



May 12, 2017

VIA EMAIL

Abigail Daken
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Jacob Bayus
ICF
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RE: ENERGY STAR Program Requirements Product Specification for Residential Ceiling Fans – Eligibility Criteria Draft 1 Version 4.0

Dear ENERGY STAR Team:

Delta T Corporation, dba Big Ass Solutions, thanks the EPA and ICF for the opportunity to comment on the Draft 1 of the Version 4.0 Proposal. Big Ass Solutions supports the EPA in its effort to establish eligibility criteria and identify products with superior energy efficiency for the benefit of businesses and individuals.

Lines 22-23 - Definitions Section E. Ceiling Fan Efficiency: The ratio of the total airflow to the total power consumption, in units of cubic feet per minute per watt (CFM/W).

The way the definition is phrased can be misleading to a consumer as the old airflow efficiencies were at specific speeds (high, medium, low). Big Ass Solutions believes this should be clarified to indicate when a value is an average value or is at a specific operating speed. For example, average airflow versus airflow at high speed.

Lines 37-39 – Definitions Section I. Controls: Controls enable the user to turn on/off or adjust the lighting and fan movement (i.e. fan speed and airflow direction). Controls may be in the form of pull chain, slide switch, wall switch/panel, and/or remote control.

As consumer demand increases for wirelessly connected home devices including ceiling fans, Big Ass Solutions recommends that ceiling fan accessibility to smart phone application based control functionality be considered and/or classified as a remote control.



Line 144 Table 1. Ceiling Fan Airflow Efficiency Requirements

Ceiling Fan Type	Minimum Efficiency [†] (cfm/W)	Minimum High Speed Airflow [†] (cfm)	Test Method & Supplemental Testing Guidance
Standard Ceiling Fan	$\geq 2.63 * D - 26.83$	$\geq 21.88 * D + 3096$	10 CFR Part 430, Subpart B, Appendix U Products shipped with ceiling fan light kits shall be tested with those light sources mounted in their intended position and switched off.
Low-Mount HSSD Ceiling Fan	$\geq 2.63 * D - 26.83$	$\geq 21.88 * D + 3096$	
Hugger Ceiling Fan	$\geq 1.75 * D - 15$	$\geq 17.87 * D + 2456$	

[†]D represents the fan blade span in inches

Big Ass Solutions supports requirements for increased ceiling fan airflow efficiency. Additionally, creating a Minimum High Speed Airflow requirement assures the customer a minimum amount of utility from the ceiling fan. Per the below ENERGY STAR table, current Minimum High Speed Airflow required for a ceiling fan is 5,000 CFM, regardless of blade span.

Criteria for ENERGY STAR Certified Ceiling Fans – Minimum Efficacy Levels

Airflow (cfm)	Minimum Efficacy Level (cfm/W)
Low	At low speed, fans must have a minimum airflow of 1,250 CFM* and an efficiency of 155 cfm/W.
Medium	At medium speed, fans must have a minimum airflow of 3,000 CFM* and an efficiency of 100 cfm/W.
High	At high speed, fans must have a minimum airflow of 5,000 CFM* and an efficiency of 75 cfm/W.

When this minimum airflow criteria was written, most ceiling fans had a blade span less than or equal to 56 inches. Since then, residential ceiling fans with a blade span of up to 84 inches have been introduced into the marketplace. For these increased blade span, residential ceiling fans, the proposed minimum high speed airflow requirement is too low and will allow a significant reduction in utility to the end user. The table below compares the EPA proposed minimum to the average airflow in the CEC database for fans of the listed diameter (blade span). Consequently, this would allow a reduction in utility of nearly 50% before the fan would be disqualified.

Table 1 – EPA Minimum vs CEC Average Performance (Non-Hugger Fans)

Fan Diameter (inches)	EPA Proposed Minimum Airflow (CFM)	Average Airflow in CEC database
70	4628	7984
72	4671	8738
84	4934	9748



Big Ass Solutions strongly recommends that the minimum high speed airflow requirement be increased so that customer utility can be maintained across all blade spans of residential ceiling fans. A more reasonable minimum airflow to assure consumer utility at all blade spans would be the greater of 3100 CFM or $130 \cdot D - 1850$.

Lines 237-241 - 4.1 Wired and Remote Controls: Certified products that offer wireless remote signal control must provide at least one hard-wired (i.e., wall-mounted switch or readily accessible pull chain) control as a backup in case of wireless signal failure. For those residential ceiling fans that can accommodate ceiling fan light kits, the lights and the fans shall be able to be controlled separately, allowing users to switch off lights during fan operation or operate the lights without using the residential ceiling fan.

Big Ass Solutions strongly recommends ENERGY STAR make a distinction in the application of this requirement in that it differentiates between ceiling fans with DC powered motors and those that have AC powered motors. An issue with applying this requirement to DC powered ceiling fans is due to the lack of a universally compatible hard-wired control option that can reliably execute the full range of each ceiling fans functionality.

Big Ass Solutions supports back-up control options and recommends multiple wireless technologies be permitted as alternative solutions for potential primary control signal failure. This includes but is not limited to WI-FI and IR control connectivity.

Lines 334-335 5. Minimum Warranty: Certified ceiling fans shall provide a warranty of at least 10 years for the motor and associated driver electronics and at least one year for all other non-lighting components of certified residential ceiling fans.

Historically ENERGY STAR compliant ceiling fans have been supplied with a mandatory 30 year warranty, however no such extended warranty has been applied to associated electronic controls. It is common in the marketplace for ceiling fans to be controlled by electronic "solid-state" speed control circuits supplied by the fan manufacturer as accessories. Customers benefit from the use of remote controls for increased convenience and many offer additional features such as an increased number of speed settings and light dimming, however these controllers are currently sold with only a 1 year limited warranty and it seems an unreasonable risk to the consumer to carry such a wide spread of warranties on mechanical & electronic parts.

Big Ass Solutions supports the inclusion of electronics into warranty provisions for DC ceiling fans provided this is benchmarked against similar equipment available on the market. Electronic inverter driven refrigeration HVAC compressors are now commonplace in residential



applications and are typically supplied with a baseline 5 year limited warranty on both compressor and other parts. As DC ceiling fans are a similar category of household air-moving equipment it is appropriate that similar warranty provisions should apply.

Big Ass Solutions supports the 10 year warranty for motors, but proposes that associated electronic control be limited to 5 year warranty only. This provides customers with all the benefits of electronics controls, plus energy efficiency, with a substantial improved warranty over existing market products.

As an industry stakeholder, Big Ass Solutions greatly appreciates the opportunity to provide these comments for your review.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Sawyer', with a stylized flourish at the end.

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