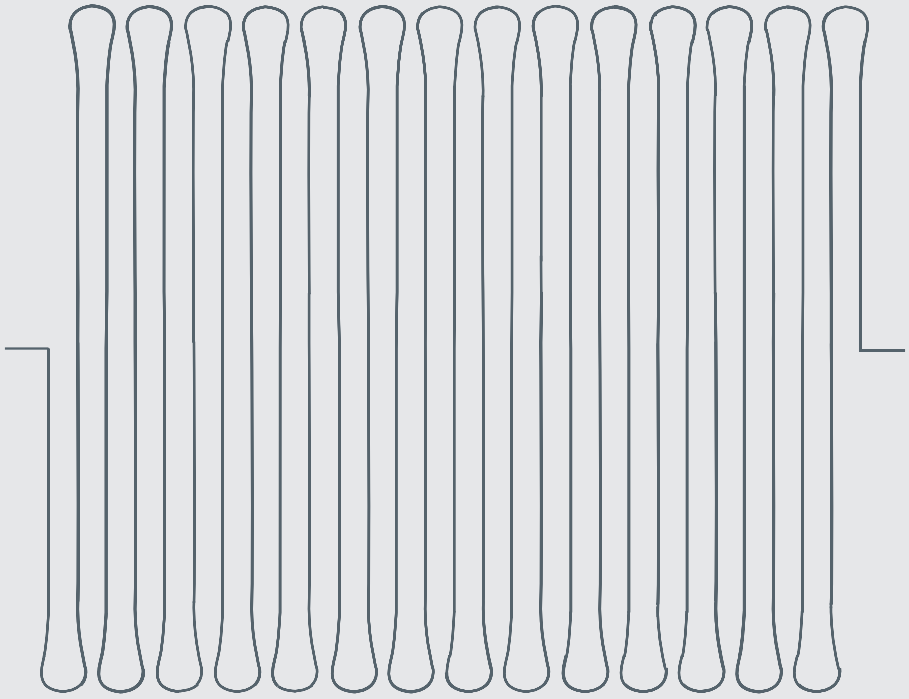
RBM



Kilma Futura

The new system
of air conditioning **dry radiant**

Made in Italy

High or low inertia?

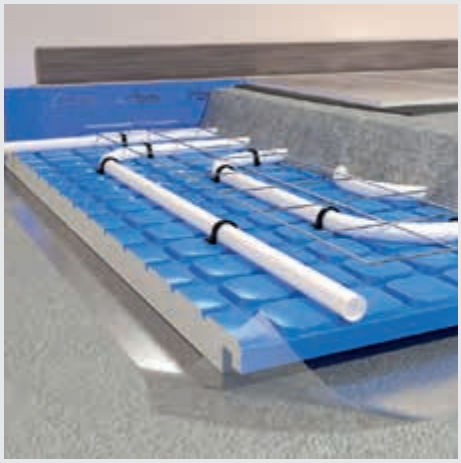
To make a radiant floor system,
you can choose between systems of different types,
depending on the intended use and characteristics of the building, whether it is new or to be renovated.

Depending on their ability to store,
retain and release heat, high and low thermal inertia radiant floor systems are distinguished.

RBM Kilma,
radiant systems
100% Italian

Traditional

RADIANT SYSTEMS WITH **HIGH THERMAL INERTIA**



High inertia systems are particularly suitable for buildings that require constant and continuous heating and, in general, for buildings that are more thermally dispersive.

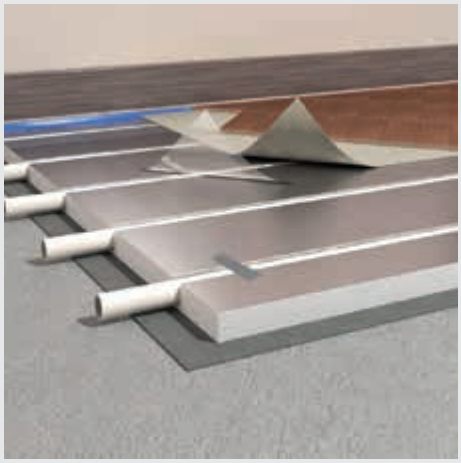
Pipes embedded in concrete screed

At full capacity in about 7 hours

Total thickness greater than 8 cm

Kilma Futura

RADIANT SYSTEMS WITH **LOW THERMAL INERTIA**

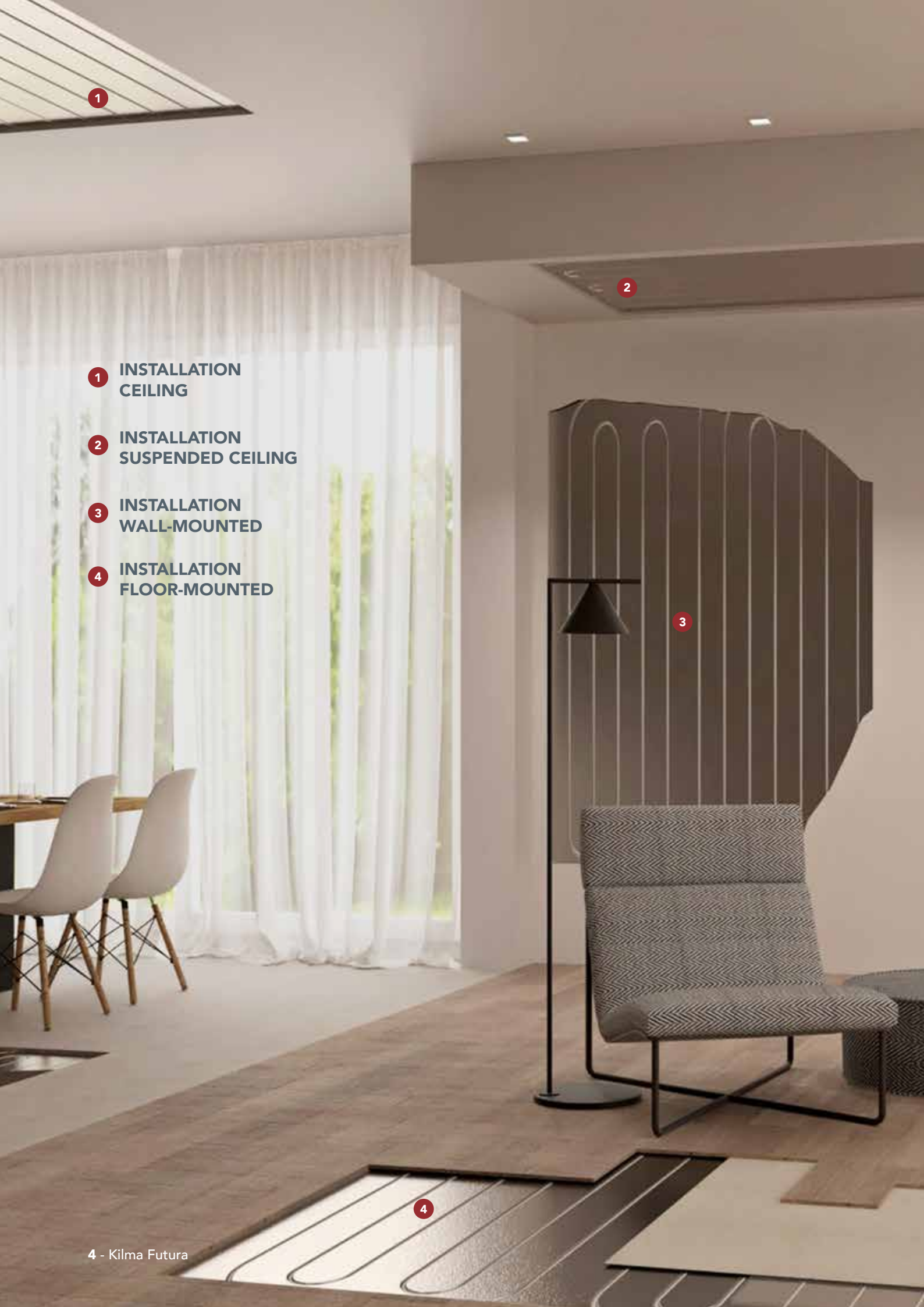


Generally of low thickness, they are often made as "dry systems." They have the ability to heat in minutes, and are also suitable for discontinuous use. Because of their characteristics, they are perfect for renovations and new housing with high thermal efficiency envelopes.

They do not require cement screed

Up and running in 43 minutes

Minimum total thickness, even less than 3 cm



1 **INSTALLATION CEILING**

2 **INSTALLATION SUSPENDED CEILING**

3 **INSTALLATION WALL-MOUNTED**

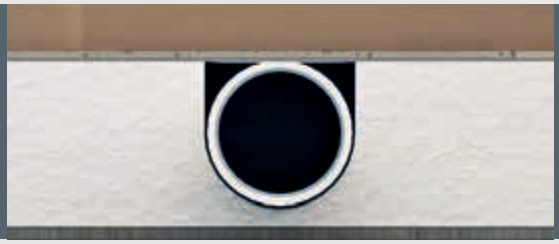
4 **INSTALLATION FLOOR-MOUNTED**

Simple, practical, efficient, versatile.

