

EUROHINCA

Europea de Hincas Teledirigidas, S.A.U.



**Specialists in tunnel and pipeline construction
with Tunnel Boring Machines**



**EUROHINCA
GROUP**

www.eurohinca.com

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Europea de Hincas Teledirigidas, S.A., EUROHINCA, was established in 1996 for the execution of pipelines with remote-controlled tunnel boring machines using the pipe jacking system. Since then, it has successfully carried out more than 200 works totaling more than 150 kilometers of bored tunnels, leading the Spanish market and being an important reference in Europe.

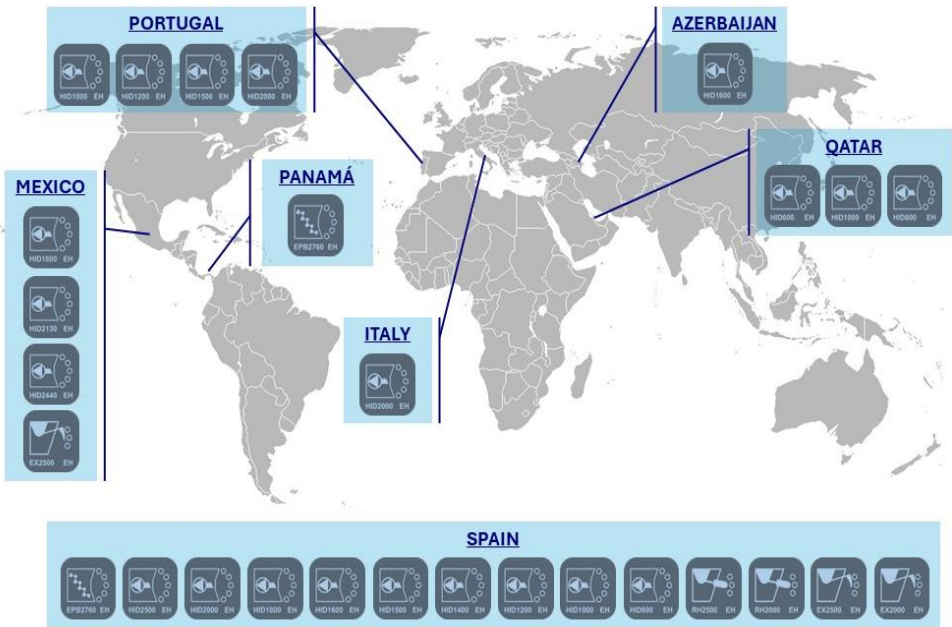
EUROHINCA has highly specialized personnel and owns 14 tunnel boring machines (11 from the German manufacturer Herrenknecht) of various types and diameters, in addition to having extensive experience in the execution of works with tunnel boring machines and rented equipment.



EUROHINCA AROUND THE WORLD

In recent years EUROHINCA has been committed to internationalization, successfully executing projects in countries as diverse as Qatar, Azerbaijan, Mexico, Italy, and Portugal.

We are also very active commercially in other countries in Latin America and the Middle East, so we expect to establish ourselves in more countries imminently.



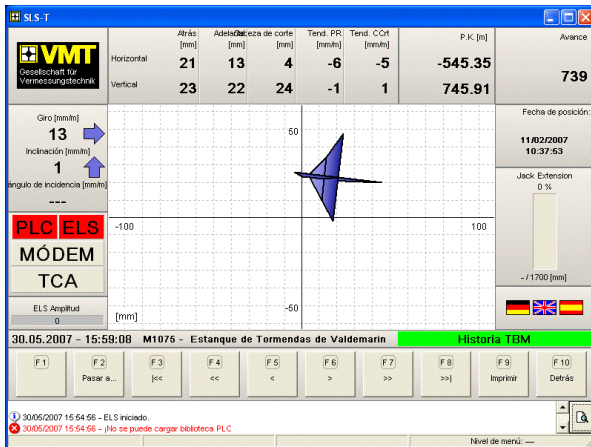
ADVANTAGES OF TRENCHLESS TECHNOLOGY

TUNNELS ↔ TRENCH

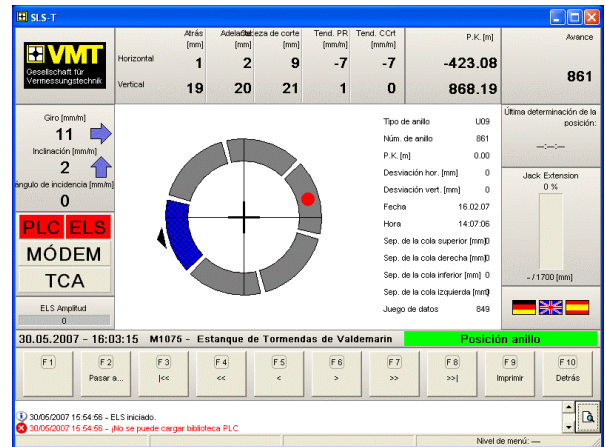
- ✓ Less impact on existing services.
- ✓ Less environmental impact.
- ✓ Minimizes debris generated.
- ✓ Concentrates facilities.

