



# MINOVA SDA HOLLOW BAR SYSTEM

SECURING PERFORMANCE. TOGETHER.

ALWAYS AHEAD  >>>>

# SELF DRILLING SYSTEMS

## QUALITY ENGINEERING

The system features hollow bars, which are used as a drill string for drilling either with water flush, air flush or cement grout flush.

All system components are rigorously tested according to stringent factory standards based on ISO 9001 to ensure that the specifications are met.

## HOLLOW BARS

The hollow bars are fitted with left-hand or right-hand R-threads or T-threads for easy extension and connection to conventional rock drilling equipment. The hollow bars are manufactured from seamless steel tubes.

The R-thread according to ISO standards and the T-thread according to factory standard are formed in a cold rolling process. The hollow bolt can be extended using couplers.

## COUPLERS

Our patented standard couplers ensure a safe connection of the hollow bars to optimally transfer the impact energy from the drill hammer to the drill bit.

## DRILL BITS

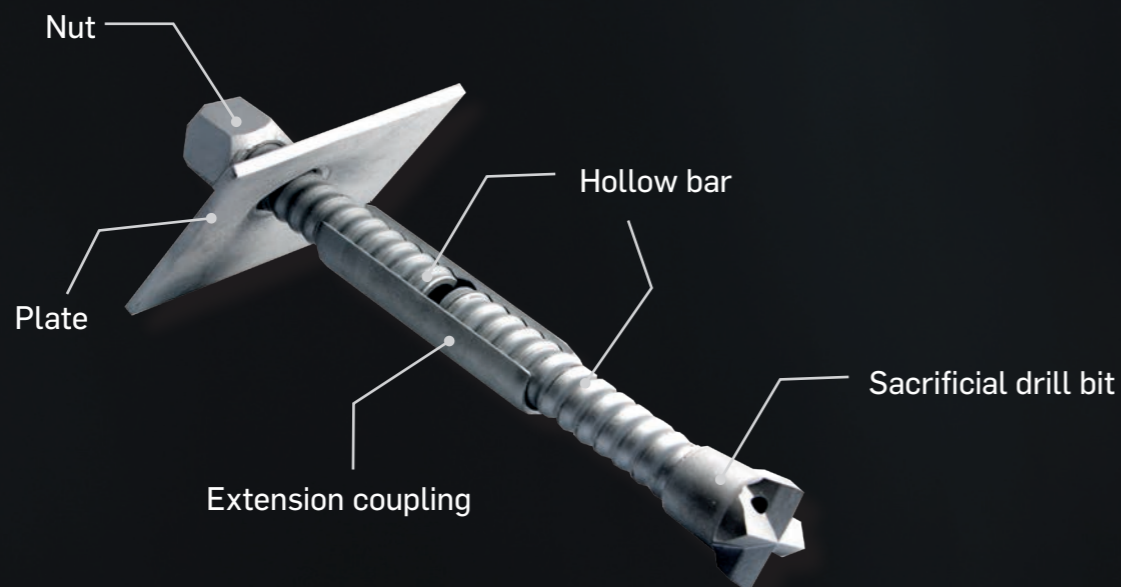
The sacrificial drill bits significantly enhance the productivity of the installation process.

## NUTS

The nuts are manufactured with at least one spherical end to compensate for deviations of the borehole angle with respect to the plate surface.

## PLATES

The domed or flat plates feature a chamfered bore to ensure firm seating of the nut.



# SUPPORT YOU CAN COUNT ON

Minova Self Drilling Systems provide you with the highest quality and support where you need it the most.

## **WHERE YOU NEED IT**

We offer a wide range of high-performance ground support and consolidation products and services for applications in slope stabilization, ground engineering, tunneling, mining and rehabilitation.

With over 135 years of experience in the production and global supply of geotechnical products and services, we provide customized solutions tailored to meet your needs.

Minova's products are manufactured to meet the highest industrial standards, providing safe, high-quality Self Drilling Systems.

