

Polyurethane

Veteran pro builds a strong case for using this misunderstood adhesive

► Why make the switch?

EASY ASSEMBLY

The lack of water in polyurethane glue means joints do not swell and lock up. And its inherent slipperiness makes assemblies slide together easily, a big advantage with fussy joinery like sliding dovetails.

Is My Go-to Glue

BY CRAIG THIBODEAU

For a long time, my go-to woodworking glue was yellow glue. Then a respected pro recommended that I try Gorilla Glue for veneering. Because of the glue's lack of moisture, the sheets of veneer didn't curl, which made the work easier. I also discovered that the glue created a very rigid glueline, a big plus with bent-lamination work. As I tried the product on other types of glue-ups, I soon discovered other advantages. Once I got through a short learning curve, I began to use polyurethane glue more and more.

Polyurethane is inherently slippery and contains no water. These are big advantages on almost all joints, but especially those that can be difficult to assemble.

There are two main downsides, one easy to deal with and one less so. The sticky squeeze-out is no problem if you apply less glue to start with and then let it dry before

touching it. The other downside is that polyurethane glue underperforms in gappy joints. Unlike yellow glue, which has minor gap-filling ability, polyurethane has none, expanding to become featherweight foam in spaces bigger than 5 or 10 thousandths of an inch. This is why some woodworkers mistakenly think polyurethane glue lacks strength in general.

But in my experience, polyurethane glue—when used correctly—is every bit as strong as other glues, as long as your joinery is sound and clamping pressure is sufficient.

Today I use polyurethane glue for almost all of the joinery I produce. As a working pro, I wouldn't do that unless it made serious sense. I encourage you to give it a try. It just might become your favorite, too.

Craig Thibodeau is an award-winning furniture maker in San Diego.

EASY CLEANUP



Polyurethane creates a much harder glueline, meaning you won't get the raised gluelines that sometimes pop up on panels after a few years of wood movement. When dry, the squeeze-out is rigid and easy to remove.

STRONGER MITERS



Polyurethane soaks more deeply into end grain than yellow glue, making it stronger on miter joints, and even adding strength to butt joints in plywood construction.

BETTER ON CURVES



With polyurethane's rigid glueline and lack of moisture, bent laminations and veneered panels stay the exact same shape as the form they were made on.

TIPS FOR SUCCESS

Mostly because of improper usage, when many woodworkers think of polyurethane glue, they think of sticky, foamy squeeze-out that is impossible to clean up. Here's how to avoid that problem on a panel glue-up, and make the most of this great glue.



Use a thin layer. Apply it to just one surface and use a brush, roller, or stick to spread it. The goal is a thin bead of squeeze-out that will be easy to remove.



Add moisture if needed. Use a damp paper towel to lightly moisten the mating glue surface in each joint. Moisten biscuits or slip tenons before inserting them. In humid environments, you won't need to do this.



Clamp well and wait. Polyurethane needs tight joinery and lots of clamping pressure. It also makes parts very slippery, so keep the boards aligned with biscuits or use clamps at the end of each joint. The glue will begin to foam up after 10 or 15 minutes, weakening its bond, so work fast. When dry to the touch, it will chisel, scrape, and sand off very easily.



TIGHT TENONS ARE NO PROBLEM

Polyurethane glue loses its strength in gaps, so trim your tenons for a snug fit. No worries—the lack of moisture will prevent swelling and the slipperiness will ease assembly. Thibodeau uses 60-day blue tape around the joint to make squeeze-out easier to remove.



Glue the mortises, wet the tenons. Don't squirt in too much glue, or it will end up as foamy squeeze-out. Spread it evenly with a stick (left). Then moisten the tenon lightly immediately before assembly. Again, a moist paper towel does the trick (right).



Peel away squeeze-out. After the squeeze-out is dry, Thibodeau uses a chisel to loosen it on one surface (above), and then peels away the blue tape to remove it from the other (left).

STRONGER MITERS

Thibodeau has had better results using polyurethane instead of yellow glue for miters. He thinks the polyurethane soaks deeper into end grain for a stronger hold. Still, he reinforces all miters with some kind of joinery (for more on how he cuts and clamps miters, see "Tablesaw Sled for Miters," FWW #257).



Two faces and two coats. Miters are one case where you should put glue on both mating surfaces, double-coating them in fact. In dry climates, start by moistening both surfaces with a damp paper towel. Then apply a coat of glue, wait a minute or two for it to soak in, and apply a second coat before assembling the joint.



Good pressure is essential. Thibodeau glues angled offcuts to the workpieces that allow the clamps to provide pressure across the joint without slipping. Once completely dry, the squeeze-out peels off easily with a chisel. Thibodeau then bandsaws off the angled cauls (far right), and planes the parts flush.

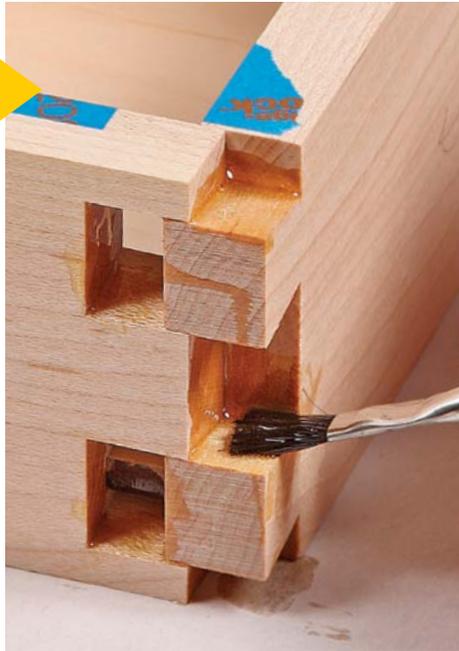


DOVETAILS GO TOGETHER EASIER

Tight, gap-free dovetails can be difficult to assemble. Polyurethane glue lets you drive them home with hand pressure only. Thibodeau finds it unnecessary to wet dovetail joints prior to gluing. If you do, a light swipe with a damp paper towel will do the trick.

