

MasterEmaco[®] S 560 FR

(EMACO S170 CFR)

Shrinkage compensated, fast-hardening, thixotropic dry mortar reinforced with a flexible chrome-nickel and polymer fiber, intended for structural repair of concrete and reinforced concrete. Application thickness is 20 to 60 mm.

DESCRIPTION

MasterEmaco S 560 FR is a ready-to-use dry mortar reinforced with a flexible chrome-nickel and polymer fiber, which is not oxidized and is chloride-resistant. Maximum aggregate size in MasterEmaco S 560 FR is 2.5 mm.

MasterEmaco S 560 FR can be easily applied using a plastering station.

MasterEmaco S 560 FR is a shrinkage-compensated product. Expansion takes place both in the plastic state (before setting) and during hardening. Expansion is constrained by the adhesion between the rough surface, being repaired, and the concrete, as well as due to a constraining effect of the metal fiber. The stress, emerging in the MasterEmaco S 560 FR matrix due to a restrained expansion, may be compared with the stress in the pre-stressed concrete, when the reinforcement transfers the force onto concrete and causes compressive stresses. This allows MasterEmaco S 560 FR to be applied in layers with a thickness of up to 60 mm, without using rebars or reinforcing mesh for expansion restraint. This is a sulfate-resistant and chloride-free product. This product is also available in the pourable option (MasterEmaco S 560 FR).

RECOMMENDED USE

MasterEmaco S 560 FR is used for a durable and reliable repair of concrete items of various geometric shapes at the reinforcement corrosion rate of up to 15%, without installation of additional reinforcement:

- Columns and beams;
- Arched structures;
- Bridge plates;
- Foundations, dams;
- Retaining walls;
- Silos and containers;
- Channels;
- Cooling towers;
- Structures in seismic areas, etc.

PACKAGING

MasterEmaco S 560 FR is packed in 30kg moisture proof sacks.

COVERAGE

1850 kg of the MasterEmaco S 560 FR dry mortar are required to produce 1 m³ of the repair compound.

SHELF LIFE AND STORAGE CONDITIONS

Guaranteed shelf life of MasterEmaco S 560 FR, stored in a closed undamaged package, is 12 months.

Store in an enclosed dry room at a maximum humidity of 70% and a room temperature not lower than 5°C. Do not use the product from a damaged sack.

TEMPERATURE CONSIDERATIONS

MasterEmaco S 560 FR may be used at the ambient temperatures of +5°C to +50°C. At low ambient temperatures (+5°C to +10°C), the strength tends to build-up more slowly. If high early strength is required, the following is recommended:

- 1) Store sacks with MasterEmaco S 560 FR in cold-protected areas;
- 2) Use hot water for mixing (+30°C to +40°C);
- 3) After pouring, cover MasterEmaco S 560 FR with heat insulating materials.

If the ambient temperature is below +5°C, use the MasterEmaco T 1000 series materials.

If the ambient temperature is very high (above +30°C), a rapid loss of fluidity by the repair compound is the only problem to be faced with.

In this case, the following is recommended:

- 1) Store sacks with MasterEmaco S 560 FR in a cool place;
- 2) Use cold water for mixing;
- 3) Mix the repair mortar in the coolest period of the day.

WATER CONSUMPTION* FOR MIXING MasterEmaco S 560 FR (Table 1)

Amount of water, liters per 30kg sack	
Minimum	Maximum
5.9	6.2

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*Approximate water consumption. Actual mixing water consumption is specified in the product quality datasheet

REPAIR NOTES

The following recommendations and suggestions are based on the practical experience of using MasterEmaco S 560 FR.

REPAIR SURFACE PREPARATION

Edges of the defective area shall be cut with a diamond tool to a minimum depth of 20 mm, in perpendicular to the surface. Use a light perforator, needle gun or water/ sand blasting machine to remove concrete debris. Make the surface rough. This operation is very important, since a well-prepared rough surface is required for providing good adhesion of MasterEmaco S 560 FR.

Furthermore, the following is required:

- 1) Remove rust from rebars and install additional reinforcement, if required. If the structure to be repaired is used in concrete and steel corrosive environments, treat the reinforcement with MasterEmaco P 5000 AP;
- 2) Using MasterSeal 590, remove all active leaks on the surface being repaired.
- 3) Clean the surface from grease, paint, lime, dirt or dust.

SURFACE IMPREGNATION WITH WATER

Prior to pouring MasterEmaco S 560 FR thoroughly impregnate the surface under repair with water. Proceed with wetting every 10-15 minutes for at least 3 hours. Use compressed air or rags to remove excess water. Prior to pouring MasterEmaco S 560 FR, the surface should be made damp, but not wet.

MIXING

Prior to mixing MasterEmaco S 560 FR with water, the following is required:

- Check whether the available amount of MasterEmaco S 560 FR is sufficient enough for work completion, considering the coverage (1850 kg of the MasterEmaco S 560 FR dry mortar for mixing 1m³ of the repair mortar);
- Make sure that all necessary materials (mixers, trucks, buckets, trowels, etc.) are close at hand;

- Verify the performance of the preliminary activities described in the Repair Notes section.

For correct mixing, follow the instructions below:

- Open the sacks with MasterEmaco S 560 FR, required for work performance, shortly before mixing;
- Pour minimum amount of water specified in Table 1 into the mixer;
- Turn the mixer on, and quickly and continuously add MasterEmaco S 560 FR. Use the entire sack with MasterEmaco S 560 FR for mixing;
- Once all required amount of the MasterEmaco S 560 FR, dry mortar has been added, continue mixing for at least 4 minutes, until lumps disappear and the mix becomes homogenous;
- Add water, if required (within the amounts indicated in Table 1), until the desired consistency is reached, and stir again for 2-3 minutes.

Water content may slightly differ from the one indicated in Table 1, dependent on the ambient temperature and relative humidity. More or less water may be required during hot & dry weather or cold & wet weather, respectively.

A mixer (max 300-400 rpm) with a spiral nozzle may be used for mixing small batches. Mixing MasterEmaco S 560 FR with gravity mixers or by hand is not recommended.

APPLICATION

The ready-to-use repair compound may be applied, using plastering stations or floats. Optionally, use a wooden, plastic or synthetic sponge trowel to smoothen the surface. The post-application treatment with a trowel may be started only when the repair compound has set, i.e. when fingers, pressing the repair compound, do not draw into it, but leave only a light footprint.

TREATMENT

A proper water treatment regime should be provided for the repaired areas for at least 24 hours, to be extended up to 2 days in case of hot, dry, windy weather. For this purpose, use standard cement-bearing material treatment procedures (cover the surface with a film or wet



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burlap; spray water), or apply special MASTERKURE film-forming compositions.

skin contact. In case of irritation, thoroughly wash the affected area with water and consult a doctor, providing the information about the product.

PRECAUTIONS

This product contains cement, irritating the skin and mucous membranes. Thus, avoid eye and

SPECIFICATIONS* (Table 2)

Index name	Index	
Maximum size of a filler, mm	2,5	
Fibre filler	Polymer + flexible metal	
Mortar agility by flow cone, mm	175-195	
Agility persistence, min.	minimum 30	
Enlargement in limited state, %	0,05-0,09	
Compressive strength, MPa, minimum	1 day	25
	28 days	60
Tensile strength at bending, MPa, minimum	1 day	8
	28 days	12
Bond strength to concrete, MPa, minimum	2,5	
Freeze resistance grade for concretes as roads and airfield pavements used in mineralized environment, minimum	F ₂ 300	
Freeze resistance grade for all types of concretes, except concretes as roads and airfield pavements, used in mineralized environment, minimum	F ₁ 1000	
Grade of water resistance, minimum	W16	
Ratio of sulfate resistance (1 year), %	minimum 0,9	

* Tests were performed according to STO 70386662-010-2014 "MasterEmaco dry repair mortars (Emaco)"

Represented information is based on our current experience. In case of various factors affecting the result, information does not mean legal responsibility. For additional information, please contact your local advisor.

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