KNAUF Therm EXPERT FLOOR HEATING 200 λ 33

WATER FLOOR HEATING PANEL

(EPS 200)

KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 polystyrene panels are designated by the following code according to standard EN 13163:2012+A1:2015

EPS –EN 13163-T(1)-L(2)-W(2)-S(2)-P(5)-BS250-CS(10)200-DS(N)2-DS(70,-)1-DLT(1)5-WL(T)2

KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 (EPS 200) insulation panels are manufactured as a ready product. Their innovative manufacturing process provides them with very good functional properties, besides excellent insulating properties. These panels are intended for broad applications for thermal insulation of floors in water floor heating systems.

PURPOSE

KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 panels are intended for thermal insulation of floors and installation of heating pipes in water floor heating systems.

KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 panels are intended for thermal insulation of floors and installation of heating pipes in water floor heating systems. Panels are made from dense expanded polystyrene, which protects them from absorbing moisture. Due to their universality, they can be used in residential and public buildings.

ADVANTAGES OF KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 PANELS

- An inset system enables quick and easy installation of heating pipes.
- The shape of insets guarantees stability of installed pipes without the need to use additional materials to lock pipes into place.
- An innovative edge shape allows for tight and stable joining of panels
- The back side of the panel in the form of "chessboard" allows to precise cutting.
- High thermal resistance

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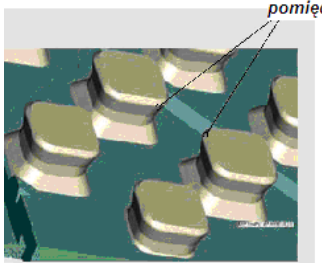
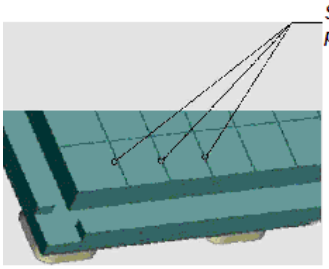
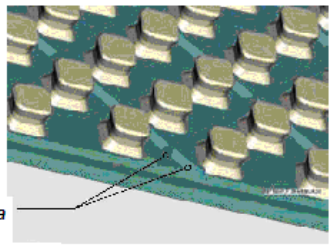
SPECIAL PROPORTIES OF KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 PANELS







GUIDELINES FOR FASTENING KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 PANELS

1. Floor heating

This is a low-temperature room heating system operating according to the principle of thermal radiation from a surface, where 70% of thermal energy is transferred via radiation and 30% via convection.

Floor heating provides thermal comfort thanks to uniform heat distribution throughout the entire surface of a room as well as beneficial temperature distribution in the room.

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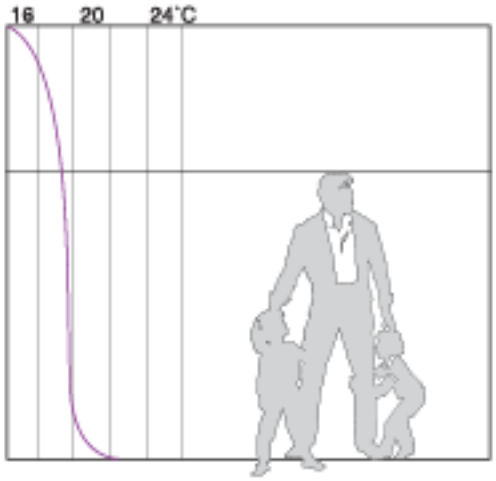
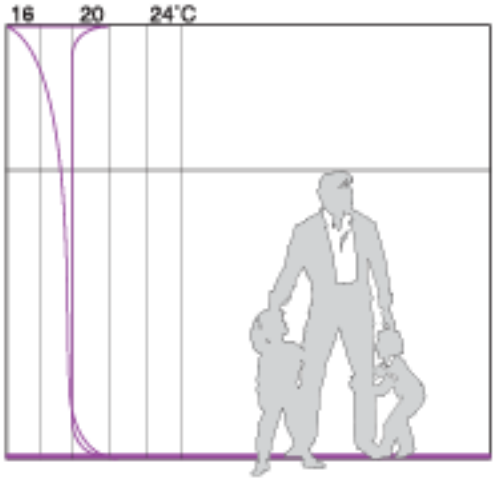
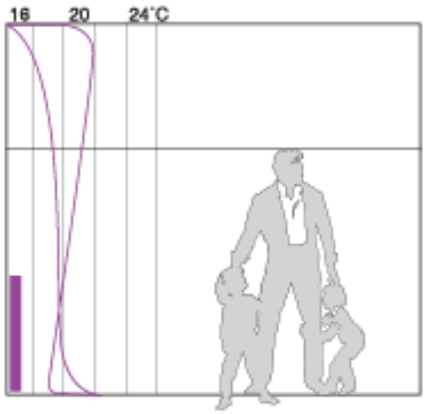
Fig. no. 1. Comparison of different heating types



