

# HEGSEL® FRP 311

Glass Mat Reinforced Epoxy Lining System

*You Build, We Protect!*

## Description:

**HEGSEL FRP 311** is an epoxy resin-based fiber reinforced crack-bridging laminate designed for chemically resistant and liquid-tight protection of concrete and steel substrates. The system is compatible with and can be integrated into other coating and putty systems within the HEGSEL product portfolio.

## Characteristics:

- Excellent chemical resistance to solvents, acids, alkalis, oils, and fats
- Thermally resistant up to 70 °C at the laminate surface
- Solvent-free binder system
- Capable of bridging cracks up to 0.4 mm

## Application Areas:

**HEGSEL FRP 311**, as a laminate system reinforced with glass fiber mats of 300 g/m<sup>2</sup> and 30 g/m<sup>2</sup>, is designed for application on metal and concrete substrates across various industries.

## Pot Life (20 °C):

| Product / Layer                        | Time     |
|--|----------|
| <b>HEGSEL FRP 311 Primer</b>           | ~ 30 min |
| <b>HEGSEL FRP 311 Trowel Compound</b>  | ~ 30 min |
| <b>HEGSEL FRP 311 Laminating Resin</b> | ~ 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 HEGSEL!

## Curing (20 °C):

The minimum waiting period before proceeding with subsequent processing steps, as well as the maximum allowable interval between application stages at 20 °C, are as follows:

| Load Capacity                     | Time     |
|-----------------------------------|----------|
| <b>Until further processing</b>   | ~ 16 hrs |
| <b>Maximum Waiting Time</b>       | ~ 48 hrs |
| <b>Chemical / Mechanical Load</b> | ~ 7 days |

## Packaging / Storage:

| Product   | Package Size                   | Shelf Life (20 °C) |
|---|--------------------------------|--------------------|
| <b>HEGSEL FRP 311 Solution</b>  | 16 / 25 kg Hobbock             | 24 Months          |
| <b>HEGSEL FRP 311 Hardener</b>  | 8.8 kg Bucket<br>25 kg Hobbock | 24 Months          |
| <b>HEGSEL FRP 311 Powder</b>  | 20 kg Bag                      | 24 Months          |
| <b>HEGSEL Filler 30</b>   | 25 kg Bag                      | 24 Months          |
| <b>HEGSEL Filler 60</b>   | 25 kg Bag                      | 24 Months          |
| <b>Glass fiber mat 300 g/m<sup>2</sup></b><br>Roll 1.27 m wide, 1.20 m Length | 153 m <sup>2</sup> Roll        | unlimited          |
| <b>Glass fleece 30 g/m<sup>2</sup></b><br>1.00 m wide                         | 250 m <sup>2</sup> Roll        | unlimited          |

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. Storage and transport at temperatures above 20 °C may reduce the product's 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

### Concrete / Screed:

Refer to DIN EN14879-1.

The substrate must generally be pretreated to achieve sufficient tensile adhesion strength. It must be free of cement laitance, cement skin, loose or friable particles, structural defects, and any substances that could act as release agents. The residual moisture content of cementitious substrates must not exceed 4%. Ingress of water or water vapor pressure from behind the coating/lining must be prevented.

## 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<br>(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

- Muhair roller
- Disc roller
- Laminating brush
- Scale
- Basket (cage) stirrer
- Mixing container
- Scissors
- Drill
- Smoothing trowel (spread blade)
- Measuring cup

**Note:** The materials to be processed may contain solvents, acidic, alkaline, or abrasive components that can act aggressively on mixing and application tools. Therefore, only use tools that are suitably resistant and appropriate for these materials.

## 4. Mixing

| HEGGEL FRP 311 Primer          |                 |
|--------------------------------|-----------------|
| Components                     | Parts by Weight |
| HEGGEL FRP 311 Solution        | 1.8             |
| HEGGEL FRP 311 Hardener        | 1.0             |
| HEGGEL FRP 311 Trowel Compound |                 |
| Components                     | Parts by Weight |
| HEGGEL FRP 311 Solution        | 1.8             |
| HEGGEL FRP 311 Hardener        | 1.0             |
| HEGGEL FRP 311 Powder          | 4.0             |

| HEGGEL FRP 311 Laminating Resin |                 |
|---------------------------------|-----------------|
| Components                      | Parts by Weight |
| HEGGEL FRP 311 Solution         | 1.8             |
| HEGGEL FRP 311 Hardener         | 1.0             |

Mixing shall be carried out using a drill equipped with a basket (cage) stirrer operating at 300 – 500 rpm. Ensure the stirrer is guided thoroughly along the bottom and walls of the mixing vessel.

Accurately measure or weigh the liquid components and introduce them into the mixing container.

Blend carefully until a uniform, homogeneous mixture is formed.

Individually measure or weigh the solid components, then gradually incorporate them into the liquid mixture in portions.

Mix thoroughly to achieve a consistent, lump-free blend.

Transfer the mixture into a clean container (re-pot) and mix once more until a completely homogeneous, lump-free composition is obtained.

