

Raise Boring Cutter

MILALION



MILALION TOOLS CO.,LTD

Hubei • Huanggang

About Us



Established in

2009



Certificate

API-7-1
ISO9001
ISO14001
ISO45001



Coverage Area

66,700 m²



Production capacity

500pcs/month



Patent

100+



On duty employees

200+



Our mission

Bring benefit to customers by providing them high quality products,bring development to the company.



Our vision

Build century-old enterprise in the world-class drilling tool industry .

Applications & Features

The Raise Boring Cutter is a key cutting tool mounted on the reaming head of a raise boring machine. It excavates shafts by rolling and cutting through rock formations. The cutter features a high-strength bearing system and wear-resistant cemented carbide inserts, providing excellent load capacity and long service life. It is widely used in mining, tunneling, hydropower, and geothermal projects for the construction of ventilation shafts, drainage shafts, and vertical raises.

Product Features:

- Efficient rock cutting with superior shaft wall quality
- High bearing load capacity and extended lifespan
- Modular design for easy maintenance and replacement
- Suitable for various hard rock conditions

Advantages of Raise Boring Applications:

In mining applications

- Ventilation
- Ore passes
- Hoisting
- Slot holes
- Back fill raises
- Mining

In civil construction

- Penstocks
- Water diversion
- Storage facilities (oil, gas)
- Ventilation
- Drainage
- Equipment access

Workshop & Equipment (Main)

Production Workshop



Intelligent Welding Robots



Imported CNC Vertical Lathes



CNC Machining Centers



CNC



Laboratory



Pilot Bit



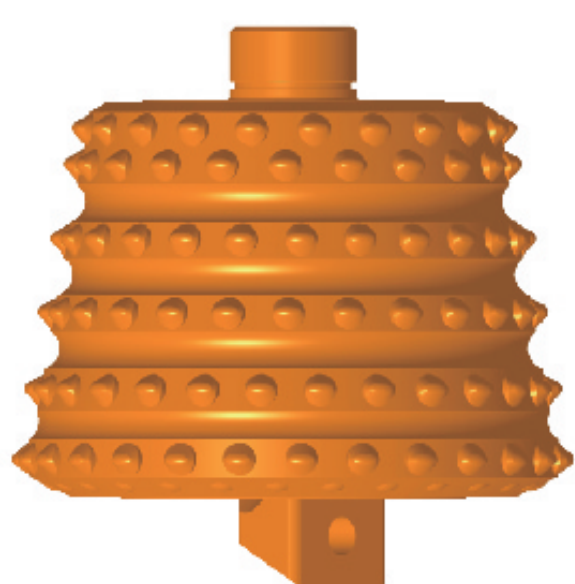
- Cemented carbide buttons in a variety of designs
- Hardfacing on lugs and extended service life wear resistant carbide protection on shirttail lip and lug
- O-ring sealed bearing for long life
- Oil Reservoir with Pressure-Balancing Compensation System Design
- Integrated Stabilization (Centralization) System Design

Diameter	IADC	Formation	PIN connection
8 1/2"	7-3-7	Hard	4 1/2" API Reg
9"	7-3-7	Hard	4 1/2" API Reg
9 7/8"	7-3-7	Hard	6 5/8" API Reg
9 7/8"	8-3-7	Extremly hard	6 5/8" API Reg
11"	6-3-7	Medium hard	6 5/8" API Reg
11"	8-3-7	Extremly hard	6 5/8" API Reg
12 1/4"	7-3-7	Hard	6 5/8" API Reg
12 1/4"	8-3-7	Extremly hard	6 5/8" API Reg
13 3/4"	6-3-7	Medium hard	6 5/8" API Reg
13 3/4"	8-3-7	Extremly hard	6 5/8" API Reg
15"	7-3-7	Hard	7 5/8" API Reg

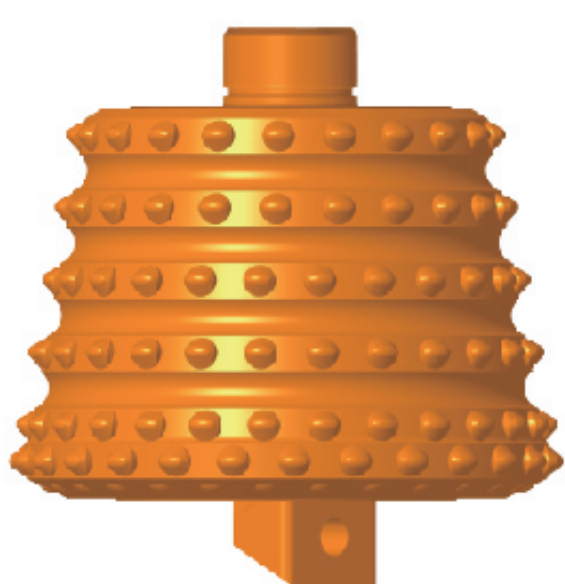
Customers List (Partial Performance Data Sheet)

