

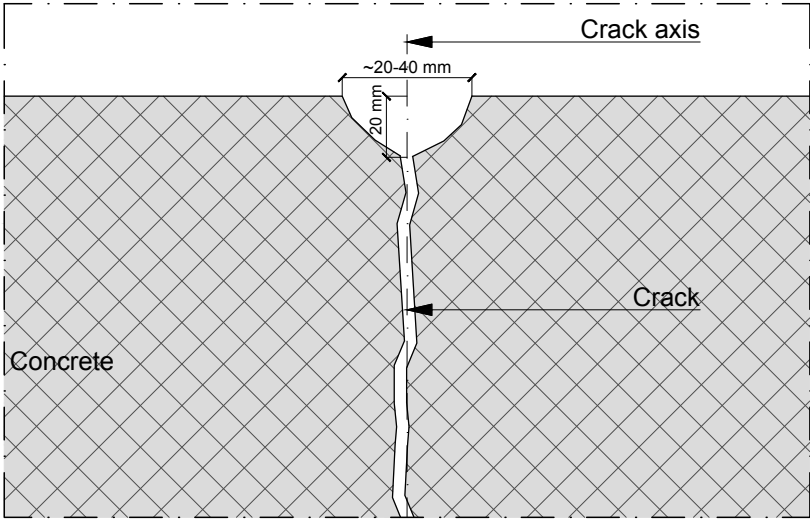


INJECTION SYSTEMS



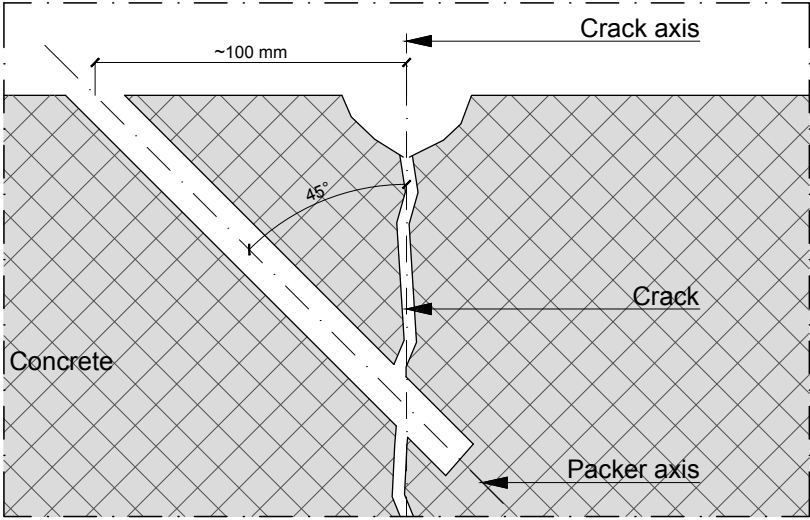
MECHANICAL PACKER INJECTION

Phase 1
OPENING OF CRACK



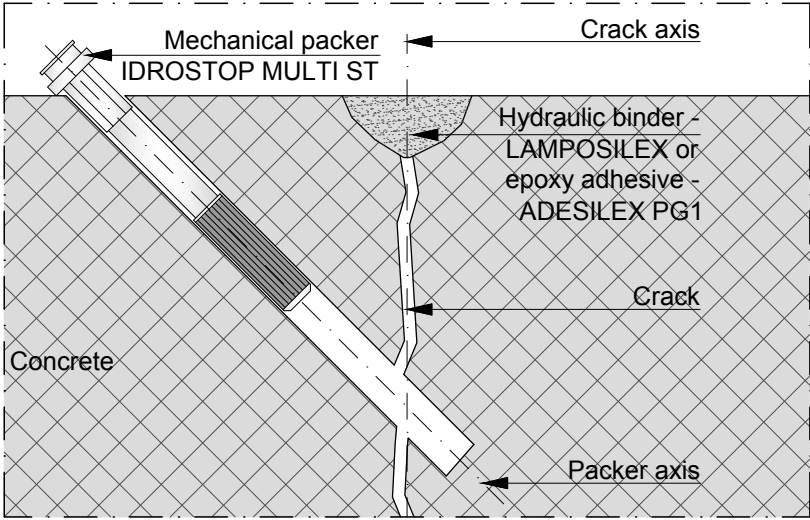
MECHANICAL PACKER INJECTION

Phase 2
DRILLING OF HOLE,
CLEANING OF HOLE AND
CRACK SURFACE



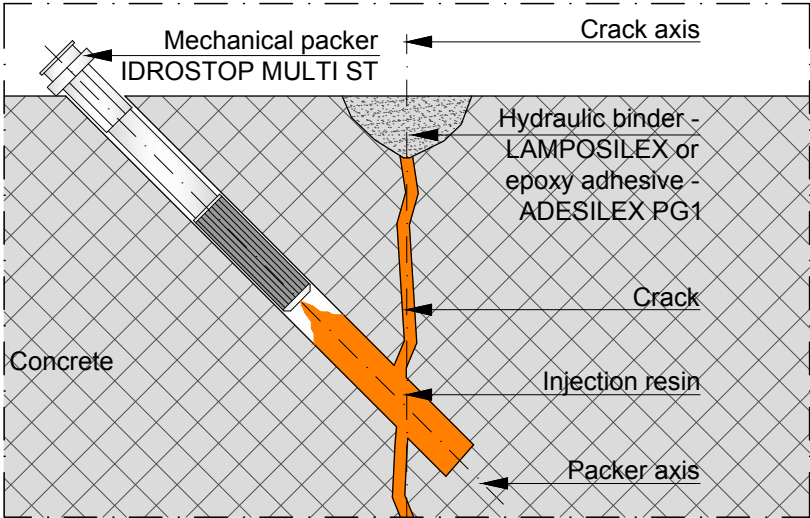
MECHANICAL PACKER INJECTION

Phase 3
POSITIONING OF PACKER
AND SEALING OF CRACK



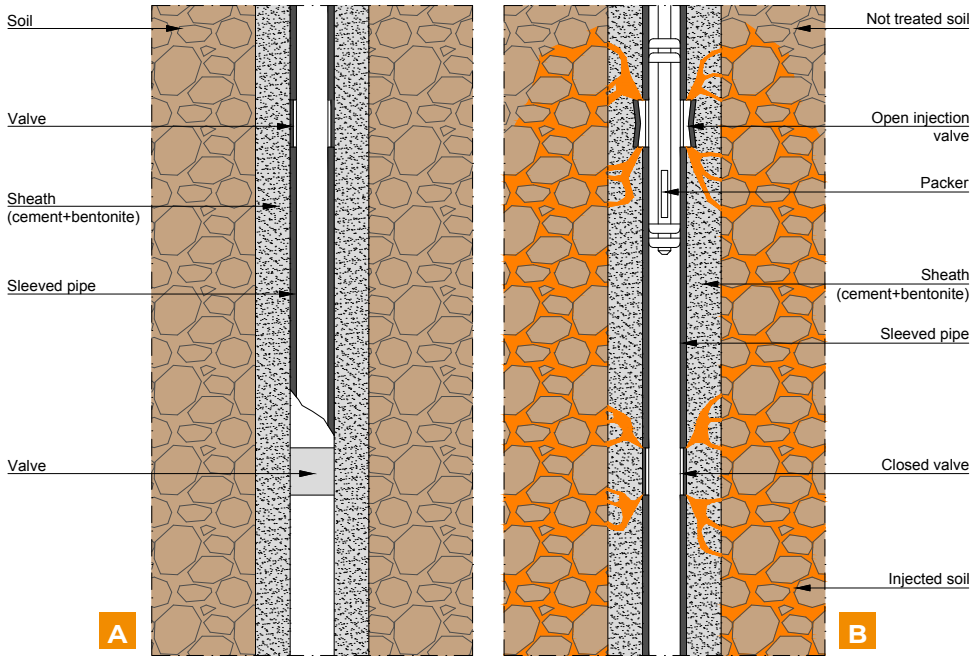
