Rock bolts from ISCHEBECK TITAN

- Self-drilling, caseless installation
- Suits all ground conditions
- Unlimited service life

Rock bolts

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Rock bolts are short, low capacity reinforcement, comprising a bar fixed into the rock and, if required, tensioned to a predetermined load.

The Ischebeck Titan rock bolt consists of a drill bit attached to a hollow steel tendon, which is drilled, installed and grouted at the same time, allowing ground improvement, increased productivity and economics.

Rock bolts are commonly used throughout the civil engineering and tunnelling industries (especially NATM). They are used to improve the stability and load bearing characteristics of a rock mass.

Within the civil engineering industry, Ischebeck Titan rock bolts are used for fixing rock netting, cliff/slope stabilisation, stanchion bases and rock fences. Rock bolts are also used in structural repairs on retaining walls, bridge spandrel walls and tunnels.

In the tunneling industry, Ischebeck Titan rock bolts are used for horizontal fore-poling, slope stabilisation at the tunnel portal and for anchoring large section tunnels with high side walls.

The advantages

- Greater productivity than conventional systems
- No casing required in collapsing ground conditions
- Unlimited service life
- Composed of high yield, low carbon steel
- Suitable for all ground conditions
- Can be either passive or stressed

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Brighton Marina

The chalk cliffs which tower above Brighton Marina became progressively unstable over a number of years, ultimately resulting in a rock fall. A scheme was designed which incorporated both permanent soil nails and rock bolts. These were used to stabilise the cliff and hold the rock fall netting in place. The near vertical rock face meant installation of the rock bolts had to be carried out by an abseil team.

- 120 year design life
- Ischebeck Titan 30/11 black bar
- Difficult access
- Abseil team/long reach excavator

Glasgow

Fracturing and slippage of a rock mass at a new residential development in Glasgow threatened gardens and the safety of residents.
Ischebeck titan 30/16 injection rock bolts were used as vertical stability bolts to consolidate the rock mass and to retain rock netting. The bolts were installed to a depth of 3 metres using a 46mm button bit.

- Ischebeck Titan 30/16 black bar
- 46mm button bit
- 35mm eye bolts to fix rock netting

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Reston Cutting

Reston Cutting is located on the East Coast Mainline. The rock bolts formed part of a cutting stabilisation scheme which involved installing some 4250m² of chainlink rock fall mesh. Approximately 150 no. 3 metre crest rock bolts were installed in 1 metre lengths using couplings. The top detail comprised an integral 30kN eyebolt which allowed 3-way connection for cable stays supporting the rock netting. Ischebeck Titan 30/11 black rock bolts were installed by hand into rock.

- Permanent works
- Ischebeck Titan 30/11 black bar
- Integral 30kN eyebolt
- Installed through made ground into rock

Wallace Monument

For some years, the Wallace Monument in Stirlingshire had been threatened with damage by the possibility of rock falls. A design was prepared to protect the monument with a rock fall fencing system. The fencing system comprised a horizontal double wire/strand configuration, coupled with wire meshing, supported by stanchions. The stanchion base plates were fixed using Ischebeck Titan 30/11 rock bolts. The installation had minimal disturbance to the environment.

- Effortless installation in difficult conditions
- Fully grouted for corrosion protection
- Ischebeck Titan 30/11 black bar used for permanent works

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Edinburgh

Due to an increase in the load requirements on a masonry wall in Edinburgh, Ischebeck Titan rock bolts were installed in permanent works to strengthen the structure.
Approximately 30 no. 9 metre long 30/11 black rock bolts were installed using a 95mm hardened clay drill bit.

Due to aesthetics, the cores were replaced once the rock bolts had been installed to retain the structure's original appearance.

- Ischebeck Titan 30/11 black bar, permanent
- Project completed within one week
- Core replaced to hide rock bolt

Inverness to Wick

An elevated rail structure was showing signs of cracking and bulging. Approximately 25 no. 40/16 combi coated rock bolts were installed.

The 100 year-old structure was approved for a further 120 years of service life by Scotrail.

Lightweight air rigs were used to install the rock bolts which resulted in the planned six-week programme being completed within three weeks.

- Excellent production rates
- 120 year design life
- Lightweight equipment in residential area

Geotextile sock system

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The Ischebeck Titan geotextile sock system eliminates potential problems relating to bond strength and corrosion protection which often occur where cavities or fissures in the ground cause excessive loss of grout

The system can be used in conjunction with rock bolts in poor/fissured rock or as part of masonry strengthening schemes, acting as the reinforcement.

Due to the control of the grout during installation, the system is also suitable for use in environmentally sensitive areas such as canal and harbour walls.

The method involves drilling the hole with a 'down-the-hole' hammer and installing a casing. Once the casing is in place, the geotextile sock system can be installed to the design depth.

A geotextile sock is attached to the Ischebeck Titan bar (which can be perforated) and closed with jubilee clips or tie wraps. Larger depths can be accomodated by coupling additional lengths of bar and geotextile sock. The assembly is then

inserted into the cased hole and a grout mix is injected through the hollow bar at 8-12 bar pressure to fill the sock. The pressure forces the water from the grout mix out of the geotextile's fine mesh, leaving the cement to cure almost instantly within the sock.

Once filled with grout, the geotextile sock moulds itself into the voids/fissures achieving a mechanical bond.

