

## Clear Epoxy Casting Resin



### 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 the information on 'Avoiding Overheating / Exotherm' in this datasheet [in the product's technical datasheet]. Failure to do so could result in damaged resin, or in extreme cases, resin smoking or igniting.

## Product Description

GlassCast® 10 is a water-clear UV resistant epoxy casting resin developed for smaller or thinner casting, such as jewellery, 3D resin-art, gaps, knots/wood inlays and more.

GlassCast 10 can be cast up to 10mm in a single pour making it perfect for small scale or shallow castings and can be layered to create depth.

GlassCast 10 has been formulated for maximum compatibility with a wide range of substrates and mould materials and is particularly suited for casting into and alongside wood, where it can be used to create stunning pieces of wood and resin jewellery such as 'Secret Wood' rings and to cast alongside fur cones and live edge wood to create blanks for pens, bottle tops and knife scales.

When casting with GlassCast 10 it is possible to layer the resin in layers of 10mm to create deeper castings or in a piece of 3D resin artwork it is possible to layer pigmented resin between clear pours to build depth and create 3D effects.

## Casting Vs Coating

GlassCast 10 is a casting resin, not a coating resin. As such flattening and polishing of the cured open surface will usually be required in order to achieve a perfectly smooth gloss finish.

For perfectly flat, glossy coatings our GlassCast 3 Surface Coating Resin should be used instead. For castings in a single pour larger than 10mm we would recommend using GlassCast 50.

## Key Features

- | Cast up to 10mm (per layer)
- | Exceptional clarity
- | Highly UV Resistant
- | Self Degassing
- | Hard wearing and highly polishable!

## Recommended Uses

### Jewellery

Can be used clear or tinted, perfect for wood and resin jewellery

### Blanks for pens, bottles tops and knife scales

For casting clear, and pigmented blanks with embeddings.

### 3D Resin Art

Can be poured in multiple layers to produce a beautiful 3D effect.

### Countertops

Thick counter-tops with embedded objects

### Water Effects for Models/Terrain

To create rivers, oceans, lakes, trenches, waterfalls, puddles.

## How to Use

GlassCast 10 has been designed to be as easy-to-use and reliable as possible. It does not require degassing or any other special equipment and in fact will thoroughly degas itself during curing, resulting in a perfectly clear, bubble-free casting

## 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 mixing and curing, it is essential to make sure you stay within strict limits of ambient temperature, time-in-pot and pour depth, as well as avoiding localised overheating from direct sunlight, nearby radiators or heat guns/hair dryers. Failure to do so could result in damaged resin, or in extreme cases, resin smoking or igniting.

The recommended working temperature for GlassCast is 18-20°C. When working in higher ambient temperatures, pay attention to the reduced pot-life and maximum pour depth, as shown below.

Ambient Temperature	15°C (minimum)	20°C (recommended)	25°C (maximum)
Maximum Time in Pot (Pot-Life)	60mins	45mins	30mins
Maximum Pour Depth	10mm	10mm	6mm
Initial Cure Time	48hrs	36hrs	24hrs

## 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 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.

## Maximum Time in Pot (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). Once you're done, if you have more than the maximum pour depth of leftover resin in the pot, place the pot outside - just in case it starts to overheat.

## Maximum Pour Depth

The thicker the pour, the more the heat builds up as the resin cures and so it is important to stay within the maximum pour depth for the ambient temperature you're working in. Care needs to be taken when pouring into or around insulating materials such as wood or foams as they will retain heat and will reduce the maximum depth that can be safely poured at a given temperature. Never exceed the maximum pour depth listed for the temperature you're working in; doing so will almost certainly result in potentially dangerous overheating of the resin.

## 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 easily 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.

## Before You Begin...

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 10.**

## Ambient Temperature

Like most epoxy resins, the way that GlassCast 10 will cure is very dependent upon the ambient temperature. The system has been designed to work in ambient temperatures between 15°C and 25°C. For best results, an ambient temperature of between 20°C and 25°C is recommended.

