

Mapei systems for radiating floor heating with high thermal efficiency

**PRODUCTS FOR CERAMIC TILES
AND STONE MATERIAL**



MAPEI systems for radiating floor heating with

Radiating panels are heating and cooling systems that use the heat from water flowing through pipe-work installed below the surfaces of rooms.

In modern building work, the use of various types and thicknesses of radiating floor panels is becoming increasingly common in both new buildings and old buildings being renovated.

With most systems, the heating principle is based on warm water (usually between +30°C and +40°C) or cold water (depending on the time of year) circulating through elements spread over a very large radiating surface area.

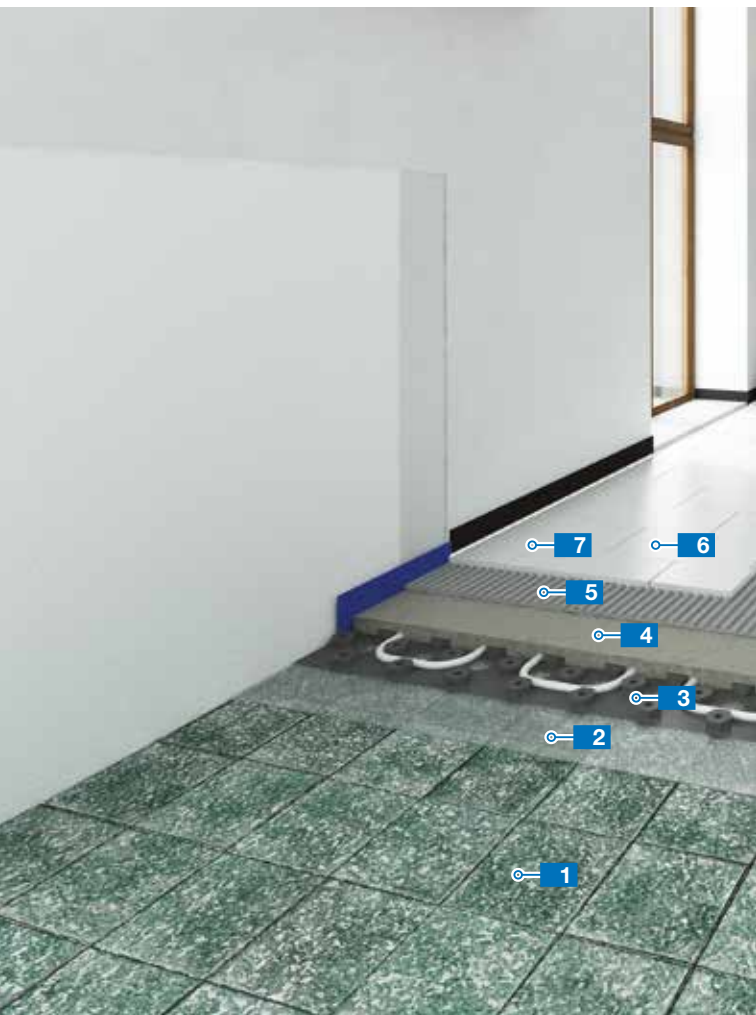
The advantages of this type of system in controlling the temperature of rooms are quite clear:

- 1.** It is an extremely advantageous system regarding the uniformity of radiated heat, with a marked improvement in living comfort. Living comfort is high because the heating system transfers heat to rooms by radiating heat from the lower part of the room towards the upper part, rather than by convection (as with conventional high-temperature radiator systems). This means that the temperature is even in all parts of the heated room.
- 2.** If modified accordingly, a radiating floor panel system may also be used to cool down rooms during the summer. In this case, cold water at approx. +10°C flows through the pipe-work to guarantee rooms are kept cool without having to install air-conditioning systems or fans on the ceiling, with savings in living space and noise levels. An integrated de-humidifying system is required to prevent the formation of condensation and high levels of humidity.

