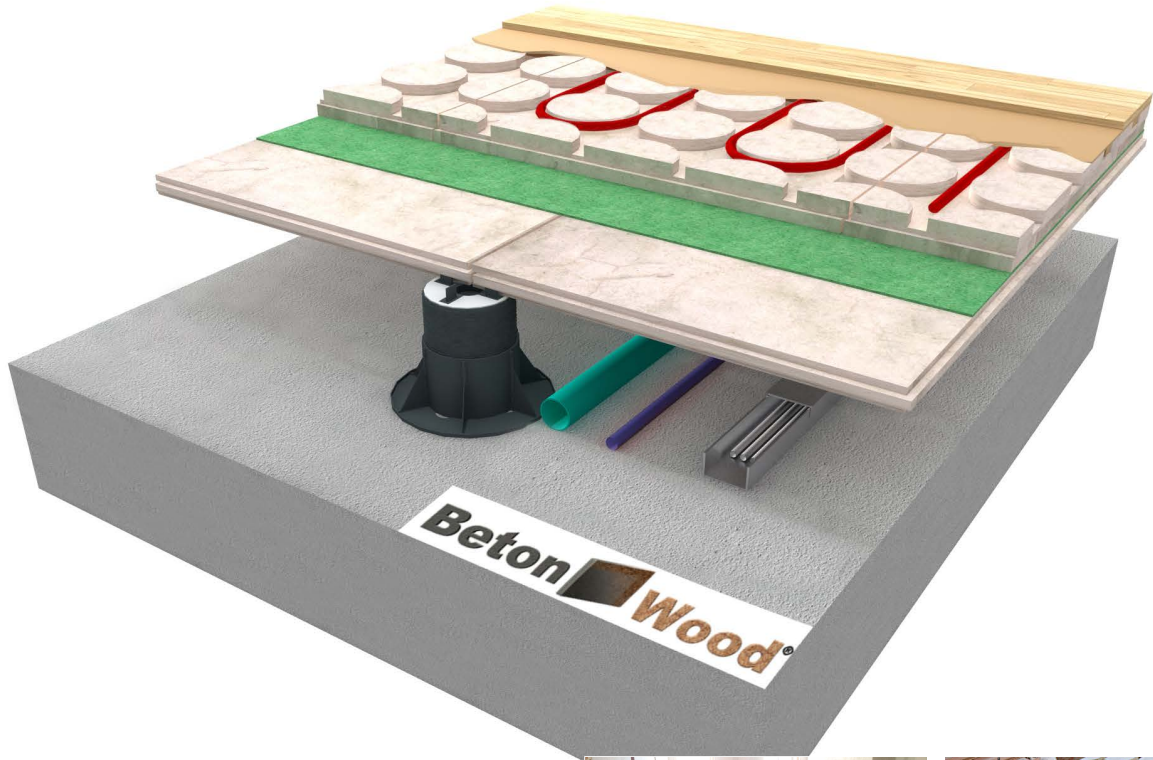


BetonRadiant UP

Modular system with cement bonded particle boards for elevated radiant floors



Installation instruction



DESCRIPTION

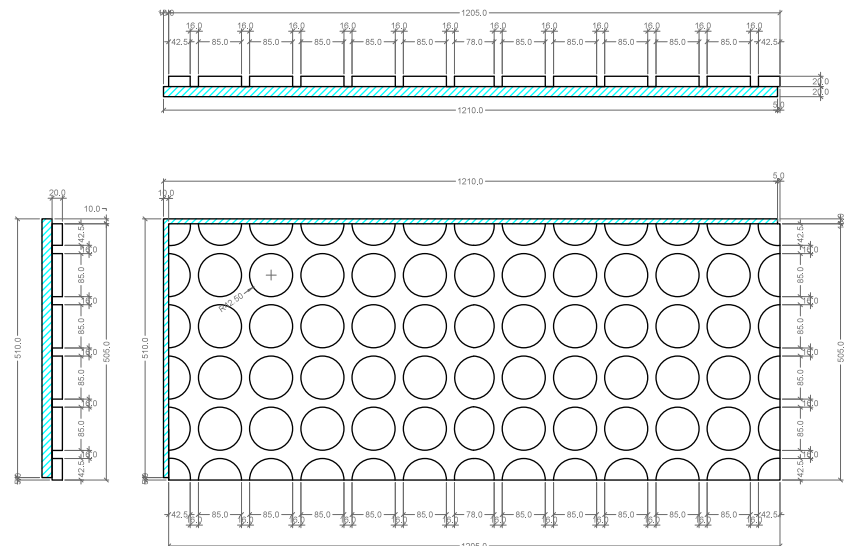
Complete elevated dry radiant system on adjustable supports SB and it is realized by: cement bonded particle boards with interlocking edges BetonWood Tongue&Groove, insulating wood fiber substrate for floors FiberTherm Underfloor, radiant cement bonded particle boards BetonRadiant and self-leveling Ultraplan Maxi (Mapei). Maximum durability over time is guaranteed, with international ETA certification.

