



Company Profile

Incorporated in 1990, TERRATEC is the world's leading designer and manufacturer of Tunnel Boring Machines, Raise Boring Machines and other custom-engineered products for the tunnelling and mining industries, encompassing all ground conditions and boring diameters from 0.6m to 15m.

TERRATEC'S success is based on the experience and excellence of its technical team which includes engineers with more than 40-years of experience in the design and manufacture of tunnelling and mining

machines. TERRATEC is also fully managed by engineers enabling quick and efficient solutions that meet customer expectations.

TERRATEC has a proven track record for projects in Australia, Japan, China, Southeast Asia, India, Europe and the Americas, being the leading supplier in some important markets like India or Thailand.

Since 2018, TERRATEC is part of JIM Technology Group, owned by three Japanese industrial giants: IHI Corporation, Mitsubishi Heavy

Industries and JFE Engineering Corp. and having the experience of over 3,500 TBMs delivered altogether since 1936 of every type and size up to 16m dia. Being part of JIMT Group, Terratec keeps operating and expanding the business internationally, with JIMT's full and direct support.

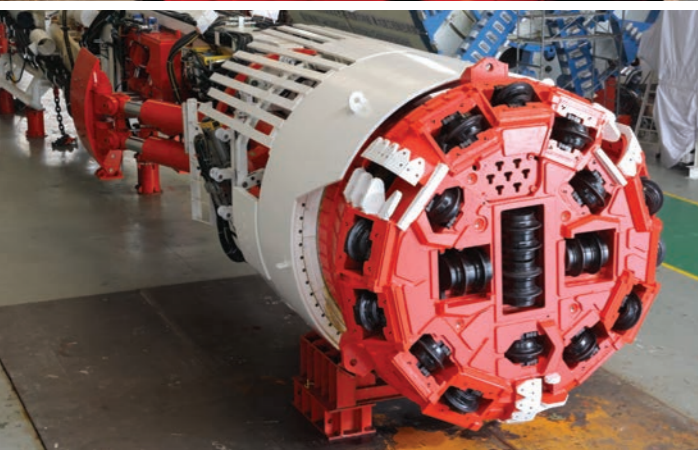


the way to the future

Tunnel Boring Machines (TBMs)

HARD ROCK TBMS

Since 1990, TERRATEC has been providing Hard Rock Tunnel Boring Machines for different types of geological conditions, from soft shale to extreme hard and abrasive quartzite.



OPEN TBM

The Open TBM is the most traditional among the Hard Rock TBMs and vperation, the rear part of this TBM, called the Gripper Device, is firmly anchored to the tunnel walls by two large gripper pads while the front part of the TBM, containing the CutterHead, is extended by the action of 2 or 4 hydraulic cylinders called the Propel or Thrust Cylinders.v