3. Because only low temperature water is required, radiating panels are also suitable for use in combination with solar panels. The system is made using suitable insulating panels on which flexible pipes (polythene pipes are generally used for modern systems) forming spirals or coils are positioned. Depending on which type of system is used, it is then embedded in a screed or self-levelling smoothing and levelling compound with appropriate performance characteristics which also forms the substrate on which the final floor covering is installed.

Mapei is also present in this sector with a series of consolidated systems comprising ready-mixed screed binders and mortars, primers and adhesion promoters, self-levelling smoothing and levelling compounds and elastic adhesives, grouting mortars and sealants which guarantee the stability, excellent deformability and long service life of the flooring.





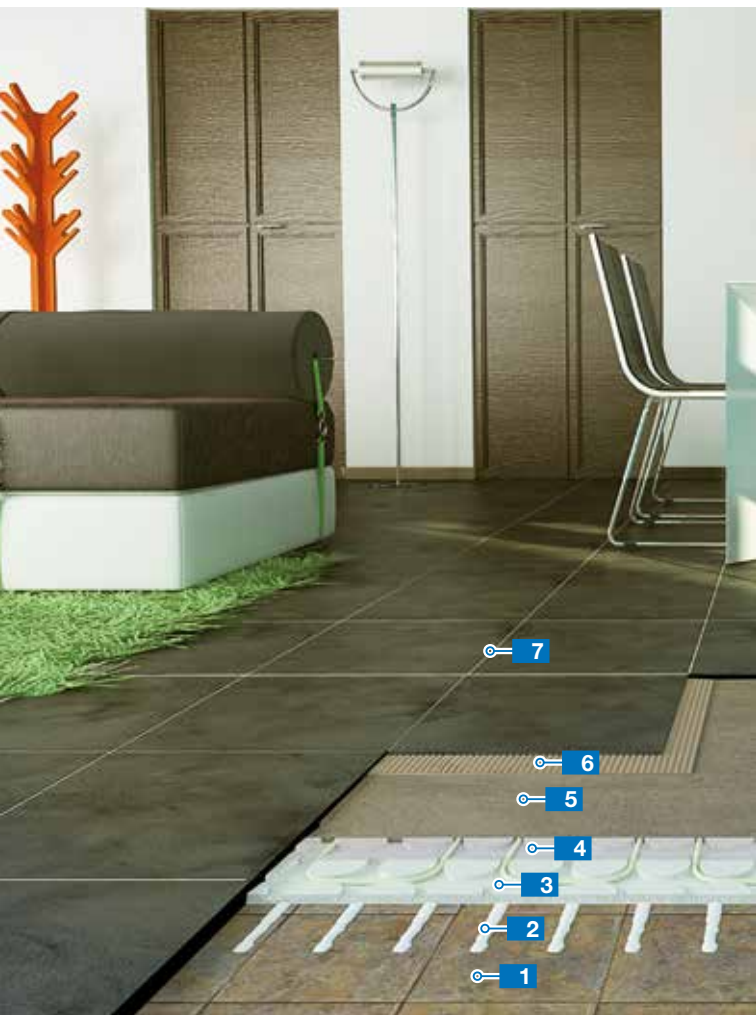
- 1 Porcelain tiles flooring
- 2 Primer
Eco Prim T
- 3 Plastic panel
- 4 Levelling compound
Novoplan Maxi
- 5 Adhesive
Keraflex Maxi S1 Zero

Thin heating systems made from plastic panels on existing substrates



6 Thin porcelain tiles

7 Grout
Ultracolor Plus



- 1 Existing flooring
- 2 Adhesive
Ultrabond MS Rapid
- 3 Gypsum or cement fibreboard panels
- 4 Primer
Eco Prim T
- 5 Levelling compound
Novoplan Maxi

Thin heating systems made from gypsum or cement fibreboard panels on existing substrates



8

- 6 Adhesive
Ultralite S1
- 7 Grout
Ultracolor Plus
- 8 Thin porcelain tiles flooring

Thin heating systems made from plastic panels on existing substrates

Thin radiating systems made from self-adhesive, pre-formed plastic panels may be embedded and levelled off with **Novoplan Maxi** over any type of existing floor, as long as it is clean, strong, dry and sufficiently flat. The preparation cycle and type of primer used depends on the characteristics of the substrate (e.g. on ceramic tiles, apply **Eco Prim T** before installing the panels. More information available from Mapei Technical Services Department). The thickness of **Novoplan Maxi** above the panel must be at least 3 mm.