No.	Cooperative Client	Using Unit	Pilot Bit Specification	Matched Raise Boring Cutter Specification	Rock Formation Description
1	Minmetals (Anhui) Development Mining Co., Ltd.	Raise Boring Drilling Workshop of Anhui Development Mining Co., Ltd	11" - IADC837	12 1/4" Hard Rock Cutting Slot Cutter	≤f20 Hard Rock & Iron Ore
2	Shougang Group Mining Co., Ltd.	Shougang Luannan Macheng Mining Co., Ltd	11" - IADC837	12 1/4" Hard Rock Cutter	f10 - f16 Rock and Iron Ore
3	Shougang Group Mining Co., Ltd.	Shougang Luannan Macheng Mining Co., Ltd	12 1/4" - IADC837	12 1/2" Hard Rock Cutter	f10 - f16 Rock and Iron Ore
4	Shandong Gold Group Co., Ltd.	Xilingol League Shanjin Alhada Mining Co., Ltd	9 7/8" - IADC837	12 1/4" Medium- Hard Rock Cutter	f10 - f12 Rock and Ore
5	Shandong Gold Group Co., Ltd.	Sanshan Island of Shandong Gold Group Co., Ltd	11" - IADC837	12 1/4" Medium - Hard Rock Cutter	f10 - f12 Rock and Ore
6	Shandong Gold Group Co., Ltd.	Jiaojia Mine Shandong Gold Group Co., Ltd	11" - IADC837	12 1/4" Medium - Hard Rock Cutter	f10 - f12 Rock and Ore
7	Shandong Gold Group Co., Ltd.	Jincheng Mine Shandong Gold Group Co., Ltd	11" - IADC837	12 1/4" Medium - Hard Rock Cutter	f10 - f12 Rock and Ore
8	JCHX Mining Management Co., Ltd.	Raise Boring Project Department Yuancheng Technology (Hainan) Co., Ltd	8 1/2" -12 1/4" - IADC837	12 1/4" Soft and Hard Rock Cutter	f8- f16 Rock and Ore
9	JCHX Mining Management Co., Ltd.	Raise Boring Project Department of Beijing Zhongcheng Trading Co., Ltd.	8 1/2" -12 1/4" - IADC837	12 1/4" Soft and Hard Rock Cutter	f8 - f16 Rock and Ore
10	Hunan Chuangyuan High-tech Machinery Co., Ltd.	Leasing Company and Equipment Supporting Supplier of Hunan Chuangyuan High-tech Machinery Co., Ltd	8 1/2" -12 1/4" - IADC837	12 1/2" Soft and Hard Rock Cutter and 14" Hard Rock Cutter	Various Geological Formations
11	Hunan Jinyue Machinery Equipment Co., Ltd	Equipment Matching of Hunan JinYue Mine Technology Co., Ltd	11" - IADC837	12 1/4" Soft and Hard Rock Cutter	Various Geological Formations
12	LLC"Drilling Tools"	Russia	12 1/4"-IADC637	13 3/4"SRCC4、13 3/4"SRCC5	f8 - f11 Rock and Ore
13	LLC"World of Mining Equipment"	Russia	12 1/4"-IADC637	14 1/2"SRCC4、14 1/2"SRCC5	f8 - f11 Rock and Ore

Technical Data Sheet



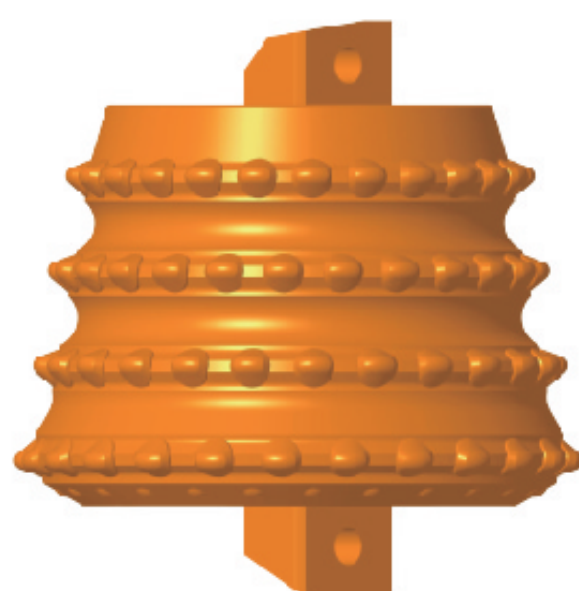
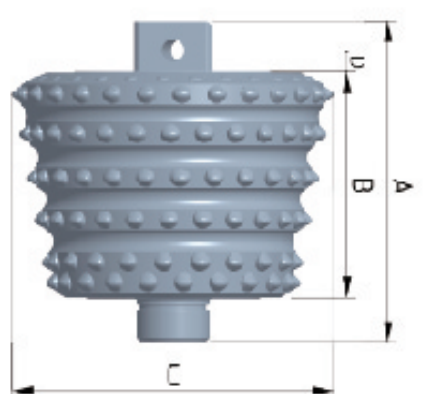
Low end double row teeth



