Consolidation Line

WEBAC®



QUALITY
SINCE WEBAC® 1978
MADE IN GERMANY



Consolidation Line

WEBAC Consolidation Line

- WEBAC offers an effective, economically product system line for "Tunneling and Mining all around the World": Consolidation Line.

The modular system

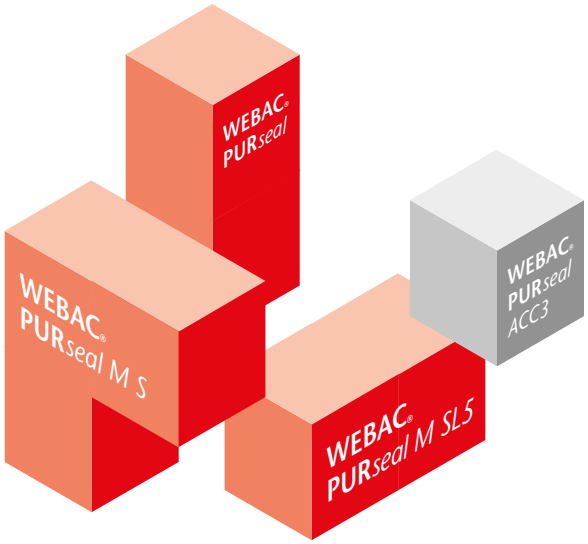
In complex projects, the objective of stabilization or sealing work can change within a very short time. For example, in tunneling through fault zones or in the event of water ingress. Here, the **WEBAC Consolidation Line** offers engineers and technicians on site a modular system: possibilities for action so as to be able to react quickly and appropriately to almost any change and to keep consequential damage to a minimum.

Thanks to the „modular system" only a few canisters of an additive suffice to make a compact product or a foam quickly stopping water from the base material – tailored to the objectives on site.

Especially for dam or tunnel projects in locations difficult to access all options are already available on site without logistical masterpieces having to be performed with high costs.

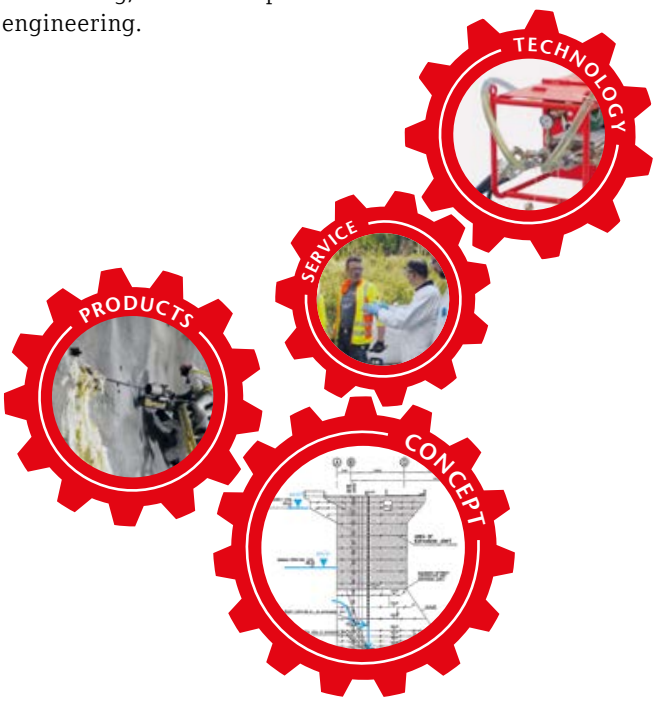
For employees who often work under difficult conditions safety is also a top priority. This requires fast, reliable and permanently effective solutions in the event of an accident. For accompanying consolidation tasks in tunneling (conventional or with TBM) or preventive stabilization and safety measures in mostly large-scale construction and rehabilitation projects.

Cost efficiency, flexibility and security: this is what **WEBAC Consolidation Line** stands for.



Four factors for success

WEBAC Consolidation Line offers tailor-made solutions based on matching products, techniques and concepts especially designed for tunneling and mining, dams and special civil engineering.



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Tunnel Vision





In contrast to traditional injection materials, WEBAC Consolidation Line systems have many advantages:

- Easy application
- Low material costs
- Short standstill periods
- Robust technology
- Modular system
- More efficient logistics

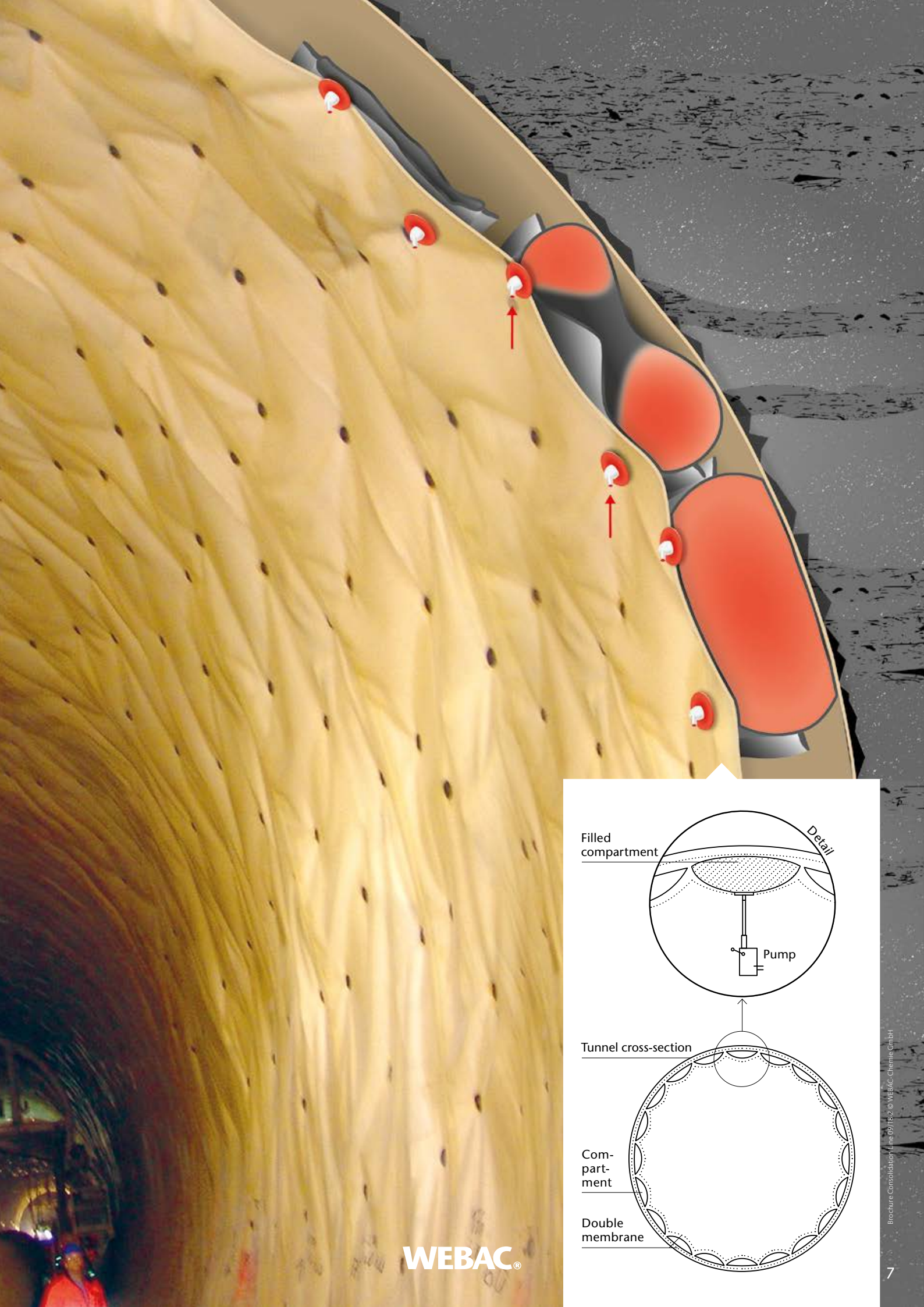
Deep in the Mountain





Compartment and Membrane Injection

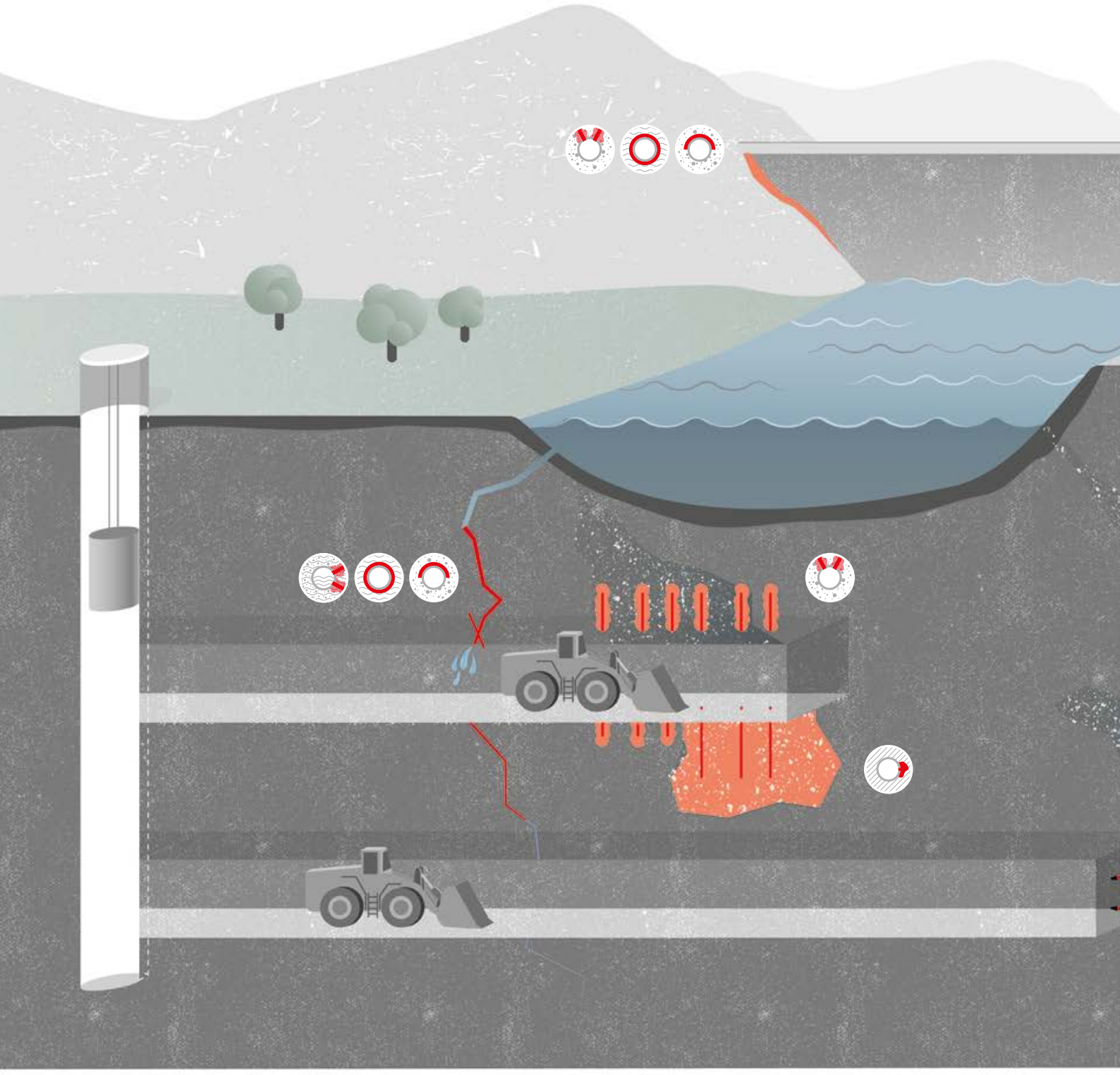


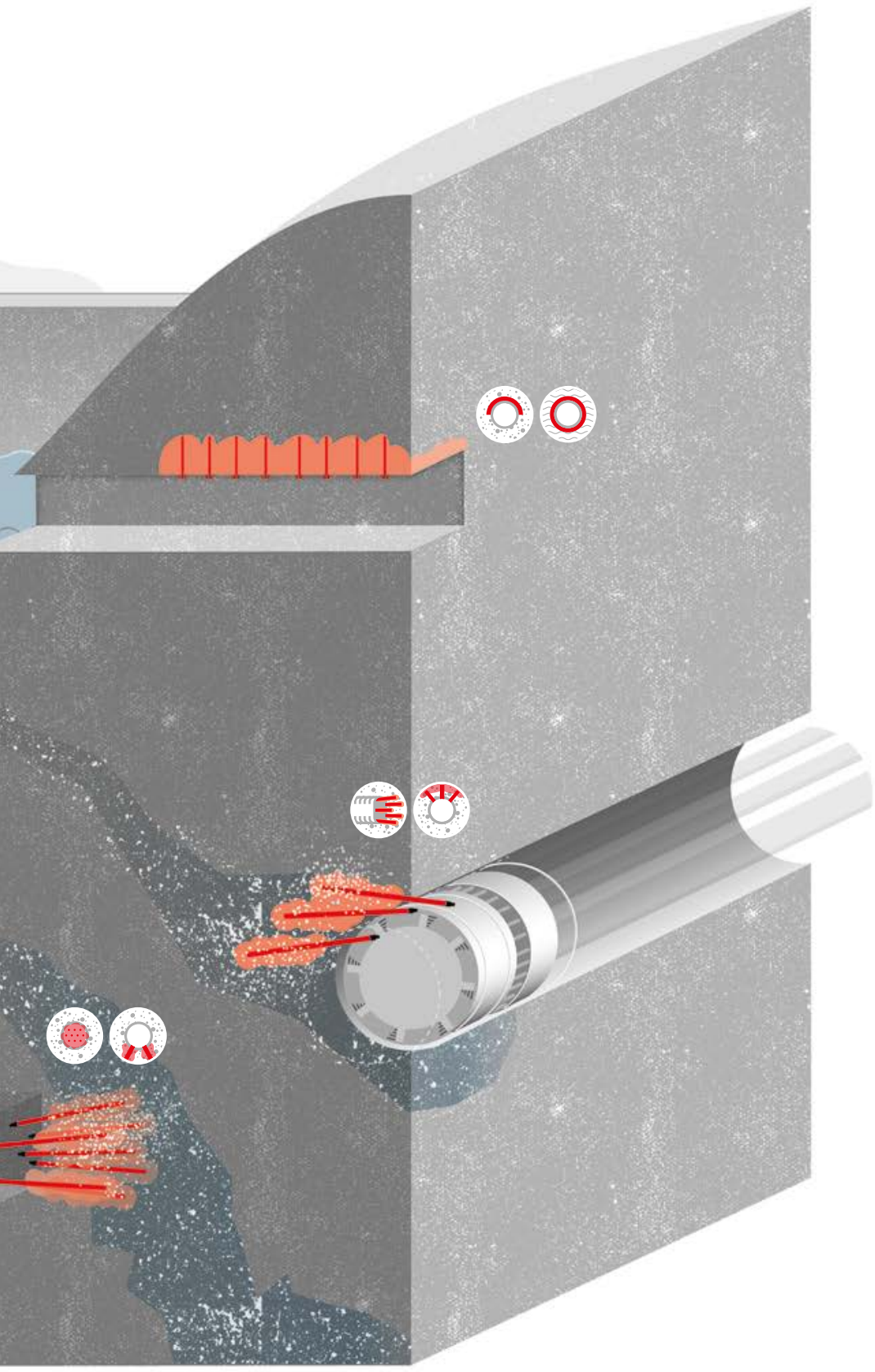


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Concepts/Applications





Rock Mass Stabilization

Permanent Sealing

Soil Stabilization

Filling of Voids and Cavities

Anchor Bonding

Tunnel Face Consolidation

Tunnel Face Pre-injection

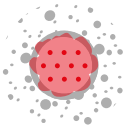
Umbrella Injection

Water Stop

