

MasterEmaco[®] T 1400 FR

(EMACO FAST FIBRE)

Pourable non-shrink fast-hardening dry mortar, containing a rigid metal fiber, designed for a structural repair of concrete and reinforced concrete. It may be used at the ambient temperatures as low as -10°C.*

* In case of boundary above-zero and below-zero temperatures, the application thickness is as follows: -10°C – 20-100 mm; +30°C – 10-60 mm.

DESCRIPTION

MasterEmaco T 1400 FR is a ready-to-use product available in the form of a dry concrete mortar, containing a rigid metal fiber. When mixed with water, it forms a reoplastic, non-shrink and non-segregating compound with a high adhesion to steel and concrete, even if used in hostile environments.

Due to its intrinsic properties, MasterEmaco T 1400 FR may be used to recover concrete and reinforced concrete structures by pouring to a thickness of 10 to 100 mm (and more, if aggregate is added) in cases where the strength build-up rate is the most important requirement (in particular, at low temperatures).

The presence of a steel brass plated fiber, restraining crack propagation, is a distinctive feature of this mortar. This feature provides the material with a high bending strength, high resistance to dynamic impacts, and high fatigue resistance.

The product does not contain chlorine compounds and reactive metal dust.

MasterEmaco T 1400 FR is recommended for use in the ambient temperature range from -10°C to +30°C.

RECOMMENDED USE

MasterEmaco T 1400 FR is used without additional reinforcement in the construction of special construction elements, which require multidirectional reinforcement. It may be used in the following cases:

- In the repair of surfaces subjected to high loads, on highways or at airports (with existing joints to be left), and in the construction of tunnels in the rocks;
- In all structures, subjected to impact and dynamic loads (bunkers and bomb shelters), since it provides adequate bearing capacity of structures even after cracking;
- In the construction of structural, earthquake-resistant elements (such as column-and-beam

connections) due to residual strength after cracking;

- In elongated areas of span girders.

PACKAGING

MasterEmaco T 1400 FR is delivered packed in 30kg bags.

CONSUMPTION

2300 kg of the MasterEmaco T 1400 FR dry mortar are required for preparing 1 m³ of concrete.

SHELF LIFE AND STORAGE CONDITIONS

Guaranteed shelf life of MasterEmaco T 1400 FR, stored in a closed undamaged package, is 6 months.

Store in an enclosed dry room. Do not use the product from a damaged package.

Indicative strength indices**

Temperature, °C			Compressive strength, MPa			
Dry mortar	Water	Environment	2 hrs	4 hrs	24 hrs	28 days
+20	+20	+20	30	40	50	80
+20	+20	-5	25	30	40	65
+5	+5	+5	3	20	30	55
-5	+5	-5	-	10	20	50
+20	+60	-10	20* **	25* **	35* **	55* **

** Data were obtained in laboratory tests.

*** Strength data were obtained while complying with all requirements and while operating at T=-5...-10°C

REPAIR INSTRUCTIONS

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

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1. REPAIR SURFACE PREPARATION

a) Damaged concrete removal

Use diamond tools to cut the damaged area edges perpendicular to the repair surface to a minimum depth of 10 mm. Destroyed concrete shall be removed by using a light perforator, needle gun or sandblasting unit. Minimum roughness of the sub-base surface is 5 mm. This operation is important to ensure good adhesion of MasterEmaco T 1400 FR to the surface under repair.

b) Rebar cleaning

Remove rust from rebars. If the structure under repair is used in environments aggressive to concrete and steel, it is recommended to use MasterEmaco P 5000 AP to treat the reinforcement (at above-zero temperatures).

Attention: do not use MasterEmaco P 5000 AP at sub-zero temperatures.

2. INSTALLATION OF ANCHORS

In case of a low-strength concrete, on which the repair material is applied, anchors shall be anticipated.

Anchors shall be installed in accordance with the operating procedure for fixing steel anchors in concrete and masonry, using the MasterEmaco T and MasterSeal 590 fast-hardening compounds (at temperatures not lower than +5°C), developed by BASF Construction Chemicals.

3. SUB-BASE WATER IMPREGNATION (for work performed at temperatures of 0°C and above)

Prior to placing MasterEmaco T 1400 FR, thoroughly soak the repair surface with water. Use compressed air or rag to remove excess water. Prior to pouring MasterEmaco T 1400 FR, the surface must be damp, but not wet.

While working at sub-zero temperatures, the sub-base shall not be dampened.

For better adhesion of the product to the surface, it is recommended to apply an adhesive layer (thin layer of MasterEmaco T 1400 FR).

