ARGENTIUM

Defining the future of underground

Modern rock support solutions for tunnelling

30 YEARS EXPERIENCE

ARGENTIUM

Company Overview/ Profile

30 years of experience as a leading solution provider for India's mining and tunneling needs. We believe that no challenge is too big to meet. We are a dynamic and innovative company with a mission to lead the change of today using the tools of tomorrow. We are committed to delivering high quality mining and tunneling products with leading-edge technology.

- Conform to international quality standards
- State-of-the-art manufactured tools confirmation to high international standards.
- Favorable cost to performance ratio standards
- Providing technology with full technical backup and application support.
- Offers latest, timely and effective solutions to our customers

Solutions offered by Argentium

30 YEARS EXPERIENCE
ARGENTIUM

01
Self Drilling Anchor
MEGABolt-SDA

02
Forepoling
MEGAPole

03
Water Expandable Bolt
MEGABolt-ERB

04
Rebar Couplers
MEGASplice

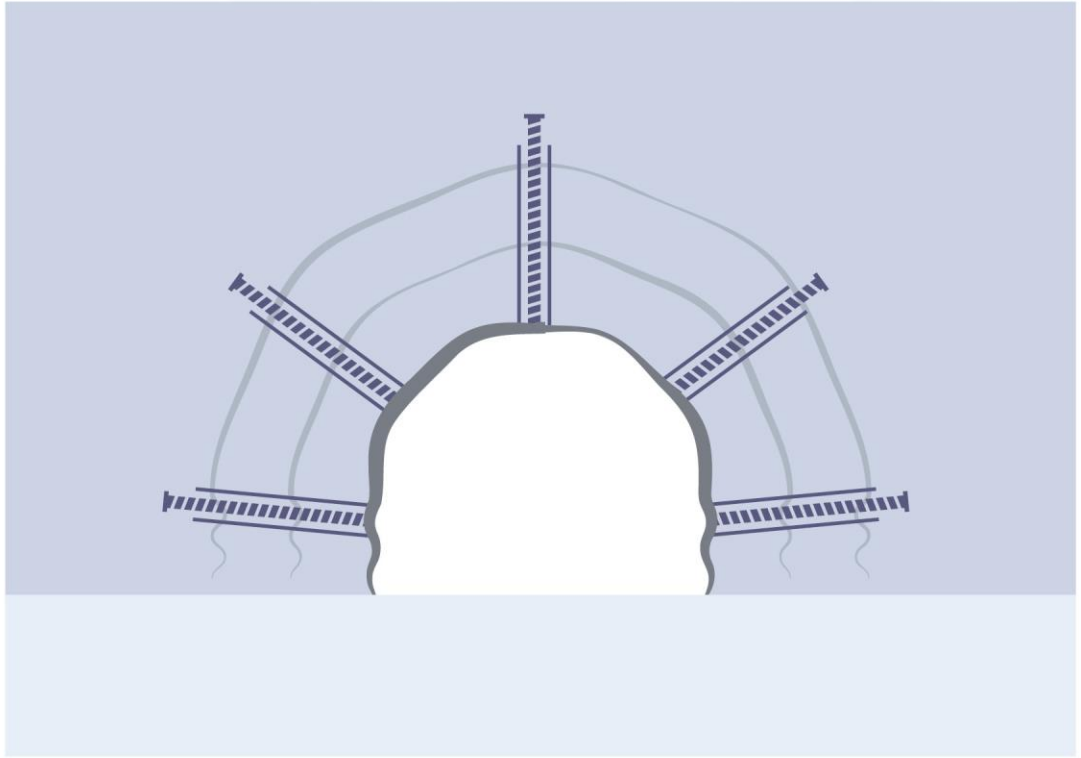
MEGABolt-SDA

01

Self Drilling Anchor

