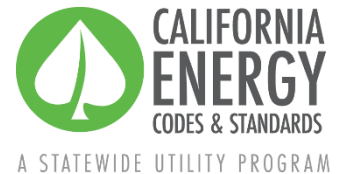


Proposal Summary



2022 California Energy Code (Title 24, Part 6)

Air Distribution – Fan Energy Index

Updated: March 6, 2020

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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that will be discussed during a utility-sponsored stakeholder meeting on March 12, 2020. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com.

Measure Description

This measure proposes to implement a new efficiency metric for certain fans in the Title 24, Part 6 code language by requiring certain fans meet a minimum Fan Energy Index (FEI) at the design conditions. This measure is based largely on the recently adopted Addendum AO to ASHRAE Standard 90.1-2016 and requires each fan and fan array that is not part of a manufactured assembly (i.e., stand-alone fans) greater than 1.0 hp or with a combined fan nameplate electrical input power greater than 0.89 kW to have an FEI of 1.00. The FEI is an efficiency metric created by the Air Movement and Control Association (AMCA), an organization that sets standards for commercial and industrial air movement equipmentⁱ. The metric and subsequent standards to develop FEI ratings have been pursued in collaboration with the Department of Energy and energy efficiency advocates, which started during a now-stalled federal rulemaking to develop commercial and industrial fan efficiency standards. FEI addresses a longstanding problem in characterizing fan efficiency; a fan's peak efficiency is often poorly correlated with its actual efficiency in typical operating conditionsⁱⁱ. The FEI metric is an easy method to encourage mechanical designers to make fan selections closer to a fan's peak efficiency, where the higher the FEI, the less energy is consumed.

The FEI component of this measure will be mandatory and will only apply to new construction, not alterations or additions. This measure will not require changes to the ACM and the compliance software.

Draft Code Language

The proposed changes to the Standards and Reference Appendices are provided below. Changes to the 2019 documents are marked with red underlining (new language) and ~~strikethroughs~~ (deletions).

New Definitions

fan array: multiple fans in parallel between two plenum sections in an air distribution system.



fan nameplate electrical input power: the nominal electrical input power rating stamped on a fan assembly nameplate.

fan energy index (FEI): the ratio of the electric input power of a reference fan to the electric input power of the actual fan as calculated per AMCA 208 at fan system design conditions.

fan system electrical power: the sum of the fan electrical power of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the conditioned spaces and/or return it to the source or exhaust it to the outdoors.

Fan system design conditions: operating conditions that can be expected to occur during normal system operation that result in the highest supply airflow rate to or from the conditioned spaces served by the fan system.

Standards

SECTION 120.10 – MANDATORY REQUIREMENTS FOR FANS

Each fan or fan array with a combined motor nameplate horsepower greater than 1.0 hp or with a combined fan nameplate electrical input power greater than 0.89 kW shall have a fan energy index (FEI) of 1.00 or higher at fan system design conditions. The FEI for fan arrays shall be calculated in accordance with AMCA 208 Annex C.

Where:

- All FEI values shall be provided by a manufacturer or third party.

EXCEPTION 1 to Section 120.10. Fans that are part of equipment listed under Section 110.2 (Mandatory Requirements for Space Conditioning Equipment)

EXCEPTION 2 to Section 120.10. Embedded fans and fan arrays with a combined motor nameplate horsepower of 5 hp or less or with a fan system electrical input power of 4.1 kW or less.

EXCEPTION 3 to Section 120.10. Ceiling fans.

EXCEPTION 4 to Section 120.10. Fans that are intended to only operate during emergency conditions

EXCEPTION 5 to Section 120.10. Does not apply to additions or alterations

ⁱ ANSI/AMCA Standard 208-2018- Calculation of the Fan Energy Index: <https://www.amca.org/publications-and-standards/standards/ansi/amca-standard-208-18-calculation-of-the-fan-energy-index.html>

ⁱⁱ Learn more about FEI:

- <https://www.amca.org/advocate/energy-efficiency/about-fan-energy-index/>
- <https://www.online.colostate.edu/brochures/amca/fan-energy-index-brief/>
- http://www.nxtbook.com/nxtbooks/ashrae/ashraejournal_amca_2018fall_v2/index.php#/1