

INSTALLATION GUIDE



BULLET



SUPERIOR WATERPROOFING

• **Lloyds Approved**

• **Full Range of Trims & Accessories**

• **Pure Virgin Resin**

• **Superior Formulation**

• **Attractive Dark / Storm Grey**

• **Ultra Tough & Durable Finish**

Our Resins are of The **HIGHEST GRADE AVAILABLE**. Unlike many other GRP brands, our resins **ARE NOT REBLENDED**.

Reblended resins are created from mixed and various batches of resin kept behind from the manufacture of pure resins. As a result, these different batches of resin cannot be mixed to the same reliability, thixotropy, and ultimately quality of the Bullet Roof® GRP pure virgin resins.

OUR PURE VIRGIN RESINS behave uniformly and perfectly regardless of which batch number you have purchased.

Being Pure, our Bullet Roof® GRP Roofing Resin has a fantastic thixotropy and cling to pitched and vertical details though the curing process without running or slumping from intended the surface.

Our LLOYDS APPROVED Roofing Resin is the finest that can be produced giving both the contractor and the customer absolute peace of mind that the end result will last for many years to come.

Our 25yr product guarantee* speaks for itself-confidence in quality. Get in touch to become a registered installer of Bullet Roof® GRP.

*When installed by competent and trained Bullet Roof® GRP contractor



CALL 01274 752643
FOR FREE TECHNICAL
SUPPORT

Before



After



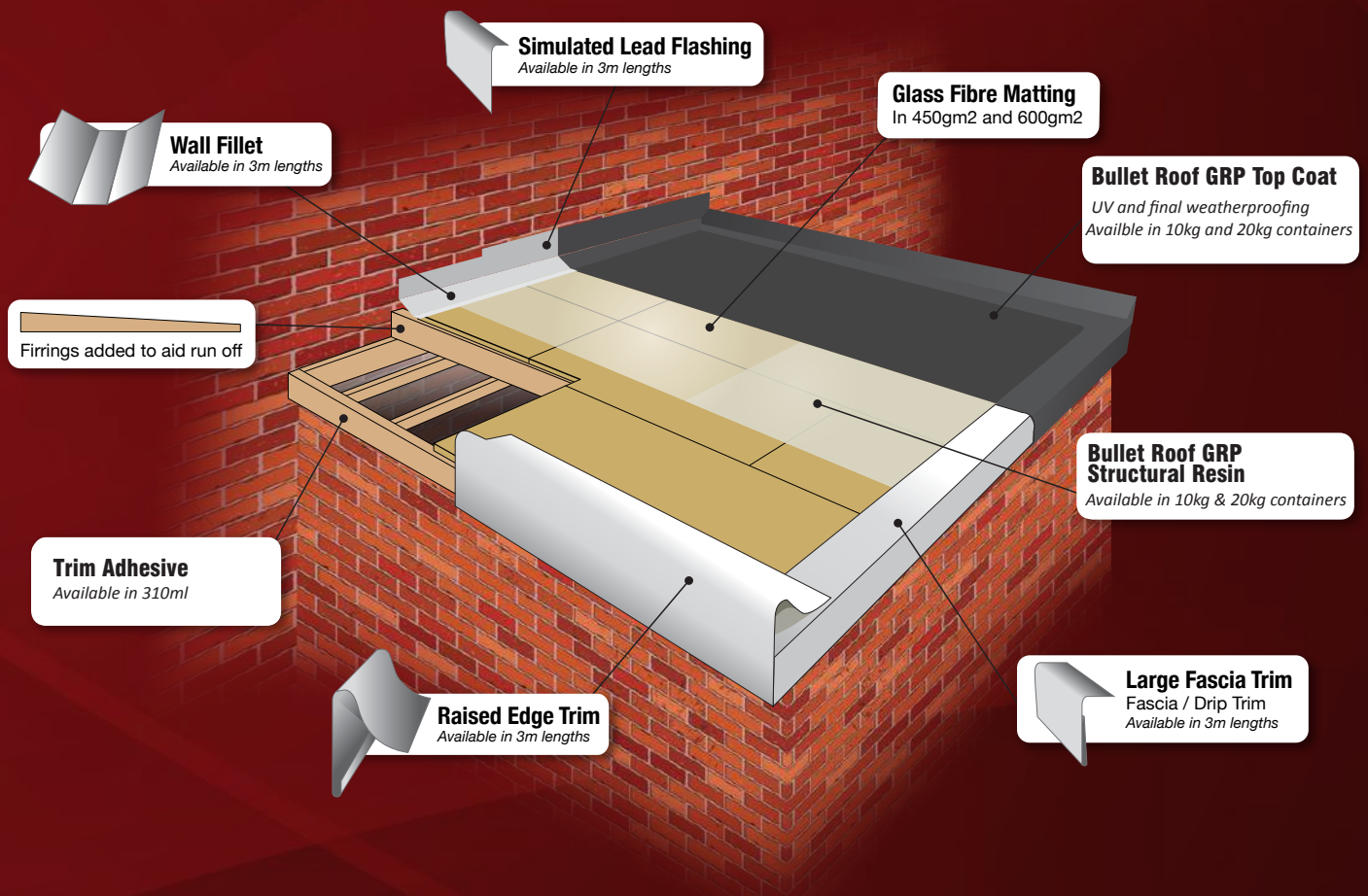
What is GRP?

