



# Product overview of steel rock reinforcement

Sustainable support for your ground

# Product range

## Drilling Consumables

High Performance rock drilling tools and consumables:

- DTH Hammers
- Bits
- Shanks
- Rods
- Drill Pipes
- Adapters
- Augers, Accessories

## Injection Grouts

Leading edge resin injection technology for demanding cases:

- Water Stopping
- Sealing
- Ground Consolidation
- Ground Stabilisation
- Construction and structural repairs

## Anchoring & Bolting Grouts

Grouting technologies offering ease of use, clean and fast setting:

- Capsules
- Cartridges
- Pumpable grouts
- Additives

## Anchoring & Bolting

A broad range of rock bolting and anchoring technologies:

- Double and single coated protected steel
- Steel Self Drilling Anchors
- GFRP bolrs of all types
- Standard bolts and meshes

## Cement-Based Additives

Cement based admixtures and additives:

- Concrete Repair
- Admixtures
- Modifiers
- Waterproofing
- Joint Sealants

## Pumps & Accessories

Cement and resin mixing and pumping technologies:

- Cement Pumps
- Resin Pumps
- Transfer systems
- Dataloggers
- Hoses, lances, packers

## Water control

Waterproofing, drainage and pumping:

- TunnelDrain innovative strip drainage system
- Drainage pipes
- Waterproofing grouts, additives and sealants
- A broad range of dewatering pumps

## Ventilation

Air quality, ventilation and safety solutions:

- Ventilation bags and systems, including Mecanicad's rigid ducts
- Fans & inline coolers
- Water atomisers

## Re-usable Hangers

Developed in the Nordics, fast, easy to use & reuse:

- Services Hooks for ventilation systems, water and pneumatic lines, electrical cables and distribution boards
- Blasting hooks

## Other products

A range of other products:

- Coatings & sealants
- Personal protective products
- Mining accessories

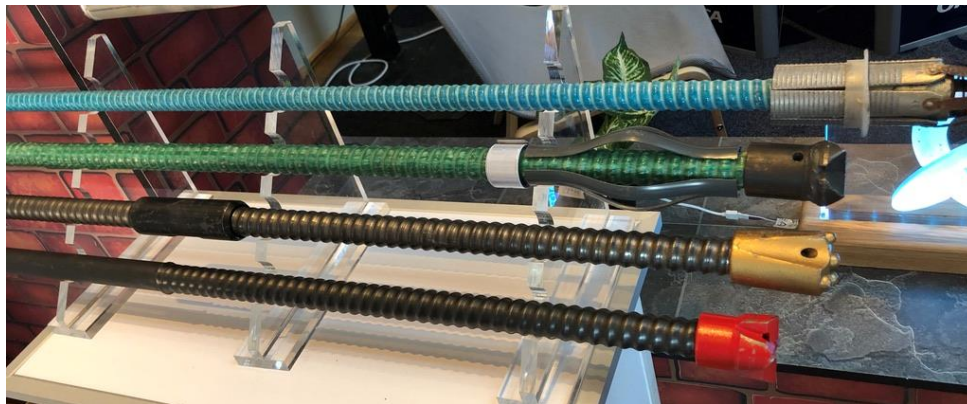
# Rock bolt types

## Steel

- Resin bolts
- Friction bolts
- Self Drilling Anchors
- Cable bolts

## Types

- Temporary steel bolts
- Permanent (corrosion protected) steel bolts
- Temporary GFRP bolts
- Permanent GFRP bolts



*Sourced from a variety of leading regional manufacturers*

# Resin bolts

Complete solution for “resin bolts”

- 2 component resin capsule
- mechanical bolt with crushed thread



## Process

- Insert capsules into borehole
- Insert bolt into hole and spin to mix resin
- Spin in opposite direction to tighten nut & load bolt