The revolutionary system with minimum total thickness and maximum energy efficiency ideal for renovations and new construction.
When laid on the floor, **Kilma Futura needs no screed**, consequently it has a very small overall footprint.
Kilma Futura **eliminates** construction site **downtime caused by waiting for**the screed to dry and, as a result, ensures immediate walkability.
Finally, thanks to the absence of the screed, it allows the construction of systems with **very low thermal inertia**.

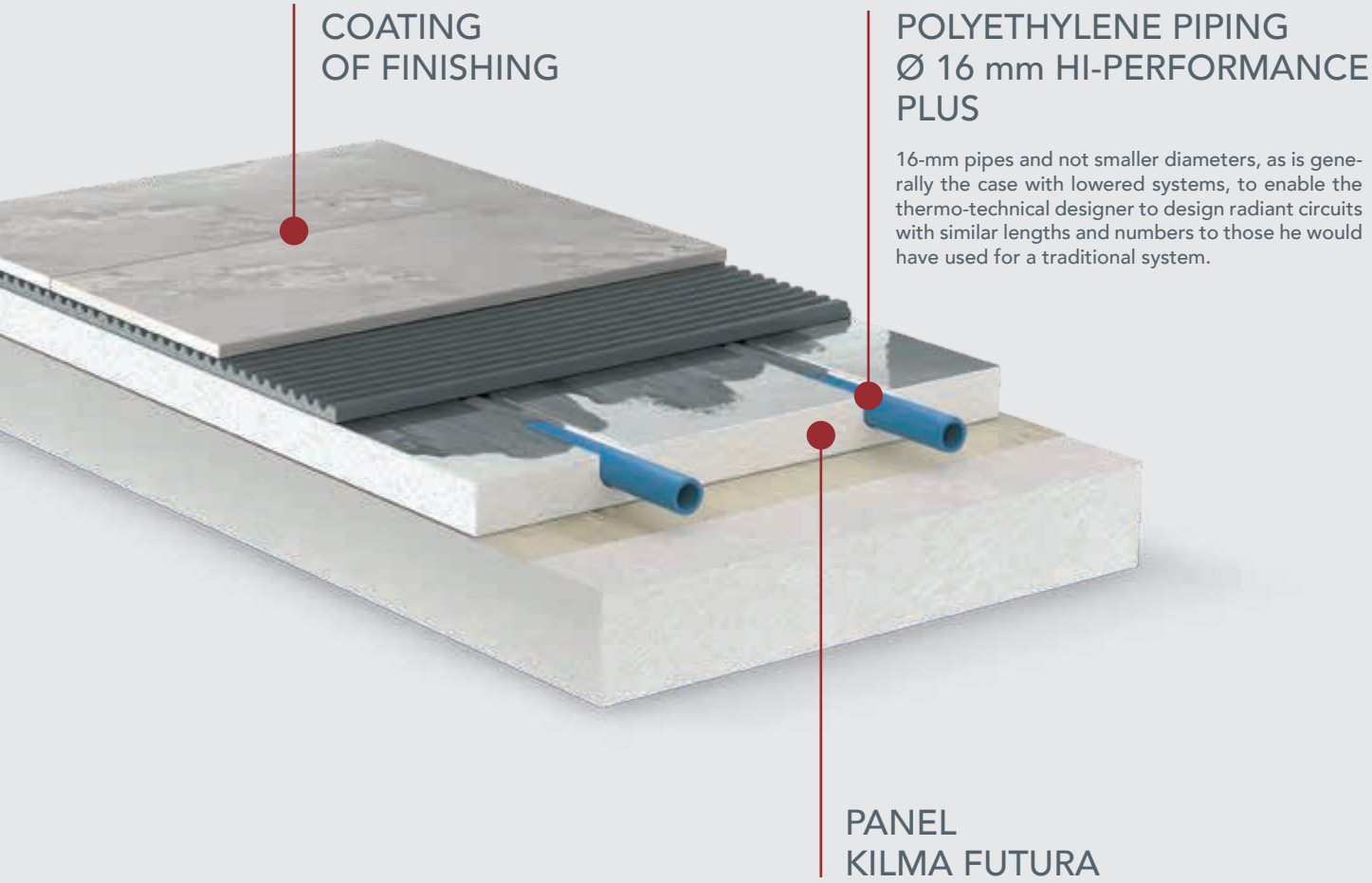
⊕ THE ADVANTAGES OF THE SYSTEM

- No need for cementitious **screed**
- **Low thermal inertia** thermal: heats in just a few minutes
- Large **savings**
- Maximum **comfort**
- Installation on **floor**, **wall** e **ceiling**
- Can be used **in both heating and cooling**
- Total thickness **less than 35 mm**
- Installation **simple** e **quick**
- Ideal for renovations and new homes with **high energy efficiency**
- High resistance to **concentrated loads**
- Suitable for **all types of finishing**



THICKNESS TOTAL
31 mm (SCALE 1:1)

UP TO 570 kg
CONCENTRATES



Simple.

DOES NOT REQUIRE SCREED OR LAYERS OF SUPPORT UNDER THE FINISHED FLOOR!

Kilma Futura is a revolutionary radiant system, without screed and characterized by the very small overall footprint that allows for finished floor heating and cooling systems in less than 35 mm. A unique feature of Kilma Futura is the **possibility of laying the floor directly on the insulating panel**, without having to provide a supporting and load-distributing layer such as metal plates, fiberglass panels, sheathing, mesh, etc. This **greatly simplifies and speeds up the installation work as well as greatly reducing the cost and criticality of implementation.**. In addition, when making an installation with Kilma Futura, only one type of panel is used for the entire site, without having to distinguish between headers, intermediates, bends, etc. Each panel is already equipped with preprinted tracks and bends to accommodate the piping.

A cutting-edge choice for living comfort

Practical.

IMMEDIATE WALKABILITY!
SPEEDS UP THE CONSTRUCTION SITE BY AVOIDING THE DRYING TIME OF THE SCREED

In traditional radiant systems, the cementitious screed always needs a drying and curing time that, although it varies depending on the height and type of material used, is generally never less than 3 to 4 weeks. In addition, at the end of this period, at least another week must elapse in order to carry out the "first start-up" test required by UNI EN 1264. Throughout the time of screed laying, the construction site is not accessible internally, which increases the time and cost of the work. In addition to this, the installation of the screed involves the presence of several operators throughout the entire period of casting, which significantly increases the risk of puncturing the pipes. Kilma Futura avoids all this.
The absence of a screed, in addition to **drastically reducing the** construction **time**, allows the plumbing installer to be able to easily control all phases of the construction site, avoiding the intervention of third parties and significantly facilitating all testing operations required by the technical standard.

With **Kilma Futura** , the construction site is always accessible and walkable, allowing the immediate succession of the different phases of work.

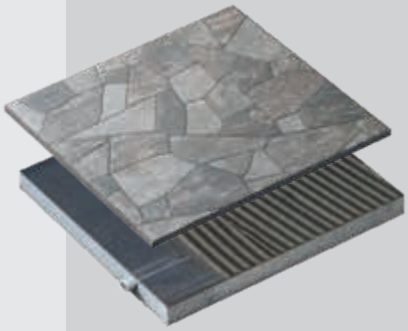
CONSTRUCTION TIME AND COSTS
REDUCED TO A MINIMUM!

