

# DOUBLE CORROSION PROTECTION

MICROPILES | SOIL NAILS | GROUND ANCHORS

# DESIGNED FOR ENHANCED PERFORMANCE

Micropiles, Soil & Rock Nails and Ground Anchors with double corrosion protection provide enhanced support, even in the most demanding conditions.

## WHAT IS DCP?

Double Corrosion Protection (DCP) is a factory pre-grouted encapsulation of our steel tendons within a corrugated plastic sheath. Using DCP ensures durability and consistent long-term performance.

We offer the Minova DCP ATB threadbar system, which is recognised for performance and meets three internationally recognised design standards\*.

## HOW CAN WE HELP?

Our solutions are ideal for complicated engineering structures in need of immediate ground control with an enhanced lifespan.

If an application has a service life greater than 24 months it is generally considered 'permanent' and should always have some type of corrosion protection incorporated into its design. The level of corrosion protection required is primarily dependent on the required service life and the aggressivity of the environment.

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**OUR ATB THREAD BAR SYSTEM CAN MEET THE MOST  
CHALLENGING CONDITIONS AND REQUIRED SERVICE LIFE**

# DCP MICROPILES

Micropiles are relatively small in diameter; transferring compression, tension, and alternating loads mainly through skin friction to the surrounding ground. They are used for a range of applications and can be installed in restricted access locations.

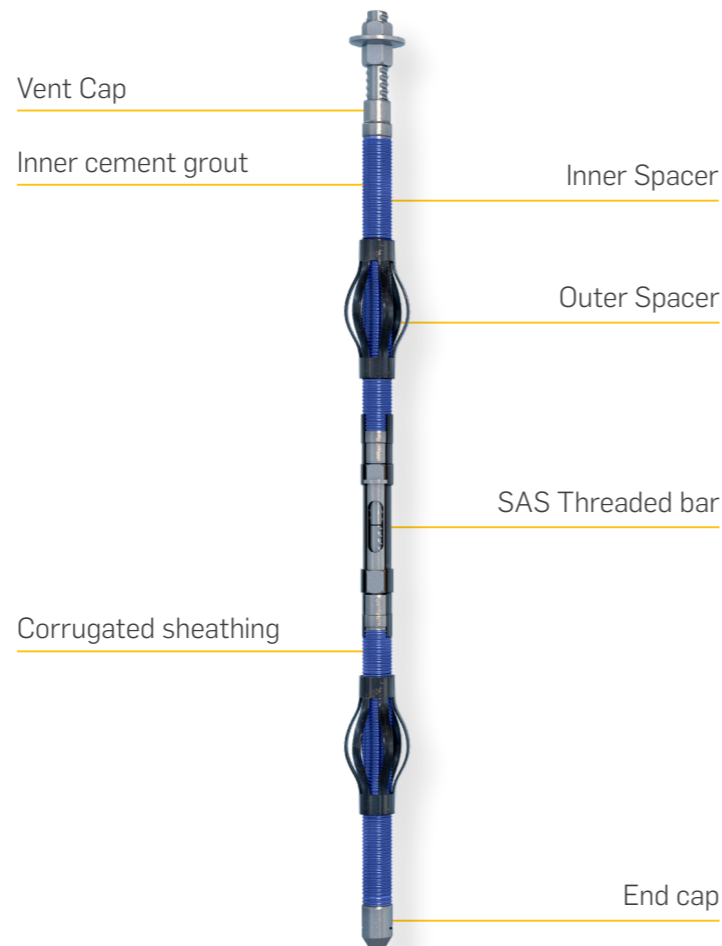
Micropiles comprise a thread-bar as the principal load carrying element inside a pressure-grouted cement body. The continuous coarse thread-bar allows the micropile to be installed in single sections, or in multiple sections, coupled together to any desired length.



## APPLICATIONS

*DCP micropiles can be used as support systems in the following application areas:*

- ▶ Anchorage of retaining walls
- ▶ Commercial & Industrial
- ▶ Silos & Tanks
- ▶ Nuclear Power
- ▶ Hydropower
- ▶ Pipelines
- ▶ Cast-in-place Method
- ▶ Cable-stayed Bridges
- ▶ Uplift Restraint



