

Energy Efficient Homes: Ceiling Fans¹

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Quick Facts

- Ceiling fans are appliances wrapped decoratively with unique housings in a variety of finishes, and they often feature furniture grade blades and accessories.
- In the summer, a ceiling fan can allow you to raise your thermostat setting by 4°F without feeling a difference in your comfort.
- Most ceiling fans even help in the winter by being operated in reverse and forcing warm air near the ceiling down into your occupied area.
- Ceiling fan/light combo kits that have earned the ENERGY STAR® label are about 50% more efficient than conventional fan/light units.

Terms to Help You Get Started

- **Downrod:** Extension rod that allows you to set the fan at the proper height from your ceiling for optimum performance
- **CFM:** Cubic Feet per Minute
- **CFM/watt:** Cubic Feet per Minute/watt measures air flow efficiency for ceiling fans; the higher the number, the more efficient the unit.
- **UL:** Underwriters Laboratories

Can ceiling fans lower my utility bill?

One of the myths about ceiling fans is that they lower the temperature in a room. Actually, ceiling fans do not lower room temperature. However, they do create a breeze, making room occupants feel cooler and more comfortable. With a ceiling fan running, you can raise your thermostat setting by up to four degrees during the cooling season with no reduction in comfort. Increasing the room temperature by even two degrees can cut your cooling costs by at least 4%–6%, and in some cases by as much as 8%.

Should I leave ceiling fans running all the time?

No, because fans cool people, not rooms. Ceiling fans are less costly than air conditioning, but they still use electricity. Running several fans 24 hours a day can add up quickly, especially if no one is home to benefit from them. Run the fan only when someone is in the room.

What features should I consider? Correct Sizing

For maximum efficiency, choose a ceiling fan that is the right size for the room. See Table 1 for the guidelines suggested by the American Lighting Association:

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Table 1. Fan Sizes Suggested by the American Lighting Association

Room Size (in ft ²)	Suggested Fan Size (diameter)
Small (Up to 75 ft ²)	29–36"
Medium (Up to 144 ft ²)	36–42"
Large (Around 225 ft ²)	50–54"

Motors

To ensure long life and quiet operation, purchase fans with motor housings constructed with heavier materials, such as die-cast metal. These models tend to produce less vibration and provide better stability for downrods. Also look for models with heavy-duty windings, precision-engineered ball bearings, and shock-absorbent internal components.

Performance-grade fans are designed for continuous, quiet operation. They use larger, more powerful motors, and are generally the most expensive models. Medium-grade models are designed to run 12 hours or less per day, and economy models are designed to run 8 hours or less per day. You will have to do some research to determine fan grades. Check manufacturer's websites for information.

Motors come either with sealed and lubricated ball bearings, which require little or no maintenance, or with bearings that operate in an oil bath, which will occasionally require you to add oil.

Three-speed motors are recommended for maximum comfort. Most fans (and all ENERGY STAR®-qualified models) can reverse direction via a switch on the housing, so that they can move warm air (which rises up to the ceiling) down into the room during the winter.

Blades

Blades should be sealed or finished to prevent moisture-caused damage such as warping, peeling, or tarnishing, especially if the fan will be used in a high-humidity situation. More blades do not necessarily move more air. The pitch (angle of the fan's blades), balance of the blades, length of the blades, motor design, motor speed, number of blades, etc., are all important in determining how much air a fan can move.

Sound

Try the fan out in the store using all settings to determine how loud it is. If it is too noisy, try a different brand, or a model with blades made of a different material.

Can I install a ceiling fan in any room?

The Energy Efficiency and Renewable Energy (EERE) program at the U.S. Department of Energy indicates that for best performance, ceiling fans should only be installed in rooms where ceilings are 8 feet or higher. They also recommend installing ceiling fans so that the blades are no less than 8 inches from the ceiling and at least 18 inches from any given wall (Figure 1).

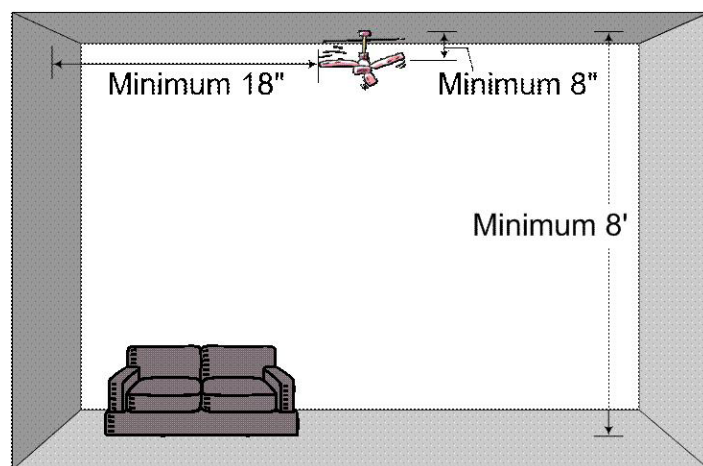


Figure 1. Minimum space requirements for a ceiling fan installation recommended by the U.S. Department of Energy.

Credits: Image created by Hyun-Jeong Lee in Microsoft Office Visio. Converted to .GIF by IFAS Communication Services.

Do fan/light combination units save energy?

Fan/light units labeled with the ENERGY STAR® logo (Figure 2) are about 50% more efficient than standard fan/light units. This can save you \$15 per year on utility bills (in addition to the heating and cooling savings gained by using the fan properly, as described earlier). Note ENERGY STAR® ceiling fan specification standards at the end of this document that became effective April 1, 2012.

Lights can also be purchased separately as an add-on to a ceiling fan. Most fans accept add-on light kits, though a number of them are only compatible within brands. Check the package for compatibility information.

Can I use a fan in damp areas?

If you're installing a fan in a bathroom or other humid location, make sure it is UL-listed with a "damp" rating. If you are mounting a fan where it may come into direct

contact with water (e.g., a porch or patio), be sure it has a UL “wet” rating. These fans have features such as sealed or moisture-resistant motors, rust-resistant housings, stainless steel hardware, and all-weather blades (ENERGY STAR®, n.d.a).

What are the current ENERGY STAR® ceiling fan specifications?

The following ENERGY STAR® ceiling fan specifications became effective April 1, 2012 (http://www.energystar.gov/index.cfm?c=ceiling_fans.pr_crit_ceiling_fans):

Equipment	Specification
Ceiling Fans	<p>Specification defines residential ceiling fan airflow efficiency on a performance basis: CFM* of airflow per watt of power consumed by the motor and controls. Efficiency is measured on each of 3 speeds.</p> <p>At low speed, fans must have a minimum airflow of 1,250 CFM* and an efficiency of 155 CFM/Watt.</p> <p>Qualifying ceiling fan models must come with a minimum 30-year motor warranty; one-year component(s) warranty; and a 2-year light kits warranty.</p> <p>At high speed, fans must have a minimum airflow of 5,000 CFM* and an efficiency of 75 CFM/Watt.</p> <p>Integral or Attachable lighting, including separately sold ceiling fan light kits, must meet certain requirements of the Residential Light Fixtures (RLF) specification. See the Qualified Product Information (QPI) form for specific requirements.</p>

To help you evaluate different ceiling fans for purchase, click on the savings calculator link at http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CF.



Figure 2. Sample ENERGY STAR® logo for use on qualified products only.

Credits: Courtesy of <http://www.energystar.gov>.

References and Resources

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