Kilma Futura:
many advantages, even for the construction site

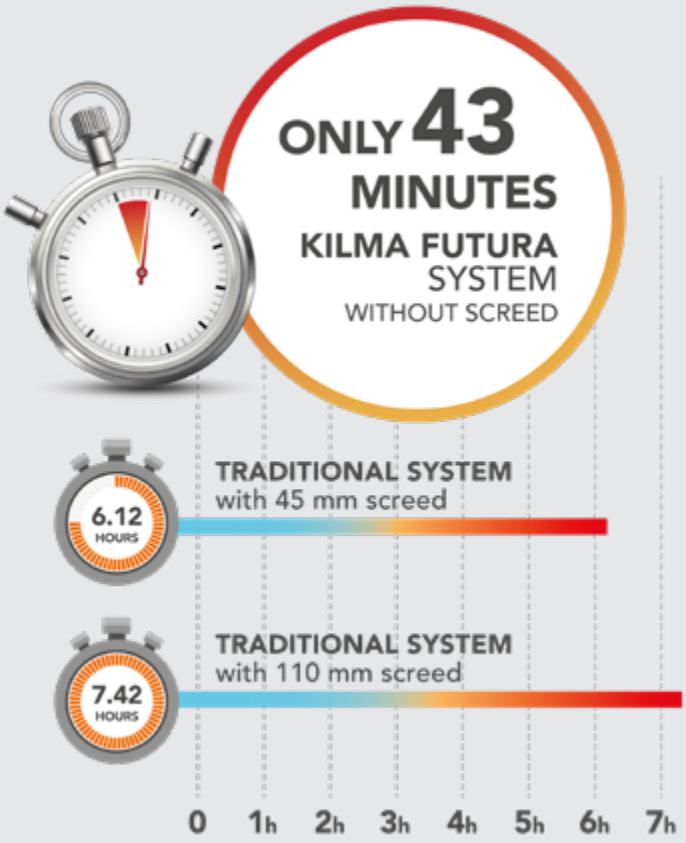
- Speed of installation
- Ease of installation
- Immediate walkability
- Low thermal inertia: rapid settlement

HIGH RESISTANCE
TO CONCENTRATED LOADS

Thanks to its special conformation and the high density of the material of which it is composed, Kilma Futura provides extremely effective mechanical support, enabling the system to withstand loads of considerable magnitude. The permanent compressive strain stress value of 90kPa allows consideration of a load
of up to 570kg distributed on a single tile
with dimensions 25x25 cm!



UP TO
570kg
CONCENTRATES

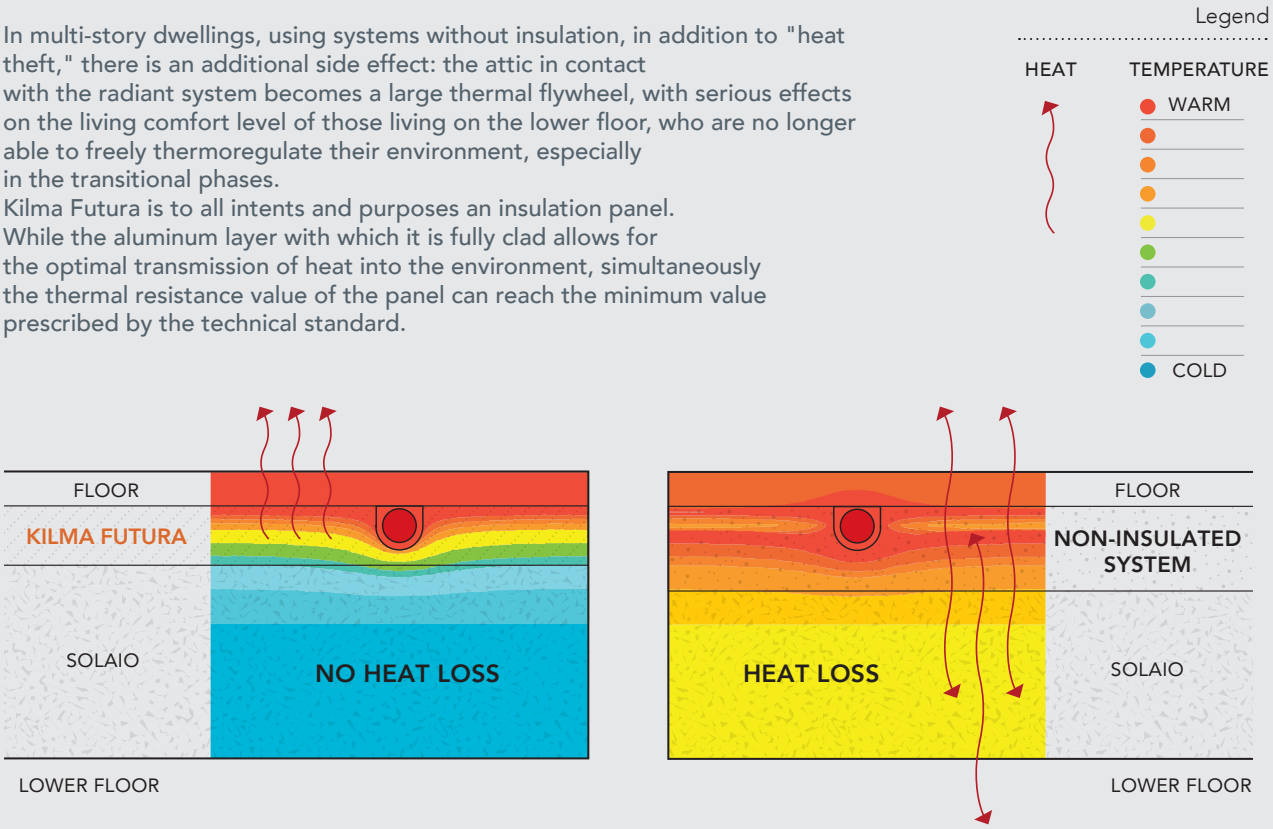


Efficient.

IMMEDIATELY RUNNING SYSTEM AVOIDS "HEAT THEFT" BECAUSE IT IS A TRUE INSULATING PANEL

Kilma Futura is an extremely fast radiant system in the regulation phase. When compared to a traditional system, it can be seen that Kilma Futura goes up **to speed in less than 45 minutes, which is 8 times faster!** This peculiarity makes Kilma Futura the ideal solution for vacation homes, rooms with occasional use and, more generally, for all homes that remain empty for many hours of the day. Thanks to Kilma Futura, it is now possible to achieve the excellent level of comfort typical of a low-temperature radiant system, **without necessarily having to keep the system running continuously** throughout the day. This results in significant money savings and improved quality of life. At the heart of the Kilma Futura system is the insulation panel of which it is made. Many radiant systems with low thermal inertia, as well as many "dry" systems, involve pipe containment layers made of materials that do not oppose the slightest thermal insulation to the downward diffusion of heat such as concrete, fiber plaster, fiber cement and the like.

In multi-story dwellings, using systems without insulation, in addition to "heat theft," there is an additional side effect: the attic in contact with the radiant system becomes a large thermal flywheel, with serious effects on the living comfort level of those living on the lower floor, who are no longer able to freely thermoregulate their environment, especially in the transitional phases.
Kilma Futura is to all intents and purposes an insulation panel. While the aluminum layer with which it is fully clad allows for the optimal transmission of heat into the environment, simultaneously the thermal resistance value of the panel can reach the minimum value prescribed by the technical standard.



The insulating panel

Kilma Futura consists of an EPS insulation layer, in which the channels for housing the ø 16 mm pipe are made, and an aluminum surface foil that is laminated so that it is totally adhered to the entire surface, including the grooves of the channels.
The aluminum layer ensures complete envelopment of the pipe by the metal for ideal and uniform heat transmission to the room.
Kilma Futura panel is made in different thicknesses: 20 mm, 25 mm 33 mm and 48 mm, in order to meet both the requirements of the smallest overall dimensions and those of compliance with the thermal resistance value provided under a radiant system by the UNI EN 1264 standard.
In the 25 mm thickness, the panel is also available with 2 different installation pitches: 100 and 160 mm.

The pipe HI-PERFORMANCE PLUS

The new HI-PERFORMANCE PLUS piping, produced with state-of-the-art technology, are equipped with of an internal oxygen barrier, externally protected from foreign agents that could compromise its continuity and effectiveness.

Versatile.

DESIGNED TO OFFER MAXIMUM VERSATILITY AND **ADAPTABILITY IN ANY ENVIRONMENT**

Thanks to its innovative technology, Kilma Futura is a revolutionary radiant air conditioning system that **can be installed** not only **on the floor**, but also **on the ceiling, false ceiling** and **wall**, making it an extremely flexible solution for any heating and cooling need. Its radiant nature allows even distribution of heat or coolness, ensuring **optimal thermal comfort in all seasons.**.

KILMA FUTURA

Floor installation

CERAMIC FINISH

1 Perimeter expansion joint

2 Glue for fixing the panel to the substrate

3 KILMA-FUTURA panel

4 HI-PERFORMANCE PLUS Ø16x2 mm

5 Possible aluminized tape for pipe clamping on bends (qty approx.1$^{m/m2}$)

6A Protective epoxy primer (e.g., PRIMER MF RBM by Mapei)

6B Acrylic primer for top glue adhesion (e.g., ACTIVE PRIME FIX by Kerakoll or ECO PRIM T PLUS by Mapei - not supplied)

7 Tile glue (e.g. H40 NO LIMITS + TOP LATEX by Kerakoll or ELASTORAPID or KERABOND by Mapei - not supplied)

8 Tiles (*) (minimum dim. 25x25 cm or alternatively laths 15x30 cm - for laying tiles directly on the KILMA FUTURA system refer to the manual of the FUTURA system)

9 Skirting

PARQUET FINISH (TYPE 1 FLOATING PARQUET)

1 Perimeter expansion joint

2 Glue for fixing the panel to the substrate

3 KILMA-FUTURA panel

4 HI-PERFORMANCE PLUS Ø16x2 mm

5 Possible aluminized tape for pipe clamping on bends (qty approx.1$^{m/m2}$)

6 PE protective sheet

7 Possible fabric/nonwoven backing layer (not provided) (**)

8 Floating parquet in simple support

9 Skirting boards

PARQUET FINISH (TYPE 2 GLUED PARQUET)

1 Perimeter expansion joint

2 Glue for fixing the panel to the substrate

3 KILMA-FUTURA panel

4 HI-PERFORMANCE PLUS Ø16x2 mm

5 Possible aluminized tape for pipe clamping on bends (qty approx.1$^{m/m2}$)

6 PHONOFIX by RBM support mat or TOP INCOLLAPAVIMENTO by Isolmant (not supplied) (**)

7 Parquet glue (not supplied)

8 Parquet

9 Skirting boards

(*) It is also possible to glue the tile directly to the Kilma Futura panel using glues such as H40 EXTREME by Kerakoll or similar and avoiding, only in this case, the use of both primers (epoxy and acrylic) prescribed in points 6a and 6b.

