Why Asphalt Shingles Won't Seal

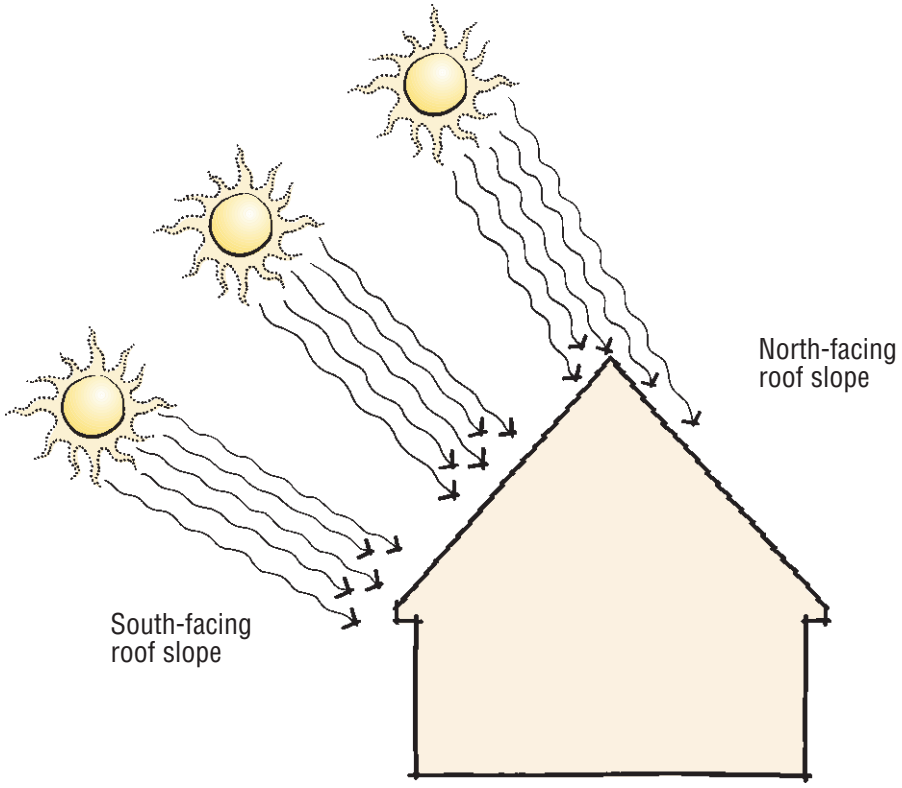
Q. *Two years ago, in the middle of the summer, I re-roofed a house here in Montana with three-tab asphalt shingles. The south-facing slope came out perfect, but the north-facing slope would not seal. I know the temperature was hot enough and the installation was done correctly. Why aren't these shingles sealing?*

A. *Architect and roofing consultant Harrison McCampbell responds:* There are several factors that may have affected the sealing of your shingles. One factor is climate: Many parts of Montana do not experience stifling heat during the summer months.

The second factor is the slope of the roof. The sun's rays will strike the roof at different angles, depending on the roof slope. If the roof has a low slope — between 4/12 and 6/12 — then the effect of the sun on the north and south sides will be similar. But with the steeper roof slopes typical on newer houses — from 10/12 to 18/12 — the north roof might stay in the shade, no matter what time of day or year. If the north roof slope with the unsealed shingles is parallel to the sun's rays, then the sun never had a chance to soften the asphalt. Conversely, the south side sealed well because the slope probably put the shingles nearly perpendicular to the sun's rays during the hottest time of day, thereby sealing the shingles well to each other.

The slope of the roof can affect shingle sealing in another way as well: On steeper roofs, the weight of each shingle does not bear as heavily on the course below. The flatter a roof gets, the more the weight of the shingle can contribute to effecting a seal.

One solution to the problem of unsealed shingles is to install a dab of roofing cement or an asphalt-based caulk below each shingle. Otherwise, it is a moot point unless you have high wind conditions that cause a blowup of some shingles or blow off a section.



Much of the year, the rays of the noon sun can be almost perpendicular to a south-facing roof slope, while the north-facing roof slope is mostly in the shade. This may prevent north-facing shingles from sealing.

Sagging Ceiling Drywall

Q. *When 1/2-inch drywall is installed on ceiling joists spaced 24 inches on-center, will the drywall sag? If the ceiling has blown-in cellulose insulation, will the drywall be more likely to sag than it would under fiberglass batt insulation?*

A. *Corresponding Editor Paul Fisette responds:* According to drywall manufacturers, 1/2-inch drywall can be installed on ceiling framing spaced at 24 inches on-center. However, I have known 1/2-inch drywall to sag when installed on 2-foot centers. For a better installation, either use 5/8-inch drywall, or first strap the ceiling with 1x3s installed at 16 inches on-center.

