

GlassCast[®] 50 PLUS

Clear Epoxy Casting Resin



Key Features

- Up to 50mm (per layer) into wood
- High Transparency
- Highly UV resistant
- Self degassing

Recommended Uses

- Furniture
Deep river tables, large encapsulations
- Wood and resin projects
Lamps, solid castings for turning
- Clear castings
Sculptures and larger ornamental castings

Description

GlassCast 50 PLUS is designed for deep section castings of 50mm, with a slow cure to allow deep single pours with a slower, longer curing time. This resin is ideal for projects like large resin river tables, large dried flower encapsulation, and thick castings for projects like paperweights and lamp bases. The recommended pour thickness for GlassCast 50 PLUS is 50mm and it can be layered to achieve a greater depth.

Technical Specification

Uncured System Properties

	Units	Resin	Hardener	Combined
Material	-	Epoxy Resin	Formulated Amine	Epoxy
Appearance	-	Clear with light blue tint	Clear	Clear
Viscosity @25°C	mPa.s	~500	~100	~300

Cured Mechanical Properties

	Units	Resin
Hardness 25°C	Shore D1	D80
Elongation at Maximum Strength	%	4.5
Flexural Modulus	MPa	2100
Tg Room Temperature cure	°C	39
Tg after 16h at 50°C	°C	47

Before You Begin...

Important: Risk of Resin Overheating/Exotherm

In common with all epoxies, GlassCast generates heat during its cure and can easily overheat if not used correctly. Before use, it is essential for users to read and follow information on 'Avoiding Overheating/Exotherm' in this datasheet.

It is important for users to familiarise themselves with the following information and ensure that instructions are followed correctly, particularly those points relating to working temperatures, weighing and mixing.

Unsatisfactory results are almost always caused by unsuitable ambient temperatures or improper weighing or mixing. It is very important to read the Safety and Technical Datasheets before starting a project with GlassCast.

Avoiding Overheating/Exotherm

The GlassCast range of resins, in common with all epoxies, generate heat as part of the curing process. In order to ensure that the resin does not overheat during curing it is essential that you stay within the strict limits of ambient temperature, time-in-pot and pour depth. As well as avoiding external heat sources from direct sunlight, nearby radiators or excessive use of heat guns/hair dryers. Failure to work within the stated parameters can result in damage to the resin, other materials and the surrounding area.

The recommended working temperature for GlassCast is 20°C. When working in higher ambient temperatures, pay attention to the reduced pot-life and maximum pour depth. For warmer conditions and thicker pours, a fan positioned to blow air over the surface will help to shed any excess heat and reduce the chance of the resin overheating.

Ambient Temperature	17°C (minimum)	20°C (recommended)	23°C (maximum)
Maximum Time in Pot (Pot Life)	4hrs	2hrs	1hr
Maximum Pour Depth Into a thin-walled mould (silicone/plastic)	100mm	80mm	75mm
Maximum Pour Depth Into wood or an insulating mould	70mm	50mm	35mm
Initial Cure	9 days	7 days	5 days

For volumes above 4kg and a thickness greater than 40mm, it is recommend to decrease the exothermic temperature by using a fan to blow air over the surface for the resin.

Ambient Temperature

Epoxy resins are highly sensitive to ambient temperature (room temperature) throughout their cure. For best results, we recommend working in a consistent room temperature of 20°C. GlassCast 50 PLUS can be used in temperatures from 17 to 23°C but higher temperatures will reduce the pot-life and the maximum pour-depth of the resin significantly. Never work in ambient temperatures exceeding 23°C, or exceed the maximum pour depth for a given ambient temperature (as shown in the table above) otherwise the resin could dangerously overheat, especially on larger pours.

Pot Life

As soon as the resin and hardener are mixed together, the curing reaction begins. Due to the volume of resin all in one place, mixed resin in the pot will begin to gradually warm up. The amount of time that mixed resin can stay in the mixing pot before it overheats is known as its pot-life. Once you've mixed your resin, make sure you use it within the pot-life stated for your ambient temperature (see table above).