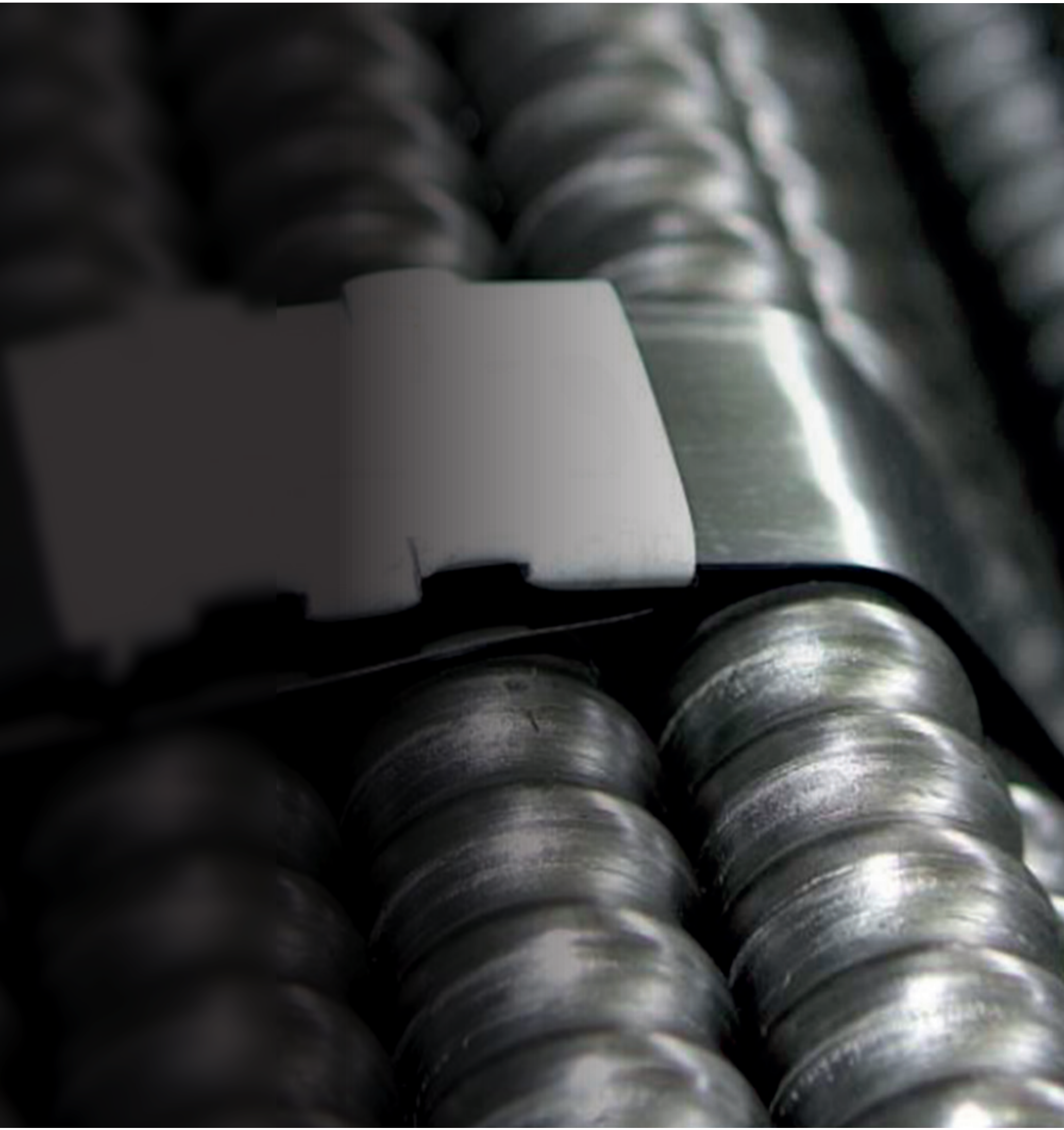
The production facility is certified according to ISO 9001.

## **A FLEXIBLE SOLUTION**

Our offerings include reinforcement solutions for unstable ground conditions such as sand, gravel, silt, clay and soft to medium hard and fractured rock.

Our Self Drilling Systems provide an efficient and cost-effective reinforcement solution.

Our products can be used both as Self Drilling Soil and Rock Nails (SRN) or as Self Drilling Micropiles (MIP).



# CERTIFIED QUALITY

Our Self Drilling Systems are available in various lengths and diameters to suit your project needs.

