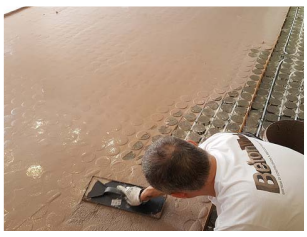
BetonRadiant

Modular system with cement bonded particle boards for traditional and elevated radiant floors

Installation instruction



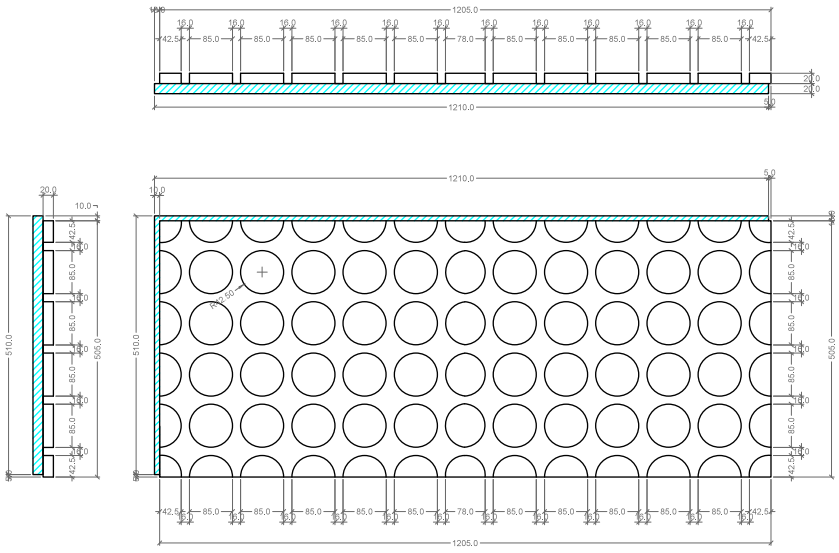
DESCRIPTION

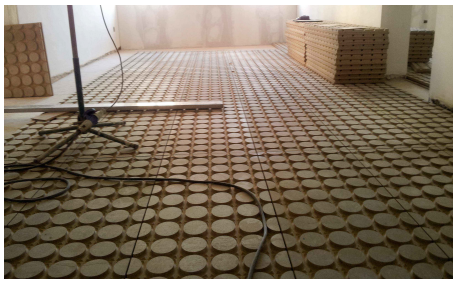
Beton Radiant is a modular system for radiant heating floors realized by two cemet bonded particle board BetonWood, with high density (1350 Kg/m^3) according to European standard EN 13986.

Beton Radiant is an excellent solution to have a radiant floor heating system traditional or elevated with condensation boilers. The system can also be used on the ceiling and for ceiling air conditioning, thus eliminating both radiators and air conditioning units.

TECHNICAL DRAWING OF RADIANT FLOOR Beton Radiant

Module for radiant floors dimensions 1200 x 500 mm and thickness 20 + 20 mm





PARAMETRI STATICI SECONDO DIN-1055-3

Usage	Examples	kN/m²	kN	Thickness
Senza classificazione	Unworkable floors	=	=	25
Attics	Attic space up to 1.8m headroom not suitable for residential use but accessible	1,0	1,0	25
Rooms for residential use or stay	Rooms, hallways in residential buildings, rooms with beds in hospitals, hotel rooms including kitchens and bathrooms	2,0	1,0	25
Work office surfaces, corridors	Hallways in offices, medical offices, department rooms, meeting rooms	2,0	2,0	25
Work office surfaces, corridors	Hallways in hospitals, hotels, colleges, etc. kitchens and clinics including operating theaters without heavy equipment	3,0	3,0	25
Work office surfaces, corridors	Hallways in hospitals, hotels, colleges, etc. kitchens and clinics including operating theaters without heavy equipment	5,0	4,0	28
Meeting rooms and areas for people's meetings	Surfaces with tables eg class-rooms, cafes, restaurants, dining rooms, reading and reception rooms	3,0	4,0	28
Meeting rooms and areas for people's meetings	Surfaces with fixed chairs e.g. churches, theaters or cinemas, congress halls, university lecture halls, meeting and waiting rooms	4,0	4,0	28
Meeting rooms and areas for people's meetings	Walkable surfaces, eg museums, exhibitions, etc. and entrances of public buildings and hotels	5,0	4,0	28
Meeting rooms and areas for people's meetings	Dance halls, gymnasiums and stages	5,0	limited to 6,0*	out of standard
Meeting rooms and areas for people's meetings	Surfaces with a high number of people eg concert halls, terra-ces, entrances and grandstands	5,0	4,0	28
Business premises	Superfici di locali commerciali fino ad una superficie di 50 m² in edifici civili, uffici ed edifici paragonabili	2,0	2,0	25
Business premises	Retail store areas and warehouses surfaces	5,0	4,0	28
Business premises	Surfaces such as n. 13 with larger single weights due to high storage shelves	5,0	limited to 6,0*	out of standard
Factories, workshops, shops and stores	Surfaces in factories and workshops or shops with light activities	5,0	4,0	28
Factories, workshops, shops and stores	Surfaces in warehouses including libraries	5,0	limited to 6,0*	out of standard