Beton Radiant is a modular system for radiant heating floors realized by two cement bonded particle board BetonWood, with high density (1350 Kg/m³) according to European standard EN 13986.

TECHNICAL DRAWING OF RADIANT FLOOR

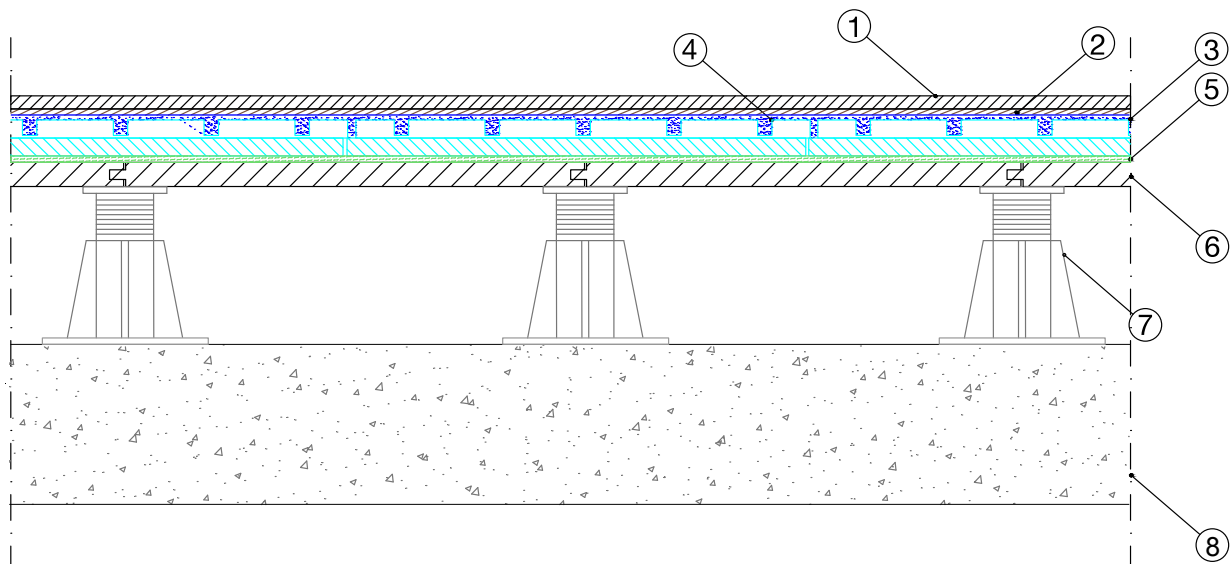
Beton Radiant

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





STRATIGRAPHY



1. Parquet or ceramic floor

2a. **Ultrabond Eco (Mapei) for parquet** Single-component adhesive based on silicate polymers Ultrabond Eco S968 1K type suitable for laying solid and pre-finished parquet of any wood species and formed on any type of substrate, including heating screeds.