## HIGH PERFORMING & COST EFFECTIVE

To improve the performance and cost-effectiveness of our Self Drilling Systems, we collect project data from around the world. Our focus is on continuous optimization of our drill bits to further improve the penetration rate and bit quality while reducing manufacturing costs. For an improved corrosion resistance, Self Drilling Systems components are either Hot-Dip Galvanized or fitted with an Epoxy coating.

## ISO CERTIFICATION

Production is certified according to:

- ▶ ISO 9001 Quality Management Systems

## NATIONAL TECHNICAL APPROVALS

- ▶ IBDiM-KOT-2020/0571 Instytut Badawczy Dróg i Mostów (IBDiM) Poland
- ▶ Certificate of Conformity of the Factory Production Control No 052-UWB-012

## EUROPEAN TECHNICAL APPROVALS

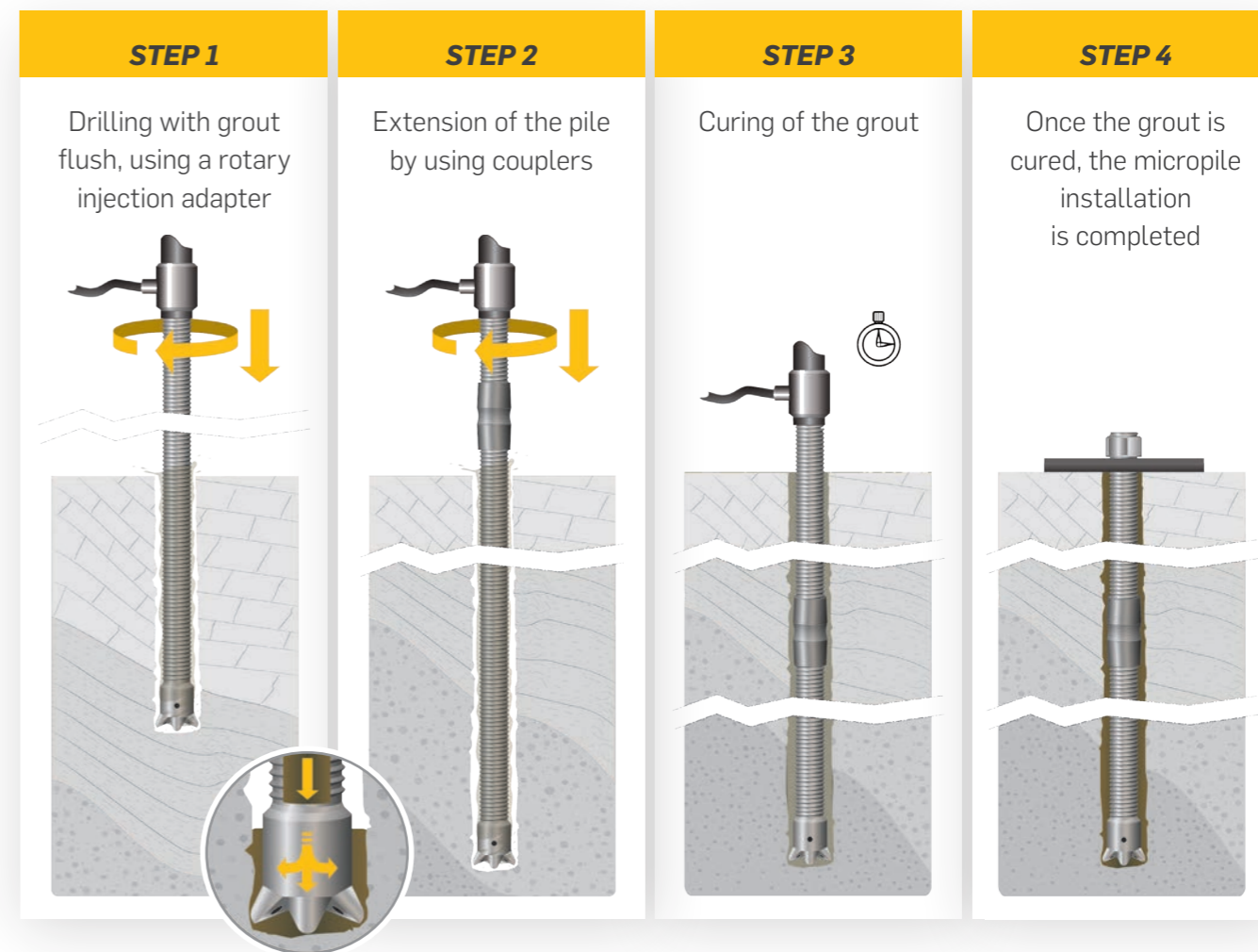
- ▶ ETA-11/0134 Austrian Institute of Building Engineering (OIB) Austria
- ▶ Certificate of Conformity of the Factory Production Control No 2579-CPR-0009