GRP Stands for 'Glassfibre Reinforced Plastic', more commonly known as 'Fibreglass' It is a very strong and robust material - seven times the flexural strength of steel - yet very lightweight with the high energy absorption properties which have made it the material of choice for racing cars,boats, baths & even aeroplanes.

This system is Durable, Attractive, Cost Effective, Maintenance Free and can be Cold Applied i.e. no blow torches or live flames.

Bullet Roof GRP is a specially developed resin system that accommodates everyday structural expansion and contraction and can be moulded and shaped into even the most complex of architectures. Bullet Roof GRP is a long term, leak free and value for money system for flat roofs of any shape or size, from small porches to large domestic and commercial projects. GRP roofing technologies are extensively used for refurbishment or new roofs, by local authorities, architects, and major building contractors throughout the UK

- **Extensions**
- **Garages**
- **Dormers**
- **Porches**
- **Balconies**
- **Stairs**
- **Green Roofs**
- **Non Slip Walkways**
- **Architectural Projects**
- **Summer Houses**
- **Bay Windows**
- **Bespoke Detail**
- **Simulated Lead Finishing**



BULLET ROOF GRP

4 KEY INSTALLATION STAGES



Stage One

Preparation and Deck Fitting

Remove the old roof and re-deck with Structural T&G OSB.



Stage Two

Edge Trims Fitted

Fit GRP trims. A wide range are available to meet any configuration.



Stage Three

Lamination and Cure

Resin and strand matting applied and allowed to cure, ready for sanding.



Stage Four

Topcoat

Topcoat formulated to give a good even layer and can be pigmented to a colour of your choice.

BULLET ROOF GRP

Materials & Tools

DECKING BOARDS

Preferred Method: (Sterling Board/OSB) 18mm conditioned tongue and grooved OSB 8 x 2ft sheets should be used.
Secondary Method: (Plywood) Only good 18mm exterior plywood should be used. Never use none waterproof boards.

FIXINGS

Nails for tacking all roofing trims should be galvanised and 12-20mm in length. The preferred method of fixing the decking boards to the roof joists is by countersunk galvanised screws. If nails are used they should be minimum 60mm galvanised or sherardized annular ring shank.

TAPE

The adhesive tape to be used should be 25mm masking tape or similar, this should be used to bridge all joints between the decking boards.

RESIN

Bullet Roof GRP resin is a specially formulated polymeric coating for this application. For estimating purposes you should allow 1.5kgs per square metre of roof area.

