

# REPARATUR MALTER FS2

*Cement-polymer based mortar for structural repair of concrete, used for hand and mechanical application by spraying (Shotcrete)*

*Technical characteristics and usage are in compliance with:*

*EN 1504-3 Class R2; EN 1504-9 Method 3.1; 3.3; 7.1*

## FILED OF APPLICATION

Reparatur Malter FS2 is used for structural repairs of concrete and reinforced-concrete structures, increasing of protection layer of concrete covering steel reinforcement, repair of damaged and segregated section on concrete (gravel pockets) etc.

Reparatur Malter FS2 is used for repair of vertical and ceiling surfaces, engineering and hydro-technical structures, concrete surfaces with irregular and rounded shape - tunnels, silos, tanks, bridges, etc.

In accordance with the European standard EN 1504-3, the product Reparatur Malter FS2 is classified as mortar based on hydraulic cement and polymer additive (PCC), intended for repair of concrete in accordance with the following Principles / Methods for repair of concrete structures:

- Repair of concrete with hand applied mortar (Method 3.1 according to EN 1504-9)
- Repair of concrete with spraying concrete (Method 3.3 according to EN 1504-9)
- Restoring passivity of the reinforcement by increasing cover with additional mortar (Method 7.1 according to EN 1504-9)

## PROPERTIES

- High adhesion to concrete substrate;
- High early and final strength;
- Compensate shrinkage caused by cement setting;
- Reinforced with polypropylene fibers;
- Protects the structure from freezing;
- Protects the structure from ingress of water and aggressive substances;
- Resistant to atmospheric influences;
- Easy for preparation and application;
- Used for hand and machine application on vertical and curved surfaces, enables finishing with hand tools (trowel);
- Economical;
- Do not contain chlorides;

## TECHNICAL FEATURES

PROPERTY	METHOD	DECLARED VALUES
Appearance	-	Grey powder
Water/material factor	-	0,15-0,17
Maximal size of aggregate	-	2 mm
Specific density	EN 12190	2100±100 kg/m <sup>3</sup>
Setting time		
Start of setting		1÷3 h
End of setting	EN 13294	2÷4 h
Compressive strength		
after 7 days		>20 MPa
after 28 days	EN 12190	>30 MPa
Bending strength		
after 7 days		>3 MPa
after 28 days	EN 1015-11	>5 MPa
Adhesive bond	EN 1542	≥0,8 MPa
Capilarity absorption	EN 13057	< 0,5 kg · m <sup>-2</sup> · h <sup>-0,5</sup>

## METHOD STATEMENT

### SURFACE PREPARATION:

Substrate on which Reparatur malter FS2 is applied need to be clean, free of dust and grease, all labile section must be removed. Substrate also needs to be saturated with water. Surface temperature when material is applied must be between +5°C and 30°C. In case of reparation of steel reinforced structures, exposed reinforcement must be mechanically cleaned from corrosion (using steel brush or sand-blasting). It is recommended for the prepared steel surfaces to be protected using Reparatur Penetrat. In case of concrete substrate with low strength characteristics and high porosity, in order to achieve better adhesion as well as concrete surface stabilization, prior to application of Reparatur malter FS2 it is recommended to treat concrete substrate with pre-coating Vrska U.

## APPLICATION

### 1. HAND APPLICATION

Reparatur malter FS2 is prepared by mixing with required quantity of water, 150 to 170 g of water per 1,0 kg material (one bag of material - 25kg is mixed with 3,75 to 4,25 kg water). Mixing is carried out with slow mixer until complete homogenization - minimum 3 minutes. Application is carried with metal trowel. Maximal thickness to be applied in one layer is 1,5 cm. When applying Reparatur Malter FS2 in several layers, each subsequent layer is applied after bonding the previous one (after several hours, depending on the temperature, consistency, wind and humidity).

