

General Art Epoxy Resin

1. Overview

Manufactured in South Africa.

Manufacturer's Brand Name: ArtPoxy and Art Resin (both names are used)

Clear, UV Stabilised (slow to yellow compared to non-stabilised resins).

This resin has a higher viscosity (lower flow) than our other resin. The lower flow can be useful when pigments must not settle and in some applications of resin art. This can, however, lead to air bubbles being trapped and visible in clear casting, especially in cool weather.

Cast in layers of 1mm to 10mm thick with maximum 500g per cast.

Not approved for food contact and not suitable for heat contact or exposure above 80°C.

Mixing ratio is 100 Resin : 50 Hardener by weight. This can also be stated as 2 to 1.

2. Safety and Health

Many suppliers state that their Epoxy Resins are zero VOV and not harmful. The fact is that all Epoxy resins can be harmful so take note of the following:

- Epoxy Resins are an irritant to skin, eyes and mucous membranes.
- Avoid breathing fumes. The most significant risk of harmful fumes is if the resin overheats during curing. As a minimum, use epoxy resins in a well-ventilated work area. The use of a respirator is strongly recommended for larger projects and regular users.
- Avoid eye contact. Wear protective eyeglasses.
- Avoid skin contact. Wear rubber gloves and long sleeve shirt. Over time, skin contact can cause sensitisation (this basically means one can become allergic to the chemicals).
- Do not clean resin off your skin with solvents. This can accelerate penetration of harmful substances through your skin. Use soap and water to clean skin.
- Do not swallow. Keep out of reach of children.
- The harder (Part B) is corrosive and may cause severe eye damage and skin burns. It is a sensitizer that may cause dermatitis from skin contact and exposure to fumes.
- If sanding or machining cured resin, then wear a dust mask to prevent dust inhalation.
- First Aid:
 - In the event of eye contact, wash eyes under running water for 15 minutes and get medical attention.
 - In the event of skin contact, wipe clean with white vinegar then wash with soap and water. Get medical attention if irritation develops.
 - If fumes are inhaled or if breathing becomes difficult, move to fresh air. Get medical attention if symptoms develop or persists.
 - If swallowed do not induce vomiting. Drink 1-2 glasses of water and seek medical attention.

3. Key Parameters

- Used in layers between 1-10mm thick with maximum 500g per cast.
- Should be used in environments between 18-27°C. Reduce maximum layer thickness to 5mm if ambient temperature is higher to prevent overheating.
- Pot Life*: 15-20 minutes (for 500g batch) at 25°C.
- Cure Time: Expect a cure time of 24 hours before removing resin from a mould. Cure time of thin layers and curing in cold weather will take longer.
- This resin has a higher viscosity than casting resins. Trapped air bubbles can be a problem, especially at lower temperatures and it is thus not recommended for clear castings.
- Subsequent layers can be applied after the resin is hard and cooled to room temperature.
- Use a propane torch to pop any air bubbles after pouring the resin.
- UV Stabilised (slow to yellow compared to non-stabilised resins).
- The cured resin is suitable for temperatures up to 80°C.
- The cured resin is glossy, strong and hard (Shore D Hardness: 80).

*Pot Life

Larger volumes and containers with lower surface area reduce the pot life. The pot life will be reduced in hot weather. You can extend the pot life by pouring the mixed resin into flat trays. If you leave the resin too long it will start to thicken and air entrainment and heat generation will become a problem. Never leave mixed resin unattended as it can start to generate excess heat, give off toxic fumes and even become a fire danger. If this starts to occur, then move the resin to a safe place outdoors and don't try to use it. Don't mix more than you can use in a relatively short space of time.

4. Maximum casting thickness and dangers of heat

The curing chemical reaction between epoxy resin and hardener generates a significant amount of heat (exothermic chemical reaction). When this heat cannot escape it increases the temperature causing the epoxy to cure faster and generate even more heat. The higher temperature increases differential shrinkage in the casting which may lead to induced stress and cracking. A potentially massive build-up of heat can cause the epoxy to crack and discolour.

