

MINOVA GFRP PRODUCTS.

Securing Performance. Together.
www.minovaglobal.com



GFRP PRODUCTS.

SPINSET



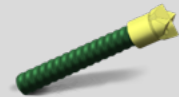
The purpose of the new SPINSET system is to provide a quick and safe bolt installation for a two-step application of GFRP rock bolts for underground mining and tunnelling applications.

POWERTHREAD



POWERTHREAD GFRP rock bolt was developed for strata support in mining and tunnelling as well as for slope and face stabilisation.

SPINMAX



SPINMAX GFRP self-drilling bolts are easily cuttable and an economical alternative offering enormous advantages for modern rapid heading methods in tunnelling.

CABLEX



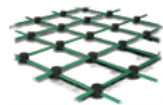
CABLEX cable bolt with its wide range of possibilities serves all applications that require long bolts e.g. long bolting of pilot tunnels in confined space, or bolting set from a parallel tunnel. It can also be used for face stabilization or slope protection.

HIPREX



HIPREX GFRP high-pressure injection system is a new development of a GFRP high torque tube, valves and integrated packer for the use of stabilising fractured rock using the combination of injecting two-component resins and bolting.

POWERMESH



GFRP POWERMESH was developed in accordance to standard grid application but with requirements to durability and/or cuttability. The high load capacity at each joint – comparable to welded steel mesh – is unique and makes the design of GFRP grid reinforced concrete structures easy for engineers or architects.

REBAR



For the temporary reinforcement of diaphragm walls the section of the reinforcement cage which will be cut by a TBM, can now be reinforced with GFRP.

THE COMPLETE SOLUTION.

Bolts alone may not be enough. Many applications require additional components to ensure the desired results. Minova provides the full range of ground support products for mining, tunnelling and surface ground engineering applications.

- ▶ Steel rock bolts & accessories
- ▶ Shotcretes & membranes
- ▶ Resin capsules
- ▶ Pumpable and injection resins
- ▶ Pumpable grouts
- ▶ Application equipment



SPINSET.

SPINSET bolts provide a quick and safe bolt installation for a two-step application of GFRP rock bolts for underground mining and tunnelling applications.

TWO-STEP SOLUTION

The set consists of the spin bolt, nut and plate for an improved installation procedure especially in hard coal mines.

The purpose of this GFRP system is the accelerated and pre-tensioned installation of groups of bolts during systematic bolting for advanced strata support in mine galleries.

Following borehole drilling, Lokset resin capsules are inserted and the bolt is spun with ease.

The nut allows an initial torque for spinning in, afterwards free running for tensioning and lastly, a protection against over-spin of the bolt shaft.

The result is a safe, quick and very cost-effective system and installation procedure.

ADVANTAGES

- Anti over spin function
- Easy handling
- Continuous installation process
- Installation time saving
- High torque resistance
- Antistatic coating (optional)
- High loading

APPLICATION FEATURES

- Permanent support
- Temporary application
- Pre-stressed anchors



LOKSET COMPATIBLE

Spinset has been developed to work with our Lokset resin cartridges, helping you to maximise your bolting efficiency.



SPIN BOLT Outer diameter [mm]	Torsion strength (SPIN BOLT) [Nm]	Torsion strength (Standard GFRP Bolt) [Nm]
18	60	50
20	90	60
22	100	70
23	130	100
25	150	120
27	180	130



ANTI OVER SPIN

function

The nut allows an initial torque for spinning in, afterwards free running for tensioning and protection against overspin of the bolt shaft

SPIN NUT Colour code	Torque level [Nm]	Shear pin [Nm]	Minimum shear pin torque resistance [Nm]
White	40	35-45	-
Blue	60	45-65	60-70
Red	80	65-85	80-90
Grey	100	85-105	100-110
Black	120	105-125	120-130
Green	140	125-145	140-150
Yellow	160	-	160-170

SPIN PLATE [mm]	Plastic PP / Black	Plastic ABS/White	GFRP Natural
140	-	-	>10 tonnes
200	6-8 tonnes	10-12 tonnes	>10 tonnes
250	6-8 tonnes	10-12 tonnes	>10 tonnes

POWERTHREAD.

The POWERTHREAD GFRP rock bolt was developed for strata support in mining, tunnelling, slope and face stabilisation.

