Mapetherm® MW System

EXTERNAL THERMAL INSULATION COMPOSITE SYSTEM (ETICS)
ETA 21/0950

DESCRIPTION

MAPETHERM MW SYSTEM is a **thermal insulation system** by MAPEI and consists of **bonding insulating panels in mineral wool,** directly on suitably prepared external walls, masonry, render, concrete or wall coatings, skimming the surface, embedding the reinforcing fibreglass mesh in the skim coat and then applying a decorative, protective finishing coat.

With this system it is possible to optimise performance properties and characteristics of a building: **living comfort**, protection for built structures, compliance with current legislation and standards, **energy savings**, lower running costs for central heating and air-conditioning systems and, above all, **a reduction in the emission of pollutants**.

COMPONENTS OF THE SYSTEM

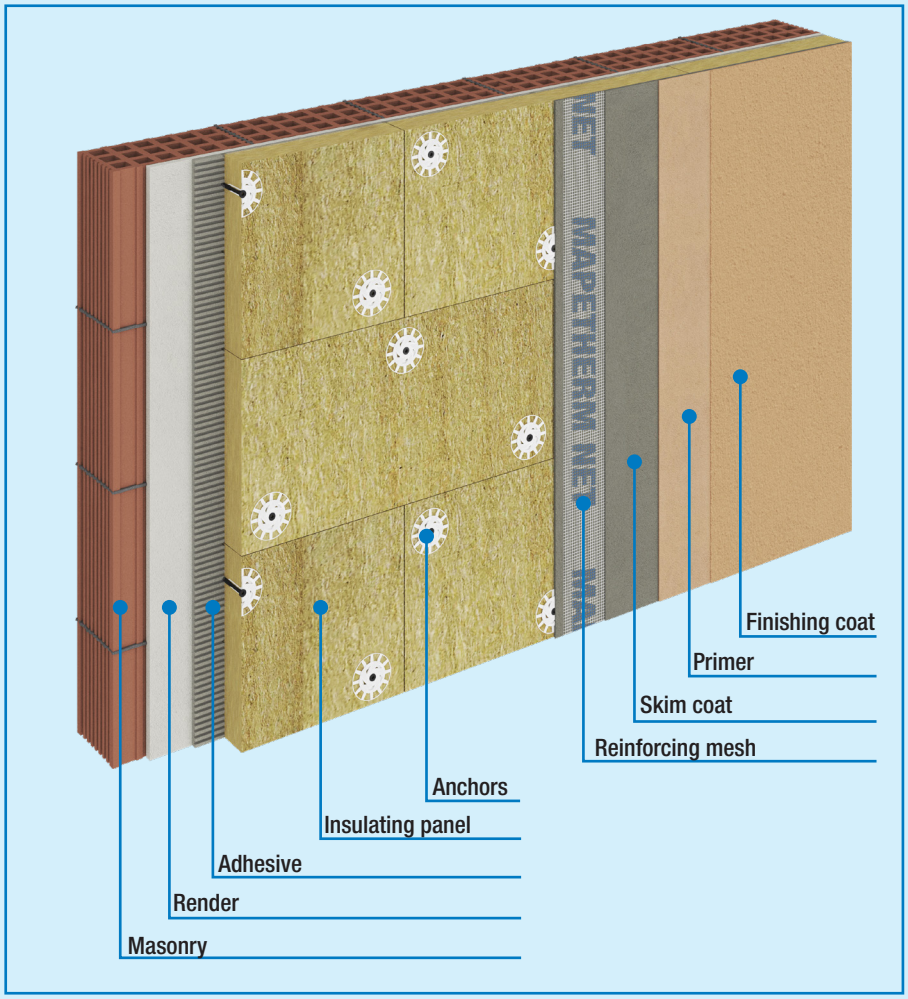
The external insulation system is made up of several components and must be evaluated and taken into consideration in its entirety. Each single element must be compatible with all the others in order to guarantee the performance properties and the service life of the system

- **Adhesive:**
  This is the most important element in the system and must maintain its adhesion properties over time, withstand considerable stresses and counteract the effect of thermal expansion the insulating panels are subjected to.

