

MAPETHERM TILE SYSTEM XL

System for the application of large format and thin ceramic tiles on external thermal insulation systems

DESCRIPTION

The increasing use of external thermal insulation systems, aimed at improving thermal comfort in buildings, led to study and develop **MAPETHERM TILE SYSTEM "XL"**, a specific system allowing the application on insulating panels of ceramic, natural stone and reconstructed stone coverings, as an alternative to traditional mineral-based finishes.

The international acronym used to identify external thermal insulation systems is ETICS (External Thermal Insulation Composite System).

MAPETHERM TILE SYSTEM "XL" technical characteristics allow to:

- Realise external insulation systems covered with thin ceramic tiles up to 100x150 cm in size and traditional thickness ceramic tiles (8 to 10 mm) up to 60x120 cm in size.
- Ensure a continuous thermal insulation thanks to the application of an insulating covering on the building's façade, which corrects thermal bridges and reduces the effect of abrupt and significant variations in the outdoor temperature on the structure and walls.
- Realise a thermal insulation system which is compliant with the regulatory requirements for the energy certification of newly built or renovated buildings.



- | | |
|----|---|
| 1 | Render INTOMAP R2 FIBRO |
| 2 | Adhesive for insulating panels MAPETHERM AR1 GG |
| 3 | Thermal insulation panel |
| 4 | Structural render (1 st coat) PLANITOP HDM MAXI |
| 5 | Alkali-resistant glass fibre mesh MAPEGRID G 120 |
| 6 | Anchor + thermal break washer MAPETHERM TILE-EJOT SDF-S PLUS Ø 8 UB + MAPETHERM TILE-EJOT SBV-P 8/90 K |
| 7 | Structural render (2 nd coat) PLANITOP HDM MAXI |
| 8 | Tile adhesive ULTRALITE S2 FLEX |
| 9 | Tiles - any type |
| 10 | Grout ULTRACOLOR PLUS |
| 11 | Sigillante MAPESIL LM |

INNOVATION OF THE SYSTEM

Unlike usual coloured finishes, the application of large format ceramic tiles on external insulation systems requires a substrate with higher mechanical strength in comparison with traditional skimcoats usually applied on thermal insulation panels.

For this reason, the covering must be supported through a structural render realised with **Planitop HDM Maxi**, two-component, high ductility pozzolan-reaction, fibre-reinforced mortar classified as R2 according to EN 1504-3 and G-M15 according to EN 998-2. Thanks to its high content of resins and synthetic fibres **Planitop HDM Maxi** has a high coefficient of adhesion and creates a compact, strong layer which is impermeable to water and resistant to freeze-thaw cycles after hardening. This characteristics make **Planitop HDM Maxi** the ideal product for laying ceramic coverings, since it protects both the panels and the underlying masonry. A special primed, alkali-resistant glass fibre based mesh must be embedded in **Planitop HDM Maxi**, which is **Mapegrid G 120**, characterised by high durability in alkaline environments and suitable for the realisation of reinforced skimcoats.

To complete the support system for the ceramic tiles, **MAPETHERM TILE- EJOT SDF-S PLUS Ø 8 UB** high performance screw anchor with high load and bending moment, certified ETA 04/0064, must be secured to the underlying structure and used in combination with the additional thermal break washer **MAPETHERM TILE -EJOT SBV-P 8/90 K**.

In addition to typical thermal performances of traditional external insulation systems, **MAPETHERM TILE SYSTEM "XL"** also has the following advantages:

- wide range of coverings possible
- high durability over time
- easy installation and maintenance

APPLICATION PROCEDURE

1. General assessment and preparation of perimeter walls

A correct preparation and evaluation of the walls is essential for the successful application of **MAPETHERM TILE SYSTEM "XL"**.

- The wall on which the system is to be applied must be flat, otherwise it will be necessary to realise a render surface which, once completely cured, is not subject to capillary rising damp, mechanically strong and regular, in order to prevent the formation of gaps between substrate-adhesive and insulating panel. The substrate must be perfectly clean and free from any substance that could compromise the adhesion of the panel to the substrate (such as detaching parts, dust, dirt, grease, form-release agents, old paint or degraded render etc.).
- The colour of the covering must be taken into consideration. According to the characteristics of the substrate and the deformation that the covering will be subjected to, a suitable ceramic covering must be selected, with a light colour shade and in particular with a reflectance index over 20%.

2. Preparation of the substrate

In case the flatness and verticality requirements of the perimeter walls cannot be met, realise a levelling render with products such as **Intomap R2 Fibro**.

According to the type of substrate (when an adhesion promoter is required) the application of an anchoring scratch-coat of approx 3 to 5 mm thickness may be necessary. To realise an anchoring scratch-coat that can uniform the absorbency of the substrate and improve the adhesion of the following render, mix **Intomap R2 Fibro** with **Planicrete** latex, diluted with 1:2 water by weight.

3. Positioning the profiles

When the substrate is dry and completely cured, apply **MAPETHERM-EJOT PRO BSOP PVC** support profiles, to be integrated with **MAPETHERM-EJOT PRO SOP PVC** base closure profile.

