HEGGEL® FRP 320

Multi-Component Phenolic Resin Laminate

You Build, We Protect!

Description:

HEGGEL FRP 320 is a crack-bridging laminate based on modified phenolic resin, used on primed steel, concrete or HEGGEL acid protection membranes.

Characteristics:

- Temperature resistance up to 60°C on concrete and up to 90°C dry load on steel without tile or brick lining (Dependent on the type of chemical being used)
- Suitable for indoor or outdoor use
- Excellent chemical resistance to a wide range of media: Various inorganic and organic acids, oils, greases and fuels, solvents and chlorinated hydrocarbons
- Electrically conductive adjustable by using **HEGGEL Hybrid-Fleece**

Applications:

HEGGEL FRP 320 is designed as laminate system reinforced with 300 g/m² or 450 g/m² glass fibre mats, suitable for areas in various industries requiring strong resistance to acids, solvents, chlorinated hydrocarbons and methylene chloride.

Pot life (20°C):

Product / Layer	Time
HEGGEL Pox 409 Primer	Approx. 60 - 120 min
HEGGEL FRP 343 Barrier Layer	Approx. 40 min
HEGGEL PL 620 Scraper Coat	Approx. 60 min
HEGGEL FRP 320 Laminating solution	Approx. 30 min

Note: Depending on the actual ambient temperature, the pot life may vary. Higher temperatures could shorten the pot life, while lower temperatures would prolong it. For further information, please consult HEGGEL!

Curing (20°C):

Product / Layer	Until Further Processing	Maximum Waiting Time
HEGGEL Pox 409 Primer	16 hrs	14 days
HEGGEL FRP 343 Barrier Layer (2nd primer layer)	3 hrs	78 hrs
HEGGEL FRP 343 Barrier Layer (For HEGGEL PL 620 Scraper Coat / Laminate)	3 hrs	14 days
HEGGEL FRP 320 Laminate	24 hrs	48 hrs

Note: The finished coating is fully mechanically and chemically loadable after 7 days at 20 °C.

Packaging / Storage:

Product	Package Size	Shelf Life (20°C)
HEGGEL Pox 409 Solution	25 kg Hobbock	24 Months
HEGGEL Pox 409 Hardener	12.5 kg Bucket	24 Months
HEGGEL FRP 343 Solution	25 kg Hobbock	6 Months
HEGGEL FRP 343 Accelerator	2.5 kg Can	24 Months
HEGGEL FRP 343 Hardener	1 kg Bottle	12 Months
HEGGEL Filler 30	25 kg Bag	24 Months
HEGGEL PL 620 Solution	25 kg Hobbock	12 Months
HEGGEL PL 620 Powder	15 kg Bag	24 Months
HEGGEL FRP 320 - Solution	25 kg Hobbock	12 Months
HEGGEL FRP 320 - Hardener	10 kg Canister	24 Months
Glass-fibre-mat 450 g/m² (W=127 cm L=80 m)	102 m² Roll	Unlimited
Glass-Fleece 30 g/m² (W=100 cm)	250 m² Roll	Unlimited
HEGGEL- Hybrid - Fleece	Roll	Unlimited
HEGGEL Filler 90	0.5 kg Bag	24 Months

The products must be stored in a cool and dry place, away from direct sunlight. The solution part must be frost-free. If the shelf life is passed, the materials must be tested prior to use. Higher temperatures by storage and transport would reduce the shelf life, whereas lower temperatures would extend the minimum shelf life. The containers are to be kept closed tightly. All liquid products must be stored in frost-proof conditions.

1. Surface Preparation

1.1. Steel

Refer to DIN EN14879-1.

All The steel surface shall be blasted to a near white blast cleaning. A preparation degree of SA 2½ as specified in DIN EN ISO 12944-4 and a roughness grade “medium (G)” as specified in DIN EN ISO 8503-1 must be achieved; minimum surface roughness Rz = 70 µm. After blasting, a new formation of rust is to be avoided by appropriate procedures.

1.2. Concrete

Refer to DIN EN14879-1.

Ensure the surface is prepared properly for adequate adhesive strength. It should be dry, clean, free from any cement slurry, loose parts, defects, contaminants such as oil or grease or any substances that prevent adhesion. The residual moisture content of concrete shall not exceed 4%.

It is essential to protect the coating / lining from potential water or vapor pressure from its reverse side.

2. Environmental Conditions

The specified environmental conditions must be complied with during surface preparation. During the application, the substrate must be kept completely dry. No moisture (condensate, mist, etc.) may get onto the surfaces that are to be protected. The construction site has to be protected against direct sunlight, rainfall and draught.