Localised Heat Sources

Whilst close attention should be paid to the ambient (room) temperature, it is also important to avoid any localised heat sources which can also cause an exotherm. Examples of localised heat sources include:

- A hot radiator at one end of a cooler room – If the resin project is positioned above or near the radiator it could start to exotherm, even though the room temperature is within the recommended limits.
- Direct sunlight from a window – Sun shining through a window onto your resin project or surrounding area can cause significant hot-spots which can cause the resin to exotherm, even in a relatively cool room.
- Heat-guns or hair dryers – If using a heat-gun or hair-dryer as part of your resin project, do so sparingly to avoid warming up the resin significantly. Excessive use of a heat-gun or hair dryer can easily accelerate the cure and cause the resin to exotherm.

Mixing Method

To avoid unnecessary aeration of the resin, we strongly recommend mixing by hand and not using a paddle mixer/shear mixer drill attachment. Please see the section titled 'How to Measure and Mix' for further information.

Humidity

Whilst GlassCast is curing it can absorb moisture from the air. In higher humidity environments this moisture absorption can affect the surface finish for best results, avoid pouring GlassCast in humid environments (relative humidity of 70% or more). This becomes particularly important in lower ambient temperatures where a slower cure leaves the uncured resin exposed to humid area for longer.

Surface Preparation

To ensure the resin can make a good bond with the surface, it should be thoroughly cleaned of all contaminants and keyed to provide a texture which the resin can 'grip' too.

Substrate Moisture

In much the same way that GlassCast resin can be adversely affected by moisture in the air, it will also be affected by any moisture in the surface of which it is poured. Whatever surface you are pouring onto, it is important to ensure that the surface is as dry and stable as possible. This is particularly relevant when working with natural materials like wood, cork or concrete where moisture levels within the substrate can be high.

When working with wood that is either freshly sawn or reclaimed/salvaged from a damp environment it will be necessary to dry the wood thoroughly before us. This could take weeks, months or even years depending on drying conditions. Failure to ensure that the wood is properly seasoned and stabilised can result in a surface reaction with the resin, as well as 'bowing' or distortion if the wood starts to dry after the resin layer has been cast.

Sealing Coat - Required for all porous surfaces

When working with porous substrates such as wood, chipboard, concrete or ceramics it is highly recommended to first seal the substrate with a thin application of GlassCast. Doing so will seal and stabilise the surface, greatly improving the flatness of the final pour. The sealing coat must be allowed to fully cure and then 'keyed' before proceeding. The sealing coat can be applied with a disposable brush. Given the very long cure time of GlassCast 50 PLUS it may be preferential to use one of the other faster curing GlassCast resins such as GlassCast 3 for this step.

Embedments

Just as with the surface preparation, it is important to ensure that any materials that are going to be embedded within the resin, such as pennies, crushed glass, bottle tops, flowers, leaves etc. are thoroughly dry. Any embedments may also need to be glued/fastened down to stop them floating in the resin once it is poured.

Curing Time

Depending on the ambient temperature, GlassCast 50 PLUS will take around 5-7 days to become touch-dry. During this period it is essential to keep all dust and dirt away from the uncured pour.

Once the surface is 'touch-dry' it is much less susceptible to contamination from dust but it will still be quite soft and easy to mark and so you should avoid touching or using the surface for as long as possible.

The time it takes for the resin to cure fully will depend very much on the ambient temperature; at 20°C you should allow at least 7 days before demoulding (if casting into a mould) or attempting to do any work on the resin (such as sanding or polishing).

Trapped Air - Heat Gun or Blow Torch Required?

GlassCast 50 PLUS includes advanced technology to help it expel air that has been entrapped by the mixing and pouring process, in many cases the resin will fully release any trapped air to leave a beautiful bubble-free finish. After pouring, it usually takes the resin around 5-10 minutes to expel trapped air depending on the volume of resin.

Factors such as ambient temperature, mixing action, pouring thickness and the substrate you're pouring onto can all influence the appearance of trapped air (bubbles) within the resin. After around 30 mins, if you find that you can still see trapped air bubbles with this resin then lightly passing over the surface of the resin with a heat gun or blow torch on a low setting will help to dispel any bubbles. In both cases only ever use a light pass and wait for any heat in the surface to dissipate before repeating.

Safety Precautions

Work in a well ventilated area.

Whenever weighing, mixing, pouring or checking the state of the cure of the resin, you should be wearing suitable protective gloves and eye protection as a minimum precaution.

Always wear gloves when you are 'testing' to see if the surface has cured. Do not touch or handle the surface without gloves until you are sure that it is fully cured.