4. Application of adhesive for insulating panels

After waiting for the render to be cured (10 days per cm of thickness), apply the panels using **Mapetherm AR1 GG** adhesives, or alternatively **Mapetherm AR1** or **Mapetherm AR1 Maxi**. Apply the adhesive for thermal insulating panels with the double buttering technique. Spread the adhesive uniformly both on the substrate and the back of the panel using a suitable 10/12 mm square notched trowel, in order to completely cover the back of the panel.

5. Application of insulating panels

- Insulating panels included in the system must be suitable for external thermal insulation systems, CE marked and made of EPS or EPS with graphite, mineral wool (for other types of insulation panels, please consult MAPEI Technical Service); thickness of the panels is to be defined according to the calculation of heat loss, carried out by a thermotechnician.
- Consider the option of using highly insulating panels to correct thermal bridges in parapets and frames of doors and windows.
- Apply the panels on the substrate in horizontal rows, staggered at 50% of the length. Accurately press them together to better distribute the adhesive and avoid gaps. The panels must be protected from rain both during application and storage phase.
- Where doors and windows openings are located, use a whole panel in which suitably corners can be cropped.



- Where building corners are located, application must be carried out applying alternate panels in overlapped and staggered rows. This process is fundamental to correctly distribute tension and guarantee the system's resistance and durability over time.



- Any gaps between insulating panels must be accurately filled in all their depth with a piece of the same insulating material; never grout the gaps by inserting smoothing mortar.
- During application respect existing or planned structural joints, which must be protected with **MAPETHERM-EJOT DFP-CO-E** profiles, in case of flat joints, or with **MAPETHERM-EJOT DFP-CO-V** profiles, in case of corner joints.
- In correspondence with all corners and openings use **MAPETHERM-EJOT PRO GEW PVC** corner profile, with pre-mounted alkali-resistant glass fibre mesh.
- Insert **Mapefoam** polyethylene foam cord and then seal with one-component acrylic sealant in water dispersion **Mapeflex AC4** between joints of the thermal insulation system and other areas of the building (such as parapets, window frames and openings in general), to prevent any contact of the insulating panel with the external environment.

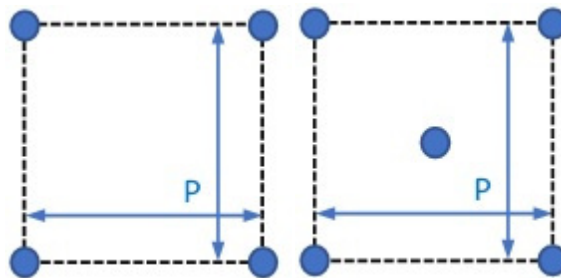
6. Realisation of reinforced skimcoat

- Once the adhesive has hardened, after at least 2-3 days from the application of panels, create a structural render using **Planitop HDM Maxi**, to be applied in two subsequent coats, the first being 4 to 5 mm thick, for a total thickness of approx 8 to 10 mm.

- Apply **Mapegrid G 120** on the mortar while still fresh, overlapping adjacent sheets by at least 5 cm.
- In correspondence with window and door openings apply an additional reinforcement with 35 x 20 cm mesh sections, to be applied obliquely to the openings, in order to prevent the formation of cracks in corners where the system's mechanical stress is concentrated. Such reinforcement must be positioned and embedded using **Planitop HDM Maxi**.



- Then fasten the insulating panels to the substrate on the still fresh mortar using anchors such as **MAPETHERM TILE- EJOT SDF-S PLUS Ø 8 UB**, always combined with **MAPETHERM TILE -EJOT SBV-P 8/90 K** washers. The anchor must be inserted down the hole until the washer is held against the **Mapegrid G 120** mesh. Anchors must have a suitable length, so that they are fastened to the solid substrate underneath (the anchoring depth of the specific anchor used must be taken into consideration). The amount of anchors per m² depends on their positioning (P) and on the presence or absence of a central anchor, according to the following application schemes (calculate approx. 5 anchors per m² with P = 60 cm):



Consult MAPEI Technical Service Department to determine the correct length and amount of anchors to apply.

Within 24 hours from the application of the first coat of **Planitop HDM Maxi** apply the second coat of mortar to obtain a thickness of 4 to 5 mm.

7. Application of the ceramic covering

- According to MAPEI experience and to the peculiarity of the system, as well as great stress and tension generated by dimensional variations of the covering due to thermal gradients and direct sunlight exposure, the selection of light coloured tiles is recommended (reflectance index over 20%).
- The ceramic tiles must be applied using a suitable adhesive, selected according to format and type of tiles and according to overall laying conditions. Use highly deformable C2 S2 class adhesives according to EN 12004, such as **Ultralite S2 Flex** or, in case a quick setting adhesive is required, **Ultralite S2 Flex Quick** or **Elastorapid**.
- Apply the adhesive with the double buttering technique both on the substrate and the back of the tile using a suitable notched trowel to ensure complete wetting. Tap the tiles with a suitable rubber trowel to ensure the correct wetting of the adhesive on the back of the tile.
- Lay the tiles using the levelling systems **MAPELEVEL EASY WDG SYSTEM** (made of spacers and levelling wedges), planning grouts at least 4 mm wide and perimeter and expansion joints approximately every 9 m².
- Limit the cutting of shaped tiles in correspondence with openings.

