

MasterEmaco S 498 FR

R4 thixotropic structural fiber-reinforced mortar. With contrasted expansion and high durability for reinstatements of reinforced concrete. 10 to 50 mm without reinforcement.

MATERIAL DESCRIPTION

MasterEmaco S 498 FR is a thixotropic cementitious mortar with counteracted expansion in the air, resistant to aggressive environmental agents, sprayable containing PAN (polyacrylonitrile) fibers and reinforced with flexible and durable inorganic fibers. The special reinforcement fibers have these characteristics: length 12 mm, diameter 15 microns, tensile strength 1700 MPa, elasticity modulus 72000 MPa.

In the absence of wet maturation, a condition not always achievable on site, to improve the air expansion of MasterEmaco S 498 FR, it is possible to add component B (MasterEmaco A 400). This additive allows to reduce the shrinkage in the plastic and hygrometric phase, improving the seasoning.



FIELDS OF APPLICATION

MasterEmaco S 498 FR has been designed to restore and / or reinforce any concrete structure. It can be applied with a spraying machine or trowel, in thicknesses between 10 and 50 mm in a single layer, without applying an electro-welded mesh. Typical interventions are represented by:

- repairs of portions of deteriorated concrete structures and reconstructions of the concrete cover layer;
- Restoration of structural elements in concrete, including prestressed, of both civil and infrastructural works;
- structural restoration of elements subject to cyclical stresses, impacts and abrasions;
- structural restoration of hydraulic works, sewer pipes

and tunnels;

FEATURES AND BENEFITS

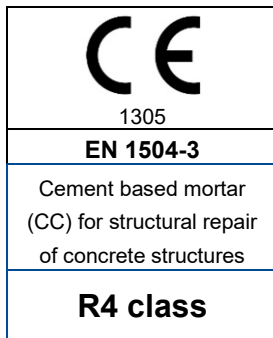
MasterEmaco S 498 FR also has the following features:

- application without the aid of the electro-welded mesh: the flexible inorganic fibers, contained in MasterEmaco S 498 FR, make it possible to eliminate the use of the electro-welded mesh and to apply the product easily, even by spraying;
- contrasted expansion in the air (monolithicity with the support): the ability to provide a contrasted expansion with the curing of the mortar in the air, i.e. in real construction site conditions, allows MasterEmaco S 498 FR to obtain monolithicity with the support concrete; MasterEmaco S 498 FR, subjected to the bowing / bowing test, shows already after 24 hours a bowing (\cap) of the specimen which demonstrates, in a simple and immediate way, the effective ability of the product to guarantee the contrasted expansion in air; Materials that on the other hand, if they show a bending, ie lifting at the edges (\cup), they would be inadequate for restoration interventions because they are characterized by shrinkage and therefore unable to guarantee monolithicity with the support;
- resistance to cracking in the plastic phase: to combat micro-cracking in the plastic phase, MasterEmaco S 498 FR is also enriched with polyacrylonitrile PAN fibers
- resistance to long-term cracking: this fundamental requirement for the durability of the restoration can be assessed through the O Ring test. MasterEmaco S 498 FR does not show any cracks even after long curing;
- resistance to aggressive environmental agents: MasterEmaco S 498 FR, thanks to the very particular chemistry and nature of its components, is absolutely impermeable to water, environmental agents such as chlorides and sulphates, resists freeze / thaw cycles (compatibility thermal) and is not subject to carbonation phenomena.

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In compliance with the European Regulation (EU No 305/2011 and EU No. 574/2014) the product is provided with the CE marking according to UNI EN 1504-3 and the relative DoP (Declaration of Performance).



CONSUMPTION

- 18,5 kg/m² for cm thickness
- Component B MasterEmaco A 400 (when used): minimum dosage 0,25% on the powder weight.

PACKAGING

- 25 kg bag
- Component B MasterEmaco A 400: 5 kg can

STORAGE

Store the product in a dry and sheltered place at a temperature anywhere between 5 and +35°C.

