

## On the House

### Mounting Downspouts on EIFS

**Q.** What is the best way to attach gutter downspouts to a house with EIFS?

**A.** John Edgar, senior technical services manager at Sto Corp., a manufacturer of EIFS systems, responds: To fasten something light to an EIFS wall, you will need screws or lag bolts long enough to reach through the rigid foam to the sheathing or framing. You'll also need a PVC sleeve (plastic tubing or conduit) with an interior diameter a little larger than the fastener. The sleeve allows the installer to tighten a screw against a solid object without crushing the EIFS.

Fastening an object through EIFS will be easier if the sheathing under the foam is plywood rather than gypsum. If the sheathing is plywood, use the following procedure:

1. Mark the location of the fastener on the finish.
2. Drill a hole through the EIFS up to

— not through — the sheathing.

3. Line the hole with a neutral-cure caulk. (If the caulk smells like vinegar, it should not be used. A vinegar smell indicates an acid-cure caulk, which may corrode the fastener.)
4. Cut a length of your PVC sleeve about  $\frac{1}{8}$  inch longer than the thickness of the EIFS, and insert it into the hole. The sleeve should be  $\frac{1}{8}$  inch proud of the EIFS. Tool any excess caulk.
5. Fill the sleeve with additional caulk and immediately fasten the downspout through the fresh caulk in the sleeve. Remove any excess caulk.

If the sheathing is gypsum, the only locations where fastening is possible are at studs or blocking. Follow the same procedure described above. If it is necessary to fasten between studs, a toggle bolt may work. Of course,

before drilling through any wall, be sure that there are no electric wires or gas lines in the area.

#### Grout or Caulk?

**Q.** When installing a mortar-bed shower floor, should the gap between the drain and the adjacent tiles be finished with grout or with caulk?

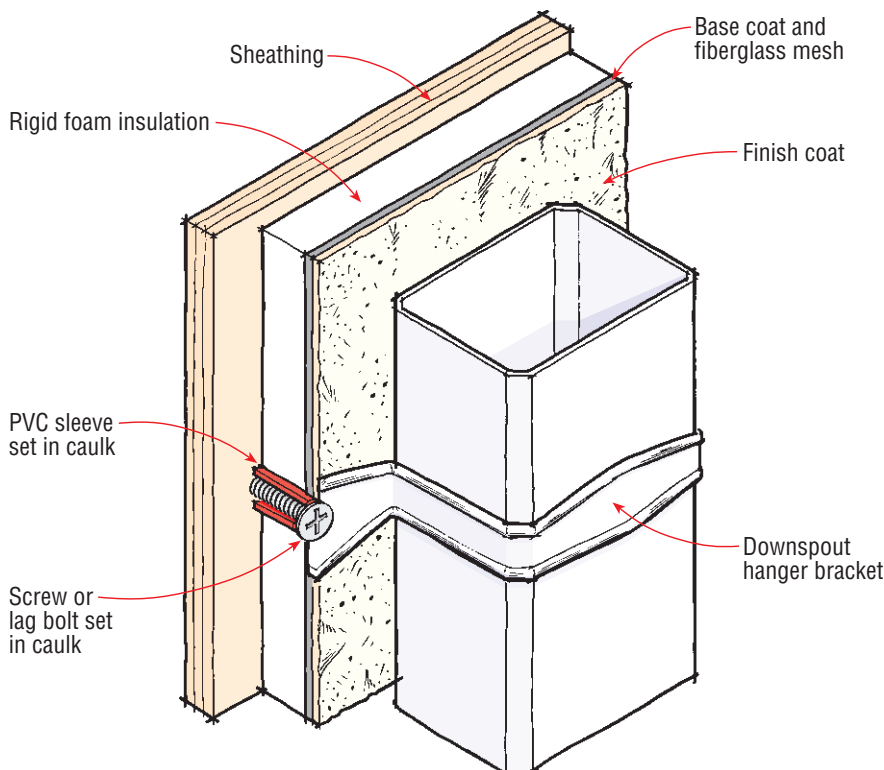
**A.** Tilesetter Tom Meehan, owner of Cape Cod Tile Works in Harwich, Mass., responds: Use grout. Since the shower floor, if installed properly, has a mud base (Portland cement and sand) at least 2 inches thick, there should be almost no potential for deflection. Caulk is used mostly at the joint between vertical and horizontal surfaces, where movement is more likely. One reason to limit the use of caulk is that many caulks will mildew and discolor in wet areas.

#### Condensation on Windows

**Q.** A customer with insulated-glass windows has a problem with excessive condensation on the interior of the windows. Can you please list the most important causes of high humidity in a home?

**A.** Energy and sustainable design consultant Andy Shapiro responds: Two factors affect the humidity level in a house: how fast water is being introduced and how fast it is leaving. A very tight house doesn't need a lot of moisture input to result in high humidity and condensation on the windows, while the same amount of water introduced into a very leaky house won't raise the humidity much.

You can use a blower door to check the house air leakage rate, though your wet windows may already be telling you that it is relatively tight. You can also check the humidity in the house with a Radio Shack temperature-humidity indicator. The windows



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should tolerate 40% relative humidity without condensing in cold weather. If they don't, then they are part of the problem — they're not well enough insulated at the edges. If the homeowner isn't willing to upgrade the windows or add storms, then you'll have to lower humidity levels further.

Showering contributes a lot of moisture to a home. A bath exhaust fan should take care of it, but often the fan is missing, undersized, or little used. Drying clothes indoors also releases a lot of water. (Dryers should always be ducted outside.) Every drop of water that goes to houseplants ends up as moisture in the air. Drying firewood in the basement can add quite a lot of water. Cooking, particularly if the occupants don't use a range hood that is vented to the outside, can generate a lot of moisture.