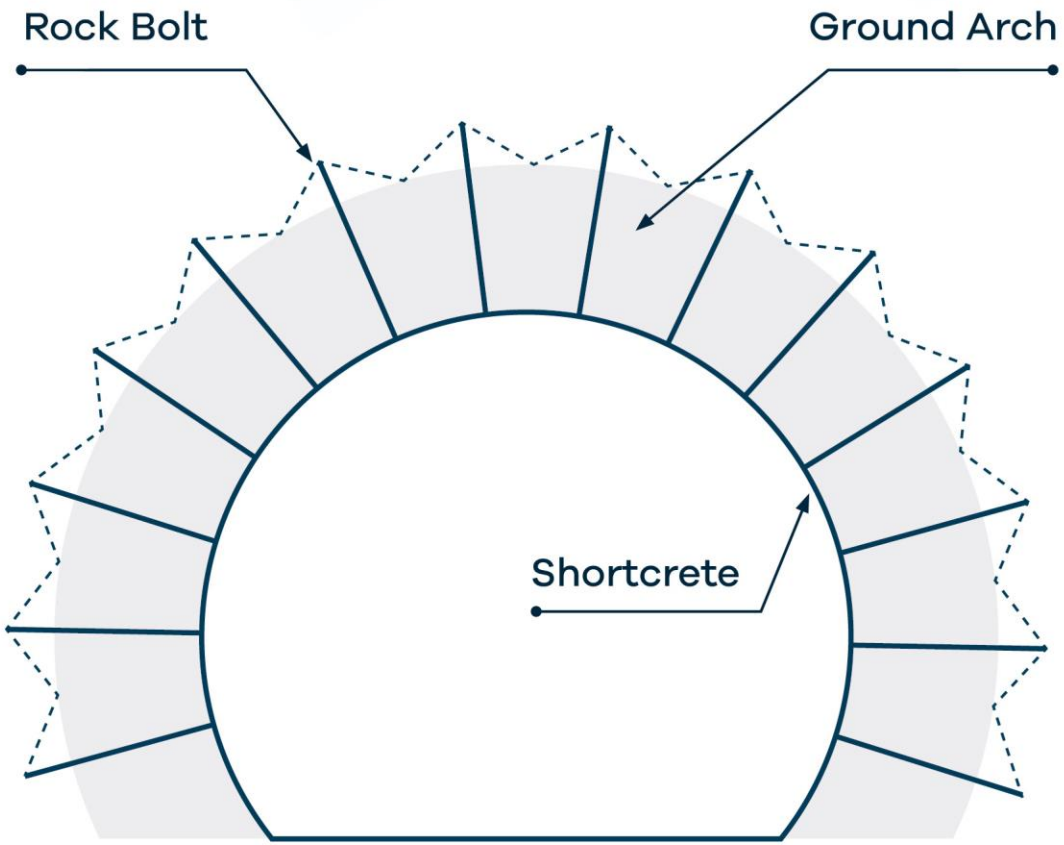
01 Introduction to Bolting

The principal objective in the design of a roof support system is to help the rock mass create a self-supporting structure. The usage of rock bolts can be combined with wire mesh, shotcrete, and concrete lining to cope with different situations encountered during mining or tunneling.



01.1 Problems with current bolting practices

1. Need to drill hole and then retract hoping the hole does not collapse, install the bolt and actuate to tension
2. possible need to auger the hole
3. number of consumables is high
4. Ability to reach rib with head plate
5. Safety (Time spent on operation)
6. Potential for rib collapse
7. Manual handling
8. Mesh alignment



01.2 What is SDA?

» Megabolt - Self drilling anchor (SDA) is a bolting solution for unstable ground conditions such as sand, gravel, silt and clays and in soft to medium fractured rock formations.

» Basic application of SDA is for use in soil conditions where there is a risk of the drill hole collapsing due to pulling out of drill bit, as in the classical anchor installation process.

