

MasterCrete 498

Class R4 cementitious mortar, thixotropic, expansive, reinforced with inorganic fibres, normal-setting, for repairs with thicknesses ranging from 10 to 50 mm in a single layer, without reinforcement.

Material description

MasterCrete 498 is a high-performance, thixotropic, single-component structural cementitious mortar (class R4 in accordance with EN 1504-3), composed of high-performance hydraulic binders, selected aggregates, synthetic polyacrylonitrile (PAN) reinforcing fibres, inorganic macro-fibres and special additives that give **MasterCrete 498** expansive properties under conditions of constrained expansion and air curing. The use of the SRA additive should be assessed based on the site conditions and the curing time of the applied product; if in doubt, please contact Master Builders Solutions technical support.

MasterCrete 498 is suitable for the structural repair of deteriorated concrete structures, with application thicknesses ranging from 10 to 50 mm, in a single layer. Furthermore, the special formulation ensures high dimensional stability, minimising the risk of cracking due to hydraulic shrinkage and guaranteeing excellent adhesion to both the old concrete and the reinforcement bars. The presence of special inorganic macro-fibres allows the product to be applied without the use of reinforcement.

Main uses

The thixotropic, structural fibre-reinforced cementitious mortar **MasterCrete THI 498** allows for the structural repair of concrete structures, both horizontally and vertically, ensuring maximum effectiveness and durability. It can be applied manually with a trowel or sprayed using a suitable machine, in thicknesses ranging from 10 to 50 mm in a single layer and without reinforcement.

Some examples of application are:

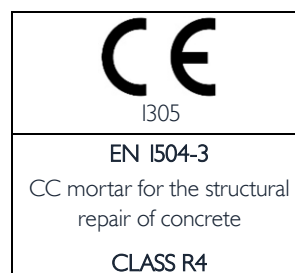
- repair of concrete infrastructural structures: viaducts, bridges, tunnels, underpasses, dams, canals, pipelines, etc.;
- restoration and repair of concrete elements and structures of any type and size in civil, industrial, or commercial buildings that exhibit deteriorated concrete, defects, or detachments;
- jacketing of reinforced concrete structures;
- reconstruction of the reinforced concrete and prestressed concrete structures;

- structural repairs for specific areas of airports and ports where the use of metal reinforcement – whether in the form of mesh or fibre – is not permitted.

Features

- **Plastic shrinkage crack resistance:** **MasterCrete 498** is reinforced with polyacrylonitrile (PAN) synthetic fibres, which reduce the risk of surface micro-cracking during the plastic phase of the product.
- **Resistance to hydraulic shrinkage cracking:** thanks to the special formulation of **MasterCrete 498**, the repair work will result in a monolithic and durable finish; the product's expansion properties, when applied to a suitably prepared substrate and allowed to cure correctly, make it possible to exploit the 'chemical pre-compression' effect generated by constrained expansion, thereby achieving excellent levels of interaction between the old and new structures and counteracting the stresses arising from constrained shrinkage. This counteraction is aided also by the presence of special inorganic macro-fibres that act as a dispersed reinforcement within the concrete mix.
- **Excellent adhesion** on properly prepared substrates, both horizontally and vertically, even overhead.
- **Excellent waterproofing properties**, in accordance with EN 12390 Part 8, against water and, consequently, against any aggressive substances it may carry, such as chlorides and sulphates.

In compliance with the European Regulations (EU No. 305/2011 and EU No. 574/2014), the product is CE marked in accordance with UNI EN 1504-3 (class R4) and the relevant DoP (Declaration of Performance).



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Consumption

Approximately 18.0 kg/m² per cm of thickness.

Packaging and storage

MasterCrete 498 is available in 25 kg bags.

Keep the product in its original packaging in a dry, protected location at a temperature between +5°C and +35°C.

Under the above conditions, the product has a shelf life of 12 months.

Preparation and method of application

Preparing the substrates

- Remove all sections of deteriorated and/or contaminated concrete from the surface, as well as any concrete that is not fully bonded and is starting to come away, so as to achieve a solid and macroscopically rough substrate with surface irregularities of at least 5 mm. The aggregates must be visibly exposed. The edges of the repair area, for localised repairs, must be at right angles, allowing a minimum application thickness of 10 mm for the mortar.
- Remove any rust from exposed reinforcing bars by brushing (manual or mechanical) or sandblasting.
- Treat the reinforcing bars with a corrosion-resistant coating from the **MasterCrete range**.
- Saturate the substrate with water until it is fully saturated but free of surface water (s.s.a.); ensuring clean, saturated surfaces is essential to guarantee high adhesion between the substrate and the applied material and to prevent cracking of the product.

Preparation of mortar

Mix **MasterCrete 498** for approximately 4–5 minutes in a concrete mixer or the mixer of the plastering machine, together with a quantity of water equal to three-quarters of the total specified in the technical data sheet, gradually adding the remainder of the mixing water until a homogeneous mixture is obtained (do not exceed the maximum amount of water specified in the technical data sheet).

If the quantity to be mixed is small—though it should never be less than the contents of a bag—mix it in a bucket using a low-speed paddle mixer.

In order to make the most of the expansive properties of **MasterCrete 498**, if it is anticipated that wet curing will not be possible on site, the SRA additive **MasterCrete 400** must be used at a dosage of 0.25% or more by weight of the powder. If **MasterCrete 498** is to be applied in multiple layers, the SRA additive may only be added to the outermost layer.

