

A VENT HOOD THAT WORKS

1 Height

To do its job, a vent hood has to be able to capture smoke and steam from the cooktop, without getting in the way of the cook. That often puts manufacturers at odds with designers and architects, who tend to hike up hoods (especially over islands) so that they don't interfere with sightlines or cooks' foreheads. This need not affect performance, as long as 100 cfm are added for every 3 in. the hood is raised above the recommended height.

2 CFM rating

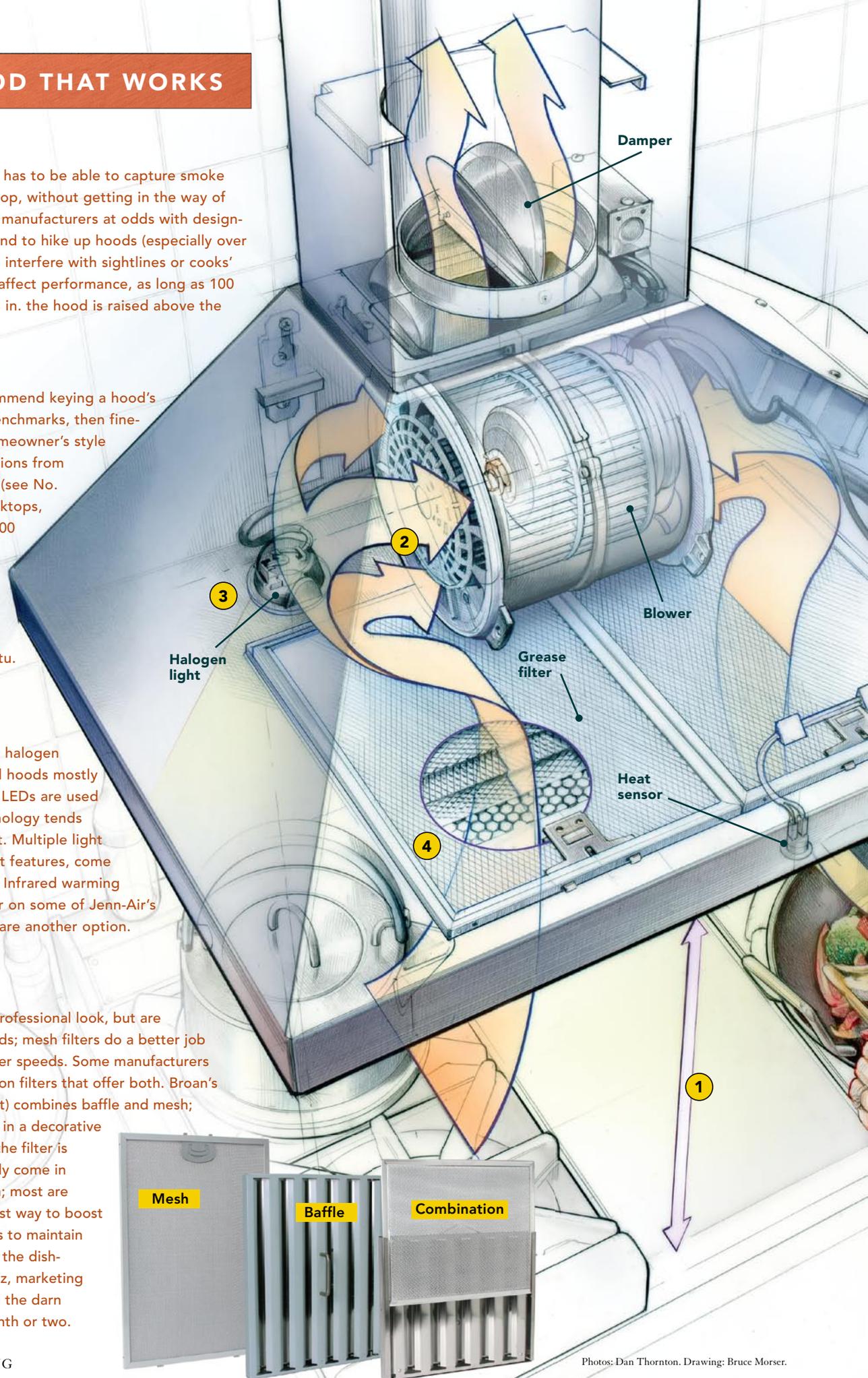
Most manufacturers recommend keying a hood's cfm rating to accepted benchmarks, then fine-tuning it based on the homeowner's style of cooking and any deviations from the recommended height (see No. 1). For most standard cooktops, the benchmark starts at 100 cfm for each linear foot of cooking surface; for professional-style appliances above 60,000 Btu, the rule of thumb becomes 1 cfm per 100 Btu.