- **Insulating panel:**
  Panels with the **CE marking according to EN 13162** must be used and which have been declared as suitable for External Thermal Insulation Composite Systems (ETICS) according to EN 13500.
  The system may be used to upgrade the energy efficiency of public and private buildings.
  The overall thickness should be calculated by an engineer familiar with dimensioning this type of system, which is based on several factors (type of building, stratigraphic layout of the walls, climate zone and applicable norms and standards).

- **Anchors:**
  Even though it is the adhesive that has the task of binding the system together, fastening the insulating panels in place mechanically with special anchors is an important safety feature.
  The properties of the anchors, the number required, and their layout should be determined according to the type of substrate, the type of insulating panel, the bonding system employed, the shape and height of the building and wind loads.
  For all these reasons it is recommended to use anchors that comply with the prescriptions in **European Assessment Document - EAD 330196-01-0604**.

- **Skim coat (base render):**
  This is the second most important connecting element of the system and must guarantee that the elements remain bonded over the years, it must help counteract the thermal-hygrometric tensions (expansion and contraction of the insulating panels in particular) and give the whole system a high level of mechanical strength.



Mapetherm® MW System

SYSTEM EVALUATED ACCORDING TO **EAD 040083-00-0404** WITH **ETA 21/0950**		
MAPETHERM MW SYSTEM COMPONENTS		
Component	**Products**	**Description**
ADHESIVE	**Mapetherm AR1** **Mapetherm AR1 GG**	one-component fine-textured cementitious mortar one-component medium-textured cementitious mortar
INSULATING PANEL	Generic panel of mineral wool	Generic insulation board made of rock wool Generic insulation board made of glass wool
ANCHOR	**Mapetherm-Ejotherm STR U 2G** **Mapetherm-Ejotherm STR H** **Mapetherm-Ejotherm H2** **Mapetherm-Ejot H3** **Mapetherm- Ejotherm S1** **Mapetherm-Ejotherm S1 short** **Mapetherm-Ejot SBL 140 plus** **Mapetherm-Ejot VT 90** **Mapetherm-Ejotherm VT 2G**	Screw-in anchor with steel core for countersunk and surface fixed installation Anchor for countersunk and surface fixed installation on wood substrates or dry structures. Universal hammer-in anchor with steel core Hammer-in anchor Screw-in anchor Screw-in anchor for lower thicknesses Combi washer for mineral wool panels Combi washer for mineral wool panels Washer for countersunk installation into mineral wool panels.
SKIM COAT	**Mapetherm AR1** **Mapetherm AR1 GG**	one-component fine-textured cementitious mortar one-component medium-textured cementitious mortar
REINFORCING MESH	**Mapetherm Net**	alkali-resistant fibreglass mesh
PRIMER	**Malech** **Quarzolite Base Coat** **Silancolor Base Coat** **Silancolor Base Coat Plus** **Silancolor Primer** **Silancolor Primer Plus**	transparent acrylic primer coloured acrylic undercoat coloured silicone undercoat coloured silicone undercoat with hygienising properties transparent siloxane primer transparent siloxane primer with hygienising properties
FINISHING COAT/DRESSING	**Elastocolor Tonachino Plus** **Quarzolite Tonachino** – standard or **Plus** **Silancolor AC Tonachino** – standard or **Plus** **Silancolor Tonachino** – standard or **Plus**	Elastomeric hygienising coating Acrylic coating – standard or hygienising Acrylic-silicone coating – standard or hygienising Silicone coating – standard or hygienising

