

ROCK REINFORCEMENT

GFRP Self-Drilling Bolts Glass Fiber Reinforced Polymer (GFRP) Bolting System



Normet's Glass Fiber Reinforced Polymer (GFRP) rock reinforcement systems offer superior alternatives to steel in applications where steel is unsuitable. Made from high-tensile fibres embedded in a polyester or epoxy resin matrix, GFRP offers greater tensile strength than steel while being four times lighter, ensuring easier handling and logistics. It is highly durable, corrosion-resistant, non-magnetic, chemically inert, and easily cuttable, making it suitable for both temporary and permanent applications.

Normet's Self Drilling GFRP bolts offers a solution where hole drilling and reinforcement installation is combined into a single product, offering rapid installation in varied and complex ground conditions, mitigating the need to install temporary support.

WORKING PRINCIPLE

Normet's GFRP self-drilling system is composed of a GFRP fully coarse thread hollow bar and a sacrificial steel drill bit. The hole is drilled using this anchor bolt system through typical mechanized or semi-mechanized methods similar to conventional borehole drilling, 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 GFRP self-drilling system is ideal for temporary or permanent applications where minimizing steel components is essential, particularly in soft and loose ground conditions.

BENEFITS

- > **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.

RANGE AND SPECIFICATIONS

GFRP Self-Drilling Bolts		R32	R38
Hollow Bar	Outer Dia. (mm)	32	38
	Inner Dia. (mm)	15	20
	Thread Direction	Left	Left
	Linear Wt. (kg/m)	1.20	1.52
	Ultimate Load (kN)	365	500
	Torsion (N-m)	300	420
Accessories	Plates, Nuts and Couplers		
Sacrificial Drill Bits	Steel Types: EC, ES, ESS, EW, EX, EXX, EY GFRP Type: EX		