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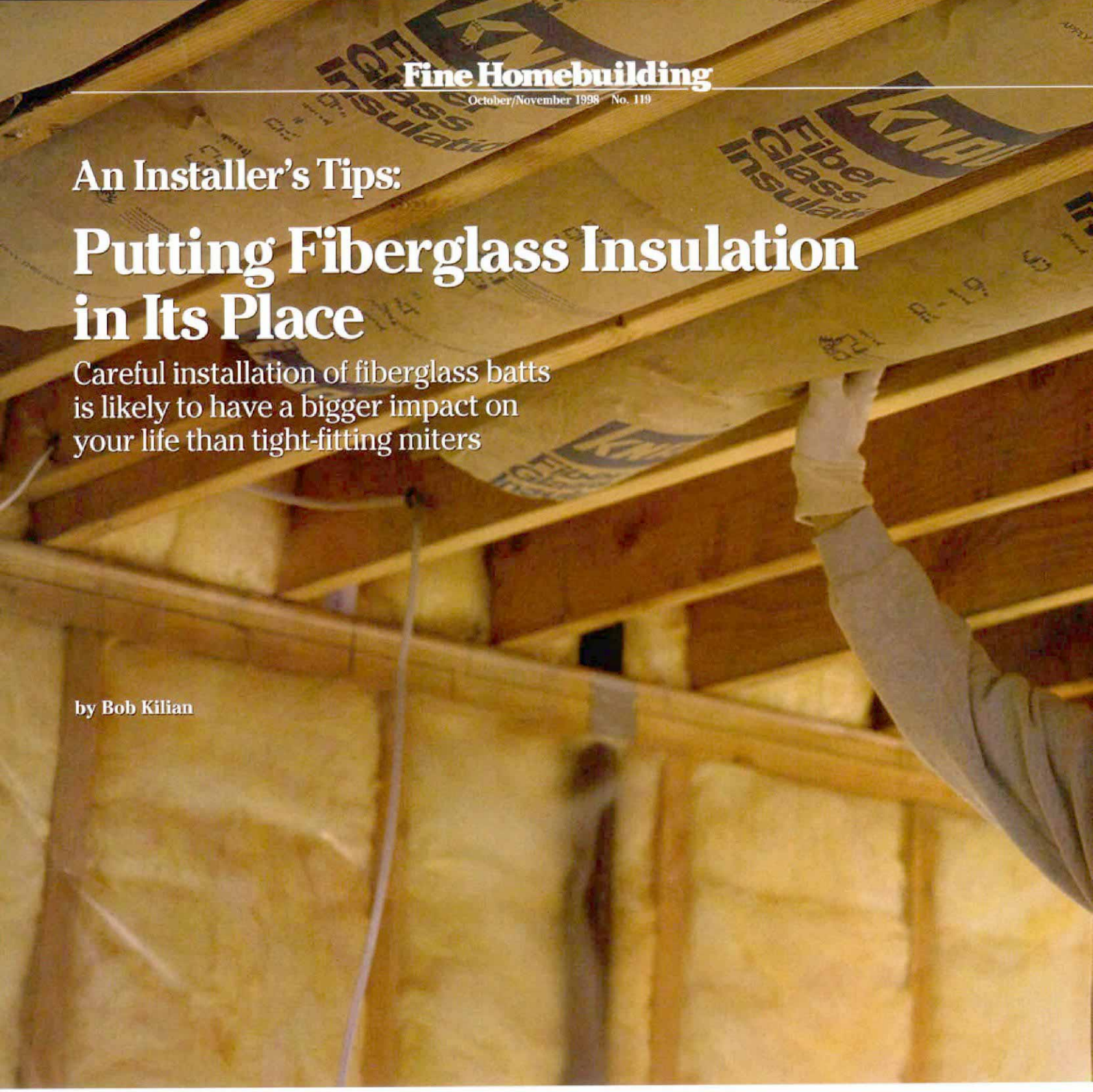

An Installer's Tips:

Putting Fiberglass Insulation in Its Place

Careful installation of fiberglass batts is likely to have a bigger impact on your life than tight-fitting miters

by Bob Kilian

I like to play golf. It gives me an excuse to get outdoors, knock the ball around and get some sun. I also like golf because it's a difficult game. If I want improve my handicap, I have to work hard to avoid hooking the ball into the jungle or losing it in a water hazard.

