GlassCast®
THE CLEAR CHOICE IN RESIN

TECHNICAL DATASHEET

GLASSCAST®50(v2)

CLEAR EPOXY CASTING RESIN

Key Features

- Up to 25mm (per layer)
- Exceptional clarity
- Highly UV Resistant
- Self Degassing
- Hard wearing and highly polishable!

Recommended Uses

- **Furniture**
  River Tables, Knot Holes, Crack Filling
- **Wood and Resin Projects**
  Lamps, Solid castings for turning
- **Clear Castings**
  Sculptures, Figurines, Paperweights
- **Encapsulations**
  Dried Flowers, Stones, Models

Product Description

GlassCast 50 is a crystal clear, two-part epoxy resin designed deep section castings for projects such as wood-turning blanks, furniture like resin river tables and large castings. The recommended pour thickness for GlassCast 50 is up to 50mm deep for pours less than 1kg in thin walled moulds or 25mm for pours above 1kg.

GlassCast 50 can be left clear or pigmented with a wide range of pigments and metallic effects and is our recommended resin for furniture, figurines, encapsulations, large scale blanks for turning and more. It can be layered for greater depth castings.

Technical Specification

Uncured System Properties

	Units	Resin	Hardener	Combined
Material	-	Epoxy Resin	Formulated Amine	Epoxy
Appearance	-	Clear	Pale Yellow	Clear
Viscosity @25°C	mPa.s	800-900	65-85	470
Density @25°C	g/cm^3	1.17	0.99	1.11

Cured Mechanical Properties

Following 7days at room temp.

	Units	Resin
Hardness 25°C	Shore D	74-82
Maximum Tg	°C	45
Maximum Use Temperature	°C	40
Tensile Strength	MPa	52.9
Tensile Modulus	GPa	3.0
Tensile Elongation	%	7.0
Flexural Strength	MPa	91.0
Flexural Modulus	GPa	3.0
Flexural Strain	%	11.2

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 to 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 thicker pours of 25mm and upwards, we recommend positioning a fan to blow air over the surface of the resin. This moving air will help to take away any excess heat and reduce the chance of the resin overheating.

Ambient Temperature	15°C (minimum)	20°C (recommended)	25°C (maximum)
Maximum Pour Depth Into a thin-walled mould <1kg	50mm	40mm	30mm
Maximum Pour Depth Into wood or an insulating mould >1kg	25mm	25mm	18mm
Initial Cure	96hrs	72hrs	48hrs

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 18-20°C. GlassCast 50 can be used in temperatures from 15 to 25°C but higher temperatures will reduce the pot-life and the maximum pour-depth of the resin significantly. Never work in ambient temperatures exceeding 25°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 reaches a point where there is a risk of overheating

The greater the quantity of resin the shorter the pot life will be, the table below gives approximate timings for pot life based on 20°C ambient conditions.

Pot life vs Batch Size

Batch Size	500g	1kg	2kg	3kg	4kg	5kg
Pot Life (minutes)	60	45	25	15	10	5

When working with larger quantities of resin which require multiple buckets/pots to be mixed, it is imperative that the resin does not spend excess time in the bucket. Doing so in larger volumes will drastically reduce working time. Rather than mixing multiple buckets of resin and pouring several at once, the resin should be mixed and then poured immediately. Then the resin and hardener for the next batch can be combined and poured into the mould. This process is repeated until the desired thickness (max 25mm) is achieved.

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.

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

When casting the resin into another object, 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.

If casting into a mould or onto a mould face, appropriate release agent may be required to ensure that the cured resin will come away cleanly and not stick.

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. It is important to ensure that the surface the resin will be applied to 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 use. 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 long cure time of GlassCast 50 it may be preferential to use one of the other faster curing GlassCast resins such as GlassCast 3 for this step. If not available, you can still use GlassCast 50 for this step, it will just take longer to reach the appropriate level of cure.

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 will take around 48hrs 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. Care should be taken to 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 allow at least 72hrs 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 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 the resin is being applied to can all influence the appearance of trapped air (bubbles) within the resin. After around 10 mins, if there is still trapped air bubbles within the 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, wearing suitable protective gloves and eye protection as a minimum precaution is recommended.

Always wear gloves when '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 50 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 is required 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, with and depth to find the cuboid volume, as follows:

Length (in m) x Width (in m) x Depth (in mm)

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

For example:

1.5m (Length) x 0.15m (width) x 30mm (depth) = 6.75l

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 as it is likely that some will be absorbed in to the wood, 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 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
50ml	33ml	17ml
100ml	67ml	33ml
150ml	100ml	50ml
200ml	133ml	67ml
300ml	200ml	100ml
400ml	267ml	133ml
500ml	333ml	167ml
600ml	400ml	200ml
700ml	467ml	233ml
800ml	533ml	267ml
900ml	600ml	300ml

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

100:43

If it's prefered to measure out the resin by weight (instead of volume) then the mix ratio that must be used is 100 parts resin to 43 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
50g	35g	15g
100g	70g	30g
200g	140g	60g
300g	210g	90g
400g	280g	120g
500g	350g	150g
600g	420g	180g
700g	490g	210g
800g	559g	241g
900g	629g	271g

Mix Ratio Examples by Weight		
Total	Resin	Hardener
1kg	0.70kg	0.30kg
2kg	1.40kg	0.60kg
3kg	2.10kg	0.90kg
4kg	2.80kg	1.20kg
5kg	3.50kg	1.50kg
6kg	4.20kg	1.80kg
7kg	4.90kg	2.10kg
8kg	5.59kg	2.41kg
9kg	6.29kg	2.71kg
10kg	6.99kg	3.01kg

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 a power mixer is used, the resin should be degassed in a degassing chamber before use.

Advanced Techniques

Multiple Pours

The maximum castable thickness for quantities of GlassCast 50 greater than 1kg is 25mm. GlassCast 50 can be used to create castings thicker than 25mm but this should be made up in multiple layers with the resin allowed to 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. It is however 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 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 proportionally more pigment will be needed for thin sections than required will for thicker sections.

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

Post Cure

Cured at room temperature for around 7 days the resin will achieve a Tg of around 45°C. This can be increased by means of an extended heat cycle known as a post cure, this will allow the resin to fully cure and achieve its full mechanical and temperature resistant properties.

The post cure cycle is as follows:

- Room temperature cure 24hrs followed by 16 hrs at 60°C.

Project Examples

You can find example projects, tutorials and handbooks on our website, some examples include.

- River Table
- Flower Casting
- Resin table with wooden infill (less resin river table)

Transport and Storage

GlassCast 50 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, GlassCast 50 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 it's 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 payer
- 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 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. Easy Composites Ltd shall be in no way responsible for the proper use and service of the product, nor for the safeguarding of personnel or property, all of which is the duty of the user. Any information or suggestions are without warranty of any kind and purchasers are solely responsible for any loss arising from the use of such information or suggestions. No information or suggestions given by us shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. Before using any of our products, users should familiarise themselves with the relevant technical and safety datasheets provided by Easy Composites Ltd.
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