

A close-up photograph of a penny floor in a kitchen. The floor is made of many small, circular wooden pieces, likely pennies, arranged in a dense, overlapping pattern. The floor is highly reflective, showing a clear reflection of the white kitchen cabinets above. The cabinets have a classic paneled design. To the right, a wine rack is visible, containing a white wine bottle and a dark wine bottle. The lighting is bright, creating a warm and polished appearance.

GlassCast[®]

HOW TO LAY AND RESIN A

Penny Floor

THE COMPLETE GUIDE

How to lay and resin coat a Penny Floor

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Introduction

The aim of this guide

The aim of this guide is to provide detailed step-by-step instructions that can be easily followed to help you lay and resin coat your own penny floor using GlassCast® 3 clear epoxy coating resin. A Penny floor is a real talking point and can transform a room and become the envy of all your friends. If you think your floor is crying out for the beautiful penny floor treatment it can be achieved by anyone from professionals to keen DIY'ers and requires no specialist additional equipment and no experience of floor laying. This process can of course be used to coat table tops and bar tops with inlaid objects like pennies and to encapsulate other materials such as records, crushed glass and bottle tops using the same process and techniques, or it can be used as a coating to give a hi-gloss, glass like finish on a ready made surface.



This guide includes all the expert advice you will need to avoid common mistakes and make a success of your penny floor project; so if you're serious about laying a floor like this it is advisable to read this guide and the technical and safety information in full before you start!

GlassCast® 3 has been specially developed to be the perfect resin for applications like penny floor projects and is self-levelling, has special additives to expel trapped air from mixing, and cures to leave a stunning smooth, glossy surface which requires no flattening, polishing or further finishing - it is a true 'pour and leave' product which with it's two part mixture is very easy to use!

Before You Begin

Gathering and Preparing the Pennies



The first step in laying your own penny floor is to choose the coins you wish to use - it may take a while to gather the amount you need depending on the size of the surface to be covered. You will also need to decide on the finished look, for example you may wish to have very shiny pennies which may need cleaning prior to laying or if you decide to lay your pennies in a patterned design utilising colour variations in the pennies, it's a good idea to plan this out before starting the project. Before you begin you must ensure that the floor is as level

as you can practically achieve and is clean from dirt and dust and can be left safely to fully cure.

Tools, Materials & Conditions

This project requires very little equipment and virtually no tools. This guide assumes that the floor is level before beginning and the following materials, tools and accessories will be required to complete the project:

Materials

- GlassCast® 3 clear epoxy coating resin
- Pennies
- High Quality DIY Adhesive
- Grout

Tools

- PPE equipment - safety glasses and nitrile gloves (as a minimum)
- Spirit level
- Digital scales

Accessories

- Sealant gun
- 2 x Mixing buckets & mixing stick
- Squeegee
- Resin spreader
- Vacuum cleaner and cleaning cloths

Conditions

A dry, heated environment is essential when using GlassCast® 3 epoxy resin. During setup and throughout the curing time of the resin it is important to maintain a stable temperature of at least 15°C but ideally 20°C or more. It is also essential to ensure you work in a well ventilated space.



The GlassCast 3 also needs to be at (or around) 20°C - if the resin is too cold it will not mix correctly and may result in a cloudy finish. If the resin is cold it is very simple to bring it back up to the correct temperature by submerging the containers in a bath of hot water. Do not attempt this project in cold or damp conditions as this will certainly spoil the performance and appearance of the resin.

Epoxy Resin for your Penny Floor Project



Epoxy is epoxy, right?

GlassCast® 3 is a remarkable clear epoxy resin developed specifically to provide beautiful, hard-wearing, clear gloss surfaces for tabletops, bar-tops, decorative floor effects, furniture and creative projects. GlassCast can be poured at thicknesses from just 1mm to thicker 5mm sections opening up a world of possibilities for embedments within the resin such as bottle tops, crushed glass, pennies... the list is endless! If you are looking for an epoxy resin suitable for deeper pours see the GlassCast® 10 and GlassCast® 50 clear epoxy casting resins available from www.easycomposites.co.uk

This amazing resin is self-levelling and cures to leave a stunning smooth, glossy surface which requires no flattening, polishing or further finishing - it's a true 'pour and leave' product. If you do however need to polish the resin, to remove scratches or add a soft radiused edge to a cast surface for example, GlassCast is very easy to polish using simple abrasive paper and polishing compounds to restore a full gloss.