## DECLARATIONS

- ▶ Environmental Product Declaration - Type III No.140/2020  
- Instytut Techniki Budowlanej (ITB) Poland

# EASY INSTALLATION

Our Self Drilling hollow bolts are specifically designed to be used in all ground types, including unstable and difficult ground conditions.



Conventional ground support and piles require a cased drilling process with retrieval of the casing during grouting in unstable ground conditions.

Minova's Self Drilling Systems have been designed to overcome the need for cased drilling.

The hollow bars can be drilled with water flush, air flush or via simultaneous drilling and grouting.

SRNs are typically drilled using water or air flush and are grouted after installation (post grouting).

Micropiles are typically drilled using simultaneous drilling and grouting with the grout serving as the flushing medium while simultaneously stabilizing the surrounding ground by filling voids and cracks.

After reaching the final depth, the water to cement ratio is decreased to fill the annular space between hollow bar and borehole wall for optimum load transfer.

Manual, mechanized and automated installation methods are available.



# SELF DRILLING MICROPILES

Dependent on the ground conditions, Self Drilling Micropiles are designed either as end-bearing or friction piles.

Self Drilling Micropiles are installed via simultaneous drilling and grouting using cement grout as the flushing medium.

The main areas of application include:

- ▶ Foundation of new structures
- ▶ Underpinning of existing foundations
- ▶ Minimizing settlements
- ▶ Buoyancy control for structures below groundwater level

In cohesionless or unstable ground conditions, e.g. sand, clay or gravel, this is the fastest and most efficient installation method for micropile systems.

Our Self Drilling Micropiles can be used with smaller drilling equipment, making them ideally suited for projects with limited access, confined spaces or low headroom conditions.

# SELF DRILLING SOIL AND ROCK NAILS

## **SURFACE**

The SRNs are predominantly subjected to tensile stress, but may also be subjected to bending and shear loads.

In geotechnical engineering, SRNs are used to stabilize natural or artificial slopes or to support structures, e.g. retaining walls.

Minova offers various support systems, e.g. flexible reinforcing meshes or geotextiles to further stabilize the surface of the slope or rock.

## **UNDERGROUND**

In underground applications, SRNs are predominantly used for forepoling, spiling, face bolting and radial bolting.

Our SRNs provide ideal solutions for weak, unstable or cracked ground conditions a



# CORROSION PROTECTION

We offer a suite of complementary products to help your bolting needs.



## LOSS IN CROSS SECTIONAL AREA DUE TO CORROSION

Type	Parameter	Sacrificial corrosion [mm]															
		0	0.05	0.1	0.15	0.2	0.3	0.4	0.45	0.5	0.6	0.7	0.8	0.9	1.0	1.4	1.7
R25N	%	0	2	3	4	5	8	10	12	13	15	18	21	23	25	36	44
R32L	%	0	2	3	4	6	8	11	13	14	17	19	23	25	27	39	48
R32N	%	0	1	2	3	5	7	9	10	11	14	16	18	21	22	32	39
R32S	%	0	1	2	3	4	6	8	9	9	11	13	15	17	18	26	32
R38N	%	0	1	2	2	3	5	6	7	8	9	11	13	14	16	22	27
R51L	%	0	1	2	3	3	5	7	8	8	10	12	14	16	17	25	30
R51N	%	0	1	1	2	3	4	6	7	7	8	10	12	14	14	21	25
T51S	%	0	1	1	2	2	4	5	5	6	7	8	10	11	12	17	20
T63N	%	0	1	1	2	2	4	5	6	6	7	8	9	10	12	16	20
T76N	%	0	1	1	2	3	4	5	6	6	8	10	10	11	13	18	22
T76S	%	0	1	1	2	2	3	4	5	5	6	7	8	9	10	14	17
T111L	%	0	1	1	2	2	3	4	5	5	7	8	9	10	11	15	19

### PROLONGING THE LIFE SPAN

The required service life is an important design criterion.