Approval	NOM-Ø [MM]	Yield Load [kN]	Ultimate Load [kN]	Cross section area [mm <sup>2</sup> ]	Cross section area [m/to]	Weight [kg/m]	Elongation A <sub>gt</sub> [%]	Elongation A <sub>10</sub> [%]	
<b>SAS 500/550</b>									
DIBt	20	160	175	314	404.9	2.47	6	10	
	25	245	270	491	259.7	3.85			
	28	310	340	616	207.0	4.83			
	32	405	440	804	158.5	6.31			
	40	630	690	1260	101.3	9.87			
	43	726	799	1452	87.7	11.40			
	50	980	1080	1960	64.9	15.40			
<b>SAS 500/620</b>									
BMVIT	20	175	195	314	404.9	2.47	6	10	
	25	270	305	491	259.7	3.85			
	26	290	330	531	239.8	4.17			
	28	340	380	616	207.0	4.83			
	30	390	440	707	180.2	5.55			
	32	440	500	804	158.5	6.31			
	36	560	630	1020	125.2	7.99			
	40	690	780	1260	101.3	9.87			
	43	799	900	1452	87.7	11.40			
	50	1080	1215	1960	64.9	15.40			
<b>SAS 555/700</b>									
BMVIT	57.5	1441	1818	2597	49.1	20.38	5		
DIBt	63.5	1760	2215	3167	40.2	24.86			
<b>SAS 500/550</b>									
BMVIT	75	2209	2430	4418	28.8	34.68	5		
<b>SAS 670/800</b>									
ETA	25	329	393	491	259.7	3.85	5	10	
	28	413	493	616	207.0	4.83			
	30	474	565	707	180.2	5.55			
	35	645	770	962	132.5	7.55			
	43	973	1162	1452	87.7	11.40			
	DIBt	50	1315	1570	1963	64.9			15.40
		57.5	1740	2077	2597	49.1			20.38
		63.5	2122	2534	3167	40.2			24.86
75		2960	3535	4418	28.8	34.68			

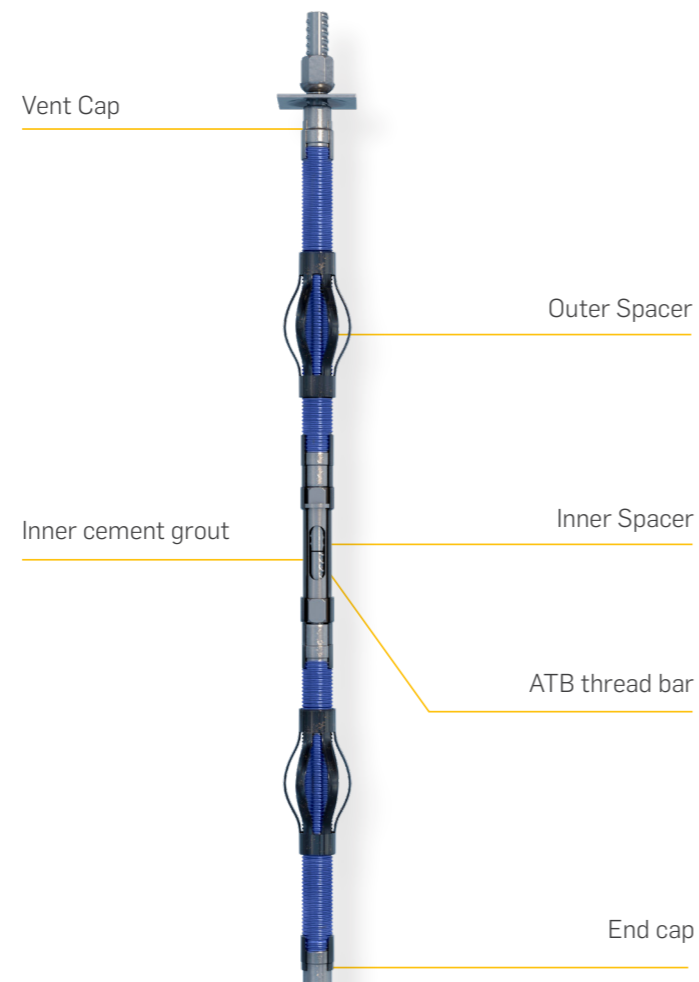
# DCP SOIL NAIL & ROCK NAILS

Soil nailing is a passive system used mainly to stabilise slopes, deep excavations and retaining walls. The reinforcing elements are drilled and grouted in the ground. As a result of the deformation of soil or weathered rock mass, tensile and shear forces act on the reinforcement. These axial tensile loads are transferred by the soil nail to the surrounding soil through shear stresses along the grout-soil interface.



