

MasterEmaco[®] S 5400

(EMACO Nanocrete R4)

High-strength, shrinkage compensated, fibre reinforced, thixotropic structural repair mortar, intended for structural repair of concrete and reinforced concrete structures. Layer thickness varies from 5 to 50 mm.

DESCRIPTION

MasterEmaco S 5400 is a single component, extra high strength, high modulus, shrinkage compensated structural repair mortar intended for structural repair of concrete.

MasterEmaco S 5400 is a ready-to-use Portland cement based dry mortar that contains specially selected quartz sands, polymer fibres and special additives to reduce cracking risks. When mixed with water, MasterEmaco S 5400 forms a fine thixotropic mortar, reaching high strength on setting. The mortar may be applied mechanically or by hand.

FIELD OF APPLICATION

MasterEmaco S 5400 is used for the structural repair of concrete facilities such as:

- Any kind of load-bearing structures;
- Industrial facilities;
- Waste treatment and water treatment facilities, canals, pipelines and other underground utilities;
- Sea and river transport facilities;
- Bridge structures.

MasterEmaco S 5400 may be used for indoor and outdoor operations on vertical and overhead surfaces.

ADVANTAGES

- Full compliance with Standard EN 1504-3 Class R4;
- Nanotechnology application provides a shrinkage compensation mechanism while polyacrylonitrile fiber reinforcement minimizes cracking tendency in the plastic phase;
- Improved thixotropic properties allow the application of up to 50mm-thick layers without additional reinforcement and formwork installation;
- Fast curing and high ultimate strength;
- Excellent workability both after hand and mechanical application;
- High wear resistance and durability;
- High frost resistance;

- High carbonation resistance;
- High sulphate resistance;
- High water resistance;
- Low content of chromates provides environmental safety of the material;
- Does not contain chlorides.

PACKAGING

MasterEmaco S 5400 is supplied in 30kg sacks.

COVERAGE

About 20 kg of the dry mortar per 1m² at the layer thickness of 1 cm.

One sack (30 kg) of MasterEmaco S 5400, mixed with water, allows about 15 liters of fresh grout to be produced. These figures are approximate. The exact coverage depends on many factors and can be calculated only on the job site by a trial application.

SHELF LIFE AND STORAGE CONDITIONS

Guaranteed shelf life of MasterEmaco S 5400, stored in a closed undamaged original package, is 12 months. Store in a cool, dry place.

The material should be stored in the manufacturer's package in enclosed dry rooms with a maximum humidity of 70%, at the conditions, which ensure safety of the packaging and moisture protection. Do not use material from a damaged package.

REPAIR NOTES

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

1. REPAIR SURFACE PREPARATION

Substrate preliminary preparation:

Concrete

The substructure must be clean, durable and able to withstand the load (minimum tear strength - 1.5 MPa).

Very dense and smooth substructures, or layers incapable to withstand the load (e.g., contaminated old coating), coatings treated with film-forming compounds or water-repellent

MasterEmaco[®] S 5400

(EMACO Nanocrete R4)

materials, as well as damaged concrete surfaces shall be pre-treated using suitable methods, e.g., by sand or water blasting machines. The substrate roughness depth is about 3 mm, i.e. the aggregate should be clearly visible. Repair areas shall be delineated, by cutting with a diamond disk, to a minimum depth of 5 mm.

Prior to applying the MasterEmaco S 5400 repair mortar, the preliminary prepared substrate should be wetted for at least 3 hours and kept damp. The surface should be damp, but avoid puddles.

Preliminary prepared substrate:

Steel rebars

Remove all corrosion products from the concrete substrate and steel reinforcement by sandblasting or other mechanical methods. If required, cover steel reinforcement with MasterEmaco P 5000 AP. Application of MasterEmaco P 5000 AP is required at a strong influence of chlorides, or in case of insufficient thickness of the concrete protective layer above the reinforcement (less than 20 mm).

Mixing

MasterEmaco S 5400 should be mixed with water in a mixer for about 3 minutes until formation of a homogeneous thick-plastic lump-free mix (use a perforator or a low speed drill (300-400 rpm) with a spiral nozzle for mixing small amounts).

