

BluGeo GRP60

GRP CONTINUOUSLY THREADED SOLID BAR

BluGeo GRP60 is a Glass-Fibre Reinforced Plastic continuously threaded solid bar which forms a high load carrying capacity ground anchor and soil nail.

BluGeo GRP60 has been designed as an easy to install, light weight, durable alternative to traditional steel bar suitable for civil engineering applications. BluGeo GRP60 is designed for use with our specialised BluCem grout system for applications including temporary and permanent face stabilisation, slope stabilisation, ground support and systematic rock bolting. BluGeo GRP60 is used where additional durability or ease of application is required over traditional anchoring systems.

Application Advantages

- Light weight and easy to install
- No sheathing required
- Reliable single stage grouting process
- Easily transportable
- Cost effective

Lifecycle Advantages

- High tensile and shear strengths
- Highly durable and corrosion resistant
- Acid resistant
- Cuttable for future excavation
- Non - conductive: eliminates stray currents

About the Product

BluGeo GRP60 is a high strength, durable threaded bar which provides a corrosion resistant and light weight alternative to steel bar. The product incorporates a unique manufacturing process and the highest quality vinyl ester resins for a strong and durable product. For over 50 years, GRP manufactured using vinyl ester resin has been the preferred choice for applications in a range of challenging civil engineering environments and has an impressive track record across other industries. This light weigh alternative comes in a range of thread diameters and lengths suitable for various load carrying scenarios. The high specification glass fibres and resins, combined with the most stringent manufacturing processes, ensure the production of highest quality bar

Application Solutions

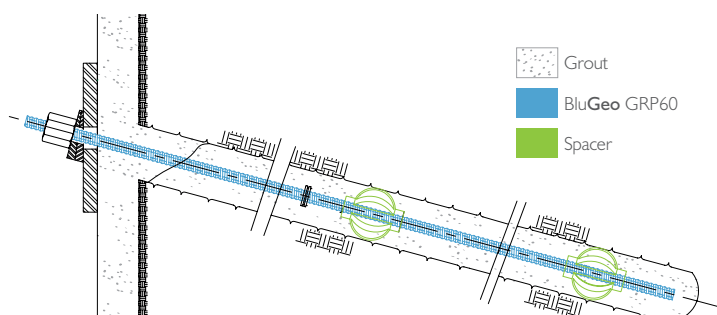
- 100 year design life rock support
- Slope stability
- Ground anchors
- Roof support
- Rock reinforcement
- Concrete reinforcement

Project Specification Clause

GRP CONTINUOUSLY THREADED SOLID BAR - The ground support bolt used for this project shall be a glass fibre reinforced bar manufactured using vinyl ester resins. The threaded bar shall be fabricated using pultrusion methods with a formed thread and fibres running continuously along the length of the bar. Threads shall not be cut or moulded onto the bar. It shall be a pre-fabricated product that has independent testing to validate the performance outlined in the technical data table on the following pages. BluGeo GRP60 manufactured by Bluey Technologies or equivalent shall be accepted.

Project Examples

Tunnel rock support, road cuttings, rail cuttings, basement construction, mining, marine structures.



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Application Specification

Installation Procedures

Outlined below are minimum requirements for installation of BluGeo GRP60 - GRP soil nails and anchors.

HANDLING

- 1.1 Gloves should be used always when handling the GRP bars.
- 1.2 Gloves, safety glasses and dust mask must be worn as a minimum when cutting GRP bars.

STORAGE

- 2.1 The product must be stored on site where it will be safe from damage or contamination.

INSTALLATION OF GRP BAR INTO BORE HOLES

- 3.1 The bars must be inspected prior to the installation to ensure there is no damage to the bar or the thread.
- 3.2 If the bar or thread is damaged, either replace the bar or cut out the damaged section and couple together with a new section of undamaged bar.

