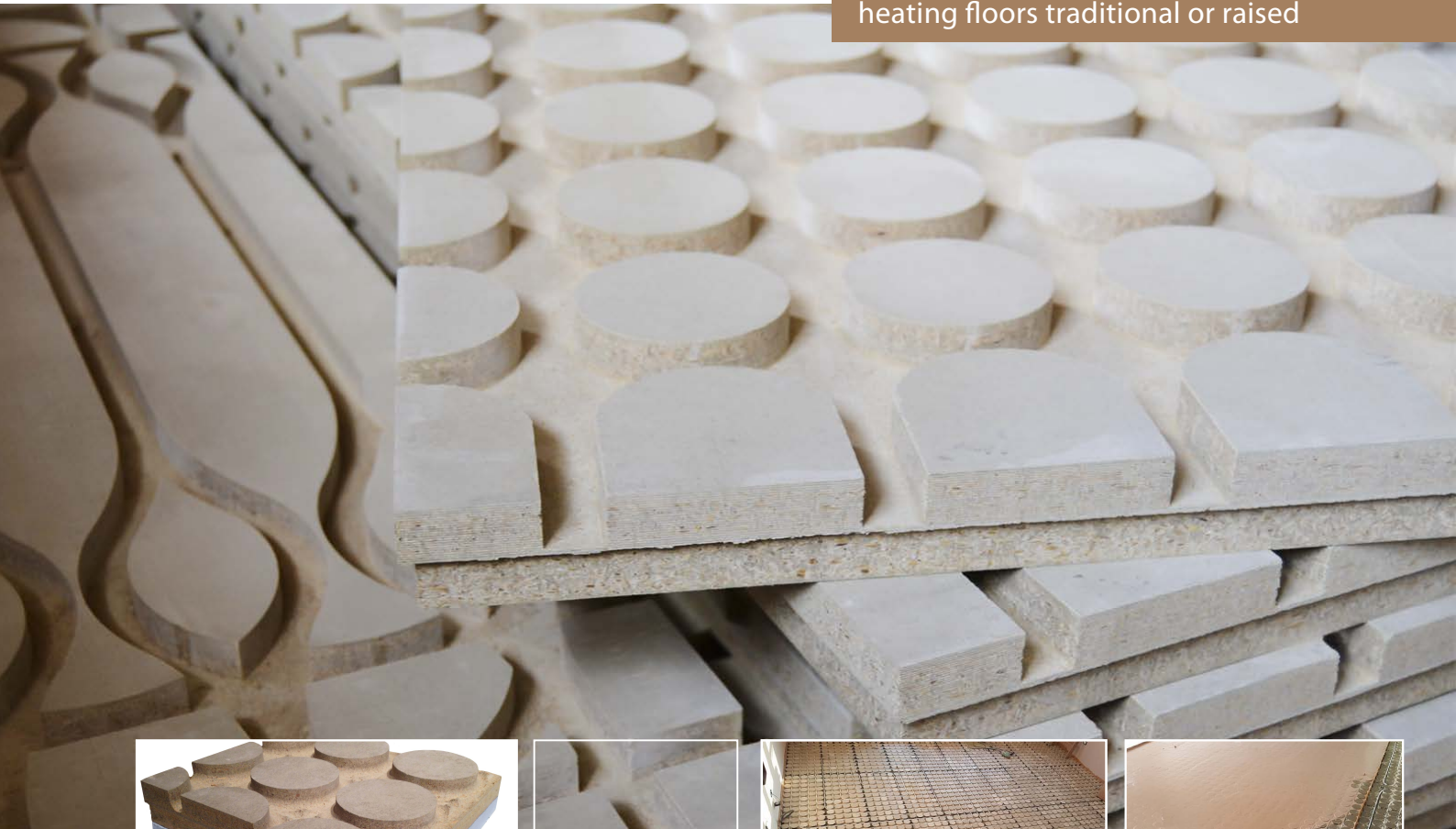


# Betonradiant *styr* XPS

Cement bonded particle board with extruded polystyrene modular system for radiant heating floors

Modular systems for radiant heating floors traditional or raised



## | AREAS OF APPLICATION

Betonradiant *styr* XPS is a modular system for radiant heating floors realized by a cement bonded particle board BetonWood, with high density (1350 Kg/m<sup>3</sup>) according to European standard EN 13986, and a extruded polystyrene panel.

