





[www.roxard.com](http://www.roxard.com)

## CORPORATE

**Roxard** is a globally trusted manufacturing company making high quality TBM cutting tools including various types of disc cutters, rings, knives, buckets, scrapers etc. for all types of TBM cutter heads in different diameters.

Our priority is to become a reliable solution partner of our customers in their tunneling projects by increasing their profitability with top quality and most durable cutting tools for their TBMs.

Our promise is clear; **Roxard** gives you the longest tunneling distance for your money.



**ROXARD**  
INDUSTRIES





# PRODUCTS AND SERVICES

---

- **Soft Ground Tools with Tungsten Carbide**

- Buckets
- Knives
- Rippers
- Scrapers

- **Hard Ground Disc Cutters**

- Single Disc Cutters
- Double Disc Cutters
- Twin Disc Cutters
- Monoblock Disc Cutters

- **Spare Parts**

- Cutter Rings
- Bearings
- Seals
- Hubs
- Shafts
- Wire Brushes

- **Services**

- Disc Cutter Refurbishment
- TBM Cutter Head Refurbishment



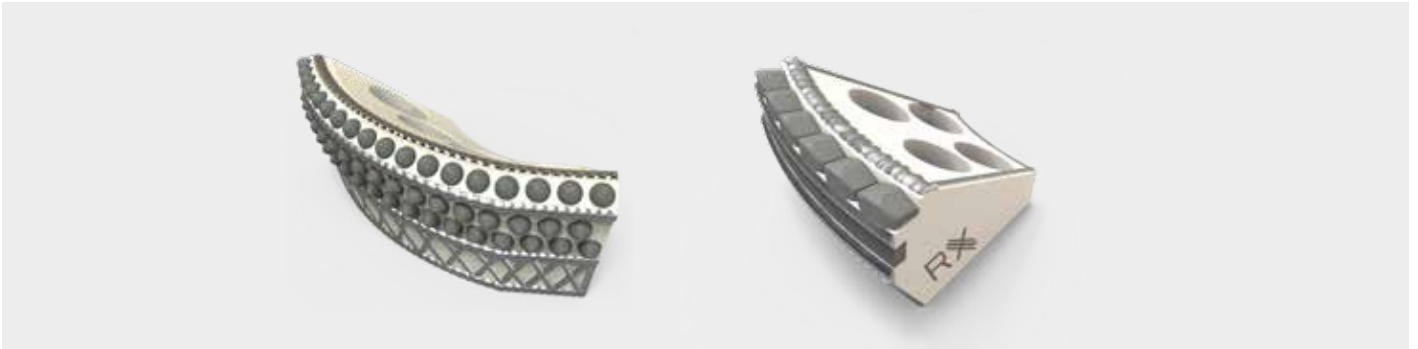
# Soft Ground Tools with Tungsten Carbide

Our soft ground cutting tools have the highest quality tungsten carbide inserts at the cutter points and wearing surfaces, and can be custom designed and manufactured according to geological conditions. These tools can perform the full excavation without roller cutters in soft ground conditions or work in combination with roller cutters in mix-designed cutter head configurations.



## BUCKETS

Buckets are positioned at the outer diameter of the cutter head to perform the final sweeping and removing the excavated material from the front side of the cutter head. They are located at the opposite sides of the cutter arm and come in right and left types as the cutter head works in both directions. Roxard uses various tungsten carbide and hard facing compositions in accordance with the ground conditions to provide highest abrasion resistance and durability.



## KNIVES & SCRAPERS

Knives and scrapers are made to scrape off the ground material and they are either bolted or welded to the front face of the cutter head.

Roxard manufactures various types of heavy-duty knives and scrapers according to different cutter head designs and requirements. We always use premium high-grade tungsten carbide inserts for maximum wear resistance. The most important and functional part of these tools are the front tip which is the first contact point. Therefore, the front tungsten carbide slots should be designed deep enough to prevent breakage and also to provide extra tungsten carbide depth as the tool wears off for longer durability. In addition, the excavated material will be flowing over these tools and causing abrasion so we make sure the upper part of our knives and scrapers are protected by tungsten carbide plates and hard facing layers.

