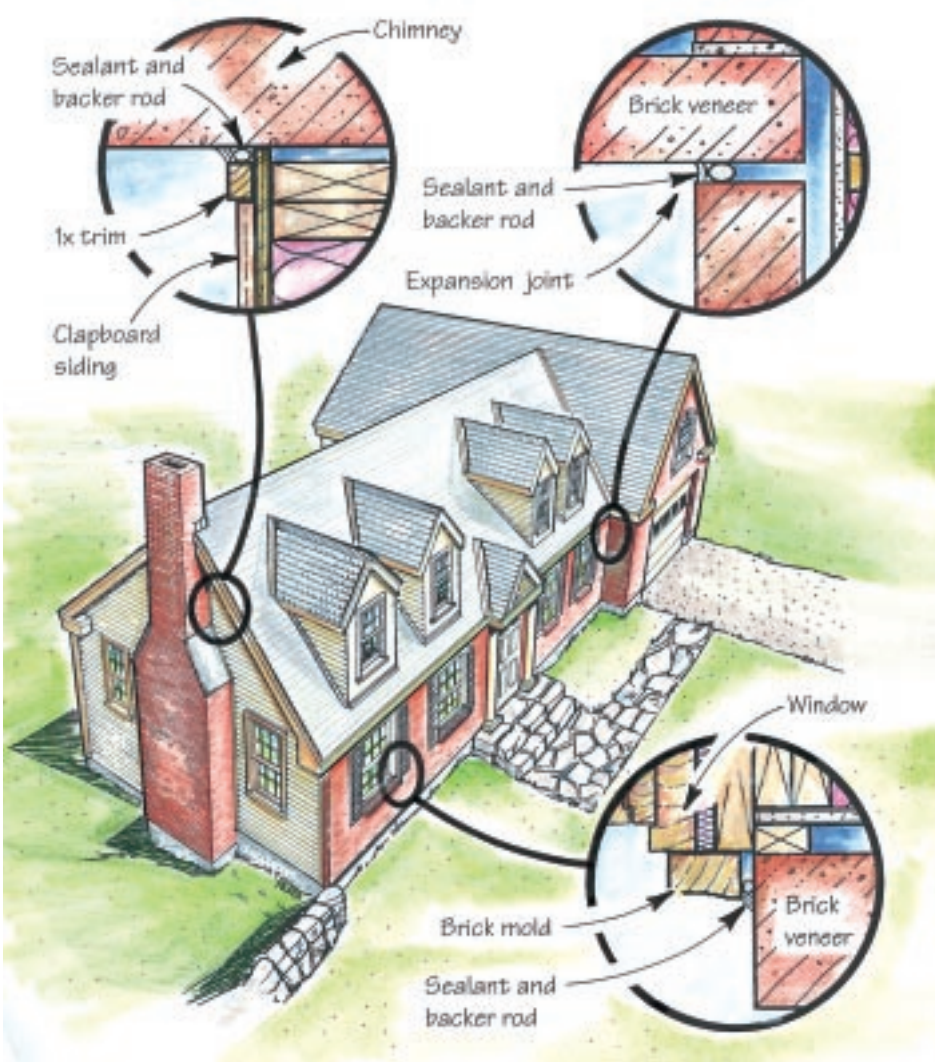
by Al Bredenberg

Caulking Joints in Masonry

To create long-lasting, waterproof joints in masonry buildings, use the tools and techniques preferred by caulking and sealing specialists



When it's done skillfully, caulking — or joint sealing — is almost invisible on a masonry exterior. But when it's botched, it can create a real eyesore. Worse, a poor caulking job can allow water into a building — with resultant damage, callbacks, lost time and money, and poor customer relations.

Masonry joint sealants are called for in three situations: in an expansion or control joint, in a joint between dissimilar materials, and at the perimeter of an opening in the masonry surface.