Special additives in the resin help to expel trapped air after mixing meaning that in most circumstances there is no need to pop bubbles with a torch or heat-gun. The advanced 'UV' formulation of GlassCast means that it has non-yellowing properties far superior to those conventional epoxies meaning that it will start beautiful and stay beautiful for years to come.

How much resin will I need?

For solid surfaces, it's easy to calculate the amount of resin you'll need to cover a given area. For uneven surfaces or those including embedments like crushed glass or bottle tops; some compensation will be required.

Typically for a grouted penny floor we would recommend a 2mm thickness over the pennies. A simple sum to calculate the area should be measured approximately in length, width and depth to find the cuboid volume, as follows:

$$\text{Length(in metres)} \times \text{Width(in metres)} \times \text{Depth(in millimetres)}$$

The resulting number will be the volume of this shape in litres: For example:

$$2\text{m(length)} \times 1\text{m(width)} \times 2\text{mm(depth)} = 4\text{litres}$$

In simple terms, 4 litres of resin can be approximated as 4 kilograms of resin.

We would always suggest slightly overestimating the amount of resin you think you will need as it's always better to have mixed too much rather than too little to cover the surface area.

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)	45mins	30mins	22mins
Maximum Pour Depth	9mm	6mm	3mm
Initial Cure Time	36hrs	24hrs	18hrs

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.

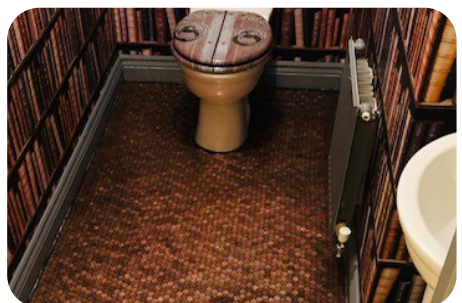
Maximum Pour Depth

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.



Step-by-Step Guide

The most important advice...

When preparing for and undertaking the resin pour itself, the key to success is to follow the 5 points below. By following these simple steps you will avoid many common problems associated with working with resin.

- **Don't start with cold materials**
The working environment and unmixed resin containers should all be at 20°C before you start (if your resin is delivered cold it can take several hours for the resin to reach room temperature), resin can easily be brought back up to an ambient temperature by placing the containers in a bath of hot water until warmed through.
- **Maintain temperature during cure**
The temperature of 20°C must be maintained throughout the curing time of the resin (at least 48 hours). You should not allow the room to become cold overnight.
- **Work in a dust free environment**
Your working environment should be clean, level and as dust free as possible.
- **Measure accurately and mix thoroughly**
When measuring out the resin and hardener make sure you understand the mix ratio, in the case of GlassCast 3 the ratio is parts-by-weight - in this case 2 parts resin to 1 part hardener. Measure the two parts as accurately as possible, and never for example 'add extra hardener'. Mix the resin thoroughly and always use the 'double potting' method.
- **Mix and pour the resin in batches**
Measure, mix and pour manageable batches of GlassCast® 3 onto the floor starting with the furthest point from the door and working back towards the point of exit.

1. Prepare the Floor

First make sure that the floor is level, clean and that the area to be laid can be kept secure for a minimum of 48 hours to allow the resin to fully cure. This timescale is subject to an ambient temperature.



Always check the level of the floor or surface you will be pouring resin on to using a spirit level. This is very important as the resin has self levelling properties and if the floor is not level or has high points you will not be able to rectify this after the pour with such a thin coating of resin. For pours of 2mm or more you will need to think about any possible areas of run-off. For example you may need to create a barrier in a door opening using something that will not stick to epoxy resin like polypropylene sheet.

2. Lay the Pennies

If you are laying your pennies in a random fashion it's best to start at a corner and work along in a row using the wall/skirting board as a guide. If you have a design or pattern you may need to try it out prior to sticking it down.



DIY Adhesive

Using a sealant gun dispense a thin bead of adhesive along the floor and stick the pennies down - using an adhesive that starts off white and dries clear so you can see where you've put it is ideal.

Only a small amount of adhesive is needed as the resin and grout will fully bond the coins to the surface.



Pennies, pennies, pennies

The laying of the pennies is easy but very time consuming - we recommend lots of help from your friends and family and a good set of knee pads!

Make sure that areas around pipework or fixtures are filled and level so no resin can leak through.



