

DOCKETED

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Test Results Related to Residential Fan Efficacy Recommendation

Additional submitted attachment is included below.

Test Results Related to Residential Fan Efficacy Recommendation

California Statewide Utility Codes and Standards Team

November 10, 2017

The Codes and Standards Enhancement (CASE) initiative presents recommendations to support California Energy Commission's (Energy Commission) efforts to update California's Building Energy Efficiency Standards (Title 24, Part 6) to include new requirements or to upgrade existing requirements for various technologies. The four California IOUs – Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Edison, and SoCalGas® – and two Publicly Owned Utilities (POUs) – Los Angeles Department of Water and Power and Sacramento Municipal Utility District – sponsored this effort. The Statewide CASE Team appreciates the opportunity to participate in the 2019 Title 24, Part 6 code development processes.

In the Residential Quality HVAC Measures CASE Report, the Statewide CASE Team recommended reducing the residential maximum fan efficacy requirement from 0.58 watts per cubic foot per minute (W/cfm) to 0.45 W/cfm. In support of this proposal, the Statewide CASE Team, in collaboration with Pacific Gas and Electric Company's Applied Technology Services (ATS) laboratory has tested ten furnaces equipped with fans that are driven by electronically communicated motors (ECMs). The objective of the testing was to determine if, using industry standard methods of installation and good practice, furnaces that meet the federal Fan Efficacy Rating standard will also comply with the proposed 2019 Title 24, Part 6 fan efficacy requirement of 0.45 W/cfm. To do this, the furnaces were tested at multiple speed settings over a range of external static pressures to determine W/cfm as well as calculating cfm per ton and applying the federal test procedure to furnaces that failed the 350 cfm/ton airflow test.

The results showed that all but one furnace maintained efficacies below 0.45 W/cfm at all tested speeds and at an external static pressure of 0.7 inch water column (inch w.c.). Test data from the furnace that did not meet the proposed Title 24, Part 6 efficacy standard at its highest speed settings was evaluated using the federal test procedure, and it was found to exceed the maximum allowable federal Fan Efficacy Rating requirements for its product class. The test results support the Statewide CASE Team's recommendation that 0.45 W/cfm is readily achievable from products that are on the market today. Additionally, 75 percent of tested furnace/flow combinations would meet the proposed 0.45 W/cfm requirement even at 1.0 inch w.c. flow resistance. This indicates that many furnaces will still meet the requirement even in installations with poorly designed ducting systems and high flow resistances, further supporting the CASE Report standard enhancement recommendation.

Appendix D of the Residential Quality HVAC Measures CASE Report has been updated to include the full furnace fan testing report and is available here: http://title24stakeholders.com/wp-content/uploads/2017/11/2019-T24-CASE-Report_Res-Quality-HVAC_Final_November-2017.pdf.

Heat pump air handlers are not covered by the federal standard, but the Statewide CASE Team recommends that the same 0.45 W/cfm limit also apply to heat pumps. Testing of several heat pump air handlers is underway, and results will be included as another appendix to the Residential Quality HVAC Measures CASE Report as soon as the testing is finished.