CANSHIELD ROCKBOLTS INC.

SELF DRILLING ANCHORS

DESCRIPTION

A self-drilling anchor is a type of bolt used to ensure the stability of the roof and walls in underground mining and tunnel construction. Unlike other types of bolts, self-drilling bolts do not require pre-drilling and can drill and hold at the same time.

These bolts are designed with a hollow threaded bar with a one-time use drill bit at its end, simplifying and reducing the installation process.

Once installed, they are filled with resin or cement mortar to consolidate the ground. In addition, these bolts can be joined by couplings to achieve lengths that would be impossible with other types of bolts.

At the end of the bolt, there is a nut that, once installed, is tightened, putting the bearing plate and the bolt itself under load, further increasing the bolt's effectiveness. Self-drilling anchors can also be used in areas where the rock is harder or more compact, using different types of bits. By drilling and securing at the same time, the need for additional equipment for pre-drilling is reduced, which also reduces cost and installation time.

FIELDS OF APPLICATION

- Rock support: Self-drilling bolts are used in mining and tunnels to provide support and stabilization of rocks.
- Anchor systems**:** Self-drilling bolts are used to fasten and secure structural elements such as tunnels, mine roofs, pillars, etc. into rock or soil.
- Rock repair**:** Self-drilling bolts are also used for the repair of damaged or weakened rocks and soils in mines or tunnels.
- Equipment assembly**:** Self-drilling bolts are used for fastening equipment, machinery, and other elements in mining and tunnels, such as lights, fans, conveyor belts, etc.

ADVANTAGES OF SELF DRILLING ANCHORS

- Fast installation: Self-drilling bolts are easy and quick to install. They can be drilled and anchored in a single operation, which reduces installation time compared to other anchoring systems.
- Less need for equipment: Self-drilling bolts do not require special drilling equipment, which means that the number of equipment and the cost associated with drilling the anchors can be reduced.
- High strength: They are extremely strong bolts and can withstand large loads. This makes them ideal for use in the mining and tunneling industry, where strong and resistant anchors are required.
- Flexibility: since they can be installed in a variety of materials, including hard rock, soil, and concrete. Additionally, they can be used in different geotechnical conditions, such as unstable terrains or presence of water.
- Safety: Self-drilling bolts are safe and reliable. Being designed to install correctly, they minimize the possibility of human errors in the installation and reduce the risk of structural failures.

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TECHNICAL PROPERTIES OF TYPE R SELF DRILLING ANCHORS

SPECIFICATIONS	R25	R32L	R32N	R32S	R32SS	R38	R51L	R51N
Outer Diamter (mm)	25	32	32	32	32	38	51	51
Inner Diametre (mm)	14	20.6	18.5	15	12.5	19	33.3	30.2
Area (mm2)	300	350	430	510	560	750	890	1070
Ultimate Tensile Load (Kn)	200	210	280	360	400	500	550	800
Yield Load (Kn)	150	160	230	280	330	400	450	630
Ultimate Tensile Strenght (MPA)	667	600	651	706	714	667	618	748
Yield Strenght (MPA)	500	457	535	549	589	533	506	589
Nominal Weight (Kg x m)	2.35	2.75	3.4	4	4.4	5.9	7	8.4
Rm / Rp 0.2 (≥)	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Agt.	≥5	≥5	≥5	≥5	≥5	≥5	≥5	≥5
Steel Grade	EN10210-1	EN10210-1	EN10210-1	EN10210-1	EN10210-1	EN10210 -1	EN10210-1	EN10210-1

***Type R self-drilling anchors have an excellent internal and external quality control. The R-type thread is in accordance with ISO10208, ISO 1820 (R51) and the internal hollow of the bars guarantees compliance with EN14199/EN14490/ASTMF432/ASTM A615 standards.

TECHNICAL PROPERTIES OF TYPE T SELF DRILLING ANCHORS

SPECIFICATIONS	T30L	T30N	T40L	T40N	T52N	T76L	T76N	T76S
Outer Diamter (mm)	30	30	40	40	52	76	76	74
Inner Diametre (mm)	16	14	22	18	26	58	51	44
Area (mm2)	344	369	713	892	1274	1605	2102	2395
Ultimate Tensile Load (Kn)	220	260	540	660	930	1200	1600	1900
Yield Load (Kn)	180	220	430	525	730	1000	1200	1500
Ultimate Tensile Strenght (MPA)	640	704	757	740	730	748	761	793
Yield Strenght (MPA)	523	596	603	589	573	623	571	626
Nominal Weight (Kg x m)	2.7	2.9	5.6	7	10	12.6	16.5	18.8
Rm / Rp 0.2 (≥)	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Agt.	≥5	≥5	≥5	≥5	≥5	≥5	≥5	≥5
Steel Grade	EN10210-1	EN10210-1	EN10210-1	EN10210-1	EN10210-1	EN10210 -1	EN10210-1	EN10210-1

***The T-type self-drilling bolt also has excellent in-house quality control. The T-wire features a longer pitch, as well as a greater profile angle, all in accordance with manufacturing standards.

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INSTALLATION OF SELF DRILL ANCHORS

- Preparation**:** before beginning the installation of self-drilling bolts, it is important to prepare the installation site. This may include cleaning and clearing the work area, removing any loose or unstable material, and assessing the local geology to determine the optimal location for bolt installation.
- Drilling of pilot hole**:** the first step is to drill a pilot hole in the rock or soil using a tungsten carbide drill bit. The diameter of the hole should be slightly smaller than the diameter of the self-drilling bolt for a good grip to occur.
- Installation**:** once the pilot hole has been drilled, the self-drilling bolt is inserted into the hole and rotated into place. The self-drilling bolt's bar has a drill bit on the end, and as it is rotated, the bolt's bar drills into the rock or soil and secures it in place.
- Grout injection**:** after installing the self-drilling bolt, grout is injected through the bolt's bar to fill the space between the bolt and the surrounding rock or soil. The grout helps to provide additional anchorage for the bolt and protects against corrosion.
- Bolt anchoring**:** to anchor the bolt in place, a tension load is applied to the bolt through a locking nut or coupling. This will ensure that the bolt is firmly anchored in place and can support the loads for which it has been designed.
- Installation inspection: after the self-drilling bolt installation, an inspection should be carried out to ensure that it has been installed correctly and that design and load requirements have been met. This may include load testing and visual verification of the bolt and surrounding area.

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