ACCESSORIES MAPETHERM MW SYSTEM	
Products	**Description**
Mapetherm-Ejot DFP-CO-E	PVC profile for expansion joints
Mapetherm-Ejot DFP-CO-V	PVC profile for expansion joints
Mapetherm-Ejot ISO-BLOCO	Sealing tape
Mapetherm-Ejot Pro BSOP	PVC starter profile
Mapetherm-Ejot Pro SOP	PVC-basebead profile with fibreglass mesh
Mapetherm-Ejot Pro GEW	PVC corner profile with integrated fibreglass mesh
Mapetherm-Ejot Pro GAP	PVC profile for doors and windows with integrated mesh
Mapetherm-Ejot Pro TKP	PVC angular drip edge profile with mesh
Mapetherm-Ejot Iso-Spirale	Spiral anchor for installation of light weight elements
Mapetherm-Ejot Iso-Dart	Installation system for light to medium weight elements
Mapetherm-Set Ejot Iso-Bar	Façade anchor for medium to heavy weight elements
Mapetherm-Ejot Iso-Bloc	Mounting MW-element for planned assembly of light loads
Mapetherm Iso-Corner	Mounting element for planned assembly of medium-heavy loads

- **Reinforcing mesh:**
  Glass fibre mesh is required to distribute the stress and increase the system's resistance to impact loads. It must be treated with anti-alkali primer to protect it against the basic pH levels of the skimming product it is embedded in and must be woven in such a way that it distributes loads correctly. It must also be **tested according to EAD 040016-00-0404**.

- **Primer:**
  Primer is used to prepare surfaces to be covered with the final finishing coat to prevent unevenness in colour and to even out the absorption level of the substrate. If a coloured primer is used (base coat) the finish is more even and its covering capacity is improved. Solvent-based primers must not be used because they could react with the insulating panels and alter their characteristics or cause them to become detached.

- **Finishing coat:**
  An external insulation system must be protected against thermal-hygrometric stresses and the surrounding environment with specific finishing products. They are generally quite thick with a textured finish and are applied using special systems to guarantee specific performance characteristics.
  Apart from being sufficiently plastic to prevent cracks forming and having balanced performance characteristics in terms of water absorption and permeability to water vapour, they must also guarantee colour stability and must be able to resist the aggressive action of algae and mould. The colour of the finishing coat should be chosen in order to protect the system from high temperatures on the surface when exposed to direct sunlight and then generating higher stresses within the system. It is recommended to use a shade with Light Reflectance Value LRV ≥ 20%.

APPLICATION OF THE SYSTEM

1. General checks
For a correct installation, it is recommended to carry out the following preliminary checks:
- Make sure there is no rising damp.
- Check the waterproofing conditions of all the elements that may have problems of water infiltration (parapet walls, balconies, terraces, roofs, etc.). These structures must be suitably protected (flashing, eaves, etc.) with drainer to allow rainwater to run off in a controlled manner.

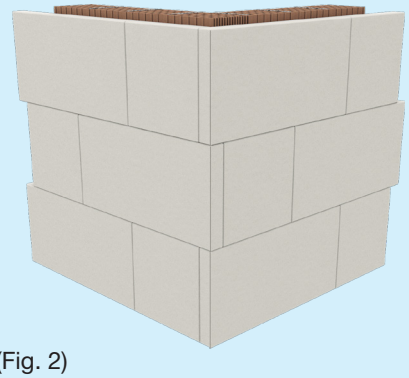
2. Substrate preparation *(see TM section 6.1)*
- The substrate must be compact and strong have, no areas with loose parts and no traces of dust, grease, oil, adhesive, etc.
- Eliminate any dust present on the surface of the substrate using **MALECH** water-based acrylic primer diluted according to the substrate absorption, to even out the surface and improve adhesion.
- It is recommended to eliminate any great unevenness in the surface with render, such as **INTOMAP R2 FIBRO**, after checking the substrate carefully.
- Before proceeding with the next stage of installation, wait until the restored surfaces are fully cured.

3. Installation of support and protection profiles *(see TM section 6.2)*
Before installing the insulating panels, starter profiles should be positioned, such as **MAPETHERM-EJOT PRO BSOP** PVC starter profiles, integrated with **MAPETHERM-EJOT PRO SOP** PVC base profiles with incorporated glass fibre mesh.
Take into consideration whether other support profiles are to be used, such as side guards, below windowsills, flashings, etc.

