Epoxy in Contemporary Turning

A virtual panel discussion with three viewpoints from

The “Resinators of Santa Cruz Woodturners”

April, 2021

Manzanita Burl and Epoxy, Dwain Christensen, 2021

Novel uses of epoxy, resins,[1] [2] [3] and pigments have rippled through the woodworking arena in recent years, and...no surprise...they have made some waves among woodturners, too.

For the purposes of this article, we will be talking almost entirely about epoxies, which are formed by the chemical reaction between 2 different, chemically engineered, synthetic resins which react to create a new, strong, generally inert and waterproof material composed of long chains of molecules (polymers).

We asked three of our club’s “Resinator” members to share their perceptions and experience. Also, to no surprise to those who know turners, we discover several different lines of sight on the topic in addition to some cheerful convergences.

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[1] See **Appendix** for expanded definitions and comparisons, including a section on resin and epoxy glues.
[2] **Excellent** web reference for choices and usage, from Rockler: Epoxy Buying Guide (rockler.com)
[3] **Superb** comparison chart of products, pdf, Rockler copyright. Compressed image in Appendix in this paper. Full size version attached and also available online epoxychart.pdf (rockler.com)

Meet our Panelists

Larry Dubia, one of our pro turners, has been doing artistic epoxy castings, miniature sculptures, composite jewelry, and "pool" applications for a long time in addition to traditional turning at an ambitious scale. He's among the first of us to try these rapidly expanding technologies, which means he's taken his share of incoming fire in the learning process.

Mattie Guthrie, an independent woodworker (www.MountainFogCreations.com) and an ambitious new turner, used resin and epoxy extensively for surfboard manufacture for years. Like Larry, he's earned his stripes through direct experience. The different approaches should be instructive! *Hint: Mattie's interview comments include a wealth of practical tips!*

Dwain Christensen, also never shy about "Just Do It" with new techniques, has done some pretty amazing work early in his journey with that 5 gal pressure pot. He's newer at it, but he's becoming a master of the accelerated *see-one, do-one, teach-one* progression.

Wells Shoemaker, moderator and editor, a learning turner, dabbler in resins, and your current club President.

Complex Segmented Bowl with resin pool and stone, Larry Dubia

Denim (!) and resin bowl, Larry Dubia

Resin finished surfboard top and bottom.
"Acid Swirl" pattern colors embedded in lamination process. Mattie Guthrie

River tables (web source images)

Last November, Scott Grove gave us a remote demo on inlay techniques which, of course, depend heavily on epoxy and resin. We've all used epoxy and cyanoacrylate glues for repairs and patches, but in this discussion, we'll go well beyond that!

Bay Laurel burl with copper powder & epoxy in multiple semilunar voids WS

Redwood burl initially with many voids and perilously unstable "wafer" cracks, solidified with slow set clear System Three epoxy (2 days immersion), turned, and finished. WS

Black acacia, maple, and redwood burl boxes with decorative embellishments of powdered stone, brass, or malachite cabochon...all enabled with epoxy. WS

We're ready for the panel's comments! In the first section, each of our panelists responds to the same question. Then we offer individualized questions for each turner.

We color coded the responses because...we celebrate diversity.

Larry is Red
Mattie is Blue
Dwain is Green
Wells' moderator questions are plain old Black

Yes, as a matter of fact, this article is going to go to pot. (Dwain & Larry's pressure vessels)

Group Questions

1. When did you first start using resins in woodturning...or other work?

   LD: My first attempt at using resin was near the beginning of my turning experience about 13 or 14 years ago. I was casting my own pen blanks and hybrids.

   MG: I was working with epoxies and fiberglass resins for a long time in surfboard manufacture, but just about 2 years ago with furniture, mostly for repairs. I've made a couple river tables...which have become really popular...but most customers are surprised by how much the materials cost.

   DC: I tried epoxy for the first time in December of 2020.

2. Can you describe your happiest triumph with epoxy and resins?

   LD: I cast a hybrid blank for a sphere and another for a dragon's egg. I used maple burl with the resin.

   MG: That was probably a surfboard which finally met the really high standards of Mike Wasch.

   DC: After pouring the epoxy and placing it in the pressure pot for 72 hours, I pulled it out to find a perfectly cured piece with NO bubbles!!

