

MasterEmaco T 1400 FR

Pourable and fast curing mortar with rigid metal fibers, very high ductility for structural applications and quick return to service down to -10 ° C, for thicknesses from 10 to 150 mm.

MATERIAL DESCRIPTION

MasterEmaco T 1400 FR is a quick-setting, quick-hardening, pre-blended, pourable cementitious mortar even at low temperatures, based on a special pozzolanic binder, fiber-reinforced with rigid metal fibers.

It is applicable for thicknesses up to 150 mm



FIELDS OF APPLICATION

MasterEmaco T 1400 FR allows you to carry out interventions in a very short time and with temperatures down to -10 ° C, such as:

- restoration of road joints,
- restoration of motorway toll booths,
- restoration of extrados and heads of slabs;
- restoration of rigid floors in reinforced concrete, industrial floors, warehouses, car parks, even those subject to high traffic and stress
- restoration of hydraulic structures subject to cavitation or solid transport.
- anchoring of manhole covers even in the presence of high intensity of heavy traffic
- anchoring of road covers, even of large dimensions, even in the presence of high intensity of heavy traffic

The application thicknesses are between 10 and 150 mm (for localized interventions applicable in thicknesses from 10 to 100 mm, for bedding or fixing manhole covers, in particular of large dimensions or subject to intense traffic, applicable in thicknesses from 25 to 150 mm, for repair or slab casting applicable in thicknesses up to 50 mm).

For interventions with a thickness greater than that indicated above, it is necessary to add washed aggregate,

free of impurities in the type and quantity to be defined according to the required thickness

FEATURES AND BENEFITS

MasterEmaco T 1400 FR also has the following features:


- highly ductile behavior: fundamental property for the reinforcement of structures and to confer resistance to dynamic stresses and impacts;
- high mechanical performance after a few hours: in fact it has very high mechanical strength after a few hours even at low temperatures;
- maintenance of workability: despite being a rapid mortar, it maintains workability for about 15-20 minutes depending on the temperature, allowing the mixing of 5-6 bags at a time in a glass mixer;
- high adhesion to concrete: this allows to create monolithicity with the support, with any reinforcements present and with steel profiles;
- resistance to long-term cracking: this fundamental requirement for the durability of the restoration can be assessed through the O Ring test. MasterEmaco T 1400 FR does not show any cracks even after long curing;
- high resistance to wear, abrasion and impact: the product ensures the maintenance of performance even in the presence of high traffic and continuous dynamic stresses
- resistance to aggressive environmental agents: MasterEmaco T 1400 FR, thanks to the very particular chemistry and nature of its components, is absolutely impermeable to water, aggressive environmental agents such as chlorides and sulphates, resists freeze / thaw cycles (thermal compatibility) 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).

 1305
EN 1504-3
Cement based mortar (CC) for structural repair of concrete structures
R4 class

CONSUMPTION

The coverage is about 20kg/m² with a coat that is 1 cm thick.

PACKAGING

MasterEmaco T 1400 FR is available in 25 kg bags.

STORAGE

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

FIBER

The special steel fibers contained in MasterEmaco T 1400 FR have the following characteristics:

Caratteristiche	
Fibre shape	Hooked ends
Material	Steel
Length (mm) - according to EN 14889-1 (mm): 30	30 mm
Diameter (mm) - according to EN 14889-1 (mm): 0,38	0.38 mm
Tensile Strength (N/mm ²) - according to EN 14889-1	>3070 MPa
Modulus of elasticity (GPa) - according to EN 14889-1	210 GPa
Elongation at break - according to EN 14889-1 (%)	0.8