MECHANICAL PACKER INJECTION

Phase 4
INJECTION



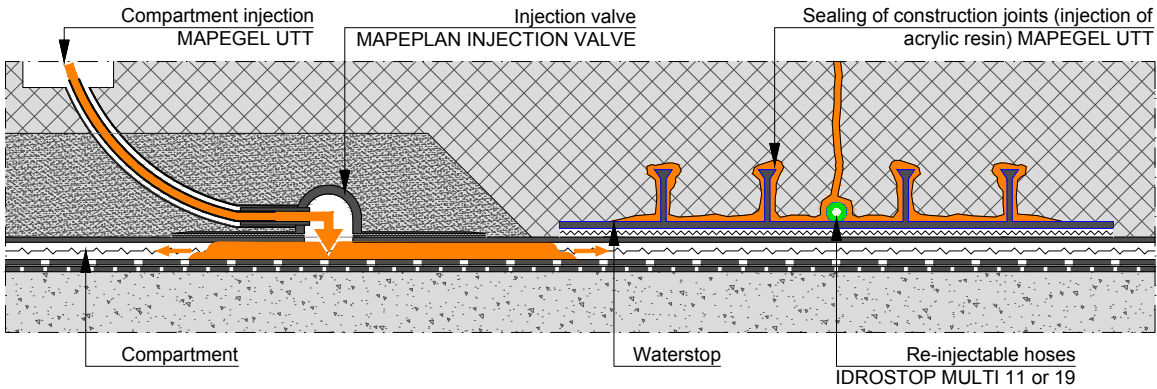
SLEEVED PIPE INJECTION

Injection phases
A - BOREHOLE DRILLING, POSITIONING OF SLEEVED
PIPE, REALIZATION OF SHEATH
B - INJECTION



WATERPROOFING ELEMENTS
REPLACEMENT AND JOINTS SEALING





Acrylic resin injection (with valve) inside compartments realized with synthetic waterproofing membrane; replacing waterstop and sealing joints with acrylic resins injection (using re-injectable hoses).