If in doubt, contact the Master Builders Solutions technical service.

Application and trowelling

In the case of manual application apply with a cement trowel to a thickness of 10 to 50 mm in a single layer, after first applying a scratch coat.

The product can also be applied by spraying using a suitable non-continuous plastering machine, for example, a screw or worm screw machine, always ensuring that the maximum thickness per single layer does not exceed 50 mm.

For overhead applications, depending on the condition of the substrate, the environment, the mixture used, and the characteristics of any machine employed, the thickness should be reduced to approximately 20 mm.

Applications exceeding 50 mm are possible, provided they involve multiple layers and care is taken to leave the fresh layer “rough” or, better yet, to roughen it before applying the next layer. If the next layer is applied the following day, the hardened previous layer must be dusted and saturated to the surface.

The finished surface should then be trowelled using a sponge trowel as soon as the mortar begins to set. The waiting time before trowelling varies depending on weather conditions. Proper trowelling is essential to prevent the formation of surface microcracks caused by plastic shrinkage.

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Ageing and maturation

We recommend curing surfaces exposed to the air for the first 24 hours, either by damp curing or by spraying on a curing agent and anti-evaporation agent from the **MasterKure** line. This solution is particularly recommended in environmental conditions characterised by low relative humidity and high ventilation.

If the product cannot be cured as described above, the **MasterCrete 400** SRA admixture must be added during the mixing phase at a minimum dosage of 0.25% by weight of the powder.

Application temperatures

Application environment temperature needs to be between +5°C and +35°C.

Warnings

- Do not apply directly on plaster, crumbly, mixed or painted surfaces.
- Do not apply **MasterCrete 498** on smooth substrates; a mechanical roughening is necessary.
- Do not add additional water or fresh mortar to the mixture that has already begun to set.
- Do not add water beyond the dosage recommended in the technical data sheet.
- Do not use the product to create layers less than 10 mm in thickness.

Technical data

Product identification data	
Packaging	25 kg bags
Powder colour	Grey
Maximum size of the aggregate	2.5 mm
Type of fibres	Inorganic
Diameter of fibres	14 µm
Length of fibres	12 mm
Mixing ratio	4.0 - 4.5 litres of water per bag (16.0-18.0%)
Consumption	approximately 18.0 kg/m ² per cm of thickness
Fresh density	approximately 2100 kg/m ³
Mixture consistency	Plastic-Thixotropic
Workability time (+20°C)	60 minutes
Application environment temperature	+5°C to +35°C
Class (EN 1504-3)	R4
Type	CC cementitious mortar
Chloride ion content (EN 1015-17) – minimum requirement ≤0.05%	< 0.05%
Applicable layer thickness (minimum/maximum)	10 mm / 50 mm

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Performance

(The performance data shown below was obtained in accordance with UNI EN 1504-3 with a water content of 17.0%)

Feature	Test method	Regulatory requirement	Product performance
Compression strength	UNI EN 12190 UNI EN 196-1	≥ 45 MPa at 28 days	1 day > 20 MPa 7 days > 45 MPa 28 days > 60 MPa
Flexural strength	UNI EN 196-1	none	1 day > 7 MPa 7 days > 9 MPa 28 days > 10 MPa
Elastic modulus	UNI EN 13412	$\geq 20,000$ MPa at 28 days	$28,000 \pm 2,000$ MPa
Adhesion to concrete	UNI EN 1542 (MC 0.40 substrate – UNI EN 1766)	≥ 2.0 MPa	> 2.0 MPa
Resistance to freeze-thaw cycles with de-icing salts	UNI EN 1542 after the UNI EN 13687/1 cycles on an MC 0.40-type substrate.	≥ 2.0 MPa	> 2.0 MPa
Resistance to accelerated carbonation	UNI EN 13295	Carbonation depth $\leq$ compared to that of the reference concrete type MC 0.45 (with a/c ratio = 0.45) according to UNI EN 1766	Specification superseded
Capillary absorption coefficient	UNI EN 13057	$\leq 0,5 \text{ kg} \cdot \text{m}^{-2} \cdot \text{h}^{-0.5}$	$\leq 0,30 \text{ kg} \cdot \text{m}^{-2} \cdot \text{h}^{-0.5}$
Reaction to fire (Euroclass)	EN 13501-1	-	A1

Additional performance

(The performance data shown below was obtained with a water content of 17.0%)

Feature	Test method	Regulatory requirement	Product performance
24-hour controlled expansion – Water curing	UNI 8147 – Method A	none	$\geq 0.04\%$
24-hour controlled expansion – Air curing	UNI 8147 – Modified method B	none	$\geq 0.04\%$
Resistance to positive hydraulic pressure	UNI EN 12390-8	Test pressure: 5 bar	5 bar - Average penetration < 20 mm 5 bar - Maximum penetration < 50 mm
Arching/warping test	-	Arching to demonstrate expansive behaviour	Arching

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Safety instructions

For guidance on the correct and safe use, transport, storage and disposal of the product, please see the latest Safety Data Sheet (SDS).

Other services

For additional technical information, brochures, references, technical reports and technical assistance please visit www.master-builders-solutions.com/it-it or alternatively contact infomac@masterbuilders.com.

Scan QR code to visit the product page and download the latest version of this technical sheet and any additional documentation.



Disclaimer

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.

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.

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