» Megabolt SDA can be deployed for various drilling and grouting

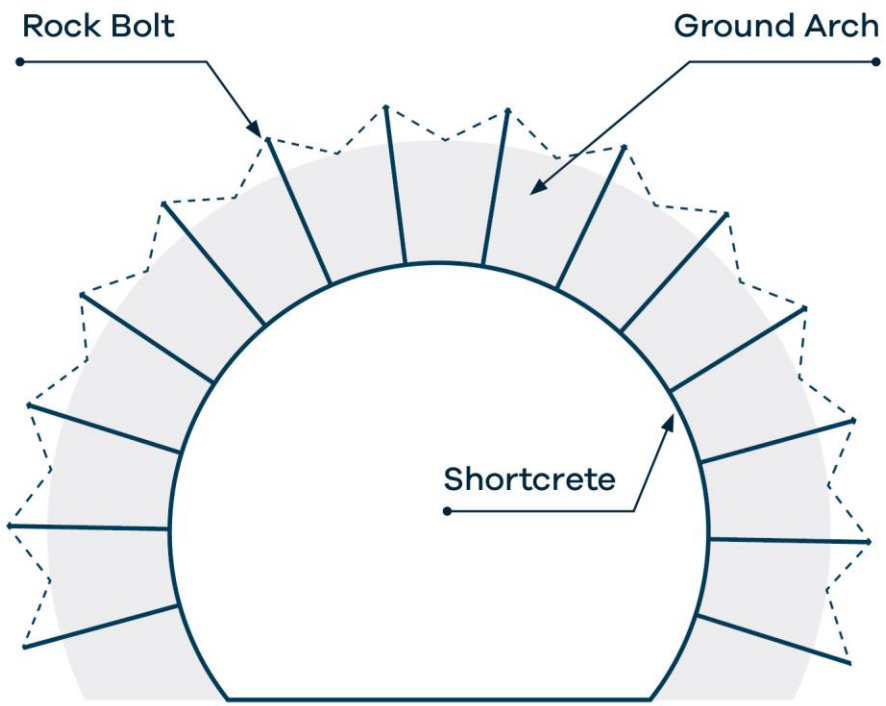
- Slope stabilization
- Strengthening of existing retaining wall
- Foundations with micropiles
- Soil nailing
- Face stabilization
- Temporary support anchoring

01.1 Technical Advantages of SDA

1. SELF DRILLING - Installation of the rock bolt is much quicker and simpler when it drills its own hole. Many time consuming steps of the normal installation process are eliminated
2. STRENGTH - axial load capability (stiffness) is increased through the combined use of mechanical anchor plus full encapsulation with either thixotropic or cementitious grout
3. PRETENSION - as the bolt is pretensioned by use of the mechanical anchor, the rib layers are forced together before the injection of the grout. Standard chemical capsules can be forced into cracks and fissures under the hydraulic pressure created when the bolt is inserted which results in serperations being held open a loss in encapsulation

01.2 Value Proposition

1. Improved safety - the operator is exposed 50% less time, reducing the risk
2. Improved productivity - drilling, placing and grouting are performed in a single operation
3. Reduced bolting cost - bolting cycle time is reduced to lower the cost of labor and materials
4. Minimal loss of shear resistance
5. No headache of insite fabrication
6. Improved maintenance outcome - halves the movements of drill rig



MEGABolt-ERB

02

Expandable
Rock Bolt

02.1 What is ERB?

The ERB - Expandable Rock Bolt is a full column anchored rock bolt that forms a mechanical interlock between the borehole wall and the bolt over the full bolt length.

This is achieved by inflating the ERB by means of high water pressure. When the pump stops the ERB immediately provides full rock support action

The expansion of the bolt creates a friction and interlocking anchor. There is immediate full-length support for faster excavation, no waiting for grouting to set and no chemicals needed, only water.

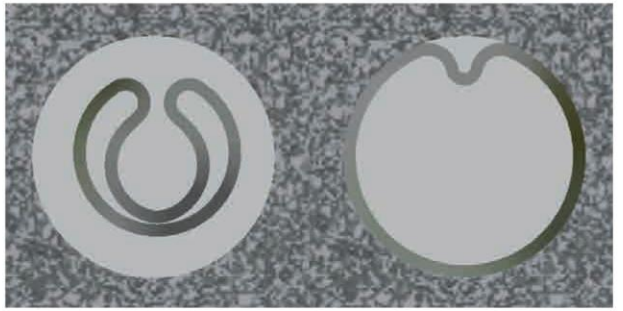


Figure 1. ERB before and after expansion.

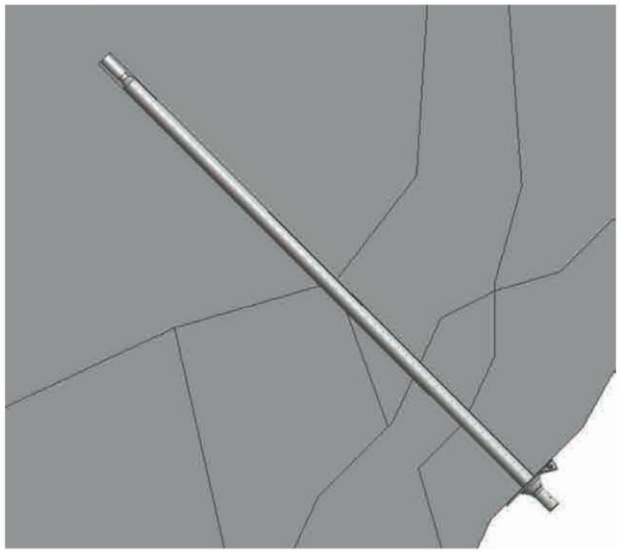


Figure 2. The folded tube is expanded inside the borehole and immediately provides full rock support action.

