

UNIPASS DYNAMIC ROCK BOLT

DESCRIPTION

The UniPass dynamic bolt is intended for use in dynamic conditions and in areas where there is a risk of rock burst.

The bolt has three sections:

- A threaded bond section at the far end of the bolt
- A smooth yielding section in the middle of the bolt
- A threaded bond section at the near end of the bolt

The yielding section comprises a smooth ductile steel tube, which easily debonds from the grout and absorbs energy during a dynamic event.

Maximising the length of the yielding section maximises the dynamic capacity of the bolt.

The bond section at the near end is optional and can be as short as 200 mm, providing sufficient space for the plate and the nut.

The bolt can be installed in self drilling mode using a sacrificial drill bit (one step method) with the drill bit welded to the bolt, which minimises the annulus around the bolt, providing optimal bonding and reducing grout consumption. A range of cross and button drill bits is available.

The bolt can also be installed in pre-drilled holes

The grouting agent (CarboThix resin or cementitious grout) is injected through the central hollow section of the bolt into the borehole and fills the annulus between the bolt and the borehole wall.

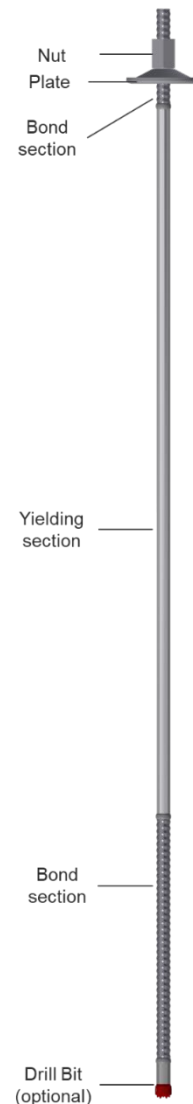


Figure 1. Dynamic Rock Bolt

ADVANTAGES

- Developed for applications in hard rock mining and tunnelling.
- Ideal solution for applications in difficult ground conditions, including broken ground and collapsing boreholes
- High advance rates in one step self-drilling mode
- Injectable with bulk resin or cementitious grout
- Dynamic capacity between 20kJ and 50kJ, depending on bolt type and configuration
- Energy absorption occurs in the bolts defined smooth yielding section and does not compromise the anchorage capacity of the bond sections
- Extensively tested in the field and laboratories in Europe and Canada
- Proven system being applied in various mines around the globe
- Various configurations available to meet local requirements

APPLICATION

There are two options for the installation of the bolts:

One step application

Bolts can be installed in self-drilling mode, with a sacrificial drill bit. This is the preferred method to maximise the bolting efficiency, especially in unstable ground conditions with collapsing boreholes.

The installation process consists of the following steps:

1. Roto-percussive drill the hollow bar with plate and nut mounted
2. Pulback the drilled bolt and grip the bolt beneath the plate
3. Disconnect the shank from the rock bolt
4. Pull the hammer back to the near end of the feed and slide in the resin injection adapter

5. Push the resin injection adapter to the front and connect to the bolt
6. Open the grippers and push the bolt into the hole
7. Start the injection process and keep pumping the resin until it becomes visible at the borehole collar
8. Maintain feed pressure on the bolt until the resin is cured (20 to 40 seconds)
9. Remove the injection adapter and the feed
10. Tighten the bolt nut (if required)

Two-step application

If boreholes are stable, bolts can be installed in pre-drilled holes following stages 5 to 10 above.

MECHANICAL DATA

Minova dynamic rock bolts are hollow bolts for dynamic / seismic conditions. Extensive testing has proven the performance of the system.

Product	Ultimate Load [kN] ¹⁾	Yield Load [kN] ¹⁾	Elongation [mm/m] ²⁾	OD [mm]	Cross section [mm]	Borehole dia. recommended [mm]	Thread specification bond section(s)
DB R28 150mm/m	220	170	150	26.9	408	34	R28 according to ISO 10208 (LH)
DB R28 200mm/m	210	145	200	28.0	462	34	
Dynamic energy absorption is proven between 20-50 kJ depending on the type and configuration. Details available upon request.							
Product	Length [mm]	OD [mm]	Ultimate Load [kN]	Thread specification			
R28 nut	50/60 ³⁾	46 ⁴⁾	300	R28 according to ISO 10208 (LH)			
R28 plate	150 x 150	Various thicknesses and shapes for static and dynamic application					

All geometrical values are nominal

⁴⁾ Width across flats

¹⁾ Ultimate Load and Yield Load are minimum values; cross section calculated based on nominal mass

²⁾ Elongation of the yielding section per meter of length

³⁾ Standard nut / Lock nut

PACKAGING AND TRANSPORTATION

Bolts are supplied in bundles of 50 pcs. Nuts are either pre-mounted or supplied in cardboard boxes (50 pcs). Plates are supplied on pallets.

HANDLING AND STORAGE

Components (hollow bars, nuts, drill bits and head plates) should be delivered to the construction site in undamaged manufacturer packaging.

Suitable lifting means, hoists and transportation shall be used for unloading and storing.

Components should be easily accessible for inspection and identification purposes.

Components should be safeguarded against any mechanical damage.

All steel parts and packed materials should be protected against corrosion. Store them clear of the ground, covered and protected against weather and soiling.

Components should be used according to the delivery sequence to reduce the risk of corrosion (first in – first out).

DISCLAIMER

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