

BY BILL ROBINSON

## Caulking Basics

**Caulking** is a fundamental part of sealing a building against water and air leaks. For a lot of folks starting out in the trades, it might be one of the first jobs they are asked to do, because it's not always a favorite task for seasoned carpenters; as a result, the right way to caulk often gets ignored. In fact, a fair share of seasoned carpenters aren't very good at it. But caulking correctly is essential, so let's embrace it and dive in.

### SELECT THE RIGHT CAULK

Caulking the right way starts with using the right material. That might sound simple, but in the world of caulks, it's more important than ever. Advanced chemistry has come to construction, and we have an array of new caulks and sealants on the market today that we didn't have a decade ago (see "Selecting Caulk," Sep/20). In general, I prefer caulks with a high solids content that won't shrink as much as a caulk with more solvent. High-solids caulks tend to be more viscous (meaning they are stiffer and require more pressure to squeeze out of a caulk gun).

I encourage everyone to find a few caulks that work for the applications they are likely to do. That means reading the product literature and understanding how those few caulks behave. What temperatures can you apply them at? How quickly do they skin over?

How soon can you paint over them? What is the solvent, and how do you clean up? How runny or thick is each one, and do you have the right gun with which to apply that caulk easily? Those are some of the questions covered in the "Selecting Caulk" article cited above, and we'll touch on some of those points again here, but it's on you to do the homework and become familiar with the material. It will make your task easier and ensure a better result.

### TOOLS FOR CAULKING

Two things are key: Tools don't make the craftsman, but using the right tool sure makes it easier to do a good job; and once you have the right tools, keep them clean. This is generally true for all tools, but it's particularly important for tools that come in contact with messy materials like caulk (or mastic or joint compounds and the like). The less build-up of old caulk and dirt you have on the gun and other caulking tools, the easier it will be to lay down a smooth, tightly bedded bead of caulk.

**Caulk guns.** Don't skimp here; buy a good caulk gun. If you are using the cheapest gun available from a big box retailer, you can still lay down a good bead, but it will be an awful lot harder and will take longer.

Your choice in gun format will largely depend on the type of

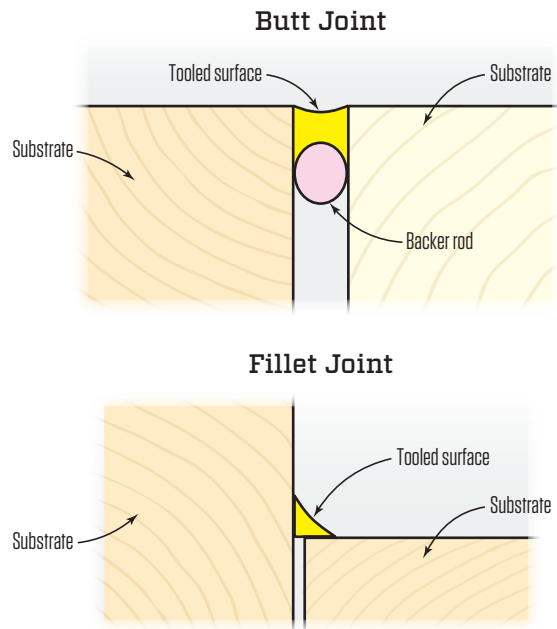


**11-ounce guns (1):** While basic "half-barrel" (orange) and "skeleton" guns (second from top) work, they're harder to use than professional-grade tools, which have a higher thrust ratio. The Irion-America gun (third from top) lets you switch between 12:1 and 25:1; the green Albion has a 26:1 ratio. The higher the ratio, the easier it is to apply more-viscous caulks.

**20-ounce guns (2):** All three "sausage" guns above are designed to hold sausage packs of sealant and have a 12:1 thrust ratio.