The system can be used for temporary (up to 2 years) and permanent applications (up to 50 years and beyond).

Minova provides products for the design of permanent elements in accordance with EN 14199 and EN 14490.

In line with the abovementioned standards, the loss in cross sectional area due to corrosion of the hollow bars and components is taken into account.

The service life of the system is closely linked to ground conditions (soil corrosiveness) and the design load.

The Minova Self Drilling Systems are available in:

- ▶ Bright (uncoated) steel
- ▶ Hot-Dip Galvanized according to ASTM A123
- ▶ Hot-Dip Galvanized according to ASTM A123 with an Epoxy coating according to ASTM A972/A972M-00 on top.

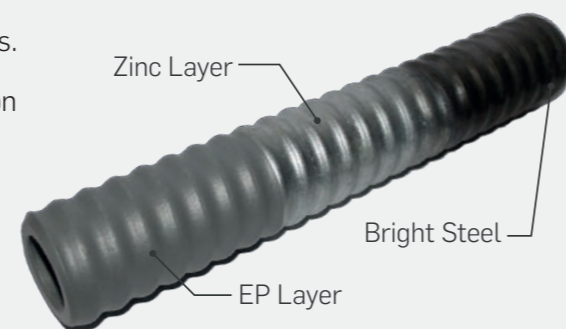
### TWINCOAT™ PROCESS

Our TwinCoat process is available for our SDA anchors.

The coating process comprises a Hot-Dip Galvanization in accordance to ASTM A123 and Epoxy coating in accordance with ASTM A972/A972M-00.

The TwinCoat process is tested for suitability in accordance with corrosion category C5-M and Im3 (durability range according to ISO 12944-2).

Testing performed by OFI (Austria) and ITB (Poland).



### UP TO 120 YEARS OF SERVICE LIFE

Additional information (residual load capacity due to corrosion for bright and galvanized systems up to 120 years of service life) is available upon request.

Years	Steel	Sacrificial corrosion [mm]		
		l	m	h
2	A	0	0	0.2
	B	0	0	0
7	A	0.15	0.2	0.5
	B	0	0	0.3
10	A	0.15	0.2	-
	B	0	0	-
20	A	0.2	0.4	-
	B	0	0.1	-
30	A	0.3	0.6	-
	B	0	0.3	-
40	A	0.4	0.7	-
	B	0.1	0.45	-
50	A	0.5	0.9	-
	B	0.2	0.6	-

#### Legend

Soil aggressiveness	Steel
l = low	A = bright (uncoated)
m = medium	B = galvanized, average thickness min. 85 µm
h = high	

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer but are to be regarded only as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the system.

# SELF DRILLING PRODUCTS

## HOLLOW BARS

The system consists of one or several coupled hollow bars for drilling with water or air flush or for simultaneous drilling and grouting.

The hollow bar features a left-hand R-thread (rope thread) or T-thread (trapezoidal thread) for easy extension and connection to all conventional drill rigs. It is manufactured from seamless steel tubes.

The R-thread according to ASTM A511 standards and T-thread according to factory standard are both formed in a cold rolling process.

## EXTENSION COUPLERS

The couplers are used to extend the hollow bars. The required length of the load-bearing element can thus be achieved also in cases of limited feed length of the drill rig or low headroom conditions.

All couplers are designed to safely transfer the specified system load, with the faces of the hollow bars bearing against each other to ensure safe energy transfer between the hollow bars and the drill bit without affecting the couplers mechanically.

The material is purchased exclusively from carefully selected suppliers with proven expertise in quality. Seamless tubes are used.

Two types of couplers are available:

- ▶ Standard couplers with an R-thread or T-thread dependent on the thread of the bar used
- ▶ A new thread design allows significant reduction in the length of the coupler for R-threads thus offering improved economy without impairing the specified system performance (LC coupler)

## NUTS

All nuts are designed to transfer the load from the plate into the hollow bolt. They feature a spherical cap on at least one end to compensate for angle deviations. All nuts are designed to ensure safe transfer of the specified system load.

The material is purchased exclusively from carefully selected suppliers with proven expertise in quality. Two types of nut options are available:

- ▶ Standard nuts with R-thread or T-thread dependent on the thread of the bar used
- ▶ A new thread design enables nuts for R-threads to be produced more economically without impairing the specified system performance (LC nut)

## PLATES

The steel plates feature a chamfered bore allowing an angle of deviation of five degrees in all directions. We offer a variety of plates dependent on the requirements of your specific project.