STRATA SUPPORT

Due to the continuous coarse thread profiles of Powerthread bolts they can be easily trimmed if required. The products have a high ultimate load and due to their profile offering a maximum bond with all grouting material. Powerthread bolts are available as polyester or vinylester to provide you with temporary or long term support.

The cutting ability protects machinery and equipment and prevents damage to machinery and equipment and prevents damage to machinery whilst drifting and enlarging tunnels.

The bolts and tubes have a high corrosion resistance under acid conditions and are well suited for permanent support.

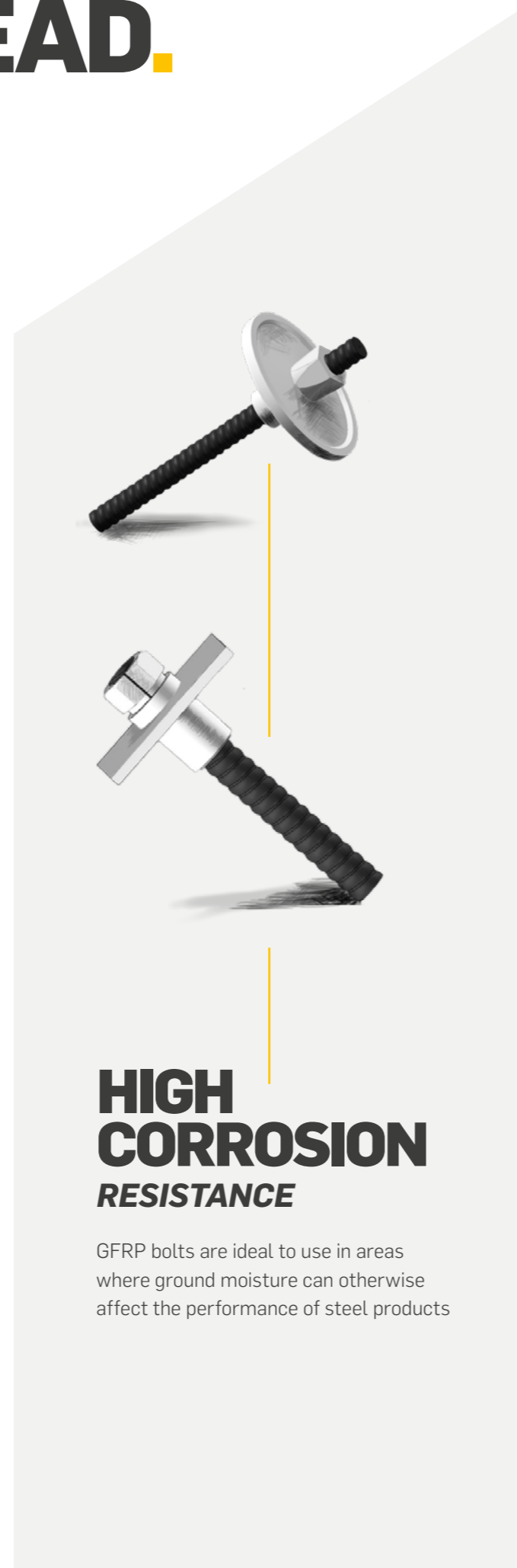
The improved flexibility of long tendons is well-suited for applications without couplings in confined locations.

ADVANTAGES

- Compatible with grouts and resins
- Cuttability
- All-thread bolt
- High tensile strength
- High loading
- Flexibility
- Low weight
- Easy handling

APPLICATION FEATURES

- Temporary application
- Permanent application
- Application without coupling in confined spaces



HIGH CORROSION RESISTANCE

GFRP bolts are ideal to use in areas where ground moisture can otherwise affect the performance of steel products

ITEM	UNIT	J64-25	J64-28	J64-32
Outer diameter	mm	25/12	28-12	32-12
Cross sectional area	mm ²	250	350	430
Ultimate load	kN	220	350	430
Breaking load thread Steel nut l=100 mm	kN	140	200	200
Breaking load thread GFRP nut l=70 mm	kN	70	70	70
Breaking load thread Powernut	kN	150	180	-
Torsion strength	Nm	80	70	100
E-Modul	GPa	40	40	40
Stain at failure	%	2.1	2.1	2.1
Weight	kg/m	0.63	0.92	1.18

ITEM	UNIT	K60-20	K60-22	K60-25	K60-27	K60-30	K60-32
Outer diameter	mm	20	22	25	27	30	32
Cross sectional area	mm ²	200	250	350	400	510	580
Ultimate load	kN	200	250	350	400	490	560
Breaking load thread Steel nut l=100 mm	kN	80	100	180	200	200	-
Breaking load thread GFRP nut l=70 mm	kN	60	60	70	70	80	90
Breaking load thread Powernut	kN	80	100	180	180	-	-
Torsion strength	Nm	60	70	120	130	180	320
E-Modul	GPa	40	40	40	40	40	40
Stain at failure	%	2.1	2.1	2.1	2.1	2.1	2.1
Weight	kg/m	0.56	0.69	0.90	1.04	1.33	1.5

SPINMAX.

SPINMAX® is a self-drilling rock bolt with advanced torque and pressure resistance.

PERMANENT SUPPORT

Due to its cuttability, the SPINMAX® self-drilling rock bolt is an economical alternative and also offers enormous advantages for modern rapid heading methods in tunnelling.

The high load-bearing capacity of the threaded profile allows strong jointing with drill bits, nuts and couplers.

The bolt has a high radial pressure resistance for injections with resins or grout and is corrosion resistant for permanent support.

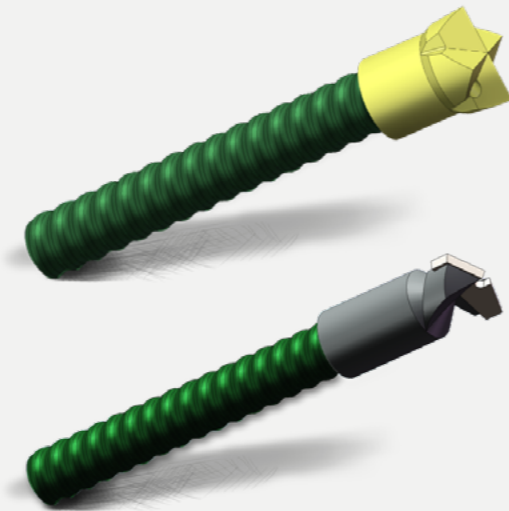
SPINMAX® offers high tensile strength and can carry high loads. Its low weight combined with high torsional strength makes the bolt well suited for works in loose rock and up to a maximum hardness of 40 – 50 MPa.

ADVANTAGES

- Very high torque resistance
- High loading
- Easy handling
- Flexibility
- R32 standard thread profile

APPLICATION FEATURES

- Face stabilization
- Forepoling
- Slope stabilization
- Ground support in soft rock
- Systematic rock bolting



