

Freyssinet SD anchor



FREYSSINET
SUSTAINABLE TECHNOLOGY

- High speed drilling
- Easy installation in difficult conditions
- High bond capacity

Soil nails, micropiles, ground anchors

Technical data sheet reference n°: FT En C IX 2 3

The system

The Freyssinet SD anchor system is used for anchors installed in loose or collapsing soil. This system enables drilling, installation of the bar and grouting in a single operation, which avoids the use of tubing.

Simultaneous drilling and grouting offers excellent bond capacity, compared with the conventional installation method.

The system is made up of the following components:

- Fully threaded hollow bars
- Couplers
- Nuts and anchor plates
- Drill bits

Installation

A drill bit is screwed onto the first bar. The bar is then directly connected to the shank of the drilling machine (with a grout injection box if necessary). The drilling operation starts, together with the injection of the grout into the bar. The cement grout diffuses in the ground through the injection hole in the drill bit.

When the first bar is fully inserted into the ground, grouting and drilling are stopped and the bar is unscrewed from the shank. A second bar is connected both to the first one and to the shank, then the process of drilling and grouting is repeated until the anchor is completely installed in the soil.

Grouting is sometimes performed after drilling. In this case, the bore hole is generally flushed by air blown into the bar and drill bit during drilling.



Installing a micropile

Hollow bars

The hollow bars are fully threaded with a left hand R or T profile. They are available in lengths of 1, 2, 3, 4 and 6 metres. The steel quality, the inside diameter and outside diameter define the yield load and the ultimate load. The steel tube hardness is between 185 and 240 HB.



Type	Nominal diameter (mm)	Ultimate load (kN)	Yield load (kN)	Outside stress diameter for calculation ø (mm)	Minimum guaranteed stress area S (mm ²)	Minimum guaranteed mass (kg/m)	Average Young's modulus (kN/mm ²)
R25N	25	200	150	22.1	250	2	190
R32N	32	280	230	29.1	350	2.7	190
R32S	32	360	280	29.6	430	3.4	190
R38N	38	500	400	36.5	590	4.7	190
R51L	51	550	450	46.6	740	5.9	190
R51N	51	800	630	47.9	940	7.4	190
T76L	76	1200	1000	71.3	1,650	12.9	190
T76N	76	1,600	1,200	71.1	2,080	16.3	190
T76S	76	1,900	1,500	71.2	2,460	19.3	190

The residual ultimate load F_r , after loss of the sacrificial steel thickness, is calculated as follows:

$$F_r = F \left[1 - \frac{\pi}{S} (\sigma_s e - e^2) \right]$$

F: initial reference load (ultimate or yield) (kN)

F_r : residual load after loss of sacrificial steel thickness (kN)

t: sacrificial steel thickness to be taken from radius (mm)



Simultaneous grouting and drilling

Applications

The Freyssi SD self-drilling anchor system is particularly suited to use in nailing or rock bolting. In foundations, the system can be used as a micropile.



Temporary active tie rods can also be created with this system by using a sheath over the free length.

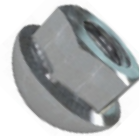


Corrosion protection

The bars and accessories can be hot dip galvanized on request.

Connection accessories

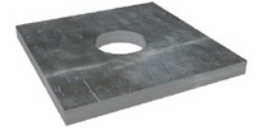
The connection between the anchor itself and the structure is provided by the anchor head, made up of a nut and a plate.



Spherical nut



Flat nut



Anchor plate

The bars are connected together by a coupler. A system is specially designed to stop the bar in the middle of the coupler. The grouting swivel enables the mechanical connection of the bar and simultaneous grouting via the drilling machine.



Coupler



Grouting swivel

Drill bits

A wide range of drill bits allows for efficient use of Freyssi SD self-drilling anchors in any situation. Different threads and outside diameters are available for each type of bar.

Shape	Description	Drilling diameter available by bar thread (mm)				
		R25	R32	R38	R51	T76
	Steel cross bit Made from heat treated steel.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 76 Ø 90 Ø 100 Ø 115 Ø 130	Ø 115 Ø 130 Ø 200
	Carbide cross bit Made from heat treated steel with carbide inserts.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 90 Ø 100 Ø 115 Ø 115 Ø 130	Ø 115 Ø 130 Ø 200
	Steel button bit Made from heat treated steel.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 76 Ø 100 Ø 115	Ø 120 Ø 130
	Carbide button bit Made from heat treated steel with carbide inserts.	Ø 42 Ø 51	Ø 51 Ø 76	Ø 76 Ø 90 Ø 115	Ø 76 Ø 100 Ø 115 Ø 115	Ø 120 Ø 130
	Steel arching-button bit Made from heat treated steel.	-	Ø 76	Ø 76 Ø 90 Ø 115	Ø 76 Ø 100 Ø 115	Ø 115 Ø 130
	Carbide arching-button bit Made from heat treated steel with carbide inserts.	-		Ø 76 Ø 90 Ø 115	Ø 76 Ø 100 Ø 115 Ø 115	Ø 115 Ø 130
	Retro flush drill bit Made from heat treated steel. Particularly suited to clay, soft sand and loose gravel.	-	Ø 76 Ø 100 Ø 110	Ø 90 Ø 110 Ø 130 Ø 150	Ø 76 Ø 90 Ø 100 Ø 150 Ø 175	Ø 120 Ø 130 Ø 150 Ø 175 Ø 200 Ø 300
	Drill bit adapter This adapter allows the use of a bar with a drill bit with a coarser thread.	R25/R32	R32/R38	R38/R51	R51/T76	-