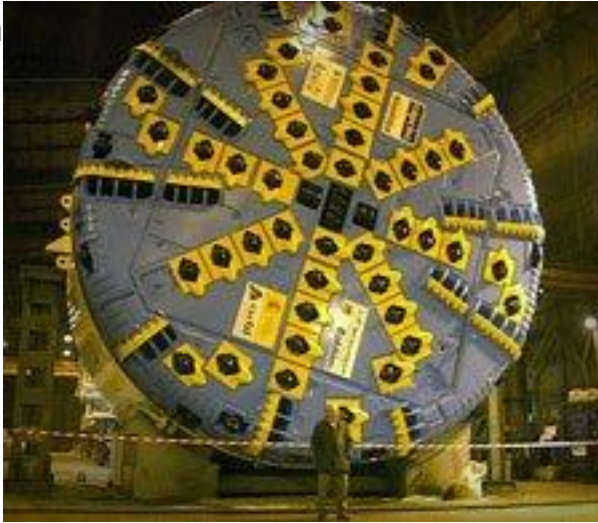
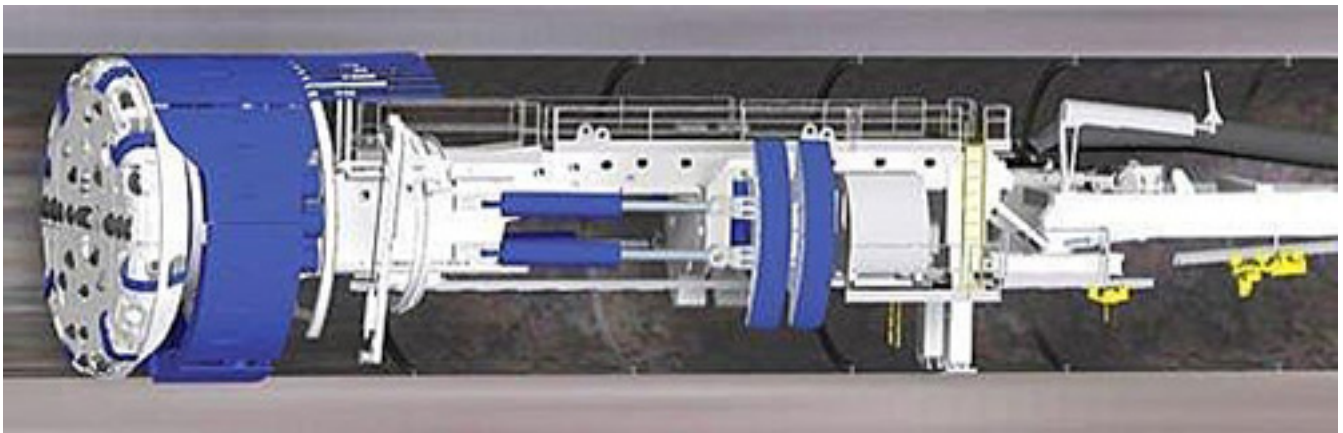


Definition



Open-faced shields are shields without a system for pressure regulation at the tunnel face in order to contain groundwater. Thus open-faced shields can be used in ground conditions with no ground water or where the ground water was lowered before.

Gripper TBMs



A gripper TBM has a cutterhead that excavates the full tunnel face in a single pass.

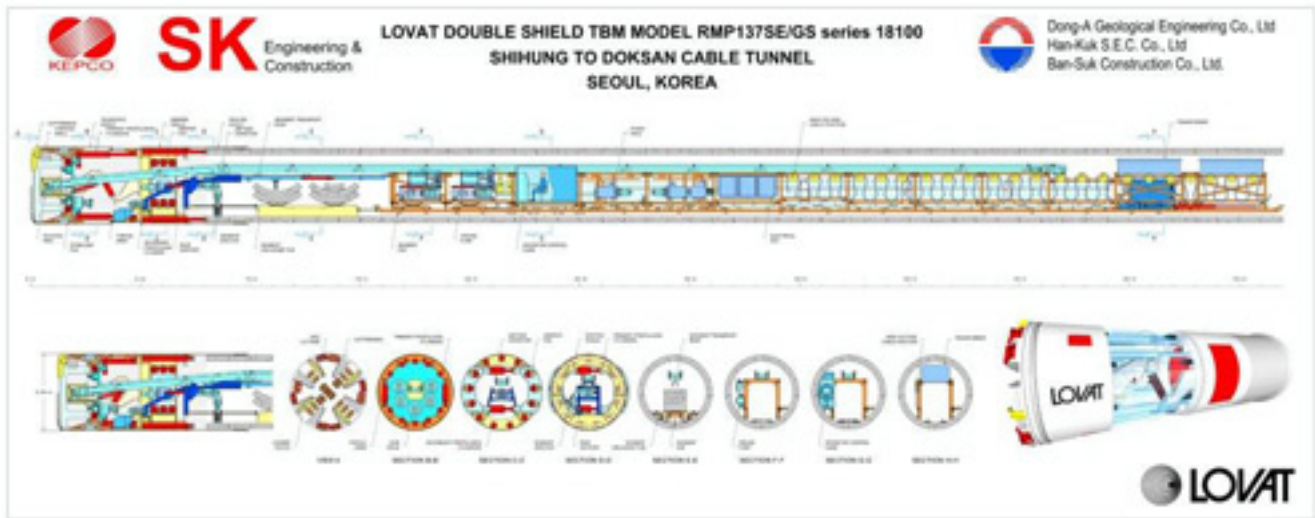
The thrust on the cutterhead is reached by grippers which push radially against the rock of the tunnel wall. The machine advances sequentially in two phases :

- excavation (gripper unit is maintained still)
- regripping

Shield TBM

A gripper shield TBM is like a gripper TBM except that it is installed inside a cylindrical shield incorporating grippers.

Double shield TBM



A double shield is a TBM with a full face cutterhead and two sets of thrust rams that react against either the tunnel walls (radial grippers) or the tunnel lining.

The thrust method used at any time depends on the type of ground encountered. With longitudinal thrust, segmental lining must be installed behind the machine as it advances.

To know more:

- [Robbins Main Beam TBM Boring Cycle](#), video on You Tube
- [Robbins Hard Rock Disc Cutters](#), video on You Tube

Videos from Herrenknecht AG: