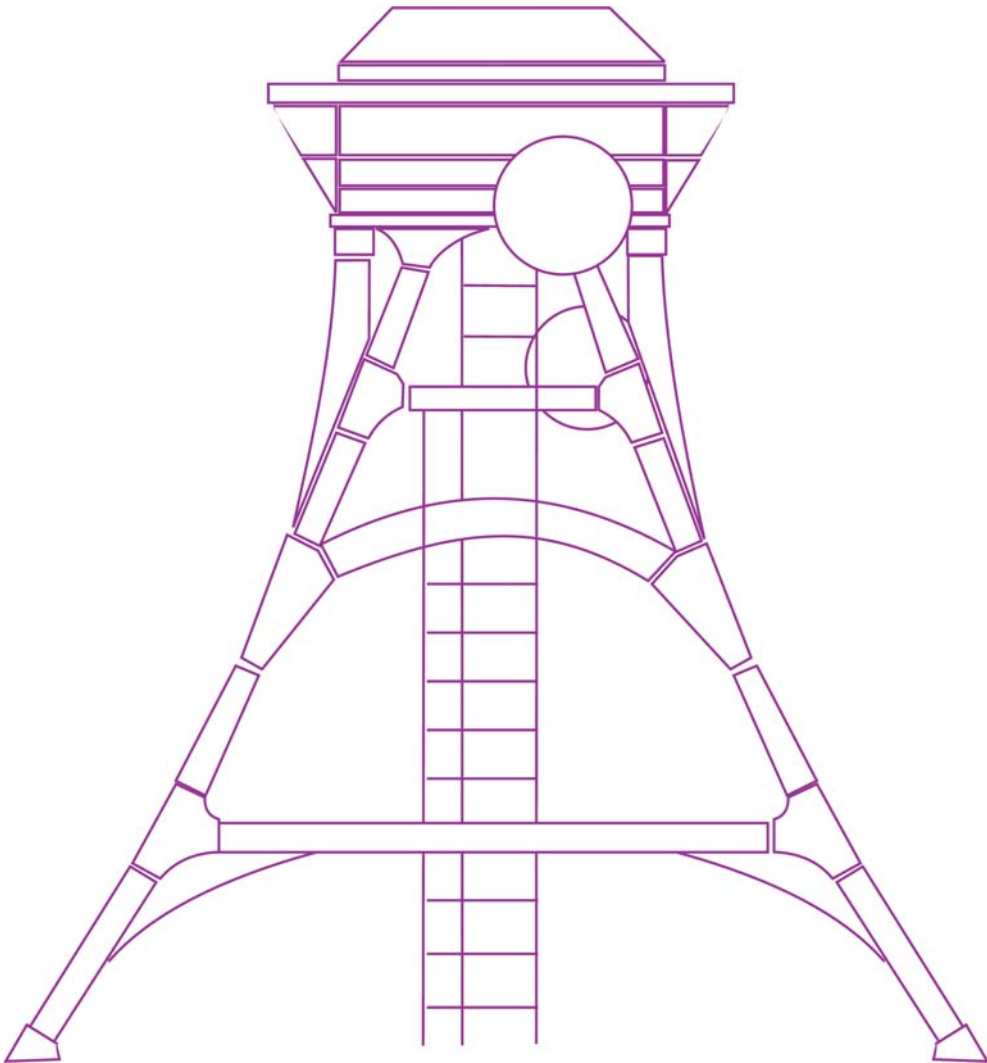


K-UTEK

SONDERSHAUSEN



[Technical Information on Injection Mortars](#)

Technical Information on Injection Mortars

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Managing Director: Dr Holger Thoma

Department Waste Management and Backfilling

Head of the Department: Wolfgang Krauke (Engineer)

