

**KEY FEATURES**

KRISTAL™ is a water clear, UV stabilised, 2-part epoxy resin casting system used to create **river tables, countertop coatings, resin art, encapsulation, electrical potting, 3d floor art coating** and many other casting related applications.

This high-performance epoxy resin has excellent self-levelling properties and outstanding self-clearing properties leaving castings virtually bubble free.

Once cured, **KRISTAL** castings exhibit negligible shrinkage are scratch resistant (*but not scratch proof*) and are anti yellowing UV stabilised. (Please note that even though these materials are UV stabilised to promote anti-yellowing, "ambering" or yellowing will occur if continually exposed to harsh UV environments). Not suitable for exterior applications.

Cured **KRISTAL** castings are FDA compliant for culinary applications making them food-safe (please note that food should not exceed 50°Celsius). (Kristal 6, 30, 50 and 100 *Test method: FDA 21 CFR 177.2600 report number GZ190826027FR*). (Kristal 55 and Kristal 10 1:1 *Test method FDA 21 CFR 177.1010 report number C230608017001-1*)

PHYSICAL PROPERTIES

The **KRISTAL** casting resins are available in **6 unique systems**:

- **KRISTAL DIAMOND COAT 6**, ultra-hard scratch resistant coating resin with a 5mm maximum casting thickness per layer
- **KRISTAL 10 (1:1)**, very hard resin with a maximum casting thickness of 10mm per layer. Small project applications
- **KRISTAL 82**, very hard resin with a maximum casting thickness of 10mm per layer. Small project applications
- **KRISTAL 30**, very hard resin with a maximum casting thickness of 20mm per layer. Max volume cast of 10 litres
- **KRISTAL 50**, very hard resin with a maximum casting thickness of 30mm per layer. Max volume cast of 20 litres
- **KRISTAL 55**, very hard resin with a maximum casting thickness of 30 mm per layer. Max volume cast of 20 litres
- **KRISTAL 100**, very hard resin with a maximum casting thickness of 60mm per layer. Max volume cast of 40 litres

SPECIFIC GRAVITY ON ALL ABOVE PRODUCTS 1.1

KRISTAL PRODUCT	Mix Ratio By Weight	Mix Ratio By Volume	Pot Life**	Cure Time**	Shore D Hardness	Heat Distortion Temp	Viscosity Part A RESIN	Viscosity Part B HARDENER	Compressive Strength Kg/mm2	Max Casting Thickness
6	100:33	n/a	40 min	24hrs	90	60°C	500-1000cps	100cps	13.4	5mm
10	100:90	1:1	40 min	24hrs	87	50°C	1500cps	500-800	n/a	10mm
82	100:82	n/a	40 min	24hrs	87	50°C	1500cps	500-800	n/a	10mm
30	100:33	n/a	40 min	24hrs	85	60°C	1000-2000cps	100cps	8.8	20mm
50	100:33	n/a	60 min	48hrs	85	60°C	1000-2000cps	300cps	13.4	30mm
55	100:33	n/a	90 min	72hrs	85	60°C	1000-2000cps	100cps	13.4	30mm
100	100:33	n/a	90 min	96hrs	85	60°C	1000-2000cps	100cps	13.4	60mm

PROCESSING RECOMMENDATIONS

Materials should be stored and used at an ambient room temperature of 23°C with relative humidity below 85%. Warmer temperatures will reduce pot life and will also influence the casting thickness.

If ambient room temperature is warmer than 25°C, reduce maximum casting thickness by 50% or as appropriately required to avoid excessive exothermic reactions.

It is advisable to reduce the maximum casting thickness by 30% to 50% if casting large volumes in a single pour. Mass castings can create stress in different areas of the casting and cause shrinkage, distortion and cracking.

For large, thick castings it is advisable to do multiple pours. Allow the layer to cure for at least half the maximum cure time and cool down to room temperature before adding another layer.

Due to the higher viscosity of cold Epoxy, it is recommended to pre-warm resin and hardener to 28°C - 30°C prior casting to minimise air bubble entrapment, then leave to cure at 18°C - 23°C.

Kristal resin systems can also be vacuum de-aired to minimise air bubble entrapment.