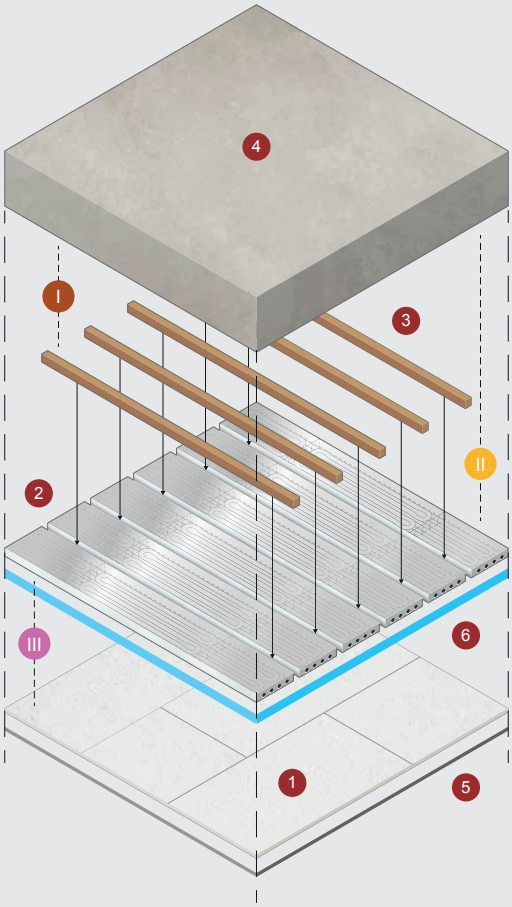
(**) for compatibility of the finishes with the mat models, refer to the data sheets of the mat models, which can be found on the manufacturer's website.

KILMA FUTURA

The new high efficiency radiant heating and cooling system for dry installation

A1 KILMA FUTURA / CEILING SYSTEM

Version: IN ADHERENCE on ceiling soffit
Assumed finish: 12.5 mm plasterboard sheet



COMPONENTS

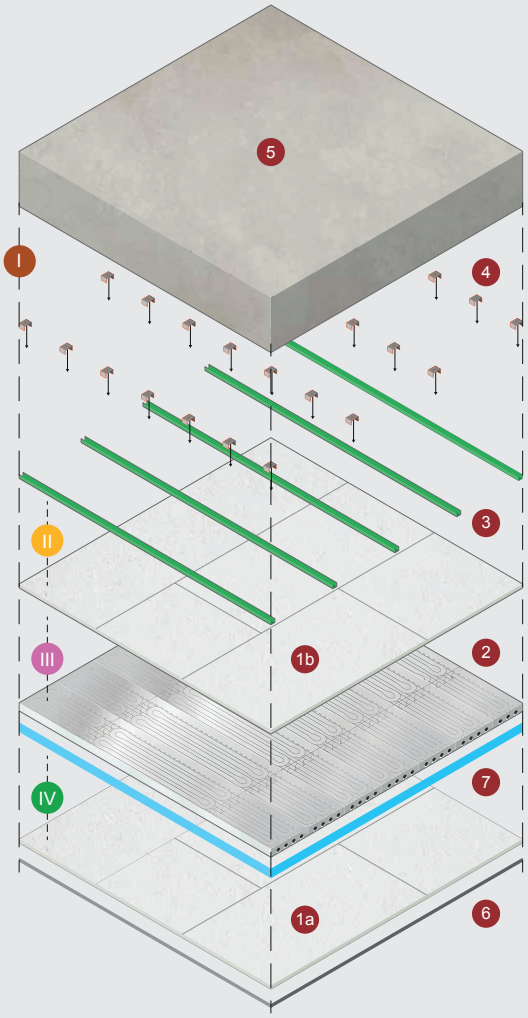
1. **Plasterboard slab**
   12.5 mm indicatively
2. **Kilma Futura panel 25 mm thickness**
   (or other chosen thickness, excluding 20 mm thick)
3. **Wooden planks section 40x25 mm**
   with possible section breaks to allow the passage of the pipe bends and circuit adductions.
4. **Floor slab**
   (necessarily planar)
5. **Elastic joint for plasterboard sheets**
   PLEASE NOTE: Any expansion joints to be provided are the responsibility of the plaster installer, in accordance with the particular installation specifications of the chosen finish.
6. **Perimeter strip**
   (optional)

TYPES OF FIXING

- I **Fixing I:**
  wood planking on soffit slab
- II **Fixing II:**
  futura panel on soffit soffit (wide-head screws suitable for EPS)
- III **Fixing III:**
  plasterboard finish fixed to wood planks

C1 KILMA FUTURA / CEILING SYSTEM

Version: WITH SINGLE FLOTTING ORDERING on soffit slab. Spacing of the warping NOT CONNECTED to the installation of the radiant system.
Assumed finish: 12.5 mm gypsum board slab



COMPONENTS

- 1a **Plasterboard slab of FINISHING**
  12.5 mm indicatively
- 1b **Plasterboard slab of SUPPORT**
  12.5 mm indicatively
- 2 **Kilma Futura panel 25 mm thickness**
  (or other chosen thickness, excluding 20 mm thick)
- 3 **1st level warping**
- 4 **Simple snap hooks acting as spacers**
- 5 **Floor slab**
  (necessarily planar)
- 6 **Elastic joint for plasterboard sheets**
  PLEASE NOTE: Any expansion joints to be provided are the responsibility of the plaster installer, in accordance with the particular installation specifications of the chosen finish.
- 7 **Perimeter strip**
  (optional)

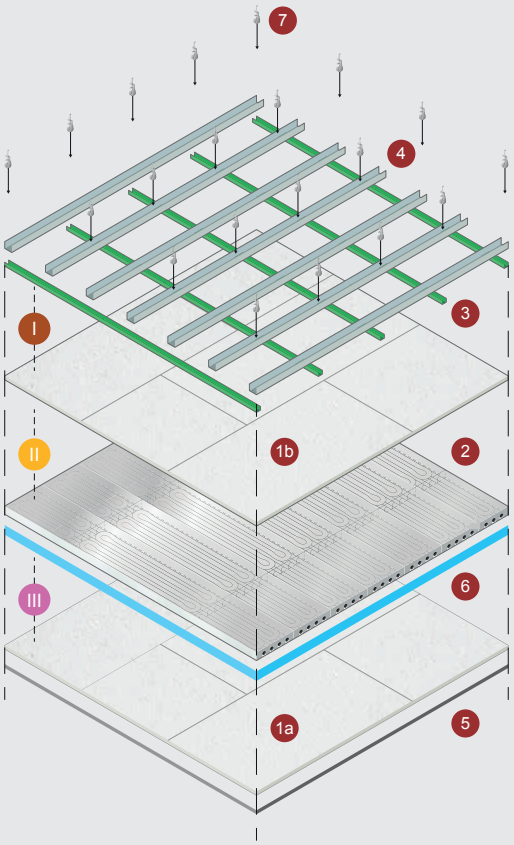
TYPES OF FIXING

4x FIXING

- I **Fixing I:**
  simple hook for profiles on soffit soffit
- II **Fixing II:**
  for reinforcing slab (1st slab) on metal profile
- III **Fixing III: for Futura panel on 1st level warping**
  we recommend: "large head" screws suitable for EPS self-drilling type
- IV **Fixing IV: plasterboard finish on metal profile**

B2 KILMA FUTURA / CEILING SYSTEM

Version: PENDINED with DOUBLE-ORDERED overlapping cavity. Step of the 1st level warping NOT CONNECTED to the installation of the radiant system.
Assumed finish: 12.5 mm plasterboard sheet