2b. **Keralastic (Mapei) for ceramic coatings or alternatively Ultralite S2 Quick (Mapei)** Two-component polyurethane adhesive for ceramic and stone tiles.

3. thickness 3 mm | **self-levelling with ultra-rapid hardening Ultraplan maxi (Mapei)** Self-leveling, ultra-rapid hardening smoothing for thicknesses from 3 to 30 mm, also for heated floors. When mixed with water it gives rise to a very smooth mixture that can be applied to the pump, with high adhesion to the substrate and quick drying.

4. thickness 40 mm | **Beton Radiant panels** Beton Radiant is a system for radiant floors and consists of two cement bonded particle boards BetonWood, high density (1350 Kg / m³), made of Portland-type concrete conglomerate and debarked Pine wood fiber. One of the panels is designed to house pipes for radiant floor heating systems, while the other is the support layer.

5. thickness 4 mm | **Wood fiber FiberTherm Underfloor mat** wood fiber floor mat characterized by good impact sound insulation and high improvement of environmental acoustics, excellent insulation, high pressure resistance up to 20 t / m² - important for interlocking systems. Density 250 kg/m³ and a declared thermal conductivity equal to λ 0,06 ÷ 0,1 [W / (m* K)].

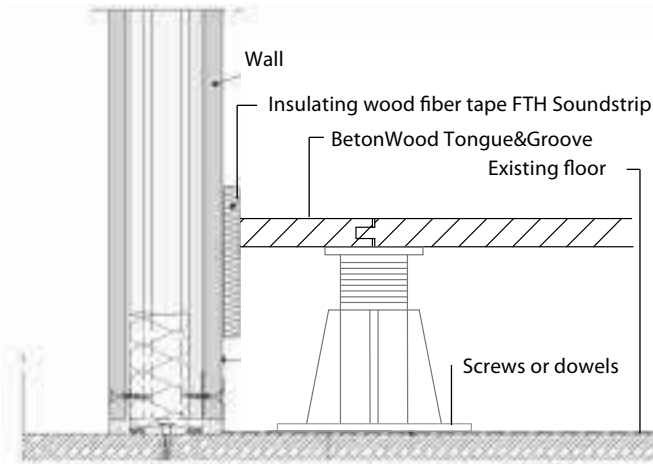
6. thickness 20 mm | **BetonWood Tongue&Groove** The cement bonded particle board with tongue & groove edges is made of Portland-type concrete conglomerate and high-density debarked pine wood fiber ($\delta=1350$ Kg/m³) and with the following thermodynamic characteristics: coefficient of thermal conductivity $\lambda=0,26$ W/mK, Specific heat capacity $c=1,88$ KJ/Kg K, coefficient of resistance to vapor penetration $\mu = 22,6$ and fire class A2-fl-s1.

7. thickness 25 mm of SB1 to 270mm of NM5 | **Adjustable support** The SB, SE and NM adjustable floor supports consist of polypropylene elements, a 205 mm diameter base and a variable height screw. Possibility to adjust the height millimetrically (adjustable from 25 to 270 mm), in favor of a perfect leveling of the flooring.

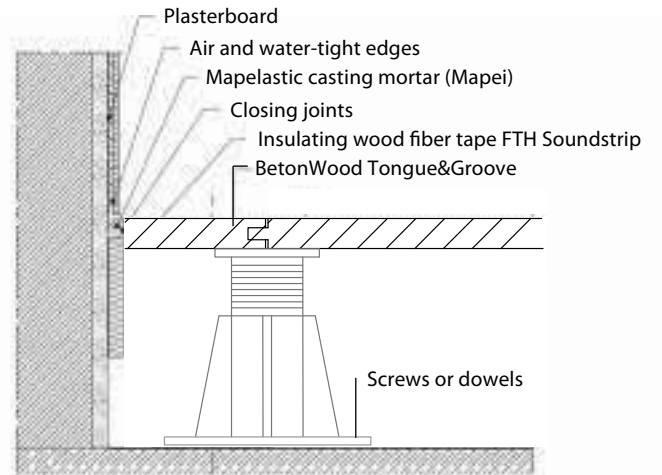
8. Slab in brick and cement with existing covering / X-Lam floor / Wood floor / Metal frame floor