Novoplan Maxi is a ready-mixed, self-levelling product suitable for filling and levelling all types of thin radiating systems made from plastic, gypsum fibreboard or cement fibreboard panels installed directly on an existing floor or screed.

Novoplan Maxi is classified as CT-C20-F4-A1_{fl} according to the EN 13813 standard and its coefficient thermal conductivity " λ " = 1,727 W/mK, certified by an independent standards body.

Novoplan Maxi: rapid-hardening, free-flowing cementitious levelling mortar with high thermal efficiency ($\lambda = 1.727$ W/mK)

Technical data

Workability time:	30-40 minutes
Thickness applied:	from 3 to 40 mm
Set to light foot traffic:	approx. 3 hours
Waiting time before installation:	from 12 hours for ceramic and natural stone flooring not sensitive to damp from 24 to 72 hours for resilients and wood (depending on thickness)
EMICODE:	EC1 R Plus - very low emission
Application:	trowel or pump
Consumption:	1.8 kg/m ² per mm of thickness
Packaging:	25 kg bags
Thermal conductivity:	$\lambda = 1.727$ W/mK

Eco Prim T: solvent-free acrylic primer with very low emission of volatile organic compounds (VOC) for absorbent and non-absorbent substrates

Technical data

Consistency:	fluid
Colour:	white
Dilution rate:	neat on non-absorbent surfaces, 1 : 1 or 1 : 2 on absorbent surfaces
Waiting time before installing panels:	2-5 hours depending on surrounding conditions and absorption of the substrate
Dry solids content:	43%
In service temperature range:	from -20°C to +80°C
EMICODE:	EC1 Plus - very low emission
Application:	roller, brush or spray
Consumption:	0.10-0.20 kg/m ²
Packaging:	20 and 5 kg drums

Thin heating systems made from gypsum or cement fibreboard panels on existing substrates

Thin radiating systems made from gypsum fibreboard or cement fibreboard panels must be installed and fastened firmly in place on a substrate that is clean, strong, dry and sufficiently flat. Bond the panels with **Ultrabond MS Rapid** applied in beads around 30 cm apart. Before levelling off the surface with **Novoplan Maxi**, remove all traces of dust from the panels and prime them with **Eco Prim T**. The thickness of the smoothing and levelling product must be at least 3 mm.

Ultrabond MS Rapid: rapid-setting assembly adhesive for internal and external use with a high grab effect

Technical data

Viscosity:	thixotropic paste
Density:	1.55 kg/l
Open time:	5'
Initial tensile strength:	25 N
Final tensile strength:	30 kg/cm ²
Hardening time:	approx. 2 h
EMICODE:	EC1 R Plus - very low emission
Colour:	white
Application:	silicone gun
Consumption:	5 metres of bead, triangular section
Packaging:	300 ml cartridges





- 1** Substrate
- 2** Soundproofing membrane
Mapesilent Roll
- 3** Insulating panel
- 4** Screed
Topcem Pronto

Heating/cooling systems with a screed over insulating panels



5 Adhesive
Ultrabond Eco S948 1K

6 Wood

Heating/cooling systems with a screed over insulating panels

Screeds made from **Topcem** or **Topcem Pronto** are characterised by their rapid drying times (4 days) and high mechanical strength. They are suitable for installing any type of flooring (except resin-based) in residential and commercial environments.

Their short drying times and rapid development of mechanical strength reduces waiting times before commissioning the heating system for the first time, just 4 days compared with 21 days with traditional screeds.

Topcem Pronto is classified CT-C30-F6-A1, according to EN 13813 standard and its coefficient of thermal conductivity “λ” is 2.008 W/mK, as certified by an independent standards body.

