

CEILING FANS

The 2015 Hawaii Energy Code (HEC) requires all bedrooms and the largest space that is not used as a bedroom to have a **ceiling fan or ceiling fan rough-in** per Section R401.2.1 Tropical Zone and Section R404.2 Ceiling fans (Mandatory).

The effect of ceiling fans can be significant in improving thermal comfort for the occupants of the space. Ceiling fans result in a perceived cooling effect of 5.4°F to 12.6°F based on fan speed (air speed of approximately 3.3 ft/s to 9.84 ft/s respectively). Ceiling fans, coupled with the thermal envelope requirements, will reduce or eliminate the need to cool the space with traditional air

Choosing the Right Ceiling Fan Size

First things first: **select the right size of fan for your space.** Not only will your fan work as effectively and efficiently as possible, choosing the right size fan will ensure your safety and comfort as well.

Bigger rooms need bigger fans. Start by measuring the room in which the fan will be installed. The following guidelines will help you select the right size fan for your room:

Room Dimensions	Suggested Fan Size	Suggested Rooms
Up to 75ft ²	29 – 36"	Bathroom, utility room, other small areas
76 – 144 ft ²	36 – 42"	Dining room, kitchen, small to medium bedroom
144 – 225ft ²	44"	Family room, large bedroom, lanai
225 – 400ft ²	50 – 54"	Great rooms, extra-large areas
> 400ft ²	54 – 72" or multiple fans installed	Great rooms, extra-large areas

Reference: Modified from American Lighting Association, 2003

Ceiling Fan Placement

Next, **mount your ceiling fan in the appropriate place** for maximum comfort, circulation, safety and aesthetics.

Ceiling Height

Ceiling fans should be placed at least **18 inches from the walls** and 7 feet above the floor, at a minimum. For optimal performance, the fan should be installed 8 to 9 feet from the floor.

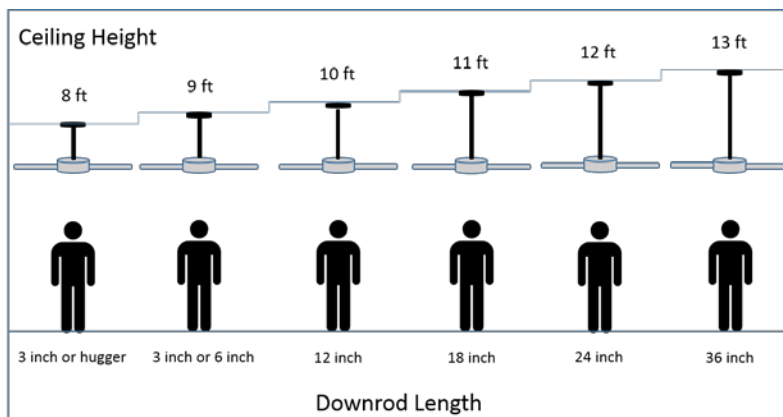
For optimal air flow, your fan should be **10 to 12 inches from the ceiling.**

For low ceilings 8 feet in height or less, purchase a low-profile, or "hugger," ceiling fan. Alternatively, a flush mount may be used.

For tall, sloped, or vaulted ceilings, mount your ceiling fan with an appropriate downrod to lower it to the desired **8 or 9 feet from the floor.**



FIGURE 1. SELECTING A DOWNROD



Does your ceiling fan have a light kit? If so, reduce the length of the downrod by 12 inches.

Fan Placement within a Room

Ceiling fans should be placed in the middle of most rooms for optimal air flow to the entire space. However, you should consider where furniture is located and where people frequently gather. In living and great rooms, center the ceiling fans directly over the seating area. In dining rooms, center the ceiling fan directly over the dining room table. Depending on the size of your kitchen, center the fan in the room or install several small fans throughout. In bedrooms, center the fan over the bed.

Ceiling Fan Components – A Few Important Considerations

The efficiency of your fan and how well it moves are also depends on how your fan is made, particularly the fan blades and motor.

Fan Blades

Blade pitch is the angle of your fan's blades (measured in degrees) and, in conjunction with the fan motor, determines how well your fan is able to circulate air. Higher blade pitches typically move more air, which is given in cubic feet per minute, or CFM. The optimal blade pitch for a ceiling fan is between **12 and 15 degrees**.

Blade number, design, and material can contribute to the amount of air movement as well. The typical ceiling fan comes standard with **4 or 5 blades**; fans with more blades are usually quieter but also move less air. 4-blade and 5-blade fans achieve the ideal balance between performance and ambient noise. High-quality blades come in **weighted, balanced sets** to minimize wobble and additional noise. To prevent peeling and warping, blades should also be **sealed from moisture** by the manufacturer.

Motor

The motor is often the most important feature of your ceiling fan as it drives the fan blades. For quiet, efficient operation, select a **performance grade fan** with a motor that has sealed and lubricated ball bearings, heavy-duty windings, and shock-absorbent internal components.

Additional features that maximize the lifespan of a fan and ensure quiet operation include heavy-duty windings, precision engineered bearings, and shock-absorbent internal components.

Tip: Choose a fan that uses heavier materials, such as die cast metals, to house the motor. These fans generally vibrate less, provide more stability for longer downrods, and provide a good surface for high quality finishes.

Ceiling Fan Location and UL Listing

It's important to consider location when selecting a fan, especially if the fan will be exposed to humidity or moisture. There are three UL-listing ratings for ceiling fans – indoor, damp, and wet locations. Indoor fans should be used indoor in dry spaces only. Fans with a damp-rating are good for bathrooms, laundry rooms, and other rooms that are often humid, and can also be used outdoors when protected by a porch or similar structure. Wet-rated fans can be installed in outdoor locations where they will be exposed to water.

References and Additional Resources

American Lighting Association. (2014). Selecting a Ceiling Fan. Retrieved from <https://www.americanlightingassoc.com/Lighting-Your-Home/Ceiling-Fans.aspx>

Bermudez, M. (2015, May 13). Ceiling Fan Size Guide - How to Measure and Size a Fan for Any Room. Retrieved from <http://www.delmarfans.com/educate/basics/what-size-ceiling-fan-do-i-need/>

ENERGY STAR. (n.d.). Ceiling Fan Basics. Retrieved from https://www.energystar.gov/products/lighting_fans/ceiling_fans/ceiling_fan_basics

ENERGY STAR. (n.d.). Ceiling Fan Performance: Components that Count. Retrieved from https://www.energystar.gov/products/lighting_fans/ceiling_fans/performance_components_count

Home Depot. (2015). How to Buy Ceiling Fans and Accessories. Retrieved from http://www.homedepot.com/c/ceiling_fans_and_ceiling_fan_accessories_buying_guide_HT_BG_LF

Lumens. (2016). Fan Buyer's Guide - Ceiling Fan Size. Retrieved from <http://www.lumens.com/fan-buyers-guide/ceiling-fan-size.html>

Walch, J. (n.d.). The Best Place to Put a Ceiling Fan. Retrieved from http://www.ehow.com/info_12268254_place-put-ceiling-fan.html