COMPONENTS

- 1a **FINISHING plasterboard sheet** 12.5 mm approx
- 1b **Plasterboard slab of SUPPORT** 12.5 mm indicatively
- 2 **Kilma Futura panel 25 mm thickness** (or other chosen thickness, excluding 20 mm thick)
- 3 **1st level warping**
- 4 **Warping 2nd level**

FREE WARPING PITCH

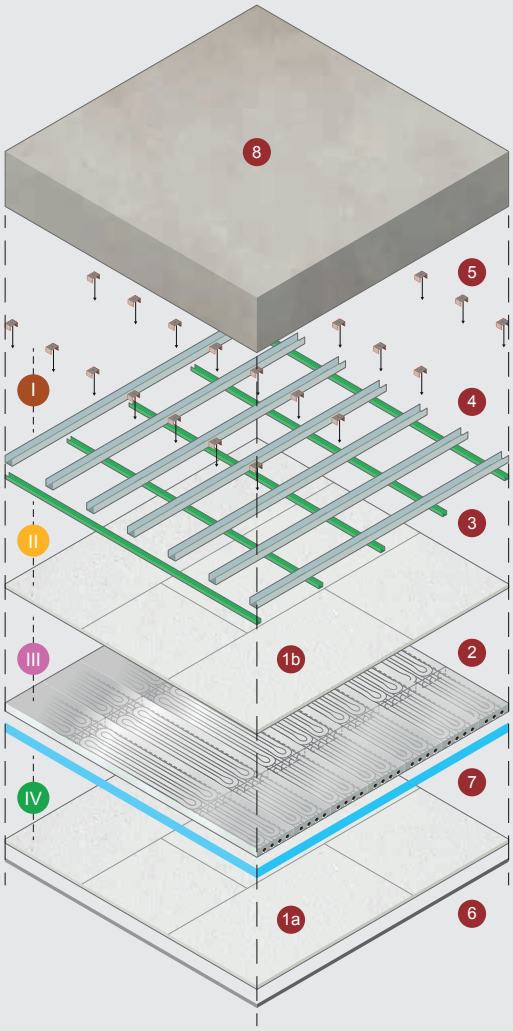
- 5 **Elastic joint for plasterboard sheets** PLEASE NOTE: Any expansion joints to be provided are the responsibility of the plaster installer, in accordance with the particular installation specifications of the chosen finish.
- 6 **Perimeter strip** (optional)
- 7 **Floor slab** (necessarily planar)

TYPES OF FIXING

- I **Fixing I:** for support slab (1st slab) on 1st level warping
- II **Fixing II: futura panel on 1st level warping** (or on supporting plasterboard slab) we recommend: "large head" screws suitable for EPS self-drilling type
- III **Fixing III: for finishing slab on 1st level warping**

C2 KILMA FUTURA / CEILING SYSTEM

Version: WITH DOUBLE FLOATING ORDERING on floor soffit. Step of the warping NOT CONNECTED to the installation of the radiant system.
Assumed finish: 12.5 mm plasterboard sheet



COMPONENTS

- 1a **FINISHING plasterboard sheet** 12.5 mm approx
- 1b **REINFORCEMENT gypsum board slab** 12.5 mm approx
- 2 **Kilma Futura panel 25 mm thickness** (or other chosen thickness, excluding 20 mm thick)
- 3 **1st level warping** alternatively, only one level of warping can be used, defining an overall footprint of less than 90 mm.
- 4 **Warping 2nd level**
- 5 **Simple snap hooks acting as spacers**
- 6 **Elastic joint for plasterboard sheets** PLEASE NOTE: Any expansion joints to be provided are the responsibility of the plaster installer, in accordance with the particular installation specifications of the chosen finish.
- 7 **Perimeter strip** (optional)
- 8 **Floor slab** (necessarily planar)

TYPES OF FIXING

- I **Fixing I:** simple hooks for profiles on soffit soffit
- II **Fixing II:** for support slab (1st slab) on 1st level warping
- III **Fixing III: for Futura panel on 1st level warping** we recommend: "large head" screws suitable for EPS self-drilling type
- IV **Fixing IV: plasterboard finish on 1st level warping**

KILMA FUTURA

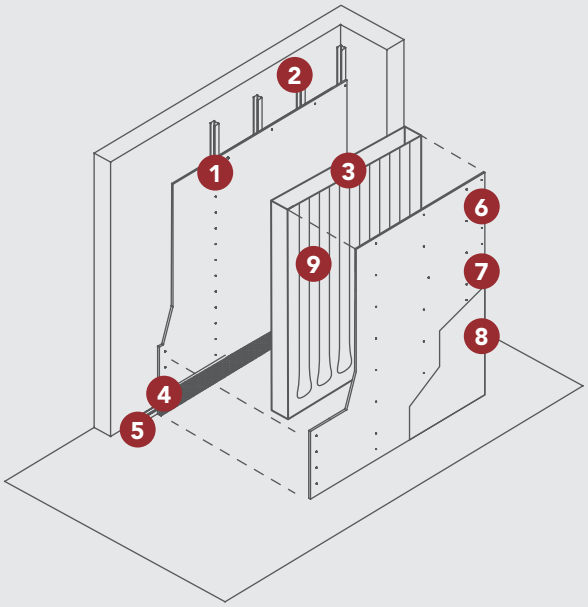
Wall mounted

The Kilma Futura panel **can also be applied to walls**. It can be installed on a masonry or plasterboard wall, then the panel is covered with a sheet of plasterboard or fiberboard. The reduced thickness, quick installation and the use of 16x2 pipes that can be connected directly to the radiant manifold make the Kilma Futura panel suitable for any installation.

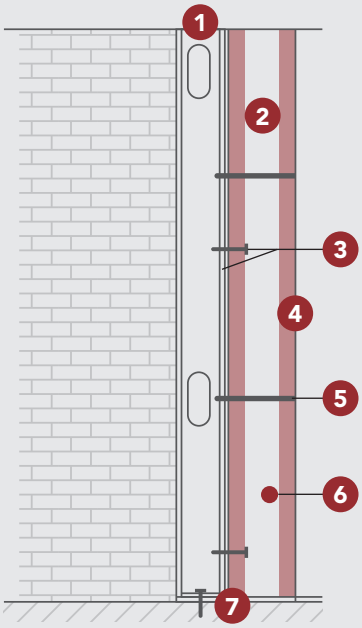
MASONRY WALL

1. Wooden planking 40x25 mm
2. Kilma Futura panel 25 mm thick
3. Hi Performance Plus pipe Ø16x2 mm
4. Plasterboard panel
5. Possible buffer strip for installation of electrical outlets according to CEI 64-8

MASONRY OR PLASTERBOARD WALL



1. Single plasterboard panel (support)
2. Riser profile
3. Kilma Futura panel 25 mm thick
4. Respect band from floor level (for electrical sockets according to CEI 64-8)
5. Base profile
6. Finishing slab fastening
7. Plasterboard slab (system closure)
8. Skimming and finishing
9. Hi Performance Plus pipe Ø16x2 mm



1. Metal profile (upright)
2. Kilma Futura panel 25 mm thick
3. Fixing I:
   for support slab on upright profile warping
4. Plasterboard slab + skimming
5. Fixing II:
   for finishing slab on upright profile warping
6. Hi Performance Plus pipe Ø16x2 mm
7. Base profile

Laying stages

Ease of installation is another strength of the Kilma Futura system. All operations can be performed by the installer, with a few simple tools. In order to achieve an optimal result, it is important that all the precautions and prescriptions given here are followed. This photo sequence represents an indicative guideline, which does not replace what is prescribed by the UNI EN 1264 standard and by the manufacturers of the various accessory components of the system. In any case, before installing the system, we recommend that you consult the system installation manual, available at **www.rbm.eu** or by framing the **QR code** on this page.

Download the **data sheet**

THE SYSTEM MUST BE LAID ON A PERFECTLY LEVEL SUBFLOOR AND COMPLANING

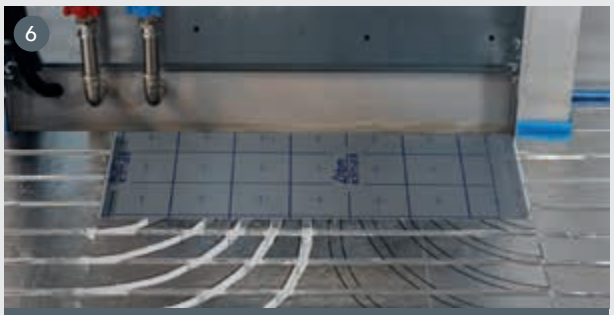
Lay the perimeter edge for the absorption of expansion of the system. This element must be applied on the walls along the entire perimeter of the rooms affected by the system.

Glue the board to the substrate using KILMA FUTURA AD glue.

Now you can begin the installation of the radiant circuits, following the properly drawn up installation diagram.

