Choosing a Range Hood

All you need to know to pick the right kind, not the right brand



BY SCOTT GIBSON

Viking's largest gas kitchen range is a 5-ft. long colossus with six burners, a griddle and a char-grill that collectively can throw off 123,000 Btu of heat—enough to warm a small house in a cold climate. Not many at-home cooks will tax that kind of range to its limit, but professional-style cooking appliances with high-output burners and amenities like grills and griddles are more common than ever. Range hoods capable of whisking away the smoke, grease, moisture and combustion gases must be correspondingly robust, drawing as much as 1200 cu. ft. of air per minute (cfm).

At the other end of the scale are what many residential cooks continue to use: four-burner gas or electric ranges generating one-third the heat and fewer air contaminants. Although any standard range can smoke up a kitchen, vent hoods drawing as little as one-tenth the volume of air—and costing one-tenth the price—may be enough.

Why do I need a hood?

No matter what the range or cooktop, kitchen designers, appliance manufacturers and building scientists all suggest it be used with a range hood. Research at Broan-NuTone, a manufacturer of kitchen-ventilation equipment, suggests that in addition to obvious spatter, steam and odors, cooking produces unseen hazards. Tiny particles of grease less



than a half-micron in size can float in the air for days. Electrostatic forces, air currents and a phenomenon called thermal plating drive grease into fabrics, cabinets and wall surfaces. And as more rigorous building practices create tighter houses, air contamination becomes a health as well as an aesthetic problem. That's because those drifting grease particles are nutrients for microorganisms such as mold and bacteria.

From small to large, a vent for every cooking style and appliance

There are nearly as many kinds of range vents as there are ranges. At the low end, some selling for as little as $30, are simple hoods with low-powered, self-contained blowers (photo 1, below). Downdraft and slide-out vents are hidden when not in use but deploy when needed (photo 2, below). Over-the-range microwaves double as vent hoods (photo 3, below). Chimney-style hoods mount on the wall and become a design element in the kitchen (photo 4, below). Ceiling-mounted units are designed for cooktops and ranges located away from a wall (photo left). At the top end in terms of size and performance are professional-style hoods with powerful blowers that may cost $5,000 or more.

Many low- and mid-range hoods can be installed as recirculating fans that are not vented to the outside (sidebar p. 98). Others can be set up so that their blowers aren't even in the kitchen at all but mounted in the duct itself or in a wall- or roof-mounted terminal fitting. Duct sizes vary with the capacity of the blower (sidebar p. 96).

Two ways to calculate how much airflow you need

The higher the potential for cooking contaminants—that is, the more heat the range can produce—the bigger the blower the manufacturer will recommend. There are, however, no absolutes in sizing a range hood and blower. Dale Rammien, director of the Home Ventilation Institute (HVI), an industry trade group, says the minimum for a wall-mounted range hood should be 40 cfm per lin. ft. of range. A range on a kitchen island or peninsula needs 50 cfm per ft. of range.

"There is a lot of cooking that is nicely ventilated with 100 cfm," says David Wolbrink, vice president for research and development at Broan-NuTone. Although minimums may be enough, modestly powered range hoods are designed for modest cooking demands and basic four-burner 30-in. ranges. Cooks who favor the high-temperature cooking style that produces a lot of smoke and grease will be disappointed.

With higher heat output and larger range sizes come higher-capacity blowers and larger hoods. Robert McBride, senior product manager for cooking and ventilation at Viking Range Corp., says the industry often uses the 100-to-1 rule: For every 100 Btu of heat generated by the range, the blower

AIR SCOOPS: BASIC AND BEYOND



1 *Basic, self-contained*



2 *Downdraft*



3 *Microwave vent*

Range hoods are available in a number of styles and blower capacities. 1. Basic, self-contained hoods house a fan motor and grease filter, and are the most economical option. 2. Downdraft models draw cooking contaminants from behind the range or from the middle of the range top. 3. Microwave ovens mounted over the cooking surface also can double as range hoods, although they are less efficient at gathering smoke and steam than other types. 4. Chimney-style hoods are mounted against a wall or an island.