DOUBLE SHIELD TBM

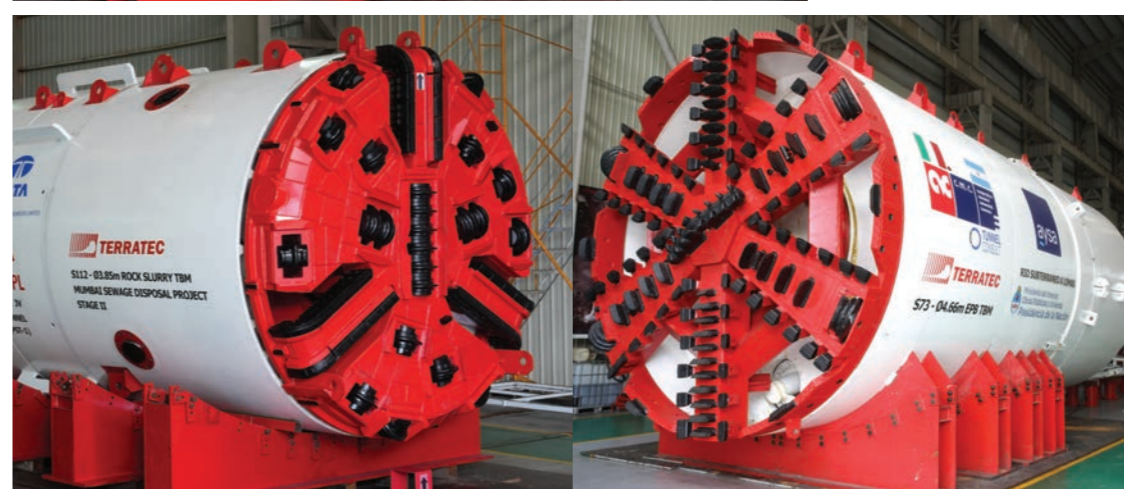
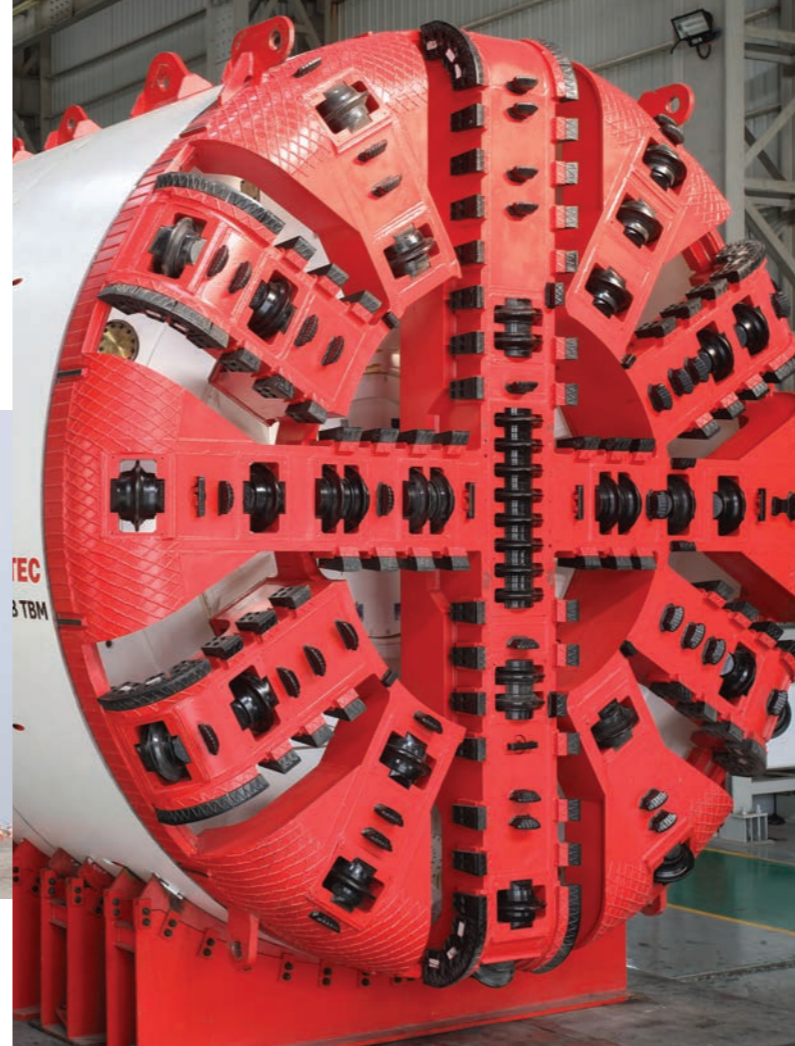
For those rock formations containing unstable or faulty zones, using a Double Shield TBM is the safest and most efficient way to excavate tunnels.

Double Shield TBM propulsion is achieved also by using a Gripper Device, but in difference from the Open TBM, the Front and Rear parts of the TBM are completely shielded. The TBM installs a concrete lining ring formed by precast segments to perfectly protect the tunnel from the surrounding ground as the CutterHead excavates, allowing excellent advance rates.

SINGLE SHIELD TBM

When rock strength is low and the tunnel walls cannot react against the action of the Gripper Pads, the excavation of the Rock has to be done with a Single Shield TBM.

The Single Shield TBM reacts against the concrete lining ring to advance forward, and due to this, installation of Segments and excavation cannot be done simultaneously.



TBM SOFT/MIXED GROUND

For tunnelling projects in soft-ground or mixed geology with small overburden, generally carried out under cities, the TBM has to control accurately the pressure in the excavation face, which must be higher than the one inside the boring machine.

EARTH PRESSURE BALANCE MACHINE

The Earth Pressure Balance Shield Machine (EPBM) evacuates the material through a Screw Conveyor. The pressure in the front of the machine is controlled by regulating the advancing speed of the shield and the evacuation flow. The EPBM can work with or without pressure in the front in stable layers.

SLURRY SHIELD

The Slurry Shield TBM is suitable for excavating soils or mixed formations with high water content. This TBM is equipped with a Slurry System which controls the pressure in the excavation face by injecting pressurized slurry into the Cutter Chamber where the slurry is mixed with the excavated material. The mixture is pumped out of the Tunnel to a separation and recirculation plant.

MICROTUNNELLING

Microtunnelling, or Pipe Jacking Method, is a trenchless solution for constructing small diameter tunnels, used especially for projects that require the tunnel to cross under dense traffic roads, railways, rivers, etc.

This technique requires no personnel inside the tunnel being constructed. The system installs concrete Pipes, by a Pushing or Jacking Frame installed in the Launching Shaft. A special Shield with a CutterHead, called the Micro Tunnel Boring Machine (MTBM), is attached to the head of the Pipe that follows the path of the tunnel as it is being bored.

TERRATEC MTBMs are suitable for the construction of tunnels with an inner diameter ranging from 500mm up t800mm.