High LOAD BEARING

Allows strong jointing with drill bits, nuts and couplers

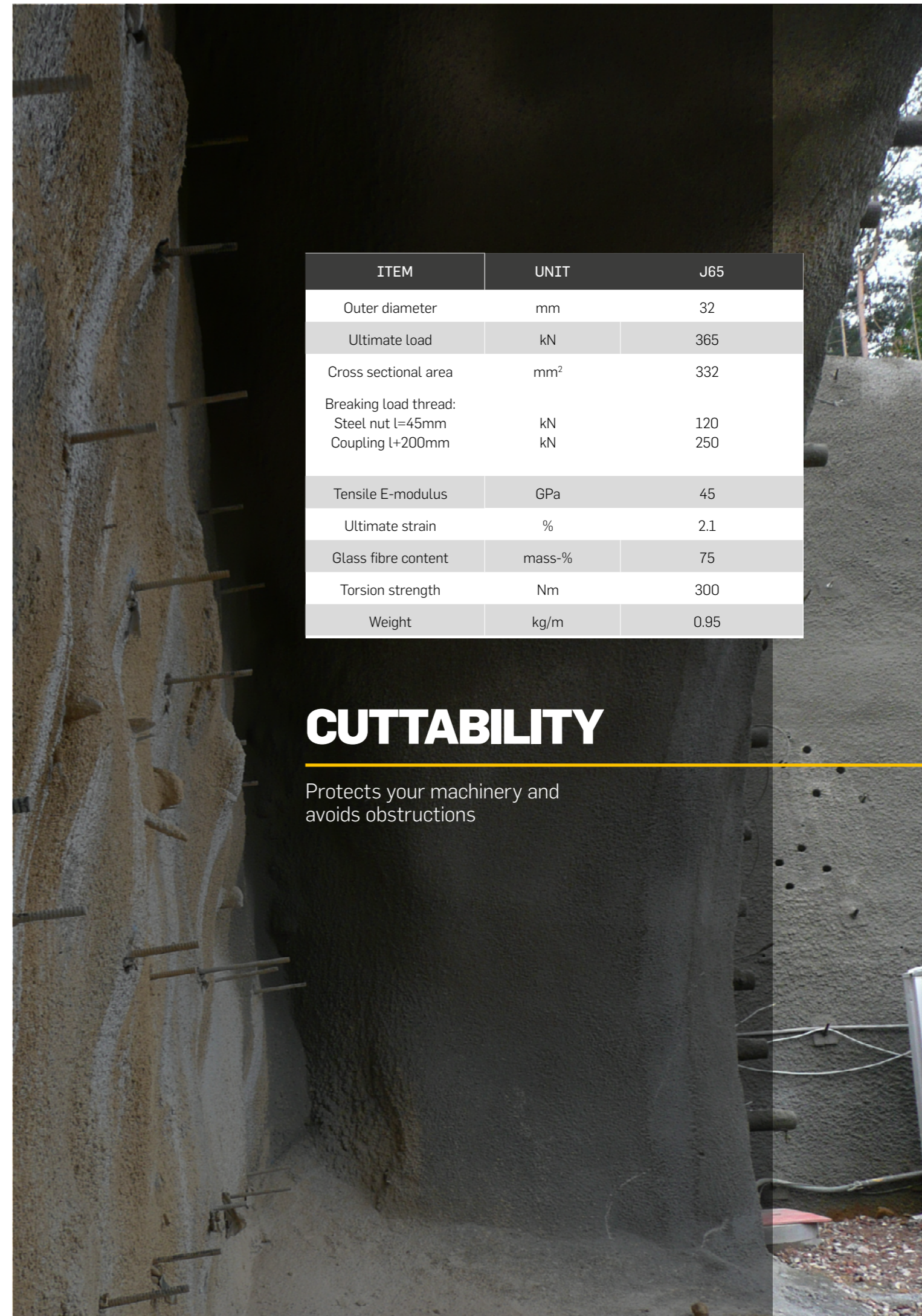
Very high TORQUE RESISTANCE

Well suited for works in loose rock up to a maximum hardness of 40 – 50 MPa

ITEM	UNIT	J65
Outer diameter	mm	32
Ultimate load	kN	365
Cross sectional area	mm ²	332
Breaking load thread:		
Steel nut l=45mm	kN	120
Coupling l+200mm	kN	250
Tensile E-modulus	GPa	45
Ultimate strain	%	2.1
Glass fibre content	mass-%	75
Torsion strength	Nm	300
Weight	kg/m	0.95

CUTTABILITY

Protects your machinery and avoids obstructions



CABLEX.

CABLEX® is a GFRP cable bolt with high strength, flexibility and durability.

SELF ASSEMBLY

The bolt can be assembled easily, either at the factory or directly on the job site, as there are no special tools or equipment required to do so.

The CABLEX cable bolt has a wide range of applications that require longer bolting e.g. long bolting of pilot tunnels in confined spaces, or bolting set from a parallel tunnel. It can also be used for face stabilisation or slope protection.

CABLEX cable bolts have a high corrosion resistance for durable and permanent support. In spite of its low weight, it has a high load-bearing capacity.

ADVANTAGES

- Easy assembly on job site
- Easy handling
- Flexibility

APPLICATION FEATURES

- Long bolting of pilot tunnels
- Bolting set from parallel tunnels
- Face stabilization
- Slope protection



HIGH CORROSION RESISTANCE

CABLEX is ideal for durable and permanent support

FLEXIBLE APPLICATION

CABLEX has a wide range of applications requiring long bolts including tunnelling, face stabilisation and slope protection

ITEM	UNIT	
Single strand		
Diameter	mm	6
Weight	g/m	50
Breaking load	kN	35
Ultimate elongation	%	2.1
Bending	m	0.3
Cable bolt		
No of strands	pcs	6-20
Breaking load	kN/ 6 strands kN/ 12 strands	210 420
Breaking load (bolt head)	kN	70-200

HIPREX.

HIPREX® is a GFRP tube with integrated packer function for high-pressure injection of weathered rock mass.

PREVENTING BACKFLOW

The GFRP hollow bar is fitted with an expansion packer and integrated non return valve. Two additional valves are fitted to both ends of the tube, the top valve to open when the packer is inflated, the bottom valve to prevent back flow after injection.