*Note: kN/m² = useful load/m²

AVAILABLE DIMENSIONS Beton Radiant

		Cylinders	
	Thicknesses	18	20
Cement bonded particle board	18	•	
	20		•

Standard sizes		
Cement bonded particle board and cylinders coupled of 18 mm (36mm)	850 x 500	1000 x 500
Cement bonded particle board and cylinders coupled of 20 mm (40mm)	1200 x 500	

Thanks to the BetonRadiant panels shape , these are able to accommodate the pipes necessary for radiant heating.
The pipes can have a diameter of from 8 to 18 mm.

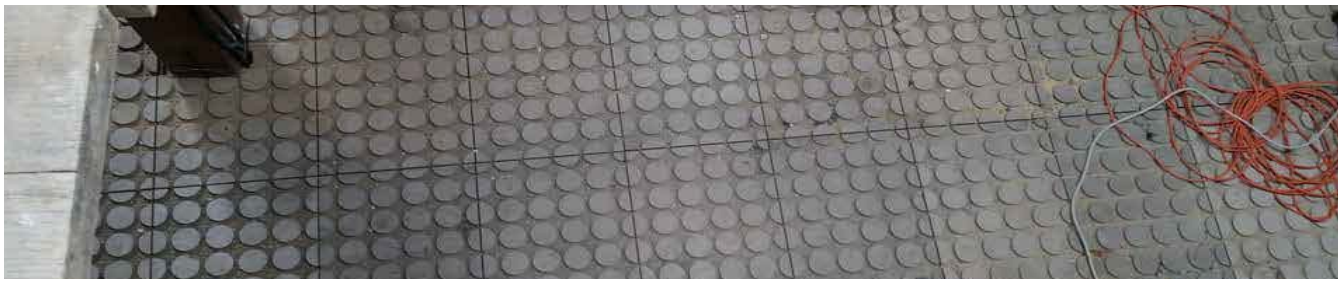
N.B.: pace and diameter of the pipes are produced on commission.

On request it is possible to produce different formats for minimum quantities of 300 m².

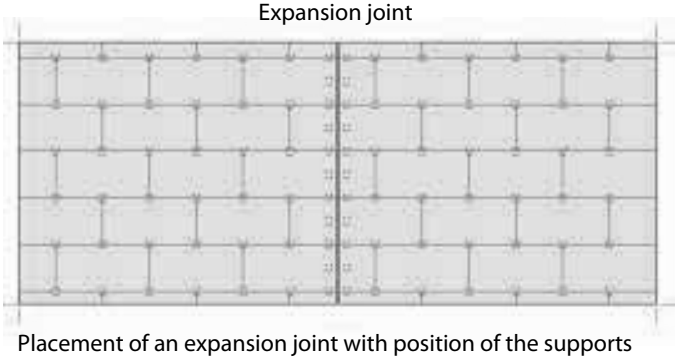
TECHNICAL CHARACTERISTICS Beton Radiant

Density ρ [kg /m³]		1350
Reaction to fire in order to the standard EN 13501-1		A2
Thermal conductivity coefficient λ_D [W/(m*K)]		0,26
Specific heat c [J /(kg * K)]		1.880
Steam penetration resistance	μ	22,6
Coefficient of linear thermal expansion	α	0,00001
Swelling in thickness after 24h of storage in water		1,5%
Superficial PH value		11
Compressive strenght	kPa	9.000,00
Transversal tensile strength	kPa	500,00
Shear strength	kPa	500,00
Modulus of elasticity	kPa	4500,00

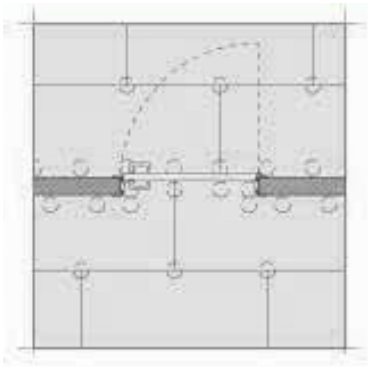
BetonWood cement bonded particle board are also:
- resistant to the outside
- antifreeze
- free from formaldehyde and asbestos