INSTALLATION OF THE NUTS AND COUPLERS

- 4.1 Ensure the correct nut and/or coupler has been selected in accordance with design requirements.
- 4.2 Before the installation of the nut or coupler the thread must be checked to ensure there is no damage.
- 4.3 Ensure the thread is clean and free of contaminants such as grout, concrete, oils, grease etc.
- 4.4 When installing the nuts, they must only be hand tightened to a 'snug' fit against the plate ensuring there is no gap. If there is any angle compensation an approved dome ball washer may be used to compensate for the angle.
- 4.5 Be sure not to apply any torsion or torque as the BluGeo GRP60 bars are only rated to a low torsion load.
- 4.6 If an initial load is required contact Bluey for advice on applying the load.

Testing Procedures

Outlined below are minimum requirements for testing BluGeo GRP60 - GRP soil nails and anchors.

SETTING UP TESTING FRAME

- 1.1 When using timbers or steel whalers or a test frame you must ensure that they are secured to the slope or wall and transferring the load to the soil, not to the grout or nail.
- 1.2 The testing frame must be set up to ensure that everything is square and the nail is being pulled in direct tension. The bar must not bend or twist in any direction.
- 1.3 There must be a nominated free length when testing. Ensure the GRP bar isn't secured into the concrete facing or grout pad.

TESTING EQUIPMENT

- 2.1 Ensure the testing equipment has been calibrated.

INSTALLATION OF THE NUTS

- 3.1 Ensure the correct nut has been selected in accordance with design requirements.
- 3.2 Before the installation of the nut the thread must be checked to ensure there is no damage to the thread.
- 3.3 Ensure the thread is clean and free of contaminants such as grout, concrete, oils, grease etc.
- 3.4 When installing the nuts they must be only hand tightened to a 'snug' fit against the plate ensuring there is no gap. If there is any angle compensation an approved dome ball washer may be used to compensate for the angle.
- 3.5 Be sure not to apply any torsion or torque as the BluGeo GRP60 bars have a low torsion load rating.
- 3.6 When installing the nuts there must be a minimum of 3 threads (30mm) protruding from the nut.
- 3.7 Do not test to loads above 90% of the rated load for the nut or coupler used for testing. The rated loads are outlined on the Technical Data Sheet.
- 3.8 If you exceed the capacity of the nut or coupler the GRP thread is likely to strip.
- 3.9 The rate of load application must not exceed 5kN/minute.

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Product Data

Please refer to Important Notice on following page

Outer Diameter	22mm	25mm	32mm	40mm
Unit Weight	0.69kg/m	0.9kg/m	1.5kg/m	2.1kg/m

TESTED CHARACTERISTIC	STANDARD	RESULT			
		22mm	25mm	32mm	40mm
Tensile Stress Area	ACI440.3R-4	250mm ²	346mm ²	580mm ²	950mm ²
Ultimate Tensile Strength*	ISO 10406-1 CSA-S806-02	250kN	350kN	560kN	860kN
Shear@90°	DIN 21521	115kN	170kN	245kN	420N/mm ²
Shear@50°	DIN 21521	-	345kN	490kN	-
Tensile E-Modulus	ACI440.3R-4	60GPa			
Electrical Resistance	FM 5-578	>1000kΩ/cm			

ULTIMATE NUT LOADS:	STANDARD	RESULT			
		22mm	25mm	32mm	40mm
GRP Dome Nut	ISO 10406-1	60kN	70kN	90kN	90kN
GRP Power Nut	ISO 10406-1	100kN	180kN	180kN	-
Steel Duo Nut (Power Nut)	ISO 10406-1	-	300kN	450kN	800kN
DT Steel Nut (150mm)	ISO 10406-1	-	220kN	320kN	380kN
Steel Coupler (300mm)	ISO 10406-1	-	220kN	320kN	380kN

* Appropriate reduction factors must be applied in accordance with relevant design Standards such as AS4678 and BS8006.

Please contact Bluey for further advice and recommended reduction factors.

Accessories

GRP domed nut and plate

GRP power nut and plate

Couplers

Steel nuts and plate

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Contact Bluey

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