Venting a Downdraft Range

Careful planning and precise layout keep the smoke out of your eyes

BY DAVID GETTS



OUT WITH THE BAD AIR

Downdraft vents work by way of a plenum wrapping around the back of the range to its bottom. Then a blower—either range-mounted or as shown, mounted at the exhaust duct's termination—exhausts the air from the plenum. Short, straight ducts are best, but in this case, site conditions limited the duct's path. The run was short enough, however, that a properly sized blower easily accommodated the three 90° elbows.

Drawing: Don Mannes

Early in my kitchen-remodeling career, I installed my first range with a downdraft vent. The vent moves exhaust air from the range to the outside through a duct (usually in the floor), making an overhead vent unnecessary. Because they afford an unobstructed view, downdraft vents are great for islands and peninsulas. I thought the first job was going to be difficult and was surprised by how simple it was. The lesson I learned on that job, though, is that good planning is essential. With meticulous planning on the front end of the project, you can eliminate the agony that goes along with careless layout.

Know the duct's path

To determine the path the duct will follow, you need to know where it attaches to the range and where it exits the building. The shorter and straighter the duct is between these two points, the better the downdraft vent works.

Downdraft-vent ducts don't have to go straight down through the floor; they can go into a cabinet on either side of the range and then through the floor or toward the back of the range, into the wall and then either up or down (drawings right). Most downdraft vents go through the floor, though, and careful planning to locate the hole in the floor is essential.

A new kitchen has a flexible layout

Because this project involved a new kitchen-cabinet design, I had some flexibility when I drew a full-size outline of the cabinets and range on a piece of plywood tacked to the kitchen's subfloor. I measured from the lines representing the back and sidewalls of the range to find the centerpoint for the smooth-walled galvanized duct (photo p. 98). I took my time on this critical step because manufacturers' specifications differ regarding duct placement and sizing. I placed the point of my compass on the centerpoint for the duct hole and inscribed an 8-in. dia. circle (1 in. larger than the duct). Then I verified that the floor joists wouldn't interfere with the duct location.

After cutting away the subfloor and cutting sections of the duct to the correct length, my crew and I assembled a 5-ft. section of duct with sheet-metal screws and duct tape. A straight section with 90° elbows on each end was secured to the framing with sheet-metal straps made on the job site (photo left, p. 99). Insulation placed beneath the duct helps to reduce vibration and noise.

In this case, I was able to run the duct between the floor joists. If the hole for the duct had landed over a joist, I'd have tried to move the cabinet layout a few inches, which is easier than modifying the floor framing. The same is true when venting through an I-joist system, which usually requires that the ductwork fall between joists. Check with a building official or structural engineer before altering engineered joists.

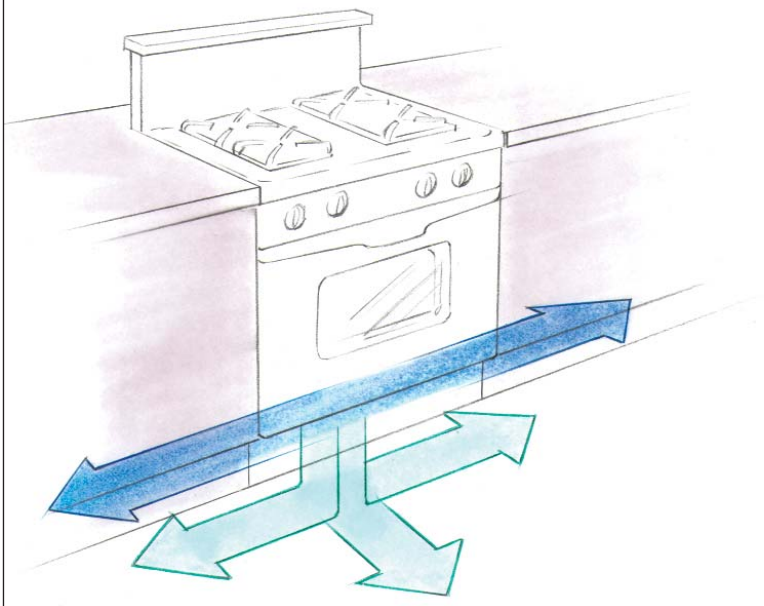
An existing layout isn't so easy

If you're replacing an existing range with a downdraft model or working with an existing kitchen or a fixed cabinet layout, you need to make the chosen vent location work, which may mean altering the existing framing. In this case, if the hole for the duct had landed over a joist, I'd have had to cut the joist on each side of the duct and resupport the newly cut joist ends by heading them off on each side of the opening. The duct then would have been routed through the new opening and surface-mounted to the bottom of the joist system or ceiling below. Surface-mounting also is necessary if the duct must run perpendicular to the joists.

On this project, air was to be vented to the exterior through a

There's more than one way to vent

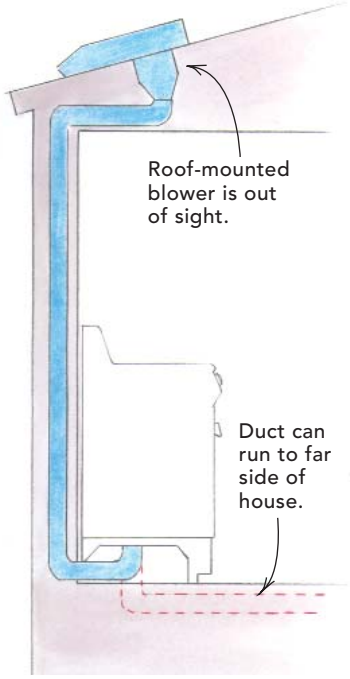
Once exiting the bottom of the range, downdraft vents commonly continue downward through the floor. The duct size, length and number of elbows can vary, so range manufacturers recommend blower sizes, either range-integrated or remote, based on the specifics of each project.