INJECTION RESINS		polyurethane	RESFOAM 1K-M (one-component, foaming only in presence of water, foaming ratio in presence of water: 30-40 times, reaction time: fast, accelerator is needed)						
			RESFOAM 1 KM HS (one-component, high stability, foaming in presence of water, foaming ratio in presence of water: 30-40 times, reaction time: fast, accelerator is needed)						
			RESFOAM 1 KM FLEX (one-component, foaming only in presence of water, low viscosity, low and slow foaming ratio depending on water quantity, reaction beginning/ending: 20"-1'/1'-5', accelerator is needed)						
			FOAMJET F (two-component, foaming in presence and in absence of water, foaming ratio: 20-30 times, reaction beginning/ending: 10'/3'-5')						
			FOAMJET F ST (two-component, structural, foaming in presence and in absence of water, foaming ratio in presence of water: 7-8 times, foaming ratio in absence of water: 1 time, reaction beginning/ending: 4'-5'/20'-30')						
			FOAMJET T (two-component, foaming only in presence of water, foaming ratio in presence of water: 3-10 times, reaction beginning/ending: 30"-1'15'/3'-8')						
			FOAMJET 260 LV (two-component, elastic, low viscosity, not expanding, reaction time: 7'-180')						
		organo-mineral	PURGEL (one component, flexible, foaming in presence of water, foaming ratio in presence of water: 10-20 times, reaction time: 55")						
			SILICAJET EXP / SILICAJET EXP-E (two-component, foaming in presence and in absence of water, foaming ratio: up to 40 times, reaction beginning/ending: 10"-30'/2'-3')						
SILICAJET EXP/4 (two-component, structural, foaming in presence and in absence of water, low foaming ratio, reaction beginning/ending: 15"-20'/3'-5')									
SILICAJET ST (two-component, structural, not expanding, reaction beginning/ending: 1'-2'/5'-10')									
SILICAJET ANK (two-component, structural, not expanding, reaction beginning/ending: 10"-2'/5')									
SILICAJET ST HP (two-component, structural, not expanding, reaction beginning/ending: 1'-2'/5'-10')									
acrylic	MAPEGEL UTT SYSTEM (three-component, quadri-component, low viscosity, not expanding, gel time: 30"-45')								
epoxy	EPOJET LV (two-component, low viscosity, structural, not expanding, workability/hardening: 30'-70'/5-8h)	X							
CHEMICAL INJECTION		MAPEJET SYSTEM N (two-component, low viscosity, workability: 30')							
		MAPEJET SYSTEM LP (two-component, low viscosity, workability: 3h)							
		MAPEJET SYSTEM NS 15 (two-component, very low viscosity, workability: 45')							
MICRO-FINE CEMENTS		MICROCEM SERIES (micro-fine hydraulic binder for ground consolidation and waterproofing injection of cementitious-based mixes)							
CEMENT GROUT/MORTAR	cementitious grout with wash-out resistance	MAPEGROUT COMPACT SERIES (premixed product with controlled rheology and fluidity)							
	expanding	EXPANJET (one-component pre-mixed mixture, high degree of fineness, expanding ratio: 0.7)		 M	 M				
	extended workability	MAPEQUICK CBS SYSTEM (two-component system for cement-based grout, workability: 72 h)							

<div><div></div><div>rock</div></div>		FILLING OF CAVITY	CONCRETE INJECTION			TBM INJECTION		COMPARTMENT INJECTION	RE-INJECTABLE HOSES INJECTION
			STRUCTURAL	WATERPROOFING	CERTIFICATION	PRE-GROUTING	OVERLEAF SEGMENTS		
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EQUIPMENT	COMPATIBILITY
IDROSTOP MULTI 11 (PVC re-injectable hoses)	injection resins
IDROSTOP MULTI 19 (PVC re-injectable hoses)	micro-fine cements
IDROSTOP MULTI ST (mechanical packer, different sizes available)	injection resins, chemical injection

LEGEND			
X	dry condition		pressurized water inflow
	surface damp, water leakage		water saturated soils
	water inflow	M	soil mechanical re-compression

MAPEI UTT

Underground Technology Team

UTT TECHNICAL ASSISTANCE PROVIDES:

- Great technical skills based on deep knowledge of products, production phases and construction systems;
- Assistance during construction and design phases, for a perfect focus on the correct products and technical solutions;
- Global intervention, 24 hours a day and 365 days a year;
- Production optimization and consequent costs reduction.

THE WORLD OF UTT

- SHOTCRETE TECHNOLOGY
- MECHANIZED TUNNELING PRODUCTS
- DRILLING AND GROUND CONSOLIDATION PRODUCTS
- INJECTION SYSTEMS
- WATERPROOFING SYSTEMS
- TUNNEL MAINTENANCE, RENOVATION AND COATING PRODUCTS

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