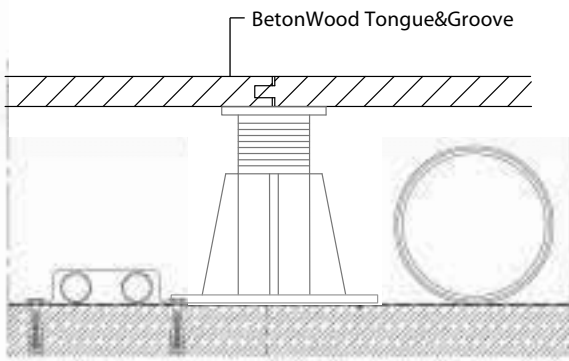
SECTIONS FOR A CORRECT INSTALLATION OF ADJUSTABLE SUPPORTS



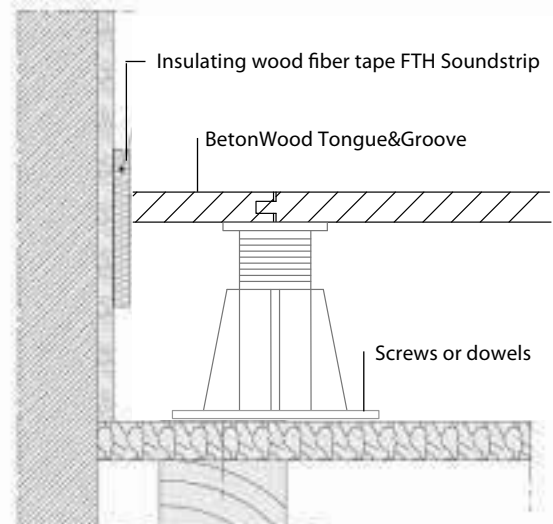
Wall connection with insulating wood fiber strips
FiberTherm Soundstrip



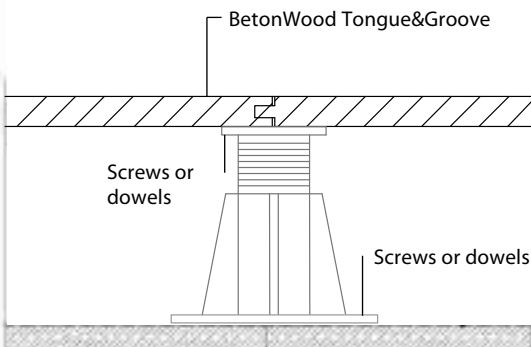
Fix the base of the adjustable feet with screws or plugs



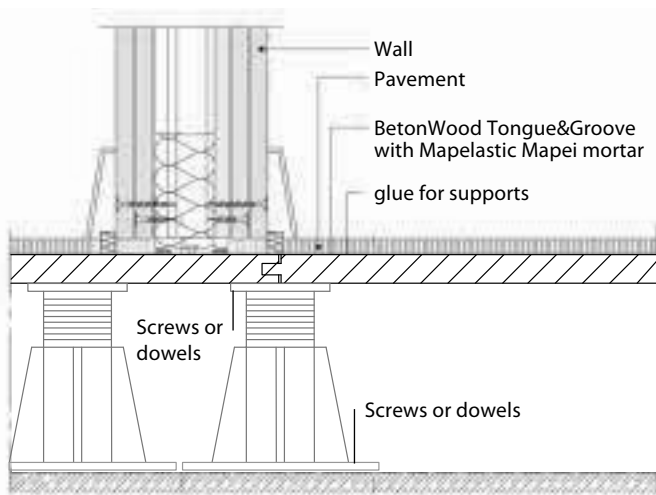
Use of the cavity for passage of systems



