

MasterCrete FL 475

A normal-setting, pourable, expansive class R4 cementitious mortar, reinforced with synthetic fibres, formulated for the repair of concrete structures with thicknesses ranging from 10 to 50 mm.

Material description

MasterCrete FL 475 is a high-performance, single-component, pourable structural cementitious mortar (class R4 in accordance with EN 1504-3), composed of high-performance hydraulic binders, selected aggregates, synthetic polyacrylonitrile (PAN) reinforcing fibres and special additives that give **MasterCrete FL 475** expansive properties under conditions of constrained expansion and air curing; the possible use of SRA additive will be assessed based on site conditions and the curing conditions of the applied product.

If you have any queries, please contact Master Builders Solutions technical support.

MasterCrete FL 475 is suitable for the structural repair of degraded concrete surfaces, with application thicknesses ranging from 10 to 50 mm. 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 reinforcing bars.

Main uses

The structural pourable cementitious mortar **MasterCrete FL 475** is designed for structural repair work on concrete structures, for pouring into formwork or within areas confined by the existing substrate, ensuring maximum effectiveness and durability. It can be applied manually or pumped using a suitable machine, in thicknesses ranging from 10 to 50 mm.

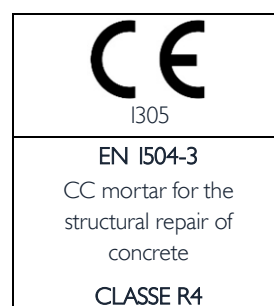
Some examples of application are:

- 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 residential, industrial or commercial buildings, where the concrete is deteriorated, defective or has come away;
- jacketing of reinforced concrete structures;
- Reconstruction of the concrete cover in reinforced concrete and prestressed concrete structures.

Features

- **Plastic shrinkage crack resistance:** **MasterCrete FL 475** 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 FL 475**, 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 controlled expansion, thereby achieving excellent levels of interaction between the old and new structures and counteracting the stresses arising from restricted shrinkage.
- **Excellent adhesion** on properly prepared concrete substrates.
- **Excellent waterproofing properties**, in accordance with EN 12390 Part 8, against water and, consequently, against any potentially corrosive 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 has the CE marking in accordance with UNI EN 1504-3 (class R4) and the relevant DoP (Declaration of Performance).



Consumption

Approximately 20.4 kg/m² per cm of thickness.

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Packaging and storage

MasterCrete FL 475 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 for a minimum mortar application thickness of 10 mm.
- Remove any rust from exposed reinforcing bars by brushing (either by hand or mechanically) or sandblasting.
- Treat the reinforcing bars with an anti-corrosion coating from the **MasterCrete** range.
- Saturate the substrate with water until it is thoroughly saturated but free of surface water (s.s.a.); ensuring that surfaces are clean and saturated is essential to guarantee high levels of adhesion between the substrate and the applied material and to prevent the product from cracking.
- For large-scale projects involving mortar thicknesses exceeding 30 mm, the installation of reinforcement must also be included.

Preparing the formwork

For applications involving the use of formwork, the latter must be made of sufficiently strong material and treated to be non-absorbent; e.g. in the case of wooden formwork, this can be achieved through saturation or by using release agents from the **MasterFinish RL** line. They must also be effectively secured and reinforced, and demonstrate adequate integrity to prevent the loss of material.

Preparation of mortar

Mix **MasterCrete FL 475** for approximately 4–5 minutes in a concrete mixer, 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 mix is obtained (do not exceed the maximum water content specified in the technical data sheet).

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

In order to take full advantage of the expansive properties of **MasterCrete FL 475**, if it is anticipated that wet curing of the applied product will not be possible on site, the SRA additive **MasterCrete 400** must be used at a dosage of 0.4% or more by weight of the powder.

If the concrete is to exceed 50 mm in thickness, depending on the characteristics of the project, you may choose to add an aggregate with an appropriate particle size distribution to **MasterCrete FL 475** or use a fine concrete mix from the **MasterCrete** line.

If you have any queries, please contact the Master Builders Solutions technical support team.

Installation

The product can be applied manually or using suitable pumping systems (not continuous-cycle).

In the case of formwork, the concrete must be poured from one end to allow the mortar to properly fill the entire volume, thereby expelling air and preventing the formation of voids within the concrete.

In the case of complex geometric shapes or high reinforcement density, the flow and compaction of the concrete can be optimised using tools such as rods or chains, or by gently vibrating the concrete itself.

For horizontal applications and on large surfaces, the product can be levelled using a levelling straightedge.

In any case, for applications exceeding 30 mm, reinforcement must be included and securely fixed to the existing substrate, ensuring a minimum concrete cover of 10 mm.

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Ageing and maturation

It is recommended to cure surfaces exposed to the air for the first 24 hours using a wet method or by spraying a curing and anti-evaporation agent from the **MasterKure** range. This solution is particularly recommended in environments characterised by low relative humidity and high ventilation. If the curing of the product cannot be carried out as described above, the additive SRA **MasterCrete 400** must be added during the mixing stage at a minimum dosage of 0.4% 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 FL 475** 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 this product for application thicknesses of less than 10 mm.

Technical data

Product identification data	
Packaging	25 kg bags
Powder colour	Grey
Maximum size of the aggregate	2.5 mm
Mixing ratio	2.75 - 3.25 litres of water per bag (11.0-13.0%)
Consumption	approximately 20.4 kg/m ² per cm of thickness
Fresh density	approximately 2290 kg/m ³
Mixture consistency	Fluid
Workability time (+20°C)	80 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 12.0%)

Feature	Test method	Regulatory requirement	Product performance
Compression strength	UNI EN 12190 UNI EN 196-1	≥ 45 MPa at 28 days	1 days > 30 MPa 7 days > 55 MPa 28 days > 75 MPa
Flexural strength	UNI EN 196-1	none	1 days > 5 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	$\leq 0.5 \text{ kg} \cdot \text{m}^{-2} \cdot \text{h}^{-0.5}$	$< 0.15 \text{ kg} \cdot \text{m}^{-2} \cdot \text{h}^{-0.5}$
Reaction to fire (Euroclass)	EN 13501-1	-	A1

Additional performance

(The performance data shown below was obtained with a water content of 12.0%)

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 < 10 mm
Arching/warping test	-	Aching to demonstrate expansive behaviour	Arching

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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