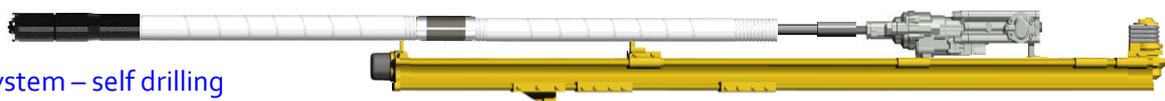


ATP FIT System

Description



GFRP tunnel consolidation system – self drilling

Fit System has been developed in a way that consolidation can be executed through the TBM machine.

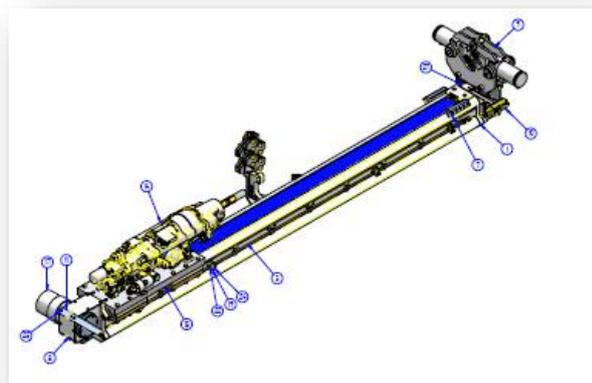
FIT (FRP Injection Tube) is the drilling system that transmits the rotation and percussion of rod to the Ring Bit, which is mounted to the top of FRP tube through Casing Shoe.

Rod and FRP tube will be added up to necessary length, drilled by Drill Jumbo or Crawler Drilling Machine. This double-pipe drilling system has outer FRP tube and inner Rod. FRP tube mounted with Casing Shoe, Ring Bit will be left inside the hole, and inner Rod with Inner Bit (or Adapter) will be retracted after drilling. FIT system realized to perform drilling at the geological condition where the bored hole is easy to be collapsed, so that reinforcement of tunnel face could be done without problem.

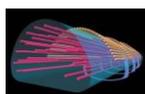
As for grouting, there are two methods. One is grouting by valve injection from the mouth and the other is injection by packer.

In general, mainly FRP bolts are applied for the tunnel face bolt and in case bored hole is easy to be collapsed, the face bolt with short length (3-6m) was the only method by Self-Drilling Type or Double Pipe Method with Special Machine. However, there are tunnels where is necessary to make the face improvement by FRP tube with long length tubes in order to avoid deformation movement of the tunnel. FIT system realized to improve the tunnel face with long length tube by Drill Jumbo.

FIT method can apply to forepile, face bolt and side-pile omni directionally depending on the geological condition around the face, thanks to the FRP tube which has big Pull-Strength and high durability for bending with small diameter.



**GFRP tunnel face
consolidation through TBM**



System description

Drawing	Description
	Robit@ RoX+ GFRP 76,1/8 Ring Bit - ø76,1 – a set of connected ring bit, casing shoe and threaded connection for fiberglass
	Robit@ RoX+ GFRP 76,1/8 Pilot Bit - R32 – pilot bit with Robit 's patented spiral locking system
	Robit@ RoX+ GFRP 76,1/8 Starter Casing – a set of connected ring bit assembly and threaded fibers class tube
	Ø 76/60 mm. GFRP tube (with improved adherence surface). Length 3,0 and 4,0 m.
	Ø 76.3 mm. Steel Joint coupler L = 240 mm.
	Manchette injection valve L = 40 mm.

System scheme