If the house is new, the construction materials contain literally tons of water that will evaporate over the first winter. Therefore, condensation problems that show up the first winter may not show up again. Poor basement drainage on a wet site can also be a major source of water. (Your nose will tell you if there is water in the basement — you can usually smell the damp or the mold.) Consistently bringing wet or snowy cars into an attached garage that is not adequately sealed from the house can bring in a lot of water.

To solve condensation problems, first reduce the sources of moisture and then ventilate to get the humidity down to acceptable levels. I recommend powered ventilation for all houses. An inexpensive ventilation approach is to install a quiet, efficient bathroom exhaust fan, like the Panasonic FV-08VQ. The fan can either run continuously or be wired to a control like the Airetrak, which runs the fan at a constant adjustable speed and has a push button for 20 minutes of high speed (see "Simple Whole-House Ventilation," 8/95).

### Vinyl Siding Over Foil-Faced Rigid Foam

**Q.** *Can vinyl siding be installed directly over foil-faced rigid foam?*

**A.** *Corresponding editor Paul Fisetette responds:* Some vinyl siding manufacturers void their warranty for heat distortion when their siding is installed over foil-faced foam. One study has shown that when vinyl siding is installed over foil-faced foam, the temperature of the back of the siding can be 8°F warmer than when it's installed over foam without foil. Installers who are concerned about heat buildup should select rigid foam without foil facing.

Nevertheless, some manufacturers have no objection to the installation of vinyl siding over foil-faced foam. Whenever vinyl siding is installed over rigid foam (with or without foil facing), studs should be spaced no more than 16 inches on-center, and the thickness of the foam should be limited to 1 inch. Because rigid foam doesn't provide much resistance to vinyl siding sagging under its own weight, such an installation requires threaded nails that are long enough to pass through the rigid foam and penetrate at least 1 inch into the sheathing and studs.

Some building codes may require a secondary weather barrier (asphalt felt or housewrap) under the siding, so check with your local building authorities before proceeding. Where allowed by code, rigid foam will perform adequately as a weather-resistive barrier, as long as all seams and flashing are taped with foil tape.

### Overhanging Brick Veneer

**Q.** *It's not unusual for a foundation to be slightly out of square. If the house has brick veneer siding, it's sometimes necessary for the first course of bricks to overhang the concrete foundation. What is the maximum safe overhang in such a situation?*

**A.** *Consulting architectural engineer Clayford Grimm responds:* To provide structural stability, at least two-thirds of a brick masonry wythe should bear on the foundation. Three-inch brick veneer should not overhang the foundation by more than 1 inch, and 3<sup>5</sup>/<sub>8</sub>-inch brick veneer by not more than 1<sup>1</sup>/<sub>4</sub> inches.

One reason this condition occurs fairly often is that the American Concrete Institute's *Standard Tolerances for Concrete Construction and Materials* (ACI 117) provides that footings may be misplaced as much as plus or minus 2 inches. One solution to a misplaced footing is to relocate the wall. The *Specifications for Masonry Structures* written by the Masonry Standards Joint Committee (MSJC99) provides that the location of walls may differ from the intended location by as much as plus or minus <sup>3</sup>/<sub>4</sub> inch. So as long as the wall location can be adjusted in the right direction, it is possible for 3<sup>5</sup>/<sub>8</sub>-inch brick veneer to stay within the allowable tolerances for both masonry and concrete.

### Compressing Fiberglass Batts

**Q.** *I've heard that if you use 5<sup>1</sup>/<sub>2</sub>-inch-thick fiberglass batts in a 2x4 wall, the insulation will have a higher R-value than standard 3<sup>1</sup>/<sub>2</sub>-inch batts provide. But some people say that compressing fiberglass batts lowers the R-value. What's the story?*

**A.** *Bruce Harley, an energy efficiency expert at Conservation Services Group, responds:* Both statements are correct. When you compress fiberglass insulation, you increase its R-value per inch, up to a point. However, when you compress a batt of a particular thickness, the total R-value does decrease. For example, standard low-density batts, at their nominal rated thickness — R-11 at 3<sup>1</sup>/<sub>2</sub> inches, or R-19 at 6 inches — have an R-value of about 3.1 per inch. If you compress a 6-inch R-19 batt into a 3<sup>1</sup>/<sub>2</sub>-inch cavity, you get

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about R-14, or 4.0 per inch. This is a much higher R-value per inch, but the total value of R-14 is still substantially less than the R-19 you started with. Even in a 5½-inch wall, the R-19 (which is rated at 6 inches of thickness) gives you only R-18.

For the best performance, any batt should be installed carefully, to fill the entire space without compressing around wires, pipes, bridging, or other obstructions. For those seeking higher R-values per inch than standard fiberglass batts, one alternative to compressing large batts into small cavities is to use so-called high-density batts (R-13 or R-15 at 3½ inches, or R-21 at 5½ inches). Although they cost more than standard batts, they are stiffer, easier to fluff up, and easier to cut around obstructions in wall framing. These factors result in a bigger benefit in real-world performance than the factory ratings indicate.

### Solid Surfacing for Flooring

**Q.** *Can solid surfacing be used for flooring in a bathroom?*

**A.** *Associate editor Martin Holladay responds:* Some solid-surfacing fabricators have used the material for flooring, in spite of the fact that most manufacturers, including DuPont, the manufacturer of Corian, will not provide a warranty for flooring applications.

Besides the high cost, one disadvantage of using solid surfacing for flooring is its surface texture. Solid surfacing is so smooth that it's slippery when wet. But if the material is cut into 12x12-inch tiles, installed with grout lines, it will be somewhat less slippery than a seamless application.

### Got a question?

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