GLASS-FIBRE MAT

Bullet Roof GRP Glass Fibre-Mat is available in two weights, 450gsm and 600gsm. It is an emulsion bound chopped strand mat and is used to reinforce and bind the system. The 450gsm is the standard product for most applications and the 600gsm is designed for use in trafficked applications such as balconies and terraces.

TOPCOAT

Bullet Roof GRP Topcoat is a specially engineered polymeric surface coating designed to withstand all the elements that a roof may encounter. Bullet Roof GRP Topcoat is pigmented dark grey. For estimating, allow 1kg of Topcoat per 2 square metres. Other colours are available to special order.

CATALYST

To enable both Resin and Topcoat to set (cure) you need to add a catalyst / hardener. This is called MEKP which is methyl ethyl ketone liquid; you need to add at a rate of between 1 and 4% by weight depending on the weather conditions.

ADHESIVE SEALANT

Use Bullet Roof GRP Dual Purpose MS Polymer sealant and adhesive for fitting the roofing trims and also sealing other areas on the roof. The product is supplied in 310ml tubes which can be used with a standard mastic dispenser. This product will give excellent adhesion and sealing properties and is moisture tolerant. If for any reason you are unsure contact Bullet Building Products Ltd

TOOLS & ANCILLARIES REQUIRED

The tools listed below are just about all you will need to fit a glass-fibre roof from start to finish.

POWER TOOLS

Power Saw
Cordless S/Driver/Drill
Hand Grinder
Electric Sander

HAND TOOLS

Hand Saw
Screw Driver
Hammer
Stanley Knife / Scissors
Tin Snips
Mastic Gun
Mixing Tools

ANCILLARIES

4 & 2" Brushes
Polyester Roller
Paddle Roller
Abrasive Paper
Sweeping Brush
Mixing Buckets
Hand Cleaner
Disposable Gloves
Masking Tape

Note: you will also need a suitable solvent to clean your rollers and brushes; the best product for this is Bullet Roof GRP ACETONE. Read carefully the health & safety data sheet as this product is highly flammable, but safe when used correctly.

BULLET ROOF GRP

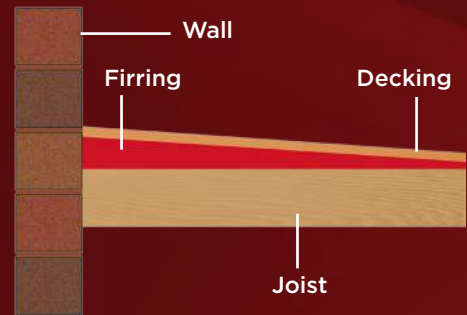
Preparation & Deck Fitting

Under no circumstances should a Glass-fibre roof be fitted directly onto any bituminous product. If you were to contaminate either Bullet GRP resin or topcoat with bitumen you would find they may not cure sufficiently. The optimum solution is to completely remove all traces of bitumen, by either stripping the roof or over decking with new boards. If you do decide to strip off the old roof, take into consideration the weather, because Bullet resin / topcoat will not cure if they come in contact with water. When laying a new deck make sure it is completely dry before you commence.

FITTING A NEW FLAT ROOF

(These notes assume you are repairing a flat roof that has been leaking, a new roof on new build would need to comply with the current building regulations at the time of construction)

Remove the old decking back to the joists, check these for any signs of weakening such as rot or excessive water damage. Replace or repair as required. Any fibrous insulation may well be holding water, this will also need to be replaced or upgraded if it is very old or thin. Whilst a Bullet Roof GRP roof is completely waterproof it is best practice to ensure there is sufficient fall for water to run off the roof without pooling. Firrings may need to be added to the joists to ensure this, building regulations encourage a minimum of 1:40. Ensure that the roof has sufficient cross flow ventilation to current standards. Diagram 1 shows tapered furring added to the joists to give the required fall before fitting the deck. (see diagram1)



DECKING AND JOINT PREPARATION

Structural grade OSB 3 is the preferred decking but WBP ply is also suitable, in both cases it should be at least 18mm and be of a tongue and groove type. The boards should be fixed to the joist by counter sunk screws or ring shank nails, and they must be galvanised or sheradised. When fitting the boards to the joists there needs to be a gap of 3 to 5mm between the sheets, this is to accommodate expansion of the roof deck during extremes of temperature. In diagram 2 the boards are shown staggered, this is to allow the expansion to be even through out the deck.



