MAPEI

Mapetherm AR1

One component cementitious mortar for bonding and levelling thermal insulating panels and insulation cladding systems

WHERE TO USE

Bonding all types of thermal insulation panels (foam/extruded polystyrene, foam polystyrene, mineral fibres, cork, etc.) directly on render, brickwork or concrete walls or ceilings.

Smoothing thermal insulation panels with embedded fibreglass reinforcing mesh on internal and external walls (thermal insulation cladding).

Some application examples

Bonding and smoothing insulating panels in interior areas and external foamed insulation on:

- cementitious renders or cement lime mortar renders;
- concrete;
- concrete blocks.

Also suitable for bonding and smoothing the following systems:

- insulation of the heating niches;
- insulation of under-tile roofing;
- insulation of attic room floors;
- internal insulation of room walls which are not underground;
- internal insulation of wall to floor walls in cellars/basements;
- internal insulation of mansard roofs;
- external insulation of ventilated façades.

TECHNICAL CHARACTERISTICS

Mapetherm AR1 is a grey powder consisting of cement, selected fine grained sands, synthetic resins and special additives prepared according to a formula developed in the MAPEI research laboratories. Mixed with water, **Mapetherm AR1** becomes a mortar with the following characteristics:

- low viscosity therefore easy to trowel;
- highly thixotropic: **Mapetherm AR1** can be applied on vertical surfaces without sagging and without letting even large sized insulating panels slip;
- perfect bonding to all materials normally used in building;
- hardens without noticeable shrinkage.

RECOMMENDATIONS

- Do not use **Mapetherm AR1** to bond insulating panels on metal surfaces or on substrates subject to strong movement (wood, asbestos cement, etc.).

Mapetherm AR1

Applying Mapetherm AR1 on the back of the panel and spot bonding with a trowel

Applying Mapetherm AR1 on the back of the panel with a notched trowel

Installing the insulating panels

- Do not use if the panels have a smooth surface; good bonding may be impeded: foam polyurethane or mineral fibres with a surface coating of kraft paper, fibreglass gauze, extruded polystyrene with a surface skin, high density pressed foam polystyrene, etc.

- Do not bond insulating panels on damaged substrates or renders. In these cases always secure with anchors nylon mechanical fixings with additional centre nail for final fixation.

APPLICATION PROCEDURE

Substrate preparation

The substrate must be sound, free from dust and loose parts, oils, glue, etc.

Gypsum substrates (hand or machine applied renders, prefabricated panels, etc.) must be perfectly dry and free of dust. Insulation panels must be treated with **Primer G**, **Mapeprim SP** or **Mapeprim 1K** before bonding them with **Mapetherm AR1**.

It is recommended to use **Nivoplan** to even out variations in cementitious surface levels.

Preparing the mix

Pour **Mapetherm AR1** into a bucket containing 22% (by weight of powder) of clean water (approx. 5.5 l of water for 25 kg of powder). Mix with a low-speed mixer, until a homogeneous and lump free paste is obtained. After 5 minutes standing it should be restirred. The mix is workable for at least 3 hours.

Applying the mix

As adhesive

Apply the **Mapetherm AR1** directly on the whole surface of the back of the panel with a notched trowel or in dabs by trowel.

Large sized panels must be bonded over the whole surface.

Small sized panels can be spot bonded or only on the edges of the panel. Follow the panel manufacturer's instructions for the installation procedure.

Once the panels have been installed, apply strong pressure over the panels so they can adhere well to the substrate. Check the level with a straight edge.

As basecoat

At least 24 hours after installing the panels, apply a uniform coat of **Mapetherm AR1** over them and insert the **Mapetherm Net** fibreglass mesh.
The alkali resistant **Mapetherm Net** must be pressed into the fresh mixture with a flat trowel. Joints of reinforcing mesh must be overlapped by at least 10 cm.

This ensure a sound and even surface and a finishing coat can be applied only when the smoothing compound has hardened and cured.

Cleaning

Tools and containers can be cleaned with water while **Mapetherm AR1** is still fresh.

CONSUMPTION

Bonding of insulating panels:	2-4 kg/m²
Bonding insulating panels with a uniform layer on the back of the panel, using a N. 10 notched trowel:	4-6 kg/m²
Smoothing:	1.3-1.5 kg/m² per mm of thickness (recommended thickness: 4 mm in 2 coats)

PACKAGING

Mapetherm AR1 is supplied in 25 kg paper bags.