3. Cool. Now can you describe your most humiliating experience?

   LD: I had a really gorgeous piece of amboyna burl with lots of figure and fissures. I misread the amounts and poured the resin. The resin only semi cured, ruining the whole project. It never cured all the way even with warming, sun…anything. I ended up throwing it away.

   MG: Really early, I was approached by a new employer who asked me to finish a couple boards as more or less an interview. He wasn't satisfied.

   (WS—good to get that behind you early in your career...the falls come from greater heights later in life.)

   DC: Realizing I used the wrong type of epoxy. Mine came out with an amber hue.

4. River tables and resin applications have become a vigorous new enterprise for large online woodworking vendors such as Woodcraft, Rockler, Woodworker Supply, and others. How do you see the future overlap of wood turning and resin applications? Is this a passing fad, or is it here to stay?

   LD: I believe this is something that will be here for some time. I'm not sure it will stay the test of time but it is here for a good long haul. There is still much to learn and experiment.

MG: Definitely here to stay. Large companies are making these products and people are using them in really creative ways. They're all expanding fast.

For turners, it's going to help when we get more user-friendly products—less tricky, less toxic especially.

DC: I think this area of woodworking is only limited by the imagination of those willing to try.

5. Specialized resins and epoxies are a chemical engineering innovation, elaborating some bad smells and toxicity. They require some specialized equipment. How does that fit with the intrigue with natural wood that attracted you to turning?

   LD : It is a mix of contrasting disciplines as well as appearances. The resin gives the turning a look that can be custom to each piece or mixed to create something truly unique.

   MG: I choose eco-friendly products and processes whenever I can. My favorite finish is a hand rubbed oil—Odie's Oil. But I don't mind using other approaches when it makes sense. I have a walnut bowl *(Thanks, Dan!)* with boring insect holes just today, as a matter of fact. I do keep a lookout for Earth Friendly products, and I think those will become more available. Intra P resin might be an example.

   DC: I think the epoxy can dramatically enhance the beauty of a piece...if done correctly of course.

6. If you have a bowl with a large "defect," such as a loose knot, an outright hole, insect burrows, or decay, what goes into your artistic decision whether to patch it with resin versus leave it "as-is"?

   LD: A resin fill would be more fitting for a larger hole with nonlinear lines such as a crack with a large void to fill. Borer holes, small fissures, and small cracks are usually cleaned out and filled with turquoise or other small stone fill. Straight lines, by the way, take away from the overall appearance of the work, making it look more manmade.

   MG: Mostly that has to do with the structure. Is it going to come apart? Will resin fix that and save an interesting piece, or does it need a mechanical fix? After we relieve a lot of internal stress with turning, does that change the stability? And of course, it's still going to move a bit with seasonal changes no matter what. I suppose you also have to ask if the finished piece is worth the time and money.

   DC: I think having a natural 'defect' in the piece is always preferable. If the defect has compromised the structural integrity of the form, then using resin is a great option.

7. Local hardware stores have a whole wall of epoxy products for general public use—slow, fast, structural, tinted, thin, thick, gel...on and on. Plenty of CA (cyanoacrylate) "super glue" products, too. Are there turning uses where these work for you, or do you order from an online vendor?

   LD: I use online vendors for CA, resin, and some epoxies. The only epoxy I use from a hardware store is for gluing in tubes in pen blanks, or mixing a fill such as copper, aluminum, or brass powder.

   MG: You won't likely get casting resins at a hardware store. If you know what you're buying, the online vendors have good selections. If not, or if you need some personal advice, go to a boat supply house. That's where I got Total Boat, a table top epoxy that was pretty easy to use.

   DC: I have yet to find a good option in any of the local shops. Most are designed for thin applications for tabletops and floors. These don't turn well. I have recently ordered a product from Total Boat. (WS: Larry & Mattie echo these comments!) I suspect this will have a far superior outcome. **Stay tuned, I have a potentially very cool project in mind.

8. What safety precautions—clothing, gloves, ventilation, etc.—do you recommend?

   LD: I always use nitrile gloves, and keep the side and overhead doors wide open and a fan running in the back of the shop to push fumes away. I also wear a smock to protect my clothes.

   MG: This is huge. I worked in an "old school" surfboard shop with bad ventilation—mostly just open windows. Some of the guys didn't really protect themselves the way they should have. A good friend told me my eyes and overall health looked phenomenally better after I quit that work.