For the small general contractor, a single-family home or remodeling job that involves exterior masonry probably won't require enough caulking and sealing to make it worth hiring a specialty sub. But any joints, such as window and door perimeters or seams where brick meets wood siding, should be correctly sealed against water penetration. At least one person on your crew should understand the fundamentals of caulking.

While face brick is probably the most common masonry finish the caulker encounters, the same principles and similar procedures will apply for sealing joints in other materials — block, precast concrete, stone, stucco, and EIFS (exterior insulation and finish systems).

Size and Shape

A very tight joint — say, a joint less than 1/4 inch wide — is fairly easy to

caulk, especially if it's a right-angle joint. This is usually the case with a window in a masonry opening. You are simply gunning the sealant and tooling it into a corner. The two perpendicular surfaces will guide the tip of your gun and your finishing tool.

However, because tight tolerances are hard to achieve in masonry work, you will typically encounter joints that are 1/2 inch wide or greater. And because a control or expansion joint needs to be fairly wide in order to tolerate the expansion, contraction, and movement in the masonry wall, it's not uncommon to come up against joints 3/4 inch, 1 inch, or even 1 1/2 inches wide. It's a real challenge to make a larger joint look good and provide a good seal.

The design of details should take joint sealants into account. If two dissimilar materials meet, there needs to be enough length of parallel return inside the joint so that backer rod will stay in place (more on backer rod below) and so that the joint sealant will have sufficient bonding surface.

Joint Prep

To achieve proper bonding on the two sides of the joint, some surface preparation may be necessary. Joint surfaces should be dry, sound, and free of dust, dirt, and loose or foreign material. Be prepared to scrape, chip, and dust the inside of the joint or even blow it out with compressed air. Depending on the conditions and the manufacturer's instructions, you may have to clean the joint with solvent or apply a primer.

If you have the unenviable job of recaulking an older building, you will need to check with the sealant manufacturer for special procedures to thoroughly cut out the old caulk. Old caulk can be pretty stubborn stuff, so you may need a special saw and a machine grinder. You also might have to prime every surface to be sealed.

Joint Sealants

The joint sealants that are most often specified for construction work are polyurethanes, silicones, and polysulfides. Silicones usually come in tubes. Polyurethanes and polysulfides can come packaged in tubes or in bulk. All joint sealants should be finished with a steel tool.

If you're a beginning caulker, tube caulk is much easier to work with. Keep in mind, though, that masonry caulking can use up a large number of tubes. For a 1/2-inch or 3/4-inch joint you may only get about 10 feet per 10.5-ounce tube. Also, tube sealants are air-cured and can take a week or longer to cure.

Bulk sealants are mixed with an activator before application, so they are chemically cured and can cure in a day or two. To work with bulk materials, you'll need a bulk gun and a large drill (at least 1/2 inch) and special mixing paddle (see Figure 1). Once you get it down, you can do a lot more caulking and save money on materials using bulk sealant. But you'll have a messier job and more cleanup, and you'll have to work with some unpleasant solvents.

Joint sealants come in a variety of standard colors. It's even possible to have the factory make up custom colors. Color decisions should be made well ahead of time, as some colors are hard to get and have to be special-ordered.

For a light-colored surface, I like a lighter sealant color; a darker surface calls for a still darker sealant color. For example, on a regular reddish brown brick wall, I often used a somewhat darker "Redwood Tan" sealant color to good effect. On a light gray block wall, a lighter "Off-White" looks good. With this kind of scheme, the caulk line doesn't stand out so much.

Backer Rod

Backer rod is made out of foam and looks like long strings of spaghetti. It comes in sizes as thin as 1/4 inch and as thick as 2 inches and up. If you choose backer rod that's just a little larger than the joint you have to caulk, you can insert it under a slight compression so it will stay in place and allow you to control the depth of the sealant.