Tooling a caulk joint ensures it beds well against backer rod (Butt Joint illustration, top right) or against a substrate (Fillet Joint, bottom right). Almost anything with a smooth, curved edge will work. The author likes the blue plastic flashing tool shown in the photo (3). Also shown (center and right in photo) are a single spatula and spatula set, from Albion.



caulk you use. Most caulks for residential uses come in 11-ounce plastic or cardboard tubes, for which you can use a standard “half-barrel” gun or a “skeleton” gun. The least expensive, most ordinary guns have a half-barrel of steel to hold the caulk tube. A small step up is a skeleton gun, which has only a spare frame around the caulk tube. Also called simply “frame guns,” they tend to be lighter and easier to clean.

High-quality caulks, sealants, and liquid-applied flashing compounds often come in 20-ounce sausage packs—foil or plastic sleeves that are a bit like a package of Jimmy Dean sausage, albeit thinner and longer. To apply this type of caulk, you need a gun with an aluminum or plastic tube to hold the sausage pack. In commercial and industrial work, we also see bulk-load guns that have a canister you fill from a 5-gallon bucket of sealant, but I have never seen those on a residential job.

**Thrust ratio.** One of the most obvious characteristics of different types of caulks is their viscosity. Latex and silicone caulks are relatively “loose,” or thin, and tend to be easier to squeeze out. Stiffer caulks include polyurethanes and butyl. The stiffer the material, the harder it usually is to squeeze out. If you are using a thicker caulk, a gun with a higher thrust ratio will make it easier to apply. A higher-ratio gun is also good for working in colder temperatures, in which even some high-solvent caulks will be stiff.

Ordinary ratchet-style guns have a thrust ratio somewhere around 4:1 to 6:1. This means for every pound of force with which you squeeze the trigger, 4 to 6 pounds of force will be delivered at the plunger. You get some mechanical advantage, but not a lot.

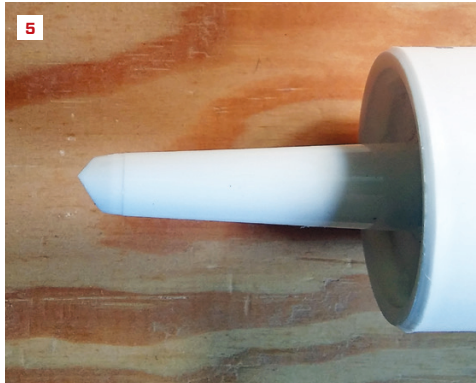
As they improve in quality, guns have higher thrust ratios. Albion, Irion-America, and Newborn all offer professional-grade

guns, and most of these start at a 12:1 thrust ratio. Higher ratios—on the order of 18:1 and 26:1—are common from pro-grade makers.

Keep in mind that a higher ratio does not necessarily mean better. Most guns for applying high-quality caulks sold in sausage packs will have a 12:1 ratio. In warm temperatures, most of the liquid flashings and other sealants that come in sausage packs tend to be fairly “loose,” and a 12:1 tool works well to apply them. Using a higher ratio tool, while good for a stiff caulk, makes it harder to control the flow of thinner materials. Irion-America makes a switchable tool that goes from 12:1 to 25:1. It’s an excellent tool, and great if you are using a variety of caulks, but it’s pricey (it runs about \$85; a tool of comparable quality at either 12:1 or 26:1 will cost from \$35 to \$50).

**Tools for tooling.** I recommend tooling caulk joints with a tool, not your finger. But such a “tool” can be as simple as a plastic spoon (if you use a spoon, be sure to knock off any fringe of plastic on the edges that might create drag lines; you want a nice, smooth edge). The purpose of tooling is simply to press the caulk into the substrate. The goal is not necessarily to make the bead look nice (though it can do that, too); it’s to ensure the caulk is fully bedded in the joint. This gives the caulk the best chance of staying adhered to the substrate.