Installing fiberglass insulation has nothing in common with golf except that it also challenges me to do better. Some people think that you can just pack the itchy stuff into a house any old way, but if you don't pay attention to some key details, the insulation can't do its job. That means you've just wasted valuable time and money that could have been spent doing other things. Although fiberglass faces increasing competition from other types of insulation (see *FHB* #100, pp. 46-53) and although there's been a fair amount of debate on the health hazards of fiberglass (sidebar pp. 68-69), it's still the most widely used insulation in the country. So if you're going to the trouble of installing it, you should know the proper techniques.

Get the right batts for the job—There are two basic types of fiberglass insulation: faced and unfaced. Each type comes either in continuous rolls or in packages of precut lengths called batts. Both types are roughly equal

If fiberglass is compressed, its ability to insulate is diminished. Before he places a batt, the author gently pulls the fiberglass out to its full thickness. He does this with all insulation, even the newer encapsulated types, which fluff up with a good shake. Running a thin putty knife along the fiberglass fluffs and aligns the batt after it's in place.

Cutting batts in place saves time. Trimming a batt to fit a smaller bay is quick if you hold the batt up and use the bay as both a guide and a cutting surface.

in price per square foot, but I prefer to use unfaced batts for most applications because they're faster to install; I take the batts out of the bag and friction-fit them into the bays, cutting only when necessary. Although I do use faced insulation for basement walls and some ceilings, it must be stapled to the framing, a time-consuming process, and it's easy to rip the paper covering, which defeats its purpose as a vapor retardant. Faced insulation is also flammable and cannot be used near potential heat sources.

To estimate the amount of insulation I need for a job, I measure the ceilings and walls to determine the square footage and divide by the number of square feet in a package. The coverage of each package of insulation varies according to manufacturer, R-value and width. For example, I prefer to use 16-in. wide, 4-ft. long R-19 unfaced batts; each package of batts covers approximately 100 sq. ft.

You'll notice that I specify 16 in. instead of the typical 15-in. wide batts. Usually available in most common R-values, these wider batts are made for walls framed with thinner-width metal studs; when used with wooden framing, that extra inch of width makes a good, snug fit between studs. You can usually get the wider widths from distributors that carry commercial in-

Insulate behind electrical boxes. To get fiberglass behind an electrical box, split the batt vertically (photo left), hold the remainder over the box and cut around the outside of the box (photo right).

Insulating around windows requires the right amount of fiberglass. Too much fiberglass packed next to a window jamb cannot insulate properly and distorts the jamb, making the sash bind. The fiberglass should be able to expand and fill the space.

sulation. Before I start the major areas, I make sure that any openings between floors are fire-stopped with fireproof caulk, unfaced fiberglass or rock wool. Plumbing and wiring chases, flue chases, hearths and chimneys all need fire-stops. It's a good idea to check your local building code to find out what materials are specified for fire-stops and where you need to put them.

When insulating walls, fill the entire bay—Fiberglass can't insulate if it's compressed, so before I install anything, I fluff up the batts, making sure that each is expanded to its full thickness (photos top right, p. 65). In empty stud bays (no electrical or plumbing obstacles), I use full-length batts, which are typically cut to 93 in. for an 8-ft. wall. Otherwise, I like to use batts in 4-ft. lengths because they're are easier to maneuver around wiring and plumbing in the bays. This means I have to stack two batts in each bay, so I make sure that the butt joint between the batts is tight. The batts should fit snugly in the bay and should fill the width of the stud

Split the batts to insulate behind wires and pipes. The best way to deal with utilities in the bays is to peel the batt in half; slide one half behind the wire and lay the remainder on top. This method also works when utilities run vertically.

Foam baffles shouldn't block soffit vents. Baffles used in cathedral ceilings to maintain an air passage to the ridge should not extend farther than the wall plate; any obstructions in the soffit will disrupt airflow.