Environmental Conditions	Value
Relative Humidity	≤ 80%
Surface / Material / Air temperature	≥ +15°C up to +30°C
Optimum Processing Temperature	+20°C
Dew Point Distance	min 3°C (At a relative humidity of above 70 % at least 5°C)

Elevated or decreased temperatures could affect the working time and consistency of the mixture. As a result, consumption, application performance and layer thickness may vary.

3. Application Tools

- Paint roller
- Disk roller
- Scissors
- Scale
- Mohair roller
- Drilling machine
- Laminating brush paint
- Brush
- Joint injector
- Measuring cup
- Mixing vessel
- Anchor stirrer
- Metal smoothing trowel

4. Mixing Instruction

4.1. Concrete

Primer		
Product Layer	**Components**	**Parts by Weight**
Primer: HEGGEL Pox 409	**HEGGEL Pox 409** Solution	100
	HEGGEL Pox 409 Hardener	50
Barrier Layer: HEGGEL FRP 343	**HEGGEL FRP 343** Solution	100
	HEGGEL FRP 343 Accelerator	2
	HEGGEL FRP 343 Hardener	2.5
	HEGGEL Filler 90	2
Sprinkling: HEGGEL Filler 30	**HEGGEL Filler 30**	-

Scraper Coat		
Product Layer	**Components**	**Parts by Weight**
Scraper Coat: HEGGEL PL 620	**HEGGEL PL 620** Solution	100
	HEGGEL PL 620 Powder	160

Note: The amount of **HEGGEL PL 620** Powder added can vary up to 10%, depending on the solution's temperature and viscosity.

Laminate		
Product Layer	**Components**	**Parts by Weight**
Glass fibre mat 450 g/m²	Glass fibre mat 450 g/m²	-
Laminating Solution: HEGGEL FRP 320	**HEGGEL FRP 320** Solution	100
	HEGGEL FRP 320 Hardener	16
Glass fleece	Glass fleece 30 g/m²	-
Alternative: Conductive laminate	HEGGEL Hybrid Fleece	-

Note: For enhanced stability on wall surfaces, add 1-part HEGGEL Filler 90 to every 100 parts by weight of the **HEGGEL FRP 320** Laminating Solution.

4.2. Steel

Barrier Layer		
Product layer	**Components**	**Parts by Weight**
Barrier layer: **HEGGEL FRP 343**	**HEGGEL FRP 343** Solution	100
	HEGGEL FRP 343 Accelerator	2
	HEGGEL FRP 343 Hardener	2.5
	HEGGEL Filler 90	2

Laminate		
Product layer	**Components**	**Parts by Weight**
Glass fibre mat 450 g/m²	Glass fibre mat 450 g/m²	-
Laminating Solution: HEGGEL FRP 320	**HEGGEL FRP 320** Solution	100
	HEGGEL FRP 320 Hardener	16
Glass fleece	Glass fleece 30 g/m²	-
Alternative: Conductive laminate	**HEGGEL Hybrid Fleece**	-

Note: For enhanced stability on wall surfaces, add 1-part HEGGEL Filler 90 to every 100 parts by weight of the **HEGGEL FRP 320** Laminating Solution.

4.3. Mixing Instruction for HEGGEL FRP 343 Barrier Layer

Warning: Strictly follow the prescribed mixing sequence for Vinylester systems to prevent potential explosion hazards.

To ensure accurate mixing, start by measuring or weighing the liquid components. For partial quantities, initiate the process by adding **HEGGEL FRP 343** Solution to the mixing vessel, followed by **HEGGEL FRP 343** Accelerator. Utilize a basket spiral mixer at a speed of 300 - 500 rpm to gently blend until achieving a uniform mixture. Subsequently, incorporate **HEGGEL FRP 343** Hardener and thoroughly mix until a consistent mixture is achieved. Ensuring thorough blending extending to the vessel's wall and bottom.

4.4. Mixing Instruction for Other Components

Before use or partial withdrawal, thoroughly stir solutions with an anchor stirrer at 300 - 500 rpm, ensuring the stirrer moves along the vessel wall and bottom. Measure or weigh liquid components, transfer them to a mixing vessel, and stir carefully. Use a drilling machine and an anchor stirrer at 300 - 500 rpm to mix the components into a homogeneous solution, moving the stirrer past the vessel wall and bottom. Measure or weigh solids individually, add them in portions to the solution, and mix carefully until a lump-free mixture is achieved.

5. Application

5.1. Concrete

Primer: Apply **HEGGEL Pox 409** Primer using a paint roller or brush, ensuring no puddles are left in concrete depressions or expansion joints.

Barrier Layer: To apply the **HEGGEL FRP 343**, use a paint roller or brush, making sure not to leave any puddles in concrete depressions or expansion joints. While the barrier layer is still fresh, sprinkle it with **HEGGEL filler 30**. After the barrier layer has cured, remove any excess **HEGGEL filler 30**.