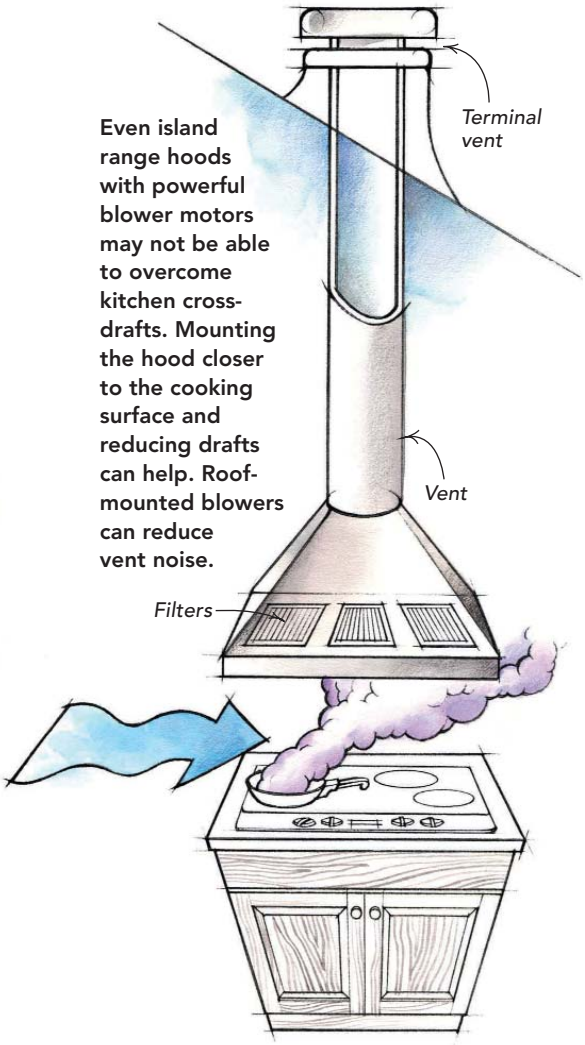


4 *Chimney-style, wall and island*

Photos this page: 1. Courtesy of Broan-NuTone; 2. Courtesy of Faber; 3. David Duncan Livingston; 4. Courtesy of Viking.

ISLAND BREEZES

HOOD



Even island range hoods with powerful blower motors may not be able to overcome kitchen cross-drafts. Mounting the hood closer to the cooking surface and reducing drafts can help. Roof-mounted blowers can reduce vent noise.

DOWNDRAFT



Downdraft units are unobtrusive but may not be as efficient as other styles in some situations. Models mounted at the back of the range can have trouble pulling vapors from the front, especially when a tall pot is used.



Sleek, low-profile island hoods *are designed to minimize visual interference. The trade-off is a smaller capture area for cooking contaminants. That's a problem for high-temperature cooking styles that produce a lot of grease and smoke. Photo courtesy of Faber.*

should move 1 cfm of air. That means a gas range with four 15,000-Btu burners should be equipped with a 600-cfm blower. Those numbers are a starting point. Downdraft and island installations may need more powerful blowers.

Not all cooks need high-capacity blowers. "Yes, if you have a pro range that has all that stuff on it, and it's 48 in. wide in a huge kitchen, you might want to go with that higher cfm," says Wendy Holdsworth, marketing director at Faber, an Italian manufacturer. "But people got brainwashed and are doing the higher cfm with every application, and it's really unnecessary."

Another potential problem with high-capacity blowers is backdrafting.

Just as important as sizing the blower correctly is using it properly. Many manufacturers say the blower should be running before a single burner is turned on—not when a hot pan is making lots of smoke. Running the blower first sets up a good flow of air and boosts efficiency.

Installation height and hood shape affect performance

Manufacturers make their own recommendations on how high the hoods should be located over the cooking surface. In general, mounting height falls in one of three ranges, depending on the size and capacity of the equipment. Small, low-powered hoods typically are installed 18 in. to 24 in. off the cooking surface; midsize hoods, 24 in. to 30 in; and high-capacity, professional-style hoods, 30 in. to 36 in.



Duct: Keep it short

Manufacturers recommend specific duct sizes for the models that they make. One of the first rules of thumb is to take their advice seriously. The industry generally suggests running the same-size duct all the way from the range hood to the fitting on the wall or roof. Transitions to smaller sizes make it harder for the blower to function efficiently.

