Q&A

Q. Should Caulk Guns Be Pushed or Pulled?

When applying caulks and sealants, is it better to push the bead with the nozzle of the caulk gun, so that more sealant enters the joint, or to pull the caulk gun along the joint, which I think leaves a cleaner-looking bead that's easier to tool?

A. *David Dobson, an architect and licensed general and glazing contractor in San Diego, responds:* On most job sites (and even in the promotional material of many manufacturers), I've found that applicators usually drag caulked sealants when they apply them. But it's hard not to pull the caulking gun too quickly and stretch the caulking bead, which will prevent enough sealant from being applied to the joint.

Applied too thinly, a caulked sealant can suffer from cohesive failure, meaning it's not strong enough to maintain its bond. Or, it can shear (split) along the length of the joint. This is particularly a problem when a sealant is used to create a "bridge" joint, where the gap between two materials is simply painted over — rather than filled — with sealant.

When using a simple caulk to fill a joint that isn't expected to move or to repel moisture, joint failure is usually no more than a cosmetic problem. But when high-performance polyurethane and silicone sealants are used to form long-lasting welds between dissimilar materials that are expected to be both flexible and air- and watertight, a properly designed and installed sealant joint is critical. That's why these sealants should be applied by using the caulk gun to push — rather than pull — the bead along the joint. This technique helps work the air bubbles out of the sealant and pushes the sealant into the joint instead of pulling it out.

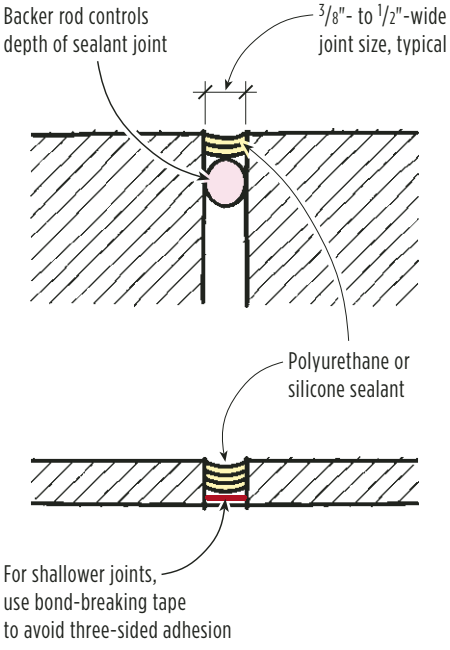
Keep in mind, though, that caulked sealants applied too thickly lose their elasticity. To picture this, take a rubber band and stretch it, then double it up a few times and try stretching it again. Like the rubber band, the thicker bead of sealant becomes less flexible and loses its elongation properties.

In general, the best joint size for most caulked sealants is between 3/8 inch and 1/2 inch (always refer to the sealant manufacturer's recommendations for joint designs).

Sealant joints should be designed to avoid three-sided adhesion. A sealant that adheres to three sides of a joint will tear along one of the sides when the two materials move differentially. One common way to avoid three-sided adhesion is to use a bond-breaking tape underneath the joint (see illustration, left).

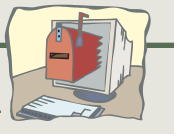
Another way is to install a closed-cell foam backer rod before filling the joint with sealant. Available in different diameters, backer rods are useful for controlling the depth of the joint between thicker materials, and therefore the size of the sealant bead.

Sealant Joint



GOT A QUESTION?

Send it to Q&A, *JLC,* 186 Allen Brook Lane, Williston, VT 05495; or e-mail to jlc-editorial@hanleywood.com.



Q&A

Q. Painting Steel Roofing

When installing painted steel roofing, is it necessary to coat the edges of cut panels in order to prevent rust?

A. *Todd Miller, president of Classic Metal Roofing Systems, responds:* Even though I don't know of any manufacturers who recommend this as part of their standard installation procedure, painting the cut edges of steel roofing wouldn't be a bad idea.

While most manufacturers offer matching touch-up paints, all you would actually need to do is rig up some simple method (brush or roller or dip tray) and apply a quality rust-inhibiting primer or paint.

It's also worth pointing out that metal panels should be cut with shears — rather than with an abrasive blade — to eliminate the possibility of creating hot metal shavings that could burn through paint coatings and cause rust.

Q. Waterproofing Under a Stone Countertop

Is it okay to use Schluter's Kerdi material as a waterproofing membrane beneath a stone countertop? Because it's flexible, I plan to use it to cover the plywood substrate on top of the cabinets, and then turn it up the wall a few inches so that I can waterproof the area behind the planned tile backsplash at the same time.

A. *Sean Gerolimatos, technical services manager for Schluter Systems, responds:* Yes, the Kerdi waterproofing membrane (800/472-4588, www.schluter.com) would be suitable for this application.