Rock Bolts for tunnel construction

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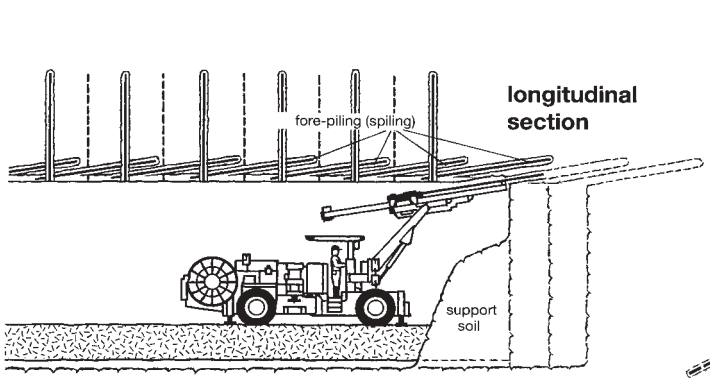
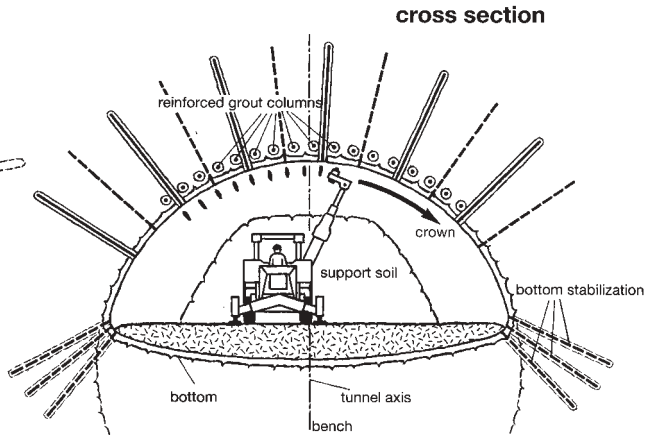
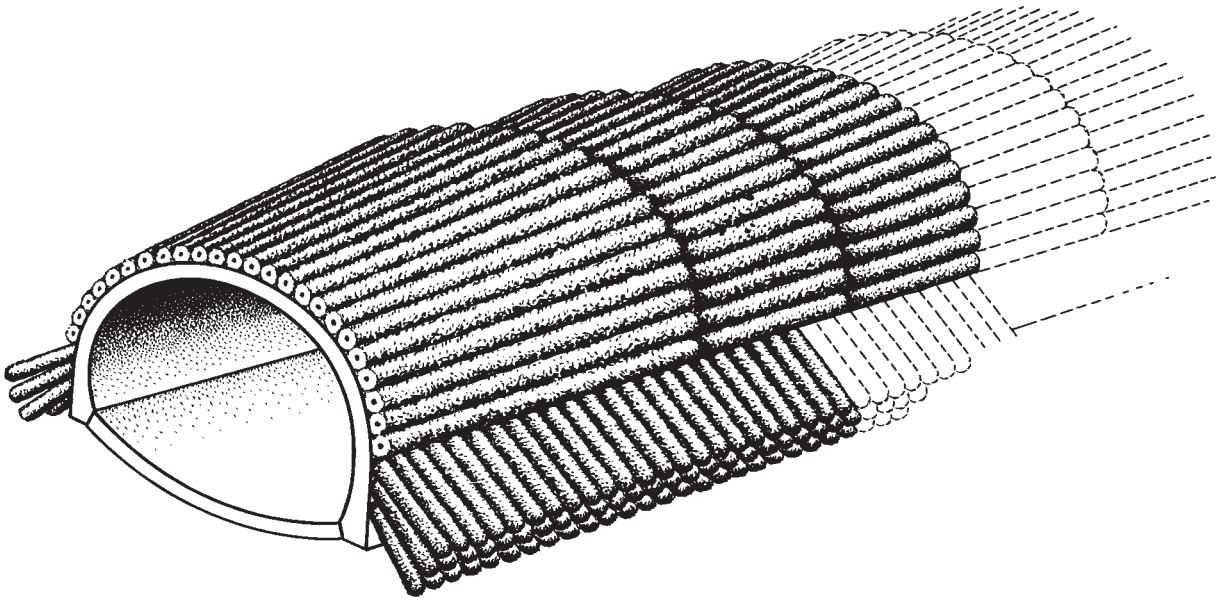
The principle behind the New Austrian Tunnelling Method (NATM) is the creation of a temporary distribution of the rock/soil pressure around the tunnel excavation until it is stabilised by the final concrete lining.

Ischebeck Titan rock bolts are ideally suited to the NATM where bolts longer than 3 metres need to be installed in loose material (i.e. glacial deposits). The rock bolts anchor within the material's layers to create a shear-resistant bearing ring for the rock.

They can also be used for horizontal piling or fore-piling by jet-grouting as well as slope stabilisation at the tunnel portal.







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Ischebeck Titan Group

Founded in Germany over 120 years ago, Ischebeck is renowned internationally for its aluminium formwork and false work systems, trench support systems and ground engineering products.

Ischebeck Titan Ltd

The company operates from headquarters centrally located in the heart of the UK.

Product Availability

Substantial stocks of equipment are available ex-stock from the company's strategically located 4-acre distribution site, with most items available nationwide on a 48-hour delivery. Products are available for both hire and outright purchase.

Technical Support

We will participate in concept stage development. Providing input on applications, production rates, budget design and costings. Active for on site support, particularly for new users. We can provide guidance on industry special european and national standards.

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