

Glass Fiber Reinforced Polymer (GFRP) Bolting System

DESCRIPTION

Normet's range of Glass Fiber Reinforced Polymer (GFRP) rock reinforcement provides an alternative to steel products for applications where steel is unsuitable. GFRP is a composite material made of high-tensile fibers embedded in a polyester or epoxy resin matrix. This composition offers unique properties, including exceptional tensile strength, light weight, corrosion resistance, and durability. Additionally, GFRP is chemically inert, non-magnetic, and easily cut by common excavation equipment, making it ideal for temporary excavation support.

In self-drilling applications, the hole drilling and reinforcement installation are combined into a single product, offering rapid installation in varied and complex ground conditions, thereby mitigating the need for temporary support.

KEY BENEFITS

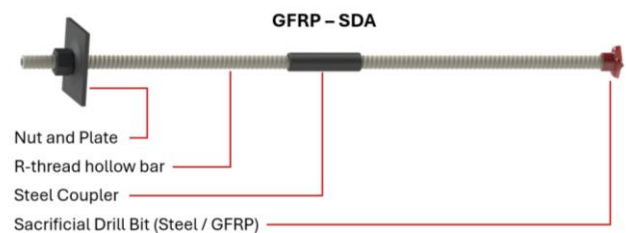
GFRP bolts are typically installed in applications where non-steel reinforcement is preferred. Below are the main GFRP characteristics:

- › **Stronger than Steel:** GFRP reinforcement offers exceptionally high tensile strength compared to its steel counterparts. This higher specification can result in cost-saving design opportunities and optimizations
- › **Lightweight:** GFRP reinforcements are four times lighter than steel, resulting in ease of handling, faster installation, and cost savings on labour and transportation.
- › **Corrosion Resistant:** GFRPs are non-steel, durable materials that prevent premature bolt failure. Its exceptional corrosion and chemical resistance result in long durability and a long lifespan, making it an ideal and cost-effective alternative to coated steel.
- › **Cutability:** GFRPs are easily cuttable and crushable, reducing concerns about steel being hauled and transported on conveyors into crushers, where steel elements can cause significant damage. It also eliminates resources and efforts associated with removing support elements from excavated ground.
- › **Sustainability:** GFRPs offer direct reductions in embodied carbon, and their higher strengths provide opportunities for further material reduction through design optimization.

TYPICAL APPLICATIONS

- › Mining and tunnelling applications
- › Temporary or permanent applications
- › Excavations needing immediate support
- › Radial/Systematic bolting
- › Face stabilization
- › Slope stabilization and soil nailing
- › Civil and hydro structures

FUNCTIONALITY & INSTALLATION



Self-Drilling GFRP Bolts

Normet's GFRP self-drilling system consists of a GFRP fully coarse-threaded hollow bar and a sacrificial steel drill bit. The hole is drilled using this anchor bolt system, and afterward, the system remains in the hole to function as the anchor bolt.

Grouting is performed either simultaneously with installation or after installation (post-grouting), using a suitable grouting or pumpable resin, such as Normet's TamPur RBG.

The typical application of self-drilling anchors involves roto-percussion drilling through mechanized or semi-mechanized methods, similar to conventional drilling in boreholes. For self-drilling GFRP bolts, installation is done with careful control over percussion, rotation speed, torque, and drilling rate. Contact your local Normet representative for installation guidelines specific to your application.

GFRP SDAs can be extended using steel couplers; however, ideally, a single continuous-length bolt is preferred whenever possible.

The GFRP self-drilling system is ideal for temporary or permanent applications where minimizing steel components is essential, particularly in soft and loose ground conditions.

GFRP Self-Drilling Bolts

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normet

ROCK REINFORCEMENT

TECHNICAL DATA SHEET

TECHNICAL DATA

Self-Drilling GFRP Bolts (GFRP – SDA)

Product		R32	R38
Hollow Bar	Outer Dia.	32 mm	38 mm
	Inner Dia.	15 mm	20 mm
	Thread Direction	Left	Left
	Linear Wt.	1.20 kg/m	1.52 kg/m
	Pitch	12.7 mm	12.7 mm
	Ultimate Load	365 kN	500 kN
	Torsion	300 N-m	420 N-m
Plate	Dimensions	150 mm x 150 mm x 6 mm	150 mm x 150 mm x 8 mm
	Hole Dia.	35 mm	41 mm
Nut	SW	46 mm	55 mm
	Length	100 mm	100 mm
	Head Breaking Load	180 kN	250 kN
Coupler	Outer Diameter	40 mm	50 mm
	Length	200 mm	200 mm
	Load	180 kN	250 kN
Sacrificial Drill Bits	Steel Types: EC, ES, ESS, EW, EX, EXX, EY GFRP Type: EX		

Whilst any information and/or specification contained herein is to the best of our knowledge, true and accurate, we always recommend that a trial be carried out to confirm suitability of the product. Please note regional climatic conditions may cause a variation in the performance of the product. No warranty is given or implied in connection with any recommendations or suggestions made by us or our representatives, agents or distributors. The information in this data sheet is effective from the date shown and supersedes all previous data. Please check with your local Normet office to confirm that this is current issue.