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Technical Information			
EN 1504-3 class	R4		
Typology	CC		
Granulometry	Max 2.5 mm		
Chloride content EN 1015-17	<0.05%		
Colour of mix	Grey		
Consistency of mix	Thixotropic		
Mixing ratio	3,75-4,25 l 25 kg bag (15-17%)		
Temperature of application	From 5 to 35°C		
Pot life	60 minutes		
Packaging	25 kg.bag		
Consumption	18.5 kg/m ² thickness 1 cm		
Minimum thickness	10 mm		
Maximum thickness	50 mm		
Essential characteristic in accordance to 1504-3 with a dosage of water of 16% Without MasterEmaco A 400		Limits and classes	Performances
Expansion characteristics with air curing:	UNI 8147 modified		1 day > 0,04 %
Expansion characteristics with air curing	Down/up warping test		Up-warping ∩
Adhesion to concrete	UNI EN 1542 on MC 0.40 substrate (with w/c ratio = 0.40) according to UNI EN 1766	≥ 1,5 MPa	≥ 2,0 MPa
Resistance to accelerated carbonation	UNI EN 13295	Carbonation depth ≤ that of reference concrete MC 0.45 (with w/c ratio = 0.45) according to UNI EN 1766	Specification obsolete
Resistance to freezing-thawing cycles with deicing salts measured as adhesion	UNI EN 1542 after cycles UNI EN 13687/1 on MC 0.40 substrate	≥ 1,5 MPa	≥ 2,0 MPa
Water impermeability measured as capillary absorption coefficient	UNI EN 13057	≤ 0,5 kg·m ⁻² ·h ^{-0,5}	≤ 0,25 kg·m ⁻² ·h ^{-0,5}
Elastic modulus	UNI EN13412	a 28 d ≥ 20000 MPa	28.000 (± 2.000) MPa
Compressive strength	UNI EN 12190 *	at 28 days ≥ 45 MPa	1 day > 20 MPa 7 days > 50 MPa 28 days > 60 MPa
Flexural strength,	UNI EN 196/1	----	1 day > 6 MPa 7 days > 8 MPa 28 days > 10 MPa
Pull-out resistance of steel bars	RILEM-CEB-FIP RC6-78	-	>25MPa
Impermeability to water measured as resistance to water penetration under direct pressure	UNI EN 12390/8	-	Average penetration depth < 5 mm
Cracking test (Ring test)			No crack after 180 days

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APPLICATION SHEET

PREPARING THE SUBSTRATE

The removal of incoherent or contaminated concrete must take place by means of hydro demolition or mechanical chiselling performed with light breakers powered by compressed air for a thickness determined by the designer on the basis of preliminary investigations aimed at identifying the state of conservation of the structure, adopting all the necessary precautions to avoid damage to the structures.

The surface of the support concrete must be macroscopically rough (roughness of about 5 mm in depth) in order to obtain maximum adhesion between the support and the restoration material. Macro-roughness is essential for the contrasted expansion mechanism to be realized, which is the basis of the functioning of expansive conglomerates in the air

CLEANING REINFORCED BARS

Incoherent or contaminated concrete that surrounds the reinforcing rods will need to be removed. Any exposed reinforcing rods must be cleaned of rust by mechanical brushing or sandblasting / hydro-sandblasting; if the removal of degraded or contaminated concrete has been carried out with hydrodemolition, this generally also guarantees a suitable cleaning of the reinforcing bars

PLACING ADDITIONAL STRUCTURAL REINFORCEMENTS

When it is necessary, for structural reasons, it is possible to add reinforcements, these must be installed ensuring an adequate concrete cover in compliance with the regulations in force

CLEANING AND SATURATION OF CONCRETE

Cleaning and saturation of the substrate concrete should preferably be carried out with pressurised water (80 ÷ 100 atm and using hot water in winter). This operation is crucial in order to prevent the concrete substrate to steal water from the mix. Inaccurate saturation would lead to the loss of adherence and to the cracking of the added material. The use of pressurised water also guarantees effective cleaning of the surfaces in order to remove dust

and small loose parts there may still be after the milling of the concrete. The cleaning and saturation of the surfaces are crucial operations for obtaining high adherence values between the substrate and the added material.

In case of low temperatures, before applying the product, make sure there is no superficial ice and eliminate it if there is any.

APPLICATION TEMPERATURE

MasterEmaco S 498 FR can be applied when the ambient temperature is between +5°C and + 35°C.