The GlassCast 10 resin and hardener also needs to be used and cured at an ambient temperature between 20°C and 25°C to achieve optimum results. If the GlassCast 10 is over 25°C or falls below 20°C it can affect the performance of the resin.

## Humidity

Whilst GlassCast 10 is curing it can absorb moisture from the air. In higher humidity environments this moisture absorption can affect the surface finish and therefore, for best results, avoid pouring GlassCast 10 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 a humid environment for longer.

## Surface Preparation

In much the same way that GlassCast 10 can be adversely affected whilst curing by moisture in the air, it will also be affected by any moisture in the surface onto 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 and 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 - which could take days or weeks indoors - before use. Failure to ensure that the wood is properly dried 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.

## Moisture in Wood

GlassCast 10 has excellent tolerance to modest levels of moisture but can still be adversely affected by higher moisture content in wood and other substrates.

Wood with a high moisture content is also liable to move (shrink) as it dries out which can cause 'bowing' or distortion of the piece if the wood starts to dry after the resin layer has been cast.

Ensure the wood is properly seasoned and dried before use.

## 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 10. 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.

## 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, corks, leaves etc. are thoroughly dry. Any embedments may also require being glued or fastened down to stop them floating in the resin once it is poured.

## Curing Time

Depending on the ambient temperature, GlassCast 10 will take around 24hrs to become touch-dry. During this initial 36hrs 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 36hrs before demoulding (if casting into a mould) or attempting to do any work on the resin (such as sanding or polishing).

GlassCast 10 will take around 7 days to reach full hardness.

## Trapped Air - Heat Gun or Blow Torch Required?

GlassCast 10 includes advanced technology to help it to expel air that has been entrapped by the mixing and pouring process and so 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.

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 10 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 10 product page on [www.glasscastresin.com](http://www.glasscastresin.com) and ensure you understand and follow the detailed safety information it contains.

## How Much Resin?

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.

The very nature of a "live-edge" on a piece on wood or working with embedments makes it difficult to calculate exactly how much resin you will need for a project. Areas that are to be filled with resin (for example the empty void around a piece of wood) should be measured approximately in length, width 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:

### 0.5m (Length) x 0.25m (width) x 10mm (depth) = 1.25l

In simple terms, 1.25 litres of resin can be approximated as 1.25 kilograms of resin.

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 and it's always better to have mixed too much rather than too little - especially when colouring the resin, to ensure a consistent colour for the entire project.

## How to Measure and Mix

Mix Ratio Examples		
Total	Resin	Hardener
50ml	33ml	17ml
100ml	67ml	33ml
150ml	100ml	50ml
200ml	133ml	67ml
300ml	200ml	100g
400ml	267ml	133ml
500ml	333ml	167ml
600ml	400ml	200ml
700ml	467ml	233ml
800ml	533ml	267ml
900ml	600ml	300ml

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

## What You'll Need

- | Set of digital scales OR calibrated mixing cups
- | Two clean mixing cups
- | Two clean mixing sticks
- | Nitrile gloves/safety glasses
- | Material or tape to create barriers like Resin Release Tape / Polypropylene
- | Optional: Heat gun or blow torch

## Mix Ratio

GlassCast 10 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

Mix Ratio Examples		
Total	Resin	Hardener
50g	34g	16g
100g	69g	31g
200g	138g	62g
300g	207g	93g
400g	276g	124g
500g	345g	155g
600g	414g	186g
700g	483g	217g
800g	552g	248g
900g	621g	279g

Mix Ratio Examples		
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

## 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.

## 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 tables below can be used to look up some common mix sizes.

## Mixing Instructions

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 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.

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

## Step by Step Guide

Depending on your requirements (and artistic ideas) there are many different ways in which you can work with GlassCast 10 to achieve some really stunning effects. The following step-by-step guide describes the most standard way to work with GlassCast 10 which is a sealing coat (for porous surfaces) followed by a single main pour. For other ways to work with GlassCast 10, including undertaking multiple pours or working with pigments or embedments, please see the 'Advanced Techniques' section towards the end of this guide.

### Step 1 - Sealing Coat

If the material you are pouring GlassCast 10 onto is not porous, for example plastic, metal, marble or granite then you do not need to seal the surface and you can skip to Step 3.