High end double row teeth

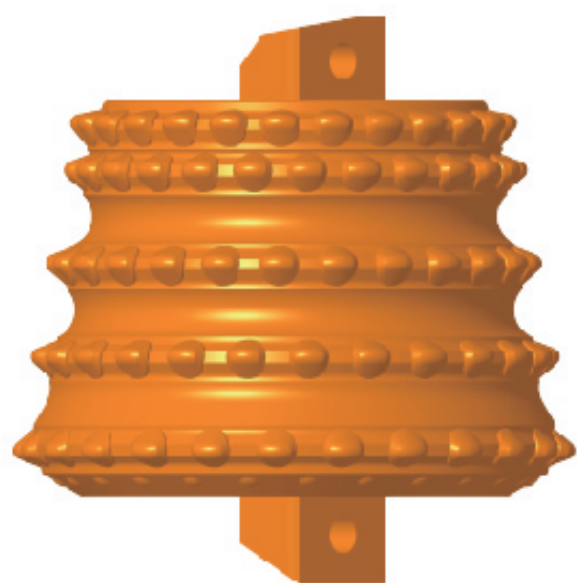
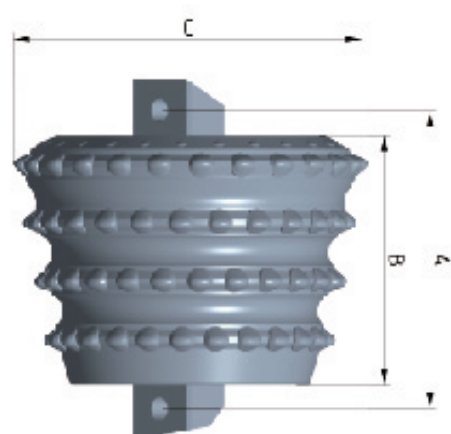
Cutting Slot Raise Boring Cutter

Model	Diameter	A	B	C	D	Taper
V61C&V62C	12 1/4"	312	217	310	25	20
Recommended Operating Parameters		12 1/4"				
Suitable Rock Hardness			Platts Hardness $11 \leq f \leq 16$			
Recommended single cutter drilling pressure			100KN~170KN			
Max withstand drilling pressure			198KN			
Recommended cutter head rotating speed			3~15 RPM			
Max line velocity			90m/min			

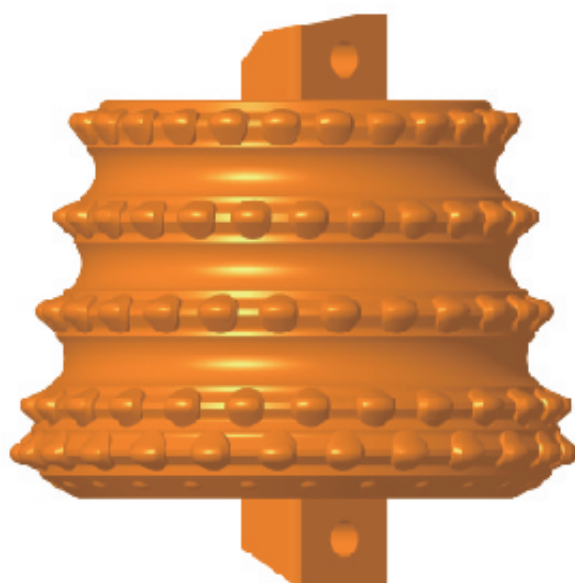


4 Rows of Tooth

Model	Diameter	A	B	C	Taper
V412M	12 1/4"	260	217	310	20
V412M	12 1/2"	260	219	320	20
V412M	14 3/5"	260	222.25	369.8	28
Recommended Operating Parameters		12 1/4"		12 1/2"	14 3/5"
Suitable Rock Hardness		Platts Hardness $11 \leq f \leq 16$		Platts Hardness $11 \leq f \leq 16$	Platts Hardness $11 \leq f \leq 18$
Recommended single cutter drilling pressure		100KN~200KN		100KN~200KN	100KN~200KN
Max withstand drilling pressure		250KN		250KN	250KN
Recommended cutter head rotating speed		3~15 RPM		3~15 RPM	3~15 RPM
Max line velocity		100m/min		100m/min	100m/min



