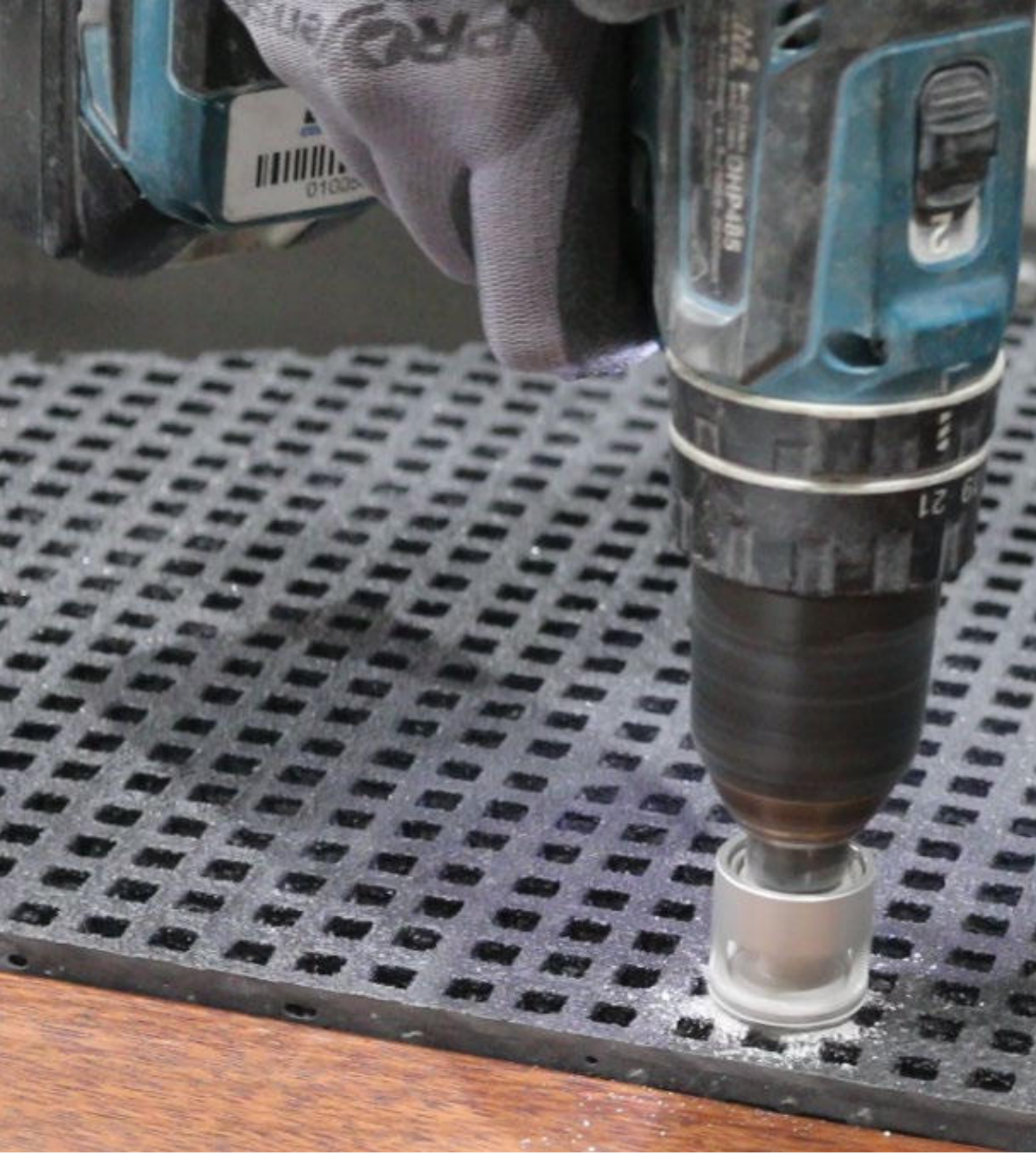


ON SITE
FABRICATION GUIDE

GRP AUSTRALIA | 2025

CONTENTS

0.0 DEFINITION

GRP - GRP Reinforced Polymer
FRP - Fibre Reinforced Polymer

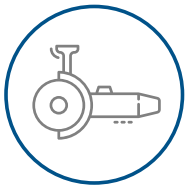
1.0 SUMMARY

Glass reinforced polymer (GRP), also known as fibre-reinforced polymer, is a composite material consisting of a polymer resin reinforced with glass fibres. The glass fibre content varies depending on the product profile, ranging from 32% in grating to 60% in pultruded profiles. GRP can also include additives such as fire retardants, colour pigments, and UV stabilisers.