I don't think that the difference in density between cellulose and fiberglass is enough to make any difference in the drywall sagging.

Venting Shed Roofs

Q. *I want to vent an existing shed roof that intersects a vertical wall at the ridge.*

Because this roof is at the front of the house, I don't want to place any visible vents in the roof. Is there an inconspicuous ridge vent available that can be installed where the roof meets the wall?

A. *Corresponding Editor Henri de Marne responds:* There is a product called the Flash Filter Vent that is designed for the application you face. This shed roof vent has a low profile and comes in dark brown, black, white and mill finish. It is available from AVI, a division of CertainTeed (800/247-8368).

The vent replaces the apron flashing normally installed at the joint between a wall and a shed roof. It requires removing the bottom course of the siding and lifting the housewrap or felt paper to insert its 4 1/2-inch leg against the wall sheathing.

This vent features an external baffle to deflect the wind over the vent. The importance of the external baffle must not be underestimated. I recently checked a house where a porch roof butts against a second-story wall. Wind had driven rain and tree debris — leaves and pine needles — under the apron flashing and caused the sheathing and the end of the beam to become wet. Carpenter ants infested a large structural beam inside the house. The same situation can occur with unbaffled ridge vents, as I have seen a number of time over the years.

I cannot emphasize enough the importance of inserting any flashing under the housewrap or felt, so that any leakage from above is directed over the flashing and not behind it and into the structure. Too often, flashing is installed over these because the housewrap or felt was installed first.

Arc-Fault Circuit Interrupters

Q. *What is an arc-fault circuit interrupter? Are they expensive? Are they subject to nuisance tripping?*

A. *Master electrician Rex Cauldwell responds:* According to the *National Electrical Code,* these little babies will be required for bedroom receptacle circuits, beginning in 2002. An arc-fault circuit interrupter (AFCI) is like a common 15-amp or 20-amp single-phase circuit breaker with a twist. It will sense any arc on the circuit that is 75 amps or higher. The arc can be a short to ground or to neutral, or an arc across itself as the wire opens and closes. Such an arc might occur in a wire beginning to break, or in a loose wiring connection. Since AFCIs are designed to sense at 75 amps, you should not get any nuisance tripping. And yes, they are expensive (about $75 to $125 each), although prices are expected to drop as they become more common.

College Construction Programs

Q. *I am currently a contractor, but I'm thinking about going back to school to further my education. Where can I find a list of colleges with architecture, construction science, and construction research programs?*

A. *David Damery, chief undergraduate advisor for the Building Materials and Wood Technology program at the University of Massachusetts in Amherst, responds:* There are a variety of construction-related programs available, but the names of the degree programs are not standardized. Programs worth considering include construction management, construction science, construction technology, architecture engineering, and wood technology. The program in which I teach at the University of Massachusetts, Amherst, is called Building Materials and Wood Technology.

If you are interested in a graduate degree program, visit the website www.gradschools.com, which lists 34 U.S. construction management programs and 32 programs in architecture engineering and construction science.

The Association of Collegiate Schools of Architecture (ACSA) lists 123 schools in the U.S. and Canada offering professional degree programs in architecture. An additional 100 schools offer one or two year non-professional programs in architecture studies or technology. The ACSA website offers many tips for potential architecture students (www.acsa-arch.org/studentinfo).

One of the more popular college search web sites is Peterson's guide. Their online version (www.petersons.com) has extensive search tools. The guide includes listings for architecture, architectural engineering, architectural technologies, civil engineering technology, construction engineering, construction management, construction technologies, and wood sciences. The website allows you to provide filters to limit your search based on geography, the type of program (two or four year, public or private), and the selectivity of the school (a gauge of admissions criteria and probability of admission).

Non-Slip Coatings for Tile Floors

Q. *We installed a ceramic tile floor in a kitchen. The client is now complaining that the floor is very slick when wet, leading to dangerous falls. Is there any way to retrofit a non-slip surface on a tile floor?*

A. *Tile consultant Michael Byrne responds:* So-called "non-slip" coatings, which work by etching the surface of the tiles, are available. Use of non-slip coatings, however, can affect the color, hue, and light-reflecting qualities of the tiles.

How you respond to this client may depend on who specified the tiles. If the tiles have a polished surface, they may not be appropriate for the intended use. If you have no responsibility regarding the selection or purchase of the tiles, you should direct your customer to a contractor who is trained in the application of non-slip coatings, which is a specialty trade. (I don't recommend that you attempt to install a non-slip coating, since the work has resulted in some rather protracted lawsuits.)