Two types of blowers

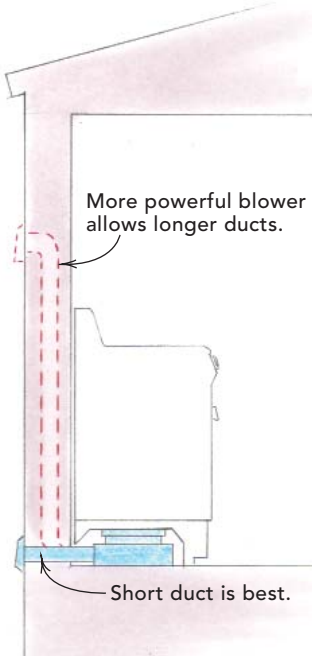
Remote blower

Remote blowers put fan noise outside. A short duct to an outside wall is usually best, but no one wants a blower venting near a patio. In such cases, ducting up and roof-mounting the blower can be an option.



Range-integrated vent

Range-integrated vents that attach to the range's bottom are easier to install than remote blowers but are usually noisier. This range-integrated vent is shown with the duct routed into the wall to two possible locations behind the range.



Drawings this page: Chuck Lockhart

remote blower (photo 2, facing page), which was mounted near the back door (for more on remote blowers, see sidebar p. 97). Although it can't always be avoided, mounting the remote blower (an exhaust fan not attached to the range) in high-traffic areas such as main entrances, patios and decks should be a last resort because remote blowers are noisy. Here, the joist direction dictated the remote blower's location; with a finished basement below, the ducting had to reside in the joist bay. Also, the exterior grade was only 6 in. below the finished floor, which required us to bring the ducting back through the floor into an adjacent cabinet. So mounting the blower near the back door became our only alternative.

The plan comes together

After the floors were put down, the hole for the duct was cut into the cabinets, and the remaining duct was installed. The range slid easily into a precise countertop cutout (these sizes can vary, even within the same manufacturer's line, so read specs carefully). The best way to avoid scratching the countertop during installation is to raise the range's leveling feet so that the range top clears the countertop (photo 4, facing page). Once the range is in position, the leveling feet can be lowered.

An accurate layout provided me with easy tie-ins between the range and the duct, gas and electrical connections, which were roughed in earlier (photo 3, facing page). At this point, the range was ready to test, so I followed the proper start-up and testing procedures. After a successful test, I told my client to invite a guest to dinner, but to be sure to boil lots of water or to fry something smoky so that she could show off her new downdraft range. □

David Getts is a cabinetmaker in Bothell, WA. Photos by John Gallagher.

Full-size layout eases rigid-material rough-in

Because this kitchen was new, drawing a full-size outline of the cabinets and range on the existing subfloor allowed the author to tweak the cabinet layout to ensure that the duct would fall between joists. He then removed the old subfloor from two joist bays and cut an exact plywood replacement. With this plywood dropped in place, he laid out the locations of the duct, gas pipe and wiring. Removed and set aside, the plywood had exact hole locations that served as a reference to place the duct, gas pipe and wiring.

During the rough-in stage, the rule of thumb is first to install rigid materials such as ducts or black gas pipe and follow with electrical wiring and flexible gas and water lines. Depending on the project, mechanical and electrical rough-in can be done after the framing is complete or after the cabinets go in.

—D. G.



The range location is drawn on a new plywood subfloor. *Using the manufacturer's installation instructions, the author determines the exact locations of the duct, gas pipe and wiring.*



With the plywood removed, the assembled duct is set in place. *Measurements taken from the subfloor edge verify the duct's location. Insulation below dampens the noise, and sheet-metal straps hold the duct fast.*



1. Pull wiring after rigid materials. *The plywood subfloor was put in place after the duct was installed and the gas line was checked for leaks.*



2. Assemble the remote blower before installation. *Screws and duct tape join the assembly before installation. A ¼-in. space (for easy future removal) around the blower's perimeter was later weatherproofed with exterior caulking.*



3. Accurate layout leads to easy tie-ins. *The duct, gas and electrical connect easily and are accessible for maintenance.*



4. Don't scratch the countertop. *Before positioning the range, extend leveling feet; lower them once the range is set.*

continued

Reader Response

Knob-and-tube wiring needs an airspace

After reading "Venting a Downdraft Range" (*FHB* #149, pp. 96-99), I saw some electrical issues in the big photo on p. 99. The photo shows the electrical wiring system known as "knob and tube." As shown, this old wiring technique will meet code unless the following applies.

The I. C. light fixture (rated for insulation contact) serving the basement and the fiberglass insulation under the duct lead me to believe that insulation will be reinstalled, a code violation because knob-and-tube relies on an airspace to dissipate the heat generated from operation. Any confinement is a fire hazard, and I would hope the electrician brought the wiring up to code before the floor was closed in.

—*Scott J. McCarthy, Hingham, MA*