3 Lighting

Most hoods today employ halogen lighting; Energy Star-rated hoods mostly use fluorescent. Although LEDs are used in some models, the technology tends to be too sensitive to heat. Multiple light levels, including night-light features, come in handy in most kitchens. Infrared warming lights, introduced last year on some of Jenn-Air's pro-style stainless hoods, are another option.

4 Filters

Baffle-style filters offer a professional look, but are effective only at high speeds; mesh filters do a better job of collecting grease at lower speeds. Some manufacturers have developed combination filters that offer both. Broan's Evolution filter (below right) combines baffle and mesh; Zephyr offers a mesh filter in a decorative casing for hoods in which the filter is visible. Mesh filters typically come in stainless steel or aluminum; most are dishwasher safe. The easiest way to boost range-hood performance is to maintain the filters. "Throw them in the dishwasher," says Brian Wellnitz, marketing manager for Broan. "Clean the darn things"—ideally, every month or two.



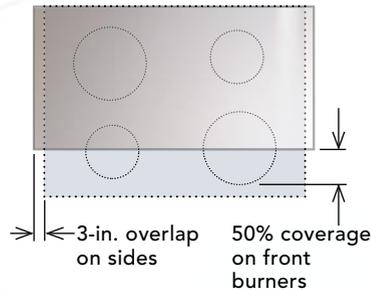
Breathe Easy With the Right Range Hood

As houses get tighter, proper ventilation is more important than ever

BY DEBRA JUDGE SILBER

5 Capture area

For optimum performance, a wall-mount hood should overlap the cooking surface by 3 in. on each side and cover at least 50% of the front burners. Capture is often deficient in liners and built-in hoods, where the ventilation appliance is inserted in a plywood housing and does not extend over the full footprint of the cooktop. It's also compromised in many design-driven hoods.



With all the emphasis today on fresh food, you'd think that fresh air in the kitchen would deserve an equal amount of attention. As a rule, though, it doesn't. It's only after the kitchen layout is worked out, the appliances are selected, and much of the budget is earmarked that, well, yes, we realize we ought to do something about the steam, the grease particles, and the unhealthy gases generated by cooking.

6 Energy efficiency

To bear the Energy Star seal, a kitchen vent hood must have a fan of less than 500 cfm and fluorescent or LED lights, as well as meet various performance standards.

According to manufacturer Vent-A-Hood, the average home creates more than a gallon of cooking grease a year, not to mention the added hazard of nitrogen dioxide and carbon monoxide that are emitted from gas appliances. That's a nasty mix of stuff to leave lingering in your kitchen.

7 Controls

Multiple fan speeds are useful for air and noise control. A remote control is worthwhile on island hoods that may be mounted too high for users to reach onboard knobs comfortably. Some Zephyr models feature memory-touch controls, returning the hood to the last setting used; others feature a "clean air" control that activates the fan for 10 minutes every four hours to disperse lingering odors. On many hoods, heat-activated sensors automatically turn on fans or adjust fan speed based on temperature changes.

The good news is that today's ventilation equipment is up to the job like never before. Daniel Forest, the chairman of the certification committee of the Home Ventilating Institute, which certifies range hoods, says that there has been "substantial improvement" in recent years in range-hood performance in terms of airflow, sound, and consumption of electricity. Still, when it comes to slick designs that push the boundaries of basic concepts—that steam rises,



Cone of silence. The sound-silencing system on Jenn-Air's Euro-style stainless hoods combines insulation and filter design to minimize noise at high speeds.

for instance—both range-hood manufacturers and consumers may discover that they need to compensate.

How much ventilation do you need?

Sizing a range hood correctly starts with a benchmark airflow in cubic feet per minute (cfm) based on the cooking appliance to be vented. Designers, manufacturers, and others vary slightly in how they arrive at that figure, but the formula suggested by Brian Wellnitz, Broan's marketing manager for kitchen ventilation, is nearly universal. For conventional gas appliances and all electric cooktops, the benchmark cfm is based on the appliance's width, with each linear foot requiring 100 cfm. The average 30-in. (2.5 ft.) range, then, would require a ventilation capacity in the area of 250 cfm. For larger professional appliances that generate 60,000 Btu or more, the basis becomes 1 cfm for every 100 Btu. Thus, a 90,000-Btu cooktop should be matched with a hood capable of moving 900 cfm.

