

BluGeo LP Rock Bolt

DCP LOW PROFILE STEEL RIGID ANCHOR

BluGeo LP Rock Bolt is a multi-component steel and polyethylene sleeved bolt which requires only installation to form a rock supporting anchor.

BluGeo LP Rock Bolt has been designed as an easy to install, reliable grouting, flexible nut and plate configuration product suitable for civil engineering applications. BluGeo LP Rock Bolt incorporates a unique patent designed, low profile fixing nut to form a Double Corrosion Protection bolt.

Application Advantages

- Easy to install
- Less than 40mm profile off rock surface
- Shotcrete application savings
- Excavation savings
- Flexible nut and plate configuration

Lifecycle Advantages

- Double Corrosion Protection
- Improved fire life safety
- Accessible for post installation testing
- 100 year design life
- Aesthetically pleasing head profile

About the Product

BluGeo LP Rock Bolt has a low profile head and is an extremely durable, high strength, easy installation bolt manufactured from Australian Standard steel, and polyethylene sleeve. This allows the product to be used in major civil engineering project applications and ensures a durable and long lasting installation. BluGeo LP Rock Bolt is a leader in its class of tunnel bolts with its exceptionally low profile head allowing savings in shotcrete application lining thicknesses. It is the reliable choice for all modern tunnel bolting applications.

Application Solutions

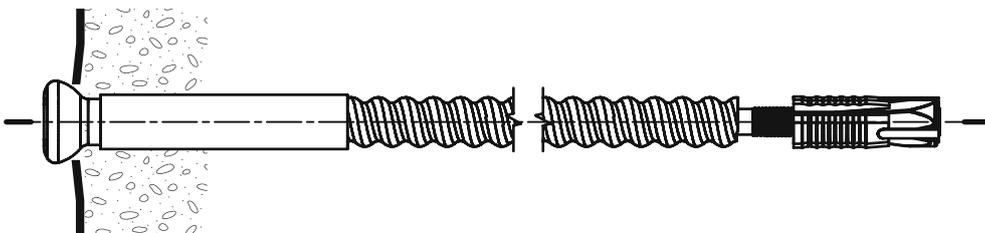
- 100 year design life rock support
- Slope stability
- Low clearance applications
- Spot bolting
- Roof support
- Rock reinforcement
- Retaining walls
- Ground anchors

Project Specification Clause

DCP LOW PROFILE STEEL RIGID ANCHOR - The rock supporting bolt used for this project shall be a multi component steel and polyethylene sleeved bolt which requires only the installation to form a durable rock supporting product. It shall be a pre-blended product that has independent testing to validate the performance outlined in the technical data table on the following pages. BluGeo LP Rock Bolt manufactured by Bluey Technologies or equivalent shall be accepted.

Project Examples

Tunnel rock support, road cuttings, rail cuttings, basement construction, marine structures.



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Application Specification

DRILLING

- 1.1 Position the bolting machine into the position and angle specified.
- 1.2 Using a 48mm bit, drill to a depth equivalent to the length of the BluGeo LP Rock Bolt.
- 1.3 Flush and air blow the drilled hole until the flushing water returns clear, and remove the extension drill steels.

ANCHORING

- 2.1 Check for correct hole depth. This is best done using conduit marked at the correct length. Ensure the hole has been flushed of all loose material so there is no breakage in the sheathing when inserted.
- 2.2 Place the specified dolly into the drill chuck
- 2.3 Load the BluGeo LP Rock Bolt onto the Jumbo boom, Shell end first – DO NOT grip the BluGeo LP Rock Bolt with any gripper jaws as the sheathing could be cut. The bolt can also be inserted by hand into the hole. Ensure a holding brace is used to keep the bolt in the hole when inserted vertically into roof.
- 2.4 Place the drive end of the BluGeo LP Rock Bolt into the drive mechanism in the base of the dolly. Rotate the BluGeo LP Rock Bolt nut to ensure it is engaged into the drive mechanism.
- 2.5 Take the bolt up to the level required for the plate to be fixed with cut face or mesh. Spin the BluGeo LP Rock Bolt using maximum rotation. No thrust or feed force at this stage. The expansion shell will expand and grip.
- 2.6 The nut and bolt will spin to the end of the remaining thread when the shell engages. This will indicate you have achieved the full preload of the expansion shell.
- 2.7 The BluGeo LP Rock Bolt is ready to be grouted.

