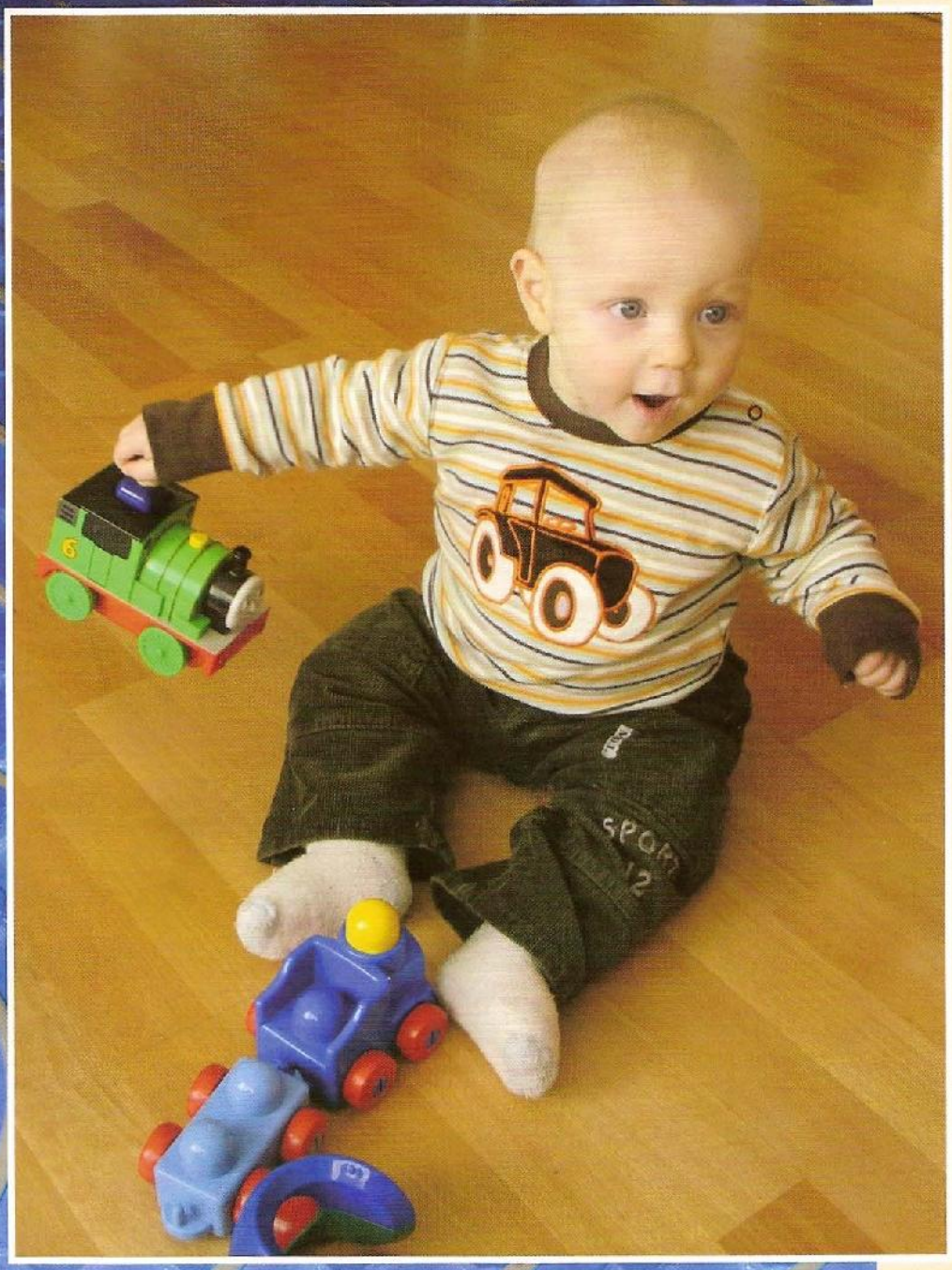
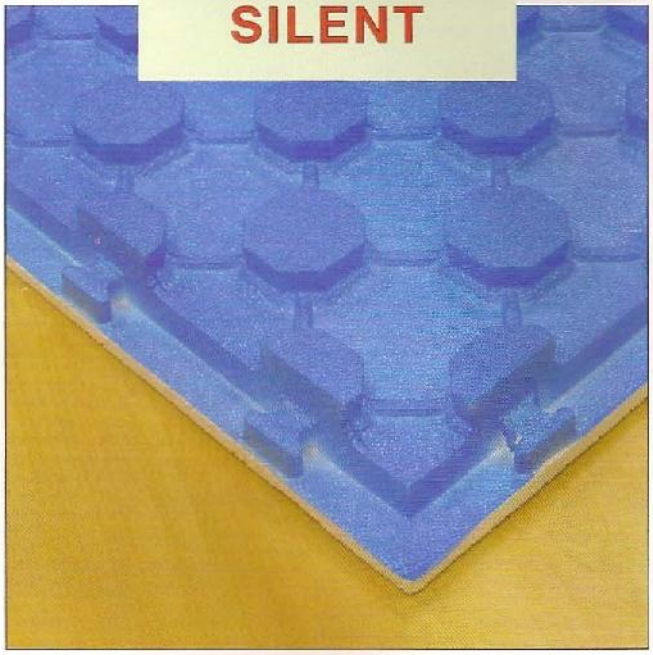
FRAGMAT