# SDA – ideal for broken ground

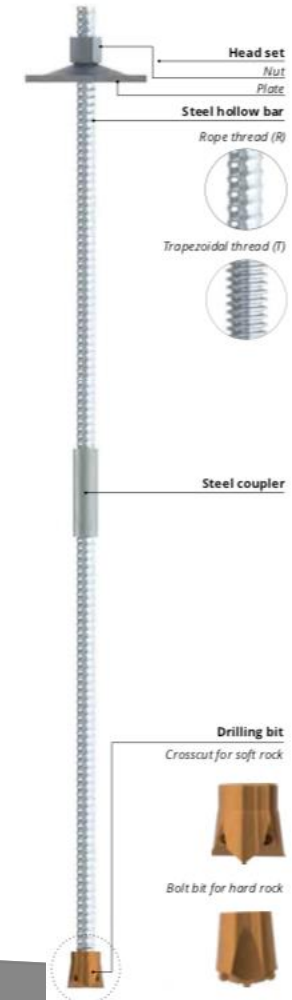
Rope Thread	R25	R32	R38	R51	T103	T103
Ultimate load (kN)	200	220 to 360	500	550 to 800	1600 to 1900	2350 to 3550
Yield load (kN)	150	180 to 280	400	450 to 630	1200 to 1500	1900 to 2650
Weight (kg/m)	2.1	2.9 to 4.2	6.0	7.5 to 9.4	18 to 22	27 to 42

**Self Drilling Anchors:** The values are indicative. Sizes R32, R38 and R51 have a range of technical specifications, reflecting the various options within each group. Products are available in larger diameters and can have either a ‘R’ thread or ‘T’ thread.

**Accessories include:**

- Couplings, Adapters, Centralisers, Drill bits, Plates and nuts

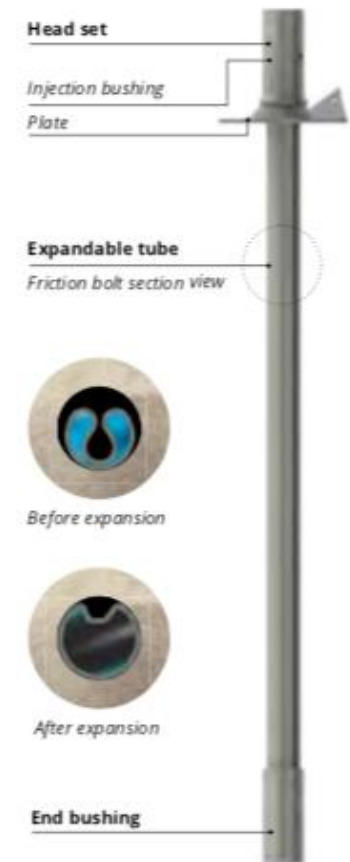
**Zinc Coated and Double coated protection systems are also available.**



# Friction Bolting Technologies

Friction bolts are a very cost-effective technology for short-term, immediate support applications.

- **Split Set** – Available in sizes  $\varnothing 33$ ,  $\varnothing 39$  and  $\varnothing 48$ 
  - Fast to install using the hammer from the drill for insertion
  - Immediate support acting as an independent or secondary bolting roof support system
- **Stiff bolt technology** – combines speed and improved performance longevity
  - Combines capsuled cements and friction bolt technology
  - Increased loading capacity
  - Longer operational life
  - Same installation processes as Split Sets
- **Expandable Bolts** – High performance friction bolting
  - Uses high pressure water to expand the bolt & optimise friction between the bolt and rock
  - Increased loading capacity
  - Longer operational life
  - Requires high pressure pumps for operation



# Cable bolts

## Low-expansion rope 1x7

- rope diameter	15.2 mm
- tensile strength of steel	1860 MPa
- total load (breaking force)	261 kN
- maximum elongation	3,5%

## Coil dimension:

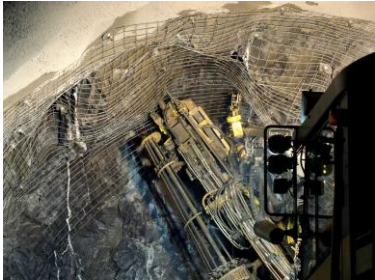
### Big coils

outer diameter	1325 - 1450 mm
inner diameter	850-900 mm
width	330-350 mm
weight of the coils	1650-1700 kg