Uncontrolled exotherm may cause the epoxy to foam, smoke, give off dangerous vapours, crack and generate enough heat to melt its container or cause nearby items to catch fire.

- Never exceed the recommended maximum thickness or volume of a resin system as this may lead to overheating. Use mixed resin before it starts to thicken or increase in temperature.
- The maximum thickness applies to resin used at ambient room temperature of 23°C with relative humidity below 85%. Warmer temperatures will reduce pot life and may also influence the safe casting thickness. If temperatures are warmer than 27°C, reduce maximum casting thickness by 50% or as appropriately required to avoid excessive exothermic reactions.
- If you pour resin into a closed mould then the heat build-up will be greater than when using a flat open mould with a large surface area for the resin to lose heat. Reduce film thickness when using relatively closed moulds.

There is no limit to the number of layers that you can cast on top of each other (see Point 14).

5. Typical Applications

- Small batch castings from 1-10mm deep with a maximum of 500g of resin per casting.
- Not recommended for clear castings due to possible air bubbles but very useful in castings where pigments should not settle.
- Art applications e.g. thin layer resin art on flat surfaces such as tiles, glass, wood etc.
- Resin encapsulation of objects
- Crack filling, epoxy repair and bonding together materials. Please note that Epoxy cannot bond together plastic, plastic is resistant to epoxy.

6. Protecting surfaces

- Large flat surfaces: Apply 3-4 coats of RAMWAX® or equivalent onto surfaces that you don't want the resin to adhere to. Apply wax, allow 15 minutes for solvents to evaporate, polish to a high gloss and then apply next coat of wax and do the same. Use a lint-free cloth (Important!).
- Small complex surfaces e.g. silicone moulds: Apply our "Liquid Wax Release Agent" for Moulds as per instructions. Note that new moulds made with high quality silicone do not require the use of a release agent.

7. Equipment Required

- Plastic or metal mixing container with smooth continuous sides for scraping. (Do not use foam or glass containers.)
- Scale. This resin must be measured by weight, not by volume.
- Stirring stick with square edge and straight sides that reach to the bottom of all containers.
- Isopropyl alcohol (rubbing alcohol) for cleaning up. Remember that the alcohol is flammable.
- Ensure that all containers and tools are free from dust, grease and other contaminants.

8. Surface Preparation

- Ensure all surfaces are completely dry and free of dust, oils and contaminants.
- Non-porous surfaces such as tiles and glass do not need priming or sealing.
- Porous surfaces (such as wood and cement) should be sealed to prevent air bubbles being released from the surface when resin is applied. Apply a thin initial layer of this resin with a foam roller to seal porous surfaces.
- Never apply the resin over an oil-based paint or varnish.
- Apply wax to all surfaces that you require the cured resin to release from.

9. Mixing

Proper mixing is a key requirement for a successful resin project. Poor mixing will lead to defects which may often be cloudy streaks or patches in the cured resin. These defects cannot be removed.

Measure the components of this resin systems by weight, not by volume.

- The ratio **by weight** of Resin and Hardener is **100 Resin : 50 Hardener (2:1 ratio)**
 - e.g. 50g Resin (Part A) with 25g Hardener (Part B).
- Accurately measure out Resin into the mixing container then measure out the Hardener.
- Stir together well for 4-5 minutes using a square edge stir stick. Include scraping of the sides and bottom of the mixing container several times. Do not mix in a manner that introduces air.
- The resin is now ready for pouring and it must be poured before it starts to get thick or hot.

If the mix quantity is large it may start to thicken and/or generate heat prior to pouring. This indicates that curing is underway. The heat generated can reach dangerous levels. You can extend the pot life by pouring the mixed resin it into large flat trays where heat can more readily escape.

10. Adding liquid colourants or powder pigments

Bastion Paint Allure Liquid Colourants, Pearlescent Pigments and Glitter Powders stir in very easily. These can be added at any time. Some other pigment types do not mix in as easily and these should be mixed as follows: Put pigment into mixing container first then add Resin (Part A) to the pigment and mix. After that add Hardener (Part B) and stir. This way, the pot life is not reduced while mixing the pigment. Limit pigment / colourant to 6% of the total resin mass. Only use more if you have tested it.