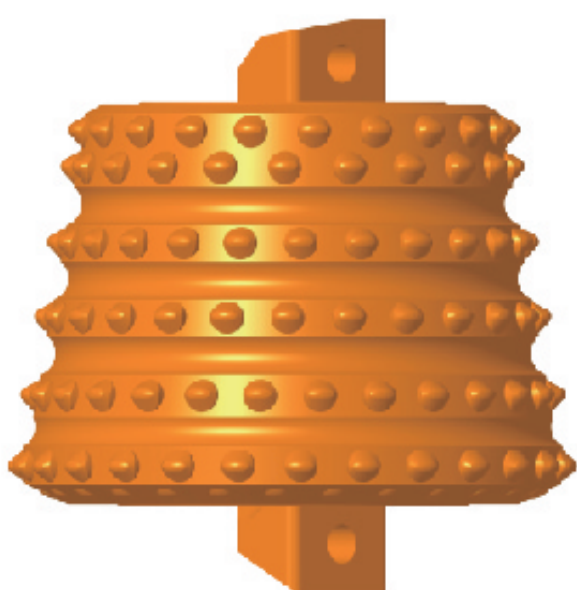
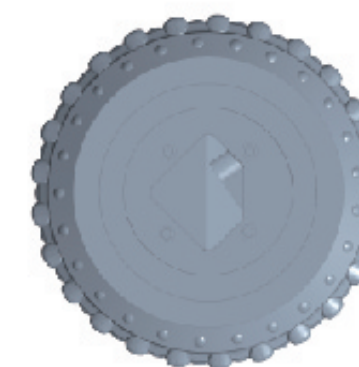
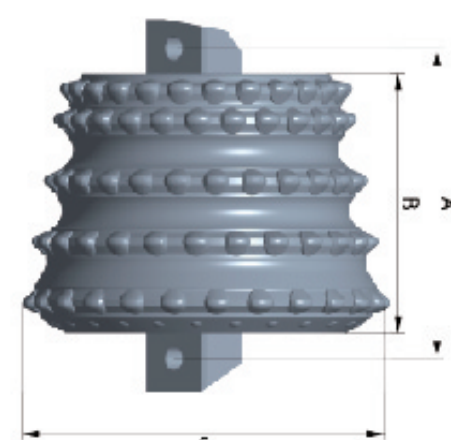
Low end double row teeth



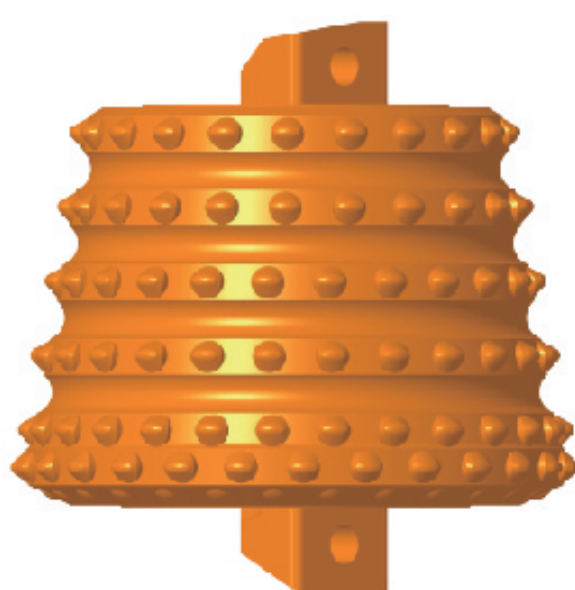
High end double row teeth

5 Rows of Tooth

Model	Diameter	A	B	C	Taper
V512M&V522M	12 1/4"	260	217	310	20
V512M&V522M	12 1/2"	260	219	320	20
V512M&V522M	14 1/2"	296	240	360	20
Recommended Operating Parameters		12 1/4"		12 1/2"	14 1/2"
Suitable Rock Hardness		Platts Hardness $11 \leq f \leq 16$		Platts Hardness $11 \leq f \leq 16$	Platts Hardness $11 \leq f \leq 18$
Recommended single cutter drilling pressure		100KN~200KN		100KN~200KN	100KN~200KN
Max withstand drilling pressure		250KN		250KN	250KN
Recommended cutter head rotating speed		3~15 RPM		3~15 RPM	3~15 RPM
Max line velocity		100m/min		100m/min	100m/min



