# Betontherm styr EPS

External-internal thermal insulation composite system
in insulating polystyrene and cement bonded particle boards

Reinforced external-internal thermal insulation composite systems



## | AREAS OF APPLICATION

Betontherm styr EPS is a modular system ideal for the realization of external/internal thermo-acoustic insulation composite systems (ETICS), with high mechanical resistance and high thermal displacement.

Thermal composite systems with an high insulating power, both internal and external, suitable for walls, ceilings, roofs. Suitable both for traditional constructions and dry wood systems in X-Lam or Platform frame.

Betontherm styr EPS is a thermal composite system made by high density cement bonded particle board (1350 Kg/m$^3$) BetonWood and an expanded polystyrene EPS. Building material certified CE.

The reinforced thermal composite system Betontherm styr EPS is a modular system studied to give a simple, smart and functional solution for the realization of a thermal composite system (ETICS) suitable for public locations and buildings like hospitals, schools, libraries, prisons, even fire protection systems. It can be installed quickly and without specialized technicians and workers.

The system includes:

- Betontherm panels realized with two panels already coupled:
  1. a cement bonded particle board BetonWood wich is the layer with high mechanical strenght and high density on wich we can apply every finish material we desire. The panel is milled on the outer edges and on the surface corresponding the the plug housing.
     Edge milling makes it possible to reinforce the joints between panel and panel before cement render by laying a fiberglass tape adhesive on one side to prevent the formation of micro-cracks in the case of settling the building;
  2. an expanded polystyrene panels (EPS) which guarantees an high thermal-acoustic insulation;
- Betonfix plugs with an anti-thermal bridge protection cap;
- Betonnet glass fiber net and accessories;
- professional cement renders.

For more informations about the uses and the installation,
our offices are ready to answer your questions on www.betontherm.com



## | MATERIAL

The Betontherm panels are provided in coupled solution with other insulating materials like cork (Betontherm Cork), or extruded polystyrene XPS (Betontherm Styr XPS), or other wood fiber panel types with riduced density like Betontherm fiber top or Betontherm fiber dry.

## | SPECIFICATION

Supply and installation of external and internal reinforced insulation with panels already coupled of dimensions ... mm and thickness .... mm. BetonTherm is made with an hanrd panel in cement conglomerate Portland type and debarked Pine wood fiber, with high density (δ=1350 Kg/m³) and with the following thermo-dynamics characteristics: declared thermal conductivity λ=0,26 W/mK, specific heat c=1,88 KJ/Kg K, water vapour diffusion resistance factor μ=22,6 and fire reaction class A2-fl-s1, according to the standard EN 13501-1. 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.

The other panel represent the insulating layer and it is made in expanded polystyrene (EPS). This panel is characterized by the following thermodynamic characteristics: coefficient of thermal conductivity λ = 0,026 ÷ 0,036 W / mK, specific heat c = 1,450 J / Kg K, coeff. of resistance to vapor penetration μ = 50 ÷ 100. The panel is supplied already coupled with dimensions ... mm. Building material certified CE.

## | TECHNICAL CHARACTERISTICS Betontherm styr EPS

Cement bonded particle board

| | | |
|---|---|---|
| Density | ρ [kg /m³] | 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 | 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 |
| Flexural strength | σ [N /mm²] | min.9 |
| Transversal tensile strength | N [N /mm²] | min.0,5 |
| Air permeability | l/min. m² Mpa | 0,133 |
| Modulus of elasticity | E [N /mm²] | 4500 |
| Shear strength | τ [N /mm²] | 0,5 |
| Resistance to distributed load | kPa | 9000 |
| Resistance to concentrated load | kN | 9 |

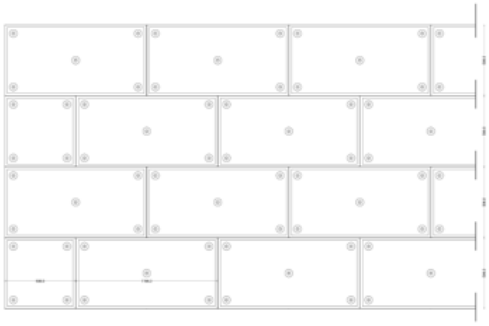
## | TECHNICAL CHARACTERISTICS Betontherm styr EPS

Expanded polystyrene EPS panel

| | | |
|---|---|---|
| Density | ρ [kg /m³] | 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 | μ | 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<br>> 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<br>>100 ≤200mm ≤ 2 |
| Modulus of elasticity | | 12.000 |

Beton Wood



## | AVAILABLE DIMENSIONS Betontherm styr EPS

| | | cement bonded particle board (mm) | |
|---|---|---|---|
| | thicknesses (mm) | 16 | 20 |
| polystyrene EPS | 40 | | • |
| | 60 | | • |
| | 80 | • | • |
| | 100 | • | • |
| | 120 | • | |
| | 140 | • | |
| | 160 | • | |
| | Sizes (mm) | 1200 x 600 | 1200 x 500 |

## | PLUS ADVANTAGES OF BETONTHERM SYSTEMS

### +1 Fire resistant

The thermal composite systems Betontherm fiber, cork and styr thans to the external cement bonded particle board witha fire class A2 are suitable for fire escape ways, schools, hospitals, public buildings in wich there are insolation and safety needs.

### +2 Excellent mechanical resistance

The thermal composite systems Betontherm fiber, cork and styr having a cement bonded particle boards with a thickness from 16 to 20 mm, offer a high mechanical resistance, not only for hanging accessories on the surface but also for resisting vandalism.

### +3 High noise reduction

The thermal composite systems Betontherm fiber, cork and styr ,combinating panels with different densities, have the advantage of effectively breaking down a wide range of acoustic frequencies, even very high.

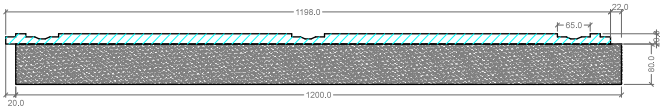
## | CERTIFICATIONS

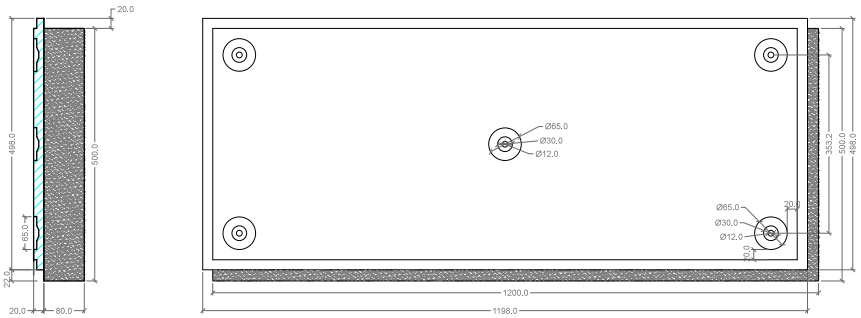
The Beton Therm panels are produced with CE certified materials in accordance with current regulations. Product certificates are available on request.

CE

## | TECHNICAL DRAWINGS OF THE MODULAR SYSTEM Betontherm styr EPS

Betontherm styr EPS 1200x500 mm thickness 20 + 80
This is only one of the panels combinations.

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