Leave to dry

It's very important to ensure that the adhesive is fully dried before moving on to the next stage. Once dry you can move on to grouting the pennies.

3. Grout the Pennies

Grouting the pennies helps to seal them to the floor and creates a seal so that the resin can't leak down between the gaps. It also creates a flatter surface for the resin to be poured over, meaning that the amount of resin needed is purely a layer over the pennies so less will be required in total.

Dark grout (either black or a dark colour of your choice) creates a great looking dark contrast around the pennies and also hides the original flooring underneath.



Grout the pennies

Apply the grout using a squeegee. Making sure that you push the grout into the gaps between the coins and around the edges between the pennies, the wall and skirting board and any fixtures.



Grout tip

When you apply the grout over the pennies and wipe off the excess the grout will act as an abrasive and make the coins more shiny, so if you wish to retain the tarnished look on the coins don't rub too hard. It is worth considering that your coins may look brighter and shinier after the grouting process.

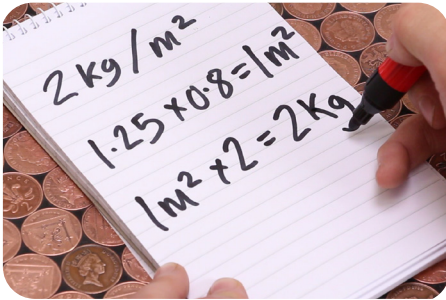


Clean up and leave to dry

Clean the excess grout off the coins using a cloth and clean water, then vacuum the surface so no dust and dirt remains. Make sure you leave the grout to fully dry before moving on to the resin stage of the process.

It is very important that the grout is fully dried because GlassCast® 3 is sensitive to moisture and it could cause a reaction and spoil the overall appearance of the resin.

4. Measure & mix the GlassCast® 3



How much resin?

Using the simple example sum on page 5 of the guide work out the area of your floor and the quantity of resin required.

You will need 2kg resin per square metre of penny floor to achieve a 2mm pour depth. Once you have worked out the area and quantity of GlassCast® 3 needed measure out the resin and hardener accordingly.

Measuring and mixing the resin

Measure out the GlassCast® 3 resin and hardener as accurately as possible using digital scales. Make sure you stick to the following mix ratio by weight:

By Weight: 2 (parts resin) and 1 (part hardener)

Best practise for mixing resin and hardener together is to always mix for a minimum of 3 minutes, making sure that you scrape the sides and bottom of the container to ensure a thorough mix before transferring to a second container to mix again (see double potting method on page 10).



Resin and hardener

The success of your GlassCast® 3 project will come down to the correct measuring, mixing and pouring procedure.

Weigh out 2 parts of the resin and 1 part of the hardener using digital scales into a bucket and mix together.



Mixing

Mix the resin and hardener together for a minimum of 3 minutes making sure that you scrape the sides and bottom of the bucket and mixing stick.

Slow, steady mixing is very important to minimise air entrapment.

Multiple Pours



Mix in multiple, smaller batches

As well as making thorough mixing more practical, mixing in multiple smaller batches has some other advantages too. Such as being able to attend to each batch individually, avoiding mixing up unwanted quantities of resin and ensuring thorough mixes throughout the project.

For large floors, the biggest batch size we recommend mixing up in one go is 5kg of combined resin and hardener. This is because large batches are both hard to mix and also in large volumes the resin can quickly heat up in the bucket and potentially exotherm resulting in the resin curing in the bucket. Keeping the batch size smaller and pouring the resin as soon as possible after mixing will avoid these issues.



Double-potting

After mixing the resin in the first mixing bucket for three minutes, transfer the mixture into a second bucket and mix again to ensure a complete mix. This is known as 'double potting'. It's a good idea to label the buckets '1' and '2' to avoid confusion.

IMPORTANT:
Double potting!

To get the best results from the GlassCast® 3 epoxy resin it is advisable to 'double-pot' each mixture. This means mixing the resin and hardener together steadily and thoroughly in the first bucket, making sure that you scrape the sides and bottom of the bucket then after approximately 3 minutes transfer the mixture into a second bucket without scraping the bucket and mix again for a further 3 minutes. This will ensure no unmixed resin finds it's way on to the surface being coated.

5. The Resin Pour



Pouring the resin

Pour the mixture over the surface using a spreader to distribute it as evenly as possible.

Repeat the measuring, mixing, pouring and spreading for the total surface area of the project.