Betonradiant *styr* XPS is an excellent solution to have a radiant floor heating system 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.

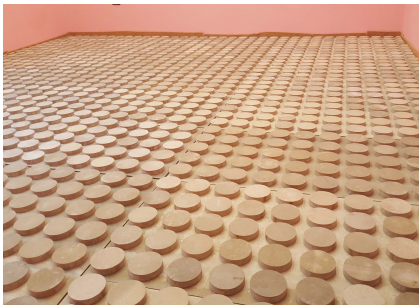
The radiant floor Betonradiant *styr* XPS is a modular system suitable for any finish, ensuring an excellent ease of installation and a flexibility that makes it ideal for the realization of traditional dry floor radiant heating systems, floating floors on loose material or over height-adjustable supports.

The panel is made up of a cement bonded particle board BetonWood, above which are distributed and coupled in the factory by patented system, the cylinders, also in cement-wood material, for housing the pipes needed to run the radiant heating system On the floor. The "upper layer" consisting of cement-bonded cylinders, after laying the pipes and installing a suitable self-leveling agent, is suitable for any surface finish of coating chosen by the end user.

This panel is coupled with another thermo-acoustic insulating panel in extruded polystyrene.

The wood used in the processing of the Betonradiant *styr* XPS panel comes from FSC forests controlled by reforestation cycles and pressed with water and hydraulic binder (Portland cement) with high cold compression ratios.

For more informations about the uses and the installation, our offices are ready to answer your questions on [www.betonradiant.com](http://www.betonradiant.com)



## | MATERIAL

The panels in Beton Radiant can be supplied in a stepped version and coupled with insulating materials such as cork (Beton Radiant Cork) or XPS (Beton Radiant Styr XPS). The Beton Radiant® cement-based radiant floor offers the advantage of having a specific heat  $c = 1.88 \text{ kJ / kg K}$ , which makes the panel a whole radiant mass. This highly improved value compared to the fiber-reinforced panels makes it possible to have a uniform heat distribution.

## | SPECIFICATION

The system is made up of a cement bonded particle board on which cylinders create the spaces intended for laying the heating pipes of the rooms. This type of panels can be used in traditional dry screeds and elevated floors on loose materials or on height-adjustable supports.

The base panel and the cylinders are made of Portland-type concrete conglomerate and high-density debarked pine wood fiber ( $\delta = 1350 \text{ kg/m}^3$ ) and with the following thermodynamic characteristics: coeff. of thermal conductivity  $\lambda = 0.26 \text{ W / mK}$ , specific heat  $c = 1.88 \text{ kJ / Kg K}$ , coefficient of resistance to vapor penetration  $\mu = 22.6$  and reaction class to fire A2-fl-s1, according to EN 13501-1 standard. The cylinders, BetonWood type, are coupled to the base panel in the factory and have thickness ... mm, the space between one rod and the other creates the space for housing the pipes of diameter ... mm. The base panel with a thickness of ... mm, is coupled also with an insulating panel made of extruded polystyrene (XPS). This panel is characterized by the following thermodynamic characteristics: coefficient of thermal conductivity  $\lambda = 0,026 \div 0,036 \text{ W / mK}$ , specific heat  $c = 1,450 \text{ J / Kg K}$ , coeff. of resistance to vapor penetration  $\mu = 50 \div 100$ . The panel is supplied already coupled with dimensions ... mm.

The wood used in the processing of cement is from forests controlled by FSC reforestation cycles and pressed with water and hydraulic binder (Portland cement) with high cold compression ratios.