4. SUB-BASE HEATING (work performed in the temperature range from 0°C to -10°C)

Prior to placing MasterEmaco T 1400 FR, the surface under repair shall be heated to above-zero temperatures. Use thermomats, infrared emitters or torch lamps for heating. This operation is required to remove possible aufeis from the prepared sub-

base and prevent heat loss by the repair formulation during hydration reaction.

5. FORMWORK

If a formwork is required, it should be made of a strong material and should be leak-proof and securely fixed to withstand the repair compound pressure after pouring. The formwork shall have a special air release hole, located atop, in case of vertical structural elements (e.g., support sides), or on one side only, in case of horizontal structural elements (beam lower surface). Before pouring, the formwork must be impregnated with water so that it did not withdraw water from the repair compound to dehydrate it. The formwork shall be sealed to prevent leaks of the repair compound. For this purpose, thick-consistency MasterEmaco T 1400 FR or other suitable products may be used. Do not use various fabrics for sealing the formwork, since problems, associated with the fabric removal, may occur.

6. MIXING

To ensure uniform distribution of the metal fiber, the entire MasterEmaco T 1400 FR bag shall be used for mixing with water. Before mixing MasterEmaco T 1400 FR with water, the following is required:

- 1) Make sure that all the necessary materials (mixer, trolleys, buckets, trowels, etc.) are close at hand;
- 2) Check that the product is available in sufficient amounts, assuming that 2300 kg of the MasterEmaco T 1400 FR dry mortar is required to prepare 1m³ of the compound;
- 3) Verify the performance of the preliminary operations described in the section "Repair instructions".

Do not mix more repair compound than you are actually able to use within 10 minutes.

To properly prepare the repair compound, follow the below-mentioned instructions:

- 1) Open the bags with the MasterEmaco T 1400 FR dry mortar, required for work, shortly before mixing;
- 2) Pour water at the rate of 3.2 – 3.8 liters of water per one 30 kg MasterEmaco T 1400 FR bag;
- 3) Turn on the mixer and quickly and continuously add MasterEmaco T 1400 FR;
- 4) Once all MasterEmaco T 1400 FR, dry mortar is added, continue mixing for 4-5 minutes. The ready-to-use mix should be of wet consistency, lump-free and evenly distributed metal fiber.

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For mixing small amounts of MasterEmaco T 1400 FR, a slow-speed drill (max 300-400 rpm) with a spiral nozzle may be used. Mixing by hand is not recommended.

If a layer with a thickness of more than 100 mm is required, add gravel in an amount of up to 30% by weight of the dry mixture.

Please, contact experts of BASF Construction Chemicals in case of specific work performance requirements.

7. APPLICATION

Pour the prepared MasterEmaco T 1400 FR repair compound continuously, without vibration.

Pouring shall be arranged from one side to prevent air entrapment.

Placed mix ramming is advisable. Surface of the laid material may be smoothed by a grater.

At the ambient temperatures above +25°C, use cold water for mixing. This will extend the survivability of the concrete mix.

At the ambient temperatures below 5°C, use hot water at a temperature of +30 до +45°C for mixing.

8. MAINTENANCE

At the ambient temperatures above +20°C, an adequate water treatment regime for the repaired surface shall be provided for 8 hours after application.

PRECAUTIONS

The product contains cement that causes irritation. Avoid contact with eyes and skin. In case of contact, thoroughly wash the affected area with water and consult a doctor, providing the information about the product properties.

SPECIFICATIONS*

Index name	Index
Maximum size of a filler, mm	2.5
Fibre filler	Polymer, rigid metal
Mortar agility by flow cone, mm	260-280
Agility persistence, min.	minimum 10-20
Determination of enlargement - shrinkage, %, maximum	0,05
Compressive strength, MPa, minimum	
2 hours	30
4 hours	40
1 day	50
28 days	80
Tensile strength at bending, MPa, minimum	
2 hours	10
4 hours	12
1 day	14
28 days	16
Bond strength to concrete, MPa, minimum	2,5
Freeze resistance grade for concretes as roads and airfield pavements used in mineralized environment, minimum	F ₂ 200
Freeze resistance grade for all types of concretes, except concretes as roads and airfield pavements, used in mineralized environment, minimum	F ₁ 600
Grade of water resistance, minimum	W16
Ratio of sulfate resistance (1 year), %	minimum 0,9
Material consumption, kg/m ³	2300



We create chemistry

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

Physical and mechanical properties of the product may differ if:

- Surface preparation requirements are not met;
- Product preparation requirements are not met;
- Product handling requirements are not met.

At sub-zero temperatures of the ambient air, sub-base, etc., the product hardening and strength build-up rates tend to slow down.

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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