MasterCrete THI 405

Class R2 cementitious mortar, thixotropic, polymer-modified, reinforced with synthetic fibres, formulated for smoothing concrete surfaces with thicknesses from 1 to 3 mm in a single layer.

Material description

MasterCrete THI 405 is a one-component, thixotropic, fine-grained, polymer-modified cementitious mortar with high durability performance (class R2 in accordance with EN 1504-3), made from high-performance hydraulic binders, fine selected aggregates, synthetic polyacrylonitrile (PAN) reinforcing fibres and special admixtures.
MasterCrete THI 405 is suitable for smoothing concrete surfaces, with application thicknesses ranging from 1 to 3 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 the concrete substrate.

Main uses

The fine-grained, thixotropic, polymer-modified cementitious mortar **MasterCrete THI 405** allows for the smoothing of concrete structures, both horizontally and vertically, ensuring maximum effectiveness and durability. It can be applied manually with a flat trowel or sprayed using a suitable machine, in thicknesses ranging from 1 to 3 mm in a single layer.
Some examples of application are:

- smoothing of existing concrete surfaces requiring thin surface concrete repair and protection
- smoothing of surfaces that have been completely or partially restored using repair products from the **MasterCrete** range.

Features

- **plastic shrinkage crack resistance**: **MasterCrete THI 405** is reinforced with polyacrylonitrile (PAN) synthetic fibres, which reduce the risk of surface micro-cracking during the plastic phase of the product.
- **excellent adhesion** on properly prepared substrates, both horizontally and vertically, even overhead;
- **excellent durability characteristics**, helps protect reinforced concrete structures by offering good resistance to CO_2 and water penetration

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 R2), UNI EN 1504-2 (MC and IR) and the relevant DoP (Declaration of Performance).

CE 1305
EN 1504-2 Concrete surface protection systems Category MC-IR

CE 1305
EN 1504-3 CC mortar for concrete repair CLASS R2

Consumption

Approximately 1.6 kg/m^2 per mm of thickness.

Packaging and storage

MasterCrete THI 405 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

- The concrete surface to be smoothed with **MasterCrete THI 405** must be perfectly clean, solid, without degraded, loose or detached parts, without irregularities that could compromise the application of the product, and free of cement laitance, traces of release agents, or any substance that could affect the adhesion of the product to the substrate.
- Once the above has been verified, you can proceed according to the possible scenarios described below:
  - If it is not necessary to restore degraded areas or repair significant surface irregularities, the substrate

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must still be made slightly rough by sandblasting, hydro-sandblasting or high-pressure washing.
- If, on the other hand, the substrate has significant irregularities or is significantly uneven, these must be repaired, after adequate treatment and saturation of the dry substrate surface with water, using fine-grained cortical repair mortars from the **MasterCrete** range.
- If the substrate shows deterioration with thicknesses to be restored exceeding 1 cm and any exposed reinforcement rods, the latter must be treated with the **MasterCrete** range passivating mortar, while the appropriate **MasterCrete** line product must be used for the volume to be restored, depending on the nature of the work.

- Any structural joints, expansion joints or discontinuities subject to continuous dynamic stress must be adequately treated using elastic strips or sealants from the **MasterJoint** range.
- Before applying **MasterCrete THI 405**, ensure that the substrate is also dust-free and saturated with water but with a dry surface; in any case, there should be no traces of water on the surface, which should be removed with compressed air or absorbent sponges if necessary.

Preparation of mortar

Pour 3/4 of the necessary water into a clean, sufficiently large container to create the final mixture. Gradually add the powder while mixing with a mechanical mortar mixer or drill with a whisk attachment, at low speed (< 500 rpm) to avoid excessive air incorporation. Continue mixing and add the remaining water to the mixture to comply with the mixing ratios indicated herein,until the mixture is smooth and lump-free.
Leave the dough to rest for a few minutes, then stir for about a minute.
The workability time of the product at 20°C is approximately 60 minutes.

