

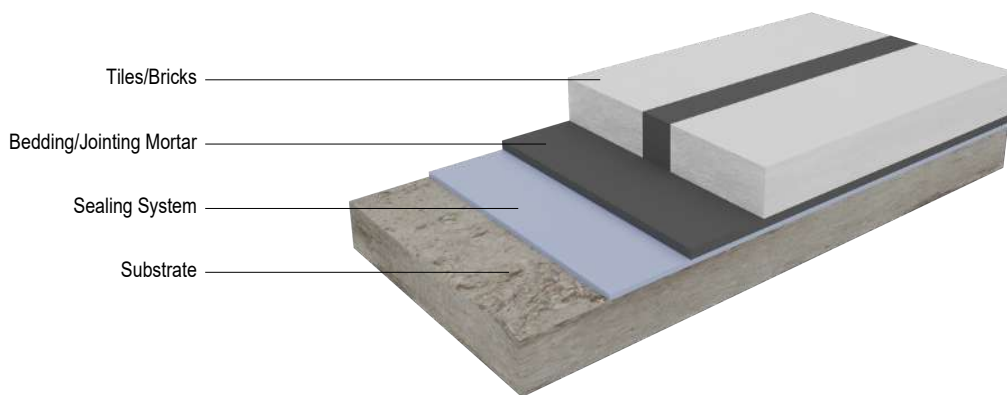
## TI 322B

Technical Information Surface Protection Linings  
Issue 13.06.2024

# FURADUR F MORTAR

Hydrofluoric acid resistant, electrically conductive, aldehyde-free resin based mortar for corrosion resistant tile linings and brick linings

## System Design



## Description and Use

Hydrofluoric acid-resistant, aldehyde-free 2-component synthetic resin mortar based on furan resin to bedding and jointing tile linings, bricks and shapes. For the production of chemically, thermally and mechanically resistant coverings and linings.

Typical applications are tile and brick linings in the chemical industry, for waste and process water treatment, in pits or secondary containments, in sewers, for traffic and reloading areas, for neutralization plants, acid pickling lines or phosphoric acid plants.

It is electrically conductive and is particularly suitable for battery rooms or rooms exposed to solvents.

For the electrical conductivity of the system, the information in the chapter "Testing the Electrostatic Conductivity" must be observed.

## Properties

- Good mechanical properties and outstanding chemical resistance (also against hydrofluoric acid when using suitable bricks or plates)
- Temperature and solvent resistance can be improved by post heat treatment (temperature resistant up to 180 °C)
- Can be used for electrically conductive coverings, taking into account the substructure
- Workable with jointing injector
- Colour black

## Physical Data

Physical Property	Testing Standard	Value	Unit
Density	DIN EN ISO 1183-1	2.2	g/cm <sup>3</sup>
Flexural strength	ASTM C 580	20.0 <sup>[1]</sup>	MPa
Flexural modulus of elasticity	ASTM C 580	5,400 <sup>[1]</sup>	MPa
Tensile strength	ASTM C 307	10.0 <sup>[1]</sup>	MPa
Compressive strength	ASTM C 579	85.0 <sup>[1]</sup>	MPa
The thermal coefficient of linear expansion	DIN 51045	1.9 x 10 <sup>-5</sup>	1/K
Thermal conductivity	DIN EN ISO 22007-2	2.1	W/mK
Dissipation resistance	DIN EN 14879-6	≤ 10 <sup>6</sup>	Ohm
Abrasion resistance	DIN 52108	11	cm <sup>3</sup> /50 cm <sup>2</sup>
Adhesive strength to ceramic bricks	DIN EN ISO 4624	> 2.0	MPa

Data are mean values

## Chemical Resistance

Resistant to acids, alkalis, solvents, fats and oils and conditionally resistant to oxidising chemicals.

Resistant to 70% hydrofluoric acid.

Please contact our Application Technology Department for approval of the project-specific possible application.

For detailed information about the chemical resistance please refer to TI 320.

## Substrate

Uneven spots should be levelled in the substrate already. Do not apply the mortar directly to the substrate! If the substrate is not provided with a surface protection system, apply with a suitable primer and sprinkle if necessary. Please contact our Application Technology Department for possible solutions.