GROUTING

- 3.1 Refer to BluCem HS400 TDS for mixing and pumping instructions.
- 3.2 Lay out the grout, mixer, pump and hoses to suit the location of the BluGeo LP Rock Bolt to be grouted. The longest pumping distance for the Thixotropic grout must be kept below 30 metres.
- 3.3 Check the mixer and remove any scale/debris.
- 3.4 Check that all taps and fittings in the grout line are operational.
- 3.5 Place some water into the mixing bowl, test the operation of the mixing paddles and pump this water through to slick the grout lines.
- 3.6 Ensure all test water is removed from the mixing bowl before commencing
- 3.7 ALWAYS MEASURE the volume of water and add to the bowl.
- 3.8 Keep mixing until smooth, lump free slurry is achieved. The consistency should be checked by scooping a level handful with a rubber glove and the grout must not fall off when the hand is turned upside down.
- 3.9 Attach the grout line to the lance and run the pump to clear any water through the line until thixotropic grout appears. Turn off the pump ready for filling of BluGeo LP Rock Bolt.
- 3.10 Connect the grout lance to the BluGeo LP Rock Bolt, ensuring the lance is screwed on with a complete seal with the nut. If using a Jumbo grouting boom ensure the grout cup is hard against the nut and plate.
- 3.11 Keep mixer blades rotating to feed grout into the pump chamber and turn the pressure relief tap to off.
- 3.12 Commence pumping until grout appears at the indicator hole in the plate.
- 3.13 Release the pressure in the grout line by turning on the pressure relief tap. The grout must not keep running from the hole collar for more than 4-5 drips after the grout line is de-pressurised.
- 3.14 Disconnect the grout lance from the BluGeo LP Rock Bolt, being careful of any grout which may drip from above. The grout lance will only rotate/disconnect if the line is de-pressurised.

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Product Data

Please refer to Important Notice on following page

Cross Sectional Area	380mm ²
Mass	3.00kg/m
Drill Hole Size	35mm Temporary 48mm Permanent

TESTED CHARACTERISTIC	STANDARD	RESULT			
		X Grade M24 Bar			
		Minimum		Maximum	
Yield Strength	AS1391	600MPa	228kN	650MPa	240kN
Tensile Strength	AS1391	840MPa	306kN	920MPa	335kN
Standard Elongation	AS1391	15%		19%	
Shear Strength (0.7 x UTS)	AS1391	223kN		245kN	
Bar Diameter		Core 21.7mm		Major 23.5mm	

SHEATHING SPECIFICATIONS					
PROPERTY	TEST METHOD	NOMINATED CELL CLASSIFICATION	ACCEPTANCE CRITERIA FOR NOMINATED CELL CLASSIFICATION	TEST RESULT	CELL CLASSIFICATION ACHIEVED
Density	ASTM D1505	3	>0.940 - 0.947g/cm ³	0.948g/cm ³	4
Melt Index	ASTM D1238	3	<0.4 - 0.15g/10min	0.3g/10min	3
Flexural Modulus	ASTM D790	5	758 - 1103 MPa	790MPa	5
Tensile Strength	ASTM D638	3	21 - 24MPa	22.9MPa	4
Slow Growth Crack Resistance	ASTM D1693/ ASTM F1473	3	192 hours (D1693)	11 hours (F1473)	4
Hydrostatic Strength Classification	D2837	3	8.62MPa	8.62MPa	3
Colour		C	2.0% - 3.0%	2.0% - 3.0%	C

Sheathing must be corrugated and HDPE conforming to achieve 100 year design life
 Corrugations must be uniform and generally sinusoidal in shape, conforming to the following:

- 1 Wall thickness (w) of ducts: $w \geq 2\text{mm}$
- 2 Pitch of corrugations (p): $12w \geq p \geq 6w$
- 3 Amplitude of corrugations (a): $a \geq 3w$

The profile must not allow voids to be formed in the grout column.

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