02.2

ERB consists of folded steel tube with upper bushing and inflation bushing welded at each end of the tube. A specially designed adjustable faceplate is delivered as an option

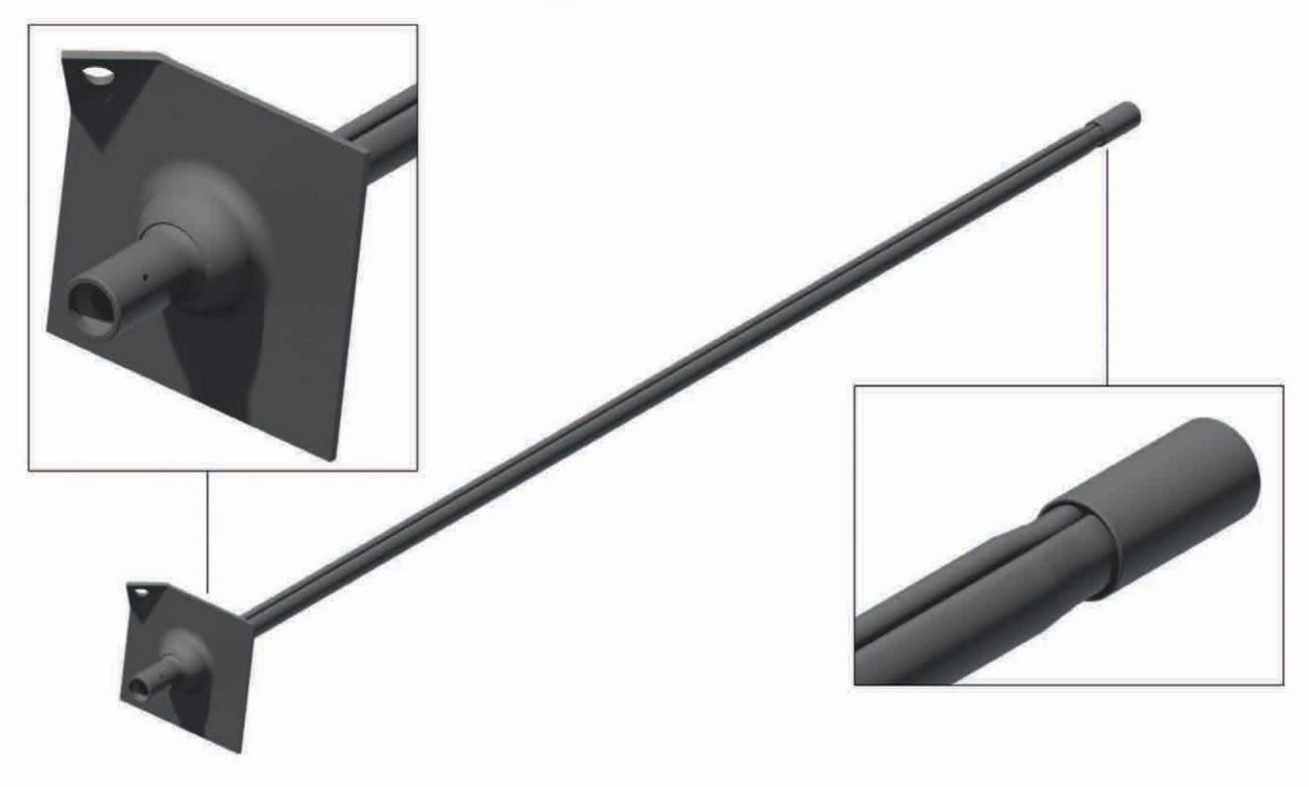


Figure 4: SSAB ERB consists of folded steel tube with upper bushing and inflation bushing welded at each end of the tube. A specially designed adjustable face plate is delivered as an option.