TBM's ↔ MINING

- ✓ Increased safety for workers. (Working inside the shield)
- ✓ Less risk of seating on the surface. (Front support)
- ✓ Higher yields. Shorter lead times.
- ✓ Reduced impact on phreatic level.



Guidance system. Position and tendency of the TBM



Guidance system. Choice of position in universal ring

MOST COMMON WORKS

- **SANITATION AND SUPPLY NETWORKS. COLLECTORS.**
- **PASSAGES UNDER EXISTING SERVICES**
(Roads, railroads, rivers, airports runways, golf courses, facilities, etc.)
- **SUBMARINE OUTFALLS. INTAKE OR OUTFALL PIPELINES.**
- **TUNNELS WITH TUNNEL BORING MACHINE.**
- **VISITABLE GALLERIES.**
- **GAS AND OIL BRINES. DRAINAGE AND EVACUATION SYSTEMS.**
- **MICROTUNNEL UMBRELLAS AT CROSSINGS UNDER ROADWAYS.**
- **SEAWATER INTAKE FOR DESALINATION PLANTS AND FISH FARMS.**
- **BOTTOM DRAINS AND CATCHMENS IN RESERVOIRS.**



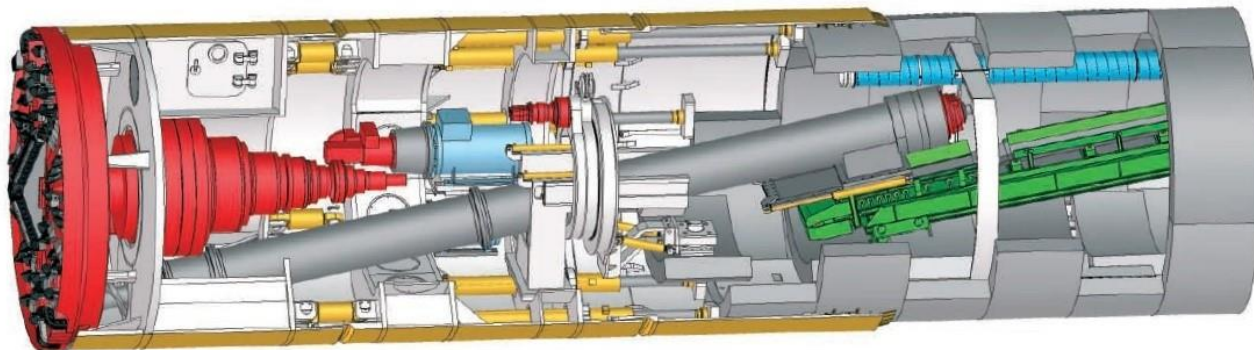
Submarine outfall launching shaft. A corula



TBM crossing under road.



EPB TUNNEL BORING MACHINES



EPB TBMs (Earth Pressure Balance) support the front with the pressure exerted by the soil inside the excavation chamber, which is evacuated by means of variable speed auger to control the extraction of material.

The debris is transported to the shaft by conveyor belt or wagon.

Tunnel boring machines initially designed for clayey soils, with the use of foams and polymers it has been possible to extend their field of action to other types of soils.



Control cabin of an EPB TBM



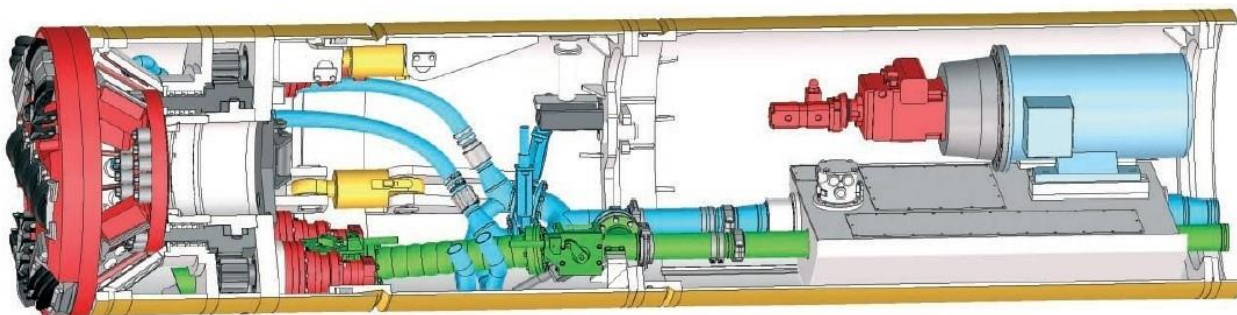
EPB TBM Back up inside the tunnel



EPB TBM assembly



HYDROSHIEL TUNNEL BORING MACHINES



The Mixshield or hydroshield TBMs support the face by means of the pressure in the excavation chamber due to the pumping of clayey slurry that mixes with the material excavated by the cutting crown.