The GFRP system allows cutting during heading or mining of ore.

HIPREX ensures that no delays occur during rapid heading operations. Its light weight makes handling easy, even in confined underground conditions.

ADVANTAGES

- Super high hydraulic pressure resistance
- All-thread hollow bar
- High end loading
- Flexibility
- Easy handling

APPLICATION FEATURES

- Stabilisation of fractured rock and mineral
- Confined underground conditions
- High injection pressure option



ITEM	UNIT	J64
Outer diameter	mm	25
Inner diameter	mm	8
Cross sectional area	mm ²	350
Ultimate load	kN	350
Breaking load thread		
Steel nut l=100 mm	kN	180
Steel nut l=70 mm	kN	70
Bending E-modulus	GPa	40
Antistatic	∅	10E8
Inner pressure	MPa	240
Strain at failure	%	2.1
Weight	kg/m	0.78

GFRP REBAR.

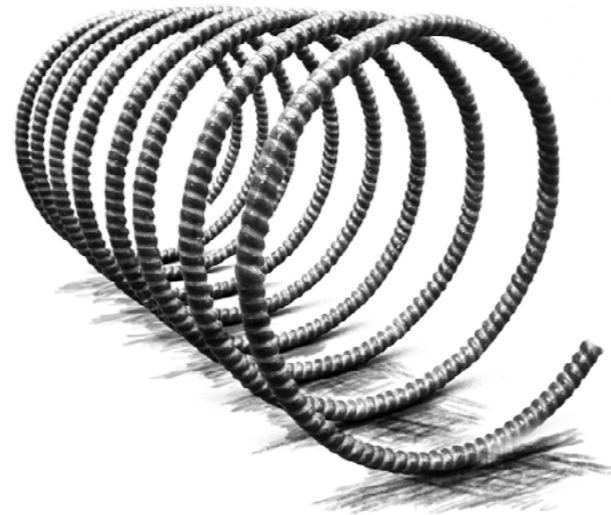
GFRP REBAR reinforcement is used as internal reinforcement. We offer a wide range of different shapes to suit your needs.

PERMANENT OR TEMPORARY SUPPORT

REBAR GFRP reinforcement can either be used for permanent applications e.g. high durability requirements, low maintenance and corrosion free structures, as well as the avoidance of disturbances of electric or magnetic fields.

For temporary reinforcement of diaphragm walls, it is now state of the art to use a mixed cage consisting of steel in the upper and lower section and GFRP in the middle section.

This section, called "Soft-Eye", is later cut by the TBM, facilitating a fast, smooth and cost-effective operation.