Always staple batts inside the bay, rather than on the face. When you staple over the face of the framing, the layers of paper can get bunched up, making it harder for the drywall crew to find places to nail and often causing nail pops later.

from the sheathing inward. I run a shoemaker's knife (R. Murphy; 978-772-3481) with a 4-in. blade along the edge of the batt to make sure that the batt is fully expanded and isn't protruding beyond the face of the stud. I like this knife because it takes the place of the 1-in. putty knife that other installers use for this job and because its edge is as sharp as a utility knife. (A sharp knife is essential when you work with insulation.)

If the bay is narrower than the batt, I cut the batt by holding it against the studs and cutting the proper width (photo bottom right, p. 65), a strong ⅛ in. wider than the space. I cut the batts to length using the same technique. An easier but slower method is using a straightedge (a 2x4 works well) as a guide as you cut on the floor. When I cut kraft-faced batts, I always turn the batt over so that the paper is face down. Cutting from the paper side can rip the paper and ruin its efficiency as a vapor barrier. In the case of a stud or rafter bay that's wider than the rest, I fill the bay with a full batt plus a portion and make sure there are no gaps.

Split batts around outlets, wires and pipes—Insulating would be a real snap if it weren't for all the wires, pipes, light fixtures and outlet boxes. These obstructions can really slow you down and make you want to stuff in the insulation any old way just to keep going. Don't do it. It takes a little time to do a proper job, but it's time well spent. And the house will be better insulated for your troubles.

To get around horizontal wires, I split the batt so that half goes behind the wire and the remainder goes in front (photo pp. 66-67). It is essential to insulate the area behind an obstacle fully, especially plumbing. When the bay is narrow, it's quick to make a shallow horizontal cut across the back of a batt so that it will accept a wire. The splitting technique also works for insulating behind vertical runs of plumbing and not only insulates copper pipes but also helps to reduce noise from PVC waste stacks.

I cut around electrical boxes by first splitting the batt (photo top left, p. 66), pushing half behind the box and then cutting carefully around the box with a knife (photo top right, p. 66) or even heavy-duty scissors. The key is to surround the box with insulation. If I'm installing kraft-faced batts, I use the outside of the box as a guide to slice the paper carefully, which lessens the chance of ripping it.

Insulating around windows requires a soft touch—As I move along exterior walls, I insulate the narrow spaces between the window jambs and framing. It's important that this space is sealed first to prevent airflow from the outside; fiberglass can't insulate if air is moving. Many builders seal windows by caulking behind the exterior casings, and others use expanding spray foam to seal the cavity from the inside. When using fiberglass to insulate the remaining cavity, many make the mistake of compacting too much into that space, which makes the insulation useless and often distorts the window jambs, making windows difficult to operate.

I tear scraps of fiberglass into sizes a bit wider than the space between the jamb and stud. Starting at the top of the window, I work the strip into the space with a knife (bottom photo, p. 66) using gentle pressure; if I have to push hard, I know that I'm overfilling the space.

Make sure that insulation doesn't block ventilated ceiling bays—If I'm insulating cathedral ceilings, I usually need to maintain some sort of continuous venting between soffits and ridge, so it's important not to block airflow with fiberglass. Several manufacturers make rigid-foam baffles that keep an airspace open between sheathing and insulation; I use a product called Raft/R/Mate by Owens Corning (800438-7465) that's stiff enough to maintain its shape, even when compressed by the fiberglass. It comes in 24-in. widths that split in half to fit 16-in. bays. Starting from the ridge and working down, I make sure that when I staple the baffles to the roof sheathing (top photo, p. 67), they don't extend down into the soffits and block airflow, a mistake I see all too often. After the baffles are up, I tuck the R-30 batts into the bays. Insulating a ceiling with unfaced batts involves the same technique as walls, That extra width comes in handy now; the batts will usually stay in place until I come back with the poly vapor barrier.

