

HA Flex SLV

1-component, super low viscosity, hydrophobic, aqua-reactive, flexible polyurethane injection grout for filling and repairing of construction joints and water leaks in concrete constructions.

**• field of application**

- Designed for grouting joints or stopping water leaks in concrete structures which are subject to movement or settlement.
- Specifically developed for injection of fine and ultra fine cracks and construction joints (smaller than $\pm 0,5\text{mm}$).
- For stopping water leaks through the joints between tunnel segments.
- For curtain injections behind tunnel segments.
- For injection of the LPDE or HDPE membrane in tunnel constructions.

• advantages

- HA Flex SLV forms a flexible gasket or flexible plug in the joint or crack into which it has been injected to prevent further water infiltration.
- HA Flex SLV penetrates fast, expelling the water and can be applied without the need to stop the seepage of leaks prior to injection.
- Non-flammable, solvent free.
- Choice of different expansion rates.
- User friendly: 1-component product.
- Controllable reaction times: by using catalyst curing times can be reduced.
- Cured compound is resistant to most organic solvents, mild acids, alkalis and microorganisms.*

• description

In its uncured form, HA Flex SLV is a pale yellow, non-flammable liquid. When it comes in contact with water, the grout expands and quickly (depending on temperature and the amount of accelerator HA Flex Cat used) cures to a tough, flexible, closed-cell polyurethane foam that is essentially unaffected by corrosive environments.

• application

Before commencing the injection, consult the Technical Data Sheets and MSDS in order to be familiar with the materials at hand.

Always shake the catalyst well before use.

1. Surface preparation.

- Remove surface contaminants and debris to establish the pattern of the crack or joint. Active leaking cracks larger than 3 mm need to be sealed with an approved method.
- Drill holes of the correct diameter for the selected packer. Drill at an angle of 45°. Preferably the holes should be drilled staggered around the crack to insure good coverage of the crack in case it is not perpendicular to the concrete surface.
- The depth of the bore should be approximately half of the thickness of the concrete. As a rule of thumb the distance of the drill point from the crack is 1/2 the wall thickness.
- Distance between holes can vary by 15 to 90 cm, depending on the actual situation.
- Insert the correctly sized packer into the hole up to 2/3 of its length. Tighten with a wrench or spanner by turning clockwise until sufficient tension has been reached to keep the packer in place during injection.
- Flush the crack with water before injecting with resin. This will flush out dust, debris and prime the crack for the injection resin and improve penetration of the product into the crack. Water in the crack will activate the resin.

2. Resin and equipment preparation.

- Prepare the resin with the predetermined amount of catalyst. Shake HA Flex Cat well before use. No reaction with the resin will occur until the resin comes into contact with water.
- Keep the resin protected from water, since this will trigger a reaction in the container used and might cause the resin to harden or foam prematurely within the injection equipment.
- It is highly recommended to use separate pumps for the water and the resin injection to prevent cross contamination and blockages.
- The pumps should be thoroughly primed with Washing Agent Eco to lubricate and dry the system before injection. We recommend the use of pneumatically or electrically driven 1-component pumps equipped with a static mixer.

3. Injection.

- Start the injection at the first packer.
- Start injecting at the lowest pressure setting of the pump. Slowly increase the pressure until the resin begins to flow. Pressures may vary from 14 bar to 200 bars depending on the size of the crack, the thickness of the concrete and the general condition of the concrete.
- A little leakage of resin through the concrete or crack is useful in showing the extent of resin travel. Large leaks should be plugged with rags, wait for the resin to set, then inject again.
- During the injection water will first flow from the crack, followed by foaming resin. After this, pure resin will flow from the crack.
- Stop pumping when the pure resin reaches the next packer.
- Move to the next packer and repeat the procedure.
- After injecting through a few of the packers, go back to the first one and re-inject with resin.
- After the resin injection, water can be reinjected into the ports to cure resin left behind.
- Let the resin cure thoroughly before removing packers. The resulting holes can be filled with a hydraulic cement.
- When the injection is finished, clean all tools and equipment which have been in contact with the resin with HA Washing Agent Eco. This should be done within 30 minutes. Do not use solvents or other cleaning products since they give less positive results and can create hazardous situations. Products should be disposed off according to local legislation.

- Refer to Material Safety Data Sheet for general recommendations. In case of spills and accidents, refer to the Material Safety Data Sheet of the products or when in doubt contact the De Neef Division responsible for your territory. Always wear appropriate protective gear for the job at hand according to local guidelines and regulations. We recommend that gloves and protective goggles are worn when handling chemical products. See MSDS for further recommendations.

4. Reactivity.

Reactivity	HA Flex Cat	Approx. induction time	Approx. polymerisation time
At 10°C	1%	1'50"	7'00"
	3%	1'10"	3'55"
	5%	0'58"	3'10"
At 20°C	1%	1'40"	6'50"
	3%	1'05"	3'50"
	5%	0'52"	3'05"
At 30°C	1%	1'40"	6'05"
	3%	1'00"	3'05"
	5%	0'49"	2'50"

• technical data/properties

Property	Value	Norm
Uncured		
HA Flex SLV		
Solids	100%	ASTM D-1010
Viscosity at 25°C	150 - 250 mPas	ASTM D-1638
Density	1,05 - 1,10 kg/dm ³	ASTM D-1638
Flash Point	> 130°C	ASTM D-93
HA Flex Cat		
Viscosity at 25 °C	10 - 20 mPa.s	ASTM D-1638
Density	1,015-1,025 kg/dm ³	
Flash Point	C.O.C. 170°C	
Cured		
Density	Approx. 1 kg/dm ³	ASTM D-3574
Tensile Strength	Approx. 1,2 N/mm ²	ASTM C-190-1963
Elongation at break	Approx. 100%	ASTM D-3574

• appearance

HA Flex SLV : Yellow liquid.
HA Flex Cat : Grey transparent liquid.

• consumption

Has to be estimated by the engineer or operator and depends on width and depth of the cracks and voids, which need to be injected and on the expansion rate of the chosen resin.

• packaging

HA Flex SLV : 200 kg - 25 kg mtal drum.
HA Flex Cat : 20 kg drum - 1 l plastic bottle.
1 pallet HA Flex SLV =
• 24 x 25 kg drums.
• 4 x 200 kg drums.
HA Flex Cat: 1 box = 16 x 1 l bottles.

	1 pallet HA Flex Cat = <ul style="list-style-type: none">• 24 boxes.• 24 x 20 kg drums.
• storage	HA Flex SLV is sensitive to moisture and should be stored in original containers in a dry area. Storage temperature must be between 5°C and 30°C. Once the packaging has been opened, the useful life of the material is greatly reduced and should be used as soon as possible. Shelf life: 2 years.
• accessories	<u>To be ordered separately:</u> <ul style="list-style-type: none">• IP 1C-100-H hand pump. (Please consult the relevant data sheet).• IP 1C-210-E electric airless diaphragm pump. (Please consult the relevant data sheet).• Packers and connectors. (Please consult the relevant data sheet).
• health & safety	HA Flex SLV is classified as harmful. HA Flex Cat is classified as corrosive. Always wear protective clothing and gloves. For full information, consult the relevant Material Safety Data Sheet. (*) For chemical resistances please contact your De Neef representative.