



Hide glue

AGE-OLD TECHNOLOGY HAS UNMATCHED ADVANTAGES

BY W. PATRICK EDWARDS

If you were lucky enough to learn woodworking from your grandfather, he would have patiently shown you which end of a handplane is the front, the right way to use a chisel (not for opening paint cans), and how to cook glue. Unfortunately, the traditional glue pot disappeared from woodshops and trade schools soon after World War I when synthetic adhesives took over, leaving later generations of woodworkers to learn this secret of the craft on their own.

Hot animal-protein glues have many advantages over synthetics. They are very quick-setting; transparent to stains, oils, and other finishes; easy to clean up; and reversible, making repairs possible. They are also organic in nature, and are not toxic to humans or pets.

If you doubt the strength of animal glue, check out the recent test in *FWW* #192 (“How Strong Is Your Glue?”), where hide glue stood shoulder-to-shoulder with yellow glues and epoxies. And of course, witness the host of antique furniture that has survived for hundreds of years.



The right stuff. Solid at room temperature, with a very long shelf life, hide glue is sold in granules and pearls. Edwards recommends the granulated type, made in the United States.

All wood glues create a mechanical bond by penetrating the porous surface and solidifying there. But animal glues also create a strong molecular bond with wood (and other animal glues), due to the attraction between certain molecules and atoms.

The glue sets initially by losing heat, and then cures fully by losing moisture. As mentioned earlier, this process is always reversible, and can be repeated even after a century or more.

The right animal glue for you

Although there are many excellent organic glues—from fish, milk protein, rabbit skin, horse bone and hide, and vegetable compounds—I’ll focus on hide glue, the most versatile type for furniture making. Today, hide glues are sold either in pearl or granulated form; I recommend only the latter, which turns to gel very quickly when cold water is added.

Hide glue can vary in quality, and it can go bad if exposed to moisture. Some people have sworn off hide glue after buying

Host of uses for hot glue



No other glue has hide glue’s quick tack, easy cleanup, and transparency to stains and clear finishes. You can apply veneer (left), rub on glue blocks (below), and apply inlay (right) in minutes and with no clamps.



Simple recipe for success

Edwards' setup is a double-boiler glue pot with a meat thermometer and natural-bristle glue brushes inside. Unless you reheat your glue every day, just cook up a fresh batch when you need it.



No measuring necessary. Add just enough cold water to cover the granules. You'll have gel in about an hour (left).



poorly made or poorly stored animal glue from indiscriminate sources all around the world, and then experiencing joint failures. Others complain about the smell. Good-

quality glue has a very mild animal odor. If it smells rancid, it is bad and should be thrown out.

Milligan & Higgins is the only American company still making these glues. Because they make the glue themselves, they can guarantee its formulation and strength. Also, their glue's quality is controlled by the Food and Drug Administration.

Glues are graded according to a pressure test that is measured in grams. The lower strengths are more flexible and have longer open times, while the higher strengths are more rigid and set up very quickly. I recommend Milligan & Higgins 192-gram hide glue for all furniture-making tasks; I've been using it for 40 years. It actually is a mix of bone and hide glues, and has an open time of 1 or 2 minutes at normal room temperature and humidity levels, setting up as it cools. You can order hobbyist quantities of Milligan & Higgins 192 from Tools for Working Wood (www.toolsforworkingwood.com;



Two tests. Hot glue loses moisture as it cooks, so check the viscosity from time to time. A brush should trail a long, even stream of glue (left), up to a foot long before it breaks into droplets. If not, stir in some hot water. To be sure you have good glue, or to see if old glue needs replacing, try a little hot glue between your finger and thumb. The glue should begin to get tacky and make long strands as it cools (right).



Put off by the pot? Try liquid hide glue

Edwards produces a urea-modified hide glue, called Old Brown Glue (<http://wpatrickedwards.com/gluepage.htm>), which is liquid at room temperature and has a longer open time than yellow glue.



All-purpose glue. For standard woodworking tasks like this panel glue-up, liquid hide glue allows plenty of assembly time. It still needs to be warmed a bit to thin it out, but a simple bath of hot tap water does the trick.



Hammer veneering is quick and easy

Hide glue lets you press beautiful veneers onto almost any flat or curved surface in minutes without clamps or cauls. The veneer hammer is used like a squeegee. Move very quickly, as the glue starts to set up after a minute or two.

