A GUIDE TO GLASSFIBRE FLAT ROOFING

INTRODUCTION

The roof must be laid onto a dry deck in dry conditions at a temperature not below 5 degrees C.

This guide relates only to the application of the GRP laminate and flowcoat and does not cover the design or structural details for the roof itself. The deck should be of 18 mm exterior plywood or OSB3 board (Smart Ply/Sterling Board) and be well fixed to the underlying joists. OSB3 board (Smart Ply) is preferable to plywood as the GRP bond to these boards is far superior than to plywood. You can apply to concrete if it is bone dry but if moisture is present this should be sealed first with G4sealer

The deck may be a new deck or may be formed over an existing roof. You should ensure that the new deck is laid to adequate falls in order to allow good drainage, so that there is no standing water on the roof after completion. Always try to plan starting a roof when a settled period of weather is forecast.

MATERIALS

Once the new deck has been formed you will need the following:

Glassfibre cloth: Emulsion bound chopped strand mat (CSM). The number of layers is at the discretion of the contractor. We normally recommend 2 layers of 450g/m" cloth which equates to approximately 1 kg per m2, particularly if applying to plywood or other materials such as concrete because of the risk of de-lamination. You can however choose to put down 1 layer of 450g/m2 or 600g/m2 For 450 g/m2 allow approx. 500gm per m2; for 600g/m2 allow approx. 700gm per m2. This allows for a 10% overlap/wastage

Resin: The resin: glass ratio will be between 2.25 and 2.5:1 which means for 2 layers 450g/m2CSM you will use 2.25 – 2.5kg resin. For 1 layer 450 CSM you should allow approx. 1.25 – 1.5kg per m2 and for 1 x layer 600 CSM allow approx. 1.5 – 1.75 kg/m2. Better to err on the high side to ensure you have sufficient to finish the job

Flowcoat: Allow 0.5 – 0.6 kg/m2. Note this material is pigmented – normally a dark grey.

Catalyst: This is the hardener for the resin and flowcoat. Use at 2 – 3% in cool weather and 1 – 2% in warmer conditions. 2% addition equates to approx. 20cc per litre
N.B. To prevent splashes in the eye or onto the skin it is safest to use a calibrated dispenser.

Brushes and rollers: For applying and consolidating the resin and flowcoat.

Acetone: Solvent for cleaning brushes and rollers etc. after use.

Protective clothing: Gloves, coveralls, safety glasses, fume masks

Trims: Various preformed GRP trims can be used for edge details or alternatively these details can be formed with prepared timber.

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APPLICATION

Once you have prepared the new deck, the work is carried out in the following sequence.

1. Trimming: Fitting the GRP edge trims or assembling the timber edge detail.

2. Bandaging: Reinforcing the board joints.

3. Laminating: Applying the GRP membrane (CSM glassfibre cloth plus resin)

4. Top coating: Applying the Flowcoat.

TRIMMING

The edge trims are supplied in 3 m lengths and should be fitted by nailing the bonding edge to the deck. The fascia, drip and upstand trims should be bonded to an underlying slate batten in order to support the edge. The drip trim can be offset in order to ensure that the drip stands over the gutter.

Preformed corners may be used or if preferred, the corners can be sealed in site by mitering and patching with GRP.

THE CHOICE OF TRIMS IS AS FOLLOWS-:

Drip fascia: used wherever the roof drains into a gutter.

Edge fascia: used along any free-standing edge wherever no drainage is required.

Wall flashing: used in place of lead wall flashing, usually with fillet trims.

Fillet trims: used wherever a roof meets an abutting wall.

Expansion joint: used only on roofs over 100 m2.

Flat flashing: used mainly as a slate flashing where a pitched roof meets a GRP flat roof.

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BANDAGING

All the board joints and all the trims must be “bandaged” to the roof to ensure that no stress cracking can occur at the joints. A 3” wide glassfibre bandage is applied to each joint and to all the trim edges. These bandages must be well consolidated.

The procedure for bandaging is the same, on a smaller scale, as that used for the main laminate. A small amount of resin, usually about 1 kilo is decanted into a small bucket and mixed with catalyst. (See catalyst addition chart for a guide to the correct amount of catalyst). The resin is then applied to the board edges and to the trim edges with either a 3” brush or small roller. The pre-cut glass bandage is then rolled out over the resin and a further amount of resin applied to the glass, which is allowed to wet out before consolidating with a small consolidation roller. All the details work may also be completed at this stage, drain outfalls, channels, pipes and roof fittings can all be sealed with GRP. You will find that a brush is more useful than a roller for consolidating the glassfibre for these details.