When the temperature is 5 ÷ 10°C the development of mechanical resistance occurs more slowly; it is recommended to store bags of MasterEmaco in a heated environment, to use heated mixing water (30 ÷ 50°C), to saturate the substrate with hot water, to apply the mortar in the middle of the day.

It is recommended not to apply at temperatures below + 5°C, as indeed should be the case for any cement conglomerate if no special precautions are taken.

When the temperature is 30 ÷ 40°C it is recommended to keep the bags of MasterEmaco in a cool place, to use low temperature mixing water, to apply the mortar in the cooler hours.

PREPARING THE MIXTURE

Mixing must be carried out in a cement mixer or in the mixer of the spraying machine and continue until a plastic, homogeneous and lump-free mixture is obtained. To mix small quantities, a drill with whisk can be used, but mixing by hand is not recommended.

Each 25 kg bag of MasterEmaco S 498 FR must be mixed for its entire content with 3.75 - 4.25 (15-17%) liters of water.

The use of component B (MasterEmaco A 400, which is an additive that allows to improve the expansion in the air and to reduce the shrinkage in the plastic and hygrometric phase by improving the curing), with a minimum dosage of 0.25%, it is especially indicated in case of restorations with large surfaces exposed to the air and in the absence of correct curing. It also allows greater maintenance of workability in summer climates. In the case of multi-layer applications, fresh on hardened, MasterEmaco A 400 must be added only in the final layer and not in the lower layers. Any additions of aggregate must be checked in advance on site.

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APPLICATION

MasterEmaco S 498 FR must be applied on macroscopically roughened, coherent, clean and water saturated surfaces.

In the case of large surfaces, it can be applied for thicknesses from 10 to 50 mm in a single layer using auger or piston spraying machines (not in a continuous cycle).

During the spray interruption phases (also depending on the external temperature) it is necessary to provide for the thorough cleaning of the pipes and the pump itself using pressurized water and a soft rubber ball to clean the pipes.

In trowel applications (small surfaces) to achieve the desired thickness (maximum 5 cm) it is necessary to proceed first with a rough coat and then with the curling.

The mechanized application can take place with screw or piston pumps and not in a continuous cycle, from specialized manufacturers (such as Turbosol, PFT, Putzmaister, Bunker, Imer, etc.). For further details consult our Technical Service

FLOATING

In the case of surfaces exposed to air, we recommend a floating that must be applied using a sponge float after sufficient time has elapsed following the application, depending on the weather. The time interval between the application and the float finish depends on the first hardening phase of the mortar, which is determined by placing your hand on the surface and your fingers do not sink but leave a light mark on the mortar. Proper floating will be essential to effectively counter the formation of micro-cracks resulting from plastic shrinkage.

HARDENING

It is always advisable to carry out a correct wet maturation of the surfaces exposed to the air. In the case of particularly adverse conditions characterized by low relative humidity and high ventilation, both in hot and cold climates, in the absence of humid ripening, we recommend using the products of the MasterKure line.

PROTECTION

To lengthen the useful life of the structure, enhancing durability even in areas which require no maintenance, it is always recommended to apply a protective system of the MasterProtect line on the entire structure. This acts as a barrier to the entrance of aggressive environmental agents, also improving the aesthetic appearance of the structure.

SAFETY INSTRUCTION

For information on the correct and safe use, transport, storage and disposal of the product, consult the most recent Safety Data Sheet.

OTHER SERVICES

For price analysis, specifications, supplementary brochures, references, reports and technical assistance, visit the website www.master-builders-solutions.com/it-it or contact infomac@mbcc-group.com.

Scan the QR code to visit the product page and download the latest version of this datasheet.



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Since 16/12/1992, Master Builders Solutions Italia Spa has been operating under a Certified Quality System compliant with the UNI EN ISO 9001 Standard. Furthermore, the Environmental Management System is certified according to the UNI EN ISO 14001 Standard and the Safety Management System is certified according to the UNI ISO 45001 Standard.

Master Builders Solutions Italia Spa

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For further information, please consult the local Technician of Master Builders Solutions. The technical advice on how to use our products, either written or verbally given, are based on the current state of our scientific and practical expertise, and does not imply the assumption of any guarantee and/or responsibility for the final results of works executed using our products.

Therefore, the customer is not exempted from the exclusive task and responsibility of verifying the suitability of our products for the intended use and purposes.

This version supersedes all the previous ones.