Floor heating

STIROTERMAL

STIROTERMAL SILENT



Floor heating is becoming more and more popular nowadays because of its exceptional characteristics. Its main advantage is its ideal temperature profile; this is a favourable distribution of temperature from floor to ceiling. Because of it living in a room with floor heating is pleasant and healthy. STIROTERMAL boards are intended for installation into modern floor heating systems. They are manufactured in accordance with the highest quality standards and with the help, technical equipment and licence from the German company HEWING. They allow for a simple and quick high-quality installation of floor heating systems.

With floor heating the same sensation of warmth is achieved as with radiator or convector heating, but with an average temperature of 1 to 2 °C less, which means 6 to 12% energy savings. Besides, there is less energy loss through airing than in rooms where radiators are placed under the windows.

With floor heating the entire surface of the floor represents a uniform heating device, which heats the room also at small temperature differences. This is also possible, because great surfaces emit 50 to 80% of their heat by radiation, while the share of radiation in radiator heating is 25% at the most, and is practically negligible with convectors. There is also almost no ascent of dust particles through air movements.

The sensation of warmth does not depend only on air temperature

Heating method and kind and quality of the thermal insulation of the surface influence to a great deal our feeling of comfort. Because the human body temperature is usually 37 °C, heat from the body surface flows constantly to the colder surrounding. Part of it is given away to the surrounding air by convection, part of it by radiation to objects and the walls of the room and part of it is lost by direct contact. The heat transfer by convection is always the same, because the air temperature is stable, but the intensity of the heat flow by radiation depends on the surface temperature of objects and walls, which can be higher or lower than the air temperature in the room.

In living spaces without floor heating the floor temperature is usually between 15 and 18 °C, with floor heating it moves between 20 and 25 °C. The biggest influence on the intensity of body temperature loss has the temperature difference between body and floor; in the first example it lies between 19 and 22 °C, with floor heating it is only 12 to 17 °C. Because of a smaller temperature difference the heat flow from the sole of the foot to the floor is essentially less than with other heating methods. Because the foot is very sensitive, such a small temperature difference is felt like a pleasant sensation of warmth. Statistical and medical research show that the highest (allowed) floor temperature should be 29 °C for rooms, where we stay for longer times, and 35 °C for others (bathroom).

With floor heating air movements in the room and mixing of cold and warm air are also not so intensive. In the requirements for calculating the loss by transmission (DIN 4701) the so-called normed indoor temperatures are given. According to the definition of these norms we do not talk about the actual air temperature in a room, but about the sensation of warmth, because of the combined influence of air temperature and surface temperature in a room. Precisely because of this we feel the same feeling of comfortable warmth in a room with floor heating, as in a room with radiator heating, despite a lower temperature. The air temperature can be for 2 °C less, and therefore there is also less heat loss because of airing.

Floor heating installation with STIROTERMAL boards

STIROTERMAL system boards enable a simple, high-quality and quick realization of floor heating. They are manufactured from expanded polystyrene (styropor) by expansion in a mould. The upper side of the board is designed for pipe fastening, and its surface is coated with polyethylene foil, protecting it against dampness during installation with cement screed, and increasing its resistance against mechanical damage. The boards are connected to each other by overlapping.

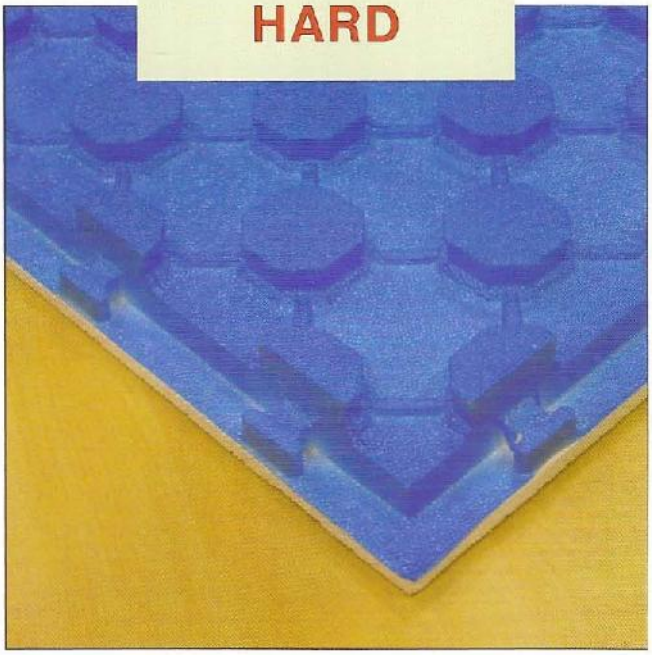
The panels STIROTERMAL Silent combine different functions into one element: The special form of the upper side with octagonal knobs allow for easy installation of pipes and the panels offer a basic thermal insulation. Because of an elastification process, they absorb footsteps and a polyethylene foil on the upper surface protects the panel against dampness.