## NAIL AND PILE NECK PROTECTION TUBE

Protection tubes for soil and rock nails (plastic tubes) and pile neck protection tubes (plastic or steel tubes) are available upon request.

## SPACERS OR CENTRALIZERS

Spacers are used to center the hollow bars within the borehole and to ensure the correct grout cover of the load-bearing element according to the relevant standards and as specified in the approvals.

## GROUT SWIVELS

The grout swivels consist of a grout body and a swivel shaft and are attached to the shank adapter. The grout swivels are suitable for simultaneous drilling and grouting.

## MINOVA'S HOLLOW BAR TECHNICAL DATA

### MINOVA POLAND SDA R-THREAD

Bar Designation		Nominal Diameter		Nominal Cross Sectional Area		Weight		Yield Load		Tensile Load	
Bar Size	mm	Inside mm	Outside mm	mm <sup>2</sup>	in	lbs/lf	kg/m	kips	kN	kips	kN
R25N	25	14	24.7	300	0.465	1.58	2.35	34	150	45	200
R32L	32	20.6	31.3	350	0.54	1.85	2.75	36	160	47	210
R32N	32	18.5	31.3	430	0.66	2.28	3.4	52	230	63	280
R32S	32	15	31.3	520	0.806	2.76	4.1	63	280	81	360
R38N	38	19	38	750	1.16	3.96	5.9	90	400	112	500
R51L	51	33.3	50	900	1.395	4.74	7.05	101	450	124	550
R51N	51	30.2	50	1070	1.66	5.64	8.4	142	630	180	800

### MINOVA POLAND SDA T-THREAD

Bar Designation		Nominal Diameter		Nominal Cross Sectional Area		Weight		Yield Load		Tensile Load	
Bar Size	mm	Inside mm	Outside mm	mm <sup>2</sup>	in <sup>2</sup>	lbs/lf	kg/m	kips	kN	kips	kN
T51S	51	26.6	51.9	1325	2.05	6.99	10.4	169	750	236	1050
T63N	63	40.6	64.9	1720	2.66	9.07	13.5	202	900	315	1400
T76N	76	51	75.4	1870	2.89	9.88	14.7	270	1200	360	1600
T76S	76	44	75.4	2400	3.72	12.67	18.85	337	1500	427	1900
T111L	111	85	111	3185	4.93	16.8	25	450	2000	593	2640
T111N	111	75.5	111	4395	6.81	23.18	34.5	618	2750	821	3650

### COMMERCIAL GRADE SDA T-THREAD

Bar Designation		Nominal Diameter		Nominal Cross Sectional Area		Weight		Yield Load		Tensile Load	
Bar Size	mm	Inside mm	Outside mm	mm <sup>2</sup>	in <sup>2</sup>	lbs/lf	kg/m	kips	kN	kips	kN
T30/11	30	11	30	406	0.63	2.18	3.25	58	260	72	320
T40/20	40	20	40	777	1.20	4.09	6.10	97	430	121	540
T40/16	40	16	40	913	1.41	4.82	7.17	118	525	148	660
T52/26	52	26	52	1250	1.94	6.65	9.9	164	730	209	929
T73/53	73	53	73	1680	2.60	8.87	13.20	218	970	261	1160
T73/45	73	45	73	2267	3.51	11.96	17.80	286	1270	357	1588
T73/35	73	35	73	2700	4.18	14.25	21.20	321	1430	422	1875
T103/78	103	78	103	3220	4.99	17.00	25.30	405	1800	513	2280
T103/51	103	51	103	5680	8.82	29.97	44.60	620	2760	823	3660

### COMMERCIAL GRADE SDA R-THREAD

Bar Designation		Nominal Diameter		Nominal Cross Sectional Area		Weight		Yield Load		Tensile Load	
Bar Size	mm	Inside mm	Outside mm	mm <sup>2</sup>	in	lbs/lf	kg/m	kips	kN	kips	kN
R25N	25	14	24.7	300	0.465	1.58	2.35	34	150	45	200
R32L	32	20.6	31.3	350	0.54	1.85	2.75	36	160	47	210
R32N	32	18.5	31.3	430	0.66	2.28	3.4	52	230	63	280
R32S	32	15	31.3	520	0.806	2.76	4.1	63	280	81	360
R38N	38	19	38	750	1.16	3.96	5.9	90	400	112	500
R51L	51	33.3	50	900	1.395	4.74	7.05	101	450	124	550
R51N	51	30.2	50	1070	1.66	5.64	8.4	142	630	180	800