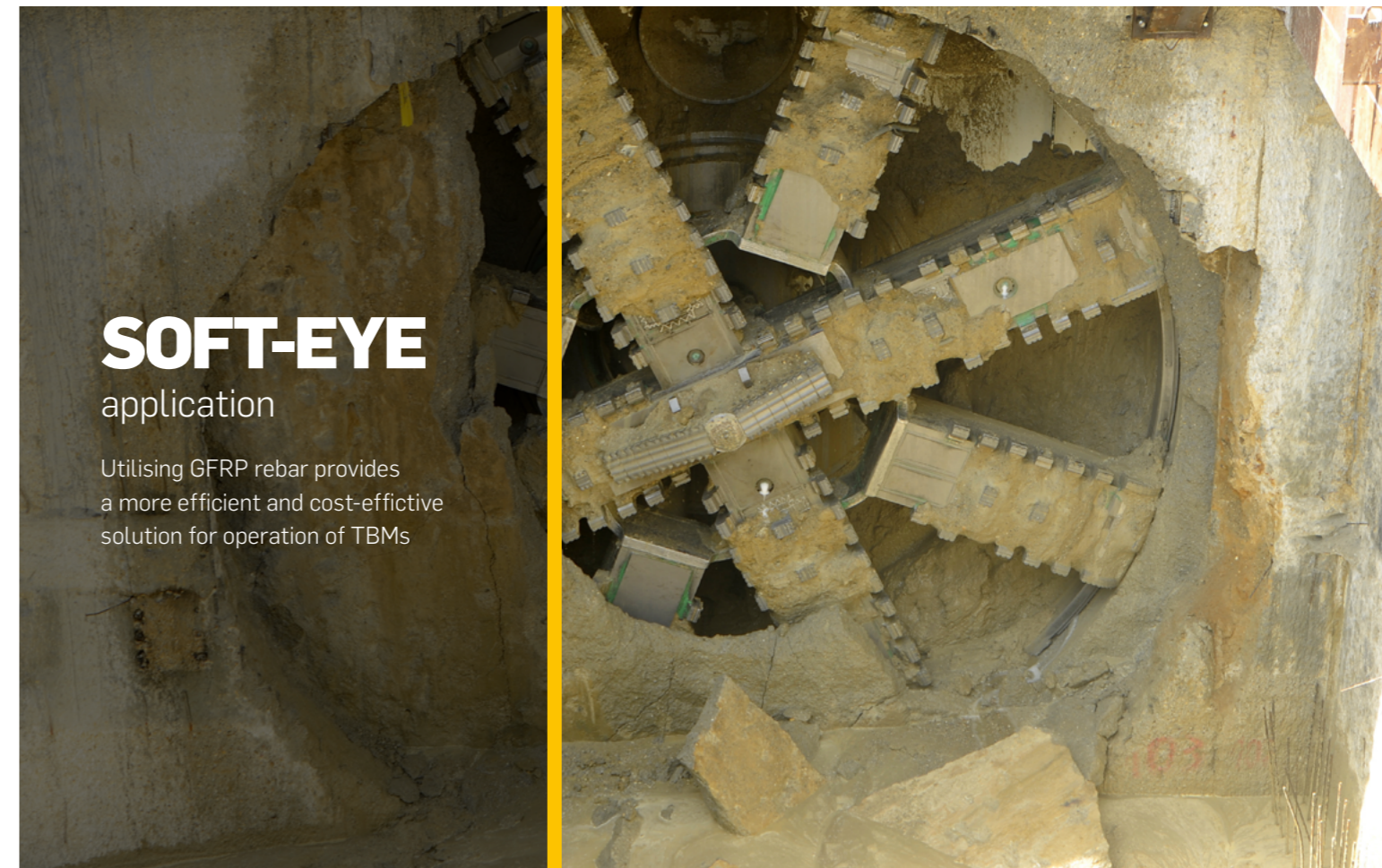
ITEM	UNIT	S	P	E
Fibre		Glass	Glass	Carbon
Resin		Polyester	Vinyl ester	Vinyl ester
Application		Temporary	Permanent	Permanent
Colour code		Blue	Grey	Yellow
Tensile strength	MPa	1000	1000	3500
E-modulus	GPa	50	60	230
Density	g/cm ³	2.1	2.1	2.1
Nominal diameter	mm	6-45	6-45	6-20
Breaking strain	%	2.1	2.1	2.1
Shape		S(P60) / L(P10) / U(P20) / O(P30)		

ADVANTAGES

- High corrosion resistance for permanent application
- High tensile strength
- Low weight
- Magnetic neutrality (anti-magnetic)
- No electrical conductivity
- High thermal isolation
- Easy cutting
- Cost-effective
- Wide range of shapes

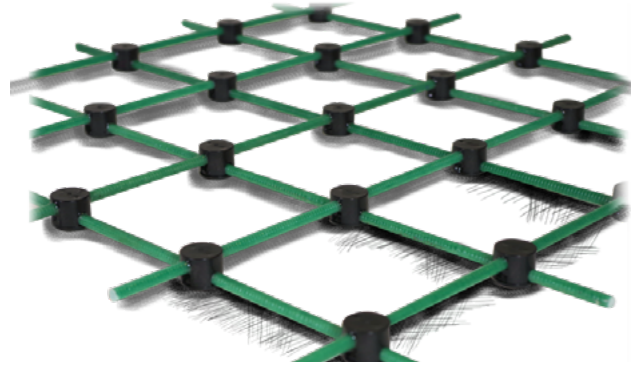
APPLICATION FEATURES

- Exposed Structures
- Buildings
- Pre-cast Concrete
- Waterway Engineering
- Temporary application (Soft-Eye)
- Railways/ aprons using induction loops
- Avoidance of thermal bridges
- Foundations
- Industrial plants



SOFT-EYE application

Utilising GFRP rebar provides a more efficient and cost-effective solution for operation of TBMs



POWERMESH.

POWERMESH® GFRP fabric was developed in accordance to traditional steel mesh products.

HIGHLY DURABLE

POWERMESH offers mechanical properties that are similar to steel mesh and high load capacities at each joint together with all the advantages of GFRP.