The thickness of the basic layer for thermal insulation is enough for installation between floors, for the ground floor and floors above rooms that are not heated an additional thermal insulation is necessary.

The panels are intended for the realization of floor heating systems in living spaces and offices with normal pressure load.

TECHNICAL DATA	SILENT
total size:	1075×775 mm
usable size:	1050×750 mm
usable surface:	0,79 m^2
use:	1,27 piece/m^2
total thickness:	58 mm
insulation thickness:	33/30 mm
height of pipe fastening:	25 mm
form of pipe fastening:	octagonal knob
minimal distance between pipes:	75 mm
pipes diameters:	16 – 20 mm
distance of pipes from insulation:	5 mm
basic material insulation:	EPS
heat conduction coefficient λ:	0,039 W/(m.K)
heat resistance of the panels - R:	0,78 m^2K/W
heat stability:	DS(70,-)1
fire class according to EN 13501-1	E
acoustic insulation according to EN 29052-1:	yes
dampness protection - foil:	yes
material of the foil:	polyethylene - P
colour of the foil:	blue

STIROTERMAL HARD

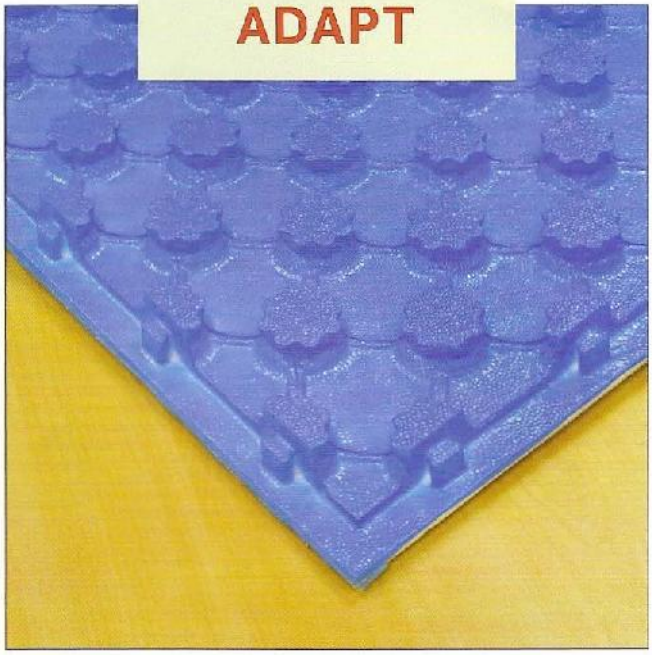


The panels STIROTERMAL Hard are manufactured from hard EPS without elastification, therefore they have a higher resistance to pressure. Octagonal knobs on the upper side allow for easy installation of heating pipes, polyethylene foil on the surface ensures protection against dampness from screed during installation.

The thickness of the basic layer for thermal insulation is enough for installation between floors, for the ground floor and floors above rooms that are not heated an additional thermal insulation is necessary.

The panels are intended for the realization of floor heating in premises with higher stress to the floor, like garages, parking garages, industrial halls and so on.

STIROTERMAL ADAPT



The panels STIROTERMAL Adapt are less thick, also the star-shaped knobs are lower, but they allow for a very dense installation of pipes. The upper surface is coated with polyethylene foil as a protection against dampness.

Because the thickness of the thermal insulating layer is minimal, these panels are mostly intended for adaptations, where the final height of the floor is often restricted.

HARD	ADAPT
1075×775 mm	1020×720 mm
1050×750 mm	1000×700 mm
0,79 m^2	0,70 m^2
1,27 piece/m^2	1,44 piece/m^2
58 mm	36 mm
33 mm	15 mm
25 mm	21 mm
octagonal knobs	star-shaped knobs
75 mm	50 mm
16 – 20 mm	14 – 16 mm
5 mm	5 mm
EPS	EPS
0,036 W/(m.K)	0,036 W/(m.K)
0,91 m^2K/W	0,41 m^2K/W
DS(70,-)1	DS(70,-)1
E	E
no	no
yes	yes
polyethylene - PE	polyethylene - PE
blue	blue

WHY FLOOR HEATING?

