



POND LINING GUIDANCE

Getting Started – Safety First

Before using the product, please familiarise yourself with the material by reading both the technical and safety datasheets (available for download via www.mbfg.co.uk under the technical and safety sheets tab of the fibreglass kit purchased). Work in a well-ventilated area and wear appropriate PPE (personal protective equipment), if you have any questions please get in touch.

Resin

The resin provided in this kit is a high-quality Lloyds approved unsaturated polyester laminating resin with good UV and weathering resistance. The resin is ideal for boat and watercraft repairs. It may also be used for general applications such as automotive repairs, flat roof, pond lining, lawnmower deck repairs and more. Available in unpigmented and white. (Pigments may be added to the unpigmented resin system)

Catalyst (MEKP)

The catalyst provided is a medium reactivity catalyst for curing unsaturated polyester laminating resins in ambient temperatures.

Matting

Chopped strand mat (CSM) is provided with each of our repair kits, this mat is an E-Glass which is a non-woven material regularly used for lamination and repair work. Consisting of glass fibres spread in random orientation and held together with a binder. This mat is reasonably soft and conforms well to complicated shapes (when used in conjunction with the laminating resin).

Surface Tissue

A fine glass veil spread in random orientation bound together with a binder, used as a last layer to improve the look of a repair, or as a first layer to mask the glass reinforcement pattern from showing through the gelcoat layer. For the application in pond lining, the surface tissue is used to leave a more refined surface prior to top coating for an overall smoother finish.

Topcoat

The topcoat in this kit is a high quality Isophthalic based polyester resin with excellent weathering properties making it ideal for outdoor applications. Thicker than the polyester laminating resin it provides a smoother surface with better durability and additional water resistance.

G4 Sealer / Primer - (Optional)

G4 is a moisture cured sealant / primer which will seal the cement render providing additional water resistance but also aiding adhesion between the concrete render and fibreglass laminate.

Pigments

Lead free polyester coloured liquid/paste mediums based on pigments dispersed within a solvent-free reactive unsaturated polyester resin. They are available in a wide range of colours varying in strength and consistency, we have however only selected the most popular colours for pond lining in our kit.

PREPARATION

Pond structures vary in size, shape, and construction and this guidance is based around a smooth cement rendered surface as a starting point. We would recommend that internal and external corners should be constructed with a radius to allow for easier application of the glass fibre, 90° edges / corners for example will create more difficulty during the laminating stage. Rough / heavily texture surfaces will require additional measures before starting to line the structure with fibreglass as these surfaces will likely cause difficulties in creating a water-resistant fibreglass lining in the structure. Resurfacing of the render or considering using a lighter grade of chopped strand glass fibre and resin to provide a smoother surface for subsequent layers.

Radius / Radiused = to give a rounded form to (a corner or edge).

Surface must be clean, dry, and free of contaminates and loose material where possible and should be used in ambient temperatures. Optimal working conditions are 18°C to 22°C. Whilst the material will still cure at slightly lower temperatures, the rate of cure will be slower. There is a potential that the material will be unable to reach a full stage of cure if used below 10°C and is not recommended.

Its best practice to prepare your materials as required before attempting to mix the resin and catalyst as doing this after will only reduce the amount of working time you have before the resin starts to cure. Having all materials prepared prior to starting gives the best chances of success.

Providing you have chosen the correct kit size; each kit contains enough material for two layers of 450gm chopped strand mat. While technically a single layer of 450gm chopped mat could provide a water-resistant barrier, we have found through experience that the rendered surface is almost never perfect and you are likely to experience some inconsistencies on the surface such as exposed aggregate and coarse render for example, which can lead to break through / penetration of the fibreglass layer. There is also the possibility of dry patches in the laminate due to insufficient resin quantities / improper consolidation. Having a second layer will drastically reduce the chances of having dry patches in the exact same area as the preceding coat whilst providing further benefit of an additional layer. The first layer will typically bridge over gaps and sharp objects leaving a better surface for the subsequent and final fibreglass layer.

Pipework and Fittings

Pipework and fittings are commonly manufactured from thermoplastics which can be difficult to achieve a bond with fibreglass. There are a variety of fillers than can be used with the resin to create a filleting paste such as glass bubbles and silica filler or calcium carbonate (glass bubbles and silica offering better water resistance) for filling gaps between the pipework / fittings and render prior to applying the laminate. While there are a few specialist primers which can be used with PVC to help with bonding, more common methods of sealing the pipework / fittings are with the use of marine safe silicone or polyurethanes sealants, for filling gaps and then further sealing between the pipe and fibreglass laminate. For bottom drains an effective technique is to laminate over the drain down onto the sides once the laminate has cured apply a sealant between the drain and laminate. We would highly recommend speaking to your supplier of the fittings for recommendations also.

Material Requirements – Resin / Mat Ratio.

It is recommended to use a high ratio of resin to mat to ensure a resin rich laminate to help with water resistance. Typically, 2.5 parts resin to 1 parts by weight of fibreglass chopped mat would be used for pond lining. Using less would not be recommended as the resin is what will be providing the water resistance after all. A more simplified way of expressing this would be to say that: 1m² of 450gm CSM would require approximately 1.12Kg. In real terms it's unlikely that the resin consumption will be less, and you could expect to be using extra depending on experience, so worth taking the above into consideration and accounting for loss from original containers and potential waste / spillages etc. (This ratio would apply to the surface tissue also)

Resin / Catalyst Ratio's

The recommended ratio is between 1% & 2% MEKP catalyst to total weight of resin. Mix ratio of the polyester resin and catalyst are also provided on the labels of each product. Polyester resins are relatively tolerant to slight variations in the mixing ratio, whilst we recommend the product is weighed, mixing by volume can also be used however pot life and cure times can be affected. Its important not to over catalyse as this can lead to a much shorter pot life but also cause defects such as excessive shrinkage and warping when cured etc.