The product does not meet the criteria for classification as Hazardous according to NOHSC Australia. This guide outlines various fabrication techniques employed when working with glass-reinforced polymer (GRP). The information provided is general in nature. Working with GRP typically involves skills and knowledge similar to those required for woodworking and steel fabrication.

2.0 HAND TOOLS

FRP structural sections and moulded grating can be produced using standard woodworking tools. It is advisable to use diamond-coated disks, blades, and bits as GRP is highly abrasive and will cause rapid wear on conventional tools. Below is a list of recommended hand tools for GRP fabrication:


Angle **Grinder**


Circular **Saw**


Cordless **Drill**


Impact **Driver**


Jig Saw or **Reciprocating Saw**


Demolition Saw **(Concrete Saw)**

Note: To avoid generating dust, wet cutting and grinding methods can be used.

PPE Requirements

Cutting, drilling or machining GRP produces a dust that can cause irritation to the eyes, skin, nose and throat. Workers should take steps to reduce their exposure to the dust by using suitable personal protective gear & working in well-ventilated areas. Use dust extraction or wet cutting/drilling wherever possible.
It is recommended that the following PPE be worn:

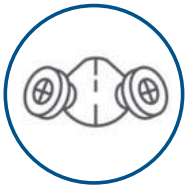
- ***Gloves, long sleeve shirt with closed collar & long pants***
- ***Particulate respirator which complies with AS/NZ 1716:2012***
- ***Eye protection (safety glasses)***
- ***Hearing protection when/if required***
- ***Protective footwear (safety toe)***

Wash all exposed skin areas thoroughly after cutting, grinding or drilling. Any clothing worn while working with GRP should be laundered separately from other clothing items. You should also rinse the washing machine before washing other types of clothing.


Protective **Gloves**


Protective **Eye wear**


Long Sleeve **Shirt & Pants**


Particulate **Respirator**


Hearing **Protection**


Protective **Footwear**

3.0 FABRICATION PRACTICES

Cutting or Sawing
When performing any cutting operation, use light, evenly applied pressure.

Ripping
For small-volume work, a hand-held circular saw is suitable for on-site fabrication. A table saw is recommended for volume ripping and will provide a more accurate cut.

Cross Cuts
A compound mitre drop saw is ideal for cross-cutting pultruded sections. For small cuts or trimming, an angle grinder is suitable.

Circular or Curved Cuts
Circular and curved GRP cuts can be made with a jigsaw, reciprocating saw, or band saw. For larger radius cuts, an angle grinder with a diamond blade is suitable. A hand router equipped with a TCT bit is also suitable. When using a router, plunge the bit into the material to a depth no greater than the bit's diameter.

Recommended Tools

Example:
CIRCULAR SAW
125mm Turbo Diamond Blade

Angle **Grinder**

Example:
CIRCULAR SAW
200mm Tile Diamond Blade

Circular **Saw**

Example:
JIG SAW BLADE
82mm Diamond Grit Blade

Jig Saw or **Reciprocating Saw**

Example:
SQUARE BLADE
457mm Segmented Diamond Blade

Demolition Saw **(Concrete Saw)**

Drill and Hole Sawing

Standard high-speed steel drill bits can be used but require regular sharpening. Diamond-coated hole saws are a suitable choice for creating larger holes. For smaller holes, spearhead TCT glass and tile bits offer an effective solution.