Raise Boring Machines

TERRATEC has developed through the years its own series of Raise Boring Machines, which today is recognised as a superior product due to its innovative and high-performance design. The following TERRATEC standard Raise Boring Machines are available:

TDR SERIES

The TDR Series (TERRATEC Down & Raise) allows conventional upwards reaming, as well as downwards reaming, up to 2,000mm diameter shafts.

TERRATEC's design of the TDR Series is low-profile and all the components can pass through the working table, allowing the user to work comfortably in confined spaces.

Following are the Standard Models from the TDR Series:

- TDR-600
- TDR-1000
- TDR-2000

TR SERIES

For the excavation of large shafts, TERRATEC's TR (TERRATEC Raise) Series offers an optimized design to ream shafts up to 6,000mm in diameter only upwards.

TERRATEC's standard models from the TR Series are following:

- TR-2000
- TR-3000
- TR-4000
- TR-6000

UB SERIES

The design of the Universal Borer (UB) Machine allows the Raise/Down/Boxhole drilling of shafts, which makes the UB the most versatile of the RBMs.

The standard model of the Universal Borer allows raise boring shafts of 1,500mm and Down or Box hole reaming up to 1,000mm.



Conveyor Systems



The success of the tunnelling or mining work depends not only on the selection of the most suitable boring machine, but also on the most efficient system to evacuate the spoil to the surface. Interruption in the evacuation works very often leads to the interruption of the boring availability and subsequently, to stop the overall production.

TERRATEC provide complete conveying solutions which include the Continuously Advancing Conveyor in the tunnel and the subsequent transfer conveyors, vertical conveyors and stacker conveyors as may be needed at the portal and surface.



TUNNEL CONVEYOR (CONTINUOUSLY ADVANCING)

TERRATEC has designed and built sophisticated continuous conveyor systems specifically for individual tunnel and TBM conditions.

Especially when tunnels are long, when slopes are steep or when the space for unloading spoil is limited in the tunnel portal, the usage of a Tunnel Conveyor has innumerable advantages over evacuation by Muck Cars in terms of productivity, safety and operation and maintenance costs.



Rail Based Equipment

The success of the construction of a tunnel not only depends on the most suitable tunnelling machine or method for the expected conditions but also an efficient system to remove the spoil out of the tunnel and bring in consumable items such as segments, grout, foams and oils. If a conveyor system is installed as the primary method of spoil removal, then the machine still needs to be supplied with the consumable items.

LOCOMOTIVES

TERRATEC battery locomotives are designed to provide the tunnel with the most reliable material handling solution possible whilst introducing the minimum amount of environmental impact into the tunnel environment.

ROLLING STOCKS

For decades, TERRATEC has provided all types of rolling stock from flat cars to crane cars, from muck cars to grout cars if using an integrated chassis solution TERRATEC can provide the chassis only and the drawings for the manufacture of the muck boxes or flat car decks locally (this reduces shipping costs and time as well as engaging the local community where your fabricators are located). There are many options to be considered. TERRATEC's contact person will assist the clients to select the right one.



After Sales

TERRATEC supports the operation of its Equipment through its spares and field service departments.

When acquiring a machine, it is recommended that the Customer obtains an initial package of spare parts and contracts TERRATEC's field service experts to supervise the assembly. This will guarantee smooth machine commissioning.

Even in cases where projects are being operated without the assistance of TERRATEC personnel, Customers can still enjoy immediate response and timely supply of spares and field services through TERRATEC's worldwide network of representatives and the support of our regional offices.

Project Planning

TERRATEC's commitment to the Customer goes beyond merely supplying the Equipment. Drawing from its extensive experience in the tunnelling and mining industries, TERRATEC provides valuable advice to customers during the initial stages of their Projects, ensuring that they benefit from expert guidance during the project planning phase.

- Review of project requirements
- Selection of suitable machine
- Design of suitable Segment Lining
- Development of Tunnelling Method Statements
- Cost analysis for the equipment and tunnelling works

TERRATEC is always willing to support the Customer with the design and/or supply of any custom-made equipment which may be needed for the Equipment assembly or operation, such as Reaction Frames, Launching Cradles, TBM Pulling Systems, etc. TERRATEC can either supply advice and equipment or even provide the manufacturing specifications for Customers to arrange local fabrication.

Total Tunnelling Solution

TERRATEC's capacity to provide a wide range of tunnelling services makes it not just an equipment supplier but if required a qualified and experienced partner for the execution of the Works.

As a result, TERRATEC is increasingly supplying the Total Tunnelling Solution, a package consisting of the TBM, other tunnel equipment (Rail Based Equipment, Conveyors, Segment Moulds, and Ventilation), spares and consumables for the equipment, and a team of TERRATEC field personnel able to assist clients for operating and maintaining the equipment throughout the whole project.





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