If the material you will be pouring GlassCast 10 over is porous such as wood, chipboard, MDF or ceramic then it is highly recommended to apply a sealing coat before the main pour.

Doing this will improve the flatness of the final surface and help to eliminate warping of the substrate after the cure. This will also minimise air entrapment.

Mix around 500g of GlassCast 10 per square metre of surface you need to seal. Don't worry if most of the resin seems to be absorbed by the substrate; this is normal for the sealing coat. Allow the 'sealing coat' to cure to at least the B-stage before proceeding to Step 2.

### Step 2 - Prepare the Sealing Coat for the Next Pour

It may be possible to pour the next layer as soon as the sealing coat has reached the B-stage, this can be tested by pressing a gloved finger on to the resin, you should be able to indent the resin but no residue should stick to the glove.

If the resin has fully cured before you can add the next layer of GlassCast it may be necessary to key the surface to ensure a strong bond between layers. To do this you will need to 'key' the surface of the sealing coat using some coarse abrasive paper. This will also help to flatten off any slight raised texture where the substrate has absorbed some of the sealing coat. Use a sheet of coarse abrasive paper (such as P120) to 'key' or scratch the entire surface. Don't worry that the surface then looks scratched and light in colour - this will disappear as soon as the next layer of resin is poured.

Ensure that the surface is cleaned thoroughly after keying and any dust and dirt removed before moving on to the next step

### Step 3 - The Resin Pour

- Ensure your work area is as free of airborne dust as possible
- Ensure the ambient temperature is between 20°C- 25°C

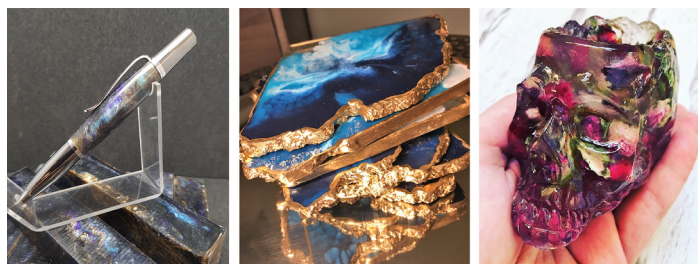
#### IMPORTANT:

Maximum casting thickness for GlassCast 10 is 10mm per layer!

Calculate how much resin you will need for the pour using the information in the 'How much resin?' section earlier in this guide.

Follow the instructions for measuring and mixing the resin making sure that your mix ratio is very accurate and that your mixing is very thorough and that you 'double-pot' the mixture as described in the 'Mixing Instructions' section.

If you are creating a layered piece, for example a 3D Resin Art piece, it is advisable to pour clear and pigmented layers in sequence to add depth and create 3D effects.



Around 10 minutes after pouring the resin, take a careful look over your casting. If any trapped air bubbles still persist, you can use a heat-gun or gas blow torch lightly over the surface of the resin to lift any remaining air bubbles out of the resin, taking care

Once you are happy with the casting, cover it as soon as possible to prevent any airborne dust or contamination from landing on the surface.

Once the resin has reached the B-stage, mix and pour the next layer, re-cover the piece and leave to cure to the B-stage if more layers are needed or leave to fully cure if complete. To learn more about multiple pours please see the 'Multiple Pours' section

When the surface is fully cured (this is likely to be up to 36hrs), depending on the ambient temperature it can be handled and demoulded.

Please see the Curing Time section earlier in this guide for full information, please note that the resin will continue to harden to full strength over a period of 7 days.

### Step 4 - Polishing, Finishing & Shaping

Once fully cured, GlassCast 10 can be shaped, flatted and polished up to a full gloss finish. This can be particularly effective in creating soft, radiused edges on cast surfaces such as wood and resin jewellery or when flattening the cast surface to be perfectly flush with the surrounding material, such as a flat table surface when filling surfaces of reclaimed wood.

To flat and finish GlassCast 10, follow standard flattening and polishing techniques of working up through the grits of abrasive paper until you reach around P1000 grit before changing to a polishing compound and power polisher for the final gloss finish.