02.3 Applications

The ERB is a cost-effective means of rock reinforcement in a variety of rock conditions from soft to hard rock. Itis flexible and will allow variations in the borehole diameter. The main applications of ERB are:

- Underground mining
- Underground civil engineering work
- Road- and railway tunnels
- Underground storage facilities

02.4 Value Proposition

Advantages

- Provides immediate and full support action
- Accommodate large rock movements and still maintain its high load bearing capacity
- High deformability to accommodate ground movements in tension as well as in shear

Safe & Easy Installation

- Accommodate variations in borehole diameter
- Quality assured installation - when the pump stops the bolt is successfully installed
- No cement grout or other chemicals required to anchor the bolt

MEGABolt-ERB

MEGAPole

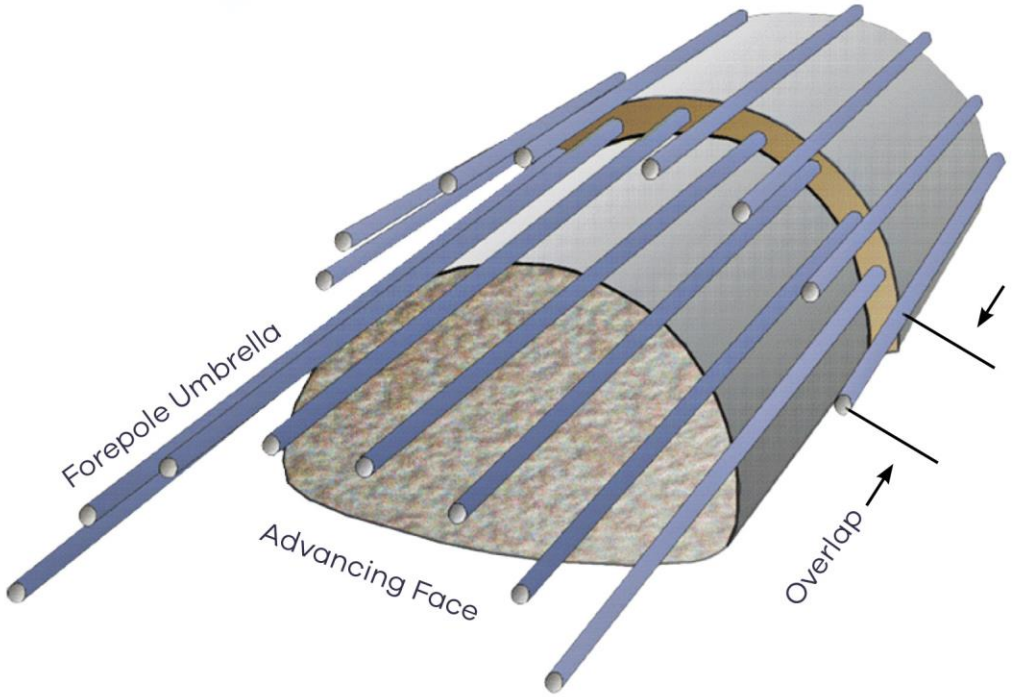
03

FOREPOLING / CANOPY TUBES/ TUBE UMBRELLA SYSTEMS

MEGAPole

03.1 Mega Pole

- For advanced geotechnical drilling, MEGAPole's case advancing systems offer solutions for a variety of construction techniques, including forepoling, well drilling, and anchoring
- MEGAPole's drilling system consists of casing tubes which are drilled through the overburden as an umbrella and filled with grouting.
- The casing system allows easy driving of the casing tubes into the ground with low torque demand



03.2 Mega Pole Applications

MEGAPole Casing Systems can be used in all major ground drilling applications including:

- Forepoling
- Anchoring
- Piling and Underpinning
- Water and thermal well drilling
- Site investigation
- Horizontal Drilling

MEGAPole

03.3 Mega Pole Features

Operational Benefits

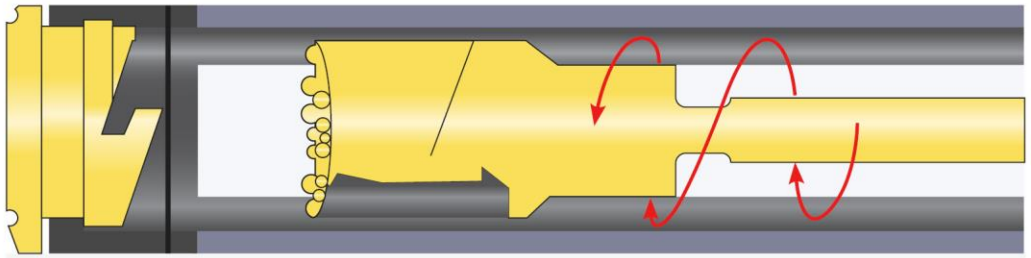
- Fast drilling and easy handling
- Carefree drilling
- Straight holes
- No unnecessary flushing to soil