Installation

For manual application of **MasterCrete THI 405**, use a smooth trowel to apply a thin layer, applying constant pressure to promote adhesion of the product to the substrate, then complete with a second coat of product on the first layer while it is still fresh, to achieve a final thickness of maximum 3 mm.
For spray applications using a non-continuous plastering machine. Using a machine application, **MasterCrete THI 405** can be applied in a single continuous layer with a thickness of 3 mm.
For highly heterogeneous substrates, we recommend the use of a reinforcement mesh (e.g., A.R. glass fiber mesh for skim coats with a weight greater than 100 g/m^2).

Ageing and maturation

In environmental conditions such as dry, very windy or particularly hot climates, curing carefully the applied product to prevent excessive and sudden drying of the product itself. In such cases, proceed by keeping the surface moist with sprayed water.

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 THI 405** 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.

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Technical data

Product identification data	
Packaging	25 kg bags
Powder colour	Grey
Maximum size of the aggregate	1 mm
Mixing ratio	4.25 - 4.75 litres of water per bag (17-19%)
Consumption	approximately 1.6 kg/m^2 per mm of thickness
Fresh density	approximately 1900 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)	R2
Category (EN 1504-2)	MC-IR
Type	CC cementitious mortar
Chloride ion content (EN 1015-17) – minimum requirement ≤0.05%	< 0.05%
Applicable layer thickness (minimum/maximum)	1 mm / 3 mm

Performance – UNI EN 1504-2

(The performance values shown below are obtained in accordance with UNI EN 1504-2 for a dry thickness of 2 mm)

Feature	Test method	Regulatory requirement	Product performance
Adhesion to concrete	UNI EN 1542 (MC 0.40 substrate – UNI EN 1766) – Rigid without traffic	≥ 1.0 MPa	> 3.0 MPa
Water permeability as capillary absorption coefficient	EN 1062-3	W < 0.1 kg/m^{2}h$^{0.5}$	W < 0.1 kg/m^{2}h$^{0.5}$
Water vapour permeability	EN 7783-1	Class I, Sd < 5 m Class II, 5 m ≤ Sd ≤ 50 m Class III, Sd > 50 m	Class I, Sd < 1.5 m

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Performance – UNI EN 1504-3

(The performance data shown below was obtained in accordance with UNI EN 1504-3 with a water content of 18.0%)

Feature	Test method	Regulatory requirement	Product performance
Compression strength	EN 12190 EN 196-1	≥ 15 MPa at 28 days	1 day > 15 MPa 7 days > 30 MPa 28 days > 38 MPa
Flexural strength	EN 196-1	nobody	1 day > 4 MPa 7 days > 5 MPa 28 days > 6.5 MPa
Adhesion to concrete	EN 1542 (MC 0.40 substrate – UNI EN 1766)	≥ 0.8 MPa	> 3.0 MPa
Resistance to freeze-thaw cycles with de-icing salts	EN 1542 after the UNI EN 13687/1 cycles on an MC 0.40-type substrate.	≥ 0.8 MPa	≥ 3.0 MPa
Resistance to accelerated carbonation	EN 13295	Carbonation depth ≤ 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	EN 13057	≤ 0.5 $kg \cdot m^{-2} \cdot h^{-0.5}$	≤0.2 $kg \cdot m^{-2} \cdot h^{-0.5}$
Reaction to fire (Euroclass)	EN 13501-1	-	A2, S1-d0

Additional performance

(The performance data shown below was obtained with a water content of 18.0%)

Feature	Test method	Regulatory requirement	Product performance
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

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).

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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.

Master Builders Solutions Italia Spa
Via Vicinale delle Corti, 21 – 31100 Treviso – Italia
T +39 0422 429200 F +39 0422 421802
www.master-builders-solutions.com/it-it
e-mail: infomac@masterbuilders.com