

SAS thread bars *rock bolts*



SAS ROCK BOLTS

For minor rock slope stabilization projects, engineers and contractors use the proven SAS thread bar system for non-stressed or stressed rock bolts.

For non-stressed rock bolts, SAS thread bars Grade 75/80 ksi per ASTM A 416 can be used, while for stressed bolts Grade 150 ksi per ASTM A 722, Type II, is applicable.

Unlike some other “threaded” bar systems using machined threads, SAS bars have a continuous rolled-in, thread-like deformation along the entire length, allowing anchorages and couplers to be threaded onto the bar at any point. The deformation eliminates jamming of nuts, even when the bar is covered by mud or dirt at the construction site.

All SAS end anchorages and couplers develop 95% of the guaranteed ultimate strength of the thread bar.

For permanent rock bolts (>24 months), corrosion protection using either DCP (Double Corrosion Protection) or SP (Single Protection) is applied as follows:

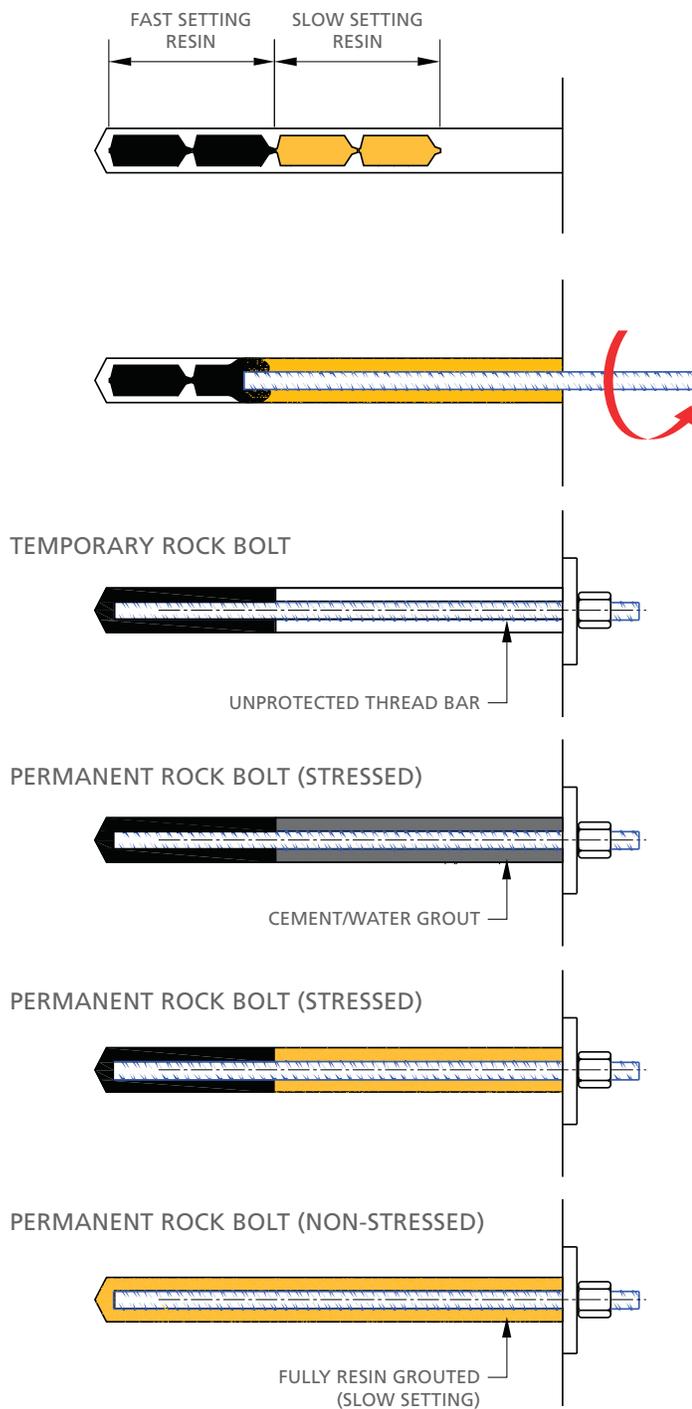
For DCP bolts, the bars are enclosed in a HDPE or PVC sheath over the entire anchor length. Once the rock bolt is installed and grouted inside the drill hole, the cement grout in the drill hole is considered the second layer of the double corrosion protection.

For SP bolts the bars are protected against corrosion by epoxy coating the thread bar per ASTM A 934 or by using a fast curing polyester resin grout.



Seismic retrofit of pedestrian overcrossing using SAS Rock Bolts





Rock bolts using a fast curing polyester grout develop a superior bond when compared with the typical cement/water grout. One advantage is the fact that the resin transfers the load to the rock within a few minutes after installation of the bolt. Resin grouted SAS rock bolts are primarily used in tunneling, but are also used in concrete or rock where water is present. Grade 60, 75/80 ksi and 50 ksi are used with resin grout but total anchor length is limited to approximately 25 feet.

The cartridge consists of a heat sealed tube containing either a slow or a fast curing resin and a catalyst. The required number of cartridges are inserted in the drill hole prior to installation of the rock bolt. The resin gels after the compounds are mixed as the bolt is placed into the drill hole puncturing the cartridge while rotating at 60 to 80 revolutions using a small air track or hand held rock drill.

Stressing of the bolt can proceed after the fast setting has cured but prior to the cure of the slow setting resin to allow the “stressing length” of the bar to elongate.

Non-stressed bars are fully encased in slow setting resin and rely on movement of the rock strata to load the anchor (similar to soil nails or MSE walls).

Yet another system to anchor an SAS rock bolt is the use of a mechanical anchor such as an expansion shell and cone used to develop a friction lock between the rock and head assembly. This type of anchor can only be used in competent rock and maximum load capacity is limited to approximately 100 kips.

SAS thread bars for prestressing are available in 1”, 1 1/4”, 1 3/8”, 1 5/8”, 1 7/8”, 2 1/2” and 3” nominal diameter and for reinforcing (ASTM A 615) in sizes #5 to #20. Both types are available in mill lengths up to 60 ft.

For additional information or sample specifications for rock bolts contact the SAS office nearest you.