FRP COMPOSITE FASTENERS

PRODUCT GUIDE

GRP AUSTRALIA | 2026

FRP COMPOSITE FASTENERS

GRP Australia composite fasteners are made from epoxyresin with E glass fiber reinforcement which gives them several advantages overtraditional fasteners.

Corrosion resistance

GRP Australia composite fasteners are resistant to aggressive fluids and gases including, salt water, acid and caustic environments.

Non-conductive and Non-magnetic

The glass fiber and epoxy resin composite make an excellent insulator system due to their natural non-conduciveness and non-ferrous nature.

Thermal Properties

The epoxy fasteners have low thermal conductivity and so ideal for use in refrigeration and HVAC systems.

APPLICATIONS

- Flue gas desulphurization plants
- Onshore/off shore engineering
- Chemical plants
- Hydraulic engineering, sewage treatment plants, desalination of seawater
- Onshore/off shore engineering
- Transformers, dry-type and oil immersed
- Generators
- Switchgears
- Instrument construction, high-frequency systems
- Refrigeration and air conditioning
- Cable trays
- Electrostatic powder coating
- Electroplating plants

MATERIAL PROPERTIES OF THREADED ROD, BOLTS AND NUTS

The FRP rods are manufactured using a pultrusion process using E Glass fibers in a matrix of epoxy resin. Material properties of the pultruded rods are shown in the table below.

Pultruded material is anisotropic as the glass fibers are aligned in the longitudinal direction of the rods. In the production of threaded rods, bolts and nuts, the threads are machined into the pultruded rods.

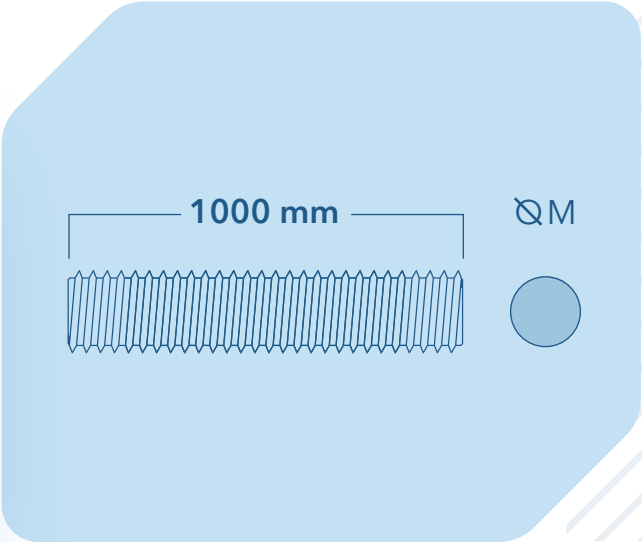
Technical Specification	Unit	Specification Value
Density (at 20 C°±2 C°)	g/cm^2	2.2 – 2.35
Water absorption rate (at 20 C°±2 C°,24h)	%	≤ 0.05
Tensile Strength – Longitudinal only	MPa	≥ 1200
Shear Strength	MPa	≥ 260
Shearing strength along laminas	MPa	≥ 50
Bending Strength	MPa	≥ 960
Bending strength at 150 C°	MPa	≥ 350
Torsion strength	MPa	800
Water diffusion test (1%NaCl, Boiling for 100h 12Kv/1Min)	mA	≤ 0.1
Volume resistivity (140 C°,96h)	Ω.m	$\geq 10^{10}$
DC withstand voltage (10mm)	kV	≥ 50
Lighting surge withstand voltage (100Kv, 10mm)	Times	≥ 5

PRODUCTS

Threaded Rods

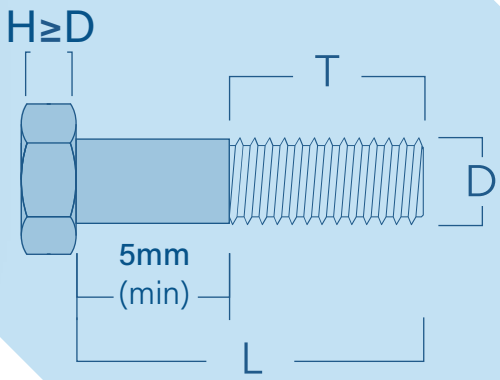
Standard threaded rod sizes are noted below and stocked in 1000mm lengths. These can be cut to client requirements. All threads are Metric coarse threads.

Size	Availability	Length (mm)	Colour
M10	To Order	As Required	Light Green
M12	Std Stock Item	1000	Light Green
M16	Std Stock Item	1000	Light Green
M20	Std Stock Item	1000	Light Green
M24	To Order	As Required	Light Green



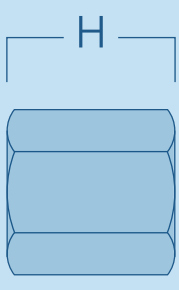
Composite Bolts

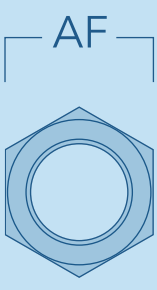
We're equipped to manufacture composite bolts to your precise specifications, offering thread sizes from M10 to M24. To proceed with an order, you will need to supply the following dimensions outlined in the accompanying diagram, while adhering to minimum order quantities. MOQ for custom bolts is 100.