### Small coils

outer diameter max.	1300 mm
inner diameter	720- 850 mm
width	275 -300 mm
weight of the coils	850 - 900 kg

# Flexible mining mesh



The size of the mesh:

- maximum mesh width – 2600 mm
- maximum mesh length – 6000 mm

Aperture size (mm) – 50x50, 75x75, 100x100, 200x200

Wire thickness (mm) – 4 to 10 mm

Protective coating options – hot dip galvanized

Yield point (N/mm<sup>2</sup>) – 200 to 400

Tensile strength (N/mm<sup>2</sup>) – 300 to 450

Elongation (A10) % ≥ 18

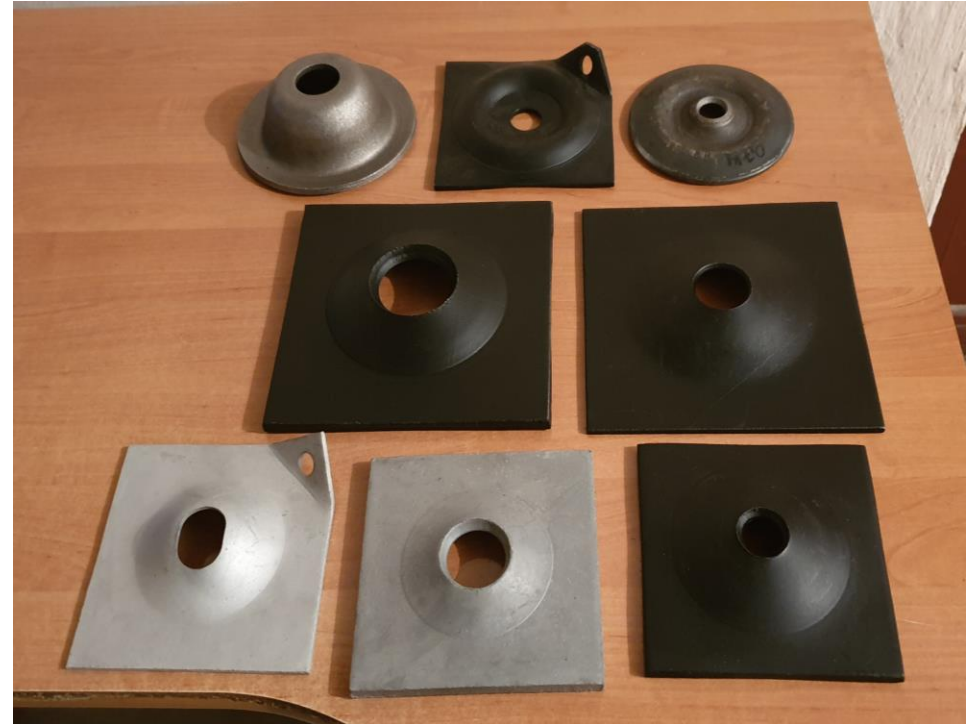
Weld point strength (kN) ≥ 8,0



# Accessories

- Face plates:
  - we supply dome plates, Swellex-type plates and round plates in different sizes
- Nuts:

In addition we have a full range of grouts – both cementitious and resin – for anchoring bolts – either in cartridges or pumped grouts.



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## Other products

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# Anchor & bolting grouts

- Our range of chemical grouts includes both resin capsules and pumpable resin grouts.
- We also market Forsoc's range of pumpable cementitious grouts.



# Capsule Resin Technology

## For productivity and improved bolting performance

- This easily handled capsule design uses high performance polyester resins for securing bolts and anchors.
- The simple installation makes bolting fast and easy with manual or automated loading of the resin capsule into the pre-drilled borehole.
- The resin design can be fine-tuned to meet project specific setting times, lengths, diameters and insertion methods.
- Immediate load-bearing capacity.
- Fully encapsulated bolts.
- Clean – no dust or pumps to be cleaned.
- No extra equipment needed, like pumps.
- Suitable for specific underwater applications and in wet boreholes.