Positioning of the supports on screeds with
wooden beams / X-Lam



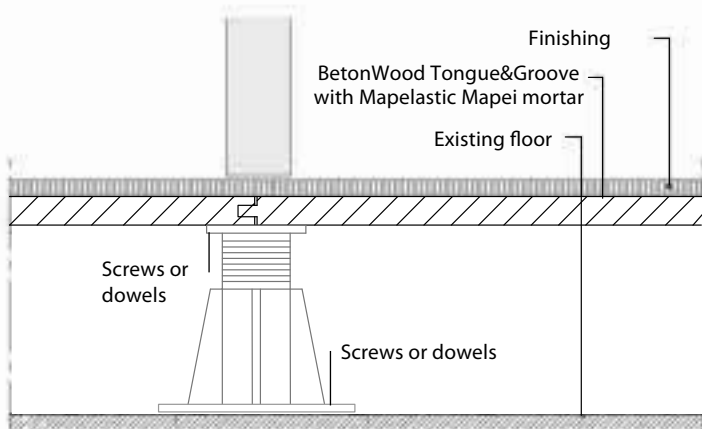
Correct positioning of the supports with laser leveling
and fixing of the head with screws or dowels



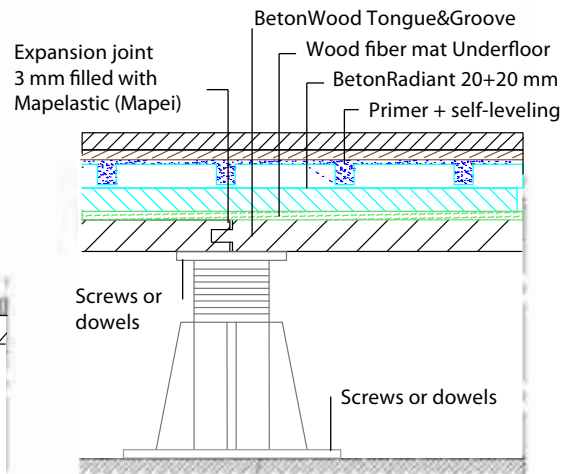
Divider wall with BetonWood Tongue&Groove



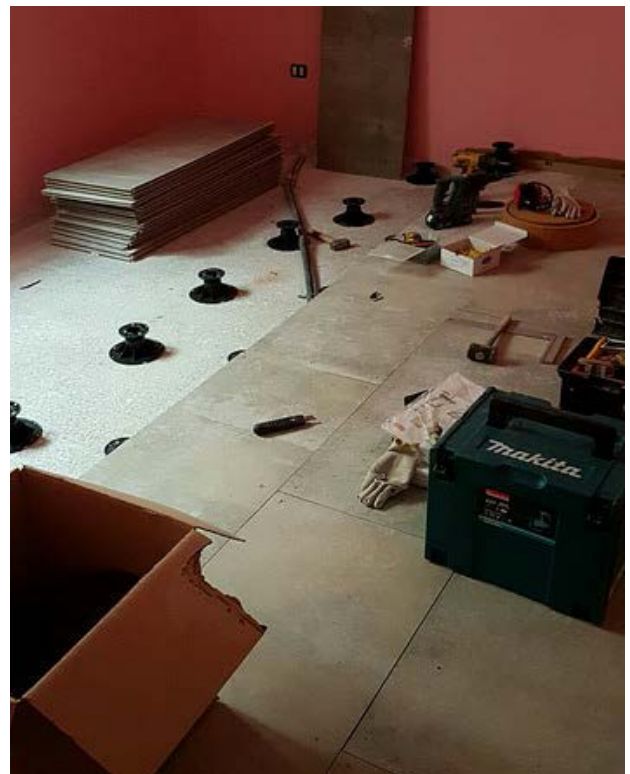
Laying laser-level supports fixed to the base and head with screws and plugs on BetonWood