Economic Benefits

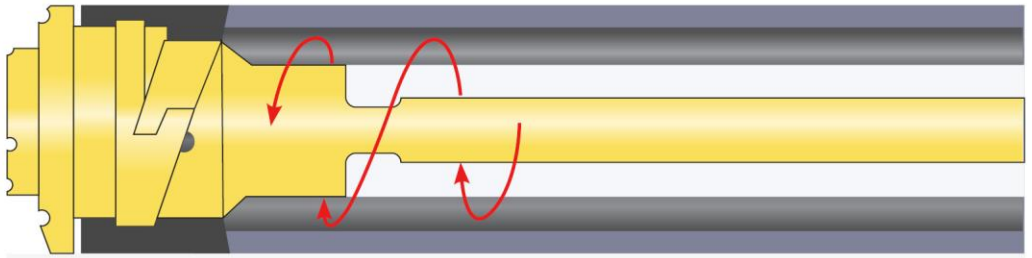
- Low investment and running cost
- More holes in time unit
- Low set-up times
- Long pilot bit lifetime

MEGAPole

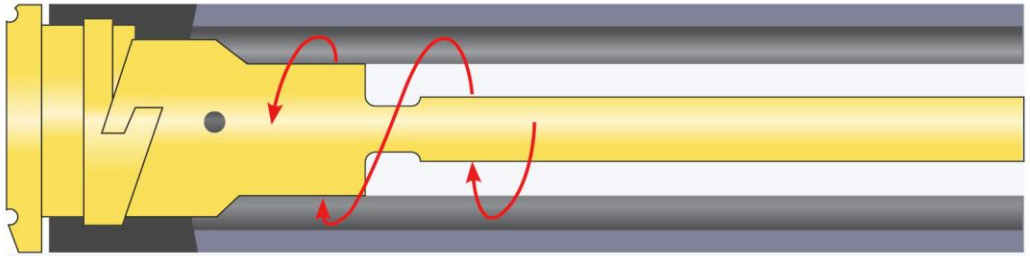
03.4 How does it work?



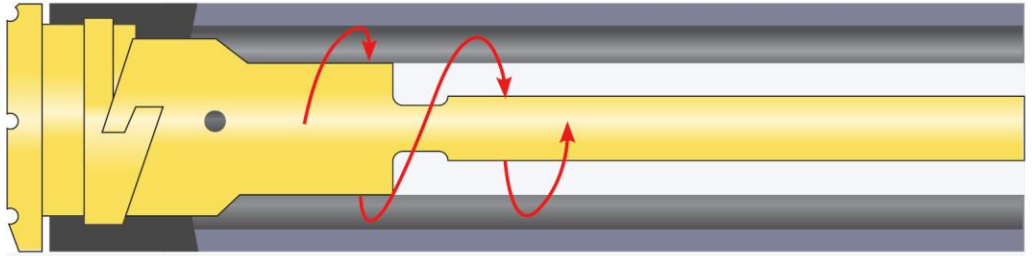
1. A pilot bit is driven through the casing tube