SAFETY AND HANDLING

Epoxy resins and hardeners are chemicals, and the below safety precautions should be practiced when using these materials:

- Work in an environment with adequate ventilation and avoid breathing fumes (a NIOSH approved respirator is recommended)
- Use protective Nitrile gloves to avoid skin contact
- Barrier creams can also be used to minimise skin contact
- If accidental skin contact occurs, use soap and water or hand cleaner to wash hands (never use solvents)

ALWAYS:

- Measure out part A – resin and part B hardener as indicated using an accurate digital gram scale
- Mix resin and hardener together thoroughly for 3 – 5 minutes using a flat paddle mixer, also scraping the sides and bottom of the container several times. Pour mixed material into a clean container and mix for another 60 seconds before casting. (this is a “mix pour mix” technique that ensures that part A & B on the sides and bottom of the container are properly blended so that there are no tacky spots or streaking in the cured casting)
- Allow adequate time to fully cure before sanding, polishing, and using.
- Wear appropriate safety gear and dust mask when sanding and polishing cured resin

AVOID:

- Applying onto oily or contaminated surfaces
- Applying onto damp or wet surfaces
- Whipping and beating material while mixing, this will introduce additional unnecessary air bubbles

APPLYING A RELEASE AGENT

Ease Release 200, 205 or Ram Wax can be used to effectively release cured epoxy castings to prevent adhesion on non-porous surfaces like metal, glass, melamine, or acrylic sheeting.

ADDING COLOUR

KRISTAL epoxy casting resin can be coloured by using Epoxy Pigments, So-Strong Pigments or UVO pigments and some amazing effects can be achieved by using metallic & pearlescent powders or phosphorescent glow in the dark powders like Glow Worm.

IMPORTANT:

Epoxy resin systems are exothermic, meaning that heat is generated when resin & hardener are mixed and begin to cross link. Larger volumes will create more heat and if mixed and cast in larger volumes than indicated, can generate enough heat to melt plastic mixing cups, burn skin or even ignite combustible materials. Please take care and reduce casting thickness when working in environments warmer than 25°C

If a batch of material begins to get excessively hot from the exothermic reaction, move to an open-air environment and be careful not to breathe fumes.

Please note that even though these materials are UV stabilised to promote “anti-yellowing”, ambering or yellowing will occur if continually exposed to harsh UV environments. This material is not suitable for exterior applications and areas subject to high UV exposure.

POURING

When pouring, it is recommended to pour to the lowest point and allow material to seek its level. Pouring in a uniform manner will help to reduce air bubble entrapment. Do not exceed recommended casting thickness.

If pouring in stages, allow previous layer to cure and return to room temperature before pouring the next layer. A propane torch can be used to dissipate surface air bubbles. (Move the torch / open flame over the surface of the resin, keep the torch moving so not to burn the surface.)

****POT LIFE AND CURING TIME:** Epoxy casting resins are mass-sensitive, larger volumes of material will generate higher temperatures through the exothermic reaction which will reduce pot life & cure time. Thinner castings will generate less heat and will take longer to cure. Ambient room temperature will also play a significant role in the pot life & cure time. Typical cure time at 23°deg C may take 24 to 72 hours.

Temperatures below 18°C may cause cure inhibition.

REMOVING EPOXY: Uncured epoxy can be removed by scraping as much material as possible from the surface using a paint scraper, acetone or isopropyl alcohol can be used to remove the residue that is left.

Disclaimer

Any information, data, advice or recommendations for processing materials or products supplied by AMT Composites is given in good faith. It remains at all time the responsibility of the customer to ensure that the products and materials recommended are suitable for the production method used and purpose intended.

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FAQ, PROCESSING TIPS AND IDEAS

TIPS TO HELP PRODUCE A PERFECT DEEP POUR EPOXY RIVER TABLE!

1. MIX RATIO

Mix at the correct mix ratio. Use an Accurate Scales to do this. Scales are available at AMT Composites
Please read the datasheet carefully to get the correct mix ratio. We strongly recommend you mix by weight as it is the most accurate method.

2. MIXING

Mix the two parts together very well. Stir with a flat paddle stick for a minimum of 3 minutes, scraping resin from the sides and bottom of the containers into the mix. Then transfer the mix to another container, mix again and then pour.