   The fumes—VOC's—from epoxy and resins tend to pool on the floor, rather than going upwards...something a lot of folks don't expect. A little fan up high isn't going to help you much. You need cross flow, ideally fresh air entering high and getting evacuated out low.

   Remember that the VOC's will creep through walls and get into the house. *Just never use this in the house!* A garage isn't bad, especially if it's fire-taped according to code these days, which helps block the fumes. But it has to have good ventilation.

   A respirator with a VOC filter is a must. A mask, even a good mask, is meant for dust and particles, not VOC's.

   Solvents in polyester resins are a bigger problem than the off-gassing from epoxy.

   DC: I wear gloves and a good respirator, and I make sure my shop doors and windows are all open for good ventilation.

Individual questions for **Larry:**

1. You're an accomplished professional turner, Larry, which means you need to sell your works at something above cost, *right?* Has the expense of these rather costly raw materials, plus the pressure pots and other equipment, broken even for you?

> LD: The cost of the casting resin is not all that high. [4] I do also have to purchase stabilizing resin to solidify the wood to remove any possibility of air bubbles which would ruin the casting. That process takes a minimum of three days plus an hour to "cook" the blank making it solid and usable. Only then can I cast the wood in a mold.

2. Larry, you have collaborated with Maarten Meerman to create some miniature environments using burl and resin castings, and then turning and polishing those. That's amazing work, but it must be monumentally labor intensive. Do you see an economic future in that...or is this mostly a personal quest?

> LD: I think these will be economically viable once I figure out how to get them right. It is a *lot* of work! The pieces Maarten has made for me have not been turned yet. The "Moon base" still has some work to be done on it when I get back to it. I would hate to ruin them when they get cast. The first one bubbled really badly.

3. Where do you see resin applications in your portfolio a few years from now?

> LD: I will be casting things periodically just because they are fun to do. They get a lot of attention when they are put on my table for sale.

4. I'm pretty sure you were the first SCW club member with a pressure pot. Can you describe the difference in the way that works, compared to simply submerging a blank in slow setting epoxy?

> LD: The pressure pot does double duty as a pressure pot for shrinking bubbles in cast materials as well as a vacuum pot for sucking out the air. I just had to change the plumbing on the pot and get a second lid made. You would not want to just drop a piece of wood in slow curing epoxy. It would bubble and ruin the casting.

5. Last question—do you use lots of different products, or stick with a few until you know their quirks?

> LD: I use only two currently but am going to try Total Boat as I have heard very good things about it. I am using U.S. Composites Sylmar 41 for very long open time and Alumilite clear for smaller projects where open time is not as crucial. It has a 20 minute mix to solid time, then 24 hours for curing. I don't use resin from the art store or craft store. The resins have a limited shelf life and they can be close to that when you purchase it.

[4] WS: Cost goes up fast for large furniture applications which can use quart or gallon quantities.

Water imagery with burl and resin, Larry Dubia

Green resin and burl "dragon's egg"...and smoky resin and burl globe.
Craftsman and photographer captured in the reflection for bonus! Larry Dubia

For **Dwain**:

1. You bought a pressure pot for a multimedia project you displayed for our President's Challenge in January. That project was truly gorgeous (see our front page photo of manzanita burls embedded in epoxy). How hard was it to work out the details?

> **DC**: Not hard at all. The biggest challenge was trying to figure out how much epoxy to mix. I didn't want to waste any material. I had to modify the top of the pot with new fittings. It was purchased from Harbor Freight and their stuff isn't always top shelf.

2. Are you planning to do more of this, or was this a "one-off" for you?

> **DC:** I have just purchased a gallon kit from Total Boat as I have a new project in mind. I suspect I will do Epoxy turns for years to come.

3. Can you compare the satisfaction of shaping natural wood with a tool to creating a new material with different visual intrigue?

> **DC:** Better than sex. [Don't tell] :) I get huge satisfaction out of creating something truly unique. Having multiple media only enhances this.

4. I see ads and videos online about special tools (such as negative rake carbide cutter tips) to turn cured resin. What did you use, and do you plan to plunge into that vendor pool?

> **DC**: Short answer is: I used all the usual tools in the quiver.

5. Parting comments, Dwain?

> Resin / Epoxy turning can be nerve wracking. It's extremely messy and can be dangerous. A catch creates glass-like shards. Gloves are a MUST. I also wear a respirator during all phases of the process.
>
> Also... finishing for me has consisted of Ack's Paste and OB Shine Juice. The finish is like glass.