Now that the deck is laid and been swept clean the expansion joints need to be taped with 25mm masking tape. We recommend masking tape as some other kinds of tapes have glues that react with the resin and will invalidate the manufacturers guarantee. The taping prevents resin from sinking into the gap, wasting resin and filling the expansion joints preventing them from working correctly.



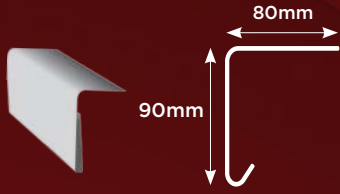
Diagram 3

All the masking tape joints should be then over laminated with a Glass-fibre bandage tape. Alternatively you can cut your own strips of Glass-fibre 75mm wide and as long as the full length of the joint. If it is not possible to over-laminate the prepared deck immediately, then the deck should either be coated with a thin layer of Bullet Roof GRP resin or covered so as to keep out any moisture. If for any reason the deck does get wet or damp, then the roof should be dried thoroughly before the deck can be coated with the first process of laying the Glass-fibre laminate.

RANGE OF TRIMS

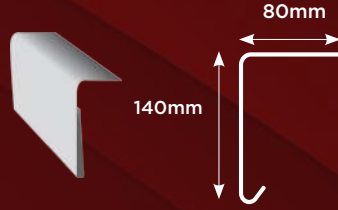
A200 STANDARD DRIP

Flat to roof edge above gutter.



A250 LARGE DRIP

Flat to roof edge above gutter.



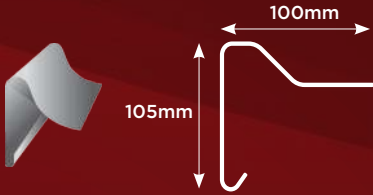
ER35/40 RIDGE ROLL

Simulates Lead



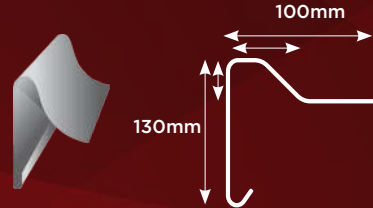
B230 RAISED EDGE

Fitted to prevent water run off.



B260 RAISED EDGE

Fitted to prevent water run off.



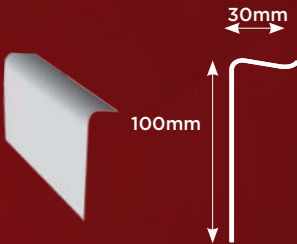
E280 EXPANSION

for use on large areas.



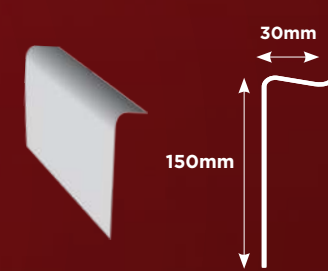
C100 SIMULATED LEAD FLASHING

Replaces traditional lead flashing



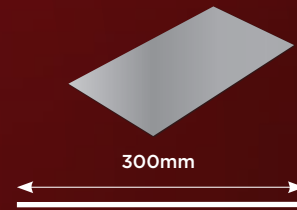
C150L SIMULATED LEAD FLASHING

Long Leg - Replaces traditional lead flashing



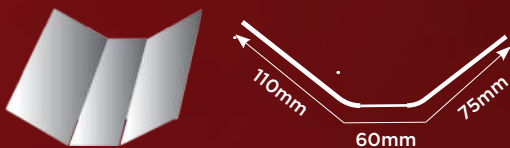
F300 FLAT SHEET

300mm flat sheets available in 5 meter lengths.



