

# HA Flex™ LV AF /Flex SLV AF

Next generation, phthalate free, closed cell, 1-component high performance hydrophobic, hydroactive, flexible polyurethane injection grouts for waterproofing leaking joints and cracks

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## Product Description

In its uncured form, HA Flex™ LV AF /Flex SLV AF are white or yellow, non-flammable liquids without phthalate plasticisers. HA Flex LV AF /Flex SLV AF are next generation 1-component injection resins with improved waterproofing performance. When they come in contact with water, the grout expands and quickly (depending on temperature and the amount of accelerator HA Flex Cat AF used) cures to a tough, flexible, closed-cell polyurethane foam that is essentially unaffected by corrosive environments.

## Field of Application

### HA Flex LV AF /Flex SLV AF

- Designed for grouting joints or stopping water leaks in concrete structures, which are subject to settlement and movement.
- Used for protective waterproofing and gap filling around the brush tails of the TBM and for repairing the waterproof gasket.
- For stopping water leaks through joints between tunnel segments.
- For injection of the LDPE or HDPE membrane in tunnel constructions.
- For curtain injections behind tunnel segments.

### HA Flex SLV AF (Specific fields of application)

Specifically developed for injection of fine and ultra fine crack and joints.

### Joint and Crack Dimensions

- Always select a resin based on the crack or joint size to be injected.
- Small cracks will require low or ultra-low viscosity resins to ensure good crack penetration.

As a general recommendation, the following crack dimensions can be used:

HA Flex LV AF	cracks > 0.5mm
HA Flex SLV AF	cracks < 0.5mm

## Product Advantages

- ADR free transport.
- Next generation resin with improved waterproofing performance.
- Improved cell structure of the cured compound resulting in better mechanical properties and durability.
- Phthalate free resins, REACH compliant.
- Improved performance at temperatures below 5 °C, no crystallisation of HA Flex Cat AF.
- HA Flex LV AF /Flex SLV AF form a flexible gasket or flexible plug in the joint or crack.
- 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 micro- organisms. (\*)

(\*) For chemical resistances please contact your GCP representative.

## Application

- Before commencing the injection, consult the Material Safety Data Sheet (MSDS) in order to be familiar with the materials at hand.
- Always shake the HA Flex Cat AF 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 3mm 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 half 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 AF well before use. No reaction with the resin will occur until the resin comes into contact with water.
- Do not prepare more resin than can be injected within 4 hours after mixing HA Flex Cat AF in the resin. Avoid mixing full drums, it is recommended to batch mix smaller quantities in a separate pail or in the pump reservoir.
- Protect the resin 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 pneumatic or electric 1 - component pumps.

### 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 bars 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 re-injected into the ports to cure resin left behind.
- Let the resin cure thoroughly before removing packers. The resulting holes can be filled with hydraulic cement.
- When the injection is finished, clean all tools and equipment which have been in contact with the resin with Washing Agent Eco. This should be done within 30 minutes. Never leave the pump filled with resin overnight or for periods beyond 1 shift. 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 (MSDS) for general recommendations. In case of spills and accidents, refer to the MSDS of the products or when in doubt contact your local GCP representative. 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 AF	START REACTION		END REACTION		EXPANSION
		HA Flex LV AF	HA Flex SLV AF	HA Flex LV AF	HA Flex SLV AF	
At 5°C	1%	Approx. 3'30"		Approx. 17'00"		Approx. 12V
	2%	Approx. 2'15"	Approx. 1'30"	Approx. 8'30"	Approx. 6.30"	Approx. 14V
	5%	Approx. 55"	Approx. 50"	Approx. 4'00"	Approx. 3.25"	Approx. 16V

At 15 °C	1%	Approx. 2'10"		Approx. 10'50"		Approx. 14V
	2%	Approx. 1'25"	Approx. 1'10"	Approx. 7'00"	Approx. 5'10"	Approx. 16V
	5%	Approx. 40"	Approx. 35"	Approx. 3'05"	Approx. 2'35"	Approx. 16V
At 25 °C	1%	Approx. 1'30"		Approx. 9'00"		Approx. 14V
	2%	Approx. 1'05"	Approx. 1'00"	Approx. 5'35"	Approx. 4'30"	Approx. 16V
	5%	Approx. 35"	Approx. 35"	Approx. 2'10"	Approx. 2'20"	Approx. 17V
At 30 °C	1%	Approx. 1'05"		Approx. 7'30"		Approx. 14V
	2%	Approx. 45"	Approx. 50"	Approx. 4'40"	Approx. 4'20"	Approx. 16V
	5%	Approx. 25"	Approx. 30"	Approx. 1'45"	Approx. 2'00"	Approx. 17V
At 35 °C	1%	Approx. 55"		Approx. 6'45"		Approx. 15V
	2%	Approx. 40"	Approx. 50"	Approx. 4'00"	Approx. 3'35"	Approx. 17V
	5%	Approx. 20"	Approx. 25"	Approx. 1'35"	Approx. 1'45"	Approx. 18V

HA Flex SLV AF should always be used with a minimum of 2% HA Flex Cat AF.

## Technical Data / Properties

PROPERTY	VALUE	NORM	
Uncured	HA Flex LV AF	HA Flex SLV AF	
Solids	100%	100%	EN ISO 3251
Viscosity at 25 °C (mPas)	Approx. 550	Approx. 200	EN ISO 3219
Density (kg/dm <sup>3</sup> )	Approx. 1.020	Approx. 1.075	EN ISO 2811
Flash Point (°C)	> 132	> 132	EN ISO 2719
HA Flex Cat AF			
Viscosity at 25 °C (mPas)	Approx. 15		EN ISO 3219
Density (kg/dm <sup>3</sup> )	Approx. 0.950		EN ISO 2811
Flash Point (°C)	105		EN ISO 2719
Cured			
Density (kg / dm <sup>3</sup> )	Approx. 1.000		EN ISO 1183
Tensile Strength (N / mm <sup>2</sup> )	Approx. 1.2		EN ISO 527
Elongation (%)	Approx. 100	Approx. 100	EN ISO 527

## Packaging

### HA Flex LV AF /Flex SLV AF

5kg, 25kg or 200kg metal drums

1 Pallet	180 x 5kg drum
	24 x 25kg drum
	4 x 200kg drum

## HA Flex Cat AF

0.25 or 1L plastic bottle or 20kg metal drum

1 box	15 x 0.25L
1 box	16 x 1L
1 Pallet	84 boxes with 0.25L bottles
	24 boxes with 1L bottles
	24 x 20kg metal drums

## Appearance

HA Flex LV AF	Yellow liquid
HA Flex SLV AF	Yellow liquid
HA Flex Cat AF	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.

## Storage

HA Flex LV AF /Flex SLV AF are 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

### To be ordered separately

- IP 1C - Manual hand pump.
- IP 1C - Compact electric airless diaphragm pump.
- IP 1C - Pro electric airless diaphragm pump.
- Packers and connectors.

(Please consult the relevant data sheet).

## Health and Safety

HA Flex LV AF Flex SLV AF resins are classified as harmful.

HA Flex Cat AF is classified as irritant.

In case of spills and accidents, refer to the Material Safety Data Sheet of the products or when in doubt contact your local GCP representative. Always wear protective clothing, gloves and protective goggles when handling chemical products. For full information, consult the relevant MSDS.

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