## APPLICATIONS

- ▶ Stabilisation of terraces, existing and new slope faces, deep excavations
- ▶ Retaining Walls
- ▶ Embankment stabilisation
- ▶ Fixation of rock fall mesh



Approval	NOM-Ø [MM]	Yield Load [kN]	Ultimate Load [kN]	Cross section area [mm <sup>2</sup> ]	Cross section area [m <sup>2</sup> /to]	Weight [kg/m]	Elongation A <sub>gt</sub> [%]	Elongation A <sub>10</sub> [%]
<b>SAS 500/550</b>								
DIBt	16	100	110	201	632.9	1.58	6	10
	20	160	175	314	404.9	2.47		
	25	245	270	491	259.7	3.85		
	28	310	340	616	207.0	4.83		
	32	405	440	804	158.5	6.31		
	40	630	690	1260	101.3	9.87		
	43	726	799	1452	87.7	11.40		
	50	980	1080	1960	64.9	15.40		
<b>SAS 500/620</b>								
BMVIT	16	110	125	201	632.9	1.58	6	10
	20	175	195	314	404.9	2.47		
	25	270	305	491	259.7	3.85		
	26	290	330	531	239.8	4.17		
	28	340	380	616	207.0	4.83		
	30	390	440	707	180.2	5.55		
	32	440	500	804	158.5	6.31		
	36	560	630	1020	125.2	7.99		
	40	690	780	1260	101.3	9.87		
	43	799	900	1452	87.7	11.40		
	50	1080	1215	1960	64.9	15.40		
<b>SAS 555/700</b>								
BMVIT	57.5	1441	1818	2597	49.1	20.38	5	
DIBt	63.5	1760	2215	3167	40.2	24.86		
<b>SAS 500/550</b>								
BMVIT	75	2209	2430	4418	28.8	34.68	5	
<b>SAS 670/800</b>								
ETA DIBt	18	170	204	254	500.0	2.00	5	10
	22	255	304	380	335.6	2.98		
	25	329	393	491	259.7	3.85		
	28	413	493	616	207.0	4.83		
	30	474	565	707	180.2	5.55		
	35	645	770	962	132.5	7.55		
	43	973	1162	1452	87.7	11.40		
	50	1315	1570	1963	64.9	15.40		
	57.5	1740	2077	2597	49.1	20.38		
	63.5	2122	2534	3167	40.2	24.86		
	75	2960	3535	4418	28.8	34.68		

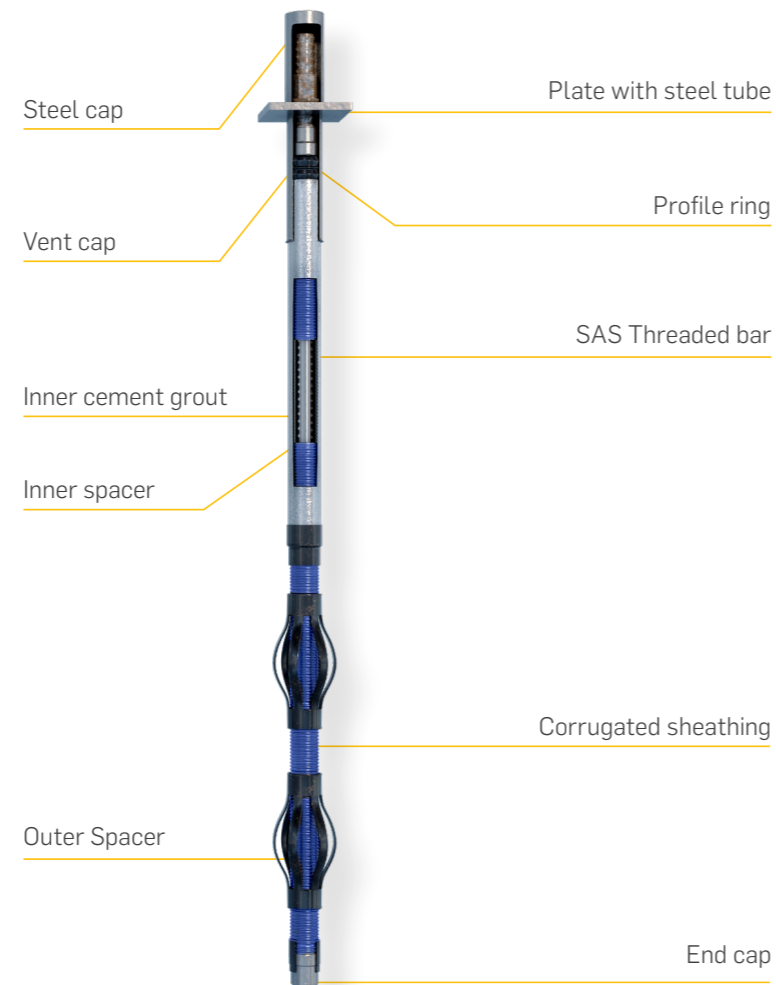
# DCP GROUND ANCHORS

Prestressed soil and rock anchors are components initiating high forces on tension members into the foundation soil. The prestressing process enables stabilisation with low deformation, by preventing elongations and distortions. The forces are directed from the anchor head, which transmits the load into stable soil layers.