Phone: ++49 - 3632 - 610 - 140

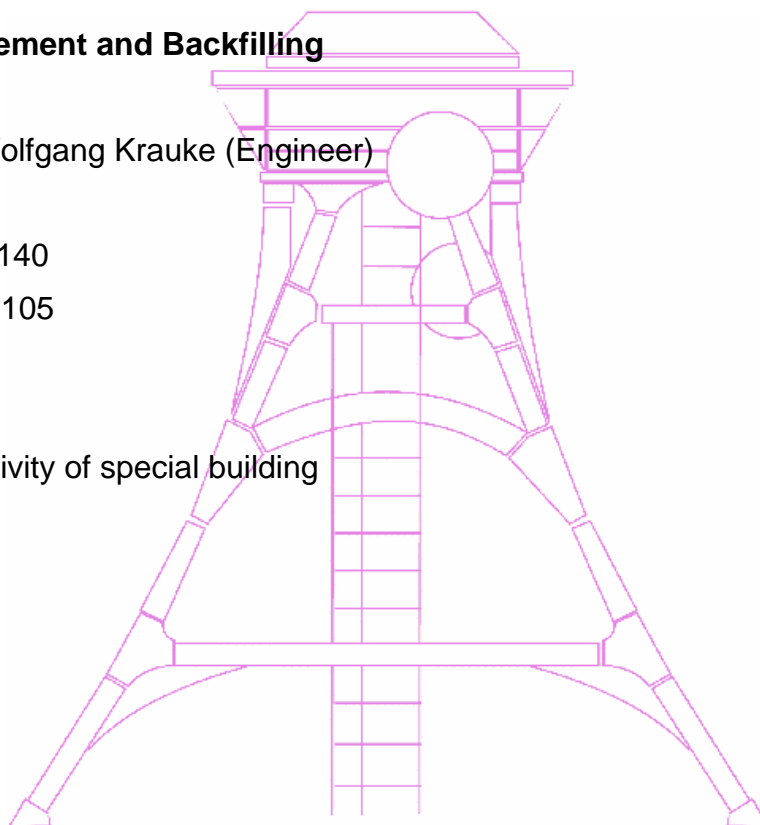
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e-Mail: evt@k-utec.de

Specialists for the field of activity of special building material:

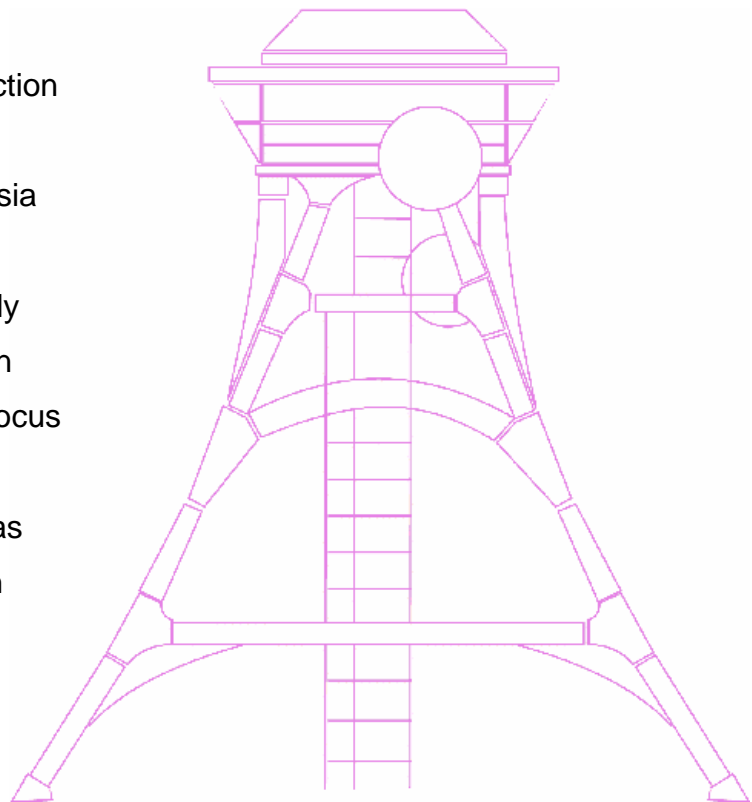
Wolfgang Krauke

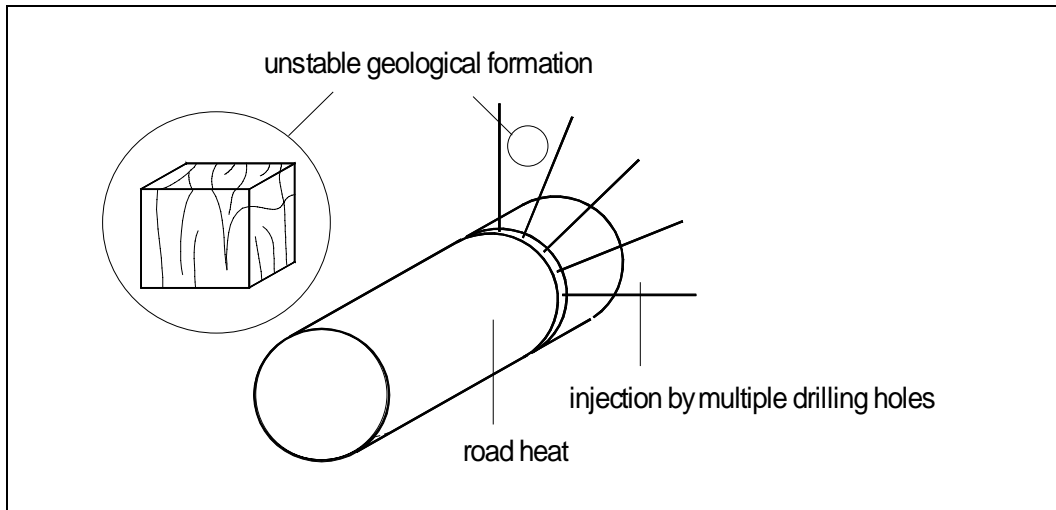
Dittmar Lack



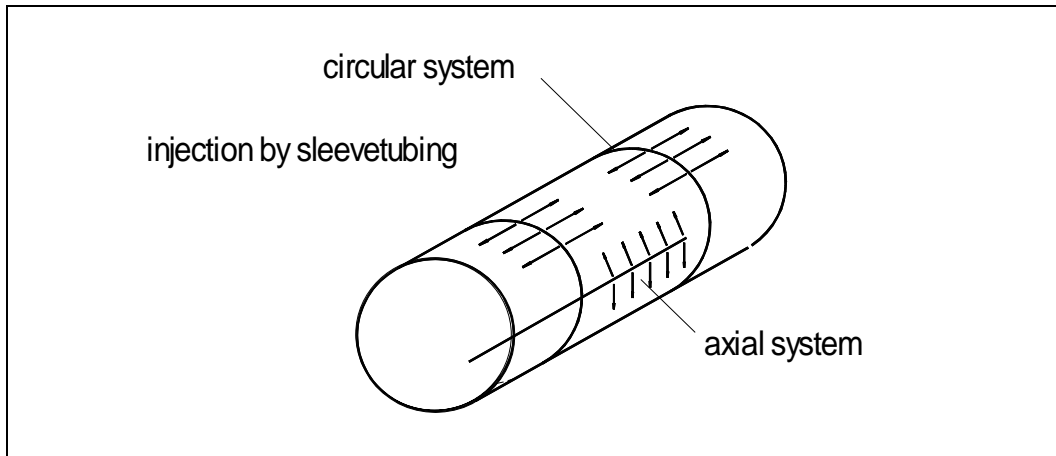
Injection Mortars	
<p>➤ Sealing</p> <ul style="list-style-type: none"> • permeable rock zones • joint between sealing sections and host rock • leaky dams or other buildings 	<p>➤ Stabilization</p> <ul style="list-style-type: none"> • disturbed rock zones • damaged building structures • backfilling masses

K-UTEC has developed injection mortar systems for saline application based on magnesia binders. These mortars are characterised by adding finely grained material up to a grain size of 100 µm with a main focus of a grain size of 10 - 20 µm. The mortars are developed as systems including expansion rates.