Usually the mortar is applied onto STEULER-KCH-range coating systems.

## Requirements

Application temperature approx.	10 - 30 °C
Dew point distance	> 3 K
Dew point distance from 70 % air humidity	> 5 K

Optimal temperature is 20 °C. Higher and lower temperatures influence the pot life and consistency of the mixtures.

Curing is noticeably delayed below 15 °C.

Avoid draughts and solar radiation.

During application, the substrate must be kept dry. No moisture (condensate, mist, washing water) may enter in open joints, onto the bedding joint or the undersides and edges of tiles.

## Concrete / Screed

Refer to DIN EN 14879-1 as well as to STEULER-KCH-Formsheet 010.

To achieve sufficient adhesive tensile strength, the substrate must generally be pre-treated in such a way that it is free of cement slurry, cement skin, loose and friable parts, structural defects and separating substances.

The residual moisture of cementitious substrates must not exceed 4 %.

The condition of the substrate must be documented by STEULER-KCH-Test-Record 006 (concrete) resp. STEULER-KCH-Test-Record 007 (screed).

<sup>[1]</sup> After heat treatment

## Steel

Refer to DIN EN14879-1 as well as to STEULER-KCH-Formsheet 020 and 030.

The steel surface is blasted to near white blast cleaning. A surface cleanliness of Sa 2½ according to DIN EN ISO 12944-4 and the roughness grade "Medium (G)" according to DIN EN ISO 8503-1 must be achieved; minimum surface roughness Rz = 70 µm. After blasting, the formation of new rust must be prevented by suitable measures, such as priming directly.

The condition of the substrate must be documented by STEULER-KCH-Test-Record 003 (Steel) resp. STEULER-KCH-Test-Record 004 (Inspection of Grit Blasting Works).

## Alkaline Bedding Compound

The mortar can also be used to joint bricks and tiles that have already been bedded with hollow joints. If laid in alkaline bedding compounds (such as water glass mortar or cement mortars), they must be hardened, acidified and dried. The open joints should have a rectangular cross-section, be at least 15 mm deep and 4 - 8 mm wide.

15 % alcoholic sulphuric acid is suitable for acidification and can be supplied via STEULER-KCH (item number 5045009999) or mixed individually: 25 % by weight water, 15 % by weight sulphuric acid (96 % strength) and 60 % by weight alcohol (isopropyl alcohol/ethanol or methylated spirit). It can also be acidified with 15 % aqueous sulphuric acid. However the drying will be slower.

**WARNING! Start with water when mixing! Add the acid slowly whilst stirring. Heat development! Observe safety measures!**

## Packaging / Shelf Life

All components must be stored and transported dry. The minimum shelf life applies to a storage temperature of 20 °C, unless otherwise specified. Higher temperatures reduce, lower temperatures increase the minimum shelf life.

Component	Item Number	Package	Content	Shelf Life
Furadur-Mortar-Solution	5033020001	Hobbock	25 kg	24 months
Furadur-F-Powder	5033032001	Bag	25 kg	24 months
Furadur-Accelerator	5033016045	Bottle	1.25 kg	24 months
Furadur-Inhibitor	5033019007	Can	1 kg	24 months
Hard wax solid	9300001146	Drum	10 kg	24 months
SKC-Mortar-Smoothing-Agent	5045002003	Canister	5 kg	24 months
Steuler-Universal-Cleaner	5040023005	Canister	4 kg	24 months

For handling, transport and storage observe the relevant safety data sheets.

## Mixing Ratios / Consumption

### Furadur F Mortar

Component	Mix	Consumption kg/l
Furadur-Mortar-Solution	2.30 kg	0.375
Furadur-F-Powder	11.20 kg	1.825
<b>Total</b>	<b>13.50 kg</b>	<b>2.200</b>
Mix yields approx.		6.1 l
A reserve of 10 % is to be added to the calculated project requirements for bedding and butt joints.		

With FURADUR ACCELERATOR (TI 193A) below 15 °C or FURADUR INHIBITOR (TI 193) above 30 °C, the pot life can be adjusted. **The application must be coordinated with the Application Technology Department!**

1 liter material spread over 1 m<sup>2</sup> is always 1 mm thick.