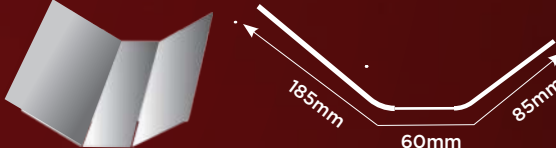
D260 ANGLE FILLET

Buts up against up-stand wall.



D300 ANGLE FILLET

Wider Fillet - Buts up against up stand wall.

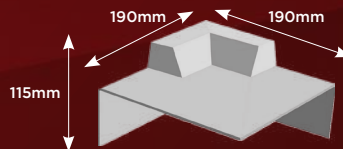


AT195 EXTERNAL & AT195 INTERNAL

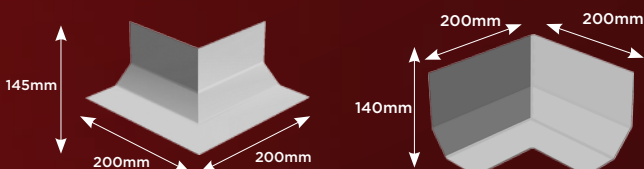
Internal and External trim, to be used for gutters floors e.t.c



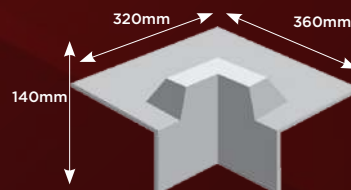
C1 UNIVERSAL EXTERNAL CORNER



C3 EXT & INT CORNER



C4 UNIVERSAL INTERNAL CORNER



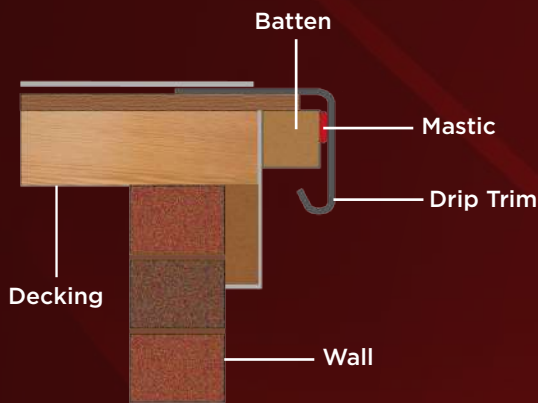
BULLET ROOF GRP

EDGE TRIMS & BATTENS FIXED

A wide range of GRP Trims are available to suit most applications and different roof configurations. Details of how to choose and fit these are shown below.

Fix a slate batten along the edge of the roof about 25mm below the deck. (Diagram 4) This should be nailed to the fascia board or to the lower side of the protruding edge of the deck sheet. If it is required that the trims stand off the roof further, two battens or a thicker piece of timber may be used.

Where it is required that the run off of water should drain into a gutter the drip fascia trim should be used.



Where water run off is not required the, raised trim should be used (Diagram 6). This is fitted in the same way as described in the previous section and may be jointed in a similar manner. Please note that the fascia must be fixed with sealant as described to ensure that the trim edges will remain in place in all conditions.

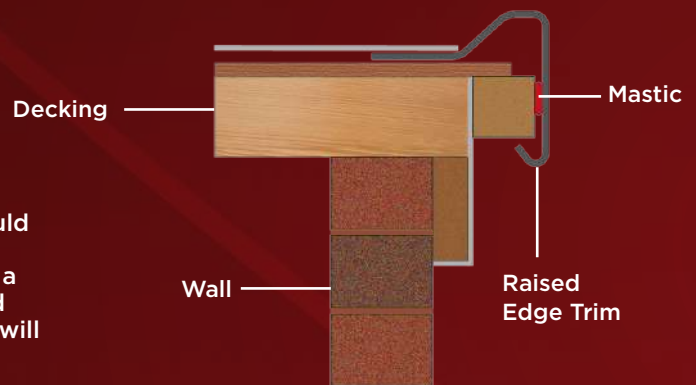
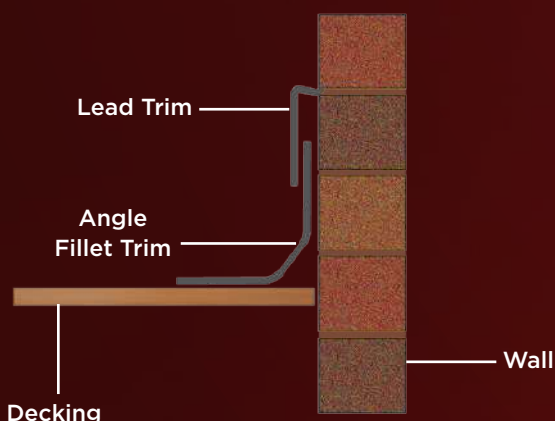