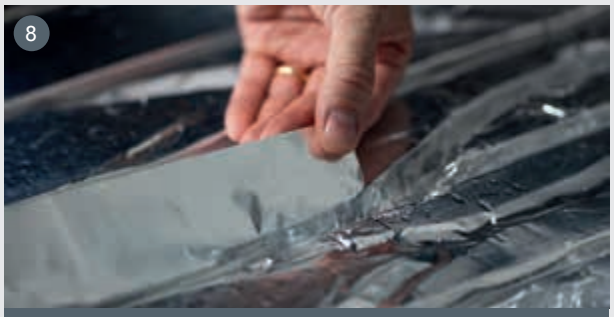
At the bends the track is already prepared, so it will be enough to cut the surface layer of aluminum, freeing the underlying preformed housing for the pipe.

The pipe must absolutely remain well embedded under the surface of the panel.
Apply aluminized tape to the bends or where needed to hold the pipe in place.



Cutting a new track/guide for the pipe: it may be necessary to make a new track on site to complete one or more circuits or to create new ones.

After marking with a marker the track you wish to create, proceed to make it with a cutter or, better yet, with a common DIY electric polystyrene router.



Insert the aluminized adhesive tape provided by RBM into the trace made, in order to restore the aluminized surface layer. Take care to ensure that the tape adheres well to the panel.

Curve holders prevent the possible crushing of the pipes near their entry into the panel.

Before laying the flooring, carry out the system leakage test, as required by the standard.

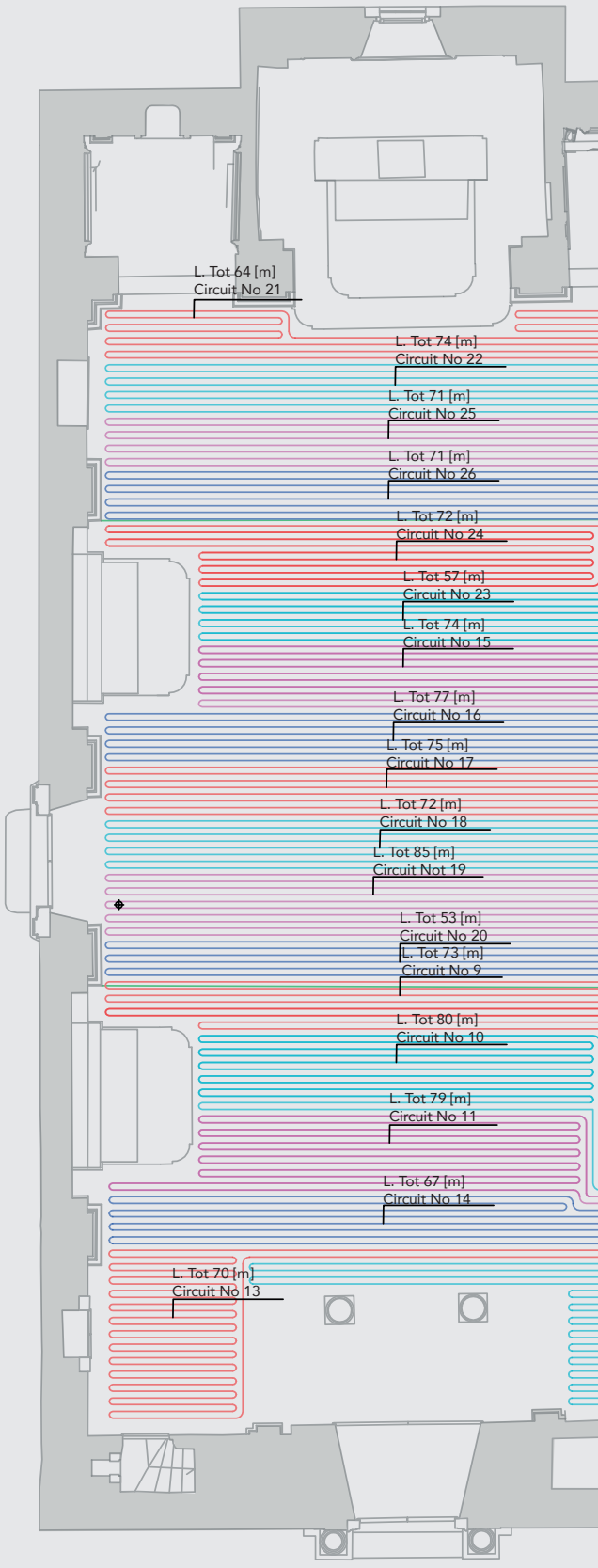
Before applying ceramic tile flooring or cement-based substrates (glued parquet or resilient flooring), apply RBM MF by Mapei epoxy primer and, thereafter, adhesion primer.

Bond ceramic or natural stone tiles with suitable adhesives such as, for example, ELASTORAPID by MAPEI® or similar.

With "floating parquet", no primer will be required but, before laying the parquet with its fabric/nonwoven backing layer, spread a layer of PE.

Laying drawing of a typical installation

RBM KILMA is also pre and after sales service.
Our technical department is at the designer's disposal to advise him in the choice of the most suitable system for his needs and to support him in the design process of the radiant system, assisting him in the delicate task of establishing the ideal conditions for its operation.
The installation diagram, drawn up with certified calculation software and based on the specifications of the heating engineer, will help the installer in the phase of laying out the circuits.



Code 1-1
Description NAVATA
Area126.22 [m²]


Description SAGRESTIA
Area 20.12 [m²]
Code 1-7
Description LOCAL 4
Area 5.27 [m²]
L. Tot 70 [m]
Circuit No 31
L. Tot 48 [m]
Circuit No 28
L. Tot 67 [m]
Circuit No 30
L. Tot 62 [m]
Circuit No 32
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Circuit No 29
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Circuit No 33
Code 1-6
Description LOCAL 3
Area 10.20 [m²]
C5
C4
L. Tot 21 [m]
Circuit No 27
L. Tot 51 [m]
Circuit No 34
Code 1-5
Description LOCAL 2
Area 6.10 [m²]
Code 1-4
Description LOCAL 1
Area 30.14 [m²]
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Circuit No 38
C6
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Circuit No 37
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Description GARAGE
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Circuit No 39
L. Tot 74 [m]
Circuit No 36
C3
L. Tot 75 [m]
Circuit No 40
L. Tot 76 [m]
Circuit No 35
C7
C1
L. Tot 44 [m]
Circuit No 7
C2
L. Tot 75 [m]
Circuit No 1
L. Tot 70 [m]
Circuit No 2
L. Tot 73 [m]
Circuit No 3
L. Tot 74 [m]
Circuit No 4
L. Tot 69 [m]
Circuit No 8
L. Tot 75 [m]
Circuit No 5
L. Tot 68 [m]
Circuit No 12
L. Tot 51 [m]
Circuit No 6
Code 1-2
CHAPEL Description
Area 52.52 [m²]

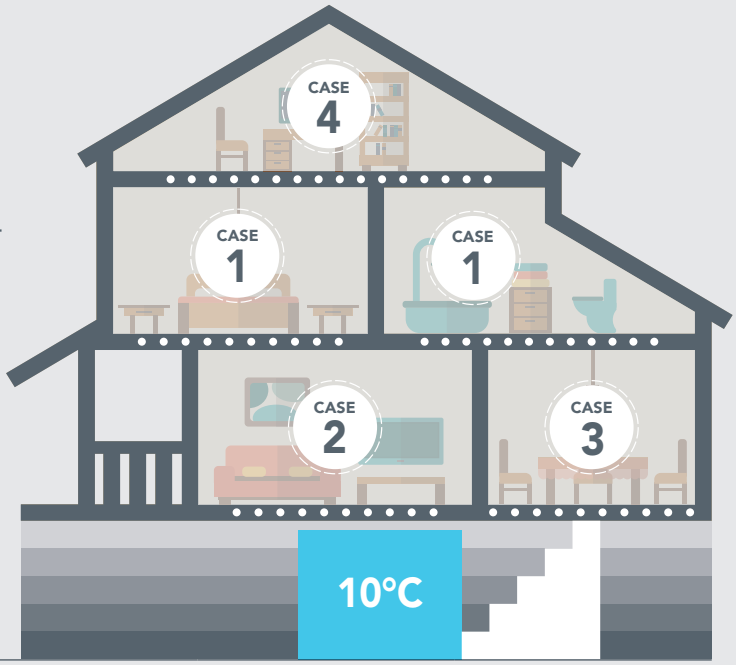
Thermal insulation values of the panels for systems radiant floor heating systems

The UNI EN 1264 standard prescribes minimum thermal resistance values of insulation to be provided under the radiant system piping, depending on the situations in which the system is installed.
The standard also allows these minimum values to be achieved by overlapping multiple layers of insulation, provided they are joined firmly together and laid in a staggered manner so that the joints between the panels are not aligned with those of the adjoining layer. The image and table on the opposite page show the minimum values prescribed by the standard for each of the cases indicated.
The Kilma Futura panel with insulation thicknesses 33 mm and 48 mm allows, in many situations, to meet the requirements dictated by the standard on its own. When it should be necessary to obtain higher thermal resistance values, it will be possible to combine an additional insulation layer under the Kilma Futura panel, depending on of the thermal resistance value to be obtained.
It is important that the additional insulating layer has mechanical properties compatible with the outstanding compressive strength of Kilma Futura. Some possible combinations with the high compressive strength extruded polystyrene panel RBM Kilma Therm are listed in the table.