Material Requirements – Topcoat.

Typical application thickness of .5mm to .65mm is recommended (approx. 550g to 700g per m²). Care must be taken not to apply to thinly, application via brush and / or a short hair roller.

Ratios

Determine the quantity of resin to be mixed

Catalyst ratio chart

From the top bar choose your weight of resin and directly below the chart will provide the quantity of catalyst required for your weight of resin.

Resin Weight →	100g	250g	500g	1kg	2kg	5kg
Catalyst Ratio ↓	Catalyst Requirements ↓					
1.0%	1g	2.5g	5g	10g	20g	50g
1.5%	1.5g	3g	7.5g	15g	30g	75g
2.0%	2g	5g	10g	20g	40g	100g

With accuracy the resin will perform to the specifications provided in the resin technical datasheet based on the specific test environment. Larger quantities of resin and different environment conditions may cause a variance in pot life and setting time. If choosing to mix by volume, substitute grams for millilitres this may lead to slight differences also.

APPLICATION STEPS

Surface Sealing with G4 (optional)

G4 will seal the rendered surface whilst also acting as a bonding agent aiding adhesion between the rendered surface and the fibreglass. While the G4 will tolerate slightly damp surfaces, it will perform best on a dry surface. With good working temperatures after the G4 has been applied it will begin to cure in the open air and once the G4 has reached a tacky state (usually within 30-60 minutes depending on temperatures and humidity levels). The polyester resin and matting should be applied once the G4 reaches its tacky stage, do not allow more than 4 hours to elapse before applying resin and mat to get a good bond. If G4 is allowed to fully harden, then it is advised to abrade the surface and clean of any dust / debris before applying.

Resin & Chopped Strand / Tissue Layup

The basic method of application is to first apply a coat of resin to the surface / substrate and then set the matting into place, gently press the mat into the resin so the mat stays in place. You can begin to stipple / roll the resin into the mat. As the resin breaks down the binder in the chopped mat you will notice the mat will start to become transparent (using the unpigmented system) as it does this the mat will become pliable. After a few minutes the binder should be broken down sufficiently enough that you can use a consolidation roller to push out trapped air and force the resin into the fibres to flatten the layer onto the surface.

Starting with the sides of the pond and allowing approx. 75mm (3 inch) overlaps at the edges and base. Once the sides are complete you can lay the base layer. For the second layer start at an offset to avoid directly overlapping in the same spot as the preceding layers. The second layer can be applied directly onto the first layer before it has cured however this isn't always practical / possible depending on size and shape.

APPLICATION STEPS

When overlapping or joining sections of matting it is good practice to use a feathered edge, if the mat has cut edges simply tearing the glass by hand will leave a feathered edge.

Sharp internal and external right-angled corners will cause issues and the layup will not sit well, you may need to fillet internal corners with a mix of resin and fibres / fillers, or potentially use a premade multifibre or suitable bridging compound to create a radius for an easy transition for the material from one plane to the other. External corners should also have a radius to allow for easy transition.

If the first layer is left for 24 hours or more, it is advised to abrade the surface and clean with acetone prior to applying the second coat for better bonding. Once the layers of resin and mat have cured, we recommend to first check for any dry patches in the laminate and make any repairs if necessary. It is good practice to also check the laminate for sharp areas of glass that have risen of the surface and remove with abrasive paper, again checking the integrity of the area and make any repairs if required. Abrading the entire surface and once complete brush off any debris with a clean brush and wipe down with acetone. Once this step has been complete the surface tissue can be applied leaving a more refined finish ready for the topcoat layer. Topcoat can be applied once this layer has gelled and begun to harden (just hard enough to walk on).

Topcoat

The best time to apply the topcoat is once the laminate is sufficiently hard enough to walk on as the best bond will be achieved, whilst the topcoat can be applied at a subsequent time. The bond strength will not be as strong. Aim to apply as soon as possible. Application via brush will tend to leave a heavier coat than via roller application. It is important that the coating is applied as evenly as possible within the recommended coverage rate. Topcoat contains a wax so secondary coats are not recommended as delamination can occur. If an area needs repaired / reapplied, the topcoat should be removed to expose the glass laminate before re-application.

TIPS FOR SUCCESS

Mix Ratio

Stay within the recommend 1% to 2% ratios for best results. Pay attention to surface and general environment temperatures and adjust as necessary.

Temperatures

Ambient temperatures are best, stay between 15°C and 20°C, cooler conditions are going to slow the process down, try to work in the shade and stay out of direct sunlight where possible.

Surface Condition

Clean / well prepped surfaces are required for good results, poor surface conditions can lead to failures or delamination.

Pot-Life

Pot-life can vary due to multiple factors such as temperatures and quantities of resin mixed at a time, container type. It's advisable to start off with small batches of catalysed resin until you are familiar with the material before attempting to work with larger quantities.

Quality of Mix

When mixing the resin and catalyst together scrape the bottom and sides of the container thoroughly to ensure a good mix is obtained, poorly mixed product can leave sections and spots of uncured resin on the laminate.

Cure Time

Multiple factors play their part in the cure times. Work in the right temperature range, quantities of resin, container type etc.

Notice

Technical Advice provided by MB Fibreglass - Either verbal, in writing or by way of trials - is given in good faith but without warranty, where proprietary rights of third parties are involved, this applies also. This does not release you from the obligation to test the products supplied by us to ascertain their suitability for the intended processes and uses. The application, use, handling, and processing of the products are outside of our control and therefore entirely your own responsibility