Drawings: Brian Jensen



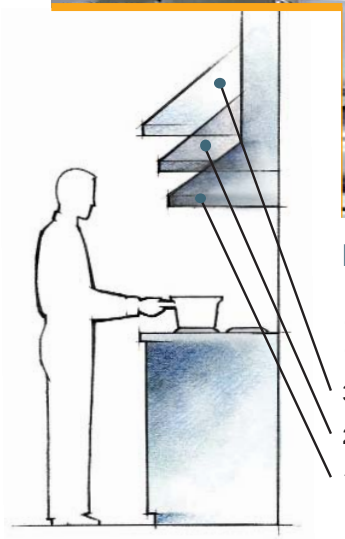
Professional-style hoods *with large capture areas are designed to handle the high cooking temperatures typical with professional-style ranges. The hood traps smoke, grease and odors, giving the blower time to expel contaminants. Photo courtesy of Faber.*

Most cooks, especially tall ones, are more likely to increase the distance between the cooktop and the hood to make food-tending easier. When deciding where to mount a hood, Holdsworth suggests making a cardboard template of the hood and taping it to the wall. If the installation seems too low, the unit can be moved up. But manufacturers are careful to recommend against exceeding design maximums. Even pro-style hoods mounted higher than 36 in. won't work as well.

The same goes for cooking alcoves. Think of one as a large hood. Its opening should not be much higher than 36 in. above the cooking surface, and the ceiling shouldn't be much more than 18 in. above that.

Hood shape also is a big factor in performance. Pro-style hoods not only generate toupee-lifting air currents but also have cavernous interiors, some 18 in. deep. These hoods have high capture efficiencies: a large area beneath the hood where smoke, grease and moisture are trapped before the blower pulls them away. Industry experts say the best performance comes from hoods that match the footprint of the cooking surface in width and depth. Even better is a hood that extends beyond the sides of the cooking surface slightly (drawing p. 98).

Range hoods are highly visible, and manufacturers have taken pains to make them as attractive as possible. In fact, studies show that consumers are most interested in what the hood looks like, not how well it works, says Brian Wellnitz, product manager at Broan-NuTone. The result is a number of designer hoods with low, sculpted profiles or nearly flat shapes. They are popular on island installations because they don't block the view of the rest of the kitchen. Depending on blower size and cooking preferences, designer hoods may work fine, but they are not as effective at capturing contaminants as more conventionally shaped hoods.



INSTALLATION HEIGHTS

Manufacturers specify mounting heights above the cooking surface. In general, as hood size and blower capacity increase, the higher the hood can be installed.

30 in. to 36 in. High capacity (professional)

24 in. to 30 in. Midsize

18 in. to 24 in. Small, low-powered

Downdraft and islands: two ventilation problems

Downdraft ventilation systems are an attractive option for anyone who doesn't want to look at a range hood. Some ranges are built with vents integrated into the cooking surface. Other manufacturers make a type of downdraft vent that pops up at the back of the range when in use and retracts when not needed. Although downdraft models can be effective for many cooks, they also are fighting the laws of nature.

Rear-mounted downdraft units work best for shallow pots and pans on a back burner;

Minimum duct size is usually 3¼ in. by 10 in., the equivalent of a 6-in. round duct. Large-capacity hoods may need an 8-in. or 10-in. round duct. It should be made of metal.

Second, the industry says, keep the duct run as short and as straight as possible. Just about any blower should be able to handle a run of 30 ft. and turn a few corners. But too many twists and turns slow down airflow. Installing a single 90° elbow is the equivalent of adding 5 ft. to 10 ft. of straight duct. Back-to-back 90° elbow should be avoided altogether.