This process can also be followed to restore surface scratches and dulling from continual use or alternatively you could coat the surface with GlassCast 3

You will now have a stunning casting that with care will last for many years, amazing family and guests alike. If over time the surface picks up minor scuffs and scratches these can be polished out to restore the original high gloss finish.

## Advanced Techniques

### Multiple Pours

The maximum castable thickness for GlassCast 10 is 10mm. It's absolutely fine to use GlassCast 10 to create castings thicker than 10mm but to do this they 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 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.

### Inclusions / Encapsulation

One of the stunning applications of GlassCast 10 is the inclusion of other materials within the resin. Such materials could be coins, bottle-tops, beer mats, playing cards, photographs, pebbles, crushed glass; in fact, just about anything.

With so many different types of material that could potentially be encapsulated within your GlassCast pour it's essential to experiment first to ensure that you understand how your chosen material will behave when encapsulated in the GlassCast. All materials will need to be thoroughly dry before you encapsulate them but others may require 'sealing', gluing down (to prevent floating) or some other preparation to get the best results.

As a general rule, the inclusion of any materials within your GlassCast 10 surface will result in some slight effect on the surface caused by absorption of the resin into the material being included or simply by variations in the thickness of the resin where these inclusions occur.

For this reason, when working with inclusions, it is generally best to do two pours; the first is your main pour and will encapsulate the inclusions completely, the second pour is a thinner pour intended simply to leave a perfectly flat surface. See the 'Multiple Pours' advanced technique for further information. Shaping and Polishing

## Pigments and Tints

GlassCast 10 can be pigmented with our range of GlassCast and epoxy compatible pigments including the GlassCast Translucent Tinting Pigments, Solid Colour Epoxy Pigment Paste and SHIMR™ Metallic Powder Pigments.

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

To achieve a subtle 'tint' remember that you will need proportionally more tinting pigment for thin sections that you will for thicker sections.

A transition from one colour to another can be achieved using two pours of differently tinted resin, sloping the surface slightly for the first pour to create a thickness gradient for each pour.

Always conduct a small test first to ensure compatibility with your chosen tint, pigment or powder.

## Technical Specification

### Uncured System Properties

	Units	Resin	Hardener	Combined
Material	-	Epoxy Resin	Formulated Amine	Epoxy
Appearance	-	Clear Liquid	Clear Liquid	Clear Liquid
Viscosity @25 °C	mPa.s	650-950	250 - 350	400 - 600
Density @25 °C	g/cm <sup>3</sup>	1.10 - 1.14	0.98 - 1.02	1.08 - 1.12

### Mix Ratio

By Weight	By Volume
100:45	2:1

### Pot Life and Cure Time

	Sample Specification	Units	Value
Pot-life (@20°C)	6mm; 15ml	mins	45
Gelation time (@20°C)	6mm; 15ml	hours	4 - 5
Demould time (@20°C)	6mm; 15ml	hours	36

## Cured Mechanical Properties

	Units	Value
Colour	-	Colourless
Machinability	-	Excellent
Density @ 25°C	g/ml	1.08 - 1.12
Hardness @ 25°C	Shore D/15	80 - 85
Glass Transition	°C	52 - 58
Max Working Temperature	°C	50
Flexural Strength	MN/m <sup>2</sup>	69 - 78
Flexural Elastic Modulus	MN/m <sup>2</sup>	2200 - 2700
Maximum Strain	%	3.5 - 5.5
Strain At Break	%	> 15
Tensile Strength	MN/m <sup>2</sup>	38.0 - 47.0
Elongation At Break	%	9 - 13

## Other GlassCast Versions

GlassCast 10 is designed specifically for thick castings up to 50mm per pour. For thicker sections we would suggest using GlassCast 50. If you are looking for a coating resin, then we would recommend GlassCast 3.

The number in the name represents the suggested thickness that each product should be poured (in a single pour); GlassCast 3 is recommended for coatings up to 3mm deep, the GlassCast 10 and GlassCast 50 are recommended for castings.



## Disclaimer

This data is not to be used for specifications. Values listed are for typical properties and should not be considered minimum or maximum.

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