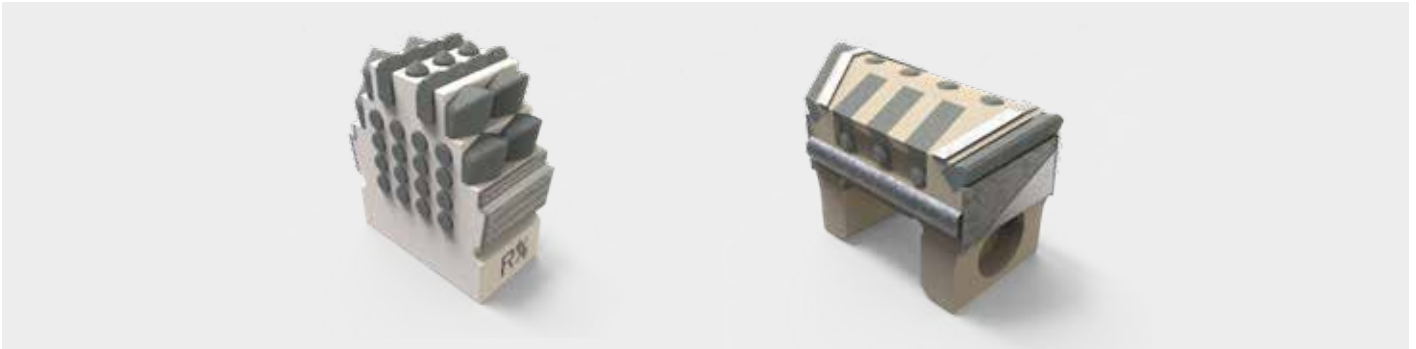
Keeping these factors in mind, Roxard makes sure our knives and scrapers do not have any unprotected working surfaces and have full protection against the most challenging conditions.





## RIPPERS

Rippers can be used at various diameters of the cutter head and for different purposes. In extra soft geological conditions, rippers can be mounted to the roller cutter housings via ripper supports to carry out the main excavation. Roxard has a wide range of ripper designs with tungsten carbide inserts and hard facing layers and our rippers come in different types such as weld-on, bolt-on, ballistic type, prismatic type and support on rippers depending on their fixing methods.



# Hard Ground Disc Cutters

Disc Cutters (Roller Cutters) are used in cutter heads designed for rock and mixed ground conditions. Different types of disc cutters are positioned at various diameters of the cutter head and, with each revolution of the cutter head, these disc cutters create concentric circles of fractures on the excavation surface. Afterwards the thrust force of the TBM shatters these fractures and the excavated material falls off to be collected by the buckets.

Roxard manufactures different sizes of disc cutters from 8" to 20" in diameter and also different types of disc cutters including Single Disc Cutters, Double Disc Cutters, Twin Disc Cutters, Monoblock Type Cutters according to various geological conditions. Superior durability of Roxard disc cutters is ensured by using hot rolled, special grade alloy cutter rings, working only with premium brand bearing and seal manufacturers, and carefully assembling and checking each disc cutter before delivery.



## SINGLE DISC CUTTERS

Disc Cutters with one replaceable cutter ring. Worn out rings can be replaced as needed without disassembling the main hub. Each disc includes a pair of tapered roller bearings to provide rotation during excavation.



## DOUBLE DISC CUTTERS

Double Disc Cutters are used in order to increase the frequency of cutting circles and decrease the trust load per ring. In general, they have the same structure of a single disc cutter with an extra ring and a spacer to adjust the space between rings.



## TWIN DISC CUTTERS

Twin Disc Cutters are mainly used in the center of the cutter head and have a very strong structure. Unlike single and double disc cutters which are mounted using inner and outer retainers, twin disc cutters are mounted using three large arms. These rings bear the main load at the center and travel less than other disc cutters located at outer diameters.



## MONOBLOCK DISC CUTTERS

Monoblock Disc Cutters have the ring and the hub in single piece and therefore bears the trust load with the entire outer body. These disc cutters are used in tough ground conditions where risks of cutter ring breakage, split ring breakage and hub damage are high. Roxard manufactures monoblock disc cutters in various types such as single, double and triple monoblock cutters.