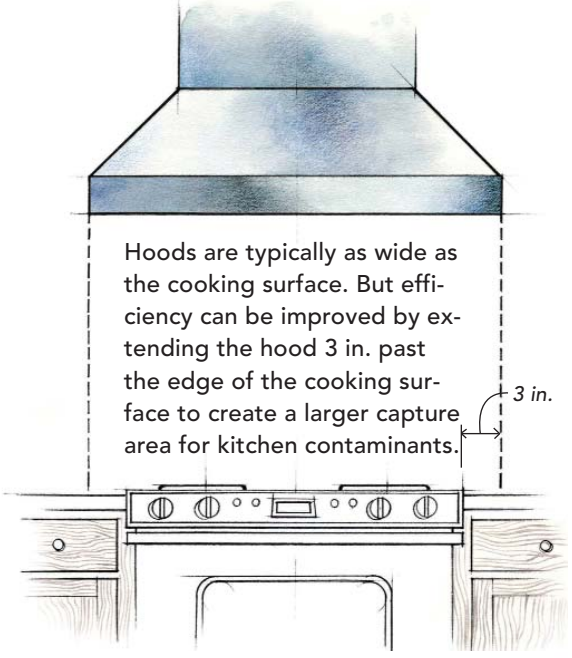
Last, buy a good-quality terminal fitting, the piece that goes on the wall or roof, preferably from the same company that manufactured your hood. Cheap fittings increase static pressure in the line and cut performance.

—S. G.



Chimney-style hoods *can work in a wall installation or over an island. This hood's stainless-steel construction and seamless corners make it easy to keep clean. Photo courtesy of Broan-NuTone.*

IMPROVING EFFICIENCY



however, these units have more difficulty capturing moisture from a tall pasta pot boiling on a front burner. One option is to bump up the cfm rating of the blower, says Linda Eberle, a designer with Dream Kitchens in Madison, Wis. If a range normally would be paired with a conventional 300 cfm to 600 cfm hood, she says, a downdraft model might be sized at 600 cfm to 900 cfm. But there are tradeoffs. "You have to have a very significant air velocity, and when you have significant air velocity, other things happen," says Wolbrink. "I've heard stories of steaks that are hot on one side and not as hot on the other."

Downdraft vents centrally located in the cooktop don't have to pull contaminants the entire depth of the cooking surface to vent them (drawing p. 96). They do, however, have to turn grease, smoke and moisture 180° before they can be vented. Once again, cooking style counts for a lot.

Island installations present another problem: crosscurrents of air that can diminish venting efficiency. Wolbrink recalls one home in which a 1200-cfm vent had been installed over a big range in an island. When the hood didn't perform adequately, the homeowners added a second 1200-cfm blower. Even that colossal power wasn't doing the job. Wolbrink was so intrigued he drove out to see the place. The problem? Leaky windows in an adjacent breakfast room. As the blower speed increased, so did the unwanted drafts. A voluminous 30-in. high hood didn't help. But with the breakfast-room door closed, the problem disappeared.

In some cases, a high-output cooktop planned for an island and peninsula might better go against a wall where a large hood isn't such a visual issue. "Especially if they're going to put in one of those 48-in. cooktops with four burners, a griddle and a grill," says Holdsworth. "Now you're talking about putting in a pro-style island hood, and you might as well put up a wall if you're going to do that. Big island hoods are heavy and difficult to mount."

Filters trap the grease

All but the large professional-style hoods use aluminum-mesh filters to trap grease (top photo, facing page). You get what you pay for. Filters on the less-expensive models are flimsy in comparison to those on more expensive range hoods. The best ones are reinforced with a stainless-steel plate for additional stiffness.

Aluminum-mesh filters should be cleaned regularly with soap and water, and many of

Recirculating devices:

Vents that don't really vent

Manufacturers universally recommend that range hoods be vented to the outside. Many hoods, including over-the-range microwave ovens, also can be set up to filter air and recirculate it back to the kitchen through aluminum-mesh and carbon filters.

Manufacturers offer recirculating hoods because outside ducting in some situations is virtually impossible. But no one claims that they work as well as conventional hoods. "It is what it is," says kitchen designer Linda Eberle. "It's better than nothing."

Recirculating systems use the same kind of aluminum-mesh filters found in ducted hoods to trap grease.

them are dishwasher-safe. Don't wash them with bleach, however, because it will corrode the metal.

Instead of mesh filters, high-capacity hoods with high airflows use stainless-steel baffles (photo left). Grease condenses as air is drawn over the baffles and collects in a shallow trough at the back of the hood.