## | TECHNICAL CHARACTERISTICS

### Betonradiant styr XPS

Cement bonded particle board

Density $\rho$ [kg / m <sup>3</sup> ]		1350
Reaction to fire in order to the standard EN 13501-1		A2-fl-s1
Thermal conductivity coefficient $\lambda_D$ [W / (m * K)]		0,26
Specific heat $c$ [J / (kg * K)]		1.880
Steam penetration resistance $\mu$		22,6
Coefficient of linear thermal expansion $\alpha$		0,00001
Swelling in thickness after 24h of storage in water		1,5%
Superficial PH value		11
Flexural strength $\sigma$ [N / mm <sup>2</sup> ]		min.9
Transversal tensile strength $N$ [N / mm <sup>2</sup> ]		min.0,5
Air permeability $l$ /min. m <sup>2</sup> Mpa		0,133
Modulus of elasticity $E$ [N / mm <sup>2</sup> ]		4500
Shear strength $\tau$ [N / mm <sup>2</sup> ]		0,5
Resistance to distributed load	kPa	9000
Resistance to concentrated load	kN	9

BetonWood cement bonded particle board are also:

- resistant to the outside
- antifreeze
- free from formaldehyde and asbestos

## | TECHNICAL CHARACTERISTICS

### Betonradiant styr XPS

Extruded polystyrene XPS panel

Density $\rho$ [kg / m <sup>3</sup> ]		15 ÷ 35
Edges		sharp
Thermal conductivity coefficient $\lambda_D$ [W / (m * K)]		0,026 ÷ 0,036
Specific heat $c$ [J / (kg * K)]		1.450
Water vapour diffusion resistance factor $\mu$		50 ÷ 100
Fire resistance class according to EN 13501-1		E
Compressive Stress at 10% deformation	kPa	120 ÷ 250
Compressive Creep	kPa	≤ 100 mm = 130 kPa > 100 mm = 110kPa
Dimensional stability under specified conditions 70°C; 90% r.h.	%	≤ 5
Deformation under specified compressive load of 40 kPa and temperature conditions at 70°C	%	≤ 5
Freeze-thaw resistance after long term water absorption by diffusion	vol. %	≤100mm ≤ 1 >100 ≤200mm ≤ 2
Modulus of elasticity		12.000



| APPLICATIONS

To guarantee an easy installation, the panels can be supplied in a stepped version. The system is also available in the coupled version directly at the factory with an insulating layer, which improves the performance of the entire package.

| TYPES

In addition to the radiant **Betonradiant styr XPS** heating system that combines a cement-bonded particle board with an extruded polystyrene panel, there are other variants that combine the cement-bonded particle board base panel with panels in thermo-acoustic insulation materials, such as: wood fiber, cork, etc. The following are the variants:

- **Beton Radiant Fiber**
- **Beton Radiant Cork**
- **Wood Radiant**
- **Beton Radiant EPS**
- **Beton Radiant**

| CERTIFICATION

The **Beton Radiant** panels are produced with CE certified materials in accordance with current regulations. Product certificates are available on request.



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| AVAILABLE DIMENSIONS **Betonradiant styr XPS**

	Thicknesses	Cement bonded particle board	
		18 + 20	20+20
Extruded polystyrene panel (XPS)	10	•	•
	20	•	•
	30	•	•
	40	•	•

Standard sizes	
Coupled panels (every thickness of those listed above)	1200 x 500

It is possible, on request, to produce different formats for minimum quantities of 300 square meters. It is possible to create panels with housing spaces for pipes larger than 14 mm (standard size), up to a maximum of 17mm.

With an increased cost of 5%.

| TECHNICAL DRAWINGS OF THE MODULAR SYSTEM **Betonradiant styr XPS**

**Betonradiant styr XPS 1200x500 mm**

Module for radiant floors dimensions 1200 x 500 mm and thickness (20 + 20) + 20 mm  
This is only one of the panels combinations, for more information please send an email to our office.