## APPLICATIONS

- ▶ Tie back of deep excavation walls
- ▶ Buoyancy security
- ▶ Bridge abutments
- ▶ Stabilization
- ▶ Foundations for cable-stayed bridges
- ▶ Slope reinforcement



Approval	NOM-Ø [MM]	Yield Load [kN]	Ultimate Load [kN]	Cross section area [mm <sup>2</sup> ]	Cross section area [m <sup>2</sup> /to]	Weight [kg/m]	Elongation A <sub>0.1</sub> [%]	Elongation A <sub>1.0</sub> [%]
<b>SAS 500/550</b>								
	40	630	690	1260	101.3	9.87	6	10
	43	726	799	1452	87.7	11.40		
	50	980	1080	1960	64.9	15.40		
<b>SAS 555/700</b>								
	57.5	1441	1818	2597	49.1	20.38	5	
	63.5	1760	2215	3167	40.2	24.86		
<b>SAS 670/800</b>								
ETA	18	170	204	254	500.0	2.00	5	10
	22	255	304	380	335.6	2.98		
	25	329	393	491	259.7	3.85		
	28	413	493	616	207.0	4.83		
DIBt	30	474	565	707	180.2	5.55	5	
BMVIT	35	645	770	962	132.5	7.55		
	43	973	1162	1452	87.7	11.40		
	50	1315	1570	1963	64.9	15.40		
	57.5	1740	2077	2597	49.1	20.38		-
	63.5	2122	2534	3167	40.2	24.86		-
	75	2960	3535	4418	28.8	34.68		-
<b>SAS 950/1050</b>								
ETA	18	230	255	241	510.2	1.96	5	7
	26.5	525	580	551	223.2	4.48		
DIBt	32	760	845	804	153.1	6.53	5	7
	36	960	1070	1020	120.9	8.27		
BMVIT	40	1190	1320	1257	97.9	10.21	5	7
	47	1650	1820	1735	70.9	14.10		
<b>SAS 835/1035</b>								
	57	2155	2671	2581	47.7	20.95	4	7
	65	2780	3447	3331	36.9	27.10		
	75	3690	4572	4418	27.9	35.90		

# DCP MATERIAL SPECIFICATION



## TENDON

ATB Threadbar: To associated National Standards BS 4449, DIN 488 and DIN 1045.  
Bar diameters: 20mm - 50mmØ grade 500/550 & 63.5mmØ grade 555/700

ATB+ Threadbar: To associated National Standards BS 4449, DIN 488 and DIN 1045.  
Bar diameters: 25mm - 75mmØ grade 670/800

PST Threadbar: To associated National Standards BS 4486, DIN 4125 and DIN 4227.  
Bar diameters : 57mm - 75mmØ grade 835/1035

## GROUT

Cement grout is injected after mixing in a high speed colloidal mixer.

Cement type: Rapid Portland Cement to BS EN 197-1 - CEM I 52.5R.

Grout additive: Tricosol 181 - 1% by weight, to reduce shrinkage and plasticise.

Water cement ratio: water cement ratio - 0.38.

Compressive strength: 40N/mm<sup>2</sup> at 28 days - tested in accordance with BS EN 12390:2009.

## SHEATHING

Generally PVC corrugated sheath over the entire length of the bar.

Minimum wall thickness: 0.8mm.

Pitch of corrugations: Between 6 and 12 times the wall thickness.

Amplitude: Not less than 3 times the wall thickness.

## ANCILLARIES

Internal spacers: Injection moulded high density polyethylene.

Internal spacer cord: Extruded polyethylene.

End caps: Injection moulded low density polyethylene.

Heat shrink sleeves: Cross-linked polyolefin with internal mastic sealant.

Grout tubes: Polypropylene.

Wrap round spacers: Injection moulded polypropylene.

Lantern spacers: Polyvinyl chloride.

## ANCHOR HEAD

Bearing plate: Fabricated from steel plate to BS EN10025-1:2004 Grade S275JR.

Anchor nut: Steel forging - Grade St. 50.2.

## APPROVALS - BMVIT AND ETA

European technical approval: ETA-11/0138, ETA-12/0601, ETA-13/0022

DIBt The Deutsches Institut für Bautechnik.

National technical approval /general construction permit for the German market

In Compliance With

EN ISO 1537 : 2013 Execution of Special Geotechnical Works – Ground Anchors

EN ISO 14199 : 2015 Execution of Special Geotechnical Works – Micropiles

EN ISO 14490 : 2010 Execution of Special Geotechnical Works – Soil Nails



# SECURING PERFORMANCE TOGETHER

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