3. DEPTH PER POUR

Choose the appropriate system to match the depth you require. The chemical reaction that occurs, generates heat. Large volumes of resin can generate excessive heat, which can lead to an exothermic reaction, and cause the resin to discolour, crack and warp!

4. CALCULATING HOW MUCH TO USE

To calculate the volume of resin required, measure the length, breadth and depth and convert to liters.

- a. A table 2met x 900mm x 50mm deep is:

$$200\text{cm} \times 90\text{cm} \times 5\text{cm} = 90000\text{cm}^3 \quad 90000/1000 = 90\text{Lts.}$$

The Specific gravity of the material is 1.1.

So 90Lts x 1.1 = 99Kg is total amount of Resin and Hardener required.

- b. To calculate the separate amount of resin and hardener required, divide the total Kilograms by the mix ratio (ie 1.33 for the 100:33 mix ratio system or 1.25 for the 100:25 mix ratio system) and that will give you the amount of resin required

Example:

$$99/1.33 = 74.44\text{Kg Resin (Mix Ratio is 100:33)}$$

$$74.44 \times 33\% = 24.56\text{Kg Hardener}$$

Total weight = 99Kg Mixed Total

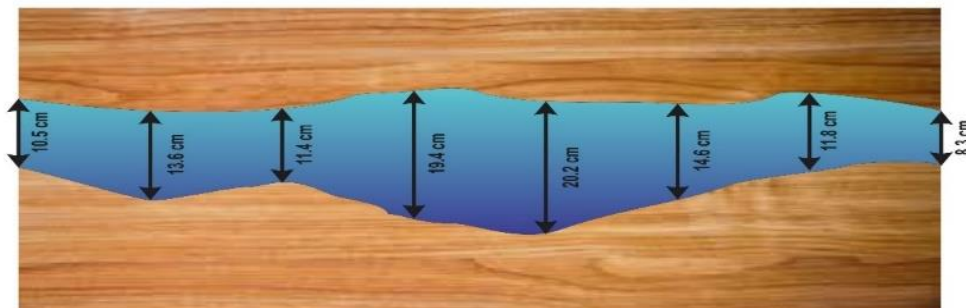
- c. For tables with wood and live edges it is sometimes difficult to calculate the exact amount of resin required because of the irregular shape of the wood.

To do this see the example illustrated below:

Length x Average Breadth x Height

Average breadth is the sum of the measurement divided by number of stations

$$\text{e.g. } 10,5\text{cm} + 13,6\text{cm} + 11,4\text{cm} + 19,4\text{cm} + 20,2\text{cm} + 14,6\text{cm} + 11,8\text{cm} + 8,3\text{cm} = 109,8/8 = 13,7\text{cm}$$





5. COLOUR CONSISTENCY

In order to ensure even colour throughout the resin in a multiple pour, first calculate the total volume of Epoxy needed for the entire job, then work out how much resin and hardener is required and mix the colour into the resin portion only. Then draw off the required amount of pre-coloured resin and add the hardener for each pour.

6. CASTING BOX

Build your casting box from Melamine chipboard. Glue all joints with a liberal bead of White Wood Glue in all joints and screw the box together. Then wipe off the excess glue with a damp cloth and let dry. Optional additional safety, glue the outside of the joints with a Hot Melt glue gun.

7. RELEASE AGENT

Use Ram wax as your release agent. Apply a coat all over the box and edges, let dry for 20minutes then buff off with a soft cloth.

8. WOOD WILL FLOAT

Wood will float in the resin so it must be clamped or screwed down to prevent this.

9. COLD WEATHER

It is advisable to heat your resin and hardener to at least 28°C before mixing and casting. To do this, place your resin and hardener bottles in a bucket of hot water. Shake the bottles to mix the resin before measuring the temperature. Use an Infrared thermometer, available from AMT composites.

10. SURFACE TENSION ISSUES

Casting thin layers (<5mm) of epoxy over wood, can lead to surface tension issues, where the resin cures with dimples on the surface. We recommend a minimum of 5mm or more to try and alleviate the surface tension.