Please download the safety datasheet from the GlassCast 50PLUS product page on www.glasscastresin.com and ensure you understand and follow the detailed safety information it contains.

How Much Resin ?

Filling a complex organic shape can make it difficult to calculate exactly how much resin you will need for the project.

There are some practical methods that can be used to actually measure the exact volume of an irregular shaped cavity - such as pouring rice or sand into the gap and then measuring the volume - but in most cases it is probably more a case of estimating the volume of the gap and then allowing a little extra.

Areas that are to be filled with resin (for example the gap between the two live-edge planks on a river table) should be measured approximately in length, width and depth to find the cuboid volume, as follows:

$$\text{Length (in m)} \times \text{Width (in m)} \times \text{Depth (in mm)}$$

The resulting number will be the volume of this shape in litres.

For example:

$$1.5\text{m (Length)} \times 0.15\text{m (width)} \times 30\text{mm (depth)} = 6.75\text{l}$$

In simple terms, 6.75 litres of resin can be approximated as 6.75 kilograms.

We would always suggest slightly overestimating the amount of resin you think you will need as it is likely that the wood will absorb some of the resin, it's always better to have mixed too much rather than too little - especially when colouring the resin to ensure a consistent colour. Any excess resin can be poured into another mould or spread out between multiple mixing cups to reduce the volume.

How to Measure and Mix

What you'll need

- Set of digital scales OR calibrated mixing cups
- x2 clean mixing pots or buckets
- x2 clean mixing sticks
- Nitrile gloves/safety glasses and other PPE as required
- Prepared form to pour resin or pre made mould
- Optional: Heat gun or blow torch

Mix ratio

GlassCast 50 PLUS is a two-part epoxy resin system. As soon as the two parts are mixed together they will begin to cure. It is essential to mix the resin and hardener exactly at the correct mix ratio. Failure to do so will result in a poor or only partial cure of the resin. Under no circumstances add 'extra hardener' in an attempt to speed up the cure time; epoxies do not work in this way.

Mixing by Volume

100:50 (2:1)

The easiest way to measure the correct ratio of resin to hardener is to use 2 parts resin to one part hardener by volume. Put simply, this means exactly 2 cups of resin to 1 cup of hardener.

Calibrated mixing cups can be used to accurately measure the correct amount of resin and hardener. Use calibrated mixing cups to accurately measure the correct amount of resin into one cup and correct amount of hardener into another. Once measured, the two cups can be poured into a larger container to be mixed.

Mix Ratio Examples by Volume

Total	Resin	Hardener
1l	667ml	333ml
1.5l	1l	0.5l
2l	1.33l	0.67l
3l	2l	1l
4l	2.67l	1.33l
5l	3.33l	1.67l
6l	4l	2l
7l	4.67l	2.33l
8l	5.33l	2.67l
9l	6l	3l
10l	6.67l	3.33l

Mixing by Weight

100:45

If you prefer to measure out the resin by weight (instead of volume) then the mix ratio that must be used is 100 parts resin to 45 parts hardener.

Use digital scales to accurately weigh the correct amount of resin into a cup, re-zero the scales and then weigh in the correct amount of hardener. Try to be as accurate to within 1 -2 grams, particularly on smaller mixes. The table below can be used to look up some common mix sizes.

Mix Ratio Examples by Weight

Total	Resin	Hardener
1kg	0.69kg	0.31kg
2kg	1.38kg	0.62kg
3kg	2.07kg	0.93kg
4kg	2.76kg	1.24kg
5kg	3.45kg	1.55kg
6kg	4.14kg	1.86kg
7kg	4.83kg	2.17kg
8kg	5.52kg	2.48kg
9kg	6.21kg	2.79kg
10kg	6.90kg	3.10kg

Mixing Instructions

To avoid mixing excess air into the resin, we strongly recommend mixing by hand and not using a sheer mixer or power mixer drill attachment.

Weigh or measure the exact ratio of resin and hardener into a straight sided container. Using a suitable mixing stick begin to mix the resin and hardener together to combine them completely. Spend around 3 minutes mixing the resin and hardener together, paying particular attention to the sides and base of the container. Remember: Any resin that has not been thoroughly combined with hardener will not cure. Mix in such a way as to combine the resin and the hardener thoroughly without 'whipping' or introducing unnecessary amounts of air into the mix.

