Sticking with Hide Glue

This stuff does some things modern adhesives can't

BY NICK ENGLER

Cook it in a pot—any pot will do. *The author brushes glue from a pot made just for hide glue onto the apron of a table. This pot sells for about $90. You could also use a doubler boiler on a hot plate, and monitor the temperature with a candy thermometer for about one-third the cost.*

Photos: William Duckworth

Let's start with what most woodworkers know about hide glue: It's yucky. It smells bad. It's not as strong or as stable as other glues. And it's old stuff, which can't compare with the new stuff. Well, some of that is true. I'll give you the yuck and most of the stink. But hide glue is every bit as strong as other glues and very durable. And because of a few unique properties, hide glue has some advantages over other adhesives. Once cured, it's more heat-resistant than other common woodworking glues, and it's far less likely to creep or move with seasonal changes.

Researchers at the Franklin glue company (the Titebond people) glued blocks, of hard maple together using different adhesives, then broke them apart using a machine to test the shear strength of the glue joint. Hide glue, they found, fails at about 3,600 lbs. per square inch (psi)—a respectable showing. By contrast, their newest (and more expensive) polyurethane glue let go at 3,500 psi. And as far as durability is concerned, Egyptian furniture from 2,700 B.C. was discovered with still-stuck hide-glue joints. "Protein-based glues, such as hide glue, are incredibly stable," says Dale Zimmerman, a Franklin scientist. "We have hundreds of years of history to back that up."

About the only thing that can undo a hide-glue joint (besides 3,600 psi) is water, making hide glue the only easily reversible adhesive on the market. Hide glue is hygroscopic, meaning it sucks up any available moisture. As it does so, it dissolves itself. This isn't a problem in most climates. A good coat of finish is more than enough to protect hide-glue joints from a few humid days.

Because hide glue is reversible, it's still the only glue used for restoring valuable antiques and for making musical instruments. And for veneering, you can't beat it—especially if you don't own a veneer press or you've suffered the indignities of using contact cement. Two other hide-glue advantages: It's less likely to interfere with finishes, and any delamination is easy to repair.

Hot or cold, hide glue has its strong points

- **Its shear strength is equal to or greater than white or yellow PVA glues and the newer polyurethane glues.**
- **It's the only easily reversible glue on the market.**
- **Its color matches wood tones better than many other adhesives, making gluelines less visible.**
- **It's highly resistant to heat.**

Premixed or glue pot—you have a choice

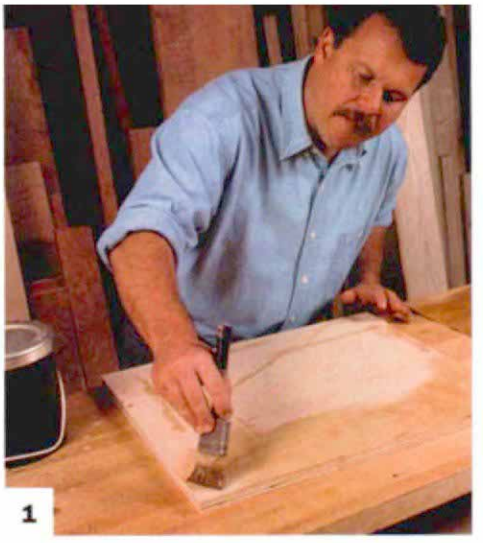
Hide glue is made from animal gelatin, the visceral protein that binds skin, muscles and bones. Manufacturers scrape it from the inside of hides, boil it from bones, dry the gelatin and then break it into granules. These granules must be softened in water and cooked, but not boiled (see the photos at left). Cold or premixed liquid hide glue, now sold in bottles, is made the same way at the factory. But manufacturers add more water and chemicals to keep it from coagulating as it cools.

Liquid hide glue can be stored and applied at room temperature, like other common glues. It has a longer working time, or open assembly time, of 15 to 30 minutes. This property makes it useful for biscuit joinery and mortise-and-tenon assembly. The bad news is that liquid hide glue has a limited shelf life of about a year, and it's even more sensitive to water than the hot variety you can mix yourself.

To cook up a pot of hide glue, you should start the evening before you need to use it. Put as

VENEERING WITH HIDE GLUE

More like maple syrup than tap water. *Hide glue should be heated to between 140° and 150°F, and the consistency should be thick but smooth. Test the viscosity by dipping a disposable brush or a small scrap of wood into the hot glue. You want the glue to drip off the brush slowly.*



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1. Coat both surfaces well. *The author starts a veneering job with a liberal layer of glue on both the veneer and the core material.*

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2. Place the veneer in position, and dampen it with a clean cloth. *Aligning the veneer just right is not critical at this stage. With hide glue, you can move it around after making contact.*

3. A laundry iron makes the job easier. *Heat from the iron and steam from the dampened veneer reactivate glue that has cooled. Keep the iron moving to prevent it from scorching the veneer.*

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4. Pressure from the veneer hammer secures the bond. *Pressing small sections at a time is better than trying to adhere a large sheet of veneer all at once, because portions of it may cool before you can bond it properly. Work from the middle, parallel to the grain. Cross-grain strokes may split the veneer.*

many granules into the pot as you think you'll use the next day, and cover them with water. By the next morning, the granules will be soft and jiggly. Pour off the excess water, and heat the pot to between 140° and 150°F, stirring occasionally. Add water a little at a time until the glue is thick but smooth in consistency. Test the viscosity by dipping a small scrap of wood in the hot glue. You want the glue to drip off the wood slowly, not run off.

Hot hide glue has a pot life of a single day according to most manufacturers. However, when I was making musical instruments, I could use a batch for two or three days with no problems. Once applied, hot hide glue cools quickly and develops a good deal of tack. But because it takes longer to set up, hide glue gives you extra time to assemble parts and fuss with the clamps.

Apply veneer without a press

For occasional woodworkers, probably the best use for hide glue is in an age-old process known as hammer veneering (see the photos above). Hide glue is stronger than contact cement, which grabs on initial contact and won't let go. If you haven't positioned the pieces precisely, you're in big trouble. Hide-glue veneering allows you to position and adjust the veneer before the adhesion process begins.

I begin by brushing an even coat of hide glue onto the back side of the veneer and the core material. After the glue cures—when it's almost dry but just a little tacky, 20 to 30 minutes—you can position the veneer over the core. Unlike contact cement, the two surfaces won't bond immediately. If necessary, once it's in place, tack the veneer to the core with a few veneer pins to prevent it from shifting.

Wipe the veneer with a damp rag—this closes the pores of the wood and prevents the veneer from scorching. With a laundry iron on a medium setting, heat the veneer surface evenly. Immediately, press the veneer onto the core with a roller or veneer hammer, starting at the center of the veneer. Work your way toward the edges, rubbing parallel to the wood' grain. (If you draw the hammer perpendicular to the wood grain, you may stretch and split the veneer.) Go over the surface a second and third time, applying more pressure as the veneer cools.

Test the glue bond by tapping the veneer surface with a dowel. It should have a solid sound wherever you tap. If you find an area that sounds hollow, the veneer has not completely bonded. Wipe the area with water, reheat it with the iron and press the veneer once again with your roller or veneer hammer. In some cases, you may have to make a small cut parallel to the grain to let air escape from under the veneer. If you find there are a lot of areas that haven't bonded, set the iron a little hotter. □

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