The mixture is crushed in the chamber itself and extracted by hydraulic pumping to the surface, where it is separated by a plant generally consisting of screens and cyclones.

This TBMs are suitable for almost all types of terrain, with outstanding performance in sand, rock under phreatic levels (submarine outfalls) and specially suitable for small diameters.



TBM rescue after underwater outfall.



TBM exit in reception shaft.



TBM control panel located on the surface.



Separation plant for extracted material.

OPEN SHIELD TBMs



OPEN SHIELDS WITH PLOW OR EXCAVATOR

Equipment consisting of a shield with an open front that allows the operator to have visual contact with the ground and excavate it with the help of powerful plows or backhoes. The material is extracted dry using wagons pushed by locomotives or winches.

It is a suitable and economical solution in non-urban areas, cohesive soils and without water presence.



Open shield with gazer



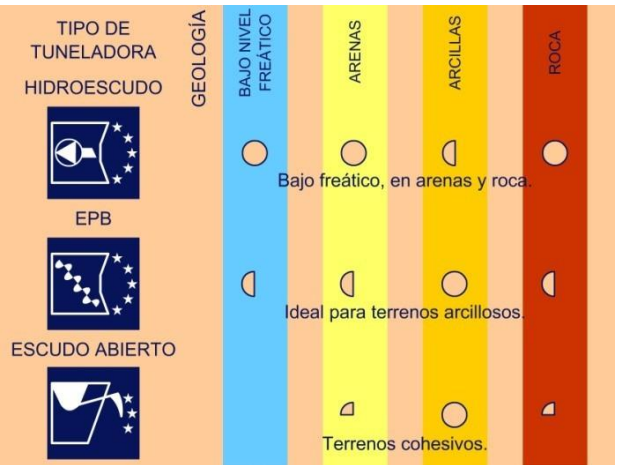
Open shield excavation face with excavator

CHOICE OF TBM

In order to choose the most suitable TBM among those available for the execution of a project, it is necessary to have a complete geotechnical study that defines the main characteristics of the ground to be crossed (phreatic level, granulometry, resistance to simple compression, abrasiveness, etc...).

In addition to the most suitable type of TBM, these parameters will influence the choice of the most suitable route, possible preventive measures to be adopted, control systems, type of cutting crown and its components, characteristics of the lining, etc.

Good planning and selection of the most suitable equipment is essential to successfully undertake any project that requires the use of a tunnel boring machine.



Fields of use of tunnel boring machines



Rock excavation face

Two types of coatings can be used with microtunneling machines:



SEGMENTAL LININGS

Precast concrete elements that are installed in the tail shield of the TBM, forming rings that constitute the final lining of the tunnel.

The TBM pushes on the placed segments, allowing for long lengths and curved routes.



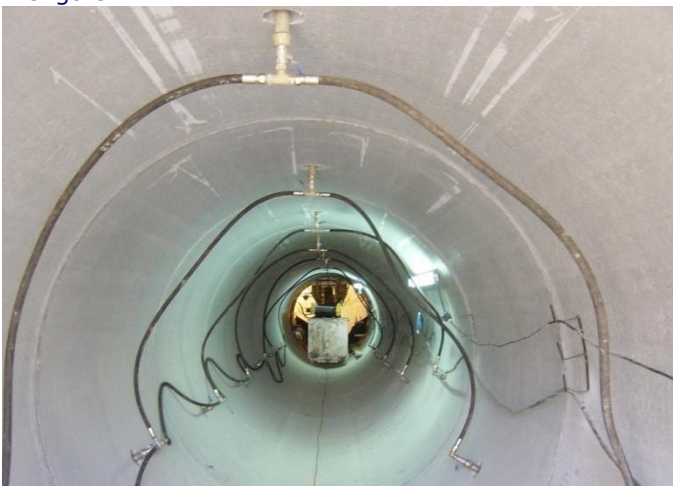
Segmental linings in the TBM back up.



PIPE JACKING

Prefabricated cylindrical elements that form the lining of the tunnel and are installed and driven from the shaft, transferring thrust to the TBM located at the face.

To reduce the friction between the pipe and the ground during the jacking phase, bentonite or polymers are injected into the socket and intermediate pusher stations are installed in long lengths.



Bentonite injection for backside lubrication



Launching shaft with thrust system.



Laying of a section of pipe for jacking.