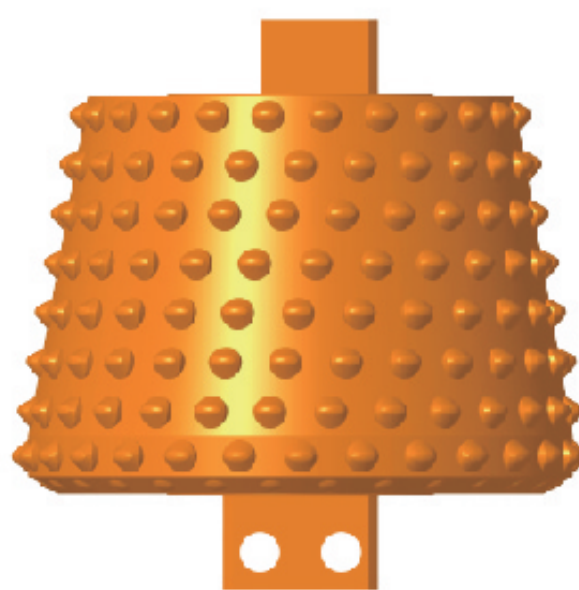
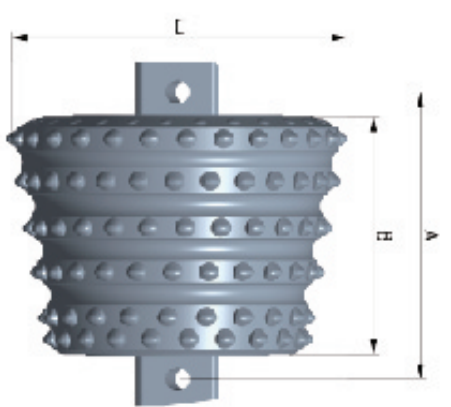
Low end double row teeth



High end double row teeth

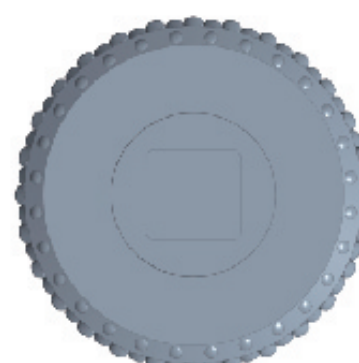
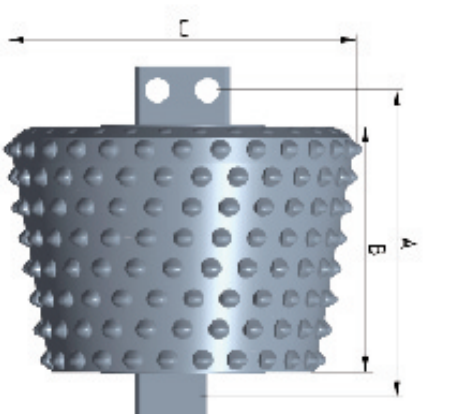
6 Rows of Tooth

Model	Diameter	A	B	C	Taper
V612M&V622M	12 1/4"	260	217	310	20
V612M&V622M	12 1/2"	260	219	320	20
Recommended Operating Parameters		12 1/4"		12 1/2"	
Suitable Rock Hardness		Platts Hardness $11 \leq f \leq 18$		Platts Hardness $11 \leq f \leq 18$	
Recommended single cutter drilling pressure		100KN~170KN		100KN~170KN	
Max withstand drilling pressure		198KN		198KN	
Recommended cutter head rotating speed		3~15 RPM		3~15 RPM	
Max line velocity		100m/min		100m/min	