UNI EN 1264

Applies to floor systems for residential buildings, offices or other buildings of corresponding or similar use.

Indication of **minimum thermal resistance values** for the insulating layers underneath the radiant floor heating system according to the values of the standard UNI EN 1264 "underfloor heating - systems and components - installation"



CASE	WHAT'S UNDERNEATH?	Resistance thermal Rt [m² K/W] according to UNI EN 1264	RBM KILMA FUTURA SOLUTIONS		
1	Heated rooms	0,75	Kilma Futura 33 mm (cod. 3841.33.**) Rt=0.952	Kilma Futura 20 mm (code 3841.20.**) + Kilma Therm 20 mm (cod. 1053.20.02) Rttot=1.158	Kilma Futura 25 mm (code 3841.25.**) + Kilma Therm 20 mm (cod. 1053.20.02) Rttot=1.309
2/3	Cold rooms, heated rooms on an occasional basis and on the ground floor	1,25	Kilma Futura 48 mm (code 3841.48.**) Rt=1.406	Kilma Futura 25 mm (code 3841.25.**) + Kilma Therm 20 mm (cod. 1053.20.02) Rttot=1.309	Kilma Futura Kilma Futura 33 mm (cod. 3841.33.**) + Kilma Therm 20 mm (cod. 1053.20.02) Rttot=1.552
4	Temperature ext > 0°C (southern Italy)				
4	-5°C < Temperature ext < 0°C (central and northern Italy)	1,50	Kilma Futura 20 mm (code 3841.20.**) + Kilma Therm 40 mm (cod. 1053.40.22) Rttot=1.758	Kilma Futura 25 mm (code 3841.25.**) + Kilma Therm 30 mm (cod. 1053.30.02) Rttot=1.609	Kilma Futura 33 mm (cod. 3841.33.**) + Kilma Therm 20 mm (cod. 1053.20.02) Rttot=1.552
4	-15°C<ext temperature <-5°C (northern Italy)	2,00	Kilma Futura 25 mm (code 3841.25.**) + Kilma Therm 50 mm (cod. 1053.50.22) Rttot=2.209	Kilma Futura 33 mm (cod. 3841.33.**) + Kilma Therm 40 mm (cod. 1053.40.22) Rttot=2.152	Kilma Futura 48 mm (code 3841.48.**) + Kilma Therm 20 mm (cod. 1053.20.02) Rttot=2.006

N.B. The thermal resistances shown in the table refer to systems with 100 mm installation pitch.

Requirements of soundproofing footfall soundproofing

A fundamental factor to be taken into account when designing a building is what is established by the DPCM 5/12/97 regarding the determination of the passive acoustic requirements of buildings, according to which the minimum values to be respected in the theoretical estimation are as follows, depending on the category of intended use of the building.

CATEGORY INTENDED USE	
A	Buildings used for residential and similar purposes
B	Buildings used as offices and similar
C	Buildings used as hotels, boarding houses and similar activities
D	Buildings used as hospitals, clinics, nursing homes and assimi-lated
E	Buildings used for school activities at all levels and assimilated
F	Buildings used for recreational or worship activities and similar
G	Buildings used for commercial activities and similar

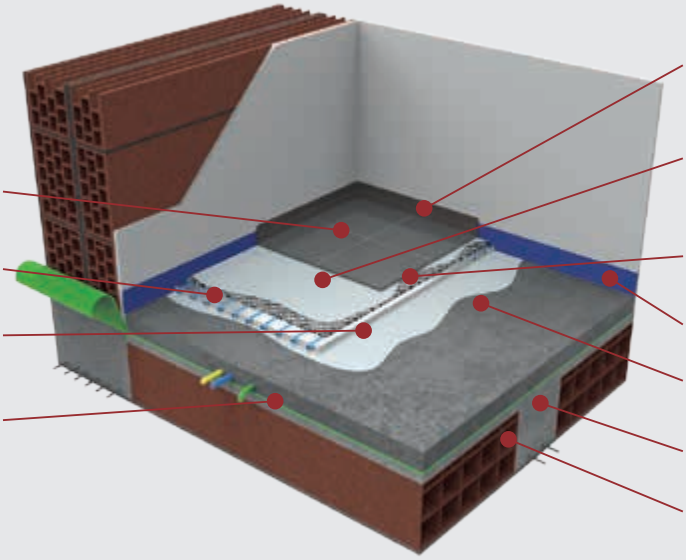
CATEGORY INTENDED USE	Soundproofing power apparent of elements of separation between two different housing units R'_w	Insulation sound of the facade of the building $D_{2m,nT,w}$	Level of footfall of the floors normalized $L'_{n,w}$	Sound pressure levels sound of installations or services at discontinuous L_{ASmax}	Sound pressure levels sound of installations or services at continuous L_{Aeq}
D	55	45	58	35	35
A-C	50	40	63	35	35
E	50	48	58	35	25
B-F-G	50	42	55	35	35

For the sole purpose of providing the designer with some simple food for thought regarding the choice of possible solutions to this problem, we report some "model" stratigraphies, containing the Kilma Futura radiant system, from which to start in order to determine, through predictive calculations, the desired results (*)

NEW OR EXISTING LATERO-CONCRETE SLAB

With the possibility of "weighting" the structure

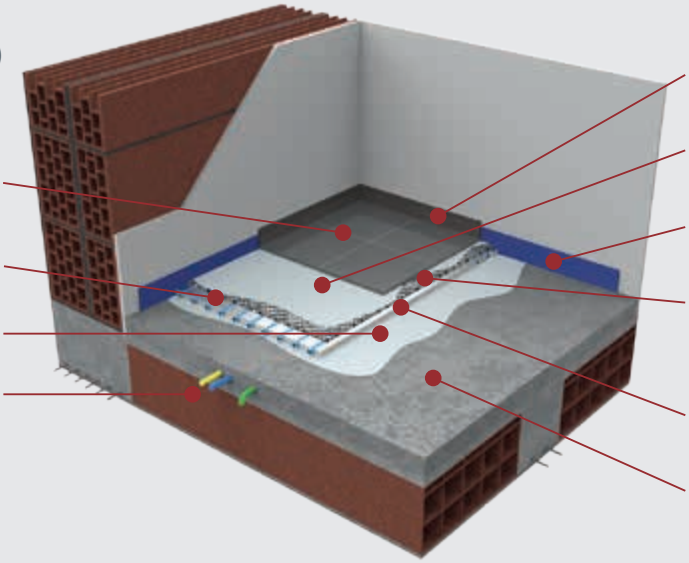
$L'_{n,w}$ = 56 dB (*)



EXISTING CONCRETE SLAB

Without possibility of "weighing down" the structure

ΔLw = 10÷15 dB (*)



(*) What is reported here is to be considered solely derived from a predictive calculation and therefore performed with reference to intact structures (discontinuities due to the presence of installations, flues or anything else that interrupts the continuity of the structure cannot be considered). The computational evaluations through which the values reported here were arrived at consider separately the acoustic performance of partitions and elements that are part of the building, although in reality the behavior of one element cannot be distinguished from that of connected elements. In order to remedy this possible discrepancy, the data obtained were appropriately worsened, by calculation, with correction coefficients (K) that would take into account the incidence of lateral and flanking transmissions. The values given in this paper, besides depending on the boundary conditions considered for the calculation, are therefore purely indicative. They cannot be in any way "guaranteed" unless previously screened and verified by a qualified technician.

(**) Please refer to the system installation manual for the glues.