### SACRIFICIAL DRILL BITS & ADAPTERS

The correct selection of the drill bit dependent on the geological conditions on site is essential to ensuring a productive and cost-effective installation of the hollow bars. Conventional drill bits are designed for longevity. We offer a wide range of drill bits suitable for diverse geological conditions. Drill bit adapters increase flexibility by allowing the use of drill bits designed for other dimensions of hollow bars.

### DRILL BITS

Bit type	EW	XX	EX	EC	ES-F	ES-D	EY	EYY	ECC	EXX	ESS-F
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EW	Clay Bit	EC	Hardened Arching Bit	EY	Hardened Center Drop	EXX	Cross Cut Carbide
XX	Clay Cross Cut	ES-F	Steel Button	EYY	Carbide Drop Center	ESS-F	Carbide Button
EX	Cross Cut Hardened Steel	ES-D	Tricone Button Bit	ECC	Carbide Arching Bit		

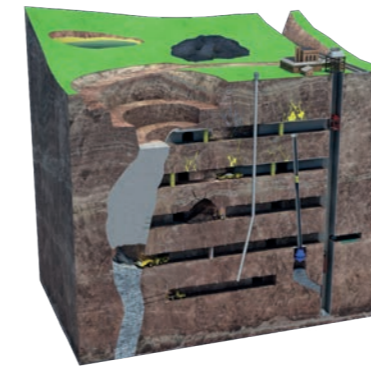
All bits sizes available.

# SECURING PERFORMANCE TOGETHER

We are an international producer of high-performance ground support products for the mining, construction and energy industries.

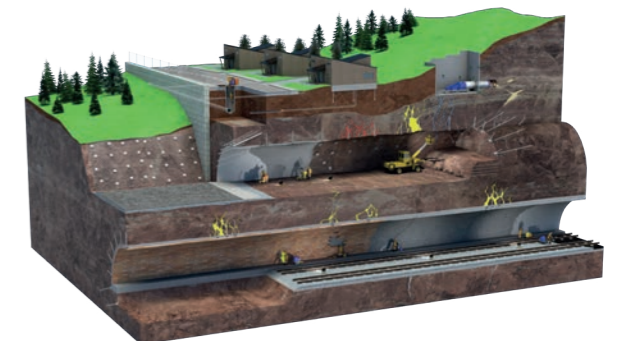
### COAL MINING

We are a leader in providing safe environments in extremely fractured and fluid ground conditions. We understand that safety and efficiency are the key requirements of coal production.



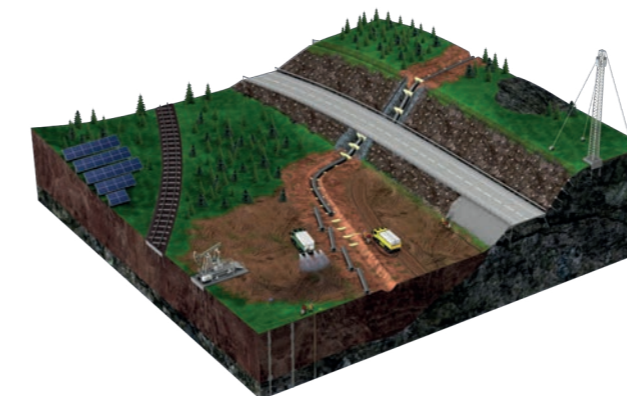
### HARD ROCK MINING

We support underground hard rock mines across the primary commodities. Our products are designed to provide safety, improve efficiency and include automated solutions.



### CONSTRUCTION

Stemming from our mining expertise, we have produced a wide range of products that are used in the construction industry. Our solutions are utilized in both above and below ground assets to secure, repair, restore and rehabilitate.



### ENERGY

We support many types of geostabilization and structural repair projects in the energy sector. Our products and services include solutions in the oil and gas and renewable energy sectors.

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