# Capsule Resin Technology

## Applications:

- Rock bolting and anchoring in mines, tunnels and construction applications
- Permanent application use
- When combined with Nordic Geo Support GFRP bolts, this offers an easier and cleaner excavation in temporarily supported areas by reducing ore contamination and lower wear on cutters, crushers and conveyers in mining and tunnelling.
- Vibration resistance offers better security of bolts near to blasting areas.
- Accessories include parachutes and a gun to fire capsules into the bolt hole.

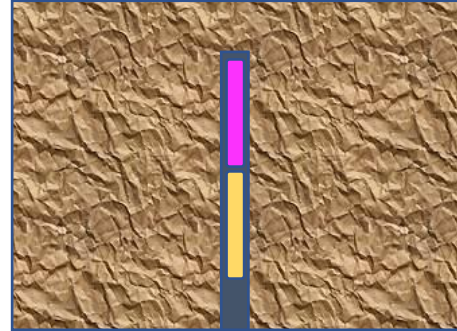
**Combine with Resin Bolts for an easy, fast and complete solution**



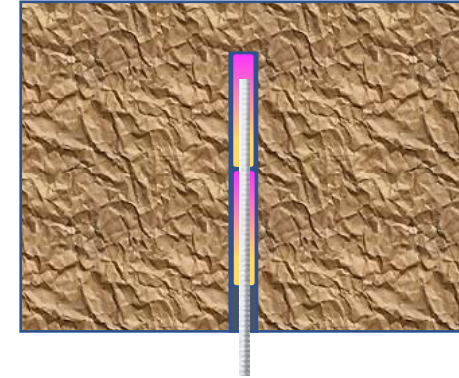
# Capsule Technologies



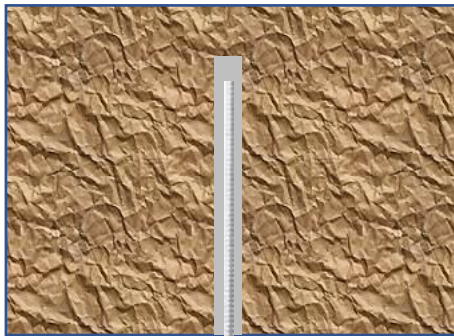
1) Drill Bolt Hole



2) Insert capsule or capsules for longer holes



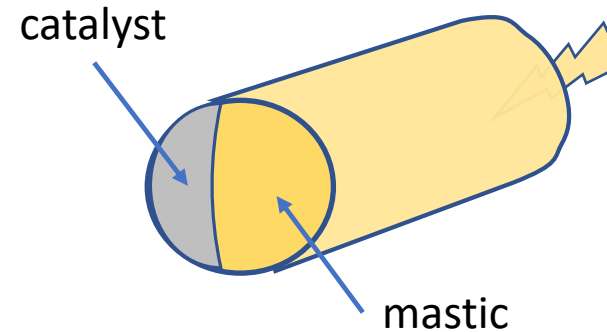
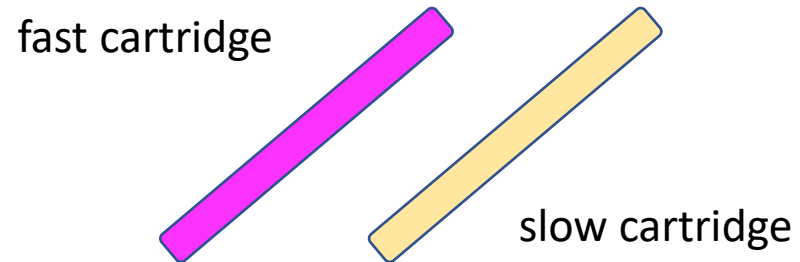
3) - Insert bolt and spin to mix capsules.  
- Wait for holding time  
- Tighten



