Epoxy is a great unsung wonder of the woodshop. This two-part mixture of resin and hardener serves duty for far more than occasional repair work. You can use it as an adhesive, a filler, a wood stabilizer, or a finish for the toughest of jobs. It cures as hard as stone without shrinking, is incredibly strong, impervious to water and chemicals, and will bond almost any material. Apply it as an adhesive on projects like entry doors and Adirondack chairs that suffer weather’s worst offerings and use it as a finish on much-abused items like bar tops, boats, benches, and bathroom cabinetry. Of course it has drawbacks too: it’s relatively expensive, and the uncured material can be a skin sensitizer. Also, cured epoxy is irreversible, so it’s not a wise choice of adhesive for furniture that may require disassembly and repair in the future.

You’ll find epoxy available in hundreds of specific formulations concocted for various industrial applications. But what matters to us as woodworkers is a relatively small variety of products. I’ll show you a few that I’ve found invaluable over the years. It’s likely that when you start working with this stuff, you’ll find new uses for it yourself.
Mixing epoxy
For our purposes, epoxy comes as a liquid, paste, or putty (Photo A). The product I use by far the most is “general-purpose” epoxy, which is packaged in containers that can be outfitted with hand pumps for measuring convenience. When dispensing the syrupy stuff, one full push of each pump delivers the correct mixing ratio for the resin and hardener (2:1 respectively). I thoroughly mix the two parts in a shallow tuna fish tin, using either a stick or the same artist’s spatula that I often wield as an applicator (Photo B). Sanding dust or proprietary fillers can be added to epoxy as thickening and coloring agents (Photo C).

Some epoxy pastes have the consistency of chocolate pudding. The two parts can be stirred together in a tin or jar using a spoon. Some epoxy putties handle like children’s Play-Doh, and require kneading by hand to combine the resin and hardener. Other putties are squeezed from tubes and mixed and applied with a putty knife.

Regardless of the epoxy type, it’s very important to follow the product instructions, especially regarding the proper mixing ratio. Most problems with epoxy are caused by improper resin-to-hardener ratio or insufficient mixing. Note the all-critical working time, combine the two parts thoroughly, and prepare only as much as you can use at a time. If adding sanding dust or other thickeners, stir them into the mix afterward. If a batch starts to tack up or cure in its mixing container, toss it. Use a clean container for each new batch so you don’t taint it with partially cured material.

Working Safely
Stickiness aside, uncured epoxy is a skin sensitizer, so don a pair of nitrile or latex gloves when handling it. Epoxy sanding dust can irritate your respiratory system, so work in a well-ventilated area and wear a dust mask. When using water-thin versions, wear eye protection to guard against splashes.
Filling knots, cracks, and voids
I treat cracks with general-purpose epoxy for a clear, tough fill that blends in under any surface finish (see opening photo). For knotholes, I mix fine sanding dust and epoxy for a quick build and color match to the surrounding area. Because wood moves while epoxy doesn’t, avoid patching cracks wider than ¼” or so, which may separate at the edge of the patched area over time.

Putting epoxy to work
Now let’s look at some common applications for epoxy in the woodshop, including gluing joints, filling and stabilizing wood, and bonding dissimilar materials.

Joinery
General-purpose epoxy works fine for joinery, but certain other formulations, such as System Three’s T-88, are specially formulated for better elasticity, impact resistance, and tenacity when joining oily or resinous woods. Whatever the epoxy used, a strong connection depends on a snug fit, so cut your joints as carefully as you would for using any kind of glue. Yes, epoxy will fill gaps, but a gapped joint will be weaker than a well-fitted joint.

Mix the proper proportions of resin and hardener, and thoroughly coat the joint surfaces using a disposable brush, putty knife, or painter’s spatula (available at art stores) as shown in Photo D. Clamp the assembly just tight enough to pull the pieces together. Undue pressure may squeeze out the epoxy, starving the joint. Leave the assembly clamped up for 24 hours.

5-Minute Epoxies
When real strength is required, avoid “5-minute” epoxy and other quick-setting varieties, which are weaker than long-cure epoxy. That said, quick-set epoxy does have its benefits. I use it in the finish room to fill small cracks and dings that show up at the last-minute. A few dabs will also “clamp” an awkward workpiece in place while its primary coating of long-cure epoxy sets up.

The damage at the tip of this plywood template is easily fixed using epoxy putty like JB Weld.

If a crack runs off the edge of a board, dam it with duct tape before filling it.

A mixture of general-purpose epoxy and fine sanding dust creates a rock-hard fill for knot voids.
If a crack or knothole extends through a board or off its edge, mask off one face or the edge with duct tape as shown in Photo E. Work the epoxy into a crack with a painter’s spatula or other thin metal blade. If it keeps seeping in, let it cure awhile before applying more. Several applications may be required.

Seal the edges of a knothole with general-purpose epoxy. Then pack it with a mix of epoxy and fine sanding dust or a thickener like System Three’s “Wood Flour,” mounding it at the surface (Photo F).

Epoxy putty can be a quick-fix for damaged templates and jigs. Mix equal amounts of resin and hardener together, and then push a glob of the material into place to repair wood or metal (Photo G). Shape it after it cures.

Stabilizer hardens rotted, punky wood in preparation for restoration with epoxy putty. This water-thin epoxy is formulated to permeate and harden fragile, punky wood. To use it, clean away any loose material from the damaged area and then pour the epoxy onto the surface, spreading it as necessary with a brush (Photo H).

Bonding dissimilar materials
When it comes to bonding dissimilar materials, epoxy reigns supreme. It’s an excellent choice for securing tool handles and attaching metal and many plastic parts to jigs and fixtures. (Some plastics don’t bond well, so do a test first.) Annoyed by a loose-handled hammer? No problem. Just drip some epoxy into the head (Photo I). Dissatisfied with your stock turning tool handles? Turn new ones and attach them with epoxy.

Cleanup and tooling
Uncured epoxy can be cleaned up with denatured alcohol. It’s best to wipe up joint squeeze-out and other excess before it hardens. Fully cured epoxy can be planed, jointed, sawn, and sanded without a problem, although it is as hard as knots on blades. I generally feed epoxy-filled boards through my thickness sander and then finish up with a random-orbit sander. Excess can also easily be removed with a cabinet scraper (Photo J).

Sources
For specific product information and dealers, contact the following manufacturers:
- JB Weld
  (903) 885-7696
  www.jbweld.net
- System Three
  (800) 333-5514
  www.systemthree.com
- West Systems
  (866) 937-8797
  www.westsystem.com

About Our Author
Stephen Metz has been working wood professionally since 1981. He owns High Point Woodworks in Bucks County, Pennsylvania, specializing in live-edge furniture and cabinetry.
SUBSCRIBE!

2 YEARS for $29.99!

go to woodcraftmagazine.com and click SUBSCRIBE

-or-

Complete the form below and mail in an envelope addressed to:

WOODCRAFT MAGAZINE
PO BOX 7020
PARKERSBURG WV 26102-9916

□ Payment Enclosed
Name
Address
City
State               Zip
Country
E-mail

Send in now to get
2 Years for $29.99!

or go to woodcraftmagazine.com and click SUBSCRIBE

By providing my e-mail address, I am indicating I’d like to receive information about my subscription and other offers from Woodcraft Magazine via e-mail.

Outside of the U.S and Canada add $30 for postage.
Foreign orders must be prepaid. Payment in U.S. Funds only.