HEGGEL® FU 631

Furan Resin Based Mortar with Carbon Fillers

You Build, We Protect!

Description:

HEGGEL FU 631 is a two-component mortar based on a modified furan resin with carbon filler used for easy bedding and jointing of acid-resistant ceramic bricks, tiles or carbon bricks.

Characteristics:

- Temperature resistance up to 220°C (Dependent on the type of chemical being used)
- Excellent chemical resistance to a wide range of media: Various inorganic and organic acids and alkalis (including hydrofluoric acid), solvents, hydrocarbons, greases, oils and fuels
- Excellent adhesion to ceramic tiles, bricks or carbon bricks
- Electrically conductive
- Suitable for tank linings, as the relatively high shrinkage does not have as strong an effect here as with large-area floor tilings.

Applications:

HEGGEL FU 631 is designed as a mortar for tile and brick lining of chemical apparatus and process vessels (such as reactors, columns, gas scrubbers) that are exposed to high chemical stresses and thermal loads at the same time. A typical application example is the use in distillation columns for the purification of 1,2- dichloroethane (EDC) in vinyl chloride or PVC production.
HEGGEL mortar systems can be used for the full-joint or hollow-joint installation of tiles/bricks.

Chemical Resistance:

Information on the chemical resistance is available on request.

Pot Life (20°C):

Product	Time
HEGGEL FU 631	Approx. 30 - 50 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
Accessible	At least 24 hrs
Chemical / Mechanical Load	At least 5 days

Note: Optimum resistance to some solvents is only achieved after several weeks at normal temperature. This process can be accelerated by heat treating the finished flooring or brick lining. please consult HEGGEL!

Packaging:

The products are supplied in the following standard package sizes:

Product	Size	Package
HEGGEL FU 631 Solution	25 kg	Hobbock
HEGGEL FU 631 Powder	15 kg	Bag

Storage:

The products must be stored in a cool and dry place, away from direct sunlight. At the indicated storage temperatures, the shelf life of the products is at least the below mentioned periods:

Product	Temperature	Shelf Life
HEGGEL FU 631 Solution	20°C	24 Months
HEGGEL FU 631 Powder	20°C	24 Months

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

As a rule, the mortar should be built up on one of the HEGGEL linings or coatings; in the case that such a sealing layer is not applied, then at least a suitable primer with adequate sprinkling must be used. Any unevenness in the substrate must already be levelled out.

1.1. Carbon Steel

All contaminants such as those which are not visible but detectable, have to be removed in accordance with DIN Fachbericht # 28 and EN ISO 8502. Ferrite steel surfaces must be blasted to "Near White Metal" in accordance with EN ISO 12944-4. A standard preparation degree of SA 2½ (SSPC SP-10; NACE #2) as specified in EN ISO 8501-1 is required.

1.2. Concrete

Appropriate action must be taken to prepare the concrete surfaces; they must be dry and dust-free and free of contaminants such as oil or grease. The concrete must have a minimum tensile strength of 1.5 N/mm². The residual moisture content shall not exceed 4%.

2. Environmental Conditions

The specified environmental conditions must be complied with during surface preparation and tile/brick lining. 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 and draught.

Environmental Conditions	Value
Relative humidity	≤ 80%
Surface & material 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 and application performance may vary.

3. Application Tools

- Mortar mixer
- Joint iron
- Joint board
- Scale
- Drilling machine
- Trowel
- Joint injector
- Measuring cup
- Mixing vessel
- Anchor stirrer

4. Mixing Instruction

HEGGEL FU 631	Parts by Weight
HEGGEL FU 631 Solution	100
HEGGEL FU 631 Powder	183

Depending on temperature and viscosity of the solution, **HEGGEL FU 631** Powder may be varied in quantity by up to 10%.

In case of higher ambient temperatures, mix smaller quantities of mortar to prevent the mixture from a strong exothermic reaction. With an anchor stirrer (300 - 500 rpm) blend the solution well before complete or partial use.

The stirrer shall be moved across the vessel wall and over the bottom. Liquid components need to be first weighed or measured and then transferred to the mixing vessel. Solid components need to be separately weighed or measured before being added to the solution in portions and blended carefully with an anchor stirrer (300 - 500 rpm) to achieve a lump-free mixture. In the process of mixing, the stirrer must be moved across the vessel walls and past the bottom several times. For smaller quantities mixture by hand is also possible. The mortar shall not be used after the expiration of the working time.

5. Application

HEGGEL FU 631 is suitable for both the full-joint as well as hollow-joint installation of tiles/bricks.

When ceramic tiles/bricks are being installed, field sizes of approx. 3 x 3 m must be considered, particularly where the substrates are flexible. After conclusion of the initial curing phase, the dividing joints between the fields are sealed (normally 24 to 48 hours).

Apply the mortar to two side edges of the tiles/ bricks for full-joint installation, then place the tile/brick in position.

Remove the mortar bead with the trowel and smooth out the joint. For a hollow joint installation, the butt joint shall remain free and be filled later. Extra consideration should be given to ensure that the application is free of voids.

The jointing can be done subsequently with a joint injector, joint iron or joint board. To compress the joint, excess material should be pressed with the joint iron into the joint. The remaining material should be removed with the trowel.

When HEGGEL Mortar is being used for hollow-joint installation of tiles, the bedding joint must be cured and dry again. There should be a rectangular cross-section in the open joint (depth: >15 mm, width: 4-6 mm). The sides of tiles must be free of mortar and the joints must be clean.

In order to obtain visually flawless surfaces after jointing, the use of HEGGEL protective varnish, hard wax or clinker oil is recommended, depending on the tiles used. Check the use on a test area in advance.

6. Consumption

Required Mortar for full-length installation (Bed joint 5 mm, Joint width 6 mm)

Material	Sizes (mm)	Coverage (kg/m²)
Bricks	240 x 115 x 80	Approx. 17.28
Bricks	240 × 115 × 65	Approx. 15.35
Tiles	240 × 115 × 40	Approx. 12.70
Tiles	240 × 115 × 20	Approx. 10.08
Bed joint	4-7 mm	
Joint width	4-6 mm	

7. Cleaning

Any tools that are contaminated with uncured material can be cleaned using **HEGGEL Cleaner**. 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	DIN	ASTM	Value	Unit
Density	DIN EN ISO 1183-1	ASTM D792	1.6	g/cm³
Shore D hardness	DIN 53505	ASTM D2240	> 60	Shore D
Flexural strength	DIN EN ISO 178	ASTM C580	30	MPa
Compressive strength	DIN EN ISO 604	ASTM C579	70	MPa
Modulus of elasticity	DIN EN ISO 178	ASTM C580	3.0×10^3	MPa
Therm. Coefficient of linear expansion	ISO 11359-2	ASTM C531	2.4×10^{-5}	1/K
Thermal conductivity	ISO DIN 22007	-	2.0	W/mK
Electr. leakage resistance	DIN EN 14879-6 At >70% relative humidity	ASTM F150/98	$\leq 10^6$	Ω

Note: Mean value, determined on annealed samples

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