

Rock bolting accessories

BEARING PLATES / WASHERS

Flat bearing plates

These are recommended for use only in conjunction with other load spreading devices such as headboards or 'W' straps. These plates, when used on their own, deform under load. This results in the tensile loads in the system being transferred to the collar of the drilled hole beneath the plate. This in turn leads to further deterioration of the rock in the immediate vicinity of the support and ultimate failure.

Deformed bearing plates

Deformed bearing plates spread the tensile loads in the system away from the collar of the drilled hole to the more competent surrounding rock. The plates are also less prone to buckling and maintain their load bearing capacity better than flat bearing plates.



APPLICATIONS

As a general rule, the more friable the ground being supported, the larger the bearing plate selected.

Where the rock surface below the bearing plate tends to be irregular, i.e. the plate would tend to align itself at an angle to the long axis of the bolt or stud, a spherical seat should be used in conjunction with the bearing plate.

Where the rock surface is relatively smooth (most coal mine roofs fall into this category), the spherical seat may be dispensed with. However, when using point anchored systems with larger diameter (+ 20mm) bolts, a spherical seat should be incorporated as this will improve the load bearing capacity of the system.



SIZES

Bearing plate type	Dimensions (mm)				Hole size (mm)				Thickness (mm)	
	100 x 100	125 x 125	150 x 150	250 x 250	18	22	27	40	5	6
Flat	Y	Y	Y	Y	Y	Y	Y	-	-	Y
Domed	-	Y	Y	Y	Y	Y	Y	Y	-	Y
Steep domed	-	Y	Y	-	Y	Y	-	-	Y	-
Domed slotted	-	Y	-	-	Slotted for yield cone				-	Y
Ribbed	-	Y	Y	-	Y	Y	Y	-	4,5	-

NUTS AND SPHERICAL SEATS

NUTS

Plain nuts

These are used in the left-hand form of rock studs where installation is by means of pneumatic rock drills, stopers or jackhammers.

Crimped nuts & shear-pin nuts

These are used on both end-anchored and resin grouted studs where installation is by means of rock bolting machines, and rotation needs to be imparted to the rock stud – to set the anchor or mix the resin respectively.



Types, threads and options

Nuts are threaded with the thread type appropriate to the stud to which they are fitted.

Material

All nuts are cold-forged grade 6 material for optimum strength.

Domed nuts are not forged.

SPHERICAL SEATS

Applications and uses

These are used as an alignment feature and are situated between the nut/bolt head and the bearing plate. This accessory is recommended where the rock surface below the bearing plate tends to be irregular, i.e. the plate would tend to align itself at an angle to the long axis of the bolt or stud. The spherical seat will ensure that the nut/bolt head is always seated correctly.

Sizes

Three sizes are available for use with various bolt diameters - 16mm, 20mm and 27mm.

Material

Spherical seats are cast in a SG 42 material with the following mechanical properties:

Grade	Tensile strength MPa (min.)	0.2% Proof stress MPa (min.)	Elongation % (min.)
SG 42	410	275	12