MAPETHERM AR1

Cementitious mortar for bonding and levelling boards in external thermal insulation system (ETICS) and for smoothing masonry - fine grain size

BENEFITS AND FEATURES

- Maximum adhesion
- Ideal for critical substrates
- Fine grain size: closed and compact texture

DESCRIPTION

Mapetherm AR1 is a powdered cementitious mortar made of cement, fine-grained selected aggregates, synthetic resins, and special additives. When mixed with water, it forms a homogeneous mortar with the following characteristics:

- high thixotropy, which allows vertical application without dripping or slippage of the insulation boards;
- perfect adhesion to all types of insulation boards and to the main substrates used in construction, such as skim coats, traditional renders, old paints and well-adhered plastic coatings, bricks, concrete, and fibre cement;
- hardening without significant shrinkage.

Mapetherm AR1 complies with EAD Guidelines 040083-00-0404 (*) and EAD 040287-00-0404 (**) and is suitable for use as both an adhesive and a levelling compound for external thermal insulation systems (ETICS), including Mapei systems with European Technical Assessment (ETA):

- ETA 21/0945 – **Mapetherm PIR System**
- ETA 21/0946 – **Mapetherm XPS System**
- ETA 21/0947 – **Mapetherm EPS System**
- ETA 21/0950 – **Mapetherm MW System**
- ETA 22/0775 – **Mapetherm PU Foam Bonded System**
- ETA 22/0854 – **Mapetherm MW Tile System S/M/XL**
- ETA 22/0855 – **Mapetherm EPS Tile System S/M/XL**

Mapetherm AR1 is CE marked according to the harmonized standard EN 998-1 (***) and is suitable for skim coats, including reinforced coats, for both interior and exterior masonry applications.

(*) External Thermal Insulation Composite System (ETICS) with renderings
(**) Kits for ETICS with panels as thermal insulation product and discontinuous claddings as exterior skin

(***) Specification for mortar for masonry – Part 1: Rendering and plastering mortar

WHERE TO USE

- External thermal insulation systems (ETICS): reinforced bonding and levelling of insulation boards (EPS, XPS, PIR, phenolic foam, mineral wool, wood fiber, cork, aerogel, etc.) on walls or ceilings, applied directly onto renders, masonry, concrete, or wooden substrates (such as OSB-3 and CLT).
- Levelling coats, including reinforced coats, for both interior and exterior applications.
- Reinforced levelling coats on boards (fiber-cement type) used as cladding for ventilated façades in exterior applications.

RECOMMENDATIONS

- Do not use **Mapetherm AR1** to bond insulating boards on metal surfaces or on substrates undergoing a large amount of movement.
- Do not use on boards with smooth surfaces that prevent adequate adhesion, such as mineral wool with kraft paper facing, extruded polystyrene with a skin, etc.
- Do not bond insulating boards on deteriorated substrates or crumbling render/paints.
- Do not use on days with strong winds.
- During the summer season, protect the façade where the intervention is taking place with suitable shading sheets.
- Do not apply to dehumidifying plasters and renders.

APPLICATION PROCEDURE

Preparation of the substrate

The substrate must be perfectly compact, sound, and clean (free of grease, oils, adhesives, etc.). In the case of old paints or coatings, it must be well-adhered and stable. It is recommended to properly prepare the substrate by mechanically removing all loose or poorly bonded parts, and then washing all surfaces with water to eliminate dust residues that could prevent proper adhesion.

It is recommended to remove any significant surface irregularities by applying plasters or renders from the MAPEI **Building Line** and/or **Renovation & Restoration Line**, after careful assessment of the substrate.

Before proceeding with subsequent intervention steps, ensure that the restored surfaces are fully cured.

In the case of highly absorbent substrates, or substrates with surface dust and poor cohesion, apply a properly diluted coat of **Malech**, a water-based acrylic primer, leveling agent, and adhesion promoter.

Gypsum substrates must be perfectly dry and free of dust before being treated with **Primer G**, prior to bonding insulation boards with **Mapetherm AR1**.

Preparation of the product

Pour clean water into a bucket and gradually add **Mapetherm AR1** while mixing, in the recommended ratio (approx. 5–6 litres of water per 25 kg of powder). Stir the mix, preferably with a mixer at low-speed, until a smooth, creamy, lump-free paste is obtained. Let the mixture rest for approximately 5 minutes and then briefly remix before use, avoiding exposure to direct sunlight. The mix obtained as described above remains workable for approx. 3 hours.