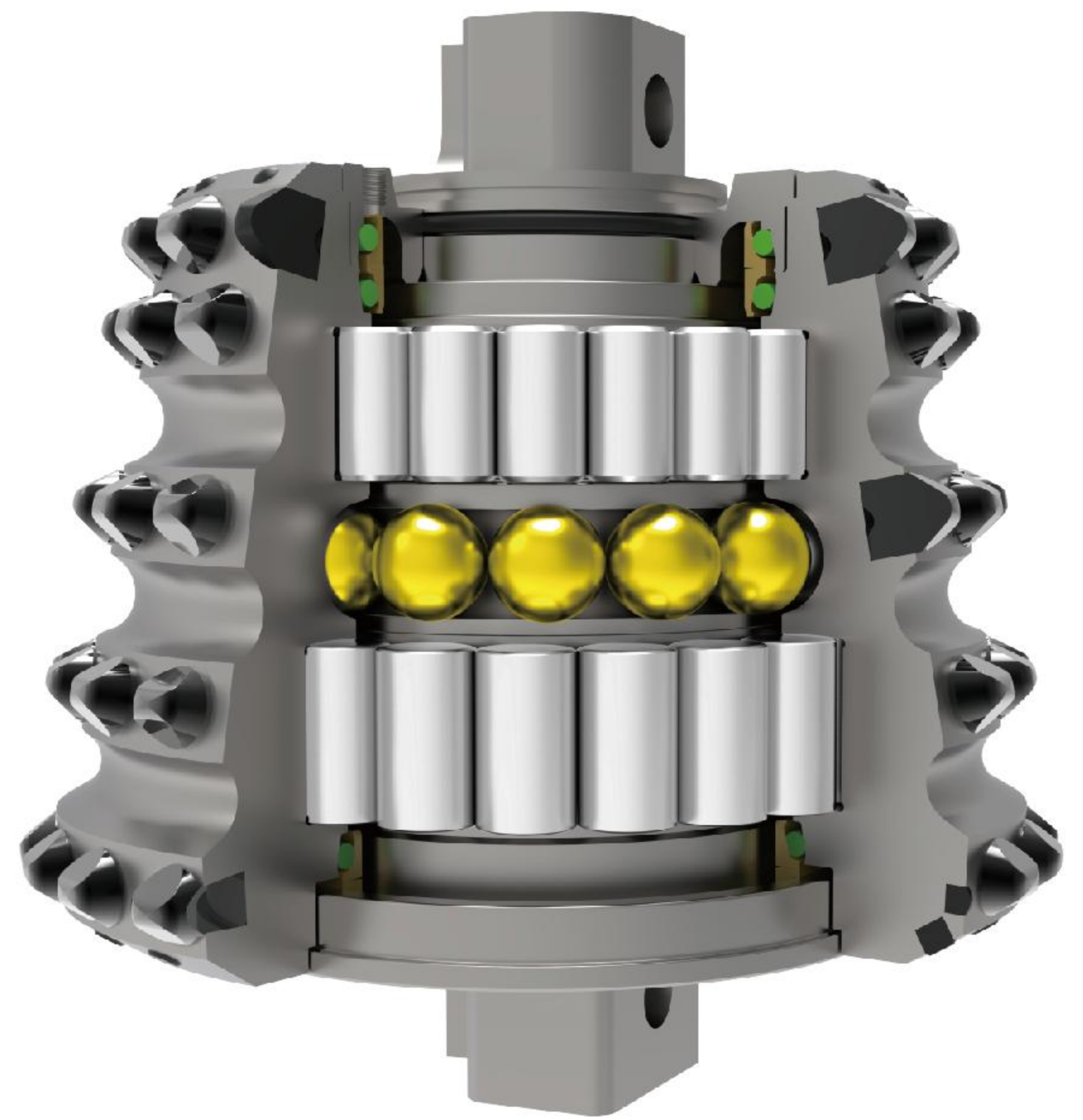
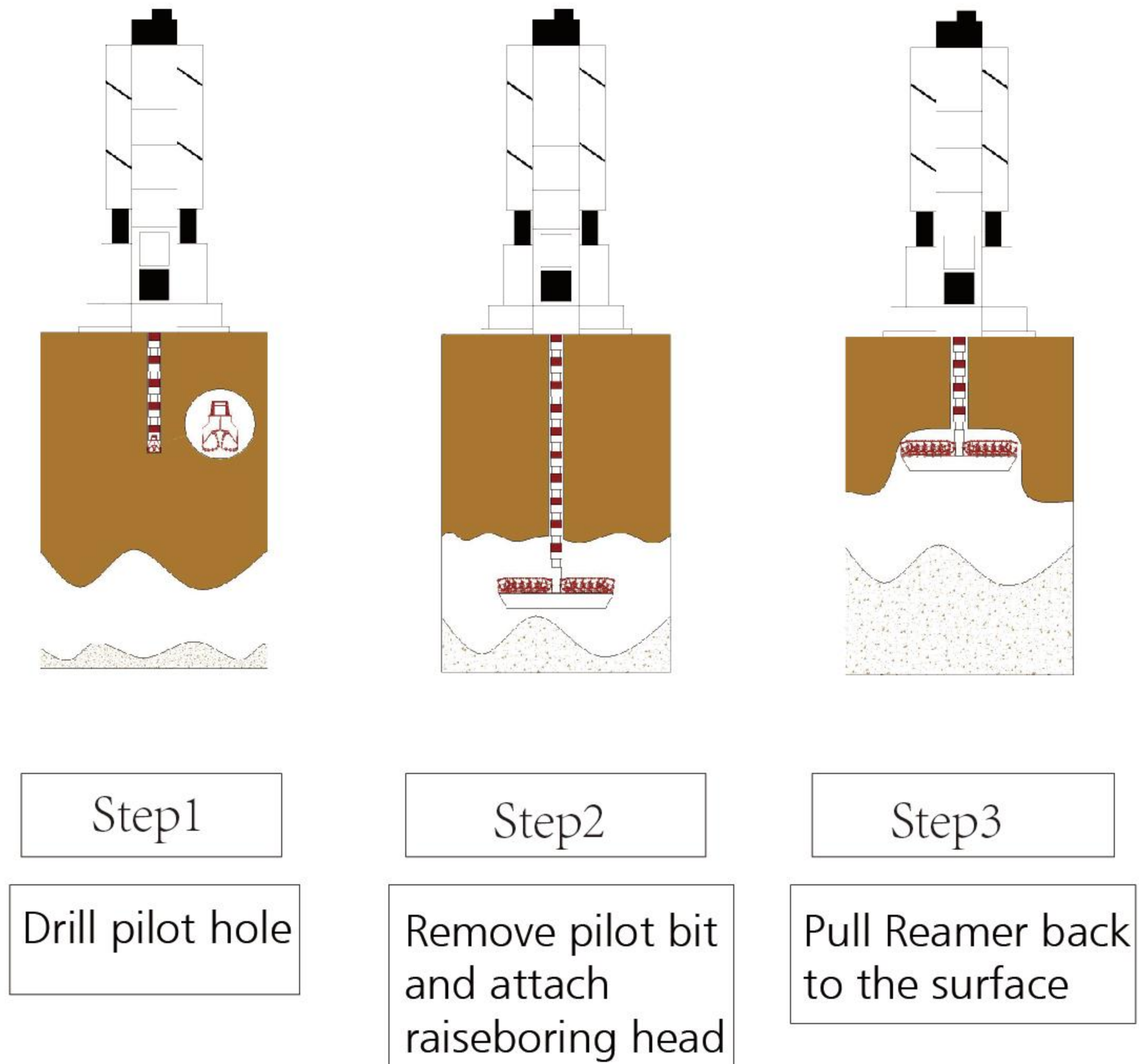
Random Tooth

