Experts in tunneling with Tunnel Boring Machines
Europea de Hincas Teledirigidas, S.A., EUROHINCA, was incorporated in 1996 for the execution of pipelines using the pipe jacking technique with tunnel boring machines. Since then, Eurohinca succeeded in more than 200 projects completing more than 80 kilometers of tunnels. EUROHINCA is the Spanish microtunneling market leader and one of the better equipped tunneling contractors in Europe.

EUROHINCA employs highly specialized personnel and owns 14 Tunnel Boring Machines (11 made by the German manufacturer Herrenknecht) with different diameter and operating principles to be able to complete a large variety of underground applications. EUROHINCA has gained a wide experience in the execution of tunnels in difficult ground conditions, operating its TBM’s and rental equipment.

MAIN CLIENTS

PUBLIC ADMINISTRATIONS

EUROHINCA cooperates with various government and public agencies in feasibility studies and develops alternative construction methods to minimize the impact on public using the most advanced Trenchless technologies.

EUROHINCA acquired the highest Spanish classifications for civil works contractor for, among others, water supply, sewers and outfalls. EUROHINCA promotes the Trenchless technology being highly involved in Trenchless Conferences, Associations, Masters and publications in professional journals.

CONSTRUCTION COMPANIES

Depending on the specific characteristics of each project, EUROHINCA can participate as a partner in Joint Ventures or as a subcontractor of construction companies of recognized prestige.

Specialized in the operation of TBM’s, EUROHINCA brings the necessary experience to successfully complete the most complex projects.

ENGINEERING FIRMS

EUROHINCA provides support to the most important engineering firms in the design and optimization of tunneling projects to be executed by TBM, and in identifying the best economically and socially profitable solution.
ADVANTAGES OF TRENCHLESS TECHNOLOGY

TUNNELS ↔ TRENCH
✓ Less effect on existing services.
✓ Lower environmental impact.
✓ Minimizes spoil and waste generated.
✓ Compact installation.

TBM ↔ MINING
✓ Increased security for workers.  
  (Works inside a shield)
✓ Less risk of surface settlements.  
  (Excavation Front is supported)
✓ Higher outputs. Minor delays.
✓ Reduced impact on ground water level.

TYPICAL APPLICATIONS
➢ SEWER AND WATER SUPPLY NETWORKS. COLLECTORS.
➢ CROSSINGS UNDER EXISTING SERVICES  
  (roads, streets, railways, rivers, airport runways, golf courses, etc.)
➢ SEA OUTFALLS. WATER RELEASE OR INTAKE.
➢ TUNNELS WITH TUNNEL BORING MACHINES.
➢ UNDERGROUND CORRIDORS.
➢ GAS AND OIL PIPELINES. DRAINAGE AND EVACUATION SYSTEMS.
➢ PIPE ARCHING FOR ROAD OR RAILWAY CROSSINGS.
➢ STEEL PRESSURE PIPES.
➢ WATER INTAKE AND RELEASE FOR FISH FARM OR DESALINATION PLANTS.
➢ WATER WASTE PIPE AND INTAKES IN RESERVOIR DAM.

Launch shaft in pipe jacking outfall. A Coruña
Road crossing with pipe jacking
The EPB Shields (Earth Pressure Balance) are TBM machines that support the tunnel face with the pressure applied by the excavated soil located inside the excavation chamber; the controlled extraction of the soil from the excavation chamber by means of a variable speed auger allows the adjustment of the pressure applied to the tunnel face.

The excavated material is transported to the launching shaft by conveyor belts or muck wagons.

The EPB Shields were initially designed to bore soft, cohesive ground, (mainly clay), but with the use of foam and polymers it is possible to bore other type of soils as sand or even rock.
The TBM mix shield, or hydro shield, supports the tunnel face by the pressure of the bentonite suspensions injected in the excavating chamber and mixed with the excavated material.

This mixture is crushed in the excavation chamber and is evacuated by hydraulic pumps to the launch shaft where a separation plant separates the excavated material from the bentonite suspension.

The Hydro shield TBM can be used in almost all type of grounds, and performs well in sand, rock, under ground water level (Sea outfalls) and it is specially indicated for small diameters.
OPEN SHIELDS - ROADHEADERS OR EXCAVATORS

Open face shields allow a visual contact to tunnel face. The front is excavated by powerful roadheaders or excavators. The extraction of the excavated material is made by muck wagons pushed by locomotives or winches.

It is an economic and optimal solution for non urban areas with cohesive soils and above ground water level.

TBM CHOICE

A detailed and comprehensive geotechnical study (including ground investigation, ground water level, type of soil, resistance to simple compression, rock abrasivity, etc.) is the basis for the selection of the appropriate TBM equipment and tunnel excavation method.

With complete information it is possible to define the most suitable TBM, cutter head configuration and tools, characteristics of the lining, the alignment of the tunnel, and also, if necessary, preventive measures to be taken, monitoring systems, etc.
TUNNEL LINING

Two types of lining are typically employed in microtunneling:

**SEGMENTAL LINING**

Precast concrete elements that are installed inside the tail skin shield of the TBM, building a complete ring that constitutes the final tunnel lining.

The thrust of the machine is made on the last ring installed: this allows to excavate great lengths and curved tunnels alignment.

**PIPE JACKING**

Prefabricated pipes (concrete, steel, etc...) that form the lining of the tunnel and are installed and pushed from the launch shaft pushing forward the TBM to the ending shaft.

To reduce the friction between the pipe and the ground during the jacking phase bentonite is injected in the overcut. Intermediate jacking stations are necessary for long distances.