POWERMESH makes construction easier and less time-consuming due to removing of the need to assemble single rods and the low weight of the fabric making it very easy to handle.

POWERMESH is the right choice for reinforced concrete structures and exposed applications requiring protection or stabilisation.

ADVANTAGES

- High durability
- Low weight
- High corrosion resistance
- High strength
- Cuttability
- Anti-magnetic
- No electrical conductivity

ITEM	UNIT	BLACK	BLUE	GREY	GREEN
Application		Antistatic	Temporary	Permanent Concrete	Permanent Soil and rock
Fibre		Glass			
Resin		Polyester	Polyester	Vinyl ester	Epoxy
Nominal diameter	mm	4-5-6-7-8			
Fibre content	mass %	75			
Density	kg/dm ³	2.2			
E-modulus	GPa	50	50	60	60
Ultimate tensile strength	MPa	900	900	1000	1000
Ultimate strength	%	2.5%			

STRATEGIC PARTNERSHIP.

Our partnership with FiReP® allows us to provide you with the flexibility that you need, wherever you are.

The FiReP® Group is one of the world's largest producers of Fibre Reinforced Polymer (FRP) pultruded bars with unique profiles and thread functions for applications in the mining, construction and energy sectors.

Minova has partnered with FiReP since 2009 to bring new products and technical expertise to our portfolio.

Since then, we have been working jointly to provide our customers with an enhanced portfolio of support products and services.



SECURING PERFORMANCE. TOGETHER.

Safety is our priority, always.
www.minovaglobal.com



FIREP® DUARMAX.

The FiReP® DUARMAX are GFRP fibres for use in concrete reinforcement. The fibres combine the advantages of high corrosion resistance and high strength.

CONCRETE REINFORCEMENT

DUARMAX can be used in shotcrete lining, industrial floor applications.

The fibres are also utilised in production of pre-cast elements. They reinforce concrete when used at watertight structures such as dams and ports.

DUARMAX flexibility allows for it to be used in combination with rebar or as a standalone product.

ADVANTAGES

- High corrosion resistance
- Anti-magnetic
- Alkali resistant
- Chemical resistant
- High tensile strength
- Good bond to concrete
- Good distribution in concrete
- Good sprayability
- Low rebound

APPLICATION FEATURES

- Shotcrete Lining
- Industrial floors
- Precast elements
- Watertight structures
- Crack width control
- In combination with rebar or alone



FIREP® TIELOCK.

The FiReP® TIELOCK® GFRP rods are one-way rods for formwork use. After use, it remains in concrete tightening the structure.

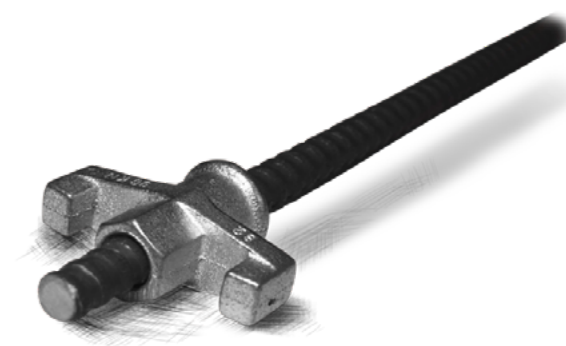
ANTI CORROSIVE TIGHTENING

The FiReP® TIELOCK® GFRP rods are used for fair-faced and water-tight concrete structures.

The rod ends outside the concrete can be cut away easily and because of the rod colour which is the same colour as concrete. The ends can also be adapted to individual requirements to make them hardly seen.

The cut ends of the GFRP rod do not corrode. Its corrosion resistance avoids rusty bleeding on surfaces of architectural concrete. Other adverse optical effects are also reduced or eliminated.

The TIELOCK® is compatible with most accessories based on GEWI thread. Special parts like cladding tubes, water stops or cones are not necessary.



ADVANTAGES

- High strength
- Low weight
- Cuttability
- Durability
- Thermal conductivity
- No electrical conductivity
- Anti-magnetic
- Easy application

APPLICATION FEATURES

- Fair-faced concrete
- Water-tight concrete

ITEM	UNIT	H60
Glass content	mass %	75
Density	kg/dm ³	2.2
Tension E-modulus	GPa	45
Bending E-modulus	GPa	40
Tensile strength	MPa	1000
Strain at fracture	%	2.1
Nominal diameter	mm	15-20-26.5

SECURING PERFORMANCE. TOGETHER.