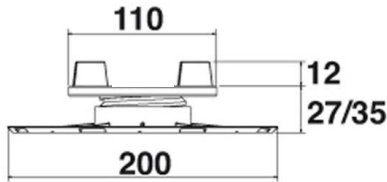
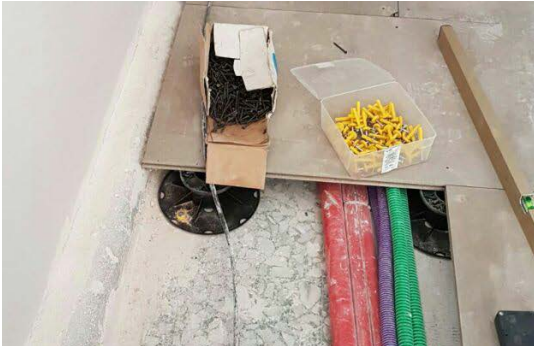


Arrangement joints under door knocker

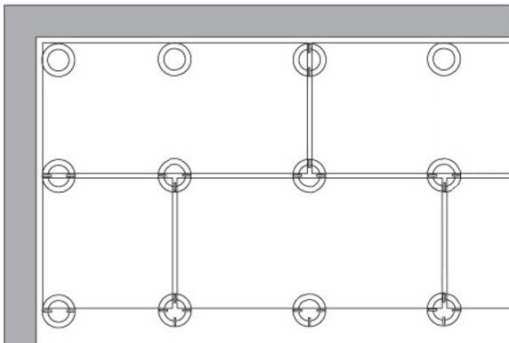


Solution expansion joints with BetonRadiant

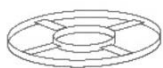




Height adjustable supports from 27 to 35 mm SB1 type. BetonWood has different types of supports which reach heights of over 1 meter.



Arrangement for laying BetonWood panels and self-leveling supports at the walls.



For BetonWood T & G with interlocking profile



For expansion joints in BetonWood or BetonRadiant systems

PHASE 1 ARRANGEMENT AND FIXING OF SUPPORTS

First of all, arrange adjustable supports **SB, SE o NM** as shown in figure, at the corners of the interlocking cement bonded particle boards **BetonWood Tongue&Groove**.

For this kind of panel we recommend a staggered arrangement, therefore for each panel we will have 6 supports, 4 for the corners and 2 to half the length.

The correct arrangement is also shown in the figure on the side.

Once the correct arrangement has been established, the base of the supports can be fixed to the existing screed (or to the X-Lam or metal floor) using 2-4 dowels or screws for each support.

Fixing must be carried out at the base of the floor support.

N.B.: on the head of each support there may or not be two wings for the facilitation of the laying and to establish the expansion joints.

If we are going to install **BetonWood Tongue&Groove** (con with interlocking edges) flat head supports will be required; while for the **BetonWood with sharp edges** we will use those with two wings.

PHASE 2 INSTALLING BETONWOOD TONGUE&GROOVE PANELS

After fixing adjustable supports continue leveling the supports at the same height through laser technique.

Once levelled the supports, arrange the cement bonded particle boards with tongue&groove edges **BetonWood Tongue&Groove** leaving a distance equal to 3 mm from one to another and glue with two-component elastic and waterproofing cementitious mortar **Mapelastic** (Mapei) in the joints.

Make a fairly liquid dough to facilitate penetration. Use a flat spatula to pour **Mapelastic** (Mapei) into the expansion joints.

Secure the panels to the supports by fixing them with 6 screws **BetonFix**.





PHASE 3
INSTALLING THE PERIMETER PROFILE

Leave about 10 mm of perimeter space as an expansion joint between the soft seal and the panels in the rooms perimeters.

In this space a strip of wood fiber is positioned with a density equal to 60kg/m³ **FiberTherm Soundstrip** for thermal and acoustic insulation.

Once it has been placed all over the perimeter, the space between the wood fiber and the concrete must be filled by pouring **Mapelastic** (Mapei) into the expansion joint to ensure complete waterproofing of the screed.