Final Result

**3 steps to fast, secure bolting  
operations in minutes**

# A flexible design for the user



## Resin Capsule Selection

- Bore hole length
- Bore hole diameter and diameter of bolt
- Setting time addressing the mines ambient conditions

A two component mix is used

- ✓ No Pumps
- ✓ No wastage
- ✓ Bolt can be tightened within a few minutes
- ✓ Can be used by manual or automatic installation

# Resin Bolts – Complete the Solution

**Gives long life and high performance characteristics to standard bolting with high performance and long life characteristics**

- A systematic approach to a complete solution between grout and bolt
- Bolts are ribbed to optimise load transfer in grout
- Bolts come complete with plate and nut
- Fast installation both manually or with fully automated drill rigs
- The resin capsule is installed into the drilled borehole
- The bolt is inserted and spun to mix the resin
- Fast setting is achieved allowing for immediate tightening and loading of the bolt
- Capsules are available in various diameters and lengths to meet the design requirements to meet ground conditions

**Ideal Cost/Performance Ratio; no pumping technologies required**



# Pumpable Resin Bolt Grouts

## Leading edge pumpable resin anchoring grouts

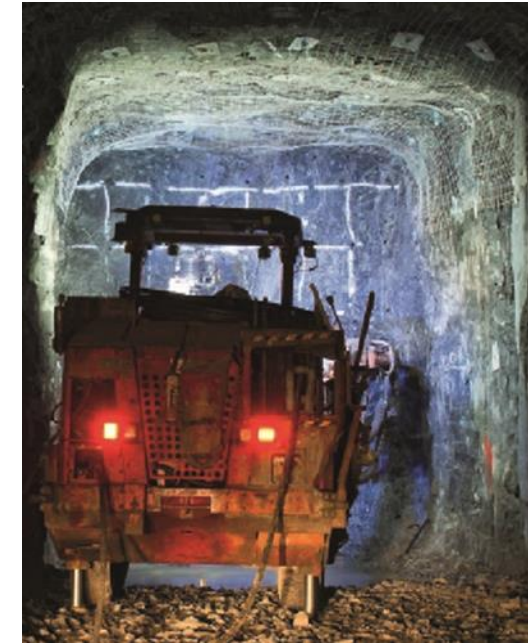
- Two component, thixotropic grout
- Well suited for sealing against flowing water
- Retains thixotropic nature allowing for sufficient time to install bolts
- High load forces achieved almost instantaneous
- Specially developed to work with post grouting applications
  - Hollow Bar anchors and bolts

### Benefits

- ✓ Fast - Immediate load capacity of the bolt
- ✓ No wastage - Secure and precise injection due to thixotropic properties
- ✓ Easy to handle - Two-component pump application
- ✓ Security - Consolidates broken ground around the bore hole

### Applications

- Anchoring Products, Cavity Filling, Ground Consolidation, Roof Control, Water Stoppage and Gas Sealing





# Single Stage Bolting Installation

**Nordic Geo Support pumpable bolting resins** can be used with conventional rock bolts, cable bolt technologies, self drilling anchors and composite bolting technologies.

Drawing from the capsule advantages of cleaner installation and faster set time of grouting and combining the features of silicate resin.

Our resin technology when combined with self drilling anchors creates a faster way to a complete bolting solution and can be used in manual, semi automatic and fully automated drilling operations.