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Technical Information						
EN 1504-3 class	R4	Temperature application	of From -10° to 35°C			
Typology	CC	Pot life	20 minutes			
Granulometry	Max 2.5 mm	Packaging	25 kg.bag			
Chloride content EN 1015-17	<0.05%	Consumption	20 kg/m ² thickness 1 cm			
Colour of mix	Grey	Minimum thickness	10 mm			
Consistency of mix	Rheodynamic	Maximum thickness	150 mm			
Mixing ratio	2.6-3.1 25 kg bag (10.4-12.4%)					
Essential characteristic in accordance to 1504-3 with a dosage of water of 11.4% and a temperature of -20°C		Limits and classes	Performances			
Adhesion to concrete	UNI EN 1542 on MC 0.40 substrate (with w/c ratio = 0.40) according to UNI EN 1766	≥ 2,0 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}	≤ 0,1 kg·m ⁻² ·h ^{-0,5}			
Elastic modulus	UNI EN13412	a 28 d ≥20000 MPa	31.000 (± 2.000) MPa			
Compression strength	UNI EN 12190	a 28 d ≥ 45 MPa	-5°C			
			5°C			
			20°C			
			3h	>8	>15	>20
			4h	>12	>20	>35
			8h	>20	>30	>40
24h	>50	>55	>60			
7d	>65	>65	>70			
28d	>85	>85	>85			
Abrasion resistance test by rotating disc	UNI EN 1338		CLASS 4 MARK I (maximum achievable value)			
Tensile strength in bending	UNI EN 196-1	-	1 g > 15 MPa 7 gg > 20 MPa 28 gg > 30 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			
Test method for metallic fibre concrete - Measuring the flexural tensile strength (limit of proportionality (LOP), residual)	EN 14651		fR1k = 14,0 MPa fR2k = 17,0 MPa fR3k = 18,0 MPa fR4k = 18,0 MPa			

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APPLICATION SHEET

PREPARING THE SUBSTRATE

The support must be in concrete. Any degraded or incoherent concrete must be removed in the thickness and in the manner determined by the designer on the basis of preliminary investigations aimed at identifying the state of conservation of the structure. The removal of incoherent or contaminated concrete should preferably be done by mechanical chiselling (or equivalent method) performed using lightweight compressed air powered breakers, taking all 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.

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 T 1400 FR can be applied when the ambient temperature is between -10 ° C and + 35 ° C .. When the temperature is 5 - 10 ° C the development of mechanical resistance is slower, it is however recommended to keep the bags of MasterEmaco in a heated environment, use heated mixing water (30 - 50 ° C), saturate the substrate with hot water, apply the mortar in the middle of the morning.

It is recommended not to apply at temperatures below + 5 ° C, as indeed should be the case for any cement conglomerate when 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.

WARNINGS

MasterEmaco T 1400 FR is not compatible with any binder and therefore also with the cement products of the MasterEmaco range; if they are mixed, this might modify their mechanical performance and therefore it is not permitted

PREPARING THE MIXTURE

Maintaining the workability of the product allows you to mix 5-6 bags at a time in a glass mixer; the mixing time must be sufficient (3-5 minutes) to obtain a plastic, homogeneous and lump-free mixture. At low temperatures it is necessary to prolong the mixing for about 6-8 minutes in order to trigger the hydration process in due time and to perfectly dissolve the dressing that holds the bunches of fibers glued. To mix small quantities, you can use a drill with whisk, however, mixing by hand is not recommended. It is always necessary to mix the entire contents of each bag. Each 25 kg bag of MasterEmaco T 1400 FR must be mixed with 10.4-12.4% of water (respectively equal to 2.6 and 3.1 liters of water per bag).

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The application thicknesses are between 10 and 150 mm. For interventions with a thickness greater than 150 mm it is necessary to add washed aggregate, free of impurities in the type and quantity to be defined according to the required thickness. When adding the aggregate, the performance must be re-verified on site with test mixes. MasterEmaco T 1400 FR is incompatible with any binder and therefore also with the cementitious products of the MasterEmaco line; their possible mixing could change the mechanical performance and is therefore not allowed.

APPLICATION

MasterEmaco T 1400 FR must be applied on macroscopically roughened, coherent, clean and water saturated surfaces. At the time of application, the support must be saturated with a dry surface and all free water that may be present must be removed.

MasterEmaco T 1400 FR must be applied by casting with a fluid or superfluid consistency.

For applications with reduced thickness and / or in the presence of reinforcement, the utmost attention must be paid to the mixing and application phase, possibly consulting our Technical Service.

Workability within the concrete mixer in motion remains constant for about 15-20 minutes depending on the temperature. Carefully wash the mixer as soon as you have finished mixing.

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.