

# Solid Bar GFRP Bolting Technologies For Sustainability

## Description

Composite technologies positively benefit the environment and your workforce. One type of product group is Glass Fibre Reinforced Polymer (GFRP) bolts, reducing CO<sub>2</sub> emissions in manufacturing and transportation. A substantially lower weight compared to steel improves the work environment and increases productivity. A variety of GFRP products are available for use in various applications including continuous thread bars, self-drilling bolts, cable bolts, hollow bars, reinforcement bars and meshes.

Advantages include:

- Corrosion resistance
- Ease of cutting
- Electrically insulated
- Flexibility for installation in confined spaces
- High tensile strength
- High torsional strength
- High thermal isolation
- Lightweight (up to 75% lighter than steel)
- A wide range of diameters and shapes in solid or hollow bar

Typical Units	Solid Bolt						
	M20	M22	M25	M27	M30	M32	M38
Outer diameter (mm)	20	22	25	27	30	32	38
Tensile stress area (mm <sup>2</sup> )	200	250	346	400	510	580	830
Ultimate load (kN)	200	250	350	400	490	560	750
Tensile E-Modulus (N/mm <sup>2</sup> )	50 000	50 000	50 000	50 000	50 000	50 000	50 000
Weight (kg/m)	0,560	0,69	0,9	1,04	1,33	1,5	2,1

To meet project requirements additional alternate technical specifications and sizes as well as alternate composite technologies are available.

## Environmental, Productive, Sustainable:

- Lower CO<sub>2</sub> emissions for projects by up to 60%
- Improve productivity and reduce user strain by lower weights and flexibility to cut on site
- Reduce downstream costs such as damaged crushers or conveyer belts in mining and easier cutting in excavations or construction works reducing wear on cutting tools.

## Applications

GRFP solid bolting technologies are used in a broad range of applications including:

### Mining:

- Roof, ribs, face and wall support in temporary use, where cutting or excavation will be required. Advantages include removing contamination and reducing maintenance at crushers and conveyer belts.
- Permanent support applications, where aggressive ground conditions occur, higher productivity requirements are needed. The light weight and easily cuttable features create ease of access and ability to size the bolt onsite.
- Environmental benefits include lower CO<sub>2</sub> emissions in manufacturing and transport. A lighter weight product means more can be transported in a single shipment reducing costs.

### Tunnelling:

- Rock bolting in permanent and temporary applications.
- Face bolting applications for all excavation works
  - Remove stray currents in blasting
  - Easier cutting for road headers and TBMs
- Improve project productivity timelines and reduce user strain through light weights and easier cuttability
- Environmental benefits include lower CO<sub>2</sub> emissions in manufacturing and transport. A lighter weight product means more can be transported in a single shipment, reducing costs.

### Construction and Repair:

- Slope stability applications including use in construction pit
  - Longer tendons that may transverse project footprint to adjacent sites may get approval to be left in ground
  - No conductivity risks
- Repair and maintenance projects
  - Remove stray currents in rail project applications
  - Ideal in aggressive and marine environments
  - More flexibility allows easier use in tight access places
- Improve project productivity timelines and reduce user strain through light weights and easier cuttability
- Environmental benefits include lower CO<sub>2</sub> emissions in manufacturing and transport. A lighter weight product means more can be transported in a single shipment reducing costs.