To move fast, work smart. Brush glue onto the substrate (right), then lay the veneer on top of it, glue side up. This keeps the substrate warm and puts some glue onto the veneer's show face. Now brush glue quickly onto the veneer before flipping it over (top right).



How to "hammer." There will be enough glue residue on the top side to lubricate the hammer. Start from the center, locking that down first so the veneer stays put as you begin to push (or pull) the excess glue to the outside.

800-426-4613), or call Milligan & Higgins at 518-762-4638 for a supplier near you.

Where to use it

If you still are stuck on synthetic glues, consider this: Almost all furniture needs repair at some time in its life. Synthetic glues don't bond well to themselves, so you'll have to remove all of the yellow glue from a joint before regluing it. With hide glue, not only can the joint be unlocked with heat and moisture, but new hide glue will bond to any hide glue left in the joint.

So the first places to start using hide glue are the areas most likely to need repair, such as feet, drawers, veneer work, and all chair joints.

With its short open time, hot hide glue also allows hammer veneering, rub joints, and many other tasks where clamping is difficult. After being held still for a minute or two, the joint can be left to cure. By the way, all hide glue creates a very rigid glueline, for laminations with no springback.

Reheat it, or mix a new batch?

In the dry state, animal glues have an infinite shelf life (longer than humans). And proper cooking does not weaken the glue, but makes it stronger. The light amber color will darken to a strong brown within days. You can just let the glue cool and gel up at the end of the day, with the brushes still in it. It doesn't hurt to cover it.

However, when left wet but not heated daily, these glues attract mold. So cook your glue every day, or just make what you need and empty the glue pot afterward. A thin layer of hard glue left in the pot will not get moldy.

REPAIRS ARE SIMPLE



To unlock any hide-glue bond, even one decades old, use steam to apply heat and moisture.

Mold, even a fine layer, means the glue is bad. Also, if the glue is heated for any length of time above 180°F or reaches 212°F at any time, it is dead. In either case, simply take the glue pot, brush, and thermometer, and clean them completely by boiling them in a pan of hot water. Start over with fresh glue.

A better glue pot—I don't recommend electric glue pots. They are expensive (\$100) and can't be controlled precisely. Instead, I use a small double-boiler glue pot (about \$30 on eBay), heated by a simple hot plate that you can get for \$10 or \$20. The outer pot holds water. The inside container holds the glue, the

Instant inlay



Apply hot glue and press it in place. Be sure the inlay is sized correctly, and then brush glue onto it.



Press it in place. Edwards uses a veneer hammer to push stringing evenly into its groove.

brushes, and a meat thermometer to ensure the glue is kept between 140°F and 160°F. An old trick is to put a small amount of glue into the water bath in the outer container, which will alert you if it runs out of water: It will stink!

Making the glue is no more difficult than making oatmeal. No measurement is required; just put the dry glue into a plastic cup and add enough cold water to cover the surface of the glue by ¼ in. or so. It doesn't matter how much glue you mix; just add enough water to cover it. The glue will quickly absorb the water completely. After about an hour, put the gelled wet glue into the glue pot.

When the glue is at the proper temperature (140°F to 160°F), it is ready to use, but you need to monitor the viscosity on a regular basis during the day as it cooks (see photo, p. 35). If it is too thick, add hot water (roughly the same temperature as the glue—very hot tap water will do the trick) to adjust the viscosity. Each day, when you start work, add a little cold water to the glue pot before it starts heating to replace the moisture that evaporated the day before. Remember: cold water to cold glue and hot water to hot glue.

How to use hide glue

Use natural-bristle brushes and just leave them resting in the glue pot. I use two round brushes, one around ¾ in. dia. and the other under ½ in. to fit into joints. For very large areas, I use the two brushes together, held like chopsticks.



Easy cleanup. After a few minutes, dampen a scrubbing pad with warm water and remove the excess glue.

Removing squeeze-out is not as big a problem as with other glues, since soaked-in hide glue is transparent to oil- and alcohol-based finishes, even on light-colored woods like maple. You will need to remove visible globs or beads, though. The best way to do this is immediately with warm water and some kind of scrubbing tool: a toothbrush, scrubbing sponge, even a paper towel. Another way is to leave the glue to gel for three or four hours, and then peel it off. If you have to wait until the glue is rock hard, you'll need a sharp chisel to remove it.

Give high-quality hide glue a try. Then, remember to teach your kids and grandkids how to use it. □