### 2. MACHINE APPLICATION BY SPRAYING

Reparatur Malter FS2 can be applied by machine spraying using "wet" and "dry" method. Spraying should be carried out perpendicular to the substrate (concrete surface), at a speed that allows proper application, at distance of 50-60 cm. This reduces the loss of material due to rebound from the surface and allows proper application and coverage of the reinforcement. If necessary, the freshly applied material can be further processed with hand tools (trowels), to achieve the required appearance and smoothness of the surface. When applying Reparatur Malter FS2 in several layers, each subsequent layer is applied after setting of the previous one. The recommended thickness of the applied material in one layer is up to 1,5 cm.

During the machine application of Reparatur Malter FS2, according to the needs of the project, admixture can be added - Accelerator for setting the concrete, in a dosage that will enable the achievement of the desired time for the start of the setting. In this way it is possible to apply Reparatur Malter FS2 in thicker layers in one working procedure.

To regulate-accelerate the setting time of the product, we recommend using the following products from the production program of Ading:

- INGUNIT P – Alkali-free powdery admixture-Set accelerator. Used in the "Dry" method of application. Dosage: 0.1-0.3 kg per 25 kg (1 bag) Reparatur Malter FS2.
- INGUNIT T EKO - Liquid non-alkaline admixture-Set accelerator. Used in "Dry" and "Wet" application method. Dosage: 0.3-0.5 kg per 25 kg (1 bag) Reparatur Malter FS2.

### 3. RECOMMENDATIONS

\* When applying Reparatur Malter FS2 in layers thicker than 5cm, it is recommended to reinforce them and connect them to the substrate with steel anchors.

\* When applying Reparatur Malter FS2 on a larger area, it is necessary for the surface to be divided into sections with working joints.

### 4. CURING OF THE FRESH REPARATUR MALTER FS2

First few hours following the applications, material must be protected from high temperatures (above 30°C), exposure to direct sunlight and wind.

## CONSUMPTION

For layer with thickness of 1.0 cm consumption is roughly 20-22 kg/m<sup>2</sup> .

## CLEANING

Tools and equipment are cleaned with water immediately after their use.

## PACKAGING

Bags 25 kg

## STORAGE

In original closed packing, in dry premises at temperature between 5 and 35 °C. Shelf life: 12 months.

## CE MARKING

<b>CE</b>	
ADING AD Skopje, Novoselski pat (ul 1409) br.11 1060 Skopje, North Macedonia 20 GCBO001/1 EN 1504-3:2005	
<b>REPARATUR MALTER FS2</b> Concrete repair product for non-structural repair – mortar based on hydraulic cement and polymer additive (PCC)	
Compressive strength	<b>≥ 15 N/mm<sup>2</sup> (class R2)</b>
Chloride ion content	<b>≤ 0,05%</b>
Adhesive bond	<b>≥ 0,8 N/mm<sup>2</sup></b>
Restrained shrinkage/expansion	<b>Bond strength after test ≥ 0,8 N/mm<sup>2</sup></b>
Thermal compatibility: Freeze-thaw cycling with de-icing salt immersion	<b>Bond strength after 50 cycles ≥ 0,8 N/mm<sup>2</sup></b>
Capillary absorption	<b>≤ 0,5 kg/m<sup>2</sup> · h<sup>0,5</sup></b>
Reaction to fire	<b>Class A1</b>
Dangerous substances	<b>No performance determined</b>

CONCRETE REPAIR

**Health hazards:** Reparatur Malter FS2 does not contain toxic materials. Nevertheless, avoid contact of the product with skin and eyes and avoid swallowing. In case of contact with skin or eyes, rinse it immediately with clean running water. If swallowed, seek medical assistance. Additional information are provided in the Safety Data Sheet of the product.

**Fire:** Reparatur Malter FS2 is non-flammable.

**Cleaning and disposal:** Loose residues of Reparatur Malter FS2 should be cleaned with water. Old and used packaging should be disposed of in accordance with local rules and regulations for that type of waste. Additional information are provided in the Safety Data Sheet of the product.