But considering only the cooking appliance would be a mistake. Wellnitz stresses that the benchmark number is a starting point for a hood of an "appropriate" size that should also take into account the hood design, its position, and the style of cooking done in the kitchen. "It's not just how many Btu," he says. "Do they cook with intensity, or do they cook gently?" If a grill is part of the mix, Wellnitz suggests at least an additional 200 cfm.

And while it's the designer's prerogative to reject the manufacturer's recommendation on how high to mount the hood over the stove—whether it's to provide a better view beneath an island hood or to avoid collisions with the cook's forehead—it's the designer's obligation to balance a higher hood with increased cfm. The rule of thumb here is 100 additional cfm for every 3 in. above the manufacturer's recommended height.

Problem: Ventilation can be bad for you

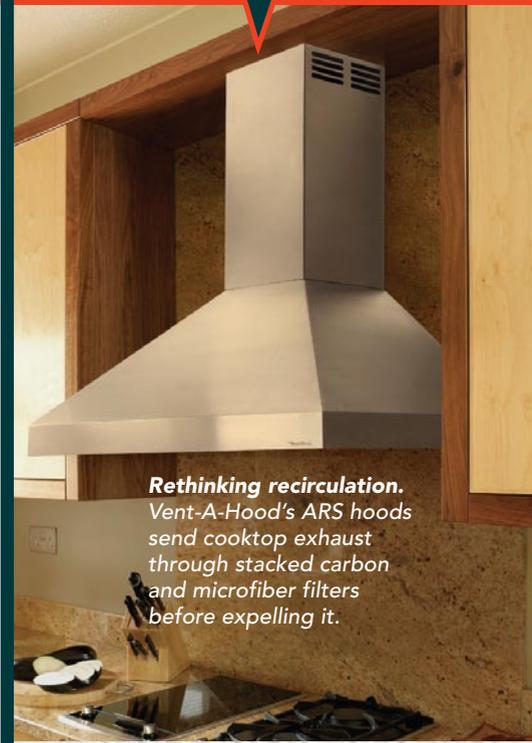
While healthful indoor air requires adequate removal of the moisture, grease particles, and gases produced from cooking—particularly gas cooking—air quality is compromised when that removal draws in contaminants from fuel-burning water- and space-heating equipment as a result of negative air pressure. As energy efficiency places a premium on tight homes, the danger increases. For manufacturers, this means more emphasis on hood designs that do a better job of capturing smoke and steam, without relying on high cfm.

Sophie Piesse, a green architect in Carrboro, N.C., consults an HVAC (heating, ventilating, and air-conditioning) contractor when concerns arise about kitchen makeup air. "It's always better to look at the house as a whole, and get your makeup air through your HVAC system," she says. A little consumer education doesn't hurt either: "Just telling people about it helps. I tell them, 'Don't run the hood longer than you need to.'"

Broan, which manufactures a range of hoods under its own name and that of other brands, is anticipating a trend toward makeup air built in to the range-hood system in response to

Dealing with

RECIRCULATION



Rethinking recirculation. Vent-A-Hood's ARS hoods send cooktop exhaust through stacked carbon and microfiber filters before expelling it.

DOWNDRAFT



Up in smoke. Many telescoping down-drafts (such as this one from Jenn-Air) now rise 14 in. above the cooking surface.

MICROWAVE-VENT COMBINATIONS



Micro-vent. Microwave units can offer adequate smoke and steam removal if vented outside.

less-than-ideal conditions

Even dream kitchens have their rude awakenings: no exterior-wall access, inadequate room for a hood, or no alternative place to put the microwave, forcing it to double as both a cooking and venting appliance. The workarounds aren't new, but the fact that these situations keep cropping up has encouraged some manufacturers to improve on the solutions they offer. For the casual cook in a compromised kitchen, it's easier to live with the limitations than without any air-clearing at all.

RECIRCULATION

As long as there are apartment dwellers, oddly positioned cooktops, and cooks who won't surrender an inch of cabinet space, there will be recirculating, or, to use the preferred industry term, "duct-free" range fans. Because they don't meet the definition of ventilation as defined by ASHRAE 62.2—that is, they don't supply outdoor air or remove indoor air from a dwelling by natural or mechanical means—the Home Ventilating Institute does not consider them a substitute for kitchen ventilation, according to Daniel Forest, chair of the HVI certification committee. He adds that there are currently no industry-accepted standards or tests to evaluate the performance of recirculation kits at capturing pollutants produced during cooking. Says Forest, "It is HVI's position that they should always be used in conjunction with an exhaust fan, of an adequate capacity, located in the kitchen."