Scraper Coat: Apply the scraper coat to the primed substrate using a metal smoothing trowel, ensuring it is spread to the desired thickness. Be careful to avoid creating trowel marks and ridges.

Laminate: To apply the Glass-Fibre-Mats, embed them in two layers one after another with a 5 cm overlap in the **HEGGEL PL 620** Scraper Coat. Press each layer individually using the disc roller, and then apply laminating solution with a paint roller. Vent each layer with the disc roller. Stagger the seams of each layer by 20 cm. If it is not possible to process all layers at once, reapply laminating solution after the surface stops sticking and then continue as before. Always process the final glass fleece layer together with the underlying glass fibre mats.

5.2. Steel

Barrier Layer: Begin by applying the **HEGGEL FRP 343** barrier layer using a paint roller or brush, ensuring no puddles form in concrete depressions or expansion joints. After the first coat has fully cured, proceed to apply a second coat of the **HEGGEL FRP 343** barrier layer for optimal coverage and protection.
Laminate: Apply the laminating solution to the cured **HEGGEL FRP 343** barrier layer using a paint roller. Then, embed the glass fibre mat in two layers, ensuring each layer overlaps by approximately 5 cm. Press each layer onto the surface individually using a disc roller, and apply the laminating solution with the paint roller. Vent each layer with the disc roller. Make sure to stagger the seams of the individual layers by 20 cm. If you cannot process all layers in one go, reapply the laminating solution after the surface stops sticking, and then continue as previously described. Always process the final glass fleece layer together with the underlying glass fibre mats.

6. Consumption

6.1. Concrete

Primer		
Product Layer	**Components**	**kg/m²**
Primer: HEGGEL Pox 409	**HEGGEL Pox 409** Solution	0.2
	HEGGEL Pox 409 Hardener	0.1
	Total	**0.3**
Barrier layer: HEGGEL FRP 343	**HEGGEL FRP 343** Solution	0.281
	HEGGEL FRP 343 Accelerator	0.006
	HEGGEL FRP 343 Hardener	0.007
	HEGGEL Filler 90	0.006
	Total	**0.3**
Sprinkling: HEGGEL Filler 30	**HEGGEL Filler 30**	0.5
Scraper Coat		
Product Layer	**Components**	**kg/m²**
Scraper coat: HEGGEL PL 620	**HEGGEL PL 620** Solution	0.72
	HEGGEL PL 620 Powder*	1.08
	Total	**1.8**
Laminate		
Product Layer	**Components**	**kg/m²**
Glass fibre mat 450 g/m²	2 x Glass fibre mat 450 g/m²	0.9
Laminating Solution: HEGGEL FRP 320	**HEGGEL FRP 320** Solution	1.725
	HEGGEL FRP 320 Hardener	0.275
Glass fleece	Glass fleece 30 g/m²	0.03
Alternative: Conductive laminate	HEGGEL Hybrid Fleece	-
Note: Additional consumption of mats, fleece, and solution should be planned based on project-specific geometry, accounting for the overlap of glass fibre materials.		

6.2. Steel

Barrier Layer		
Product Layer	**Components**	**kg/m²**
Barrier layer: HEGGEL FRP 343	**HEGGEL FRP 343** Solution	0.281
	HEGGEL FRP 343 Accelerator	0.006
	HEGGEL FRP 343 Hardener	0.007
	HEGGEL Filler 90	0.006
	Total	**0.3**
Note: Apply the barrier layer in two coats, each using 0.300 kg/m², for a total of 0.600 kg/m².		
Laminate		
Product Layer	**Components**	**kg/m²**
Glass fibre mat 450 g/m²	2 x Glass fibre mat 450 g/m²	0.9
Laminating Solution: HEGGEL FRP 320	**HEGGEL FRP 320** Solution	1.9
	HEGGEL FRP 320 Hardener	0.3
Glass fleece	Glass fleece 30 g/m²	0.03
Alternative: Conductive laminate	HEGGEL Hybrid Fleece	-
Note: Additional consumption of mats, fleece, and solution should be planned based on project-specific geometry, accounting for the overlap of glass fibre materials.		

7. Cleaning

Any tools that are contaminated with uncured material can be cleaned using **HEGGEL Cleaners**. Only clean in areas with good ventilation and observe safety measures.

8. Safety Measures

The material safety data sheets of the individual components, the safety instructions on the packing (label) as well as the legal requirements for handling hazardous materials must be observed.

Technical Data

Title	DIN	ASTM	Value	Unit
Shore D Hardness	DIN 53505	ASTM D2240	> 60	Shore D
Adhesive Strength to Steel	DIN EN ISO 4624		> 2	MPa
Adhesive Strength to Concrete / screed	DIN EN ISO 4624		> Inherent tensile strength	MPa
Electr. Leakage Resistance	DIN EN 14879-3 At >70% relative humidity	ASTM F150/98	≤ 10^6	Ω

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