

What You Should Know about Bathroom Ventilation Fans By Carol Lamkins, CMKBD, CID

Today's homes are built airtight for efficiency. Proper mechanical ventilation is critical to improving indoor air quality by exhausting stale air and replacing it with fresh air. Specifically, ventilation in the bathroom minimizes mold and mildew growth as mold needs moisture to live. Good ventilation is not just to remove humidity and odors but can also reduce indoor pollutants such as allergens, dust, household cleaners, VOCs, carbon monoxide, off-gassing formaldehyde from building materials, carpets and other furnishings and deterioration of interior wall coverings, structural framing and insulation.

Bathroom ventilation must be properly sized. Most codes require a 50 CFM intermittent fan or operable window for bathroom ventilation. The Home Ventilating Institute (HVI) and the National Kitchen and Bath Association (NKBA) recommend eight exchanges of air per hour in a bathroom. Use this formula to determine the proper CFM rating for a bathroom:

- Multiply the cubic feet (LxWxH) by 8 exchanges of air per hour.
- Divide the sum 60 to equal the required CFM for the room.
- Short cut: If the ceiling is 8', take the square footage area of the room and multiply it by 1.07 to equal the required CFM for the room.

The Home Ventilating Institute also recommends the following for bathrooms larger than 100 square feet in area using intermittent or continuous ventilation based upon fixtures:

FIXTURE	CMF
Toilet	50
Shower	50
Bath Tub	50
Jetted Tub	100

Note: Enclosed toilet rooms must have an operable window or a fan for ventilation.

Example:

The bathroom is 20'x12'. There is a tub (without jets), a shower enclosure and an enclosed toilet. Each fixture requires 50 cfm:

FIXTURE	CMF
Toilet	50
Shower	50
Bath Tub	50
TOTAL	150

It is best to place the fans in the ceiling as hot air, humidity and odors rise. A compartmentalized bathroom may require more than one fan. Fans should be switched independently.

You have two options as to where the ceiling ventilation could be installed:

1. One option is to install several ventilation fans - a 50 CFM fan over the tub, one in the shower and in the water closet. This method is very effective and will provide ventilation where and when it is needed. A word of caution is if the person using the bathroom is subject to coolness, the ventilation system will create wind chill and should not be used over the bathing area.
2. Another option is to install one 150 CFM fan. The air will then be pulled through the entire room and exhausted at a central location.

With windows closed, exhausted air will be replaced by makeup air from adjacent rooms or forced air system registers. HVI recommends that the exhaust points are located away from the supply, thereby pulling the supply air through the room. Bathroom doors need to be undercut at the base to allow makeup air to enter the room.

HVI recommends that the fan be left on for 20 minutes after use of the bathroom. A timer is a good solution, allowing the fan to turn off automatically at the proper time. For steam showers it is best to have a separate fan in the steam room that can be turned on after use.

Combination ventilation fans consist of:

- Fan/light
- Fan/light/heater
- Fan/light/heater/night light



A fan/light combination provides ambient lighting but if the correct lamp is chosen it can provide enough light for reading. Many combination units come with energy-efficient fluorescent lamps. Combination units require multiple switches and can be combined in a single-gang box.

Ventilating fan sound levels are measured in sones. A sone is an internationally recognized measurement of sound output. Sones translate decibel readings into numbers that correspond to the way people sense loudness. As a rule, the more powerful the fan, the greater the sones. For comparison purposes, we usually speak at a 4 sone level. Recommended sone ratings are around 2.5. Ultra silent fans may use 0.3 and 0.7 sones making them barely audible. More powerful fans may be 3.5 sones.

Many homeowners have recognized the need for quiet ventilating fans. Homeowners want to enjoy a quiet, relaxing whirlpool bath without being annoyed by a loud ventilating fan. However, keep in mind that sometimes it is desirable to have higher sones for guest bathrooms to support privacy.

Also, when selecting a bathroom ventilation fan, look for the Energy Star logo. These products use high efficiency motors and lighting that can reduce energy consumption by as much as 65% - all without sacrificing performance. Energy efficient controls are available that automatically run ventilation fans intermittently throughout the day when necessary.

When installing a bathroom fan check with the manufacturer's installation guide to determine the length and diameter of ductwork.



Here are some considerations:

- Under sizing the diameter of the ductwork will create static pressure reducing the efficiency of the fan
- The fan's performance can be compromised if too many elbows or transition fittings are used and the fan is not oversized
- Larger CMF fans usually require deep joist bays to accommodate the ductwork and the fan
- If a larger fan is required it may be easier to install a remote blower with ceiling-mounted exhaust grills. A remote blower can also vent a second bathroom if sized properly
- Make sure that the fan can be positioned parallel with a joist bay and in the direction of the fan's outlet
- Insulation around the ductwork will prevent condensation in unconditioned spaces
- Fans can be vented through the roof, a gable wall or a soffit
- Avoid terminating in the face of prevailing winds and the location should be inconspicuous

Aesthetics as well as efficiency should drive purchasing decisions. New designs in bathroom ventilation support many decors. Ventilation systems are easy to use and effective for promoting healthy indoor air quality. The bottom line is that proper ventilation is a good investment.



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