Epoxies can live happily within a turned object as well as surrounding them.

Inlayed rim in a black walnut platter, Dwain Christensen

Redwood bowl with inlayed rim, Raf Strudley

For **Mattie:**

1. Crack stabilization. Radial cracks in green-turned blanks, even when processed promptly and sealed, are a common nuisance for us wood-scrounging local turners. Some wood is more troublesome than others. Some hairline cracks can be secured with low viscosity "thin" CA glue. But others are too wide for that, and wood that hasn't stopped moving can crack the brittle CA glue line. You mentioned **"penetrating epoxy"** resin which flows in deeper than the more viscous epoxy. Can you elaborate?

> MG: Penetrating epoxy [5] is commonly used to seal the edges of natural edge boards before casting resins, soak into narrow gaps, and solidify soft sections. It's designed more to seal, rather than plug large gaps or serve as a finish coat.
>
> First, the wood really has to be dry...furniture dry...moisture content 10-12%. Wet wood is a problem. The moisture changes the way the epoxy sets, and the cured resin can separate from the wood. It's also a problem if you have debris which prevents the epoxy from reaching the wood for a proper bond. Wood moves seasonally, which is generally OK with epoxy, but if the wood was still moist enough that you were going to get shrinkage simply from drying, the wood adjacent to the bond can split off.
>
> If you apply to a piece with cracks all the way through, you may want to seal off one side with silicone caulk or blue painter's tape or else it might just run through to the floor. [6]
>
> If you use a finish epoxy coat without deep sealing with a penetrating treatment first, you're likely to get bubbles, and some gaps may not close.

2. How about stabilization of punky wood? I suspect you have encountered this in cabinetry before you started turning.

> MG: Sometimes you have just incredible wood with a few soft spots, and those are worth saving. The penetrating epoxy is low viscosity and will absorb into punky wood like a sponge, as long as it's dry. I like to warm up the wood (65 to 75 degrees), sometimes even with a heat gun, and also warm up the epoxy in a warm water bath so it will soak in without coagulating on cold surfaces. You can also use silicon glue or silicone caulk to make a "dam" around the area you're treating, and that allows you to make a little pool to soak in better. Epoxy doesn't stick to silicone, and the silicone peels off easily.
>
> After the penetrating epoxy seals all those surfaces, there's usually a secondary epoxy coat in furniture. I haven't gotten that far with turnings yet.
>
> I saw a video where a pro turner used walnut oil to solidify soft wood. It seemed to work for him, but I haven't done that yet.

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[5] WS: MAS Penetrating Epoxy is available from Woodcraft, Rockler and other online vendors.

[6] WS: Some epoxies effectively destroy low "grab" tape adhesives. I personally use wide Gorilla Tape rather than blue painter tap or duct tape. Do an experiment to get to know a new product...and share your experience!

3. You mentioned that woods need to be dry before you can use epoxy sealers and defect repairs. What else goes into your procedure?

MG: We discussed the bonding problems if the wood isn't fully dry.

Temperature is another thing. I mentioned warming the wood and the resins. The environmental temperature is also important. The room should be pretty warm—75, even 80 degrees. Depending on the product, epoxies make their own heat, and sometimes you need to heat it up even more, maybe with a heat gun to get the clear, bubble free surface you want.

I use a digital lab scale to weigh my materials exactly. Some people with a lot of experience will adjust the amount of hardener...less hardener leads to a slower set...but if you miss the "sweet spot," you have a mess.

Epoxy is forever. If you have bubbles or poorly mixed materials, you're not going to be able to fix that. You have to start over.

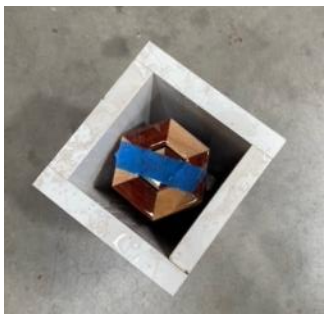
4. There's a popular surge in pigmented, deep pour epoxy for river tables and other decorative purposes. I know you've made them professionally. Meanwhile, we turners have been using epoxy slurries with powdered stone and soft metal to fill large cracks, voids, and "features," as well as creating decorative inlays. **What do you think of dye-pigmented resins** for those same purposes?

