

# HEGGEL® FRP 310

Fiber Reinforced Epoxy Resin Laminate

*You Build, We Protect!*

**Description:** HEGGEL FRP 310 is an epoxy resin based fiber reinforced crack-bridging laminate designed for use on primed steel, concrete, or HEGGEL acid protection membranes.

- Characteristics:**
- Significant resistance to diffusion
  - High operating temperature limits
  - Great resistance to temperature variations in concrete floors
  - Excellent chemical resistance to a wide range of media
  - Suitable for both metal and concrete substrates
  - Crack-bridging properties

**Applications:** HEGGEL FRP 310, as a laminate system reinforced with glass fiber mats of either 300 g/m<sup>2</sup> or 450 g/m<sup>2</sup>, is designed for application on metal and concrete substrates across various industries. It is ideal for surfaces with moderate mechanical loads, and its durability can be enhanced by applying wear protection media.

**Pot Life (20°C):**

Product / Layer	Time
HEGGEL FRP 310 Primer	Approx. 60 min
HEGGEL FRP 310 Laminating Filling	Approx. 60 min
HEGGEL FRP 310 Laminate	Approx. 60-120 min
HEGGEL FRP 310 Primer and Sprinkling	Approx. 60 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):**

Load Capacity	Time
Walkable	Approx. 16 hrs
Chemical / Mechanical Load	Approx. 2 days

**Note:** During the curing process, the temperature should not exceed 36°C.

**Packaging / Storage:**

Product	Package Size	Shelf Life (20°C)
HEGGEL FRP 310 Solution	10 / 25 kg Hobbock	24 Months
HEGGEL FRP 310 Hardener	5 / 12.5 kg Hobbock	24 Months
HEGGEL FRP 310 Powder	20 kg Sack	24 Months
HEGGEL Filler 60	25 kg Sack	24 Months
Glass fiber mat 300 g/m <sup>2</sup>	Roll 1.27 m wide	unlimited
Glass fiber mat 450 g/m <sup>2</sup>	Roll 1.27 m wide	unlimited
Glass fleece 30 g/m <sup>2</sup>	Roll 1.00 m wide	unlimited

**Note:** The material should not exceed a maximum temperature of 30°C during transportation, storage, and processing.

The products must be stored in a secure, 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. Packaging that may have been damaged during transport must be transferred to alternate containers.

## 1. Surface Preparation

### 1.1. Steel

Refer to DIN EN14879-1, Section 4.1.

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 level "medium (E)" as specified in DIN EN ISO 8503-1 must be achieved; minimum surface roughness  $R_z = 50 \mu\text{m}$ . 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 by normal sandblasting. Using stiff broom, steel brush and vacuum cleaner is not enough. 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. They must not become powdery or sandy. The residual moisture content of concrete shall not exceed 4%.

## 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	≥ +10°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

- Roller
- Paint Roller
- Brush / Paint Brush
- Disk Roller

## 4. Chemical Resistance

- Mineral oils
- Petrol
- Toluene, Xylene
- Esters, Aldehydes
- Hydrochloric acid 20%
- Chromic sulphuric acid 20%  $\text{CrO}_3$
- Hydrofluoric acid 5%
- Sulphuric acid 70%
- Nitric acid 20%
- Caustic soda, caustic potash 50%
- Ammonia 25%
- Vegetable and animal oils and fats
- Hydrogen peroxide 30%

**Note:** For detailed chemical resistance data, please consult HEGGEL!

## 5. Mixing Instruction

HEGGEL FRP 310 Primer (Optional, dependent on the substrate structure)		
Components	Parts by Volume	Parts by Weight
HEGGEL FRP 310 Solution	1.79	2
HEGGEL FRP 310 Hardener	1	1
HEGGEL FRP 310 Laminating Filling (Optional, dependent on the substrate structure)		
Components	Parts by Volume	Parts by Weight
HEGGEL FRP 310 Solution	1.79	2
HEGGEL FRP 310 Hardener	1	1
HEGGEL FRP 310 Powder	5.69	4.41
HEGGEL FRP 310 Laminate		
Components	Parts by Volume	Parts by Weight
HEGGEL FRP 310 Solution	1.79	2
HEGGEL FRP 310 Hardener	1	1
HEGGEL FRP 310 Primer and Sprinkling (Optional, in the case of subsequent tile / brick lining or for improving the mechanical loading properties)		
Components	Parts by Volume	Parts by Weight
HEGGEL FRP 310 Solution	1.79	2
HEGGEL FRP 310 Hardener	1	1

To ensure accurate mixing, start by measuring or weighing the liquid components. For partial quantities, initiate the process by adding HEGGEL FRP 310 Hardener to the HEGGEL FRP 310 Solution. In the case of HEGGEL Laminating Filling, add the HEGGEL FRP 310 Powder and mix till lump free component achieved. Ensuring thorough blending extending to the vessel's wall and bottom.

## 6. Application

HEGGEL FRP 310 can be applied by "fresh in fresh" laid with HEGGEL FRP 310 Solution along with 2 x 450 g/m<sup>2</sup> fiber glass mats or it can be prepared alternatively by 2 x 300 g/m<sup>2</sup> fiber glass mats; both continued with 1 x 30 g/m<sup>2</sup> glass mat. The standard layer thickness will be about 2.5 mm. Higher layer thicknesses can be achieved by using HEGGEL FRP 310 lamination putty, additionally.