Diagram 5 - Water run off required Drip Fascia Trim

When sealing the roof edge to an abutting wall (See Diagram 7), a fillet section should be used. This should be snugged into the corner formed by the wall and roof deck as shown and fixed onto the roof by nailing with galvanised felt nails. The vertical flange of the trim should not be fixed to the wall since this is a point of movement between the roof and adjoining wall and any fixing here will stress the roof.

The simulated lead trim (Diagram 7) is now fitted into the wall overlapping the vertical flange of the fillet. The simulated lead section may be sealed into the wall, just as traditional lead flashing is fixed, and sealed into place with cement or mastic. Traditional lead may be used for this application rather than a GRP section.



Joints can be made simply by overlapping and must be sealed with mastic in the overlap just like the trim joints.

When sealing to an adjacent pitched roof FS300 flat sheet should be used. The sheet is fed under the slates and slate felt leaving about 50mm of the flashing to show for fixing. Once the flashing is fitted correctly under the slates or tiles, the "tail" should be fixed to the deck by nailing with galvanised felt nails

Corners may be achieved by mitring the trims on site and laminating over the joints with 100mm glass fibre bandage. Also the trims should be laminated using the same bandage tape.

Once the trims are fitted, the roof is ready to be laminated. The roof at this stage should have trims fitted to each edge so that the area to laminate is edged by the horizontal flanges of the rims around the perimeter.

BULLET ROOF GRP LAMINATION & CURE

Forming the glass fibre membrane on the prepared deck is really quite straight forward but requires everything to be prepared before the catalyst is added to the resin. Ensure that the deck is clean, dry and free from any surface contamination. Choose a starting point on the roof and work back towards the exit point. Firstly roll out the glass so that it is cut correctly to overlap the trims by about 50mm. The glass should not overlap the fascias. Cut the matting to the correct length. Roll up each cut length allowing 50mm overlap between each roll.

3A: Measure out enough resin for 1 cut piece of matting at 1kg/m². Never mix more than 5kgs at one time as the resin may begin to set before you have had chance to apply it.



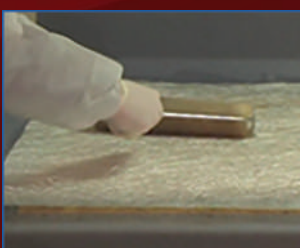
3B: Apply the resin to the deck with a lambs wool roller at the rate of 1kg per square metre if using the 450gsm Fibre-mat or 1.2kg per square metre if using the 600gsm version, ensuring that the whole area to be covered on this pass is generously wet out with resin.



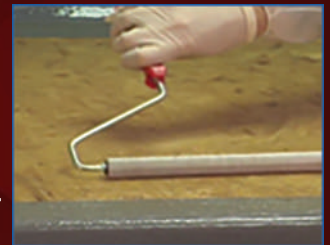
3C: Roll out the glass matting ensuring that there are no folds or kinks and that the trims are correctly overlapped.



3D: Apply more resin over the top of the glass at 0.5Kgs per square metre or 0.6Kgs per metre depending on the weight of matting being used. Ensure that there are no dry spots but if they are present, apply more resin until all of the matting is translucent.



3E: Allow 3 or 4 minutes for the glass, to wet out, then go over the whole area with a consolidating roller. You must get all the air out of the glass so that the glass fibres disappear and the grain of the timber below becomes visible as the laminate becomes transparent.