Allow the grout to settle for about 3 minutes, and then stir it again. If necessary, add a little more water to obtain desired consistency; in doing so, do not exceed the maximum amount of water specified.

The mixing water amount is specified in the material quality datasheet.

Application:

During the operation and in the next 24 hours, the temperature of the substrate and the environment should not be lower than +5°C and higher than +30°C.

Mechanical application:

Initially, apply a thin contact layer of the mixture to the prepared damp substructure, and then gradually apply the desired layer thickness. Premix plastering stations should be used for applying the material.

Hand application:

Initially, apply the first contact layer of the mixed material to the prepared and slightly damp substructure. If the substructure is very rough or its strength is uneven, apply a primer layer of MasterEmaco S 5400 instead of the first layer. For this purpose, added a little water to a small amount of the prepared mixture to obtain the consistency, at which brush application becomes possible, and apply the material onto the surface. After that, use the "wet-on-wet" technology for placing a layer of the MasterEmaco S 5400 repair material of the normal consistency.

Permissible layer thickness varies from 5 to 50 mm in one application (larger thickness is allowed for small areas, following prior installation of additional reinforcement). Following the initial setting of the mortar and its treatment, a floating operation may be started, using, e.g., a plastic or wooden float.

Working tool cleaning

Tools should be cleaned with water immediately after use. In case of hardened material, only mechanical cleaning should be used.

Post-treatment

For the following actions are recommended for post-treatment:

- Following finishing of the surface, apply the MASTERKURE film-forming material to protect against evaporation;

If concrete treatment means are not available, the following steps shall be taken:

- Place a damp burlap;
- Place a film;
- Wet dried burlap again.

If it is impossible to use treatment means and burlap, moisten the repair material, which started hardening, for 24 hours.

ATTENTION!

- Do not use MasterEmaco S 5400 at temperatures below +5°C and above +30°C;
- Do not use the material in a damaged or open packaging;
- Do not add cement, sand or other components, which change properties of the material;

MasterEmaco[®] S 5400

(EMACO Nanocrete R4)

- Do not dilute the mortar, which began setting, with water, and do not add additional amounts of MasterEmaco S 5400.

Safety guidelines

While using MasterEmaco S 5400, well-known safety measures, applicable to chemical handling, shall be observed.

After finishing the work, wash your hands. MasterEmaco S 5400 contains cement. When mixed with water, an alkaline reaction occurs. This may cause skin irritation or chemical burns to

mucous membranes (e.g., eyes), so a prolonged contact with the material should be avoided. In case of contact with the eye mucosa, immediately rinse eyes thoroughly with water, then seek medical attention. In case of skin contact, immediately remove contaminated clothing and wash skin with plenty of soap and water. Use appropriate protective gloves (e.g., nitrile-soaked cotton gloves). If swallowed, immediately 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
Mortar agility by flow cone, mm	165-180
Agility persistence, min.	minimum 30
Determination of enlargement - shrinkage, %, maximum	0,05
Compressive strength, MPa, minimum	
1 day	18
28 days	60
Tensile strength at bending, MPa, minimum	
1 day	5
28 days	8
Bond strength to concrete, MPa, minimum	2,0
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
Modulus of elasticity (28 days)	>20000 МПа
Ratio of sulfate resistance (1 year), %	minimum 0,9
Freeze resistance of contact area bond strength to concrete (50 cycles),MPa	Minimum 2,0
Water absorption capillary inleakage kg/m ² * h ^{0.5}	Minimum 0,5

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



We create chemistry

MasterEmaco[®] S 5400

(EMACO Nanocrete R4)

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.

Limited company "BASF Stroitelnye Sistemy"

Office in Moscow: +7 495 225 6436

Office in St. Petersburg: +7 812 332 0412

Office in Kazan: +7 843 212 5506

Office in Krasnodar: +7 861 202 22 99

Office in Minsk: +375 17 202 2471

Office in Kiev BASF T.O.V.: +380 44 5915595

E-mail: stroysist@basf.com www.master-builders-solutions.basf.ru

July 2015

SM

® = Certified trademark BASF-Group in many countries.