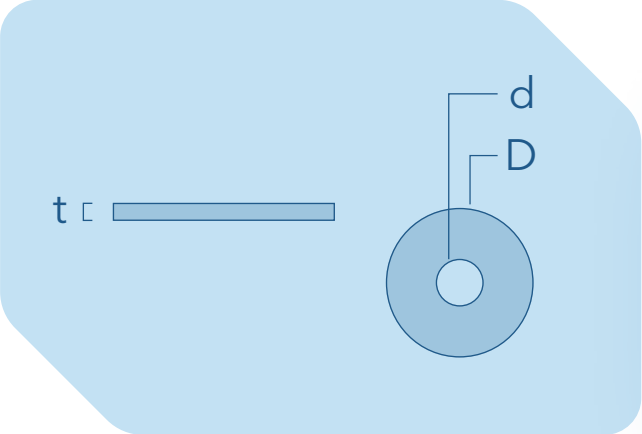
Composite Hex Nuts

Size (mm)	AF	H	Max Recommended Torque / Nm
M10	20	21	Design for Purpose
M12	20	24	30
M16	25	32	55
M20	32	40	150





Composite Round Washer Dimensions

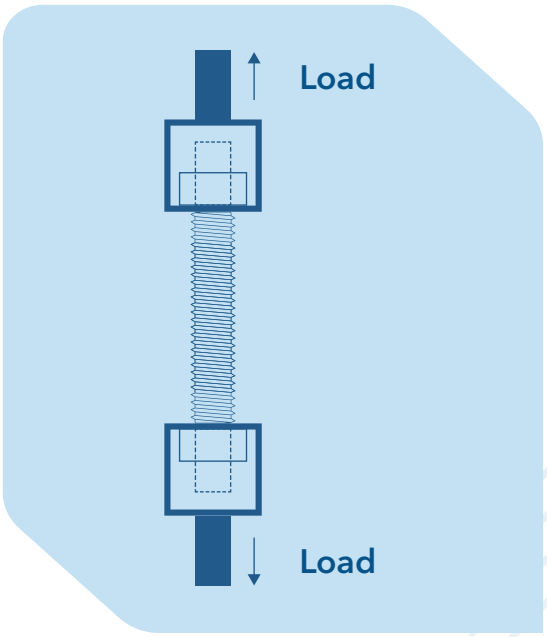


Size (mm)	D	d	t
M10	20	11	2
M12	25	13	2
M16	32	17	3
M20	36	21	3

Breaking Load

Testing was conducted on the FRP bolt, paired with a nut whose height equaled twice its diameter, to ascertain its average breaking load under tension. The predominant failure mode observed was the stripping of the rod threads.

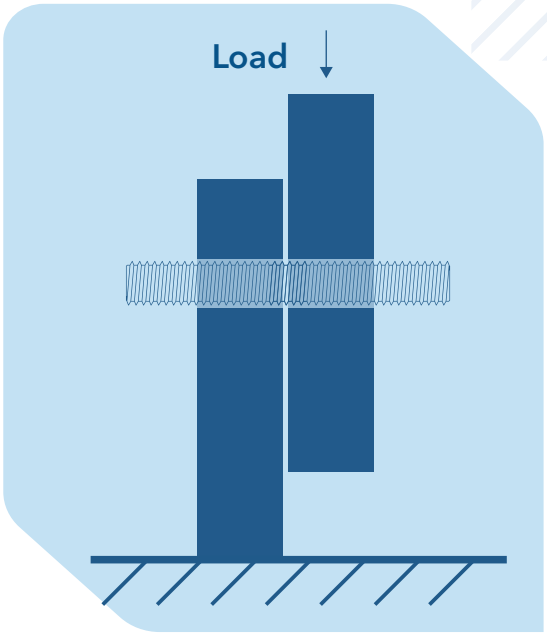
Design considerations should include corresponding safety factors. It's recommended that the long-term tensile load remains below 50% of the noted breaking load.



Size (mm)	Average Ultimate Breaking Load kN
M10	10
M12	13.5
M16	37
M20	54.5

Single Shear Across Threads

Ultimate Bolt shear loads using Single Shear fixture to ASTM F606



Size (mm)	Ultimate Shear Capacity kN
M10	16
M12	22
M16	40
M20	68

Using FRP Bolts and Nuts

Due to FRP threaded rods and nuts having a relatively high coefficient of thread friction compared to steel, premature failure can be experienced in some cases.

In order to guarantee FRP Bolts and Nuts reach the maximum stated load, the following can be done.

- Reduce the thread friction by:
  - Oiling the threads.
  - Teflon coating for the threaded rods/nuts.
- Pretension of components, which allows a tension-free tightening of the screw.
- The use of torque wrenches for a uniform clamping.

CONTACT US:

GRP Australia

936 Nudgee Rd, Banyo. QLD. 4014

sales@grpaustralia.com.au

07 3252 1244