
		Fan speed at maximum pressure (RPM)	
		FEP_{act} at maximum pressure (kW)	
		FEP_{ref} at maximum pressure (kW)	
		Maximum air flow (CFM)	
		Pressure at maximum airflow (inches water gauge)	
		Fan speed at maximum airflow (RPM)	
		FEP_{act} at maximum airflow (kW)	
		FEP_{ref} at maximum airflow (kW)	
		Is the model a Series tested fan?	Yes, No
		Associated Series Tested Fan Model Number (if not a series tested fan)	Fan product line and model, (Field is N/A if it is a Series tested fan)
		Method used to determine FEP_{act} of test method in section 1604(d)~~(2), (AMCA 214-21)~~ of this Article	~~Section 6.1, 6.2, 6.3, 6.4, or 6.5 of the test method in section 1604(d)(2), (AMCA 214-21)~~ Applicable section(s) of AMCA 214-21 per Table 1 of 10 C.F.R. section 431.174 (Appendix A to Subpart J of Part 431)

FIGURE 1. Excerpt of proposed changes to Table X on PDF Page 75 of the proposed regulatory language.

In a nutshell, the proposed regulatory language excludes the sections of ANSI/AMCA Standard 214 the DOE excluded from its test procedure in 10 CFR Section 431 (i.e., where a drive is not tested with a drive) and allow AEDM where the DOE allows AEDM for representations per 10 CFR Section 429. The CEC, however, references only the 10 CFR Section 431 method for calculating FEP_{act} in Table X of Section

1606, *Filing by Manufacturers; Listing of Appliances in the MAEDbS*; the AEDM allowance is in Section 1604, *Test Methods for Specific Appliances*. Omitting AEDM from Table X will confuse manufacturers to the point they may not realize AEDM are allowed.

More explicitly, the proposed regulatory language in Table X references only Table 1 of 10 CFR Section 431.174 (Appendix A to Subpart J of Part 431[1]) as a possible answer to how FEP_{act} is calculated. CFR Table 1 does not include usage of an AEDM. Elsewhere in the CFR, the DOE allows AEDM per 10 CFR sections 429.69 and 429.70. The CEC picks this up as Footnote 3 of Section 1604d Table D-3, *Testing Requirements for the Following Appliances*, as shown below in Figure 2.



Commercial and Industrial Fans and Blowers	10 C.F.R. section 431.174 (Appendix A to Subpart J of Part 431)[3]

[1] Very small-diameter ceiling fans are not required to be tested, unless those fans also meet the definition of "low-speed small-diameter ceiling fan" found in section 1602(d) of this Article.
[2] Not including evaporative coolers whose fans or blowers are within the scope of the testing requirements for commercial and industrial fans and blowers.
[3] Including but not limited to provisions on alternative efficiency determination method (AEDM) and additional testing requirements concerning selection of models to be tested if an AEDM is to be applied, in 10 C.F.R. sections 429.69 and 429.70

FIGURE 2. Excerpt from Table D-3, PDF Page 31 of proposed language.

AMCA believes this important and unprecedented allowance of AEDM in Title 20 needs to be included in Table X as a possible answer for how FEP_{act} is calculated; otherwise, manufacturers may now know that AEDM are allowed.

Recommendations for Table X, FEP_{act} "Possible Answers"

AMCA proposes "AEDM" be listed as a possible answer in Table X, as highlighted in yellow below:

> Applicable Section(s) of AMCA 214-21 per Table 1 of 10 CFR Section 431.174 (Appendix A to Subpart J of Part 431) or AEDM per 10 C.F.R. sections 429.69 and 429.70.

[1] For brevity, Table 1 of 10 CFR Section 431.174 (Appendix A to Subpart J of Part 431) is simplified as "10 CFR Table 1."

CFR Table 1 to Appendix A to Subpart J of Part 431

Driver	Motor controller present?	Transmission configuration?	Test method	Applicable section(s) of AMCA 214–21
Electric motor	Yes or No	Any	Wire-to-air	6.1 "Wire-to-Air Testing at the Required Duty Point".
Electric motor	Yes or No	Any	Calculation based on Wire-to-air testing	6.2 "Calculated Ratings Based on Wire to Air Testing" (references Section 8.2.3, "Calculation to other speeds and densities for wire-to-air testing," and Annex G, "Wire-to-Air Measurement—Calculation to Other Speeds and Densities (Normative)").
Regulated polyphase motor	No	Direct drive, V-belt drive, flexible coupling or synchronous belt drive	Shaft-to-air	6.4 "Fans with Polyphase Regulated Motors," (references Annex D, "Motor Performance Constants (Normative)" *.
None or non-electric	No	None	Shaft-to-air	Section 6.3, "Bare Shaft Fans".
Regulated polyphase motor	No	Direct drive, V-belt drive, flexible coupling or synchronous belt drive	Calculation based on Shaft-to-air testing	Section 8.2.1, "Fan laws and other calculation methods for shaft-to-air testing"(references Annex D, "Motor Performance Constants (Normative)," Annex E, "Calculation Methods for Fans Tested Shaft-to-Air," and Annex K, "Proportionality and Dimensional Requirements (Normative)").
None or non-electric	No	None	Calculation based on Shaft-to-air testing	Section 8.2.1, "Fan laws and other calculation methods for shaft-to-air testing" (references Annex E, "Calculation Methods for Fans Tested Shaft-to-Air," and Annex K, "Proportionality and Dimensional Requirements (Normative)").

* Excluding Section 6.4.1.4, "Requirements for the VFD, if included" and Section 6.4.2.4, "Combined motor-VFD efficiency."

FIGURE 3. CFR Table 1 in Appendix A to Subpart J of Part 431, with red-box annotations to show the exclusion of ANSI/AMCA Standard 214 Section 6.4.2.4.