## Hard Ground Disc Cutters









# Spare Parts

The performance of a TBM is highly dependent on the availability and on-time delivery of high quality spare parts.

In Roxard, we always keep large amount of stock for every type of spare parts you will need for your cutting tools. In addition, we provide consignment sales to the jobsite to make sure you get the fastest access to spare parts anytime you need.



## CUTTER RINGS

Roxard cutter rings are made of hot rolled tool steel with a specially developed chemical composition that includes C, Ni, Mo, V, Cr and W elements to achieve highest wear resistance. Our rings are specially forged using ring rolling technique to achieve a continuous grain orientation that gives the part enhanced mechanical properties. Following the CNC machining process, each ring batch then gets custom heat treatment process which adjusts the hardness and toughness values specific to the given geological conditions. Roxard rings come in different sizes from 8" to 20" in diameter.



## BEARINGS

It is essential to properly adjust the radial and axial load capacity of bearings in disc cutters. This allows discs to withstand higher penetration forces in excavation. Roxard collaborates only with premium bearing manufacturers for the design and assembly of disc cutters.



## HUBS

Our hubs are made of hardened steel alloy in order to withstand the load of rings during excavation. The outer surface of a Roxard hub is carefully machined with regard to the tolerances of the inner diameter of the ring to achieve the proper tightness level. This prevents cracks or breakage of the ring once cooled down following the shrink fitting to the hub.



## SHAFTS

Roxard shafts are made of high carbon hardened steel alloy. The outer diameter of the hub is carefully CNC machined to properly fit the precise inner dimension of the bearing.



## SEALS

Roxard uses high quality seals with heat treated and grinded steel bodies in order to prevent any leakage on the touching surfaces that can cause bearing failures and uneven ring wear.

## WIRE BRUSHES

Custom built to provide secure sealing and to withstand toughest conditions, a full line of TBM Wire Brush Tailseals are available in our stock.









# Services

Professional technical service is important to get the most out of your disc cutters and cutter head.

We aim to increase the reusability of your equipment and make sure they return back to work as soon as possible.



## DISC CUTTER REFURBISHMENT

As the solution partner of our customers in their tunneling projects, we give professional disc cutter refurbishment services in order to increase the lifetime of disc cutters and therefore profitability of our customers.

We provide disc cutter refurbishment services to our customers both on-site by supplying fully-equipped cutter shops to the jobsite or by bringing the disc cutters to the refurbishment workshop in our factory.

Our disc cutter refurbishment services are categorized in three main types;

**Refurbishment Type A:** Replacement of Cutter Rings

**Refurbishment Type B:** Replacement of Cutter Rings, Seal Sets and Lubrication

**Refurbishment Type C:** Replacement of Cutter Rings, Bearings, Seal Sets and Lubrication



## TBM CUTTER HEAD REFURBISHMENT

A TBM should not be an investment for a single project therefore we provide professional cutter head refurbishment and repair services to make your TBM ready for the next project.

This process starts with the careful inspection of the condition of the cutter head by our technical experts followed by the preparation of a detailed technical report for the customer. The cutter head refurbishment can be done both on-site or in our factory depending on the customers' requests and the condition of the cutter head.

We provide;

- Restoration of worn cutter head back to original dimensions
- Renewal of protection bars
- Renewal of wear plates
- Production and renewal of disc cutter housings
- Production and renewal of knife/scrapper supports
- Additional hard facing applications for improved wear resistance

Roxard keeps innovating new products and methods to achieve better wear resistance to deliver longer tunneling distance to our customers.









[www.roxard.com](http://www.roxard.com)



**ROXARD**  
INDUSTRIES

**ROXARD TR FACTORY**

Malıköy Başkent OSB 6.Str. No:12  
Sincan / Ankara / TURKEY

**ROXARD EU FACTORY**

Ul. Obelsko Shose No:19 1360  
Sofia / BULGARIA

+ 90 312 502 3017  
+ 90 312 502 3023  
+ 359 889 326 262

[info@roxard.com](mailto:info@roxard.com)