Q&A

Q. Sealer Failure on Saltillo Tiles

A past customer purchased Mexican Saltillo tile from a distributor and had it installed by a tile installer I referred her to. The tile came presealed and was installed — per instructions on the shipping boxes — using thin-set mortar. Within a day or two, the sealer began to fail, appearing as a milky white coating on the surface of the tile. There appears to be moisture in the tiles themselves: Could it be that the sealer was applied to tiles that were not completely dry?

A. *Tile-setter and* JLC *contributing editor Michael Byrne responds:* Saltillo pavers have always been among my favorite tiles because of their unique handcrafted appearance. I have used a wide variety of colorants and sealers on them, including aniline dyes, opaque stains, penetrating oil, hot paraffin and naphtha, beeswax, and other materials that do not react with water.

The few times I've seen problems with a cloudy finish, the culprit was latex sealers, which are not intended for exposure to damp conditions. The cloudy haze appears when latex in the sealer begins to re-emulsify. Although I can't be sure without examining them, I would guess that this is the problem with your tiles. Since they were fired before they were sealed, it's highly unlikely that any moisture left over from the tile-forming process still remains in the body of the tile.

The cure is to identify the sealer, strip it with a safe, compatible stripper, and reapply an approved colorant and sealer. Unfortunately, it's probably impossible to find anyone who can tell you what sealer was used. This is because Saltillo pavers are made by families who sell to brokers who sell to larger brokers who sell to exporters who sell to distributors who sell to dealers. Since there is no industry standard for Saltillo pavers, it's always a matter of "buyer beware" — especially with presealed pavers.

I suggest that the installer contact the tile dealer and show him the problem. If the dealer is not helpful, ask for a few sample tiles to test. Go to the local paint store and buy a stripper designed for latex coatings. Try it out on a leftover or sample tile, or on an area of the floor that is out of sight. Be cautious, because using the wrong stripper may make the situation worse by discoloring the tile or driving the sealer in deeper, making restoration to the original tone and sheen virtually impossible. Good luck.

Q. Can Fiberglass Batts Perform Well in Tightly Sealed Houses?

I understand that fiberglass batt insulation can allow air to move through it and that this air movement degrades the insulation's R-value. Two causes I've heard about are wind-washing at the eaves and convective loops that can start in a wall cavity on really cold days and wick warmth from inside to the outside wall surface. But recently I have taken pains to do a very good air-sealing job on everything I build, whether it's an addition or a new house. I'm getting blower-door readings of less than 1.5 air changes per hour at 50 pascals. I also use baffles at the eaves, and seal the sheathing to the framing before insulating. Under these conditions — with air movement cut to a minimum — will fiberglass insulation perform at its stated R-value?

A. *Patrick Dundon, an insulation contractor in Windsor, N.Y., responds:* To perform at maximum R-value, fiberglass batt insulation must be installed perfectly. It has to be of consistent density throughout the wall cavity, which means that every piece must be cut to fill the cavity completely in all three dimensions. If you can do that in every building cavity, fiberglass batts will work as labeled.

But installation perfection is hard to achieve. For example, it's common to see fiberglass batts compressed in a wall cavity that's slightly too narrow. Most installers, rather than trim a small amount of material along the edges, will simply stuff the insulation into the cavity, causing it to pinch at the edges and curl away from the studs at the corners. Tests conducted by the Oak Ridge National Laboratory several years ago showed that if a pinched batt is rounded over at a 3/4-inch radius where it meets the studs in the corners, its performance is reduced by 12 percent.

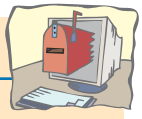
Keep in mind also that accepted test protocol for insulation calls for an average temperature in the test sample of 75°F, with 50° on one side and 100° on the other. Unfortunately, that's not a common scenario in the exterior walls of houses. The test is also conducted in such a way that it doesn't recognize the effect that air-convection loops inside a wall cavity might have on the insulation's performance. In a real house's wall, you will most likely have either 3 1/2- or 5 1/2-inch-deep wall cavities that are at least 8 feet tall; the wall may experience

outside surface temperatures anywhere from 100°F to –20°F and inside surface temperatures from, say, 65°F to 72°F on the inner surface. When the delta T, or temperature difference, across such walls is high, there will be some convection even in perfectly installed batts because the fiberglass is not dense enough to stop the air movement. On a very cold day, heat inside the house causes warm air to rise in the wall cavity behind the face of the drywall. On the outside of the wall, cold dense air drops along the face of the sheathing. This creates a convective loop in the wall that hastens heat loss from inside, effectively degrading the performance of the insulation. The effect is magnified with increased temperature extremes and increased wall height. This is why dense-pack systems — either fiberglass or cellulose — outperform fiberglass batts.

Some energy professionals use a system for rating fiberglass batt installations. A "good" rating means there are no gaps, compressions, voids, or other imperfections. "Fair" allows gaps of 2.5 percent of the surface area, or about a 3/8-inch gap along the edge of a 14 1/2-inch-wide batt. "Poor" allows for voids of 5 percent of the surface — a 3/4-inch gap. A chart posted at the Web site of the Building Performance Institute attaches R-values to these ratings ("Effective R-Values for Batt Insulation," bpi.org/standards_reference.aspx). According to the chart, a nominal 6-inch batt installed with a "fair" rating has an effective R-value of 11; installed "poor," its effective R-value is 4. Batt compression — stuffing a batt into too small a cavity — is also a critical error: A nominal R-19 batt manufactured to be used at 6 1/4-inch thickness that is compressed into a 5 1/2-inch wall cavity is rated "poor."

When you decide which insulation to use, ask yourself whether your crew (or your insulation contractor) can install fiberglass batts perfectly in every cavity, and whether your job budgets can afford the extra level of supervision and labor involved. This is the reason dense-pack fiberglass, dense-pack cellulose, and spray-foam products are gaining market share.

GOT A QUESTION?



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