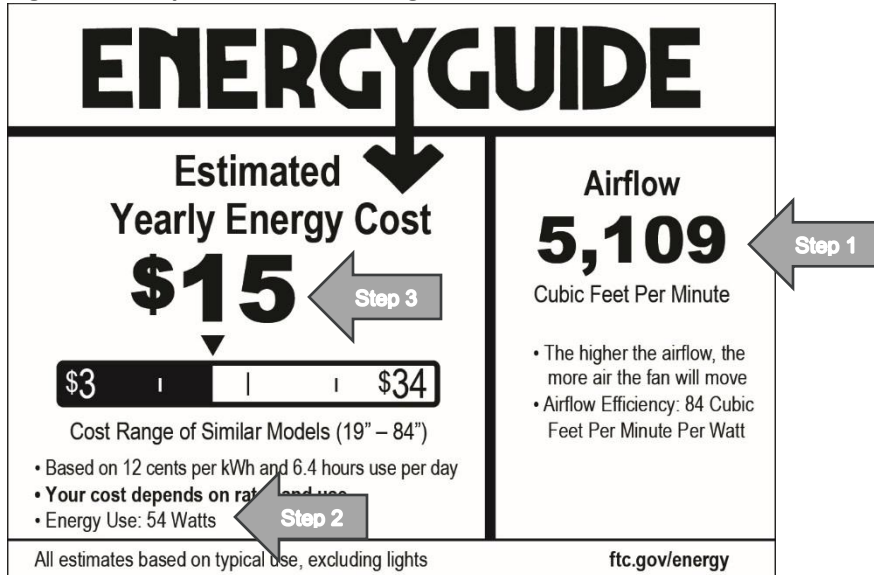


U. S. Department Of Energy
Guidance

Methodology Of Calculating Values As Required By The FTC EnergyGuide Based On Measurements Taken In Accordance With Appendix U To Subpart B Of 10 CFR Part 430—Uniform Test Method For Measuring The Energy Consumption Of Ceiling Fans

Figure 1: Sample Label 17 - Ceiling Fan



Step 1. Manufacturers should use the airflow measurements from testing, conducted in accordance with the DOE ceiling fan test procedure at 10 CFR part 430, subpart B, Appendix U and 10 CFR 429.11 (which specifies a sample of at least two ceiling fans), in the following equation to calculate the weighted-average airflow, CFM_{ave} , on the FTC EnergyGuide label (Step 1 in Figure 1):

$$CFM_{ave} = \frac{CFM_{Low} \times OH_{Low} + CFM_{High} \times OH_{High}}{OH_{Low} + OH_{High}}$$

Where:

- CFM_{Low} = mean of sample of measured airflow, in cubic feet per minute (CFM), at low fan speed,
- CFM_{High} = mean of sample of measured airflow, in cubic feet per minute (CFM), at high fan speed,
- OH_{Low} = average daily operating hours at low fan speed, from Table 3 of Appendix U to Subpart B of 10 CFR Part 430, and
- OH_{High} = average daily operating hours at high fan speed, from Table 3 of Appendix U to Subpart B of 10 CFR Part 430.

Note:

- Section 3.3 of Appendix U to Subpart B of 10 CFR Part 430 sets forth the procedures for measuring airflow at low and high speed.
- Table 3 to Appendix U to Subpart B of 10 CFR Part 430 provides the average daily operating hours corresponding to high and low speed for low-speed, small-diameter (LSSD) ceiling fans.
- OH_{Low} and OH_{High} add up to the 6.4 hours of use per day specified by the FTC EnergyGuide label.
- CFM_{ave} should be rounded to the nearest whole number.

Step 2. Manufacturers should use the power consumption measurements from the test in the following equation to calculate the weighted-average power consumption, W_{ave} , to use as the “Energy Use” value on the FTC EnergyGuide label (Step 2 in Figure 1):

$$W_{ave} = \frac{W_{Low} \times OH_{Low} + W_{High} \times OH_{High} + W_{Sb} \times OH_{Sb}}{OH_{Low} + OH_{High}}$$

Where:

- W_{Low} = mean of sample of measured power consumption, in watts, at low fan speed,
- W_{High} = mean of sample of measured power consumption, in watts, at high fan speed,
- W_{Sb} = mean of sample of measured power consumption, in watts, in standby mode,
- OH_{Low} = average daily operating hours at low fan speed, from Table 3 of Appendix U to Subpart B of 10 CFR Part 430,
- OH_{High} = average daily operating hours at high fan speed, from Table 3 of Appendix U to Subpart B of 10 CFR Part 430, and
- OH_{Sb} = average daily operating hours in standby mode, from Table 3 of Appendix U to Subpart B of 10 CFR Part 430.

Note:

- Section 3.3 of Appendix U to Subpart B of 10 CFR Part 430 sets forth the procedures for measuring the power consumption at the high and low speed settings, as well as in standby mode (if applicable).
- Table 3 to Appendix U to Subpart B of 10 CFR Part 430 provides the time spent in standby mode for those LSSD fans with standby mode power consumption.
- If a ceiling fan does not have any standby power consumption, $W_{Sb} = 0$.
- W_{ave} should be rounded to the nearest whole number.

Example Weighted-Average Power Calculation: The table below contains the relevant operating hours information for all LSSD ceiling fans and mean power data for an example LSSD ceiling fan. An example weighted-average power calculation is provided for the case when the ceiling fan does have standby mode power consumption and when the ceiling fan does not have standby mode power consumption.

Table 1. Test sample

Setting	Example Mean Power (W)	Average Daily Operating Hours (OH) From Table 3 to Appendix U to Subpart B of 10 CFR Part 430
High	73.5	3.4
Low	13.1	3.0
Standby	0.7 with standby, 0.0 without	17.6

Weighted-Average Power with Standby = 47 watts
Weighted-Average Power without Standby = 45 watts

Step 3. Manufacturers should calculate the “Estimated Yearly Energy Cost” (*EYEC*) on the FTC EnergyGuide label (Step 3 in Figure 1) using the following equation:

$$EYEC = \frac{W_{Low} \times OH_{Low} + W_{High} \times OH_{High} + W_{Sb} \times OH_{Sb}}{1000} \times 365 \times 0.12$$

Where:

The variable designations are the same as in Step 2.

Note:

- \$0.12/kWh is the cost of energy specified for the FTC EnergyGuide label (16 CFR 305.13).
- *EYEC* should be rounded to the nearest whole number.

Example Estimated Yearly Energy Cost Calculation: Using the same ceiling fan example mean power data provided in Table 1, the resulting annual energy costs are as follows:

Annual Energy Cost with Standby = \$13
Annual Energy Cost without Standby = \$13