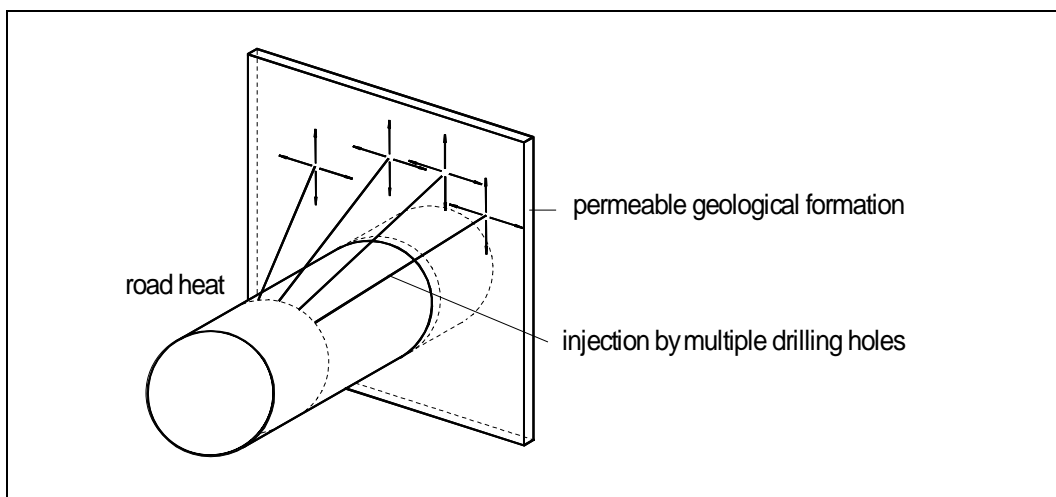




Picture 1 - Stabilization disturbed rock zones



Picture 2 - Sealing joints between sealing section and host rock



Picture 3 - Sealing permeable rock zones

Engineering Service

- Test of injection materials with respect to their compatibility with the host rock formation
- Special tuning of injections materials with respect to the host rock formation

Technical Engineering

- Design of injection programs
- Realization of injection programs with approved equipment

volume flow: 0,35 ... 1,20 m³/h

maximum pressure: 160 bar

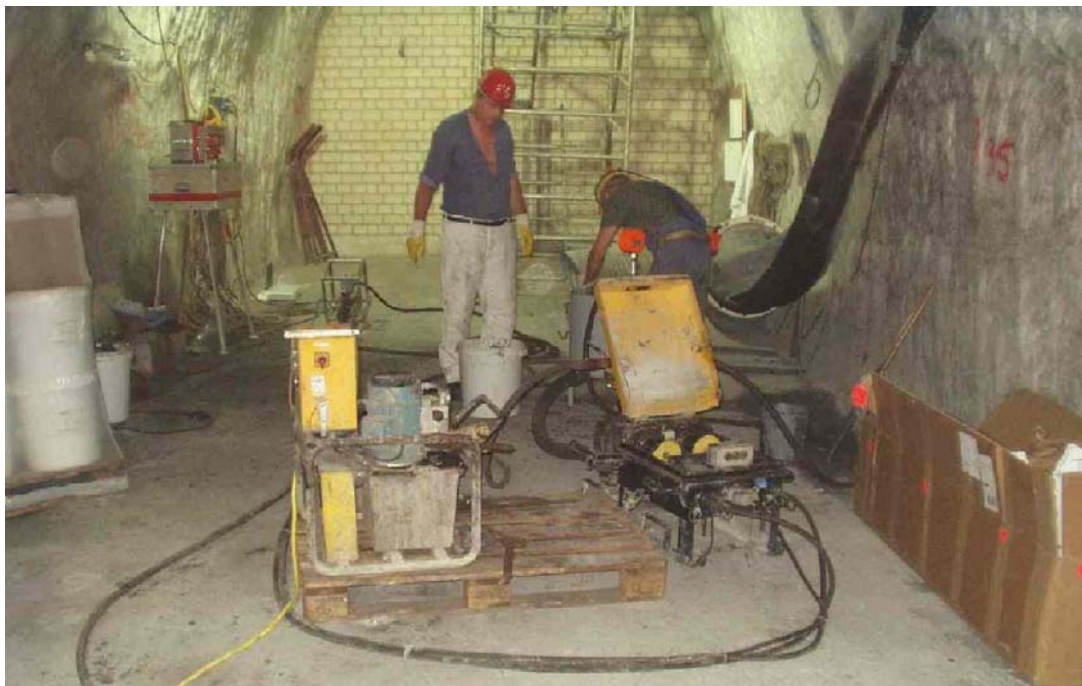
measurement and control equipment to measure injection pressure and volume flow