4. Installation of insulating panels *(see TM section 6.3)*
Apply **MAPETHERM** cementitious mortar using a notched trowel to form a layer of adhesive on the back of the panels. If the substrate is not flat enough for the panels (out of flat by more than 0.5 cm), apply beads and spots of adhesive to cover at least 40% of the bonding surface.

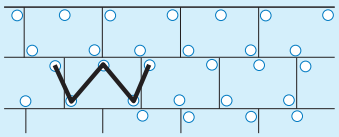
- The panels must be protected from any rainfall both in the application and storage phases.
- Position the panels on the substrate in horizontal rows, staggering them by 50% of their length (and always by at least 25 cm). Make sure they are butted against one another without gaps. Press the panels down firmly to make sure the adhesive is evenly distributed and make sure no adhesive manages to seep between the panels.
- Whole panels should be used around door and window openings and trimmed to suit (Fig. 1)
- At the edges and corners of the building, install the panels by staggering them in overlapping rows (Fig. 2)
- To obtain a valuable final aesthetic effect, during installation, with the adhesive still fresh, check, and if necessary settle, the flatness of the insulating panels using an aluminium straightedge.
- Gaps between panels must be filled to their full depth with pieces of the same insulating material. Never fill gaps with skim coat.
- When installing the panels follow the position of existing or design "structural" joints and protect them with **MAPETHERM-EJOT DFP-CO-E** profiles in the case of straight joints and with **MAPETHERM-EJOT DFP-CO-V** for corner joints.

(Fig. 1)



(Fig. 2)

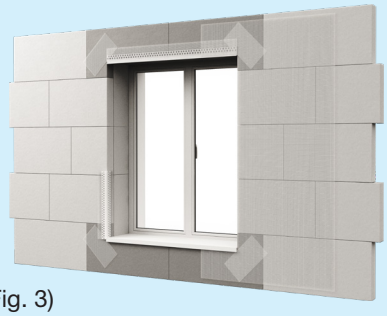
5. Mechanical fastening *(see TM section 6.4)*
Anchors may be used in addition to the adhesive, but not instead of the adhesive, to mechanically fasten the insulating panels in place. They should be inserted into the load-bearing area of the substrate to the depth prescribed once the adhesive has hardened.
For panels made of fibrous material, use a "**W**" layout for the anchors so they can help the adhesive and skimming compound contrast thermal expansion in the panels.



The holes for the anchors must be drilled after the adhesive has hardened using a drill-bit with the same diameter as the stem of the anchor. A hammer-drill should only be used to drill holes into concrete or solid bricks.
The anchor must be inserted so that the washer sits flush with the surface of the insulating panel. Use anchors such as **MAPETHERM-EJOTHERM S1**, **MAPETHERM-EJOTHERM STR U 2G** (screw-in) or **MAPETHERM-EJOTHERM H2**, **MAPETHERM-EJOT H3** (hammer-in). **MAPETHERM-EJOTHERM STR U 2G**

can also be used for countersunk installation, placing the special anchor cap made of insulating material.
In case of countersunk installation on dual-density panels, use the specific match combination washer **MAPETHERM-EJOTHERM VT 2G**.
Each anchor must be inserted to form a perfect grip, otherwise it must be removed, and the hole must be sealed with special insulating foam. Then insert a new anchor, nearby making sure it is inserted in correspondence with the underlying adhesive.

6. Reinforcing and protective elements (*see TM section 6.5*
Using the same skimming product, position pieces (30 x 40 cm) of **MAPETHERM NET** reinforcing mesh diagonally around all the edges and corners of doors and windows (Fig. 3) to counteract the effect of stresses concentrated in these sections to prevent cracking.
Use **MAPETHERM-EJOT PRO GEW** PVC corner profiles with incorporated alkali-resistant glass fibre mesh around corners and around door and window openings.
To prevent water infiltration in the system and the insulating panel coming into contact, at any point, with the other parts of the building (windowsills, window reveals, other openings, etc.), apply **MAPETHERM EJOT ISO-BLOCO** sealing tape between the panel and the connecting joints of the system.