**Faster, Safer, Cleaner**

## Drilling, installation and securing of a bolt in a single procedure

- Rapid speed of bolting installation can be achieved
- Safer – no manning of baskets required during bolting operations
- Almost instantaneous loading of the bolt, securing the ground faster
- Reduction in grout loss with cements
- Can be fully computerised based on drill rig
- High reliability
- Remote data transmission possible based on drill rig technology
- Ideal in broken ground conditions, where:
  - Consolidation around bore hole is needed
  - Longer tendons are required

# Resin Cartridges

## Lokfix E range

Tested to European Standards and comes with accreditation

Approved for use in dry, damp or flooded concrete substrates

- ✓ Can be used with cracked concrete, bonding and surface crack sealing
- ✓ Fixing of post installed reinforcement
- ✓ Anchoring of threaded rod fixings including internal threaded rods.
- ✓ For horizontal, vertical and overhead application

**Lokfix E75** - Flexible Two-component Epoxy

**Lokfix E55** - Styrene Free Vinylester Resin

Lokfix E55S: Optimised for substrate installation temperatures between -10 to +40°C.

Lokfix E55L: Low temperature grade from -20 to +15°C.

**Lokfix E35** – Styrene free Two component Polyester

Lokfix E35S: optimised for substrate installation temperatures between -5 to +40°C.

Lokfix E35L: Low temperature grade, from -10 to +30°C.

Lokfix E35T: Tropical temperature grade, from +10 to +45°C.



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# Injection Grout Technology

- **Nordic Geo Support** offers specialist high-performance cement and resin and grouting solutions.
- Our cutting-edge technology in resin-based solutions place our customers at the forefront of sustainable bolting, sealing, consolidation and stabilisation of rock and soils.
- Our expertise in design and application as well as our understanding of the total solution from drilling to grouting and capital equipment means we offer the complete system to our customers.



# NordicPUR 2 Component PU Resins

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- Our products to meet a range of project demands, including:
  - Sealing against ground water
  - Ground consolidation and stabilisation
  - Crack repair in rock and man-made structures
- Featured products:
  - **NordicPUR Extreme** – a rapidly setting resin for fast reaction times where high flowing ground water is present
  - **NordicPUR 2 Fast** – a fast setting resin used in many applications and reacts immediately when in contact with water.
  - **NordicPUR 90 DW** – [\*Drinking Water approved!\*](#) A slower reacting resin for deep injection and for deep crack repair.
  - **NordicPUR 180 Slow** – A slower reacting resin for deep injection and for deep crack repair.
  - Additives and modifiers - to customize the products to suit the project needs.

# NordicSIR 2 Component Silicate Resins

- Silicate resins can offer high expansion capability. **NordicSIR** two component silicate injection resins are for temporary or permanent applications including:
  - sealing of joints and connections in construction elements
  - void and cavity filling
  - sealing of ground water ingress
  - filling of cracks and fissures
- Featured products:
  - **NordicSIR Foam** – for rock and strata injection, sealing, cavity and void filling, stabilisation and consolidation. Ideal for ground consolidation at the face of a TBM
  - **NordicSIR Bond**– a high strength, low-foaming silicate resin. Fast reacting, flexible resin with good adhesion. Typically used for filling of cavities, crack injection work, ground stabilisation and consolidation applications
  - **NordicSIR Flex** – a high strength, non-foaming silicate resin, with excellent elasticity and adhesion properties for
  - **NordicSIR Flex UHS** – an Ultra High Strength, non-foaming silicate resin with excellent adhesion properties for stabilisation and consolidation of targeted zones.





# NordicGEO 2 Component Resin Pumps

**PISTON PUMPS:** For safe handling at High pressures (over 200 bar)

**GEAR PUMPS:** Generating high flowrates. Pulse free material flow

- High performance pumps
- Robust long life design
- Complete solution
- Range of packers and accessories
- Easy to maintain and handle
- Pneumatically (air) driven



Injection Pump	Drive	Max. Operating Pressure	Material	Max. Flow Rate	Weight
S 35 PU-N	Piston	170 bar	PU or Silicate	5,5 l/min	28 kg
GX 45 PU MN	Piston	225 bar	PU or Silicate	18 l/min	82 kg
DP 40 PU-N	Piston	205 bar	PU or Silicate	25 l/min	120 kg
PGP 30/40	Gear	40 bar	PU or Silicate	40 l/min	130 kg



# Thank you!

[www.nordicgeosupport.com](http://www.nordicgeosupport.com)