LAMINATING

The main laminate may be applied before or after the bandage has cured. The laminating must be planned depending on the air temperature. Long runs may be attempted in cool conditions while short runs must be used in warm conditions. Remember that the resin will always cure faster in hot conditions and an allowance must be made for this when deciding how much glassfibre to lay in one mix - direct sunshine will cause an almost instant cure. Before the laminate is applied the glass must be pre-cut to the desired lengths. The laminate need not be laid to falls i.e. it does not matter in which direction the joints are lapped. Clear all unnecessary items off the roof and dust off. Mix sufficient resin and catalyst to complete the first “run” (Allow a 2.5:1 Resin:Glass ratio). Wet out the first area to be done using a 6” long pile roller and roll out the glass cloth. Apply the remainder of the resin to the glass, and consolidate with the consolidation roller ensuring that no dry patches of cloth remain and that no air is trapped in the laminate.

Continue with the next "run” of glass overlapping the first by 50 mm. Do not step on the wet glass and resin. Continue this until the roof has been completely covered and the laminate has been well consolidated.

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FLOW COATING

The laminated roof must be flow coated as soon as possible. Try not to leave the laminate overnight. Test the laminate for cure by using slight finger pressure. The laminate is about half cured when it is impossible to move the glass fibres within the resin matrix. At this point it will withstand light foot traffic so that you may stand on the laminate to complete the top coating. Mix up sufficient flowcoat to complete the roof with the same amount of catalyst used on the main laminate. Decant a small amount to finish the edges and all details work with a small paint brush and apply the rest to the main roof area with a clean 6" short pile roller.

Ensure that the flowcoat is even and not more than a half mm thick. If the flowcoat is applied too generously, there is danger that it will crack.

The roof is then complete and will take several days to fully cure. It will not deteriorate and maybe cleaned occasionally with soap and warm water. DO NOT USE BLEACH or any strong alkali on the roof. The roof will withstand foot traffic and may have planters or tiles or other decorative finishes applied to it with no detrimental effects. The edge trims may be painted if required.

NOTE: Do not apply flowcoat under extreme sunshine/heat as the wax component can evapourate and the flowcoat will cure with a tacky finish.

CATALYST ADDITION CHART		**GEL TIME**		
% Catalyst	Addition	5 C	10 C	20 C
1	10mls/litre resin	4 hrs	2 hrs	30 mins
2	20 mls/litre resin	3 hrs	1 hrs	20 mins
3	30 mls/litre resin	2.5 hrs	30 mins	10 mins
4	40 mls/litre resin	2 hrs	25 mins	5 mins

HINTS ON CATALYST ADDITIONS

1. Never use less that 1% even in summer. Just mix less at a time.

2. Never use more than 4% - the cure time will not reduce with more catalyst beyond 4%.

3. Never underestimate the effect of temperature. Resins will not cure at or below freezing and will always cure much faster in direct sunlight.

5. You can buy catalysts of different strengths, to partially compensate for winter and summer conditions.

6. Remember any catalysed resin left in the bucket will exotherm. Heat is generated as it cures and it should be left well away from other stored materials. Water may be poured over the resin layer in order to suppress heat gain.

TROUBLESHOOTING

If these instructions have not been followed you may encounter some problems when laying the roof or after its completion. Please read the following to avoid later problems:

1. Delamination of the laminate from the boards: Moisture in the deck when laminating. Note: GRP bonding to OSB3 board is superior to plywood

2. Flaking and cracking of the flowcoat: Flowcoating onto a wet laminate or applying the flowcoat too thickly.

3. Resin cures too fast: Conditions are too hot to lay resin or addition of too much catalyst.

4. Flowcoat cures too fast: See No 3

5. Resin cures too slowly or not at all: No catalyst addition or temperature too low. The cure will stop as the temperature drops to freezing.

6. Patchy or Streaky cure of resin or Flowcoat: Insufficient catalyst or inadequate mixing.

7. Resin does not cure and appears milky white: Water contamination.

8. Excessive fibre pattern: Too little resin and insufficient consolidation.

9. Take care not to confuse the acetone for catalyst as this will not work!

HEALTH AND SAFETY:

Please refer to the labels on the resin, catalyst and acetone containers and note the hazardous nature of the products and the safety precautions to be taken when using them. For further information refer to the relevant MSDS (Material Safety Data Sheets) - available on request.

KEEP ALL MATERIALS OUT OF THE REACH OF CHILDREN

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