MG: People *really* like colors. They're flashy, especially with contrasting colors, red, vivid blue, and green especially. You have a choice of mixing pigments as powders or liquids. The powdered pigments, usually mineral based, are pretty easy to use, but remember that those particles are possibly irritating or toxic until they're trapped forever in the epoxy. Wear a mask! You have to mix these up really well, too, and some people fear that you'll create lots of bubbles with that.

The liquid dyes have really precise directions, which you need to follow.

Bonus Point: Mattie mixes a little bit more epoxy than he expects to use for a job...just not prudent to run out! What do you do with the leftovers?

MG: I made a couple polygonal molds—call it a catch box—that serve as a reservoir. Leftover resin goes in there instead of the landfill. As it fills up layer by layer, I get a rainbow striped casting that I can turn, use for coasters, or...we'll see.



Redwood countertop getting epoxy stabilization of crack in center and vulnerable knot.

Finished product, ready for installation—Mattie Guthrie

Vignette from the Past: A Resinated Boomer Speaks

Roy Holmberg makes us think of fiery furnaces, great big machines, and beautiful multimedia turning. Turns out...Roy was also a resinator way back in the 1960's.

How's that? He owned a series of Corvettes, which of course are mostly made of resin. And boats, too, which are held together and waterproofed with resins.

Here's a project he made back then with walnut, tinted Bondo, and a router. Some ideas keep coming back around.

He made a lot of these, but this particular dish served to keep Roy's keys "findable" for, um, 50+ years. He dabbed a fresh coat of finish on it for this monograph.

Roy also made some molded resin gear shift knobs with interesting inclusions—daisies (OK, flowers were big in the late 1960's). Then he added scorpions, black widows, and ants to the resinated repertoire. He had an offer to go into large scale production, but the United States Navy made an intervening call. After Roy's tour in Vietnam, the market had moved on to other novelties.

This hooked rack from Roy's 1960's days advertises its purpose...
lots of abandoned keys...forever encased in crystal clear epoxy.

Appendix: Terminology and Definitions: Resin versus Epoxy

They overlap. All epoxies are resins, but not all resins are epoxies.

For the purposes of this article, we were talking almost entirely about epoxies, which are formed by the chemical reaction between 2 different, chemically engineered resins which react to create a new, strong material composed of long chains of molecules.

--WS

A **resin** generally means a gooey, uniform substance...which can be natural material such as pine pitch, shellac, or casein...or a synthetic substance. For turners and woodworkers, however, it's mostly about the synthetic! Resins typically are viscous...sticky. They pour, spread out, and flow differently, but because of viscosity and surface tension, not as freely as water. Resins can harden with time (think amber).

Epoxy is typically a two-part material...a resin containing a swarm of un-linked synthetic molecules (monomers) of petrochemical origin. The second part is a Hardener, also a resin, composed of a chemical which catalyzes those molecules to link together into progressively longer chains (polymers). As this process starts, the liquid material gets thicker, then gummy, and then it eventually solidifies. That process can take as little as a few minutes or as long as days. The process of linking these molecules continues even after it hardens...for days or even weeks. Eventually, they become "cured," meaning solid, strong, and virtually inert. The chemical bonding is permanent, and it cannot be dissolved or reversed.

There are dozens of different formulations of epoxy which have different properties, both before bonding and after. Most are clear, some amber, and some are milky. Many of them can be tinted with admixture with liquid dyes or colored powders. They all release heat and odors in the chemical reaction of the setting process, after which they are usually odorless and non-toxic.

Notably, epoxy does not use solvents. It doesn't "dry" into a harder form as a solvent evaporates the way paint, most paste wood fillers, or common woodworking finishes or glues. Instead, the basic materials become directly chemically linked, forming a new material that can be molded, shaped, and colored. They are usually waterproof.