11. BUBBLES IN THE CASTING

There will always be bubbles present in the resin after mixing. These will rise to the surface after a while and they can be popped with the aid of a gas flames. Mini Gas touches are available at AMT Composites.

Some woods are very porous, and air will continue to escape from tiny holes when under the resin. In order to avoid this happening, it is advisable to first seal the wood with a coating or two of resin. Place the wood in the sun and paint on a layer of Woodcast30 and let dry. The sun will help heat the surface, open the pours and thin the resin so it penetrates the wood.

12. GAS FLAME VS HEAT GUN

A gas flame is the preferred method to pop surface bubbles. A heat gun can be used, but it does create waves, which can distort the surface.

13. ADDING PIGMENT AND METALLIC POWDERS

When adding pigments, be very careful not to add too much as they are very strong. For small batches, use a toothpick to add small amounts of pigment and stir them well into the epoxy.

There are many different glitters and pearl essence powders that can be used in these Epoxy resins, it is impossible to go through them all and a subject all of its own. It is advisable to do some tests of your own to get the affects you desire.



SANDING AND POLISHING RECOMMENDATIONS

There is a reasonable amount of work required therefore we have developed a **sanding and polishing process** that gives good results:

1. PLANING OR ROUTING WOOD/EPOXY TO ACHIEVE A FLAT SURFACE

(This step is not always required as the casting may already be very flat and smooth)

WHAT TO TAKE OFF THE TOP?

- We advise a minimal cut of 1mm or less. Be careful; if you cut too thick, the epoxy will grab the planing knives and throw the piece. A thicker cut can also generate excessive heat that will affect the surface finish, or
- With a router sled remove 1mm or less per pass.

2. DRUM SANDING

Drum sanding can even out the top or both sides of the piece, depending on the machine. Feeds should be medium with grits of less than 120. Finer grit paper of 220 or higher should be used at slower speeds. Sanded depth will vary, but 0.5 to 1mm per pass should be the maximum. Be careful to make sure sandpaper is clean and free of material as the epoxy can leave a residue on the paper and gouge the material on the next pass.

3. RANDOM ORBIT SANDING

- Use a step-up dry sanding method beginning at 80 open grit and proceeding in finer open grit paper increments: 80, 120, 180, 240, 320, 400, 600, 800, 1000, 1200 and 1500.
- Wet sand using foam backed sanding pads at medium speed at 2000 grit. Clean all residue between sanding steps.
- Wet sand at low rpm using 4000 grit foam backed sanding pads, making sure surface is always wet.

Material should be clear and slightly hazed. Do not overwork or overheat.

4. POLISHING

Use a variable speed **Rotary** polisher. (IMPORTANT)

We recommend *Mirka Polarshine 10 - P1500 compound* with a Lamb's Wool polishing Bonnet at low speed so as not to heat the surface, taking time to polish and keep pad lubricated with *Mirka* compound.

- Using a lamb's wool polishing bonnet, buff at 2000 rpm until surface imperfections disappear.
If you don't have a lamb's wool polishing system, high quality foam polishes pads can also be used with a Random Orbital polisher. They are formulated to be used at specific speeds.
- Using a 2000 grit foam polishing pad, buff at 1800 rpm and
- Using a 3000-grit foam polishing pad, buff at 1600 rpm.

5. FINISHING

Hand buff surface with a clean cotton terry towel or clean microfiber cloth to a brilliant finish.

Important:

Follow safety precautions on the technical bulletin when mixing and pouring KRISTAL Epoxy Resins. When machining, sanding or polishing fully cured epoxy, wear a NIOSH approved respirator, protective eyewear and clothing to minimize skin contact. Results may vary depending on how closely directions are followed, quality of equipment and aptitude/experience of artisan. In all cases, AMT Composites is not responsible for the outcome due to the above variables. If results are in question, we recommend testing on a small test epoxy casting before scaling up to a large project.

6. NOURISHING/COATING OILS

Incredible Enduring Oil is an excellent wood finishing oil, which can be used over the wood as well as the epoxy to get a beautiful sheen finish associated with a sanded finish.

We have had excellent results finishing the epoxy and wood surface to P600 with *Abranet* sanding discs on a Random Orbital Sander and then coating with *Incredible enduring oil* on both the wood and epoxy surface.