11. Including rocks, stones and crystals

Wash these and dry them thoroughly. Porous items should be oven dried at 100°C for an hour and cooled before use. For larger items it is a good idea to dip them into mixed liquid resin to pre-coat them prior to pouring the liquid resin over them (this is because poured resin may not get underneath them).

12. Removing air with a propane torch

Torching with a propane torch to remove air shortly after pouring is important if air bubbles are present. Do not hold the torch closer than 8cm from the resin surface as too much torching will burn and discolour the resin.

13. Prevent dust contact during curing

Dust and air-born debris are an enemy of all curing resins. Pour and allow to cure in a clean area. We recommend covering your pour with something like a sheet draped over a frame. Do not cover with something that traps fumes or heat.

14. Adding subsequent layers

There is no limit to the number of layers that can be added. The bond between layers will be permanent and invisible. Allow resin to get hard and return to room temperature before adding a new layer. If a subsequent layer is added too soon it may overheat and crack.

If too much time passes before adding a subsequent layer (more than 48 hours) then the layers may delaminate. If more than 48 hours has passed then wash with soapy water, sand and wash again before applying the next layer.

- If amine blush develops you must wait until the resin is hard and then wash with soap and water, sand and wash again. Then allow for proper drying before applying a subsequent layer. Failure to do this will ruin your project. Amine blush can be identified as the surface being cured (hard and resisting fingernail indentation) but feeling tacky. A milky or "oil on water" appearance also indicate that amine blush is present.

- After any washing, always make sure that the resin has fully dried before pouring a subsequent layer.

15. Storage

Store in cool area. 23°C is the best storage temperature. Both resin components have a best before date.

16. Cleaning spills

The best chemical to clean small spills effectively is isopropyl alcohol. Rubbing alcohol and some hand sanitisers are fine. Clean spills as soon as possible before curing. Don't clean resin off your hands with these types of solvents; use soap or hand cleaner and water to clean skin.

17. Useful Parameters

Mix Ratio By Weight	100A : 50B
Viscosity of Final Mixed Resin	Higher than casting resins
Specific Gravity – Mixed (ASTM D1475)	1.1 g/cm ³
Pot Life of 500g mass at 25°C	15 to 20 minutes
Normal Tack Free Time at 5mm depth @ 25°C	8 hours
Cure Time until hard feel (5mm thickness)	18 to 24 hours
Cure time until 95% of total cure (5mm thickness)	3-5 days
Cure time until 100% of total cure (full hardness)	30 days
Shore D Hardness after 7 days @ 23°C	80
Maximum casting thickness at 23°C	10mm (maximum 500g)

18. How to calculate the amount required

You must use a scale and resin mass. You cannot measure this resin by volume.

For a roughly rectangular shape multiply as follows:

$$\text{Resin required in kg} = \text{Surface length in m} \times \text{Surface width in m} \times \text{required resin thickness in mm} \times 1.1$$

For a roughly circular shape multiply as follows:

$$\text{Resin required in kg} = 3.14 \times \text{Circle radius in m} \times \text{Circle radius in m} \times \text{resin thickness in mm} \times 1.1$$

Example

If your rectangular mould is 27cm x 12cm and is 5.0mm deep on average.

$$\begin{aligned} \text{Resin required in kg} &= 0.27\text{m} \times 0.12\text{m} \times 5.0\text{mm} \times 1.1 \\ &= 0.178\text{kg of resin (or 178g of resin)} \end{aligned}$$

Now work out how much of Part A and how much of Part B you need to give you the total requirement of 178g.

Ratio for this resin is 100A to 50B (add these together to get 150 used in formula below)

To get 178g total resin:

$$\text{Grams Part A required} = 100/150 \times 178\text{g} = 118.67\text{g}$$

$$\text{Grams Part B required} = 50/150 \times 178\text{g} = 59.33\text{g}$$