Model	Diameter	A	B	C	Taper
VMLL8	8"	100	155	218	20
VMLL8	11"	260	227	280	20
Recommended Operating Parameters		8"		12 1/4"	
Suitable Rock Hardness		Platts Hardness $f \leq 12$		Platts Hardness $11 \leq f \leq 20$	
Recommended single cutter drilling pressure		60KN~100KN		100KN~180KN	
Max withstand drilling pressure		120KN		200KN	
Recommended cutter head rotating speed		3~15 RPM		3~15 RPM	
Max line velocity		90m/min		90m/min	



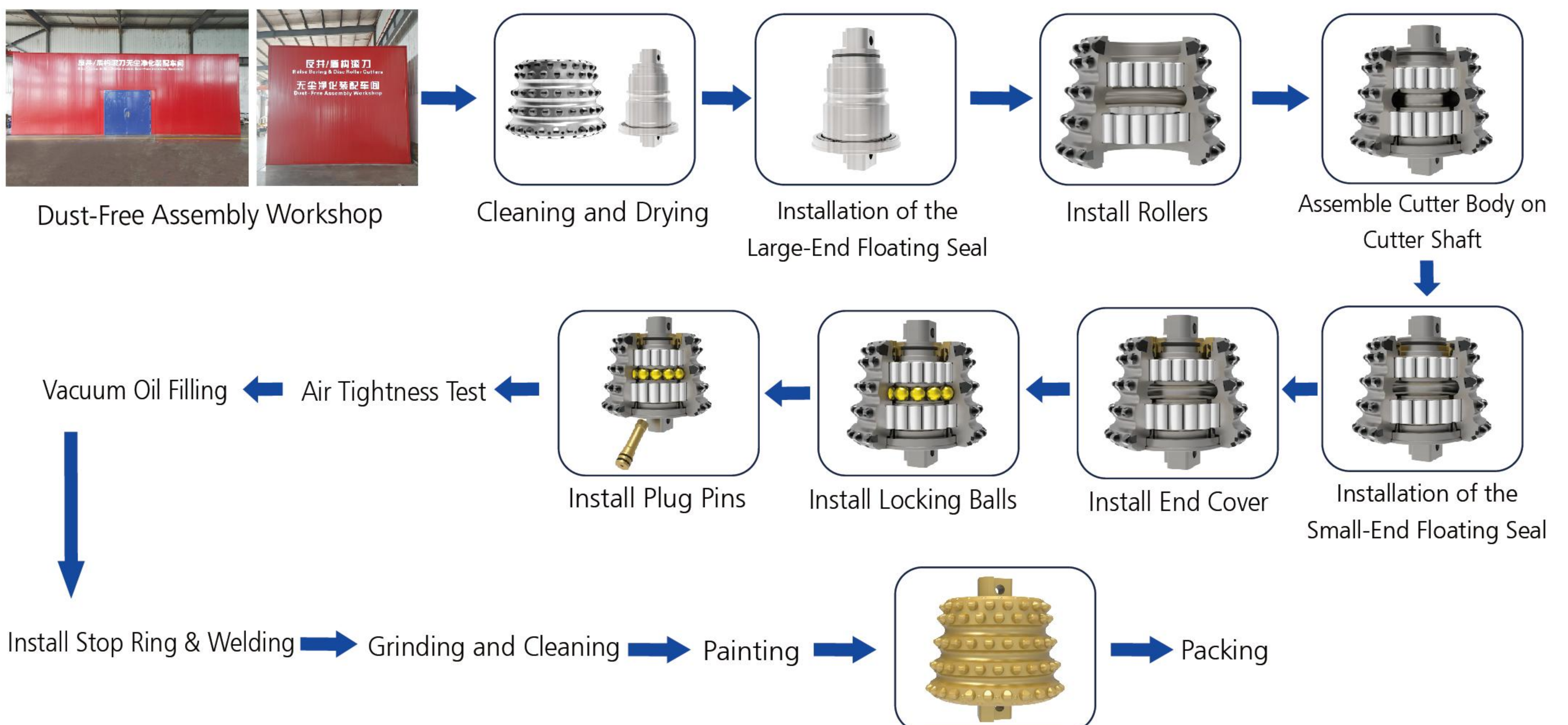
Note: Connection type can be manufactured according to customer specifications.