STORAGE

Mapetherm AR1, kept in a dry place and in its original packing, can be stored for 12 months.
Manufactured in compliance with the regulations of the 2003/53/EC Directive.

SAFETY INSTRUCTION FOR PREPARATION AND APPLICATION

Mapetherm AR1 contains cement that in contact with sweat or other body fluids produces an irritant alkaline and allergic reaction for those predisposed.
Use gloves and protective goggles.
For further information refer to the Safety Data Sheet.

WARNING

Although the technical details and recommendations contained in this 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 applications: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application: in every case, the user alone is fully responsible for any consequences deriving from the use of the product.

All relevant references of the product are available upon request

TECHNICAL DATA (typical values)

PRODUCT IDENTITY	
Consistency:	powder
Colour:	grey
Bulk density (kg/m³):	1300
Dry solid content (%):	100
Storage:	12 months in a dry place in original unopened packaging
Hazard classification according to EC 1999/45:	irritant. Before using refer to the "Safety instructions for preparation and application" paragraph and the information on the packaging and Safety Data Sheet
Customs class:	3824 50 90
APPLICATION DATA (at +23°C - 50% R.H.)	
Mix ratio:	100 parts **Mapetherm AR1** with 21-23 parts water by weight
Consistency of mix:	paste
Density of mix (g/cm³):	1.45
Application temperature range:	from +5°C to +40°C
pH of the mix:	13
Pot life:	3 hours
Open time:	30 minutes
Adjustability time:	40 minutes
Waiting time before finishing:	7 days
FINAL PERFORMANCES	
Bonding strength according to EN 12004 (N/mm²): **– after 24 hours:** **– initial (after 28 days):** **– after heat treatment (+70°C):** **– after immersion in water:**	 0.7 2.0 2.7 0.8
Flexural strength **– after 28 days (N/mm²):**	 4.5
Compressive strength **– after 28 days (N/mm²):**	 9.0
Temperature when in use:	from –30°C to +90°C
PERFORMANCE FIGURES CERTIFIED ACCORDING TO ETAG 004, AS INDICATED BY CERTIFICATE N° ETA 04/0061 (USING A PANEL OF STYROFOAM IB-A PRODUCED BY DOW CHEMICAL)	
Particle edge distribution of the product:	**%** / **mm** 100.00 / 1.00 100.00 / 0.80 97.90 / 0.50 58.78 / 0.20 27.50 / 0.04
Retention of water used for blending (%):	0.17
FINAL PERFORMANCES (WITHOUT REINFORCEMENT)	
Modulus of elasticity (N/mm²): **– after 28 days:** **– after hygrothermic cycles:**	 484.81 572.856
Tensile strength (N): **– after 28 days:** **– after hygrothermic cycles:**	 419.38 586.24
Elongation at break (%): **– after 28 days:** **– after hygrothermic cycles:**	 0.77 1.96
Bonding strength on Styrofoam IB-A insulation panel, produced by Dow Chemical (N/mm²): **– in dry conditions:** **– 2 days immersion + 2 hours at +23°C - 50% R.H.:** **– 2 days immersion + 7 days at +23°C - 50% R.H.:**	 0.13 (minimum value required: 0.08) 0.17 (minimum value required: 0.03) 0.31 (minimum value required: 0.08)
Bonding strength to concrete (N/mm²): **– in dry conditions:** **– 2 days immersion + 2 hours at +23°C - 50% R.H.:** **– 2 days immersion + 7 days at +23°C - 50% R.H.:**	 1.24 (minimum value required: 0.25) 0.61 (minimum value required: 0.08) 0.99 (minimum value required: 0.25)
Bonding strength on bricks (N/mm²): **– in dry conditions:** **– 2 days immersion + 2 hours at +23°C - 50% R.H.:** **– 2 days immersion + 7 days at +23°C - 50% R.H.:**	 0.95 (minimum value required: 0.25) 0.46 (minimum value required: 0.08) 0.85 (minimum value required: 0.25)

Applying pressure on the panels once they have been installed. This is to ensure a good bonding to the surface

Smoothing insulating panels: spreading the Mapetherm AR1

Smoothing insulating panels reinforced with a Fibreglass Mesh drowned into the coat of Mapetherm AR1

Mapetherm AR1

Bonding the insulating blocks to the façade with Mapetherm AR1

Private villa with foamed heating insulation - Hungary

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457-5-2006