Example:
GLASS DRILL BIT
Tungsten Carbite

Cordless
Drill

Example:
STEP DRILL
Straight Flute

Cordless
Drill

Example:
Diamond Coated
Hole Cutter

Cordless
Drill

Example:
Diamond Coated
Countersink Tool

Cordless
Drill

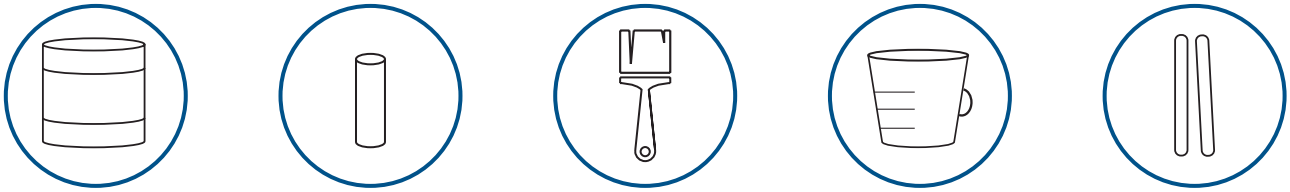
Grinding & Sanding

GRP can be ground or sanded by conventional means. Note that this may remove the veil coat and the part may need to be sealed as per section (Sealing, pg 7) - fabrication guide.

Sealing - Exposed cuts & Drill holes

It is strongly recommended that all cuts & drill holes in FRP Components be sealed using a vinyl ester resin and catalyst. Vinyl Ester resin provides durable sealing for exposed fibers from the fabrication process. GRP Australia offers sealing kits; only one coat is needed, drying in up to 12 hours. For light-duty use, an alternative to the two-pack resin kit is a polyurethane aerosol spray, such as Rust-Oleum 2x Ultra Cover Stain Clear Spray Paint.

GRP AUSTRALIA Resin Kit includes:



500ml Resin | **Catalyst** | **Application Brushes** | **Measuring Cup** | **Mixing Utensils**

Note: Shipping restriction apply to GRP Australia Resin Kits

Aerosol Spray Sealant	Two-Pack Resin Kit
	

Painting GRP Pultruded Products

Although GRP includes UV inhibitors to protect against sunlight, prolonged exposure to direct sunlight can cause the surface to develop a chalk-like appearance. This degradation depends on the level of UV exposure. For any installation in direct sunlight, we strongly recommend painting the FRP to extend its lifespan and maintain its appearance. However, indoor applications do not require coating as they are sheltered from UV damage.

- **Recommended Paints**

Domestic Applications: For non-harsh environments, a good quality outdoor acrylic paint.

Commercial Applications: In harsher conditions, a 2-Pack Polyurethane Base and Hardener is recommended for optimal durability.

- **Preparation**

Proper surface preparation ensures the best paint adherence and finish quality, whether the GRP is new or weathered.

For new GRP: *Begin by cleaning the surface with a 'Wax and Grease Remover' to eliminate residues.*

For weathered GRP: *Clean the surface thoroughly with water to remove any accumulated dust and debris.*

- **Painting Techniques**

Different application tools can be used for painting GRP, each delivering distinct finishes. Choose the right method based on the desired outcome and available tools:

Brush: *Ideal for small areas or touch-ups. Apply thin, even coats to avoid visible brush strokes. A high-quality synthetic brush works best to achieve smooth coverage.*

Roller: *Suitable for larger flat surfaces. Use a foam or short-nap roller for even paint distribution. Multiple coats may be required to ensure full coverage and a polished finish.*

Spray Gun: *Recommended for professional-level results and an even, glossy finish. Use a spray gun with adjustable settings to control paint flow and achieve uniform coverage. Ensure adequate ventilation and wear appropriate protective gear during spray painting.*

With these guidelines, GRP surfaces can be effectively coated to maintain their aesthetic appeal and structural integrity, whether they are installed indoors or exposed to direct sunlight.

Brackets & Fastening

- **Screwed Connections**

Self-drilling and self-tapping screws are effective for securing stainless steel brackets to FRP materials, eliminating the need for pre-drilled holes and streamlining assembly. Using high-quality stainless steel screws prevents corrosion, ensures durability, and combined with proper alignment and insertion techniques, creates a secure and lasting connection.

- **Bolting**

Exercise caution when tightening bolts on hollow sections to prevent crushing. Avoid over tightening. Use large flat washers (3D) on both sides of the bolted connections to spread the bearing load.