ΔLw: evaluation index of the footfall noise reduction of the floating system "screed+elastic layer"

Floor radiant

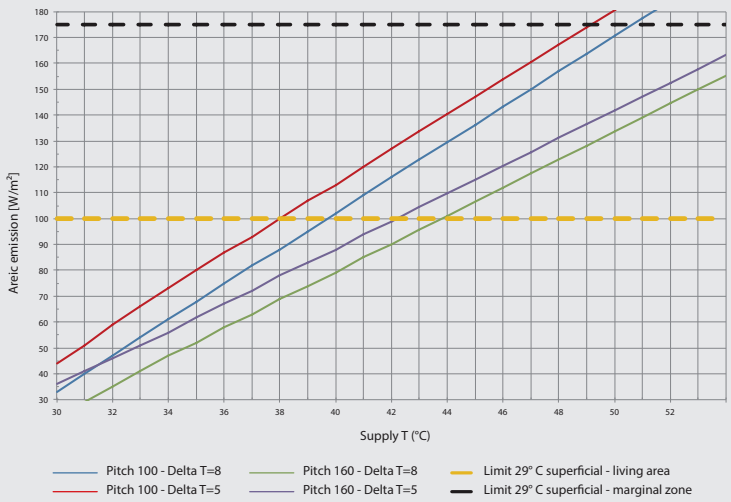
Heating power radiant floor system dry RBM Kilma Futura

(VALUES ACCORDING TO UNI EN 1264)

SYSTEM OPERATING CONDITIONS CERAMIC 12.5 MM

Floor thermal resistance (ceramic 12.5 mm)	$R_{\lambda,B}$	0.01 [m²K/W]
Thermal conductivity pipe (polyethylene pipe value)	λ_R	0.41 [W/mK]
Pipe outer diameter	D_a	16,0 [mm]
Pipe wall thickness	S_r	2,0 [mm]
Room temperature	Θ_i	20,0 [°C]

PLANT CURVES



SPECIFIC AREIC EMISSION AND SURFACE TEMPERATURE (*)

T of delivery [°C]	Delta T	Pipe spacing			
		10 [cm]		16 [cm]	
		q [W/m²]	$\theta_{f,m}$ [°C]	q [W/m²]	$\theta_{f,m}$ [°C]
33	5	66	26,3	51	24,8
	6	62	25,9	48	24,6
	7	58	25,6	44	24,3
	8	54	25,3	41	24,1
34	5	73	26,9	53	25,3
	6	69	26,6	50	25,0
	7	65	26,3	47	24,8
	8	61	25,9	62	24,6
35	5	80	27,5	59	25,8
	6	76	27,2	55	25,5
	7	72	26,9	52	25,3
	8	68	26,6	67	25,0
36	5	87	26,6	64	26,3
	6	83	28,1	61	26,0
	7	79	27,8	58	25,8
	8	75	27,5	72	25,5
37	5	93	27,2	69	26,8
	6	90	28,7	66	26,5
	7	86	28,4	63	26,3
	8	82	28,1	78	26,0
38	5	100	27,8	75	27,3
	6	96	29,3	72	27,0
	7	92	28,7	69	26,8
	8	88	28,4		26,5
39	5	107	30,0	83	27,7
	6	103	29,6	80	27,5
	7	99	29,3	77	27,3
	8	95	29,0	74	27,0
40	5	113	30,6	88	28,2
	6	110	30,3	85	28,0
	7	106	30,0	82	27,7
	8	102	29,6	79	27,5
41	5	120	31,2	94	28,7
	6	116	30,9	91	28,5
	7	113	30,6	88	28,2
	8	109	30,3	85	28,0
42	5	127	31,8	99	29,2
	6	123	31,5	96	29,0
	7	119	31,2	93	28,7
	8	116	30,9	90	28,5

* - Values obtained respecting the above operating conditions
θf,m = Surface temperature of the floor
q = Specific areic emission of the floor

Radiant floor

Cooling power radiant floor system dry RBM Kilma Futura

(VALUES ACCORDING TO UNI EN 1264)

SYSTEM OPERATING CONDITIONS

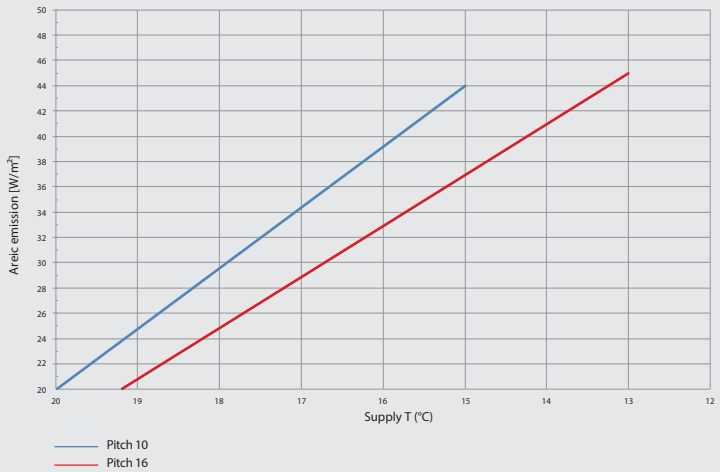
Floor thermal resistance (Ceramic 12.5 mm)	$R_{\lambda,B}$	0.01 [m²K/W]
Thermal conductivity pipe (polyethylene pipe value)	λ_R	0.41 [W(mK]
Pipe outer diameter	D_a	16,0 [mm]
Pipe wall thickness	S_r	2,0 [mm]
Room temperature	Θ_i	26,0 [°C]
Ambient relative humidity	H_r	65%
Delta T (supply - return)	ΔT	3 °C

SPECIFIC AREIC EMISSION AND SURFACE TEMPERATURE (**)

T of delivery [°C]	Delta T	Pipe spacing			
		10 [cm]		16 [cm]	
		q [W/m²]	θf,m [°C]	q [W/m²]	θf,m [°C]
13	3	53,34	17,75	44,99	19,05
14	3	48,58	18,48	40,94	19,66
15 (*)	3	43,84	19,20	36,91	20,28
16	3	39,10	19,92	32,87	20,89
17	3	34,35	20,65	28,83	21,51
18	3	29,58	21,37	24,78	22,12
19	3	24,84	22,09	20,75	22,74
20	3	20,09	22,82	16,71	23,35

* Recommended minimum limit T. flow.
** Values obtained respecting the system operating conditions given above.
θf,m = Surface temperature of the floor.
q = Specific areic emission of the floor.

SYSTEM COOLING YIELD CURVES



The invisible radiant system

INSTALLATION
CEILING

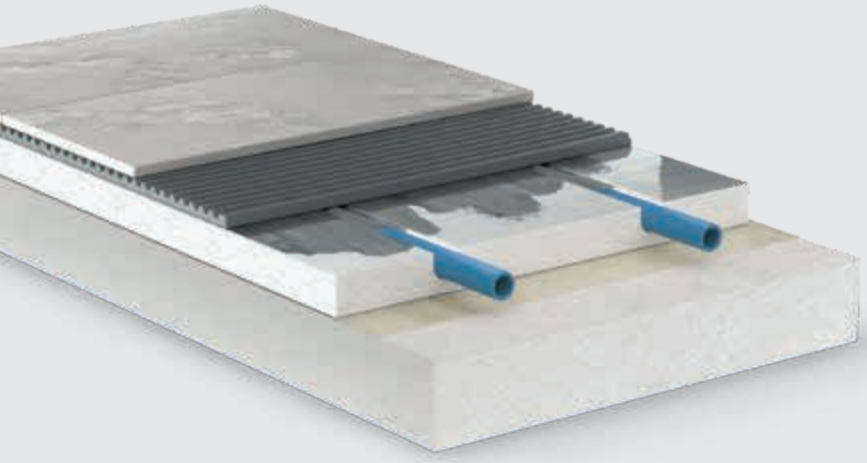
INSTALLATION
SUSPENDED CEILING

INSTALLATION
WALL-MOUNTED

CASSETTE
LINE-FLOOR *

INSTALLATION
FLOOR-MOUNTED

* Frame the QR Code
to learn more



12 good reasons to choose Kilma Futura

1. No load divider needed
2. Equipped with aluminum layer for even heat distribution
3. No "heat theft"
4. Insulation layer under the pipeline
5. Ease of installation
6. Lightness of the system
7. Only one panel pattern to make the site
8. Laying pitch easily changed as needed
9. No thermal expansion of the system
10. Speed of implementation (no screed drying)
11. Can also be used on walls and ceilings
12. Over 2,000,000 m² installed worldwide

Scan the QR Code
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RBM Support

RBM Kilma is also technical support. A dedicated staff takes care of the customer from the initial consultation at the design stage to the start-up of the system.

Our technical support team, upon request,
can help free of charge the installer who is installing the Kilma Futura system for the first time, supporting him through the different stages of implementation.

For information write to **kilma@rbm.eu**

Training of installers

KILMA
TRAINING CENTER

For installers who would like to learn the best installation techniques, RBM has created the Kilma Training Center, a professional specialization dedicated to radiant air conditioning systems. Kilma Training Center offers participants the opportunity to learn proper installation techniques and immediately put them into practice within a space dedicated to practical tests, followed step by step by an RBM technician.

For information and registration, contact your local agency or write to **kilma@rbm.eu**

QUALITY ASSURANCE
MADE IN ITALY

All RBM products are covered by warranty, according to the terms of the law.
As an additional element of protection for users of its products, RBM has taken out an insurance policy for risks arising from liability for damage resulting
to any manufacturing defects.

For more information visit **www.rbm.eu.**.

RBM

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