HA Soil AF

Next generation, phthalate free 1-component, high performance low viscosity, hydrophobic, Hydro-Active, rigid polyurethane injection grout used to increase the load bearing capacity of loose soils.

REPLACES HA SOIL AND TACSS 025 NF

• field of application

- High strength soil stabilisation.
- High strength anchoring in wet or dry conditions.
- Pre-injections for waterproofing and consolidation in front of TBM, drill-and-Blast and NATM.
- Combi-Grouting in combination with cement or micro-fine cements.
- Tie-back and screw rod anchoring in wet or dry conditions.
- Curtain injections and chemical containment.
- Soil stabilisation around sewer lines.
- Filling large voids in rock fissures, crushed faults, gravel layers in wet or dry conditions using special techniques and/or filled resins (Please contact the De Neef Conchem Technical Department).

• advantages

- ADR free transport.
- Next generation resin with improved 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 Soil Cat AF.
- Can be injected into silty sand with a coefficient of 10^{-6} m/s (or 15% of the particle size 0,074 mm).
- Non-flammable, solvent free.
- 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 Soil AF is a dark brown, non-flammable, low viscous liquid without phthalate plasticisers. When HA Soil AF comes into contact with water, the grout expands and quickly (depending on temperature and the amount of HA Soil Cat AF catalyst used) cures to a rigid polyurethane foam.

• application

HA Soil AF is used for stabilising loose soils or to increase the load bearing capacity of these soils.

1. Soil investigation

- To determine the suitability of the soil to be grouted, the soil is to be in accordance with local guidelines and regulations. A full study of the situation and the characteristics of the soil has to be made prior to commencing the injections.

2. General considerations

- It is recommended that the soil injection is carried out at the lowest possible pressure. The required pressure is influenced by the load pressure on the soil, permeability, injection speed, resin characteristics, etc.
- The flow rate required for a successful injection needs to be determined by trial injection on the site prior to the actual work.
- Spacing and depth of the injection points will be determined after studying the soil and application requirements.

3. Preliminary checks

Before installing the injection tubes into the soil, check the following:

- Investigate the presence of municipal underground utilities such as water or power supply, sewers, underground water pockets, etc.
- Investigate the presence and behaviour of the ground water.
- Investigate the characteristics of the soil and the geological composition of the site.
- Test the permeability of the soil for water and resin.

4. Resin preparation

- Shake HA Soil Cat AF well before use.
- Mix the resin with the predetermined amount of HA Soil Cat AF catalyst using a slow speed mixer (400 to 600 rpm). Shield the vessel with the premixed resin from water ingress since this will cause a reaction in the vessel and pumping equipment.

5. Injection

The injection procedure can be split up in 4 steps

- Installing the injection tube (sleeve port pipe/strainer pipe) to the planned depth.
- Start the injection with the mixed material.
- Controlled withdrawal of the injection tube at predetermined depths and time intervals.
- Continue the injection following steps 1 through 3 to ensure overlap with previously injected areas.

6. Cleaning

- 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. 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.
- For further information concerning soil injections with HA Soil AF, contact the De Neef Conchem Technical Department.

7. Reactivity

Reactivity	% HA Soil Cat AF	Start reaction	End reaction	Foam factor
At 5°C	0,5	Approx. 4'00"	Approx. 14'30"	Approx. 1V
	1,0	Approx. 2'10"	Approx. 6'30"	Approx. 2V
	1,5	Approx. 1'50"	Approx. 5'00"	Approx. 3V
	2,0	Approx. 1'20"	Approx. 4'10"	Approx. 3V
	2,5	Approx. 1'00"	Approx. 2'45"	Approx. 3V
At 10°C	0,5	Approx. 3'50"	Approx. 12'05"	Approx. 1V
	1,0	Approx. 2'00"	Approx. 5'30"	Approx. 2V
	1,5	Approx. 1'40"	Approx. 4'30"	Approx. 3V
	2,0	Approx. 1'10"	Approx. 3'40"	Approx. 3V
	2,5	Approx. 55"	Approx. 2'40"	Approx. 3V

