

# MasterEmaco<sup>®</sup> S 488

(EMACO S 88 C)

**Shrinkage compensated, fast-hardening thixotropic dry mortar reinforced with polymer fiber, intended for structural repair of concrete and reinforced concrete. The application thickness in one layer is 20 to 40 mm**

## DESCRIPTION

MasterEmaco S 488 is a ready-to-use dry mortar with a maximum aggregate size of 2.5 mm. When mixed with water, it forms a thixotropic, non-laminating mortar with good adhesion to steel and concrete. MasterEmaco S 488 is a shrinkage compensated material both in the plastic and in the hardened state. MasterEmaco S 488 does not contain metal aggregates and chlorides. In repair operations, the material is recommended to be applied onto the surface with a trowel or by spraying in a single 20-40 mm thick layer. If a thicker repair layer is required, several layers shall be applied.

## RECOMMENDED USE

- Repair of reinforced or pre-stressed beams;
- Repair of damaged and destroyed elements of concrete and reinforced concrete structures;
- Repair of elements of load-bearing structures, bridge supports, etc., exposed to repeated loads;
- Repair of machine shop structures, especially at points containing a lot of mineral oils and lubricants;
- Berth repair in ports;
- Repair of vertical and overhead surfaces;
- Chimney refractory lining repair;
- Recovery of protective layers of reinforced concrete structures.

## Non-recommended use of MasterEmaco S 488:

- For pouring into formwork (MasterEmaco S 488 PG is recommended in this case);
- Without additional protection in case of contact with environments with pH < 5.5.

## PACKAGING

MasterEmaco S 488 is packed in 30kg moisture proof sacks.

## COVERAGE

2000 kg of MasterEmaco S 488 are required to produce 1 m<sup>3</sup> of the repair compound.

## SHELF LIFE AND STORAGE CONDITIONS

Guaranteed shelf life of the product, stored in the intact factory package, is 12 months. Store in a dry room at a temperature not lower than + 5°C.

## TEMPERATURE CONSIDERATIONS

MasterEmaco S 488 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:

- Store sacks with MasterEmaco S 488 in cold-protected places;
- Use hot water for mixing (+30°C to +40°C);
- After pouring, cover MasterEmaco S 488 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 the MasterEmaco S 488 dry mortar 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 488 (Table 1)

Amount of water, liters per 30kg sack	
Minimum	Maximum
4.35	4.8

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

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## REPAIR NOTES

The following recommendations and suggestions are based on the practical experience of using MasterEmaco S 488.

## 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. To provide good adhesion of the repair compound and the substrate, roughen the surface and provide 5mm-high furrows.

This operation is very important, since a well-prepared rough surface is required for the MasterEmaco S 488 application.

Furthermore, the following is required:

- a) Remove rust from rebars and install additional reinforcement, if required. If the structure to be repaired is used in concrete and steel corrosive environments, the reinforcement is recommended to be treated with MasterEmaco P 5000 AP;
- b) Using MasterSeal<sup>®</sup> 590, remove all active leaks on the surface being repaired.
- c) Clean the surface from grease, paint, lime, dirt or dust.

## REINFORCEMENT INSTALLATION

The minimum thickness of the applied MasterEmaco S 488 layer is 20 mm.

If the thickness of the applied layer should exceed 40 mm, fix a plastering lath with anchors and leave at least a 10mm gap between the lath and the surface.

## SURFACE IMPREGNATION WITH WATER

Prior to placing MasterEmaco S 488, thoroughly impregnate the surface, being repaired, 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 placing MasterEmaco S 488, the surface should be damp, but not wet.

## MIXING

Prior to mixing MasterEmaco S 488 with water, the following is required:

- Check whether the available amount of MasterEmaco S 488 is sufficient enough for work completion, considering the coverage (2000 kg of the MasterEmaco S 488 dry mortar for mixing 1m<sup>3</sup> 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:

- 1) Open the sacks with MasterEmaco S 488, required for work performance, shortly before mixing;
- 2) Pour minimum amount of water specified in Table 1 into the mixer;
- 3) Turn the mixer on, and quickly and continuously add MasterEmaco S 488;
- 4) Once all required amount of MasterEmaco S 488 has been added, continue mixing for 3-4 minutes, until lumps disappear and the mix becomes homogenous;
- 5) 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 488 by gravity mixers or by hand is not recommended.

## APPLICATION

The ready-to-use repair compound may be applied, using plastering stations or floats. While applying the material by hand, it is recommended to prepare a primer layer of MasterEmaco S 488 with a more liquid consistency, and apply it onto the surface by rubbing the mix into the substrate with a brush with stiff bristles. Then, apply a base layer, using the "wet-on-wet" method. Optionally, use a wooden, plastic or synthetic sponge trowel to smoothen the surface. The post-application

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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 burlap; spray water), or apply special film-forming compositions MasterKure<sup>®</sup> (MasterTop<sup>®</sup> C).

## PRECAUTIONS

This product contains cement, irritating the skin and mucous membranes. Thus, avoid eye and skin contact. In case of irritation, thoroughly wash the affected area with water and consult a doctor, providing the information about the product.

## SPECIFICATIONS\* (Table 2)

Index name	Index	
Maximum size of a filler, mm	2,5	
Fibre filler	Polymer	
Mortar agility by flow cone, mm	150-180	
Agility persistence, min.	minimum 30	
Enlargement in limited state, %	0,05-0,09	
Compressive strength, MPa, minimum		
	1 day	28
	28 days	60
Tensile strength at bending, MPa, minimum		
	1 day	5
	28 days	8
Bond strength to concrete, MPa, minimum	2,5	
Freeze resistance grade for concretes as roads and airfield pavements used in mineralized environment, minimum	F <sub>2</sub> 300	
Freeze resistance grade for all types of concretes, except concretes as roads and airfield pavements, used in mineralized environment, minimum	F <sub>1</sub> 1000	
Grade of water resistance, minimum	W16	
Ratio of sulfate resistance (1 year), %	minimum 0,9	

\*Tests were conducted per STO 70386662-010-2014 "MasterEmaco dry repair mortars (Emaco)"



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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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