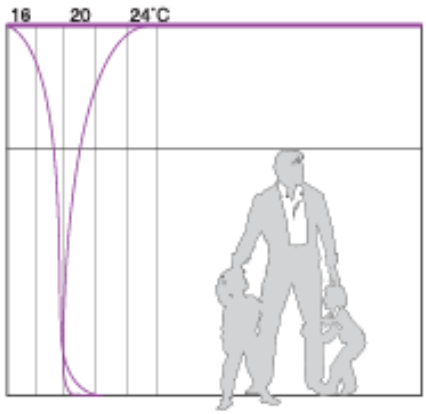
ideal curve



floor heating



radiator heating



ceiling heating

The advantages of floor heating are:

- a heated room can have any shape (no traditional radiators)
- thermal comfort is improved due to reduction of convection movement, air purity is improved
- it is possible to reduce seasonal energy consumption in comparison to radiator-based central heating
- self-regulation, based on automatic adjustment of the thermal power of pipes accordingly to the change of temperature inside the room.

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2. Operating parameters of floor heating

According to the requirements of standard DIN 4725, the temperature of the floor's surface is limited in floor heating. The optimal temperature is 24 – 26 C. For best thermal comfort, floor temperature should not exceed:

24 C – in areas permanently occupied by residents (residential and office rooms)

35 C – in the boundary area (near the building's exterior walls)

33 C – in bathrooms

27 C – in work rooms where work is performed while standing

Other initial parameters for designing floor heating should be equal to:

55 C - maximum feed temperature

55 C - temperature difference between feed

0.1 – 0.6 m/s - water flow rate in heating pipes

90% - efficiency of thermal energy transfer by heating system to room

3. Piping systems in floor heating

Selection of the piping configuration of a floor heater depends on the purpose of the room that is to be heated. Boundary zones are applied at locations with high thermal losses, near large window and door openings, and along exterior walls.

A looped system provides more uniform temperature distribution (fig. 2a), and a meandering system is used when the heated room has a partition with significantly greater heat losses than the rest (fig. 2b).

Examples of piping systems in floor heating (near exterior walls) are shown below.

Fig. no. 2a. Example of looped system with boundary zone

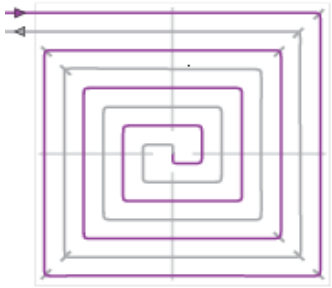
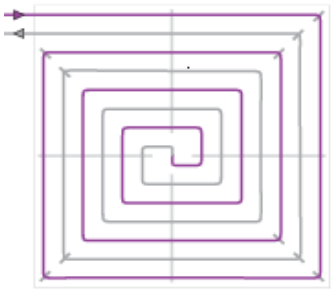


Fig. no. 2b. Example of meandering system



4. Floor heater design

The design of a floor heater depends on the structure of the floor slab or floor on which it is installed as well as on the characteristics of the heated room and its neighboring rooms. If the room in which water floor heating will be used is at ground level or lies above an unheated basement, the system of layers is as follows:

- anti-moisture insulation (in the case of heating on ground level)
- lean concrete layer
- thermal insulation (e.g. KNAUF Therm TECH Roof/Floor λ 37, KNAUF Therm PRO Roof/Floor EPS 100 λ 36 or KNAUF Therm PRO Parking EPS 200 λ 33 polystyrene panels)
- KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 polystyrene panel
- concrete heating panel with heating pipes – KNAUF screed
- floor

If the room in which water floor heating will be used lies above a heated room, then the system of layers is as follows:

- floor slab
- KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 polystyrene panel
- concrete heating panel with heating pipes – KNAUF screed
- floor (KNAUF)

Thicknesses of individual layers depend on the structure of the floor slab and the required bearing capacity of the floor.