I prefer to use a steel spatula, like those shown in the photo above, for tooling joints. Having a set with a variety of sizes is convenient if you are doing a lot of different types of caulking with a variety of gap sizes. For example, control and isolation joints in masonry and concrete tend to be much wider than the gaps in exterior siding and trim materials. Air-sealing also presents a wide variety of joint sizes.



Two ways to cut the tip: a square cut (4) and opposing angle cuts (5). Note that on the angled cuts, one cut is deeper than the other; they are not symmetrical. The author prefers to push the gun (6), keeping a small, raised puddle of caulk in front of the tip while he lays down an even, well-bedded bead.

### GOOD CAULK JOINTS

The industry typically talks about two basic types of caulk joints—butt joints and fillets. But caulking isn't only used to fill a visible gap; it's also used in assemblies to join materials and create a watertight or airtight seal. I call this third type of joint a "smush joint."

**Butt joints.** The ideal butt joint has an hourglass shape with two sides that are the same size (see Butt Joint, page 6). Sealant needs to be able to stretch and shrink as the substrates expand and contract. If the caulk adheres to three sides, it will tear itself apart as the substrate materials move at differential rates.

To get that hourglass shape, we need to install backer rod that allows us to control the depth of the caulk joint (saving on caulk material) and prevent three-sided adhesion. Backer rod comes in different sizes, ranging from 1/4 inch to several inches in diameter (the larger sizes are seldom used in residential work). It also comes in different flavors—open cell, closed cell, and a hybrid that has closed or coated cells on the exterior of an open-cell core. The 100% open-cell version is the easiest to compress into a gap and the least expensive, but it can hold moisture, so I avoid it altogether and go with a closed-cell product. When installing backer rod, insert it into the gap at an even depth that is roughly half the width of the gap. Consistency is key, and having the right size backer rod (just slightly wider than the gap) makes it easy to install at an even depth. Don't push too far. I like to push it in by hand, flush with the faces of the substrates, and then use a ripped board that is narrower than the gap and has a smoothly rounded tip to push the rod in gently to the proper depth.

**Fillets**—caulk seals in corners between two substrates—are a different animal. In commercial work, it's common to use bond breaker tape in the very corner. When covered with caulk, the tape creates two areas of adhesion that are diametrically opposed and better able to stretch evenly when the substrates move. While good in theory, this tape isn't used in residential work, largely because no one wants to see so much sealant in corners. This means fillets tend to fail sooner and need to be applied more often.

**Smush joints.** A bead of caulk that will get smushed between two pieces of wood is a perfectly valid joint. However, since the caulk squeezes out when the boards are pushed together, there is a tendency to go too lean and smear the caulk on the edge. This risks gaps that will defeat the intended purpose of creating a watertight or airtight seal. I find it works best to cut a very small hole in the tip and apply a narrow but full bead, not a smear, on the edge. (With a small hole in the tip, you will need a thin wire to puncture the tube seal; I find a piece of Romex ground wire works well.) There will be squeeze-out. Fasten the boards, and then use a sharp drywall knife to scrape off the squeeze-out.

### PRACTICE MAKES PERFECT

Applying caulk with no breaks and at a consistent bead size takes practice. For me, getting a consistent, well-bedded bead requires a combination of holding the tip at the right angle, having the right tip, and squeezing gradually so I get an even flow of caulk, all while pulling or pushing the gun at a steady speed. I usually need two hands to do this, and I find it works better to push the tip forward, rather than "drawing" a bead out by pulling the gun backward. But many folks can draw a bead skillfully and can do it one-handed with surprisingly consistent results. The "right" way is always the way that works best for you.

The cut on the tip of the caulk tube can make a big difference. The plastic tip on most tubes shows angled cut lines at different distances from the end, and I see most people cut open the tip along these lines. Instead, I cut the tip at two opposing angles or square to the end (see photos, above). Both methods give me a better visual on the amount of caulk coming out the end, and by holding the gun at an angle, I am able to keep a small puddle of caulk in front of the tip that I push through to create a smooth, bedded bead.

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