## 5. System Description

- HEGGEL FRP 311 Primer
- Scattering with HEGGEL Filler 60
- HEGGEL FRP 311 Trowel Compound
- HEGGEL FRP 311 Laminating Resin (comprising 2 layers of fiberglass mat 300 g/m<sup>2</sup> and 1 layer of glass fleece 30 g/m<sup>2</sup> embedded)

## 6. Application

Application may only begin once all application conditions are met and can be maintained throughout the entire processing and curing period. Higher or lower temperatures affect the working time and consistency of the composition. This may impact consumption rates, layer thickness, and application performance. All materials should have the same temperature during processing. Broadcasted surfaces should be lightly sanded after curing. In all cases, the surface must be thoroughly cleaned of loose material before applying additional layers.

**HEGGEL FRP 311 Primer:** Apply HEGGEL FRP 311 Primer using a roller or brush, ensuring no puddles are left in concrete depressions or expansion joints. While still fresh, scatter the primer with HEGGEL Filler 60.

### HEGGEL FRP 311 Trowel Compound:

Apply it to the specified thickness using a smoothing trowel (spread blade). Ensure the application is free of trowel marks, ridges, or other surface irregularities.

### Fiberglass Mats and Glass Fleece with HEGGEL FRP 311 Laminating Resin:

Overlap each layer by 5–10 cm, ensuring that overlaps between successive layers are staggered by 20 cm. Sequentially embed two overlapping layers of fiberglass

mats into the freshly applied HEGGEL FRP 311 Trowel Compound.

Use a disc roller to press the fiberglass mats firmly into position. Apply HEGGEL FRP 311 Laminating Resin evenly with a paint roller, then deaerate the surface by rolling over it with the disc roller to eliminate any trapped air bubbles.

The glass fleece always constitutes the final layer and is applied simultaneously with the fiberglass mats. After placement, thoroughly roll the entire surface with the disc roller to ensure complete consolidation and proper integration.

If all layers cannot be applied in a single operation, allow the surface of the last applied layer to become tack-free. Once this condition is achieved, apply HEGGEL FRP 311 Laminating Resin and proceed with the subsequent application steps as previously outlined.

## 7. Consumption

| HEGGEL FRP 311 Primer                |                   |
|--------------------------------------|-------------------|
| Components                           | kg/m <sup>2</sup> |
| HEGGEL FRP 311 Solution              | 0.161             |
| HEGGEL FRP 311 Hardener              | 0.089             |
| Total                                | 0.250             |
| Scattering with HEGGEL Filler 60     | 2.000             |
| HEGGEL FRP 311 Trowel Compound       |                   |
| Components                           | kg/m <sup>2</sup> |
| HEGGEL FRP 311 Solution              | 0.477             |
| HEGGEL FRP 311 Hardener              | 0.264             |
| HEGGEL FRP 311 Powder                | 1.059             |
| Total                                | 1.800             |
| Layer Thickness: ~ 1.2 mm            |                   |
| HEGGEL FRP 311 Laminating Resin      |                   |
| Components                           | kg/m <sup>2</sup> |
| HEGGEL FRP 311 Solution              | 0.900             |
| HEGGEL FRP 311 Hardener              | 0.500             |
| Total                                | 1.400             |
| Glass Fiber Mats                     |                   |
| Components                           | m <sup>2</sup>    |
| Glass fiber mat 300 g/m <sup>2</sup> | 2.2               |
| Glass fleece 30 g/m <sup>2</sup>     | 1.1               |

## 8. 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.

## 9. Safety Measures

Ensure proper ventilation, especially in confined areas. Follow all fire safety and no-smoking rules. Wear the required PPE and avoid skin contact; Use a dust mask during sanding. Adhere to workplace regulations under §14 of the Hazardous

Substances Ordinance, TRGS 507, and comply with all applicable accident prevention guidelines.  
Dispose synthetic resin materials that have not yet hardened, cleaning agents, and partially filled packaging as hazardous waste.  
Avoid direct contact of the materials with flames; be particularly cautious of weld spatter during welding operations.

Use up residual quantities wherever possible.  
Do not pour leftover material into drains or dispose of it in household waste.  
Collect residual quantities for disposal separately in durable, sealable, and properly labelled containers.  
Hands should be cleaned using protective soap, avoid to use solvents. Prior to starting work, it is recommended to apply

protective hand cream.  
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      | Unit                            |
|-------------------------------|-------------------|-----------|---------------------------------|
| Density                       | DIN EN ISO 1183-1 | ASTM D792 | 1.55 g/cm³                      |
| Flexural Strength*            | DIN EN ISO 14125  | -         | 180 MPa                         |
| Tensile Strength*             | DIN EN ISO 527-4  | -         | 110 MPa                         |
| Elongation at Break           | DIN EN ISO 527-4  | -         | 3%                              |
| Adhesion to Concrete / Screed | DIN EN ISO 4624   | -         | > Cohesion of the Concrete, MPa |

\*Average value determined on heat-treated specimens.

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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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