MasterGeo GRP BAR (formerly BluGeo GRP60)

Continuously threaded solid bar

Material Description

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

MasterGeo GRP BAR has been designed as an easy to install, light weight, durable alternative to traditional steel bar suitable for civil engineering applications.

MasterGeo GRP BAR is designed for use with our specialised MasterCrete grout system for applications including temporary and permanent face stabilisation, slope stabilisation, ground support and systematic rock bolting. **MasterGeo GRP BAR** is used where additional durability or ease of application is required over traditional anchoring systems.

Areas of Application

- Rock bolting and soil nailing – provides structural support in tunnelling and underground excavations.
- Temporary ground support – stabilizes rock and soil during construction phases.
- Pre-support measures (e.g., forepoling and spiling) – reinforces weak ground conditions in tunnels and deep excavations.
- Ground stabilization in underground mines – strengthens mine walls and ceilings to enhance safety.
- Roof and rib support – prevents collapses in mining and underground structures.
- Cuttable reinforcement for safe excavation – allows for easier cutting through reinforced areas without damaging equipment.
- Slope stabilization – reduces landslide risks on steep terrain and excavated slopes.
- Retaining wall reinforcement – strengthens retaining structures to support soil loads.
- Bridge abutments and decks – provides lightweight, corrosion-resistant reinforcement for bridge structures.
- Concrete reinforcement where non-corrosive reinforcement is needed – ideal for applications requiring high durability in harsh environments.
- Tunnel reinforcement – Enhances stability and longevity in tunnel linings and excavation support.
- Embankment stabilization – Prevents soil erosion and maintains structural integrity in road and rail embankments.
- Road cut and slope protection – Strengthens roadside excavations and cuttings to prevent failures.
- Reinforcement in corrosive environments – Ideal for structures exposed to water, chemicals, or harsh weather.
- Seawalls, piers, and docks – Provides durable reinforcement in marine and coastal applications.

Performance Data

Performance Properties	25mm	32mm	40mm
Tensile Stress Area (ACI440.3R-4)	346mm^2	580mm^2	950mm^2
Ultimate Tensile Strength* (ISO 10406-1 CSA-S806-02)	350kN	560kN	860kN
Shear @ 90° (DIN 21521)	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		

** Appropriate reduction factors must be applied in accordance with relevant design Standards such as AS4678 and BS8006. Please contact Master Builders Solutions for advice and recommended reduction factors.*

Accessories

- GRP domed nut and plate
- GRP power nut and plate
- Couplers
- Steel nuts and plate

GRP Accessories Performance Data

Ultimate Nut Loads (ISO 10406-1)	25mm	32mm	40mm
GRP Dome Nut	70kN	90kN	90kN
GRP Power Nut	180kN	180kN	
Steel Duo Nut (Power Nut)	300kN	450kN	800kN
DT Steel Nut (150mm)	220kN	320kN	380kN
Steel Coupler (300mm)	220kN	320kN	380kN

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Application

Outlined below are minimum requirements for installation.

Handling

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

Installation of GRP Bar Into Bore Holes

The bars must be inspected prior to the instillation to ensure there is no damage to the bar or the thread.
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

Ensure the correct nut and/or coupler has been selected in accordance with design requirements.
Before the installation of the nut or coupler the thread must be checked to ensure there is no damage.
Ensure the thread is clean and free of contaminates such as grout, concrete, oils, grease etc.
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.
Be sure not to apply any torsion MasterGeo GRP BAR or torque as the MasterGeo GRP BARs are only rated to a low torsion load.
If an initial load is required contact Master Builders Solutions for advice on applying the load.

Testing Procedures

Outlined below are minimum requirements for testing MasterGeo GRP BAR - GRP soil nails and anchors.

Setting Up Testing Frame

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.

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.
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

Ensure the testing equipment has been calibrated.

Installation Of the Nuts

Ensure the correct nut has been selected in accordance with design requirements.
Before the installation of the nut the thread must be checked to ensure there is no damage to the thread.
Ensure the thread is clean and free of contaminates such as grout, concrete, oils, grease etc.
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.
Be sure not to apply any torsion or torque as the MasterGeo GRP BARs have a low torsion load rating.
When installing the nuts there must be a minimum of 3 threads (30mm) protruding from the nut.
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.
If you exceed the capacity of the nut or coupler the GRP thread is likely to strip.
The rate of load application must not exceed 5kN/minute.

Storage

MasterGeo GRP BAR must be stored on site where it will be safe from damage or contamination.

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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. MasterGeo GRP BAR manufactured by Master Builders Solutions or equivalent shall be accepted.

Disclaimer

MasterGeo-GRPBAR-ANZ-V1-0325

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