At 15°C	0,5	Approx. 3’40”	Approx. 11’30”	Approx. 1V
	1,0	Approx. 1’50”	Approx. 5’00”	Approx. 2V
	1,5	Approx. 1’30”	Approx. 4’00”	Approx. 3V
	2,0	Approx. 1'05”	Approx. 3’10’’	Approx. 3V
	2,5	Approx. 50”	Approx. 2’30”	Approx. 3V
At 20°C	0,5	Approx. 3’30”	Approx. 10’50”	Approx. 1V
	1,0	Approx. 1’40”	Approx. 4’50”	Approx. 2V
	1,5	Approx. 1'20”	Approx. 3’50”	Approx. 3V
	2,0	Approx. 1'00”	Approx. 2’50”	Approx. 3V
	2,5	Approx. 45”	Approx. 2’20”	Approx. 3V
At 25°C	0,5	Approx. 2’30”	Approx. 8’45”	Approx. 3V
	1,0	Approx. 1’20”	Approx. 4’30”	Approx. 3V
	1,5	Approx. 1'00”	Approx. 3’25”	Approx. 3V
	2,0	Approx. 45”	Approx. 2’30”	Approx. 3V
	2,5	Approx. 37”	Approx. 2’05”	Approx. 3V
At 30°C	0,5	Approx. 2’20”	Approx. 8’00”	Approx. 3V
	1,0	Approx. 1’15”	Approx. 4’20”	Approx. 3V
	1,5	Approx. 55”	Approx. 3’05”	Approx. 3V
	2,0	Approx. 42”	Approx. 2’20”	Approx. 3V
	2,5	Approx. 34”	Approx. 2’00”	Approx. 3V
At 35°C	0,5	Approx. 2’15”	Approx. 7’35”	Approx. 3V
	1,0	Approx. 1’10”	Approx. 3’50”	Approx. 3V
	1,5	Approx. 50”	Approx. 3’05”	Approx. 3V
	2,0	Approx. 38”	Approx. 2’10”	Approx. 3V
	2,5	Approx. 30”	Approx. 1’55”	Approx. 3V

• technical data/properties

Property	Value	Norm
HA Soil AF		
Uncured		
Solids	100 %	EN ISO 3251
Viscosity at 25°C (mPas)	Approx. 50	EN ISO 3219
Density (kg/dm^3)	Approx. 1,115	EN ISO 2811
Flash Point (°C)	140	EN ISO 2719
HA Soil Cat AF		
Viscosity at 25 °C (mPas)	Approx. 15	EN ISO 3219
Density (kg/dm^3)	Approx. 0,944	EN ISO 2811
Flash Point (°C)	105	EN ISO 2719
Cured		
Density (kg/dm^3)	Approx. 1,000	EN ISO 1183
Compressive strength (MPa)*	Approx. 12,5	EN 12190
Flexural strength (MPa)*	Approx. 2	EN 12190

**Tested with sand 0,4 – 0,8 mm.*

• appearance

HA Soil AF : dark brown liquid.
HA Soil Cat AF : transparent liquid.

• consumption

Has to be estimated by the engineer or operator and depends on type of work, soil porosity and volume of strengthened soil.

• packaging

HA Soil AF : 200 kg - 25 kg metal drum.
HA Soil Cat AF : 20 kg metal drum - 0,5 l plastic bottle.

1 pallet HA Soil AF

- 24 x 25 kg drums.
- 4 x 200 kg drums.

1 pallet HA Soil Cat AF

- 84 boxes (1 box = 8 x 0,5 l bottles).
- 24 x 20 kg drums.

• storage

HA Soil AF 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.

• health & safety

HA Soil AF is classified as harmful.
HA Soil 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.

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