Continue this operation with the next piece of glass, overlapping the first by about 50mm - finish the last section of the roof ensuring that you are able to do so without standing on it.

3F: NOTE - It is good practice to go around the edge over the trim edges stippling with a brush to make sure that the glass is properly consolidated over the trims since this bond is vital to the integrity of the roof.



Now leave the roof to cure, this will take between 30 to 40 minutes depending on the weather conditions. The colder the conditions the longer the resin will take to cure.

If in doubt please consult Bullet Roof GRP for details. Reinforce trim corners with strips of glass, wetted out with resin.

NOTE

You will find that the resin thickens up at low temperatures and takes longer to wet the glass out. DO NOT be tempted to add more resin because of this. It is very important to achieve an even and correct glass to resin ratio.

NEVER WORK BELOW 5°C OR ABOVE 30°C AIR TEMPERATURE

IMPORTANT!!

NEVER put catalysed Resin or Top Coat back into your vehicle. Always ensure that any catalysed containers are kept separate from other materials on site and allowed to cure.

BULLET ROOF GRP

APPLYING TOPCOAT

Applying the final coating to complete the roof.

Topcoat is formulated to give a good even layer and can be pigmented to a colour of your choice. The Bullet Roof GRP standard colour is dark grey. A GRP laminate has adequate cure when it is impossible to move the glass fibre strands within the laminate. Do not stand on the laminate until it has reached this stage

We highly recommend the full roof be sanded with an electric sander using 60 to 80 grit disc's, sand off any protrusions that are sticking up e.g. Glass strands or pieces of debris, and then finally clean with Acetone to ensure the whole roof is completely clean ready for applying the BULLET ROOF GRP TOPCOAT.

Add the catalyst at the correct level and apply the Topcoat at the rate of half a kilo per square metre. It is important to keep this layer even since the appearance of the roof will depend on how well it has been applied. It should be free from runs, sags, brush marks and roller marks.

The Topcoat should be applied to the whole of the roof laminate including the edging trims. Brush or roller on vigorously to ensure an even finish and a good bond.

Always apply the Topcoat within 24 hours of laminating the roof. This will ensure that the Topcoat bonds well to the laminate and the completed roof will gradually continue its cure over the next few days although the roof will withstand light foot traffic within a few hours.



REPAIRING AND JOINTING PROCEDURE

If the roof surface becomes damaged by impact or has to be cut for any reason it can be easily repaired using the following procedure.

1. Clean off the damaged area with solvent and abrade the GRP surface with a hand grinder for a distance of 100mm from the damaged area or edge to be joined.
2. Cut the 450 or 600gm glass to the correct size to cover the affected area and mix sufficient resin with catalyst as previously described.
3. Brush resin onto the area to be laminated at the rate of 1 Kilo per square metre, place the glass over the area, wet out the glass with resin at the rate of 0.5KilosPer square metre. Stipple well with the brush or use a paddle wheel roller for larger areas.
4. Ensure that the laminate is free of air bubbles, is completely consolidated and allowed to cure.
5. Mix the Topcoat with catalyst as previously described and apply with a brush at the rate of 0.5 Kgs per square metre.
6. Allow to cure.

This procedure will ensure that the patch or joining piece applied will bond to the original laminate and form a weatherproof patch over the damaged or cut laminate.

The Topcoat is a high performance; modified resin and will behave in the same way as the base coat i.e.