Once you have finished mixing in one container, it is good practice to transfer the mixed resin into a second, clean mixing container and undertake further mixing for another 3 minutes using a new mixing stick. Doing so will eliminate the risk of accidentally using unmixed resin from the bottom or sides of the original container.

Power Mixers / Sheer Mixer Drill Attachments

As mentioned above, we do not recommend the use of sheer mixers or power mixers with GlassCast resins.

Use of a power mixer - especially if the mixing head is not kept fully submerged in the resin - can result in quite extreme amounts of air entrapment which will be too much for the resin to self-expel, especially on deeper pours. If you do use a power mixer, the resin should be degassed in a degassing chamber before use.

Advanced Techniques

Multiple Pours

The maximum castable thickness for GlassCast 50 PLUS (into wood) is 50mm. It's absolutely fine to use GlassCast 50 PLUS to create castings thicker than 50mm but to do this they should be made up in multiple layers with the resin allowed to at least partially cure between each layer.

Pouring onto Partially Cured (B-stage) Resin

The easiest way to build up the resin in multiple-pours is to allow the preceding layer to cure to what is known as the 'B-stage'. The B-stage is the point at which the resin has firmed up, so that it is no longer a liquid, but it has not fully cured.

When the resin is correctly at the B-stage, using a gloved finger you should be able to press a fingernail into it but no resin should come off on your glove. The advantage to pouring new resin onto partially cured (B-stage) resin is that no surface preparation is required and the new resin will bond chemically with the previous layer (known as crosslinking).

Pouring onto Fully Cured Resin

If the first layer cures past the 'B-stage' (see above) then you can still pour a new layer on top of it however it then becomes essential to allow the previous layer to cure fully and then key the surface using an abrasive paper in order to allow the new resin to mechanically bond to the previous layer.

To pour a new layer onto fully cured resin use a coarse abrasive paper (80 to 120 grit) to fully abrade the whole surface of the cured resin. Don't worry about the scratched appearance; as soon as the new liquid resin is added it will blend transparently with the layer underneath. Ensure the surface is thoroughly cleaned before the next pour.

Pigments and Tints

GlassCast 50 PLUS can be pigmented with our range of GlassCast and epoxy compatible pigments including the, CULR Universal pigments and SHIMR™ Metallic Powder Pigments.

These ranges have all been tested and are fully compatible with the GlassCast Resin range.

To achieve a subtle 'tint' a very small amount of pigment can be used, remember that you will need proportionally more pigment for thin sections that you will for thicker sections.

If using other products always conduct a small test first to ensure compatibility with your chosen, pigment or powder.

Transport and Storage

GlassCast 50 PLUS should be stored in its original container and out of direct sunlight. It is recommended that the storage temperature should be less than 15°C where possible and not exceed 25°C.

KEEP THE PACKING TIGHTLY SEALED WHEN NOT IN USE. When stored correctly, GlassCast50 PLUS will have a shelf-life of 12 months.

Crystallisation

Stored in cold conditions or left for long periods of time, GlassCast resins can be prone to crystallisation. Crystallisation can appear as cloudiness or flakes/crystals within the resin, in some cases the resin can completely harden into a solid lump. This is a natural process and one that can simply be reversed by warming the resin (to around 40-50°C) in its container. The easiest way to do this is by placing the resin in a sink or bowl of hot water with the lid securely in place.

A video demonstrating this process can be found at the following link:

www.glasscastresin.com/reversing-resin-crystallisation



If warming the resin to reverse crystallisation, it is very important to allow the resin to cool to room temperature before use, failure to do so can trigger an exothermic reaction!

The Full GlassCast Range

- GlassCast 3 - Coating and thin casting up to 3mm per layer
- GlassCast 10 - Thin to medium casting up to 10mm per layer
- GlassCast 50 - Medium to deep casting, typically 25mm per layer
- GlassCast 50 PLUS - Deep casting, typically up to 50 mm per layer

Disclaimer

This data is not to be used for specifications. Values listed are for typical properties and should not be considered minimum or maximum. Our technical advice, whether verbal or in writing, is given in good faith but GlassCast® Resin part of Easy Composites Ltd gives no warranty; express or implied and all products are sold upon condition that purchasers will make their own tests to determine the quality and suitability of the product for their particular application and circumstances.

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