Ready-mixed **Topcem Pronto** and **Mapecem Pronto** are the optimum technical solution for this type of radiating system and permit screeds to be made that comply with the directives of the current edition of Euronorm EN 1264-4.

Topcem Pronto: ready-mixed, ready-to-use, normal-setting, controlled-shrinkage mortar for quick-drying (4 days) screeds with high thermal efficiency ($\lambda = 2.008 \text{ W/mk}$)

Technical data

Mixing ratio:	1 25 kg bag of Topcem Pronto with 1.7 litres of water
Workability time:	60 minutes
Set to light foot traffic:	12 hours
Waiting time before installation:	24 hours for ceramic, 2 days for natural stone and 4 days for resilients and wood
Residual moisture after 4 days:	less than 2%
EMICODE:	EC1 R Plus - very low emission
Storage:	12 months
Application:	tamping and levelling
Consumption:	18-20 kg/m ² per cm of thickness depending on the amount of compaction
Packaging:	25 kg bags



Screeds made from **Mapecem** or **Mapecem Pronto** are characterised by their rapid hardening times (set to light foot traffic 3-4 h), rapid drying times (24 h) and high mechanical strength (> 60 MPa) and are suitable for any type of flooring.

With **Mapecem Pronto**, the heating system may be commissioned the first time just 24 hours after installing the screed.

Mapecem Pronto is classified as CT-C60-F10-A1_{fl} according to EN 13813.

Mapecem Pronto: ready-mixed, ready-to-use, rapid-setting and drying (24 hours), controlled-shrinkage mortar for screeds

Technical data

Mixing ratio:	1 25 kg bag of Mapecem Pronto with approx. 2.2 litres of water
Workability time:	20-30 minutes
Set to foot traffic:	2-3 hours
Waiting time before installation:	3 hours for ceramic and natural stone; 24 hours for resilients and wood
Residual moisture after 24 h:	less than 2%
Consumption:	20 kg/m ² per cm of thickness
Packaging:	25 kg bags

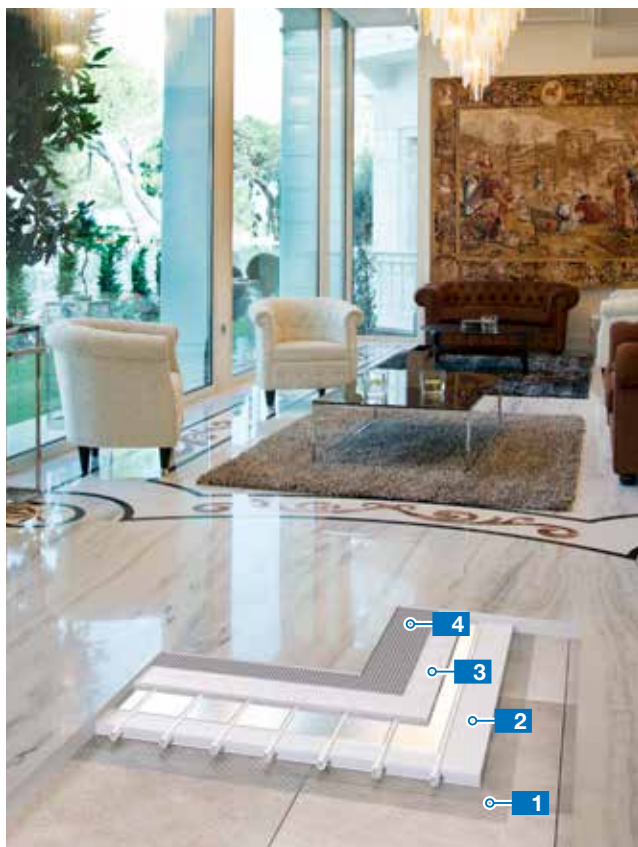


Dry-installed underfloor heating systems

Dry-installed underfloor heating systems allow renovation work to be carried out in inhabited areas without having to carry out any demolition or repair work. They are usually made from pre-formed panels placed over the substrate (screed or an old floor), if flat enough, using **Mapecontact** reinforced double-sided tape, which is positioned on the floor so that it forms a perfect bond along the long sides and in the middle of the panel. The pipework for the system is then placed in position and a double, staggered layer of steel or gypsum-fibre panels are dry-laid over the pipework.