- The designer might suggest a suitable mechanical fastener for the single tiles. The anchoring must be carried out within the thickness of the applied **Planitop HDM Maxi**.

8. Grouting of joints

Once the adhesive has completely hardened, grouting can be carried out using a cementitious mortar such as **Ultracolor Plus**.

- The suitable width of grouts must be defined according to current regulations.
- Before grouting, make sure that joints are clean, free of dust and empty for at least 2/3 of the tile thickness. Any adhesive residues present or refluxed during application must be removed while still fresh or afterwards by mechanical means, using cutters, abrasive scrapers etc.

9. Sealing of joints

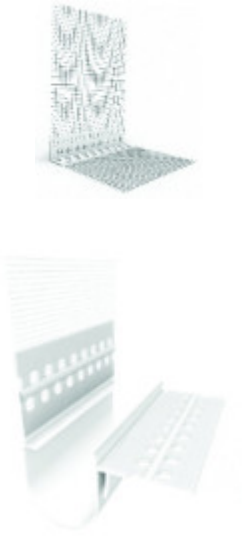
- Seal joints with a suitable flexible sealant such as **Mapesil LM**, after inserting **Mapectofoam** in case of traditional thickness tiles.
- The size of joints must be defined according to current regulations.
- Joints must be realised in correspondence with corners, edges, fittings and all architectonic elements that interrupt the covered surface's continuity. The realised expansion joints must allow a correct attenuation of thermal deformations on the covering. Always respect the dimension and position of existing structural joints.

WARNING

- Before applying the system all construction elements must be designed (openings, joints, staggering of panels, etc.).
- The system is conceived for buildings with a maximum height of 20 m, for greater heights consult MAPEI Technical Service Department.
- The ceramic tiles covering must be light coloured (reflectance index over 20%).
- The maximum format specified for ceramic tiles 100x150 cm for low thickness, 60x120 cm for 8 to 10 mm traditional thickness is indicative and has to be evaluated according to the specific work. Please consult MAPEI Technical Service Department.
- In the event of rainy weather, avoid water infiltrations during application.
- Apply the adhesive evenly on the whole surface of the panels to be installed, avoiding the beads and spots application and thus reducing the formation of gaps.
- To determine the correct amount of anchors consult MAPEI Technical Service Department, so that pull-off tests on the masonry can be evaluated and the walls characteristics and quality can be assessed in order to correctly define the number and length of the anchors to be used.
- Information regarding safety and handling of the products are contained in the safety data sheets for each product used in the system. We recommend that protective goggles and gloves are always used when mixing and applying the products.
- For further information about the single products and their use always refer to the respective Technical Data Sheets, available from our website www.mapei.com.

In case of applications that differ from the ones directly reported in this System Data Sheet and for specific data about the single products, please contact MAPEI S.p.A. Technical Service Department.

MAPETHERM TILE SYSTEM "XL" PRODUCTS				
PHASE			PRODUCT	CONSUMPTION*
	1	General assessment	–	–
	2	Levelling render (if required)	INTOMAP R2 FIBRO	14 kg/m ² per cm
	3	Support profile and base closure profile	MAPETHERM-EJOT PRO BSOP MAPETHERM-EJOT PRO SOP	–
	4	Adhesives for application of insulating panel	MAPETHERM AR1 MAPETHERM AR1 GG MAPETHERM AR1 MAXI	4.5 kg/m ² 4.5 kg/m ² 4.5 kg/m ²
		Thermal insulation panels	–	–

	5.	Profiles for corners and expansion joints	MAPETHERM-EJOT PRO GEW MAPETHERM-EJOT DFP-CO-E MAPETHERM-EJOT DFP-CO-V	–
		Sealing of joints between the thermal insulation system and other areas of the building	MAPEFOAM + MAPEFLEX AC4	Variable according to the size of the joints
	6	Structural render	PLANITOP HDM MAXI MAPEGRID G 120 MAPETHERM TILE- EJOT SDF-S PLUS Ø 8 UB + MAPETHERM TILE - EJOT SBV-P 8/90 K	15 kg/m ² per cm 1.1 m/m ² 5 pcs/m ²

	7	Adhesives for laying tiles: – normal setting – quick setting	ULTRALITE S2 FLEX ULTRALITE S2 FLEX QUICK ELASTORAPID	2.5 kg/m ² 2.5 kg/m ² 5 kg/m ²
	8	Grouting of joints	ULTRACOLOR PLUS	Variable according to the size of the joint
	9	Sealing joints	MAPESIL LM	Variable according to the size of the joint

* Consumption values are merely, always refer to the product's Technical Data Sheet and contact MAPEI Technical Service Department for a more accurate calculation based on the specific work

Mapei S.p.A.

Via Cafiero, 22, 20158, Milano



+39-02-376731



www.mapei.com



mapei@mapei.it

6148-10-2021-EN

Any reproduction of texts, photos and illustrations published here is prohibited and subject to prosecution