Measure > Mix > Pour > Repeat



Air bubbles

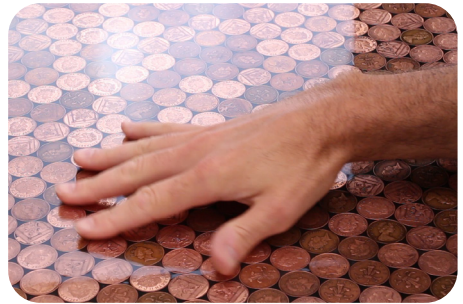
GlassCast has excellent properties for expelling air bubbles trapped in the resin from the mixing and pouring stage. When the resin has been poured you may notice some tiny air bubbles, but after a few minutes you should start to see them begin to rise to the surface and pop by themselves. If any bubbles do persist you can remove them using a heat gun or hairdryer lightly over the surface - make sure you hold the heat gun well away from the surface.



Leave to cure

Leave the surface to cure fully before handling or walking over. This is likely to be around 48hrs, depending on the ambient temperature. The resin surface will continue to harden for a period of several days so where possible avoid walking on it or placing objects or items of furniture on it until you are confident it has reached it's full cure.

6. After Care



Now that your GlassCast® 3 penny floor project is complete you will want to keep it looking great for years to come. Here are a few important things to keep in mind when looking after it:

- **UV Light** - GlassCast® 3 has been designed to have the best UV stability of any epoxy resin on the market and should withstand years of indirect sunlight with very little effect. However, common with just about all materials of this nature, prolonged exposure to UV light, particularly direct sunlight, can eventually cause some change in the appearance of the resin. For this reason, finished GlassCast® projects are not recommended for outdoor use and should be kept away from direct sunlight where possible.
- **Scratches and Marks** - GlassCast® 3 is a very hard wearing plastic and will hold up to the rigours of light daily use without marking. However, accidental damage can be caused by sharp objects scraping over the surface of the resin or from things being dropped onto it. If this occurs, scratches can be polished out using abrasive paper (for coarse scratches) and/or polishing compound can be used to restore the gloss.
- **Hot Objects** - You should not place hot objects directly on to the resin (pots, pans, plates or mugs) as this may mark the surface. Instead use coasters or heat proof mats. If you do find that hot objects have marked the surface it can be flatted and polished to remove any marks using abrasives and if required you could re-pour a patch if there was noticeable dent.

Alternative projects

The same technique can be used for a range of projects such as encapsulating records, bottle tops, mosaics, crushed glass and even advanced composite materials such as carbon fibre for a new technical look. GlassCast® 3 is the ideal epoxy resin for these applications and 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 and always seal porous materials prior to coating in GlassCast® 3.

The GlassCast® 3, 10 and 50 epoxy resins are also compatible with the Easy Composites translucent tinting pigments. It is recommended that small test samples are carried out if you wish to use the GlassCast range with other additives.

Casting depth

There are a number of situations where you might choose to cast your GlassCast using a number of pours. There is two ways of pouring the next layer as detailed below:

OPTION 1: B-Stage

In most cases, a second layer can be poured onto a previous layer if the original layer is at its 'B-stage'. This means that the resin has gone firm but still has a tack left in the surface. At this stage, it is possible to pour the new layer over the top of the original layer without the need for any surface preparation because during this B-stage, the two layers will still form a chemical bond.

If the original layer has cured past its B-stage, i.e. once there is no longer any tack left in the surface of the original pour, it becomes necessary to allow the first pour to cure fully and then 'key' the surface using a coarse abrasive paper; see OPTION 2.

OPTION 2: Cure then Key

If the original layer has cured past its B-stage then a second pour of resin will no longer be able to chemically bond to the first layer. Instead, we must ensure a good mechanical bond between the two layers. In order to achieve this it is necessary to 'key' the surface of the original layer using a coarse abrasive paper.

Before keying the surface, it's important to ensure that the first layer of resin is fully cured (not tacky on the surface). 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 over it.



GlassCast® 3 poured over a Lego Technic Coffee Table and over a Bottle-top Bar-top.

For more information and lots of project ideas take a look at the Easy Composites product pages and Tutorials for in depth guides and case study projects.

If your project requires deeper castings rather than a coating the GlassCast® 10 and GlassCast® 50 clear epoxy casting resins may be more suitable for your project.

www.easycomposites.co.uk/#!/resin-gel-silicone-adhesive/epoxy-resin