Neat as a pin.

Thibodeau tapes the inside corners to catch the squeeze-out. Start by inserting about $\frac{1}{8}$ in. of the pins between the tails. Then apply glue to both pins and tails. The partially assembled box goes together easily. As the joints slide home, they spread the glue, sending most of the squeeze-out to the outside, where it is easier to remove.

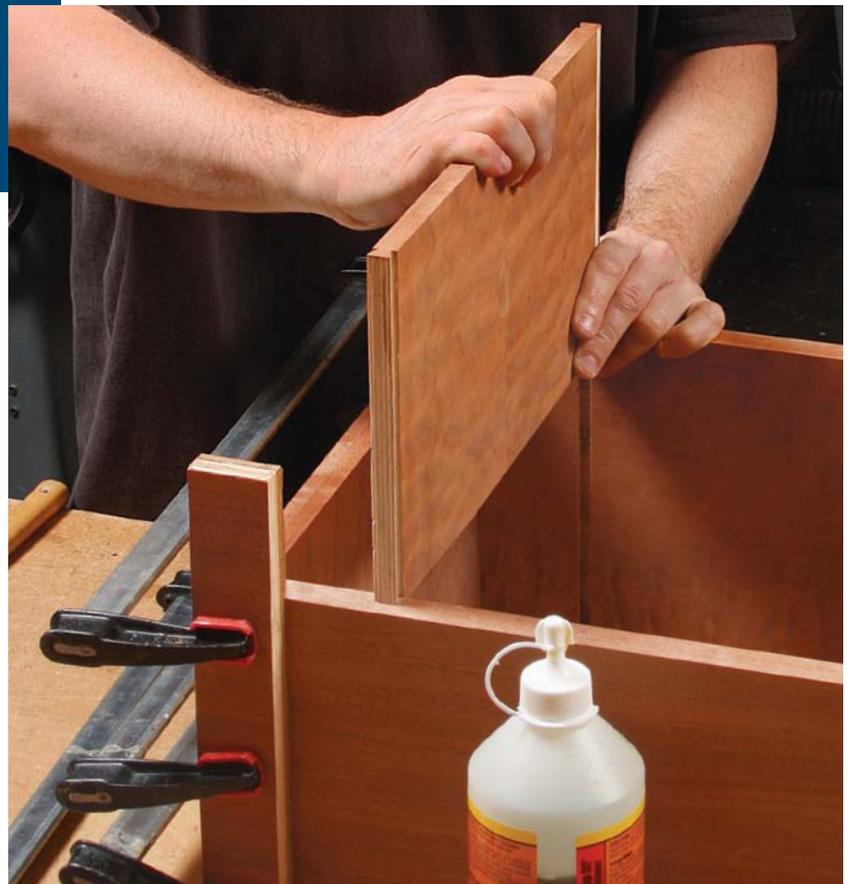


SLIDING DOVETAILS THAT ACTUALLY SLIDE

These are notorious for seizing up and locking in place half-assembled, but with polyurethane glue even the longest sliding dovetails slide home easily.

Slide it home.

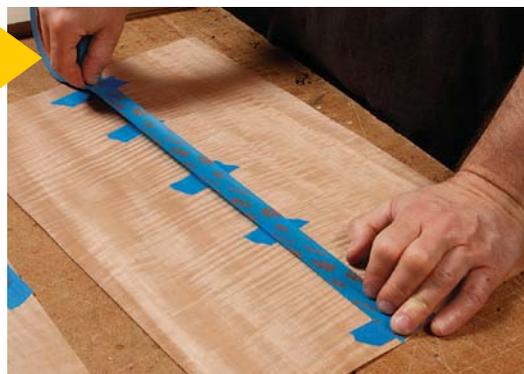
Apply glue to just the slot. Don't apply too much, and spread it evenly with a brush. Then wet the dovetail. Again, a damp paper towel applies plenty of moisture. Insert the panel from the front of the case to push any squeeze-out toward the back.



GREAT FOR VENEER AND CURVES

It's easy to spread a thin layer and, because there's no water, veneer sheets don't buckle and curved panels don't change shape as the glue cures. The rigid glueline also means that panels will hold their shape over time. Be sure to use a layer of plastic between the parts being glued and the cauls and forms, because this glue sticks to everything.

Avoid gum tape. The glue is nearly impossible to remove from gum tape and difficult on standard blue tape. So Thibodeau uses normal blue tape only across the joints, then follows with the thinner, weaker 60-day type for the seams.



Roll and spritz. A short-nap roller spreads a thin coat of glue on large surfaces like this substrate (right), and a spray bottle puts a very light mist of water on the veneer (far right).



Use a caul for clamping veneer.

Without sufficient pressure, polyurethane glue will foam up and expand, so it is critical to place an MDF caul over the top veneer in a vacuum press. A lot of bleed-through means you used too much glue, a few spots (left) mean that you got the amount right. None at all means use more glue next time.



Add clamps for curves. Vinyl or nitrile gloves let you align the wet edges of the plies without getting glue on your hands. Use plenty of clamps, and use cauls to distribute the pressure evenly. Leave the clamps on for 24 hours to ensure a full cure and no springback.