Expansion joint

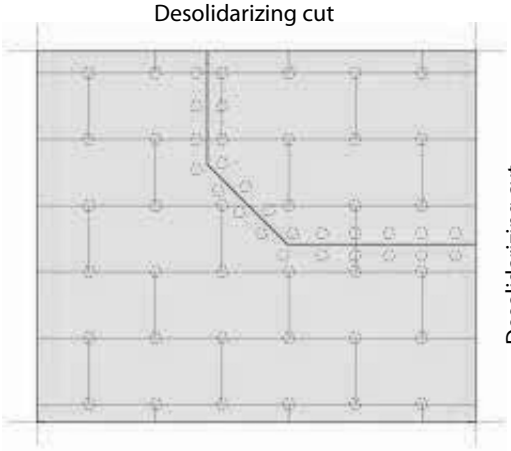


Placement of an expansion joint with position of the supports (interaxis 30 cm) - FOR ENVIRONMENTS OVER 40 m^2

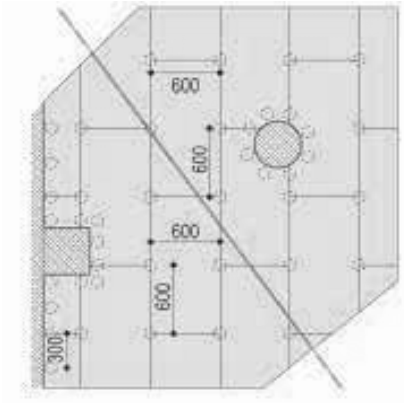


Door passage area reinforcement by additional supports in the separation line between the panels

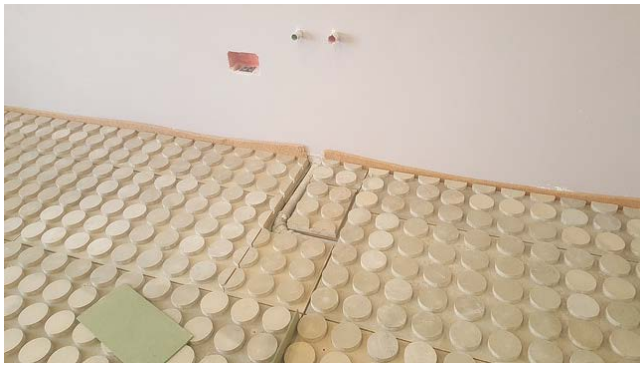
Desolidarizing cut



Desolarizing acoustic cut



Positioning of supports for ex. at pillars



Radiant BetonRadiant panels are easly workable and offer a wide range of construction possibilities.

Furthermore, this system is also available in an ELEVATED VERSION with height-adjustable supports.

PHASE 1
PLACE RADIANT BETONRADIANT PANELS

The BetonRadiant radiant panels can be directly placed on the existing floor, on X-Lam floor or metal structural frames, but we reccomand to first use a layer of acoustic insulation of 3-4 mm in wood fiber FiberTherm Underfloor (that we see in figure) for maximum comfort and to make the radiant system more complete.

The BetonRadiant radiant panels must be placed at a distance of 3 mm from each other and about 10 mm of perimeter space must be left as an expansion joint between the soft seal and the panels in the perimeters of the rooms.

In this space we place a soft seal made of density 60kg/m^3 wood fiber FiberTherm Soundstrip for perimeter thermal and acoustic insulation.

As you can see from the photos on the side, it is advisable to start placing the panels starting from the corners, so as to make installation easier.

It is recommended to use suitable tools to cut the BetonRadiant radiant panels.
We suggest using circular saws, table saws, hoses equipped with carbide or diamond wood blades, and suitable dust extraction systems.

When laying BetonRadiant radiant panels which must respect a space between one and the other for the expansion joint of 3 mm, you can use cuts and scraps of FiberTherm Underfloor wood fiber mat.

See photos on the side.

The BetonRadiant radiant panels must be fixed to the underlying layers with 5 screws, 4 at the corners and 1 at the center of the panel.

Now the two-component, elastic and waterproofing cementitious mortar Mapelastic (Mapei) can be applied to the joints and the perimeter edges.

Make a fairly liquid dough, pour it as in the figure and spread the remaining mixture on the surface with a flat spatula or a brush.

Once all joints have been grouted, dry the jointing material as indicated in the manufacturer's data sheet, and clean the channels from dust with suction tools.