Faced and unfaced batts combine to make a good thermal barrier in the attic—The most important place for insulation is the roof area, which loses more than half of the house's heat. Here in New England, building codes call for a minimum of R-30 in the attic. In new construction, I start an attic by stapling faced R-19 batts between the attic floor joists from below. I like to use kraft-faced insulation here because I think its properties as a vapor retarder are helpful in this situation. I make sure that the paper flanges are stapled to the inside of the framing, not over the face (bottom photo, p. 67). Insulation that's stapled over the face of the

Anyone who has spent more than two minutes with fiberglass insulation knows that it's definitely not cotton candy. At the very least, most people experience some skin irritation when handling fiberglass. But just how dangerous is it? Depending on the sources you consult, fiberglass is either viewed as a hazard in the same league as asbestos or as a relatively benign substance. Recent studies on the carcinogenic qualities of airborne fiberglass have been inconclusive but did show that cancerous tumors resulted when fiberglass was surgically implanted in the bodies of lab animals. These latter results have prompted all manufacturers to label their products with a "possibly carcinogenic" warning. As hazy as these warnings are, there some hard and fast rules when installing insulation. Rule No. 1 is to use a good-quality dust mask or respirator. Wear safety glasses or goggles to keep loose glass fibers away from your eyes. Manufacturers recommend that you also wear loose-fitting clothing that covers exposed skin. When you're done for the day, take a shower.

To protect the people living in the house, always make sure that the joints of air-handling ductwork are completely sealed before insulating. You don't want loose fiberglass fibers to get into the forced-air system that's circulating in the house.

Some manufacturers have developed new products that attempt to reduce the amount of airborne glass fibers. Made by manufacturers including Certainteed (800-233-8990), Johns Manville and Owens Corning, encapsulated batts (photo bottom left) seal the fiberglass in a poly covering that minimizes contact and also serves as a vapor barrier. It's a lot less itchy, and the price is only about 5% higher than traditional batts. Owens Corning also has developed an encapsulated-batt product called Miraflex (photo bottom right) that has longer, more flexible glass fibers that contain no binders, which give fiberglass its distinctive coloring and also are a source of irritation. Miraflex looks like cotton and feels soft; it lacks the rigidity of traditional batts, though, and must be stapled in place. It can also cost up to 30% more than traditional fiberglass insulation.—*B. K.*

Encapsulated insulation

Miraflex

Fiberglass information sources

For safety information, here's a partial list of manufacturers:
Owens Corning, (800) 438-7465; www.owenscorning.com
Johns Manville, (800) 645-3103; www.schuller.com/msds/bid.html
Knauf, (800) 825-4434; www.knauffiberglass.com/facts.html

To hear a more frightening, nonindustry view of fiberglass safety, contact the Fiberglass Information Network, P. O. Box 162646, Sacramento, CA 95816-2646; www.cwo.com/~glastalk/

rafters or studs can obscure or pad out framing, making life difficult for the drywall crew and possibly creating nail pops later on. A Bostitch hammer-tacker (Stanley-Bostitch; 800-556-6696) filled with ⅜-in. staples is good; it's lightweight and has a smoother action than others I've tried.

I'm especially careful when insulating around recessed light fixtures. There are two ratings for these lights: insulated ceiling (IC) and noninsulated fixtures; labels on the inside of the fixtures specify their type. If the fixture does not have the IC rating, the insulation must be kept at least 3 in. away from any part of the light to avoid potential fires. If the fixture is rated IC, I loosely insulate around and above the can with scraps.

When I've finished the faced batts, I go into the attic and lay unfaced R-19 batts perpendicular to the joists, running them out to cover the exterior-wall plates. Tight joints between batts are especially important here and prevent thermal bridging through the framing. Instead of carwalking on the joists, I bring a 2-ft. by 4-ft. scrap of plywood that spans two joists safely. As in the case of cathedral ceilings, I'm careful not to block the soffit vents. If the attic space is to have a floor or is framed with trusses, I lay the batts on top of the faced batts, parallel to the joists.

While I'm still in a horizontal mode, I insulate any crawlspaces. I use faced batts and keep the vapor barrier toward the heated area. Because it's impossible to staple the batts in place, I use wire insulation supports every 16 in. to force the insulation up against the flooring, reducing airspaces and preventing the batts from falling out. □

Bob Kilian is an insulation contractor who works on his golfgame between jobs in New Milford, CT. Photos by Charles Bickford, except where noted.

Photos this page, facing page: Scott Phillips