Raise Construction Process & Internal Structure



Sectional Drawing

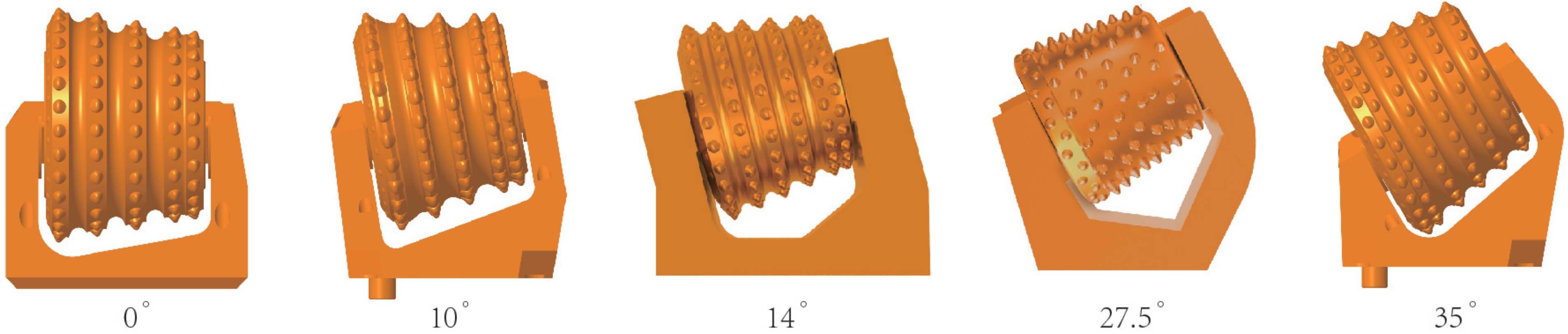
Assembly Process



Saddles

Milalion cutter saddles are made from high-quality alloy steel, offering long service life and low maintenance costs. Its structural design allows for quick replacement, minimizing downtime to the greatest extent. The cutter saddles can be bolted or welded onto the cutter head and can be easily replaced or re-secured after extended use.

Each cutter saddle is equipped with a dual-bolt locking system, ensuring secure and precise positioning of the cutters during operation. The installation angle of the cutter saddle can be flexibly adjusted (0° , 10° , 14° , 27.5° , 35°) according to different working conditions to achieve optimal cutting performance and excavation efficiency.



Reaming Heads

Milalion reaming heads are made from high-strength alloy steel through integral forging, precision machining, and strict heat treatment. It offers exceptional strength, toughness, and wear resistance, ensuring efficient cutting performance even in complex geological conditions.

The cutter reaming head features a well-optimized structural design and can be equipped with four-rows, five-rows, or six-rows cutters to meet various rock excavation requirements. Cutter saddles are available in both bolted and welded configurations, allowing for quick replacement and easy maintenance, effectively reducing downtime and maintenance costs.

With diameters ranging from 700 mm to 6000 mm, Milalion cutter reaming heads are widely used in mining, tunneling, and shaft boring projects, providing efficient and reliable excavation performance.



Application Site





Our raise boring cutters have been successfully used and well received under various working conditions across China, and have also been exported overseas.

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