Further verify the flatness of the supports and the level of bubble of future paving plans.

PHASE 2
LAYING OF THE PIPES FOR RADIANT HEATING

Position the radiant floor heating pipes according to the laying pattern indicated by the thermo technician, starting from the manifolds and making the complete circuits taking care not to damage or dent the laid pipes.

Once the laying of all the pipes has been completed, fill the hydraulic system and test it with at least double overlap with respect to the normal operating condition.

PHASE 3
INSTALLING THE PRIMER AND ULTRAPLAN MAXI SELF-LEVELING

After leaving the system under pressure for at least 7 hours and making sure that there are no leaks and that the screed is clean and dry, proceed with the roll laying of a Mapelastic (Mapei) type cementitious primer for low thicknesses (under 5 mm) above the BetonRadiant panels.

Wait for the primer to dry (3 hours) and fill the empty channels with the self-leveling Ultraplan Maxi (Mapei) following the manufacturer's installation instructions.

For further information on the products, it is recommended to consult the manufacturer's data sheet.

A total thickness of 3 mm must be achieved.

N.B: before laying the self-leveling Ultraplan Maxi (Mapei) provide expansion joints as we can see in the first figure of the next page.

Ultraplan Maxi (Mapei) is a self-leveling, ultra-fast hardening smoothing compound for thicknesses from 3 to 30 mm, which is therefore suitable for leveling and filling radiant systems like ours.

Ultraplan Maxi (Mapei) mixed with water gives rise to a very smooth mixture that can be applied by hand or pump up to distances of over 100 m.
Consumption: 1.7 kg / m^2 per mm of thickness.
A uniform thickness of 3 mm is achieved.
N.B .: do not use at temperatures below + 5 ° C.

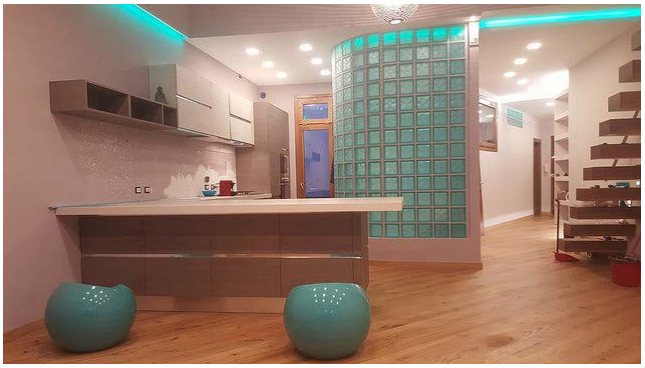
Check that at the end of the drying period there is perfect flatness.

PHASE 4
INSTALLATION OF GLUE AND FINAL FINISH

When the self-leveling is completely dry, clean and planar, you can proceed with the laying of the adhesive that varies according to the nature of the floor:

- for ceramic floors Keralastic (Mapei) or Ultralite S2 Quick (Mapei) is used;
- Ultrabond Eco S968 1K (Mapei)is preferred for wooden floors;
- for carpets or resilients we recommend to inquire from floor manufacturer.

Always leave the joints at least 3 mm between the ceramics or marble.



For direct bonding of ceramics or stone materials, use two-component and waterproof polyurethane glues such as Keralastic (Mapei) or Ultralite S2 Quick (Mapei).
Consumption: 3.5 kg / m^2
N.B .: the gluing of large ceramics is not recommended.

The joints between the tiles can be grouted after 12 hours with special elastic and waterproof grouts.

For the installation of solid and pre-finished parquet of any wood species and size, the Ultrabond Eco S968 1K (Mapei). single-component adhesive is used. The adhesive is completely free of solvents with very low emission of volatile substances.
Consumption: 800-1200 g / m^2.
Walkability: 12 hours

For further information about gluing products, consult the manufacturer's data sheets or call our technical office.

As can be seen from the images of the camera the BetonRadiant panels uniformly spread the heat being conductive and with the radiant pipes a few millimeters from the coatings.
This dry radiant solution has an excellent thermal inertia given the specific heat value of 1800 J / (kg * K).

The BetonRadiant system represents the maximum evolution of dry radiant floors.

It is made of special cement-wood panels with a very high compression strength of 9.000 Kpa with high performance thanks to the specific heat 1.880 J / (kg * K) insulated by a layer of insulation downwards in wood fiber of 200 or 250Kg/m^3 of density. The system allows both on new wooden buildings and in X-Lam, frame systems, metal structures to have a dry radiant system with an excellent mechanical resistance.

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