Application of the product

Installation of insulation boards for ETICS

Bonding

Apply the **Mapetherm AR1** mixture directly onto the board over the entire surface using a 10 mm notched trowel for flat substrates, or in beads and spots where the substrate is uneven (height differences between 5 mm and

10 mm), ensuring that at least 40 % of the board surface is covered with adhesive. After installing the boards, press them down well to guarantee good adherence with the substrate and check flatness with a straightedge.

Application of reinforced levelling coat

Once the adhesive on the insulation boards has fully hardened (under standard conditions, after at least 24 hours), apply the first coat of **Mapetherm AR1** as a levelling compound at a thickness of approximately 2.5–3 mm. Place the alkali-resistant glass fibre reinforcing mesh **Mapetherm Net** on the first layer of levelling compound while still fresh, overlapping adjacent pieces of mesh by at least 10 cm. After approximately 24 hours, and once the previous coat has fully dried, apply a second coat of **Mapetherm AR1** levelling mortar at 1–1.5 mm thickness to create a homogeneous and uniform layer, ensuring that the mesh is completely covered by at least 1 mm of mortar. Recommended total thickness of the reinforced layer: approx. 4 mm.

Simple or reinforced levelling coat on masonry

Apply a first levelling coat of **Mapetherm AR1** to achieve a sufficiently homogeneous surface (maximum thickness per coat: 3 mm). Where needed, place the alkali-resistant glass fibre reinforcing mesh **Mapetherm Net** on the levelling compound while still fresh, overlapping adjacent pieces of mesh by at least 10 cm. After approximately 24 hours, and once the previous coat has fully dried, apply a second coat of **Mapetherm AR1** levelling mortar to create a homogeneous and uniform layer, ensuring that the mesh is completely covered by at least 1 mm of mortar.

CLEANING

Tools and containers used for the application must be washed with clean water before the mixture dries.

CONSUMPTION

Consumption is heavily influenced by the roughness of the substrate and the application method used. In the case of a homogeneous substrate, the indicative consumption is:

- Bonding of insulating boards by bead-and-spot application: approx. 3.0–4.0 kg/m^2
- Full-surface bonding of insulating boards application: approx. 4.0–6.0 kg/m^2
- Reinforced levelling coat: (recommended thickness 4 mm in 2 coats): approx. 1.3-1.5 kg/m^2 per mm of thickness

PACKAGING

Mapetherm AR1 is supplied in 25 kg paper bags.

STORAGE

When stored in its original packaging, in a dry area, away from heat sources, at a temperature between +5°C and +30°C, the shelf life of **Mapetherm AR1** is 12 months. Protect from frost.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the SDS available from our website www.mapei.com.

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

Consistency:	powder
Colour:	grey
Maximum size of aggregate:	approx. 0.50 mm

APPLICATION DATA (at +23°C and 50% R.H.)	
Mixing ratio (with water):	21-24% (equal to 5-6 liters per 25 kg of powder)
Density of the mix:	approx. 1450 kg/m^3
Application temperature:	from +5°C to +35°C
Pot life:	approx. 3 h
Open time:	approx. 20'
Waiting time before the finishing coat application:	15 days **Note: In the event of rain or high humidity, normal drying times increase; it is recommended to provide adequate protective measures (e.g. scaffold sheeting).**
Consumption (depending on the roughness of the substrate and the type of application)	▪ Bonding of insulating boards by bead-and-spot application: **approx. 3.0-4.0 kg/m^2** ▪ Full-surface bonding of insulating boards application: **approx. 4.0–6.0 kg/m^2** ▪ Reinforced levelling coat: approx. **1.3-1.5 kg/m^2** per mm of thickness

PERFORMANCE CHARACTERISTICS in accordance with EN 998-1		
Performance characteristic	**Test method**	**RESULTS AND COMPLIANCE WITH REQUIREMENTS**
Density of the hardened product:	EN 1015-10	approx. 1250kg/m^3
Compressive strength after 28 days:	EN 1015-11	≥ 8.00 MPa Category CS IV
Adhesion to substrate (concrete):	EN 1015-12	≥ 1.00 MPa Failure Pattern (FP) = B
Water absorption due to capillary action:	EN 1015-18	≤ 0.20 kg/(m^{2}min$^{0.5}$) Category W_C2
Water vapour permeability coefficient (μ):	EN 1015-19	≤ 15
Thermal conductivity ($\lambda_{10\ dry}$):	EN 1745	0.34 W/mK
Reaction to fire:	EN 13501-1	Euroclass A1

OTHER CHARACTERISTICS	
Modulus of elasticity:	6000 MPa

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

LEGAL NOTICE

The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in force at the time of the MAPEI product installation.

The most up-to-date TDS can be downloaded from our website www.mapei.com.

ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.

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