Slabs or tiles can be applied to the surface within 24 hours of bonding the laminate by rolling over it again with primer and sandblasting.

Apply HEGGEL FRP 310 Laminating Solution using a paint roller or brush, ensuring no puddles are left in concrete depressions or expansion joints.

To apply the glass fiber mats, embed them in two layers one after another with a 5 cm overlap in the HEGGEL FRP 310 Laminating Solution. Press each layer individually using the paint roller, saturate with the lamination solution and next, use the disk roller to apply pressure and eliminate any trapped air. Ensure that the overlapping seams of the layers are staggered by a minimum of 20 cm.

The sealing layer must be kept dry until final hardness is achieved.

### Alternative Application

Apply primer using a roller, brush or paint brush. Once the primer has cured (within 24 hours at the latest), apply a laminating filling approximately 1 mm thick (minimizing usage) onto the primer using a levelling edge, in a scratching manner.

Place fiber glass mats and glass fleece with a 5 cm overlap in the fresh putty. Press them down with a paint roller and saturate with the laminating solution. Then, carefully press down with a disk roller to remove any trapped air. Ensure that the overlapping seams of the individual layers are offset by at least 20 cm.

**Note:** In the case of subsequent tile / brick linings or coatings, HEGGEL FRP 310 Laminate should be primed and sprinkle again within 24 hours of setting as described above. Sprinkling with SIC can be undertaken to increase the mechanical loading properties.

## 7. Repairing Defects

Defective, damaged or abutting areas of HEGGEL FRP 310 are ground down. The edges are bevelled. Following cleaning, the surfaces are primed. Once the primer has cured, fiber glass mats and glass fleece are laid onto the fresh laminating filling, following the procedure described above. The edges should overlap by approximately 10 cm.

## 8. Consumption

<b>HEGGEL FRP 310 Primer</b> (Optional, dependent on the substrate structure)	
Components	kg/m <sup>2</sup>
HEGGEL FRP 310 Solution	0.167
HEGGEL FRP 310 Hardener	0.083
<b>Total</b>	<b>0.250</b>
<b>HEGGEL FRP 310 Laminating Filling</b> (Optional, dependent on the substrate structure)	
Components	kg/m <sup>2</sup>
HEGGEL FRP 310 Solution	0.402
HEGGEL FRP 310 Hardener	0.201
HEGGEL FRP 310 Powder	0.887
<b>Total</b>	<b>1.490</b>
<b>HEGGEL Filler 60</b> Sprinkling only in the case of an additional intermediate filling for increasing thickness or for leveling substrate	4.000
<b>HEGGEL FRP 310 Laminate</b> (Standard type, reinforced with 2 x 450 g/m <sup>2</sup> glass fiber mats, approx. 2.5 mm)	
Components	kg/m <sup>2</sup>
HEGGEL FRP 310 Solution	1.600
HEGGEL FRP 310 Hardener	0.800
<b>Total</b>	<b>2.400</b>
2 x 450 g/m <sup>2</sup> glass fiber mats	0.990
Glass fleece 30 g/m <sup>2</sup>	0.033

<b>HEGGEL FRP 310 Laminate</b> (Optional, reinforced with 2 x 300 g/m <sup>2</sup> glass fiber mats)	
Components	kg/m <sup>2</sup>
HEGGEL FRP 310 Solution	1.067
HEGGEL FRP 310 Hardener	0.533
<b>Total</b>	<b>1.600</b>
2 x 300 g/m <sup>2</sup> glass fiber mats	0.660
Glass fleece 30 g/m <sup>2</sup>	0.033
<b>HEGGEL FRP 310 Primer and Sprinkling</b> (Optional, in the case of subsequent tile / brick lining or for improving the mechanical loading properties)	
Components	kg/m <sup>2</sup>
HEGGEL FRP 310 Solution	0.167
HEGGEL FRP 310 Hardener	0.083
<b>Total</b>	<b>0.250</b>
<b>HEGGEL Filler 60</b>	4.000
Optional SIC (Improving the mechanical loading properties)	4.000

## 9. 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.

Hands should be cleaned using skin friendly paint removers, hand washing paste and soap. Prior to starting work, it is recommended to apply protective hand cream.

## 10. 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.

**Note:** Dispose synthetic resin materials that have not yet hardened, cleaning agents, and partially filled packaging as hazardous waste.

## Technical Data

Title	DIN	Value	Unit
<b>Compressive Strength</b>	DIN EN ISO604	90	MPa
<b>Linear Coefficient of Expansion</b>	DIN 53505	22	10 <sup>-6</sup> . K <sup>-1</sup>
<b>Operation temperature limits (Dry loading)</b>	-	+160	°C
<b>Operation temperature limits (Wet loading)</b>	-	-	Please contact HEGGEL to confirm the project related application.

**HEGGEL FRP 310;** Revision No: 2.10 / Last Revision Date: 14.11.2023

All information contained herein is based on the current state of our knowledge and practical experience at the time of release. Therefore, please make sure that this is the latest edition of the Technical Data Sheet. All data are only intended as a guideline for informational purposes and do not constitute a legally-binding warranty of the suitability for a certain purpose of use, due to its dependence on site conditions and possible processing, use and applications. All information contained in this technical datasheet is subject to change without notice.

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