Remote installation may lower noise levels for high-capacity fans

Blowers are not as noisy as they used to be, but big hoods can make a racket. Rammien says that a few range hoods are capable of operating at 1.5 sones, but most operate at between 3 and 3.5 sones, and the noise from big ones may climb to 8 sones. Unlike the decibel scale, sones are a linear value. That is, 2 sones are twice as much noise as 1 sone. Wolbrink says that 1 sone is roughly the amount of noise made by a quiet refrigerator in a quiet kitchen, not noticeable over other everyday noises and not enough to interfere with conversation.

Installing a blower away from the kitchen (in the duct itself or at the terminal fitting) may lower noise somewhat. "One potential benefit is usually the noise factor," says Rammien. "A properly sized and properly installed in-line fan will have a tendency to produce less noise in the living space than the typical range-hood setup." But don't look for miracles. When a blower pulls a lot of air, it still has to get through the filters and ducts, and that can be noisy. Vent hoods typically come with variable-speed control switches that allow the blower to be turned up and down. So one option is to have a big blower that runs at idle until a cooking chore demands a higher blast of air. Some hoods automatically kick up the blower speed when they sense high heat. One of them is made by Zephyr (www.zephyronline.com; 888-880-8368).

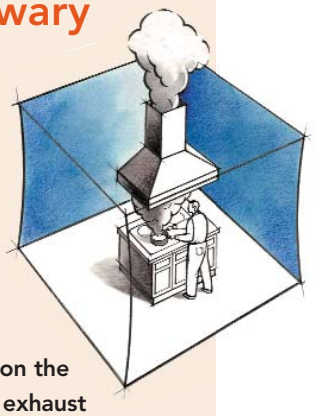
Manufacturers also may recommend switching to a remote motor installation when the homeowner wants to bump up the size of the blower but can't squeeze it into the hood. Many models can be set up with either an integrated or remote motor.

Fantech (800-747-1762; www.fantech.com) has tackled the noise problem with an in-line silencer that works like a muffler. Lindsay Ambler, the director of engineering for the company, says that the silencer reduces noise levels by 60% to 80% without affecting the device's airflow. It's available in 8-in. and 10-in. sizes. □

Scott Gibson is a contributing editor to *Fine Homebuilding*. Photos by Joseph Kugielsky, except where noted.

Makeup air:

No national standards, but be wary



A high-powered range hood pulls enough air to empty a 10-ft. by 14-ft. room in less than 60 seconds. In older houses, there may be enough leaks in the building envelope to supply makeup air. But in newer, tightly constructed houses, many potential air leaks are sealed. As a result, a potential hazard is backdrafting, a condition in which combustion fumes from fuel-burning appliances such as water heaters and furnaces are drawn into the house to replace air that's being forced out by a kitchen blower.

Commercial building codes require makeup air to be provided when ventilation equipment is installed. But residential building codes don't address the issue directly, says Chris Holland, a technical staff member at Building Officials and Code Administrators International (BOCA). Holland says a range hood that exhausts up to 300 cfm and is used intermittently probably won't cause problems.

Minnesota appears to be one of the few states that require either passive or powered makeup air in new residential construction to offset exhaust fans. Exact requirements depend on the number and power of exhaust fans in a house, and whether the furnace and other appliances have sealed combustion chambers. But the code can require powered makeup air when ventilation equipment exhausts as little as 175 cfm.

Minneapolis architect Dale Mulfinger warns clients that providing makeup air for powerful blowers can be expensive. A system to offset a 1200-cfm hood over a big commercial-style range might cost $500 to $700. "I try to talk people out of the monster ranges all the time," he says.

—S. G.

Most manufacturers say they can be washed in a dishwasher when they get dirty. In addition, recirculating hoods are fitted with carbon filters that are intended to remove cooking odors. Carbon filters must be replaced periodically.

Some hoods have an indicator light or other type of signal to remind a homeowner to change the filter. But on many others, there's no easy way to tell when carbon filters need replacement other than to use your nose. When smoke and cooking odors seem undiminished by the filter, it's time to replace it. How long a carbon filter lasts depends on how heavily it has been used.

—S. G.



Carbon filter