However, if you were planning to install tile on the countertop instead of the stone slabs, I would recommend using Schluter's Ditra uncoupling membrane instead. This is because stone slabs are basically self-supporting and are not as sensitive as tile to the inherent dimensional instability of the plywood deck. Ditra would provide better lateral flexibility than the Kerdi membrane, protecting tile and grout from movement in the plywood substrate caused by changes in moisture content over time.

You'll need to use a modified thin-set mortar to bond the Kerdi to the plywood substrate. If there are any seams, be sure to butt rather than overlap them, and seal them with Schluter's Kerdi-Band using unmodified thin-set mortar.

Q. Persistent Mildew

Twelve years ago, we sided a house with vertical-grain cedar treated with a solid oil stain. When mildew started to appear, we were asked to return and apply a second coat of stain. The house cleaned up nicely when we washed it with a bleaching solution, and we added mildewcide when we applied new stain — but now, only six months later, mildew is reappearing on the sunny side of the house. Why?

A. *Bill Feist, a former wood-finishes researcher with the Forest Products Laboratory in Madison, Wis., and co-author of* Finishes for Exterior Wood, *responds:* Mildew is a fungus found virtually everywhere; all it needs in order to flourish is oxygen, a food source, moisture, and temperatures between 40°F and 90°F.

As a siding stain degrades — due to UV exposure and other environmental factors — the mildewcide it contains breaks down. And if the climate is right (warm and humid is ideal), chalked siding offers the perfect surface for mildew growth, with dirt that's accumulated over the years providing an additional food source.

Oil-based stains are more prone to mildew growth than latex stains, but both types need good mildewcides. These typically are effective for only two or three years; if mildew reappears after just six months, most likely the old surface was not adequately cleaned of dirt, chalk, and old mildew before restaining. If mildew is present when you restain, you actually help it by providing food and moisture for the spores; furthermore, the stain could prevent bleach solutions from reaching the source of the mildew.

To remove mildew before restaining and to prevent it from reappearing, use a solution of one quart liquid household bleach containing 5 percent sodium hypochlorite and three quarts warm water; or use a commercial mildew cleaner, such as those containing

sodium percarbonate. Also, be sure to scrub the surface gently with a sponge mop or soft-bristle brush after applying the bleach or cleaner (always be careful to protect the skin and eyes during application). After 15 to 20 minutes, thoroughly rinse with water to remove any remaining cleaner or bleach solution, and let the cleaned siding dry properly before restaining.

Q. Block Walls, Vapor Barriers, and Solar Vapor Drive

With a cavity wall assembly consisting of load-bearing 8-inch CMUs (concrete masonry units), 2 inches of rigid foam, a 2-inch air space, and 4-inch concrete bricks covered with cementitious stucco and an acrylic color coat, how important is dampproofing? It seems to me that any liquid water that penetrates the stucco would be stopped by the layer of rigid foam. I am also concerned that the acrylic color coat on the exterior may act as a vapor barrier on the wrong side of the wall, trapping moisture within the wall.

A. *William Rose, a research architect with the Building Research Council at the University of Illinois at Urbana-Champaign and the author of* Water in Buildings: An Architect's Guide to Moisture and Mold, *responds:* If there's a cavity in the wall, it should always be designed to manage rainwater. That's because a CMU veneer — such as brick — allows some rainwater to enter the wall, travel along mortar droppings, and create local wetting of the block.

But saying the block wall should be "dampproofed" only begins to address the serious task of detailing the cavity water-management layer; coordinating it with insulation, ties, flashing, openings, and protrusions; and possibly having it serve as the air-barrier layer.

Moreover, the sequence of the dampproofing application needs to be scheduled so that any water collected in the block during construction has a sufficient chance to dry out.

A good source of information on this subject can be found in the Canada Mortgage and Housing Corp.'s *Best Practices Guide: Brick Veneer Concrete Masonry Unit Backing* ($89; 613/748-2003, www.cmhc-schl.gc.ca/en/).

Where dampproofing really pays off is in protecting a cavity wall against solar vapor drive, which occurs when the sun hits the masonry exterior and steams up the rain-wetted cavity. The rigid foam insulation may alone provide enough protection against this high vapor drive, depending on the type and the continuity of placement, but dampproofing behind the insulation doesn't hurt either. Whether it's necessary depends on the strength of rain wetting, the permeability of the insulation, the quality of the mortar joints, and a few other variables. I use modeling software called WUFI — which takes exterior wetting and solar drive into account — to help me make these decisions (www.ornl.gov/sci/btc/apps/moisture/index.html).

As for the acrylic coating, any finish applied to the exterior of a building will be wetted by rain from the outside and, to some extent, by moisture in the substrate. But the layer of rigid foam practically guarantees that indoor humidity will have a negligible effect. As long as the coating is an exterior-grade product intended for use with concrete block, it should be fine.

Old rules like the one concerning "wrong-side vapor barriers" are giving way to a wider palette of building-envelope designs, thanks to our ability to model their performance.