(Fig. 3)

7. Application of the reinforced skim coat (*see TM section 6.6)*
At least 2-3 days after installing the insulating panels, and only once the adhesive has hardened, apply the reinforced skimming coat.
Considering the nature of the panel, it might be appropriate to apply a preliminary levelling layer with **MAPETHERM AR1** or **MAPETHERM AR1 GG** to obtain an aesthetic result of absolute importance.
Apply a layer of **MAPETHERM AR1** or **MAPETHERM AR1 GG** and, when still fresh, embed the reinforced alkali-resistant fiberglass mesh, from the top working downwards, taking care to overlap adjacent sheet of mesh by at least 10 cm. Be very careful when positioning the mesh to avoid forming bubbles or creases in the mesh.
The mesh should be placed in the outer third of the overall layer of the skimming mortar.
After about 24 hours, and only when the first coat has hardened, apply a second coat of **MAPETHERM AR1** or **MAPETHERM AR1 GG**. Spread it evenly so that it completely covers the mesh with a skimming layer of at least 1 mm thick .
The suggested total thickness of the reinforced skim coat is of 5 mm.

8. Application of the finishing coat (*see TM section 6.8)*
Wait until the skim coat has fully cured: at least 15 days for cementitious skim coat and at least 48 hours for organic skim coat; these times refer to curing in good weather conditions.
The finishing cycle includes the application of primer compatible with the final finishing coat/dressing.
Once the primer has completely dried, apply a finishing coat of textured coating paste with a stainless steel or plastic trowel, starting from the top working downwards, and finish off the surface with a sponge or plastic float, depending on the type of product applied.
Textured coating products must be used for this application to counteract the formation of cracks.
Textured coatings with a grain size of at least 1.2 mm may be applied in a single coat, while finer textured products must be applied in several coats until they form a layer at least 1.2 mm thick.
Work should only be interrupted when an entire surface has been coated and it is recommended to use appropriate application methods and sufficient manpower to prevent visible joints.
It is recommended to use finishing products that are known to be effective (according to **EN 15457 and EN 15458**) in contrasting the formation and growth of mould and algae (PLUS range by MAPEI).
The protective finishing cycle must take into consideration the architectural features of the building, the area in which it has been built, the local climate and the instructions given by the designer engineer and Works Director.

WARNING

- Before installing the system, all construction features and details must be mapped out (openings, joints, staggering of the panels, etc.);
- Do not install **MAPETHERM MW SYSTEM** on metal surfaces or on sublayers subject to great movements. In such cases, please contact MAPEI Technical Services team from the Structural Strengthening line.
- Do not use on dehumidifying render or on masonry with rising damp, unless previously treated.
- Make sure the site is equipped with suitable protection means to prevent water seeping in while work is being carried out in the case of rainy weather.
- All the components for **MAPETHERM MW SYSTEM**, should be stored in a dry area including on site storage, to protect their original packaging and away from direct sunlight or other sources of heat.
- Protect the insulating panels from rain both during application and while being stored. Do not use damaged or dirty panels.
- To ensure the panels bond firmly to masonry, do not apply if the surrounding temperature or the temperature of the substrate is lower than +5°C or higher than +35°C.
- Recommendations and guidelines regarding safe handling and safety precautions of the products are contained in the Safety Data Sheet for each single component in the system. It is recommended to wear protective gloves and goggles when mixing and applying the products.

For applications other than those indicated in this System Data Sheet, and for information on each single product, please contact MAPEI Technical Services.

Please refer to the specific "external thermal insulation" Technical Manual for further information about the characteristics and application details of the system and to the Data Sheets for each single product, which are available for download from the company website www.mapei.com