**- NEVER USE IN WET CONDITIONS
- NEVER APPLY BELOW 5°C
- KEEP THE APPLICATION EVEN
- ALWAYS APPLY AS SOON AS POSSIBLE
WHEN THE LAMINATE IS CURED**




**IMPORTANT!!
NEVER put catalysed Resin or Topcoat back into your vehicle. Always ensure that any catalysed containers are kept separate from other materials on site and allowed to cure.**

BULLET ROOF GRP ESTIMATING GUIDE

PROJECT DETAILS:

Catalyst required (Millilitres)	Temperature/ Catalyst required	13-19 °C	9-12 °C	5-8 °C
Quantity of Resin & Topcoat (Kg)	20-30 °C 1%	2%	3%	4%
1	10ml	20ml	30ml	40ml
2	20ml	40ml	60ml	80ml
3	30ml	60ml	90ml	120ml
4	40ml	80ml	120ml	160ml
5	50ml	100ml	150ml	200ml
6	60ml	120ml	180ml	240ml
7	70ml	140ml	210ml	280ml
8	80ml	160ml	240ml	320ml
9	90ml	180ml	270ml	360ml
10	100ml	200ml	300ml	400ml

RANGE OF TRIMS AVAILABLE:

A200 Drip  Qty:	A250 Large Drip  Qty:	C100 Simulated Lead  Qty:	C150L Long Leg Simulated Lead  Qty:	ER35/40 Ridge Roll  Qty:	E280 Expansion  Qty:
D260 Wall Fillet  Qty:	D300 Wall Fillet  Qty:	B230 Raised Edge  Qty:	B260 Raised Edge  Qty:	AT195 Ext & Int  Qty:	F300 Flat Sheet  Qty:
C1 Universal External Corner  Qty:	C3 External Corner  Qty:	C3 Internal Corner  Qty:	C4 Universal Internal Corner  Qty:		

ESSENTIAL MATERIALS

Roof Area (m ²)	Bullet Roof GRP Resin required at a coverage rate of 1.5kg/ m ² (allows for 10% wastage)		Bullet Roof GRP Topcoat required at a coverage rate of 0.5kg/ m ²		Standard Chopped Strand Matting 450gsm required (33kg covers approx 66 m ²)		Catalyst (1kg) based on 4%	Decking Boards 2.4m x 0.6m x 18mm
	Kg	N. of Tins 10kg + 20kg	Kg	N. of Tins 10kg + 20kg	M ²	Rolls (33kg)	Kg	1.44 m ² /board
5	7.5	1 + 0	2.5	1 + 0	5	1	1	5
10	15	0 + 1	5	1 + 0	10	1	1	8
15	22.5	1 + 1	7.5	1 + 0	15	1	2	12
20	30	1 + 1	10	1 + 0	20	1	2	15
25	37.5	0 + 2	12.5	0 + 1	25	1	2	19
30	45	1 + 2	15	0 + 1	30	1	3	23
35	52.5	0 + 3	17.5	0 + 1	35	1	3	26
40	60	0 + 3	20	0 + 1	40	1	3	30
50	75	0 + 4	25	1 + 1	50	1	5	38
60	90	1 + 4	30	1 + 1	60	1	6	46
70	105	1 + 5	35	0 + 2	70	2	7	54
80	120	0 + 6	40	0 + 2	80	2	7	61
90	135	0 + 7	45	1 + 2	90	2	7	69
100	150	1 + 7	50	1 + 2	100	2	7	77

These calculations are based on the recommended coverage rates stated in the above table.

Use approximately 33% more resin when using the 600gsm chop strand matting

Apply resin to the deck with a roller at the rate of 1kg per square metre if using 450gsm Fibre-mat or 1.2kg per square meter if using 600gsm.

RECOMMENDED ANCILLARIES

Roof Size (M ²)	3" Rollers	3" Roller Sleeves	6" Rollers	6" Roller Sleeves	Small laminating rollers	Large laminating rollers	Small Brushes	Large Brushes	Acetone (Litres)	Small Buckets	Large Buckets	Trim Adhesive
5	1	1	1	2	1	1	1	2	5	1	2	1
10	1	2	2	3	1	1	1	2	5	1	2	1
20	1	3	2	4	1	1	2	2	5	1	2	2
40	1	3	2	6	1	1	2	4	5	1	3	3
60	2	4	3	8	1	1	4	6	5	2	3	4
80	2	4	3	10	1	1	4	8	10	2	4	6
100	3	5	3	12	1	2	5	10	10	2	4	7