PHASE 4
INSTALLING WOOD FIBER STRIPS FIBERTHERM UNDERFLOOR

Once the joints between the **BetonWood Tongue&Groove** panels have been filled and the **Mapelastic** (Mapei) cement mortar is dried, it is possible to proceed with the installation of a 4 mm thick mat of **FiberTherm Underfloorinsulating** wood fiber.

The mat is easy to work even with a cutter and simply and uniformly rests on the surface without needing additional fixings.



PHASE 5
INSTALLING RADIANT PANELS BETONRADIANT

Above the wood fiber mat **FiberTherm Underfloor** the radiant panels **BetonRadiant** must be laid, these panels can have a thickness 18+18mm or 20+20 mm and thanks to their shape, they can they are able to accommodate the pipes necessary for radiant floor heating.

The pipes can have diameter from 8 to 18 mm.

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

Also the **BetonRadiant** radiant panels must be placed at a distance of 3 mm from each other.

Leave approximately 10 mm of perimeter space as an expansion joint between the **FiberTherm Soundstrip** wood fiber strips and the panels in the perimeters of the rooms.



It is recommended to use suitable tools to cut the **BetonRadiant** radiant panels.

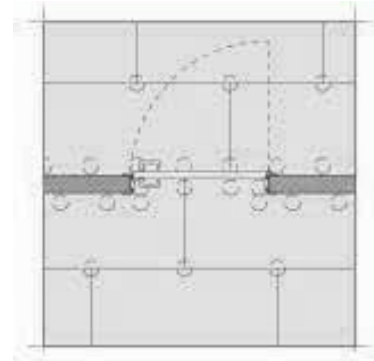
We suggest using circular saws, table saws, hoses equipped with carbide or diamond wood blades, and suitable dust extraction systems.



Expansion joint

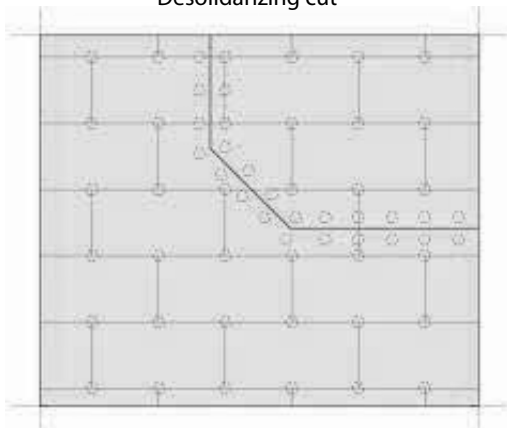


Placement of an expansion joint with position of the supports (interaxis 30 cm) - FOR ENVIRONMENTS OVER 40 m²



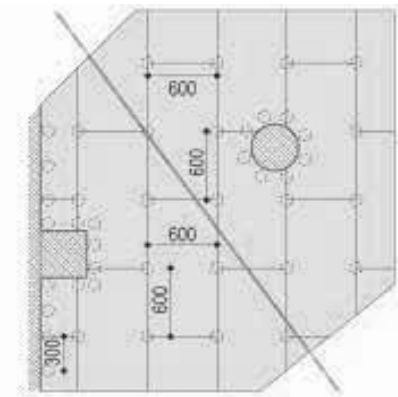
Door passage area reinforcement by additional supports in the separation line between the panels

Desolidarizing cut



Desolidarizing cut

Desolidarizing acoustic cut



Positioning of supports for ex. at pillars



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.



Now you can start to apply the cement mortar used in the joints and perimeter edges used for the **BetonWood Tongue&Groove** panels, ie **Mapelastico** (Mapei).

Make a fairly liquid dough, pour it as in the picture 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.

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.



FASE 6
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 7
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 **Mapelastico** (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 / m² 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 8 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 resilient floors 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 / m²

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.