- **Rivet Nuts**

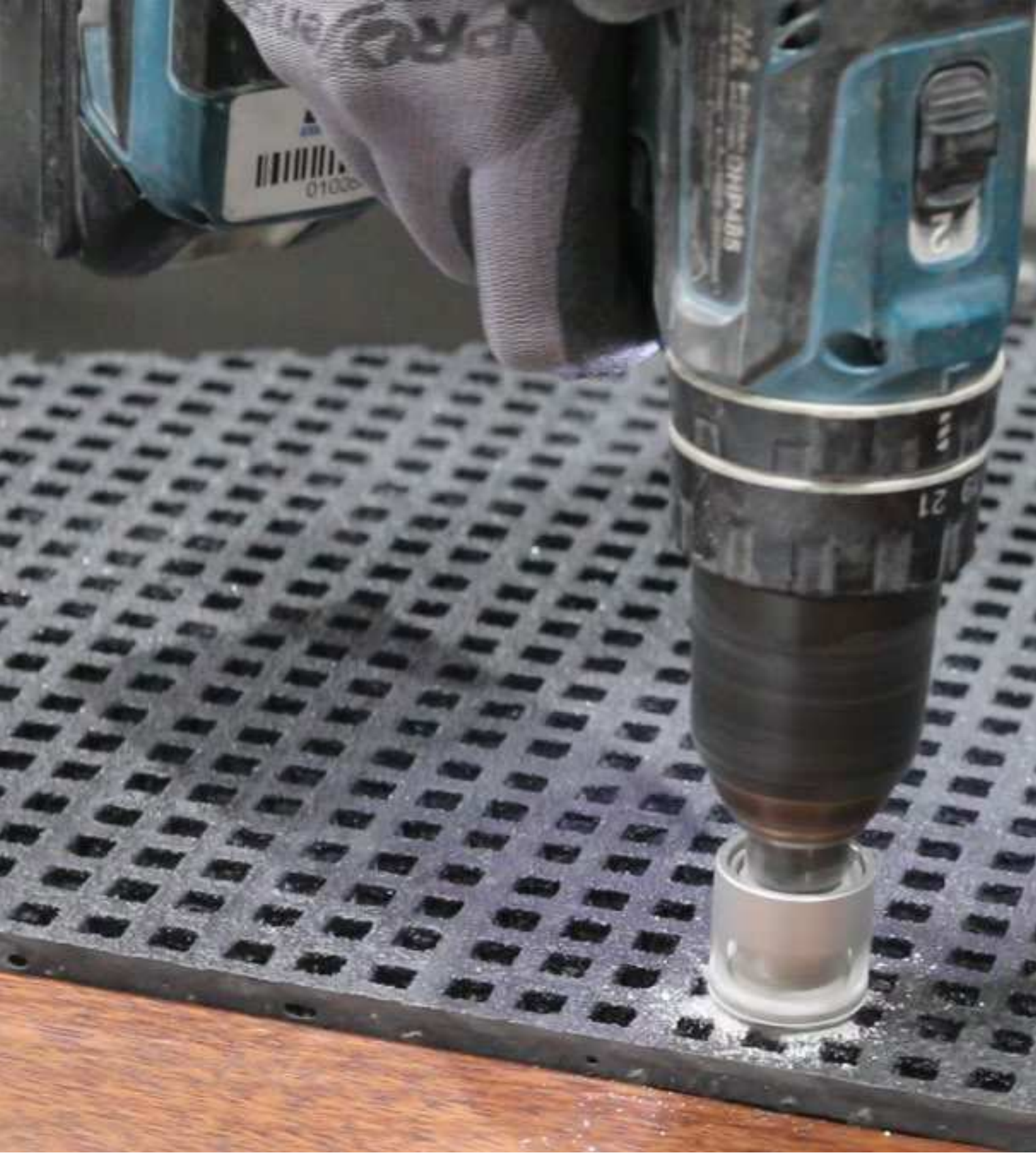
When jointing to hollow sections Rivet nuts become a viable option to consider.

- **Riveting**

Rivets can be used when attaching thin members and plates to GRP. It is important to use the correct length rivet & hole size to suit.

- **Adhesive/Bonded Connections**

For strong bonds between GRP surfaces using adhesives, proper preparation and the correct adhesive are crucial. Prepare the mating surface by sanding, followed by the application of a suitable solvent such as methylated spirits. Ensure the surface is thoroughly wiped dry prior to proceeding. Apply adhesive in a controlled environment, considering temperature and humidity for optimal curing. Combining adhesive bonding with mechanical fixings yields superior results. Bonded connectors for structural applications should be used with a mechanical fastening system. This is because bonded surfaces can fail suddenly without warning.



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