In addition, the system consists of:

- boundary tapes
- expansion profiles

Floors with concrete screed

Concrete floors in floor heating are referred to as "wet" installation of floor heating. It is very important that there are no air bubbles in the concrete, particularly near pipes. One of the most effective methods of installing water floor heating is to use the KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 polystyrene panel, which facilitates and speeds up work when installing pipes in the water floor heating system thanks to its specially shaped surface. The thickness of the concrete screed above pipes should be at least 30mm and at most 70mm.

1) Boundary insulation

Boundary insulation serves to separate the heating panel from the wall:

- absorbs stresses generated as a result of thermal deformations of the floor
- limits thermal losses of the heating panel through the building's walls
- provides acoustic insulation of structural elements

Boundary insulation is made from boundary tape (polyethylene foam with thickness of 10 mm and height of 150 mm).

2) Thermal insulation (additional)

We install thermal insulation using polystyrene panels of high hardness, e.g. KNAUF Therm PRO EPS 100 λ 36 or KNAUF Therm PRO Parking EPS 200 λ 33. The thickness of thermal insulation is dependent on the type of rooms under the heater floor and may range from 30 – 100 mm.

When installing floor heating on the ground level under a layer of thermal insulation, we also lay down a layer of hydro-insulation – e.g. polyethylene anti-moisture film.

3) Joining of insulation panels

KNAUF Therm Roof/Floor EPS 100 λ 36 or KNAUF Therm Roof/Floor EPS 200 λ 33 panels are manufactured in two versions:

- seamed version – tight joint between panels,
- unseamed version – this version can be used successfully when installing water floor heating at ground level or over an unheated room where a layer of additional insulation is present in the form of KNAUF Therm polystyrene panels intended for floor applications. KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 panels are laid like "brickwork", meaning that their joints do not overlap with the joints of additional insulation.

Stages of work when installing water floor heating using KNAUF Therm FLOOR HEATING 200 λ 33 panels

The stages of work during installation of water floor heating depend on the location of the room where it will be installed.

1. Installation of so-called additional insulation (in the case where floor heating is installed at ground level or above an unheated room) – KNAUF Therm polystyrene panels (KNAUF Therm TECH Roof/Floor λ 37, KNAUF Therm PRO Roof/Floor EPS 100 λ 36, KNAUF Therm PRO Parking EPS 200 λ 33)
2. Gluing of boundary tapes near walls and pillars (if present in the room where water floor heating is being installed
3. Laying of KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 panels – specialized panels for water floor heating
4. Installation of heating pipes on KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 panels (no need to use materials for locking pipes into place)
5. Filling of heating pipes with water
6. Construction of so-called heating panel
7. Covering of pipes with jointless floor - anhydrite or cement (such as KNAUF FE 50 jointless cement floor) – up to the height of "insets" on the KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 panel
8. Deaeration of jointless floor – pipes must be completely covered by the screed, without air pockets e.g. under pipes.
9. Leveling of the surface – if necessary - using KNAUF FE 50 self-leveling screed

ATTENTION

Do not use panels in direct contact with substances that act destructively on polystyrene, e.g. organic solvents (acetone, nitroglycerin, benzene, etc.)

PACKAGING, STORAGE, TRANSPORT

KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 polystyrene panels are only delivered in the manufacturer's, i.e. KNAUF Industries Polska Sp. z o.o., original packaging.

A product's packaging contains information concerning: product name, name of manufacturer, production date, Polish Standard no. PN-EN 13163+A1:2015, code according to standard, and declared technical parameters.

KNAUF Therm EXPERT FLOOR HEATING 200 λ 33 polystyrene panels are to be stored in a manner that protects them against mechanical damage and the weather.

TECHNICAL DATA

λ_D Thermal conductivity coefficient W/(mK)	≤ 0.033
Edge shape	rectangular
Dimensions [mm]	1120x720 (with overlap), 1100x700 (without overlap)
Thickness [mm]	20 and 30
Diameter of heating pipes [mm]	from 14 to 18
Min. pipe bending radius [mm]	50
Inset height [mm]	27
Compressive stress at 10% deformation (kPa)	CS(10)200 (≥ 200)
Self-extinguishing capacity	SELF-EXTINGUISHING
Class of reaction to fire	E
Bending strength (kPa)	BS 250 (≥ 250)

Product	KNAUF Therm EXPERT FLOOR HEATING 200 λ 33	
Base thickness [mm]	20	30
Thermal resistance R_D [m^2*K/W]	0.55	0.85

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