The main purpose of backer rod is to keep sealant off the back of the joint,

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Figure 1. *Two-part bulk sealants have to be mixed with a drill and paddle (left). Using a bulk caulking gun (middle and right) allows you to do high-volume caulking more cost-effectively, but is messy.*

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Figure 2. *Compressible foam backer rod fills the back of a joint and helps the caulk perform properly. Use a size slightly thicker than the crack and insert it gently with a blunt tool.*

thus preventing back-bonding, or three-sided bonding. To properly expand and compress, the joint sealant should be bonded to only two sides of the joint. If the joint is too shallow to fit backer rod, you can apply bond-breaker tape to the back of the joint to prevent back-bonding. Bond-breaker tape comes on a roll and looks like cellophane tape.

You can buy backer rod from joint sealant suppliers. Backer rod comes in open cell and closed cell form. Open cell compresses more and is easier to work with. However, some architects don't like it because it's like a sponge and can absorb water, while closed-cell backer rod is impervious to water.

Whichever type you're using, push the backer rod into the joint gently, using a blunt tool that won't pierce or tear it (Figure 2). A piece of wood shingle makes a good backer rod tool.

Applying Joint Sealants

Joint sealants have both a functional and an aesthetic purpose. In sealing a joint, you are trying to provide a seal against penetration by water and air, and you are applying a finish detail. The aesthetic aspect is affected mostly by your tooling method, but several factors will affect the water-tightness of a joint.

In sealing joints, don't think of yourself as just filling a crack. Be aware that you are providing a flexible seal between the surfaces of two independent building components, which move and shift in relation to one another. The dimensions of that seal must be carefully controlled. It can't be just a thin skin, but neither can it be a thick gob.

If your joint sealant is not applied properly, it will not expand and compress with the movement of the joint. Instead, it may split or rip away from one of the two joint surfaces.

Most polyurethane joint sealants are designed to tolerate up to 40% extension and 25% compression. However, they will not achieve that degree of movement if the joint is too deep. For example, for a joint 1/2 inch to 2 inches wide, one sealant manufacturer requires that the joint depth be no more than 1/2 inch.

When gunning sealant into the joint, try to achieve a smooth, even flow (Figure 3, next page). Don't just try to zip down a skin. Fill — but don't overfill — the joint, placing sufficient sealant to achieve proper joint depth.

Tooling

Correct tooling is critical to creating a sealant joint that's tight and looks good (Figure 4, next page). The best tool is a steel spatula or sculptor's tool that is slightly smaller than the width of the joint. Try to achieve a smooth, even appearance, without squeeze-out on the sides. Good tooling takes a lot of practice.

For special circumstances, I have on occasion made a custom-sized wooden tool by whittling down a tongue depressor. I have also seen plastic joint tools. Unless the joint is very small, don't try

Caulking Tips

Good caulking requires a great deal of skill and a certain amount of artistry. I've found that not just anyone can be trained to do caulking. You need aesthetic sense, patience, an eye for detail, and a real concern for the integrity and appearance of the finished product.

Here are some little tricks that might help your sealant work to go better:

For tube caulking — Cut the nozzle of your tube at an angle and slightly smaller than the size of the joint. If the joint size varies, have two or three tubes going at the same time, each with the nozzle cut at a different size.

Cold weather — Keep your material warm. You can even buy an electric heat chest to keep your tubes or bucket in. Use gloves with the fingers cut off to keep your dexterity.

Steel tooling — Use long, steady strokes. Attempt to tool every run only once rather than dabbing at it repeatedly. Rather than tooling toward your previous work (as if you were painting), pull away from the last section you tooled. Press the sealant firmly, so that it fills the joint and bonds to the sides.

Spatula — Provide yourself with a selection of various sizes. For any given run, choose a spatula slightly smaller than the width of the joint.

Keeping your tool clean — At the beginning of your work day, take a newspaper and rip it into pieces about 4x4 inches. Use these pieces to keep your tool clean.

Tools — Wear a tool belt or nail apron to carry your various spatulas, scrapers, other tools, and your pieces of newspaper. Don't use your favorite carpenter tool belt for caulking, as it will get pretty messy.