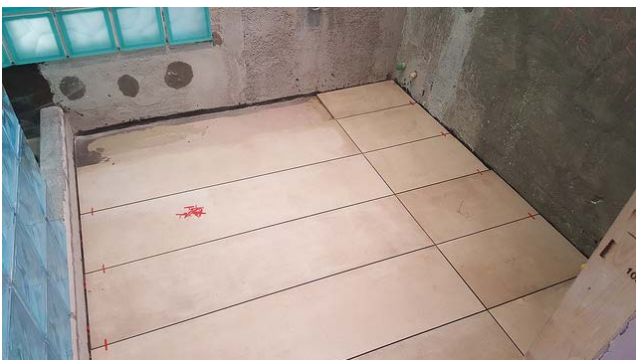
For the installation of solid and pre-finished parquet of any wood species and size, the **Ultrabond Eco S968 1K** (Mapei) single-component adhesive is used. The adhesive is completely free of solvents with very low emission of volatile substances.

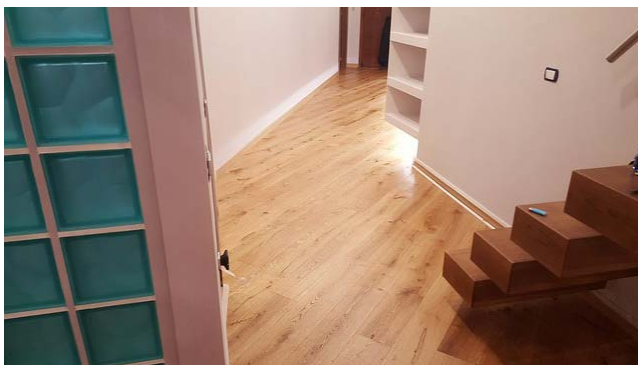
Consumption: 800-1200 g / m².

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 elevated system **BetonRadiant** represent the maximum evolution of radiant elevated floors made with dry process.

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 $1.880 \text{ J} / (\text{kg} * \text{K})$ insulated by a layer of insulation downwards in wood fiber of 200 or 250 Kg/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.

The raised radiant dry system is perfect for homes, schools, shopping centers, also because it has the advantage of leaving space for the passage of exhaust pipes, air pipes, etc. The insulation of the cavity of the overhead dry radiant system can be modified with cork granules, expanded clay, perlite, etc. to arrive at a class A + structure, the material produced entirely with FSC certified wood is suitable for projects with high ecological characteristics, which can be certified with "Leed" certificates

BetonRadiant raised is the only elevated radiant flooring system made with dry process, easy and fast to install, immediately walkable and with excellent thermal inertia. This last feature makes it very suitable for environments where rapid winter heating or summer cooling is required.

The innovative **BetonRadiant** raised floor is designed to optimize the highest thermal efficiency, guaranteeing installation speed, suitable for creating new bathrooms in dry building renovations.

MAIN ADVANTAGES

- dry system
- economic system and installation, half the cost of similar systems!
- high noise reduction and trampling
- feeling of trampling equal to a traditional screed
- fast install
- high flow rates like a traditional floor
- high energy savings
- without architectural restrictions
- absolute comfort both in heating and cooling

APPLICATION AREAS

The **BetonRadiant** system which can be applied wherever there are conditions for laying a raised floor. It is recommended for new dry environments and for renovations subject to reconfiguration of spaces.

BETONWOOD Srl

Head office:
Via Falcone e Borsellino, 58
I-50013 Campi Bisenzio (FI)

T: +39 055 8953144
F: +39 055 4640609

info@betonwood.com
www.betonwood.com

BTR-ISTPM R.18.02

This document replaces and cancels previous versions. Only complete BetonWood systems must always be applied. Mixed systems with components from other unauthorized brands are not allowed.

The indications and prescriptions indicated, are based on our current technical-scientific knowledge, which in any case are to be considered purely indicative, as the conditions of use are not controllable by us. Therefore, the purchaser must in any case verify the suitability of the product to the specific case, assuming all responsibility deriving from use, relieving BetonWood srl from any design error, product choice and installation.

For any additional information on the use of this product. contact our technical department. Consult before any purchase terms of sale on www.betonwood.com

Beton Wood