3. The casing system is ready to drill.

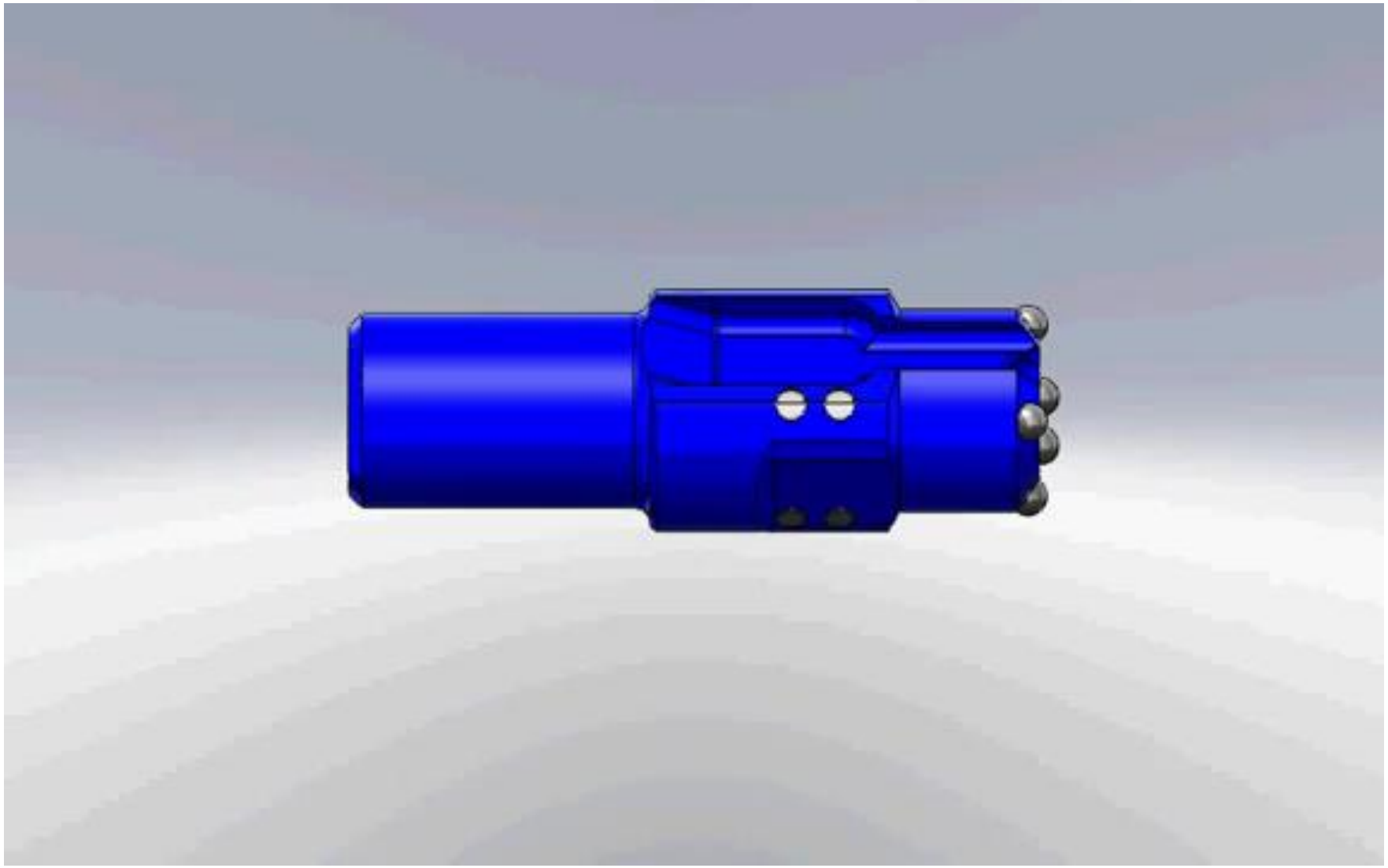


2. The tube is then rotated to locked position with the ring bit.

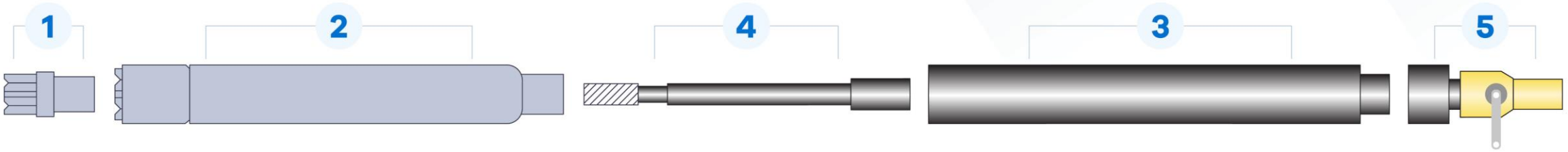


4. To finish drilling the pilot bit is rotated in the opposite direction and pulled out.

MEGAPole



MEGAPole



03.5 Mega Pole Components

1. M114 pilot bit C38
2. M114 ring bit assembly & starter casing
   a. Steel casing 114.3 including M114 ring bit assembly
   b. 1 side male threaded, L=3000mm with grouting holes + valves
3. Extension Casing
   a. Steel casing
   b. 2 side male-female threaded, L = 3000mm
4. Extension M/F Rod C38 – round 39 C38, L=3050mm or 3660 mm
5. Grouting Plug (end cap) - optional
6. Shank adapter for needed rig/drift - optional