Sturdy caulking gun — Get a good sturdy caulking gun made for production work. Get a hook attachment so you can hang it on the staging or ladder. Use a gun with a release, so you can stop the flow of sealant quickly.

Backer rod — Rather than struggling to cram large backer rod into a small joint, keep a variety of sizes on hand for different sizes of joints.

Annoying details — When you're working on a section of a building, take note of things that weren't ready to be caulked the first time you went through. Have a plan for getting back to them later, especially if they are high up, hard to get to, and easily overlooked.

— *A.B.*

C. BATES

Figure 3. *Caulk should be applied to a joint in a smooth, even bead. When applying tube caulk to a joint whose thickness varies, carry several tubes with various size openings.*

Figure 4. *To properly finish a joint, smooth it in a continuous motion with a steel caulking tool or spatula. The author sometimes custom-fabricates a tool from a wooden tongue depressor.*

to tool with your finger. It slows you down and makes a mess. Also, manufacturers' instructions usually discourage using water or solvent to tool a joint.

Planning a Caulking Job

On the surface, caulking can seem pretty simple. It's rarely on the "critical path" of a project plan. However, one key aspect of joint sealing guarantees complications: Often, the sealant is being used to treat the joint between two dissimilar materials, and these materials are often installed by different trades and at different times.

Just think of all of the various assemblies or materials that can go into a masonry opening or through a masonry wall. You could have a wood window installed by the carpenters, an aluminum-frame window installed by a window company, a hollow metal door installed by the carpenters, a metal louver installed by the hvac crew, and even a pipe run by the plumbers.

Access is a key concern for joint-sealing work. You can get everything from the ground or from a 6-foot stepladder.

If the caulking work is to be done off the staging, make sure that it will be left up long enough. Because staging is often rented, there's a lot of pressure to get it off the job quickly.

Don't forget conditions on the ground. How steep is the grade — not the finished grade, but the grade as it will be when you're doing the caulking? Will it be safe for a ladder? Will a boom lift be able to operate in the area? Keep in mind that a boom lift won't work if the grade is too steep.

Identify the scope of work. What gets caulked and what doesn't? Will one party be responsible for all caulking on the job? Or will each trade be responsible for caulking its own work? (This is a strategy that often yields poor results, in my experience.)

Weather and temperature affect caulking work. You can't caulk a wet surface, so allow flexibility in the schedule. And, although you can caulk in cold weather (check the manufacturer's limitations), sometimes ice or frost will collect in a joint and can be very hard to detect.

The application of joint sealants is a little-known construction specialty. But it can make a big difference in the integrity and life span of a masonry building. If you take care to apply the materials properly and give attention to detail, this is a trade that can add to your profits — and give the satisfaction that comes with doing fine work. ■

Former contractor Al Bredenberg, of Cornwall, Conn., writes frequently on construction topics. He provides construction information at his World Wide Web site at http://www.copywriter.com/ab/.

Manufacturers of Sealants & Tools

Albion Engineering Co.
2080A Wheatsheaf Ln.
Philadelphia, PA 19124
215/535-3476
Caulking guns and tools

ChemRex Inc.
Sonneborn Building Products
889 Valley Park Dr.
Shakopee, MN 55379
612/496-6000
Joint sealants and water repellents

Dow Corning Corp.
P.O. Box 994
Midland, MI 48686
517/496-6000
Joint sealants

GE Silicones
260 Hudson River Rd.
Waterford, NY 12188
800/255-8886
Joint sealants

Pecora Corp.
165 Wambold Rd.
Harleysville, PA 19438
215/723-6051
Joint sealants and water repellents

Sika Chemical Corp.
201 Polito
Lindhurst, NJ 07071
800/933-7452
Joint sealants

Tremco Inc.
3735 Green Rd.
Beechwood, OH 44122
216/292-5000
Joint sealants