Although most people expect a bathroom floor to get wet, a residential kitchen should not be expected to have water on it. If water is spilled on any kind of flooring, it should be removed promptly, and foot traffic should be restricted until the area is dry. Since a film of cooking grease or oil, with or without water, can be slippery, kitchen floors should be

cleaned on a regular basis. If the owners expected to have water on their floor, they should have made that clear at the time the tile was being specified, so that a special tile could have been used.

Insulating Pipes in an Exterior Wall

Q. *What's the best way to insulate plumbing supply lines in an exterior 2x6 wall?*

A. *Master plumber Rex Cauldwell responds:* This is like a trick question. The answer is, you don't. My rule is that if it is cold enough to have the pipes insulated from freezing, then you shouldn't put the pipes in the outside wall. By insulating them, all you do is keep the heat from inside the house from getting to the pipes. Insulation just slows down the freezing process, it doesn't prevent it.

Stay out of the exterior wall and go through the floor. For those of you who ignore my advice, you have to use heat tape and closed-cell foam pipe insulation.

Water in Under-Slab Ducts

Q. *Nine years ago I built a new house on a slab foundation. We put in a forced-air heating system, and the hvac contractor ran the ducts under the slab. The house is on a lake, and during certain times of year rising ground water enters the ducts.*

We installed a small pump with a float switch in the ductwork next to the furnace, and it has been doing a fairly decent job, but maintenance of the pump has been a continuing problem. The homeowner wants a more permanent solution. What is the best way to prevent water from entering the ducts?

A. *Bill Rose, architect and building researcher at the University of Illinois in Urbana-Champaign, responds:* Abandon the below-grade ductwork. Otherwise, the humidity in the ductwork will create a mold museum for the occupants, and they will be breathing a little of every water-soluble contaminant in the area. Plug the ducts at all penetrations through the slab with concrete. Route new ducts above the slab somewhere, or move to hydronic or resistance heating. No exceptions.

Velvety Wood Decay

Q. *When inspecting the porch floor joists of an 1880s farmhouse in Illinois, I was surprised to see that the joists and the underside of the tongue-and-groove fir decking appeared velvety, and looked like they were covered with matted dog hair. The surfaces felt not wet, not very dry, but very soft. Is this type of decay caused by a fungus or an insect?*

A. *Stephen Quarles, cooperative extension advisor on wood durability at the University of California Forest Products Laboratory in Richmond, Calif., responds:* Based on your description, the degradation affecting your porch was caused by a decay fungus. The velvety appearance you observed on the surface of the wood was mycelium, a term used to describe a mass of hyphae (thread-like cells of the fungus that break down the chemical constituents that make up wood into food that the fungus can absorb).

The color of the mycelium can vary, depending on the particular fungal species and how dry it is. On the back of building paper installed on a wall, I have seen white mycelium so thick that other people present mistook it for housewrap.

The presence of mycelium indicates that the growth conditions for the fungus were pretty good. With that much mycelium on the wood, you should be able to easily gouge out some wood with a screwdriver or an ice pick. It's a good idea to check how deep the decay has penetrated.

Even though the surface of the mycelium didn't feel wet, the underlying wood may or may not be wet. The wood would have to be wet for the fungus to still be active. If decaying wood dries out, and the moisture content drops below about 28%, the decay fungi will become dormant. The fungi can become active again if the moisture returns.

To address the problem with your porch, you need to assess whether the joists and boards are still structurally adequate. In any case, try to remove the source of the water. This may or may not be possible, depending on whether the porch is exposed to rain and snow. Improved air circulation under the deck can help.

If it's time to rebuild the porch, the replacement joists should be pressure-treated. Instead of tongue-and-groove fir, consider installing deck boards of pressure-treated lumber or wood-plastic composite, allowing space for drainage between the boards.

Connecting Gutter Downspouts to Footing Drains

Q. *Can gutter downspouts be connected to 4-inch pipes connected to the footing drains? The footing drains eventually terminate at daylight, away from the house.*

A. *Corresponding Editor Paul Fisette responds:* This is a terrible idea. Don't do it. Downspouts should feed into a solid, non-perforated pipe that directs roof water far away from the house. The pipe should run independently from the footing drain.

Surprisingly, there is nothing in most building codes that prevents you from connecting downspouts to a foundation's perimeter drainage system. The pipes used for perimeter drainage have slits or weep holes along the pipe to allow water to enter the pipe and be carried away. The goal is to remove water from around the foundation. Bringing additional water from connected downspouts to the base of the foundation runs counter to the system plan, since it introduces water to a place where you don't want it. In all likelihood, the downspout water would leak from the perforated pipe, saturating the soil near the footing. If the perimeter footing drain ever fails or gets blocked, you also run the risk of flooding the subsoil area.

GOT A QUESTION? Send it to On the House, *JLC*, 186 Allen Brook Ln., Williston, VT 05495; or e-mail to *jlc@bginet.com*.