## Mortar Requirement per m<sup>2</sup> Approx.

Split tiles 240 x 115 x 20 mm	7.5 l	16.5 kg
Split tiles 240 x 115 x 40 mm	9.5 l	20.9 kg
Bricks 240 x 115 x 65 mm	11.5 l	25.3 kg
Bricks 240 x 115 x 80 mm	13.0 l	28.6 kg
By filled-joint installation (bedding joints 5 mm / butt joints 7 mm)		

## Joint Dimensions

Bed joint thickness	4 - 7 mm
Joint width	4 - 8 mm
Depth of joints by hollow joint installation	at least 15 mm

## Pot Life

The pot life at a material temperature of 20 °C approx. 30 - 50 minutes.

Higher temperatures reduce, lower temperatures extend the pot life.

## Waiting and Curing Times

Waiting time until walkability depends on temperature.

Temperature	Walkable After
15 °C	16 h
20 °C	5 h
30 °C	2.5 h

The waiting time until the chemical resistance is reached is

- Application temperatures up to 160 °C 5 days at 20 °C
- Application temperatures up to 180 °C and solvent exposure 5 days at 20 °C and then 2 days at 60 - 80 °C hot air (tempering)

## Testing

### Visual Testing

The lining is checked for visible defects such as bubbles, inclusions, inequalities, cracks or mechanical damage.

### Testing the Electrostatic Conductivity

The measurement of the earth leakage resistance  $R_A$  is carried out with a commercially available resistance measuring device up to  $10^8$  Ohm with 100 volts DC as measuring voltage. A circular electrode with a diameter of 50 mm is used as the measuring electrode. Placed a 50 mm diameter piece of absorbent paper slightly moistened with tap water on the surface of the tile lining to be measured. The electrode is placed flush on this and pressed onto the surface with a force of about 10 N during the measurement.

The test takes place on site and is carried out at the earliest 8 days after bedding the tile lining (for non-electrically conductive ceramic tiles on the joint). The tile lining is cleaned before the test. There must be no insulating layers.

For non-conductive tiles, the tile size must not exceed the following dimensions to ensure conductivity across the joint material:

- For rectangular panels: 115 mm x 240 mm
- For square panels: 150 mm x 150 mm

The test specification PV 016 ELECTROSTATIC CONDUCTIVITY must be observed.

## Repair

### Rejointing

When rejointing, the joint depth must be at least 5 mm. Press the mortar into the clean joints with a joint trowel and smooth.

## Replacement of Hollow Tiles or Bricks

Cut with a separating disk straight through to the mortar bed into the joint and the bricks or tiles.

Where the lining consists of two brick layers chose the area to be removed big enough so that the bricks can be broken out from the upper brick layer down to the sealing layer in a stepped manner.

Cut carefully in the area of the mortar bed so that the sealing layer is not damaged. Remove the bricks using a caulking tool. Take care that the sealing layer is neither mechanically damaged nor detached from the substrate.

## Reconstruction

After removal of the tiles or bricks the lining can be rebuilt (see "Application").

## Safety and Disposal

The following points should be observed:

- Sufficient ventilation and venting (especially in pits and tanks)
- No smoking and no fire
- Safety Data Sheets
- Observe hazard warnings and safety instructions on labels
- Wear required personal protective equipment (avoid skin contact with materials)
- Clean and protect hands with skin protection soap (no solvents!) and skin protection cream
- Wear a dust mask when grinding (e.g. for repairs)
- Operating instructions as per § 14 of GefahrstoffV (Toxic Substances Act) and TRGS 507 (Technical regulations for Hazardous Substances - Germany)
- Accident prevention regulations by the Liability Insurance Association for the Chemical Industries (Germany)
- Avoid direct contact of the materials with the flame, especially during welding work (welding beads) on site

Preferably consume residual quantities. Do not pour into a spout or dustbin! Collect separately for disposal in durable, lockable and labelled containers.

## GISCODE

Product	GISCODE
Furadur F Mortar	SB-F10

## Cleaning of Equipment

Tools that are soiled with uncured materials can be cleaned with Steuler-Universal-Cleaner. Only clean in well ventilated areas.

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This issue replaces all previous versions.