



Tunnel Feuerbach, Stuttgart (D) Sealing Grouting

Client	DB Projekt Stuttgart-Ulm GmbH
Main Contractor	ARGE Tunnel Feuerbach Consisting of Baresel GmbH, Germany, Alfred Kunz Untertagebau, Germany and Walo Bertschinger Central AG, Swiss
Execution of works	Renesco GmbH, Abt. Marti Geotechnik
Construction period	November 2015 – February 2020
Contract sum (grouting only)	40 Mio. €

Object description

As part of the project Stuttgart 21 the new Feuerbach tunnel connects the Stuttgart main station and the train station of Feuerbach. All works are executed via a central access tunnel during the entire construction period. The railway tunnel consists of two separate tunnels each with a length of about 3 200 m.

Injection / Grouting works

The tunnel lies partially within an anhydrite formation with a swelling potential when in contact with water. Many tunnels in the past have suffered considerable damage due to the apparent swelling processes. To inhibit swelling water is completely restricted for construction.

The water-bearing ground formations were additionally grouted with polyurethane resin during the course of the tunnel driving through pre-excitation drilling holes. Subsequently, the excavation-damaged zones in the anhydrite zones are systematically grouted with acrylate gel.

Scope of work

Pre-excitation grouting:

- Polyurethane resin: approx. 230 000 l

Systematic Grouting:

- Drill holes: approx. 60 000 nos.

- Injections: 120 000 nos.

- Acrylate gel: 2 300 000 l

Particularities

For the first time in grouting technology, a digital grouting data management system was introduced for monitoring, documenting and steering of the grouting operation. The system in place allows instant access to the grouting data, automated quantity survey and interactive visualization, as well as accurate documentation of construction sub-operations.

A grouting container with fully automatic, pump control, acrylate gel pumps and chemical-resistant measuring sensors as well as a semi-automatic mixing plant, ensures the quality of the works.



1. Installation of packers
2. Grouting container
3. Grouting data management system (visualization)