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Matrix for Product Systems

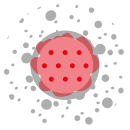
The following matrix shows an allocation of matching/suitable injection systems to typical sealing objectives and stabilization tasks.

	WEBAC® PURseal PURseal M PURseal M S	WEBAC® PURseal M SL	WEBAC® PURstop	WEBAC® PURstop 1C	NEW WEBAC® HIS
 Permanent sealing	✓	✓	●	●	●
 Rock mass stabilization	✓	✓	✓	✓	✓
 Filling of voids and cavities	+ ACC3 ✓	+ ACC3 ✓	✓	✓	✓
 Consolidation grouting	✓	✓	✓	✓	✓
 Anchor bonding	✓	●			●
 Tunnel face consolidation	✓		●	●	✓ also TBM
 Umbrella injection	●	●	●	●	✓
 Tunnel face pre-injection	✓	✓	●	●	✓ also TBM
 Water stop	+ ACC3 (SF) ✓	+ ACC3 (SF) ●	+ ACC ✓	✓	✓

✓ Main application ● Possible ✓ Special applications



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	WEBAC® SIL*compact*	WEBAC® SIL*compact M* SIL*compact M thix*	WEBAC® SIL*form*	WEBAC® SIL*fill*	WEBAC® 240
 Permanent sealing	●	●	●	●	✓ + Bseal ✓
 Rock mass stabilization	✓	●	✓	✓	
 Filling of voids and cavities	+ SILACC1 ✓	●	✓ + ADD foaming ✓	✓	
 Consolidation grouting	●	●	✓	✓	✓
 Anchor bonding	✓	✓	●		
 Tunnel face consolidation	✓ also TBM	●	✓ also TBM	✓ also TBM	●
 Umbrella injection	✓	●	✓	✓	●
 Tunnel face pre-injection	✓ also TBM	●	✓ also TBM	✓ also TBM	
 Water stop	+ SILACC1 also TBM ●	+ SILACC1 also TBM ●	✓ also TBM	✓ also TBM	

✓ Main application ● Possible ✓ Special applications

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Polyurethanes

Polyurethane resins are characterized by their fast curing process and high strength. Their foaming behavior upon contact with water can be adjusted.