When steel panels are used it is possible to form a complete system measuring less than 3 cm thick. The floor covering is then installed over the second layer using **Ultrabond Eco PU 2K**.

When gypsum-fibre panels are used instead of metal panels, thin surface needs to be primed with **Primer G** diluted 1:1 with water and then the floor-covering is installed with a highly deformable adhesive such as **Ultralite S2** or **Ultralite S2 Quick**.



- 1** Dry-adhesive tape
Mapecontact
- 2** Dry-installed underfloor heating panel
- 3** Double steel panel
- 4** Adhesive
Ultrabond Eco PU 2K

Church of Saints Salvatore and Margherita
Busto Garolfo - Milan

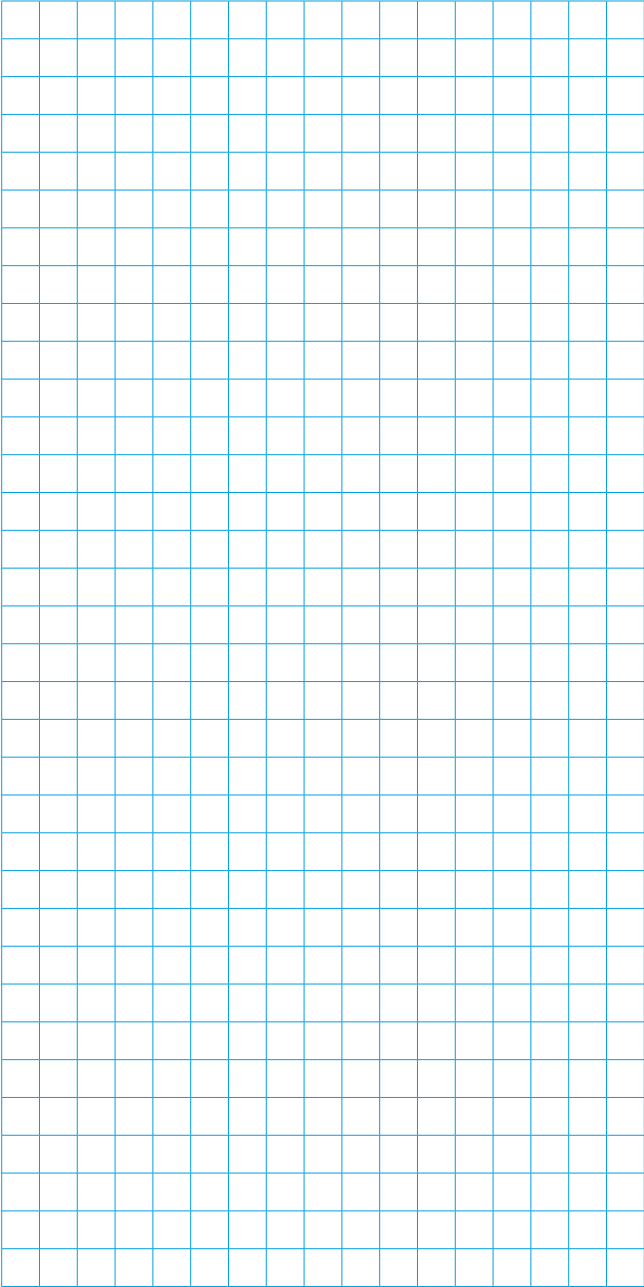


Heated screed made from **Topcem Pronto**



Applying **Novoplan Maxi** to create a thin heated floor

Notes



HEAD OFFICE
MAPEI S.p.A.
Via Cafiero, 22 - 20158 Milan
Tel. +39-02-37673.1
Fax +39-02-37673.214
Internet: www.mapei.com
E-mail: mapei@mapei.it

