

**MINING / CONSTRUCTION**

# Steel Resin Rock Bolts

**DESCRIPTION**

Rock bolt assemblies for Lokset™ resin capsule anchoring, comprise the stud, nut, bearing plate washer and a selection of accessories and modifications which can be configured to suit particular installation and rock support requirements.

Rock bolt assemblies are packaged as complete, ready-to install units.

The material is hot rolled carbon steel of homogeneous microstructure and uniform hardness across the cross-sectional area.

**APPLICATION AND USE**

After the resin capsule is set into the borehole, the bolt is spun as it is inserted into the hole, mixing and setting the resin. Used for:

- Anchoring
- Roof stabilisation
- Rock surface control
- Structural reinforcement

**ADVANTAGES**

- High shear strengths
- Combination of cold rolling and DIN 405 profile ensures that no strength is lost in the threaded zone
- Numerous bar options and accessories available



**TECHNICAL DATA**

**MATERIAL PROPERTIES**

<b>Yield strength</b>	500 MPa minimum
<b>Ultimate strength</b>	550 MPa minimum
<b>Yield to failure</b>	Minimum 12%
<b>Stiffness</b>	10 millistrain maximum displacement at 140 KN, 13 millistrain at 150 KN.

**KEY DIMENSIONS**

<b>Length</b>	+0/-5 mm from nominal length specified
<b>Diameter</b>	20 mm core diameter
<b>Straightness</b>	0.4% of length maximum deviation
<b>Deformations</b>	Height 0.5 - 0.9 mm, "DD" pattern
<b>End crop</b>	45 or 90°, as specified. Free of burrs and edges that extend beyond the bar profile

**THREAD PROPERTIES**

Diameter	20 mm
Length	120 mm unless otherwise specified
Form	DIN 405, Part 1, Knuckle threads
Hand	Left or Right as specified
Ovality	The threaded section shall be round
End crop	90°. Free of burrs and edges that extend beyond the bar profile

**SPECIAL FEATURES**

Wiggle	If specified
Wavelength	140 mm
Amplitude	5 mm
Length of wiggle	As specified: "last 300mm" or "full length"

**STANDARD MARKING**

Nominal Roof Bolt Length (m)	Colour Code*
0.6 to 0.89	Orange
0.9 to 1.19	Yellow
1.2 to 1.49	Blue
1.5 to 1.79	White
1.8 to 2.09	Green
2.1 to 2.39	Pink
2.4+	Red

\* Threaded ends coloured as per industry standard.

**NUT & LOAD INDICATOR OPTIONS**

Nuts	
Material	Steel, Grade 6, minimum hardness Vickers 220 to 302HV or Rockwell 20 - 30 HRC
Strength	170 KN minimum. When fitted to the bar and tested in tension, the nut and thread must not fail before the bar.
Shape & Size	Hexagonal, 32 AF
Break-out device	Shear pin breakout (See table below)
Location on bolt	Not more than 1 thread to show below nut with shear pin.
Load indicators	
Fitment	1:10 bolts
Load indication	45 - 55 KN

**TORQUE**

Torque Break-Outs	
Bolt Length	0.9m, 1.2m
Shear strength of drive mechanism	70 – 90 Nm

**BAR OPTIONS**

Diameter (mm)	Length (m)	Thread	Thread Length (mm)
14.5	0.5 to 3.0	16 mm DIN 405	120
16	0.5 to 3.0	18 mm DIN 405	120
18	0.5 to 3.0	20 mm DIN 405	120
20	0.5 to 3.0	22 mm DIN 405	120
20	0.5 to 3.0	22 mm DIN 405	120
25	0.5 to 3.0	M24 metric	120

**BEARING PLATE (WASHER) OPTIONS**

Type	Square Size (mm)	Thickness (mm)	Hole Size
Flat	100, 125, 300	4.5 or 5.0 or 6.0	As per diameter required
Domed Dog Ear	125, 150		
Ribbed Dog Ear	125, 150		
Flat Dog Ear	125, 150		

The stud portion of the Rock Bolt Assembly comprises the steel bar with a mechanically applied thread at one end. Bars with 14.5 mm to 20 mm core diameters have cold rolled DIN 405 thread profiles.

This combination of cold rolling and DIN 405 profile ensures that no strength is lost in the threaded zone, especially as the thread diameter is nominally 2 mm greater (rolled up) than the core diameter. Thus a 16 mm bar has an 18 mm thread; a 20 mm bar has a 22 mm thread.

The DIN 405 standard maximizes the material within the body of the thread, providing high shear strengths. Left and right hand threads are available.

**APPLICABLE STANDARDS**

<b>SABS</b>	SANS 920, SANS 1408, SANS 1700-5 (nuts)
<b>Anglo American</b>	Draft 212001, Issue 1
<b>BECSA</b>	Specifications for ground support materials and control procedures for use on BECSA collieries, November 2007

**PACKAGING AND TRANSPORTATION**

Bundles of 10 bolts, with alternating threaded /cropped ends.

Two bolts per bundle to have the washers and load indicators. Each bundle to be securely strapped.

**DISPOSAL**

May be disposed of as ferrous scrap metal.

**DISCLAIMER**

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