Polyurethane resins

Fast early strength and compact resin body
→ Sealing and stabilization of loose soils, rock formations and fault zones

Good adhesive properties and early strength
→ Ideal for anchor bonding

Modular system containing additives and accelerators
→ Adjustable: water stop – sealing – solidification



Polyurethane foam resins

Quick foaming with high expansion
→ Water stop against pressurized incoming water

Solid, stable foam
→ Stabilization of cavities and fissures

Low viscosity
→ Good penetration and stabilization of soils and sandy substrates

Silicate Resins

Silicate resins combine the strength of mineral components and the elasticity of organic components.



Silicate foam resins

Very low viscosity
→ Good penetration in fine-particle soils

High expansion
→ Economical solutions, especially for filling cavities

Considerable strength
→ High stabilization of loose rock, crushed rock and gravel

Suitable for cutting and planing
→ Can be used for stabilization work in front of TBMs

Different strengths can be set
→ Stabilization of cavities



Silicate resins

No foaming upon contact with water
→ Strength and stability irrespective of moisture condition

Flame resistant
→ (Coal) mining

Fast strength development
→ Good adhesive properties, economical anchor bonding

Suitable for cutting and planing
→ Can be used for stabilization work in front of TBMs

Different strengths and toughnesses can be set
→ Anchor bonding

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HIS Hybrid-Injection-System

The hybrid injection system HIS combines the respective advantages of cement and reaction resin in one material.



Reaction resin

- Fast reaction and curing process
- Toughness

Cement

- Economical
- Low fire load

HIS

Mixing ratio

→ HIS reaction resin : cement = 1 : 5 parts by volume (1 : 10 parts by weight)

Rapid solidification

→ Water stop using cement
- Without washing out
- Without uncontrolled run-off

Quick strength development and early resistance

→ Economical and efficient annular gap grouting

High cement content

→ Efficient grouting with very economical overall system

Acrylate Injection Gels

Acrylate injection gels are characterized by their low viscosity and high elasticity for sealing and solidification tasks in tunnel and dam construction.



Polyacrylate injection gels

Very low viscosity

→ Good penetration into fine-particle soils

Polymer reinforced with very high adhesive strength

→ Sealing of damaged foils and membranes

Rapid viscosity build-up during gel curtain formation

→ Low material loss in soil stabilization

Adjustable reaction time

→ Defined dispersion area for soil consolidation

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Technology

- 2C pumps are used for the application of silicate and polyurethane resins. The two individual components are delivered to the mixing head in separate hoses. They are only mixed together at the last minute by means of a static mixer.



WEBAC® IP 2K-40



WEBAC® IP 2K-F2



WEBAC® IP 2K-F1



WEBAC® Mixing head steck-O



WEBAC® Mixing tubes

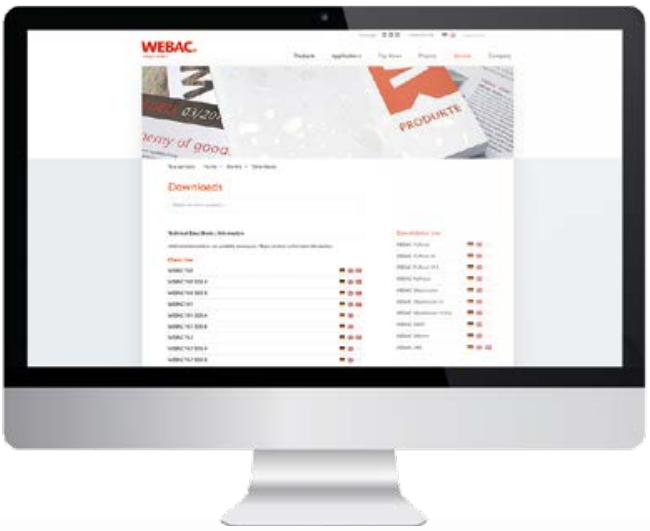
WEBAC® IP 2K-40 and **WEBAC® 2K-F2** are equipped with a Steck-O-system. This system is characterized by its:

- Easy handling
- Quick conversion (no special tools are required)
- High safety as no other sealants are necessary
- High soiling resistance



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Further Information/Service





The technical data sheets for the products of the **WEBAC Consolidation Line** can be found at any time in the **download area** at **www.webac.com**.

Here you will find the technical data sheets of all our products, all application brochures and WEBAC Newsletter.

Any Questions?
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