Architect David Edrington steers clear of ductless range hoods when he can. "If it's an electric cooktop and my clients look like they'd be responsible enough to keep the filters clean—maybe," he says, after some consideration. "I would never do it in a gas-appliance situation."

Although Vent-A-Hood claims the first patent for a ductless hood in 1945, the company never brought the idea to market because, in the words of engineer Bob Seloff, "ductless range hoods didn't work then, and they don't work now." But earlier this year, Vent-A-Hood launched a new category of ductless range hoods called ARS (Air Recovery System). These hoods combine an active canopy, centrifugal blower, deep activated carbon bed, and accordion microfiber filter to scrub the air before releasing it out the top of the stack.

DOWNDRAFT

Like ductless hoods, downdraft ventilation is an option Austin architect Paul DeGroot would rather avoid. Why? Physics. "Downdrafts can't pull steam down. Steam rises," says DeGroot. "They're OK with odors, but they're just not in the right place to capture steam." Because they're drawing air from the level of the cooktop, there's interference with the heat source itself. "They work fine on electric and modestly well on residential-size gas cooktops, although they affect the flames somewhat," says Edrington. "The ones that rise up do that less, but those just suck air. I don't think they're useful at all on commercial-style cooktops."

Jenn-Air, which introduced the downdraft ventilated range in 1965, hasn't abandoned the approach. If anything, it has upped the stakes by throwing recirculation into the mix with the introduction in 2009 of a ductless downdraft cooktop. They've embraced the model for two reasons, according to Jenifer Golba, senior brand manager for Jenn-Air Cooking. First, designing the cooktop and venting system as an integrated unit boosts performance. Second, naysayers aside, customers want both features. Jenn-Air, along with other manufacturers, has also increased the height of its telescoping downdrafts to 14 in.—high enough to collect steam from the top of a medium-sized stockpot.

MICROWAVE-VENT COMBINATIONS

Over-the-stove microwaves have two strikes against them as venting devices. First, their flat, rectangular bottoms are not designed to capture air and do not extend over the entire cooking surface. Second, the fan has more work to do. According to Brian Wellnitz, Broan's marketing manager for kitchen ventilation, 15% of the air in a microwave fan is being used to cool the magnetron. "The reality is, consumers buy them," Wellnitz says. "If you're going to use an over-the-range microwave, at least duct it. Some ventilation is better than no ventilation." For moderate cooking, a ducted microwave fan can do the job. Tammy Stone chose a Samsung SMH9187ST to vent her 30-in. Bosch gas cooktop, and it performs fine. "It has done a good job of venting smoke, which is what I use it most for," she says.

How range hoods go wrong



Nothing compromises range-hood performance like a poor installation. Most range-hood manufacturers offer training and technical assistance to installers in an effort to ensure that their products perform as promised in the field. The number-one cause of poor performance, manufacturers say, is improper ducting. Here's how to get it right.

- **Vent the hood to the outdoors** whenever possible so that odors and cooking gases can be removed completely from the home. Do not terminate a vent into an attic or chimney.
- **Do not use flexible or corrugated duct**, which will restrict airflow and reduce performance. Use only smooth galvanized-metal duct.
- **The size (area) of the duct should be equal to or greater than that of the vent opening on the range hood.** When combining multiple duct runs together, the area of the single duct, measured in square inches, must reflect the total area of the two ducts being combined.
- **Make the duct run as short and straight as possible**, with as few turns as possible. Avoid sharp-angled turns. Use smooth, gradual turns such as adjustable elbows or 45° angled turns to prevent turbulence or air dams. Never position two 90° elbows closer than 2 ft. within the duct system.
- **Make sure dampers open and close freely.** There is typically one in the duct located on or near the hood duct attachment and one in the exterior roof or wall cap. Do not use screen wire or spring-loaded doors on wall louvers or roof jacks.
- **In very tight homes, it's beneficial to install a makeup-air damper** to ensure there is an adequate supply of air when the hood is operating.

language in the 2009 *International Residential Code* that calls for an interlocked makeup-air system on local ventilation devices rated above 400 cfm. About a year ago, Broan introduced a makeup-air damper that could be mounted in a separate duct and triggered by the kitchen-vent hood. "It's not the entire package," Wellnitz admits, "but it's the controlled interlock portion. What designers have to know is that these code languages will be adopted over the next year by local municipalities and that controlled makeup air is going to be a part of their life."

