FULL RANGE TECHNOLOGY
Efficient transport systems and supply and disposal infrastructures are a prerequisite for mobility and quality in life. Mechanized tunnelling technology allows for modern underground infrastructures of all kinds to be manufactured at top quality. Since more than 40 years tunnelling technology made by Herrenknecht is paving the way for this through the underground. With technological innovations and further developments, we have contributed a great deal to the fact that there are TBM types available today for every geological formation and all diameters.

Mechanized tunnelling has clear advantages over conventional methods: it is more cost-efficient, safer, quicker and more eco-friendly. About 4,100 reference projects successfully and safely mastered with Herrenknecht technology reflect this. We deliver project-specific tunnel boring machines with diameters from 0.1 to 19 meters and for all ground conditions – always adapted precisely to depths, gradients, curves, lengths and the topographic conditions along the route. With the entire range of methods and tailor made equipment and services, we offer customers everything they need to build efficient tunnel systems precisely and reliably.

We at Herrenknecht see ourselves as pioneers in underground construction and we will continue to develop ideas, together with our clients and contractors in future, to make tunnel construction even safer and more efficient. Always following the motto: “Think positive. Together we are building our future.”

Sincerely,

Dr.-Ing. E.h. Martin Herrenknecht
Chairman of the Board of Management
Hard Rock
High-precision tunnelling under hardest conditions

Herrenknecht offers the entire product range in mechanized tunnelling technology for use in hard rock: open Gripper TBMs, Single Shield TBMs and Double Shield TBMs. Our machines provide high-performance tunnelling in all diameter ranges and high levels of safety. Integrated logistics processes and highly precise excavation allow the production of top quality tunnel structures also in challenging rock formations – often in record time.

You can find more detailed information about our hard rock TBMs, additional equipment and services as well as worldwide project references at www.herrenknecht.com

ADVANTAGES
High advance rates in all kinds of rock.
Optimum tunnelling safety in brittle, non-stable rock formations.
Also usable in groundwater-bearing geologies with prior soil conditioning.

GEOLOGY
Rock (soft, brittle rock to hard basalt)

SINGLE SHIELD TBM
EXCAVATION DIAMETERS
1.5 m 14 m
GEOMETRY
Rock (soft, brittle rock to hard basalt)
ADVANTAGES
High advance rates in all kinds of rock.
Optimum tunnelling safety in brittle, non-stable rock formations.
Also usable in groundwater-bearing geologies with prior soil conditioning.

DOUBLE SHIELD TBM
EXCAVATION DIAMETERS
2.8 m 12.5 m
GEOSTRING
2 m 12.5 m
GEOLAYER
5 4

ADVANTAGES
High advance rates in stable rock due to continuous tunnelling operation.
Flexible use in all kinds of rock.
High level of work safety for the machine personnel in geological fault zones.

GEOLOGY
Rock (all kinds of stable and unstable rock)
**ADVANTAGES**

Very high and consistent advance rates possible in cohesive soils with high clay or silt content.

Geological range of application can be enhanced by soil conditioning.

No additional support medium required.

A range of special solutions available for heterogeneous soil conditions.

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**GEOLOGY**

**Soft ground** (clay, silt, loam, low water permeability)

**Heterogeneous ground** (sand, gravel, high water permeability and water pressures)

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**EXCAVATION DIAMETERS**

**EPB SHIELD**

1.7 m

2.4 m

3.6 m

4.8 m

6.0 m

8.0 m

10 m

**MULTI-MODE TBM**

2.4 m

4.8 m

6.0 m

8.0 m

10 m

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**HETEROGENEOUS GROUND**

Maximum tunnelling safety due to precise support of the tunnel face with an automatically controlled air cushion.

Usable in high water pressures of more than 15 bar.

Even very large diameters of up to 19 m possible.

Special solutions available for special project requirements.