- Detect disturbed rock zones by frac - measurements
- Measurement of rock permeability
- Geophysical investigations to detect disturbed rock zones

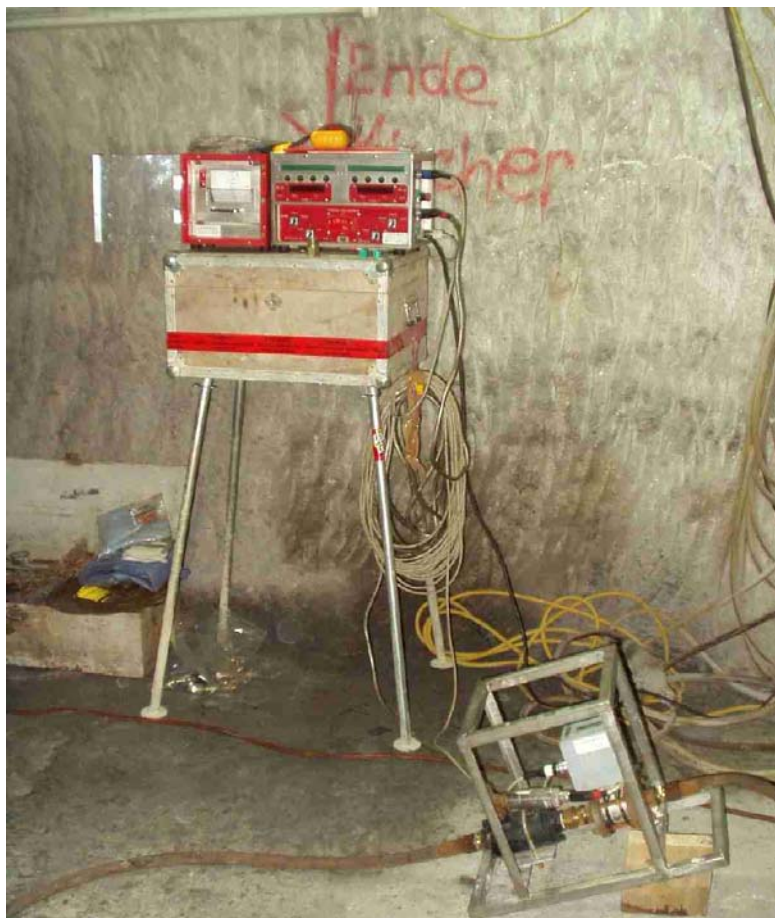
The mortars are characterized by the following parameters:

- Pot time : up to 30 minutes at a temperature of 30°C
- Setting time : about 2 hours, chemical reaction after 12 – 15 hours
- Maximal setting temperature : about 90°C
- Compressive strength after 24 hours : about 50% of the final strength
- Axial compressive strength (after 28 days) : 30 – 55 MPa
- Bending tensile strength (after 28 days) : 5 – 7 MPa
- Cubic expansion: > 5 – 10 %
- Apparent density: 1,830 – 1,935 g/cm³

Both following pictures show underground in situ photos of a finishing injection into a fluid barrier. Picture 4 shows the double piston high pressure pump with its hydraulic part and to the left of the picture the packages filled with the dry mixture as well as the mixing solution for 20 l of suspension can be seen. Picture 5 shows the flow measuring equipment with the control unit and the data log recording pressure and throughput.



Picture 4 – Double piston high pressure pump



Picture 5 – Flow measuring equipment with control unit and data logger