The talk on noise

When homeowners discuss kitchen ventilation, you're likely to hear about noise. The KitchenAid Architect Series hood in Leslie Midgely's Texas kitchen clears the air well, but, says Midgely, "it's like a freight train on the loudest [setting]. Our kitchen and dining room are open, and folks always seem to congregate in the kitchen. You definitely have to yell over it."

Choosing a hood with multiple speed options is one way to increase the odds that your fan can do its job while still maintaining the peace, says Paul DeGroot, the architect who designed Midgely's kitchen. "If you do a lot of cooking, you have to go with at least two speeds. The low speed will be quiet, even though you won't be able to use it all the time." Broan's Wellnitz, meanwhile, suggests opting for the next-larger-size blower, because a large blower run on a low setting is typically quieter than a small blower run on high.

While motor and design improvements have made fans considerably quieter at normal speeds than they were 10 years ago, bets are still off at high speeds, when it's significantly more difficult to modulate the turbulence of moving air. Up to now, manufacturers have put their money on improving performance at low speeds because that's where most cooking is done, and it has paid off. Go back 15 years, says Wellnitz, and the average hood generated 2.5 sones (a measure of loudness) at low speed; today, it's down to 1 sone. "Over the past 10 years we've been working very hard to provide products that give quieter operation at normal or typical speeds," he says. "It's defeating in terms of cost to design something



Jenn-Air infrared heat lamps

that's absolutely quiet at high speeds." Yet in the next decade, that's where he predicts hood designers will turn their attention, with advanced motor design, better hood insulation, and even noise-cancellation technology like that used on earphones favored by frequent fliers.

Until then, one of the best options is to remove the fan from the hood. An external blower not only distances a primary source of noise from the kitchen but also widens cfm options.

That's exactly what architect David Edrington of Eugene, Ore., does. "Particularly when the cooktop is on an island and one is cooking with a view, I like to mount hoods higher than in the specifications. The way I offset the reduction in efficiency is to use a larger fan motor in an outside unit—typically one above 1000 cfm." The higher hood doesn't block the view, and the remote blower doesn't stifle kitchen communication. "Because conversation is an important part of my kitchens, I do it almost all the time," Edrington says. □

Debra Judge Silber is managing editor. Photos courtesy of the manufacturers, except where noted.

SOURCES

Broan www.broan.com • **Faber** www.faberonline.com • **Jenn-Air** www.jenn-air.com
KitchenAid www.kitchenaid.com • **Kobe** www.koberangehoods.com
NuTone www.nutone.com • **RangeCraft** www.rangecraft.com
Vent-A-Hood www.vent-a-hood.com • **Zephyr** www.zephyronline.com

Expanding the definition of “hood”

Question: Can a hood that takes your breath away with its style actually clear the air? Yes, say manufacturers, if it's matched to the right kitchen and cook.

Take Zephyr's modernistic Tilt design (1). "We're honest with people that this isn't your typical vent hood," company spokesman Arcadio Lainez says. "It's not for people doing stir-fry and wok cooking every night; this is for the more casual cook. We tell people the truth and let them buy the style they want."

Despite its angled projection, Tilt uses typical mesh filters to capture air between its panels. Other minimalist hoods use perimeter induction, where cooking air is collected at the edges of the hood's frame, allowing ultrathin designs.

Jenn-Air's Jenifer Golba maintains that her company's perimetric hood (2), introduced in 2009, performs as well as a traditional-style hood as long as the usual sizing benchmarks are adhered to, although she doesn't recommend it for professional-style ranges. "It's really about the cfm, not the design," she says.

Design is the driver behind several introductions considered for the U.S. market from Broan's Italian-made Best line, including Lipstick (3).

Jerry Nast loves his 30-in. Zephyr ZTA-E30S (4). "It is very slim, unobtrusive, and sucks like a Hoover Deluxe—in a good way," he says. "It looks great with our unfussy kitchen design, and we would buy it again."

But there's one company that may never abandon the true meaning of "hood." Pioneer manufacturer Vent-A-Hood does make designer and custom hoods; however, resident engineer Bob Seloff says, "We do not compromise on the necessary capture space in order to deliver a look in place of a performing range hood."



1



2



3