

HA Flex LV AF

Next generation, phthalate free, closed cell, 1-component high performance hydrophobic, Hydro-Active, flexible polyurethane injection grout for waterproofing leaking joints and cracks.



REPLACES HA FLEX LV AND TACSS FLEX 44 LV

• field of application

- Waterproofing wet and water bearing concrete cracks and joints according to EN 1504-5, Principle D.
- 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 curtain injections behind tunnel segments.
- Injection of LDPE or HDPE membranes in tunnel construction.

Joint and crack dimensions.

Always select a resin based on the crack or joint size to be injected. As a general recommendation, the following crack dimensions can be used:

- HA Flex LV AF: 0.5 mm < Cracks < 4 mm.

• advantages

- Complies with EN 1504-5, Principle D.
- 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 resin, REACH compliant.
- Improved performance at temperatures below 5°C, no crystallisation of HA Flex Cat AF.
- HA Flex LV AF forms 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.*

• description

In its uncured form, HA Flex LV AF is a yellow, non-flammable liquid without phthalate plasticisers. HA Flex LV AF is a next generation 1-component injection resin with improved waterproofing performance. When HA Flex LV AF 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.

• 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 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 above 1 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.
- Check to assure that the crack or joint to be injected is sufficiently wet before injecting HA Flex LV AF. If this is not the case, pre-inject water until the crack or joint is saturated with water.
- Use of a separate pump for pre-injection with water is strongly recommended due to the water reacting character of HA Flex LV AF.

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 the packers with resin.
- After the resin injection, water can be re-injected into the packers to cure the resin.
- 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. See MSDS for further recommendations.

4. Reactivity

Reactivity	HA Flex Cat AF %	Start reaction	End reaction	Expansion
At 5°C	1	Approx. 3'30"	Approx.17'00"	Approx.12V
	2	Approx. 2'15"	Approx. 8'30"	Approx. 14V
	5	Approx. 55"	Approx. 4'00"	Approx. 16V
At 15°C	1	Approx. 2'10"	Approx. 10'50"	Approx. 14V
	2	Approx. 1'25"	Approx. 7'00"	Approx. 16V
	5	Approx. 40"	Approx. 3'05"	Approx. 16V
At 25°C	1	Approx. 1'30"	Approx. 9'00"	Approx. 14V
	2	Approx. 1'05"	Approx. 5'35"	Approx. 16V
	5	Approx. 35"	Approx. 2'10"	Approx. 17V
At 30°C	1	Approx. 1'05"	Approx. 7'30"	Approx. 14V
	2	Approx. 45"	Approx. 4'40"	Approx. 16V
	5	Approx. 25"	Approx. 1'45"	Approx. 17V
At 35°C	1	Approx. 55"	Approx. 6'45"	Approx. 15V
	2	Approx. 40"	Approx. 4'00"	Approx. 17V
	5	Approx. 20"	Approx. 1'35"	Approx. 18V

*For injections at other temperatures, please contact your De Neef representative.

• technical data/properties

Property	Value	Norm
Uncured		
HA Flex LV AF		
Solids	100 %	EN ISO 3251
Viscosity at 25°C (mPas)	Approx. 550	EN ISO 3219
Density (kg/dm ³)	Approx. 1,020	EN ISO 2811
Flash Point (°C)	132	EN ISO 2719
HA Flex Cat AF		
Viscosity at 25 °C (mPas)	Approx. 15	EN ISO 3219
Density (kg/dm ³)	Approx. 0,950	EN ISO 2811
Flash Point (°C)	105	EN ISO 2719
Cured		
Density (kg/dm ³)	Approx. 1,000	EN ISO 1183
Tensile strength (N/mm ²)	Approx 1,2	EN ISO 527
Elongation (%)	Approx.100	EN ISO 527

• appearance

HA Flex LV 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.

• **packaging**

HA Flex LV AF

- 5 kg, 25 kg or 200 kg metal drums

1 Pallet

- 180 x 5 kg drum.
- 24 x 25 kg drum.
- 4 x 200 kg drum.

HA Flex Cat AF

- 0,25 or 1 l plastic bottle or 20 kg metal drum.
- 1 box = 15 x 0,25 l
- 1 box = 16 x 1 l

1 Pallet

- 84 boxes with 0,25 l bottles.
- 24 boxes with 1 l bottles.
- 24 x 20 kg metal drums.

• **storage**

HA Flex LV AF is moisture sensitive 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 & safety**

HA Flex AF is 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 the De Neef responsible for your territory. Always wear protective clothing, gloves and protective goggles when handling chemical products. For full information, consult the relevant Material Health and Safety Data Sheet.

(*) For chemical resistances please contact your De Neef representative

• **certification**

	
De Neef Conchem nv/sa Industriepark 8 B-2220 Heist-op-den-Berg Belgium 11	
EN 1504-5 Concrete injections Ductile filling U (D1) W(5) (3) (0/50)	
Adhesion	0,18 N/mm ²
Elongation	> 10%
Watertightness	2 x 10 ⁵ Pa
Glass transition temperature	-31°C
Injectability into wet and water bearing cracks	0,5 mm
Corrosion behaviour	Deemed to have no corrosive effect
Release of dangerous substances	Complies with 5.4