



**EXCAVATION DIAMETER 15.62 METERS:
NEW RECORD TBM EXTENDS THE A1 HIGHWAY IN ITALY.**





Assembly of the S-574 EPB Shield in Schwanau, Germany .

A1 EXTENDED BY GIGANTIC "GALLERIA SPARVO" ROAD TUNNEL.

REQUIREMENT

GALLERIA SPARVO, ITALY



Tunnel length: 2,494m, 2,431m

Diameter (ID): 13,600mm

Geology: clay, argillite and sandstone

Contractor: TOTO Costruzioni Generali S.p.A.

Client: Autostrade per l'Italia S.p.A..

A busy section of the A1 highway between Bologna and Florence, Italy, is currently undergoing expansion. The "Variante di Valico" project involves construction of the Sparvo Tunnel between Sasso Marconi and Barberino del Mugello. The tunnel comprises two 2 parallel tubes whose respective drilling diameters represent a new record in mechanized tunnelling. 2.5km long, each tube includes a two-lane road and a third emergency lane. Loose soil containing explosive firedamp is anticipated along the 5-kilometer stretch. In order to achieve a high degree of industrial safety and swift tunnelling performance, the building contractor opted for an EPB Shield from Herrenknecht. At 15,615mm, the TBM excavation diameter represents a new world

record. Tunnelling northward is expected to commence near Florence during the first six months of 2011 with the new route to be opened by the end of 2013. This will significantly reduce the travel time between Bologna and Florence for up to 90,000 vehicles every day.



HERRENKNECHT EARTH PRESSURE TECHNOLOGY FOR SAFE TUNNELLING.

SOLUTION

S-574, EPB SHIELD

Excavation diameter: 15,615mm

Shield diameter: 15,550mm

Power installed: 12,000kW

Max. thrust force: 394,850kN (500 bar)

Cutting wheel torque: 94,793kNm

Cutting tools: 76 discs, 216 cutting knives, 24 buckets, 1 center knife

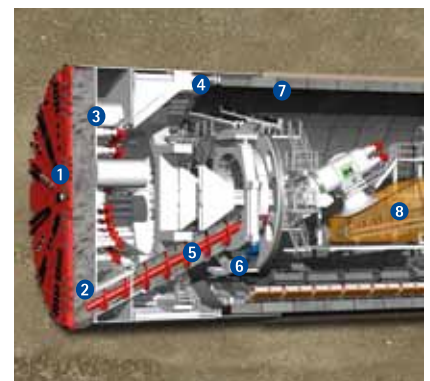
Total weight: 4,500t

Total length: 130m

Segment length: 2m

The tools on the rotating cutting wheels ❶ on EPB machines loosen the soil in the tunnel face before pressing it through the cutting wheel openings into the excavation chamber ❷ where it is combined with the loose plastic soil already there. The thrust cylinder force ❹ is transferred across the bulkhead ❸ to the loose soil, thereby preventing uncontrolled penetration by the tunnel face soil into the excavation chamber. The excavated material is conveyed by the screw conveyor ❺ from the pressurized excavation chamber into the tunnel under atmospheric pressure. The erector ❻ behind the shield helps to build the tunnel

tubes consisting of segments. ❼ The excavated material is removed by a housed, explosion-proof belt conveyor. ❽



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Drilling for progress. Herrenknecht AG is a technology and market leader in mechanized tunnelling. Herrenknecht is the only company in the world to supply high-tech tunnelling machinery for all ground conditions and in all diameters.