Rockler www.rockler.com has just produced a fantastic reference for pouring epoxies, including varied uses and limitations, mixing and pouring techniques, heat effects, and videos.
Link: Epoxy Buying Guide (rockler.com)

The state-of-the-art comparison chart in that Rockler reference is worth saving in your favorites! It may change with time, but for now, it includes most of the available products with superb clarity. **Compressed version** next page below. Full size available online
Link: epoxychart.pdf (rockler.com)

Rockler's Comparison Chart of Brands, Uses, and Specifications of Epoxies

BRAND	MAS TIME SAVING EPOXY RESINS				LIVE EDGE TIMBER CO.	SYSTEMTHREE			WEST SYSTEM
PRODUCT	 Penetrating Epoxy Epoxy	 Table Top Pro Self Leveling Epoxy	 Deep Pour Epoxy	 Deep Pour X Epoxy	 Self Leveling Casting Epoxy	 Tabletop MirrorCoat Self-Leveling	 Deep Pour Rivercast Epoxy	 One Pour MirrorCast Epoxy	 Epoxy Resin and Hardeners
MAX POUR THICKNESS	Non-building epoxy that penetrates into wood to add structural strength and seal small gaps in porous grain, live-edges, soft wood and rotting wood. Not intended for building a thick finish.	1/8" - 1/4" thick (Pours at 70˚F)	1/2"- 1" thick (Pours at 70˚F)	2" - 3" thick (Pours at 70˚F)	1" - 2" thick (Pours at 72˚F)	1/16" - 3/16" thick self-leveling	1" - 1.5" thick in one pour	.5" - 3" thick in one pour	.25" thick in one pour
DESCRIPTION	MAS Epoxies Penetrating Epoxy Sealer is ideal for wood repairs because it adds structural strength and protection against water.	MAS Epoxies Table Top Pro is a clear epoxy resin coating with a glass like finish and an easy 1:1 mix ratio. The epoxy resin goes on in thick, self-leveling pours, making it easy to get an alluring clear finish.	MAS Deep Pour Epoxy is specifically designed for molding, encapsulating and creating deep pour castings, such as those used on live edge river tables and ocean tables.	Deep Pour X is a high-performance epoxy casting system formulated with an extra-slow cure time that allows pours from 2" to 3" deep. Even thicker castings can be achieved with multiple pours.	Timber Cast Casting Epoxy is a complete casting epoxy kit with both epoxy and metallic color pigments. It is great for river and ocean tables, encapsulations and large castings. These higher volume pours will provide fast gel and cure times.	MirrorCoat creates a gleaming, durable alcohol-proof and waterproof finish for your bar or tabletop! A pourable, self-leveling two-part epoxy coating, MirrorCoat works well on a variety of surfaces, including wood, ceramics, plaster, masonry and some plastics.	RiverCast is a clear epoxy system designed specifically for woodworking casting applications like deep pour river tables. It produces ultra-clear casts with minimal bubble entrapment.	MirrorCast is a clear epoxy casting resin designed to fill small- to medium-sized cracks, knots and voids. It's a great choice for filling common defects in live-edge slabs and other rustic or reclaimed lumber, where it produces crystal clear results with minimal shrinkage.	West System Epoxy 105 Resin is mixed with West System 205 (fast), 206 (slow) and 209 (extra slow) Epoxy Hardeners. These formulas create an ultra-tough waterproof coating, a high-strength, gap filling adhesive or an easily sanded surface filler for wood, fiberglass, reinforcing fabrics and a variety of metals.
APPLICATIONS	Seals small voids and gaps in wood before doing a deep pour or tabletop, preventing bubbles and impurities from contaminating the clear look. Adds structural strength to rotten or porous wood. Also adds a moisture resistant coating .	Self-leveling clear coating for surfaces, countertops, filling narrow cracks, and voids less than 1/4" thick	Filling voids in river tables or encapsulating pieces of wood and other objects less than 1" thick.	Perfect for creating castings like live edge river tables, ocean tables and encapsulations, where it cures to a clear, glass-like finish.	Perfect for creating castings like live edge river tables, ocean tables and encapsulations, where it cures to a clear, glass-like finish.	Self-leveling clear coating for surfaces, countertops, filling narrow cracks, and voids less than 3/6" thick.	Filling voids in river tables or encapsulating pieces of wood and other objects less than 1-1/2" thick.	Filling voids in river tables or encapsulating pieces of wood and other objects less than 3" thick.	Structural epoxy, uses one resin fill with fillers to make pastes and putty's, choose your hardener as far as slow and fast NOT intended for river tables
MIX RATIO	2:1 Mix Ratio	1:1 Mix Ratio	3:1 Mix Ratio	2:1 Mix Ratio	2:1 Mix Ratio	2:1 Mix Ratio	2:1 Mix Ratio	2:1 Mix Ratio	Mix ratio depends on the hardener formula mixed with your resin.
CURE TIME (at 70° F)	24 hr Full Cure Time	24 hr Full Cure Time	24 hr Full Cure Time	24-36 hrs 3" Cure Time	24-36 hrs Large Casting Cure Time	Cures Crystal Clear	7 days Full Cure Time	7 days Full Cure Time	Cure Time depends on the hardener formula mixed with your resin.

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Now a word about Epoxy and Resin *Glues*

This article focused mostly on epoxy as a visible decorative and structural component of a turned object. We'll mention epoxy and resin glues, too, for completeness.

Glues are designed to bond 2 surfaces together, as opposed to showing off their own visual features. They have a huge variety of different formulations, as we discussed in Mickey Singer's detailed presentation to us a year ago.

Specialized **epoxies** can be used as glues an important feature in woodworking! There are also **"resin glues,"** commonly polyester. These can include some epoxy components, but also a solvent which evaporates as the glue solidifies to create a bond.

Here's a good web reference table comparing epoxy and resin terminology for **glue.**
Source Link: Difference Between Epoxy and Resin (with Table) – Ask Any Difference

Comparison Table Between Epoxy and Resin Glues

Parameter of Comparison	Epoxy	Resin
Basic definition	Epoxy is a solvent-free, water and chemical resistant adhesive well known for its bonding quality. Epoxy remains intact in conditions of heat.	Resin glue is a final product and a mixture of epoxy resin, solvent, catalyst and a hardening agent
Drying time	One of the most important advantages of epoxy glue is its curing time. It takes only about six to thirty minutes to cure, thus, is more used in cases where an instant bonding is required. *WS note: Some casting epoxies require hours or even days to cure...all for different purposes.*	The drying time of resin glue is one of its drawbacks. It takes about eight to ten hours to dry.
Strength of the bond	Epoxy is best known for its bonding quality. An epoxy bond has the capability to hold up to 2000 lbs per square inch.	Resin is also known for its strong bond but it has less strength as compared to the epoxy bond. The bond of the resin glue can hold less than 500 lbs per square inch.
Used in	Epoxy is widely used in the infrastructure industry, shipbuilding industry, aircrafts industry, etc. It is also used in bonding metals, plastics, woods, etc, where an instant bond is required for the assembly.	Resin, due to its cost-effectiveness, is used in the construction industry where they have enough time to let it dry. It is an ideal adhesive for wood bonding where there is no requirement of instant assembly.
Cost	Epoxy adhesive is costlier than resin glue.	Resin is more frequently used in various industries because of its low cost.

More extended Narrative information about glues, same online source, next page

Epoxy glue is an adhesive based on petroleum products. It does not contain any solvent and is also moisture and chemical resistant. Epoxy remains intact in case of conditions of heat. It has a suffocating odor; therefore, it is advised to apply it in properly ventilated areas.

The major advantage of the epoxy glue is its drying time. It takes only about six to thirty minutes to dry, thus, it is more used in areas where instant bonding is required. It provides the strongest bond. The bond has the strength to hold up to 2000 lbs per square inch. It has a longer shelf life and can remain as it is for several years. It is costlier than other adhesives.

Epoxy is widely used in the infrastructure industry, automobiles industry, shipbuilding industry, aircrafts industry. It can also be used for the bonding of metals, plastic and wooden products.

Resin glue is obtained as the final product after mixing raw epoxy resin, a solvent, catalyst and hardening agent. The odor of the resin glue is pleasant. It is available in the market as liquid and powder.

The drawback of resin glue is its drying time. It takes about 8 to 10 hours to dry. However, more the atmospheric temperature, the earlier it dries. The bond of resin glue is weaker than that of the epoxy glue and can hold only up to 500 lbs per square inch. It is cheaper than epoxy glue.

Resin glue is more used in areas where there is enough time to let it dry. It is used in the construction industry. It is more suitable for bonding wooden products.

Collaborative Moon Base...waiting for the resin casting and then the lathe.
Maarten Meerman (an aerospace engineer and micro sculptor) and Larry Dubia

Well, that's it!

Try some new things and tell us all how it worked out!

Wells

Avocado burl with crushed Chrysocolla and epoxy inlay in natural voids, this morning! WS

Wells Shoemaker
President, Santa Cruz Woodturners