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You can find more detailed information about our soft and mixed ground machines, additional equipment and services as well as worldwide project references at www.herenknecht.com
Utility Tunnelling
The trenchless way for quick installations

High-performance supply and disposal systems are being built worldwide using mechanized tunnelling technology from Herrenknecht. Our utility tunnelling machines dig quickly and safely through any underground even under very tight space constraints: no matter whether for new water and wastewater systems, electricity or hydropower plants or for the installation of pipelines. Always with the great advantages that trenchless tunnelling offers: transport, economy and environment on the surface remain largely undisturbed.

You can find more detailed information about our utility tunnelling machines, additional equipment and services as well as worldwide project references at www.herrenknecht.com

ADVANTAGES
Usable in almost all ground conditions and with high water pressures. Highest tunnelling safety due to hydraulic tunnel face support. Ideal technology for tunnelling in the non-man-entry diameter range (micro-tunnelling). Precise control even with small radii in vertical and horizontal curves.

GEOLOGY
Soft ground
Heterogeneous ground
Rock

EXCAVATION DIAMETERS
0.4 m
4.8 m

AVN MACHINE

CUTTERHEAD
LASER TARGET
LUBRICATION
BYPASS
SLURRY LINE
CONE CRUSHER
ACCESS DOOR
FEED LINES
WATER JETS

DIRECT PIPE®

EXCAVATION DIAMETERS
0.8 m
1.5 m
30–60” pipeline diameters

GEOLOGY
Soft ground
Heterogeneous ground
Rock

ADVANTAGES
The borehole is created and the prefabricated pipeline inserted in one single, continuous step. Permanent support for the borehole. Very high installation speeds. No expensive shaft construction required. Precise steering possible.

HDD RIG

EXCAVATION DIAMETERS
0.0 m
2 m

GEOLOGY
Soft ground
Rock (relatively stable grounds are a prerequisite)

ADVANTAGES
Economic and environmentally-friendly method for installing pipelines.

Four basic rig types for different ranges of implementation available.

Using the Pipe Thruster, the available thrust and pull force can be increased (up to 750 t additionally).

DIRECT PIPE®

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In All Directions
Special Herrenknecht machines for particular tunnelling missions

Over 40 years, Herrenknecht has distinguished itself in the tunnelling market by constantly developing project-oriented innovations. Whether horizontal, vertical, or inclined: We offer machines for the construction of underground infrastructures, no matter in which direction. Special developments like the field-proven Vertical Shaft Sinking Machine VSM or Inclined Shaft TBM verify that Herrenknecht, together with its customers, always finds a solution to achieve the most safe and economical completion of every tunnel project.

You can find more detailed information about our special mechanized tunnelling solutions at www.herrenknecht.com

PARTIAL-FACE EXCAVATION MACHINE

EXCAVATION DIAMETERS

FORWARD SHIELD MAIN DRIVE SHIELD SKIN JACKING PIPES

GEOLGY

Soft ground Heterogeneous ground Rock

ADVANTAGES

Usable in almost all non-groundwater-bearing geologies.
Various excavation tools for various geologies available.
Easily and quickly convertible.
Exact control of the excavation process: the operator sits directly beside the open tunnel face.
Low operating costs.

VERTICAL SHAFT SINKING MACHINE VSM

EXCAVATION DIAMETERS

GEOLGY

Soft ground Heterogeneous ground Rock

ADVANTAGES

Can be used in soft and stable soils up to 80 MPa and below groundwater.
High advance rates of up to 5m per shift due to parallel work processes.
Flexible arrangement of the machine equipment enables use even under tight space constraints.

INCLINED SHAFT TBM

GEOLGY

Soft ground Heterogeneous ground Rock

ADVANTAGES

Alignments with upward and downward gradients of up to 100 % possible.
Thanks to new developments like an anti-reverse locking system or special transport systems, inclined shafts can be excavated reliably and safe.
Typical fields of application: Headrace tunnels for hydropower plants or inner-city escalator shafts.

Example of a highly modified EPB Shield for a 30° downhill slope
Herrenknecht is the world’s leading premium supplier for all-around technology solutions in mechanized tunnelling. Working closely with our customers, we can meet any challenges and together realize underground infrastructure of all kinds. Successfully and in top quality.

www.herrenknecht.com