With floor heating air temperatures in different levels of the room (the so called temperature profile) are very close to the ideal state, this gives a feeling of well-being, although the average temperature in a room can be for 1 to 2 °C lower than in a room with radiator heating.

The entire surface of the room is a heating device. Thermal energy, needed for heating, is supplied even at a small temperature difference and there are less thermal air movements in the room, which means less dust movements. The share of radiation in warming up a room is 50 to 80% (only 25% with radiators). The relative humidity is higher, which is beneficent to the respiratory organs.

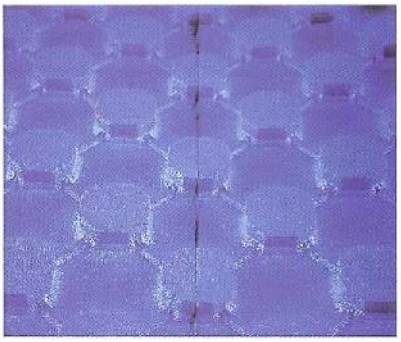
Because the temperature for heating circuit water is lower, a low temperature boiler with higher efficiency is sufficient; the use of solar heating systems or heat pumps is also easier.

STIROTERMAL

Plošče za sistem talnega ogrevanja
Floor heating panels

Opis

Plošče so izdelane iz ekspandiranega polistirena (EPS); spodnja stran je ravna, 8-robi čepi na zgornji strani pa služijo kot držala za cevi. Robovi plošč so oblikovani tako, da omogočajo medsebojno spajanje Zaradi zaščite pred vlago je zgornja površina prevlečena z polietilensko (PE) folijo. V postopku izdelave so plošče elastificirane - celična struktura stiropora je mehansko porušena; plošče zato nudijo dobro izolacijo pred udarnim zvokom.

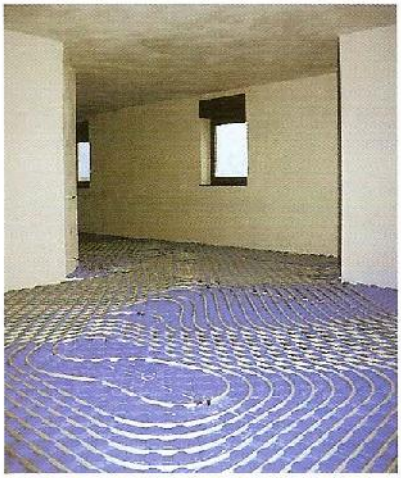


Description

Panels are made of EPS; their bottom side is flat. The eight-sided projecting parts on their upper side function as pipe-handlers. The panel edge design enables combining of individual panels. For the sake of moisture protection the upper surface is coated with PE foil. During manufacturing process the EPS cellular structure is mechanically broken down. This is the reason for their good striking sound insulation.

Uporaba

Plošče se uporabljajo kot podlaga za vgradnjo cevi v sistemu talnega ogrevanja, obenem pa služijo kot toplotna in zvočna izolacija tlaka. Nepogrešljive so pri izvedbi talnega ogrevanja v stanovanjskih in poslovnih prostorih, muzejih, cerkvah, športnih dvoranah, pokritih bazenih itd.



Use

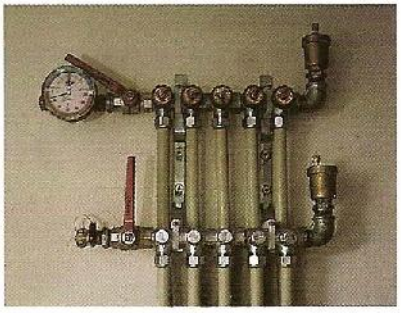
Panels are used as the base for floor heating pipes. At the same time they function as thermic and sound pavement insulator. They are most suitable for building floor heating systems in residential and business sites, museums, churches, gymnasiums, covered swimming pools, etc.

Odlike

- enostavno in hitro polaganje
- olajšana vgradnja cevi
- dobra toplotna izolativnost
- dobra zvočna izolativnost
- vgrajena zaščita pred vlago

Distinctions

- Quick and simple assembly
- Easier pipe laying
- Good thermal insulation
- Good sound insulation
- Built-in moisture protection



Teh. podatki / tech. data

dolžina / length:	1075 mm
širina / width:	775 mm
koristna dolž. / effect. length:	1050 mm
koristna širina / effect. width:	750 mm
koristna površ. / effect. area:	0,79 m²
celotna deb. / whole thickness:	58 mm
deb. izolacije / thick. of insulat.:	33 mm

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