We are an international producer of high-performance ground support products for the mining, construction and energy industries.

Our products are engineered to provide safety, efficiency and certainty to your operations wherever you are.

We can provide you with tailored solution offerings for a variety of applications whatever it takes.

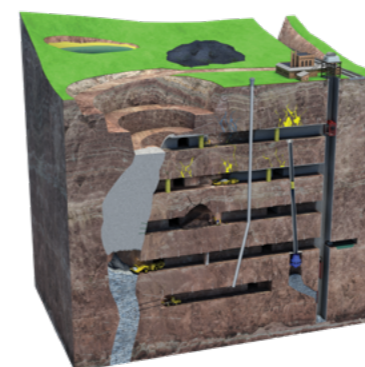
We can help you increase project performance and overcome application challenges through a flexible product portfolio with a wide range of differing characteristics, wherever you go.

OUR INDUSTRIES.

We serve the mining, construction and energy sectors.

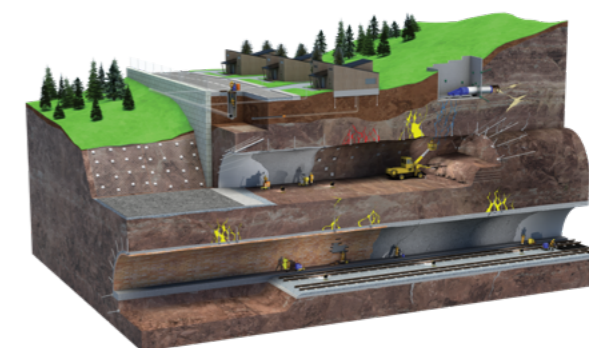
COAL MINING

We are a leader in providing safe environments in extremely fractured and fluid ground conditions. We understand that safety and efficiency are the key requirements of coal production.



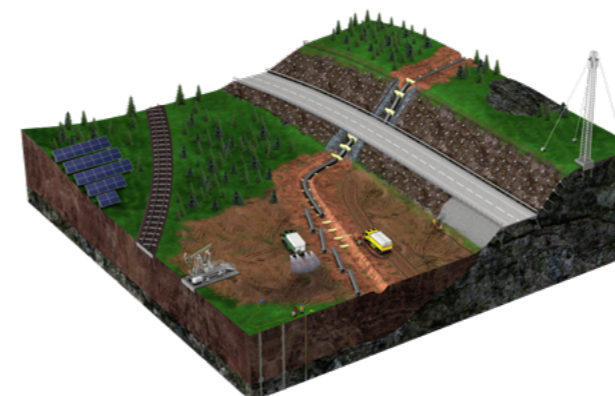
HARD ROCK MINING

We support underground hard rock mines across the primary commodities. Our products are designed to provide safety, improve efficiency and include automated solutions.



CONSTRUCTION

Stemming from our mining expertise, we produce a wide range of products that are used in the construction industry. Our solutions are utilised in both above and below ground assets to secure, repair, restore and rehabilitate.



ENERGY

We support many types of geostabilisation and structural repair projects in the energy sector. Our products and services include solutions in the oil & gas and renewable energy sectors.

FIBRE GLASS SUPPORT.

We offer a comprehensive range of reinforcement and support solutions that control and stabilise rock in excavated or unstable areas.

SUPPORT WHERE YOU NEED IT

We provide you with solutions for both active and passive methods of rock support wherever you are.

Our products range from various steel and Glass Fibre Reinforced Polymer (GFRP) bolts to steel arches, meshes and shotcretes.

FiReP[®] **SUNTHREAD.**

The FiReP[®] SUNTHREAD is a system consisting of GFRP rods and fasteners with UV protection for sub construction of solar panels in photovoltaic plants.

UV PROTECTION

SUNTHREAD's light weight allows quick installation in all ground even shore areas near coasts with reduced effort on transport or using smaller lorries saving sensitive natural soil grounds.

Its improved UV resistance will prevent the resin system to degrade during exposition to sunlight.

It is more cost effective than aluminium constructions and in combination with new technologies, it is protecting the environment by having a reduced CO₂ footprint.

SUNTHREAD is used for sub constructions of solar power plants and in the areas that are highly exposed to the UV light.

ADVANTAGES

- UV protection
- All thread rod
- Low weight
- Special accessories
- High strength
- High corrosion resistance

