On load-bearing floors with LK CombiBoard EPS 14/18/30/50/70

Design

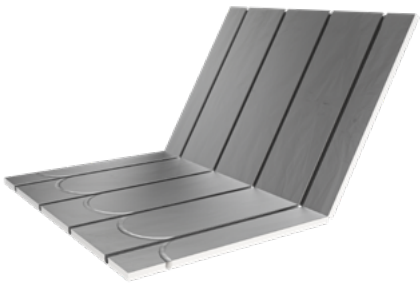
- LK Floor Heating in design with LK CombiBoard EPS for laying on load-bearing floor constructions.
- The system consists of insulation boards of EPS class S300 equipped with a laminated heat distribution layer for optimal heat distribution.
- LK CombiBoard EPS has high insulating properties as well as being excellent for short- or long-term loads.
- The EPS boards are equipped with pipe channels and integrated turning channels.

Product summary

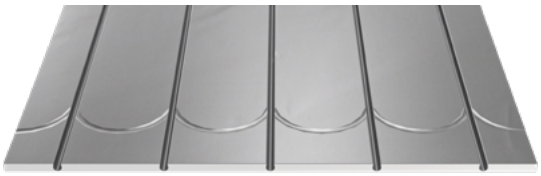
Article No.	LK CB EPS	c.t.c	pipe. dim.
241 04 63	LK CB EPS 14	160 mm	12 mm
241 04 64	LK CB EPS 18	200 mm	16 mm
241 04 65	LK CB EPS 30	200 mm	16 mm
241 04 66	LK CB EPS 50	200 mm	16 mm
241 04 67	LK CB EPS 70	200 mm	16 mm

ATTENTION!
Read the full installation instructions before starting work.

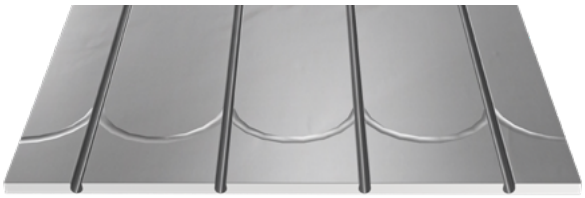
LK CombiBoard EPS 14 boards are supplied folded and must be individually unfolded.



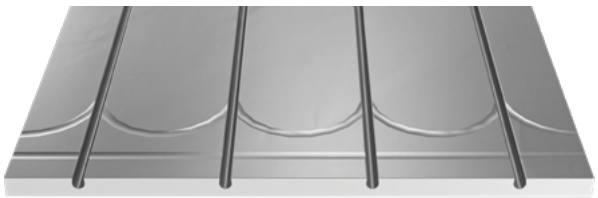
LK CombiBoard EPS 18 boards are supplied folded and must be individually unfolded.



LK CombiBoard EPS 14.



LK CombiBoard EPS 18.



LK CombiBoard EPS 30/50/70.

TABLE OF CONTENTS

Requirements

The requirements for a properly functioning underfloor heating system are a weather-controlled regulation system for the supply temperature and well-implemented and documented adjustment of the primary and loop flows.

LK CombiBoard EPS must only be laid on load-bearing floor constructions. Load-bearing floor constructions refers to concrete or floor-grade chipboard fixed to joists spaced at a maximum of c.t.c 600 mm. LK CombiBoard EPS boards must not be laid over any other floor insulation, as multiple layers of insulation cause poor floor resilience. In general the instructions apply in accordance with AMA Hus (Swedish Construction Industry Standard for house-building) and for specified builders/quality managers.

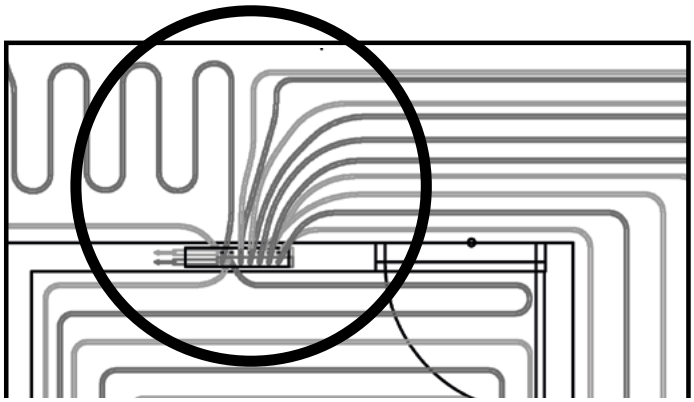
Uninsulated concrete floor constructions or cellar floors

RISK! Heat loss and moisture transfer
Uninsulated concrete floor construction or cellar floors may cause heat loss and moisture transfer. The construction should be damp-proofed. If you are unsure, contact a damp consultant or other expert for advice.

When an underfloor heating system is to be installed on non-insulated concrete slabs or cellar floors, there is an increased risk of heat loss to the ground. In addition to the increased cost of heating, this can also result in an increased risk of moisture transfer to the space from the floor and cellar walls.
There are various ways to damp-proof the floor construction. One way is to incorporate a layer that forms an air gap. Another is to choose a floorboard with extra insulation. If there is a risk of additional moisture, contact an expert for advice.

Laying LK CombiBoard EPS boards

RISK! Reduced bearing capacity
As a large number of underfloor heating circuits will be connected to the manifold, there is a risk of the bearing capacity being inadequate for the overlying floor. See illustration below. In such cases, it may be best to remove part of the LK CombiBoard EPS and fill in the gap with levelling compound. The risk is the same where a large number of underfloor heating circuits are forced together into a small space, e.g. when they pass between rooms.



RISK! Sharp edges! Use protective gloves
The laminated heat distribution layer on LK CombiBoard EPS boards has sharp edges.
Use protective gloves when handling LK CombiBoard EPS boards.

NOTE! The flatness of the sub-floor
Before laying LK CombiBoard EPS boards, check that the sub-floor is level as per AMA Hus requirements, table 43. DC/-1, class A, i.e. max. curvature ± 3 mm over a distance of 2 metres and ± 1.2 mm over a distance of 0.25 metres. The sub-floor must be vacuumed to remove any dirt and dust.

NOTE! Ceramic flooring
If laying ceramic flooring, the LK CombiBoard EPS boards must be glued to the sub-floor,
see ***"Installation, primer and fix in dry rooms – Table 1." on page 12*** and ***"Installation, primer and fix in wet rooms – Table 2." on page 15*** for the glue products to be used.

RECOMMENDATION! Tape pipe turns
LK recommends taping the pipe turns with LK Aluminium Tape when the pipes are laid.
Complete any protruding pipes with LK Aluminum Tape.

Attachment to the sub-floor

LK CombiBoard EPS must be attached to the sub-floor using one of the methods indicated below.

- Glue, floorfix, adhesive compound. See *"Installation, primer and fix in dry rooms – Table 1." on page 12* and *"Installation, primer and fix in wet rooms – Table 2." on page 15*.
- Screws. LK CombiBoard EPS boards can be screwed into the sub-floor if, for instance, chipboard is used. If using screws, it is possible to reuse all or parts of the system. Select suitable screws for the sub-floor. Screws with a large head are preferable, as this ensures the load is distributed. The screw head should be countersunk.

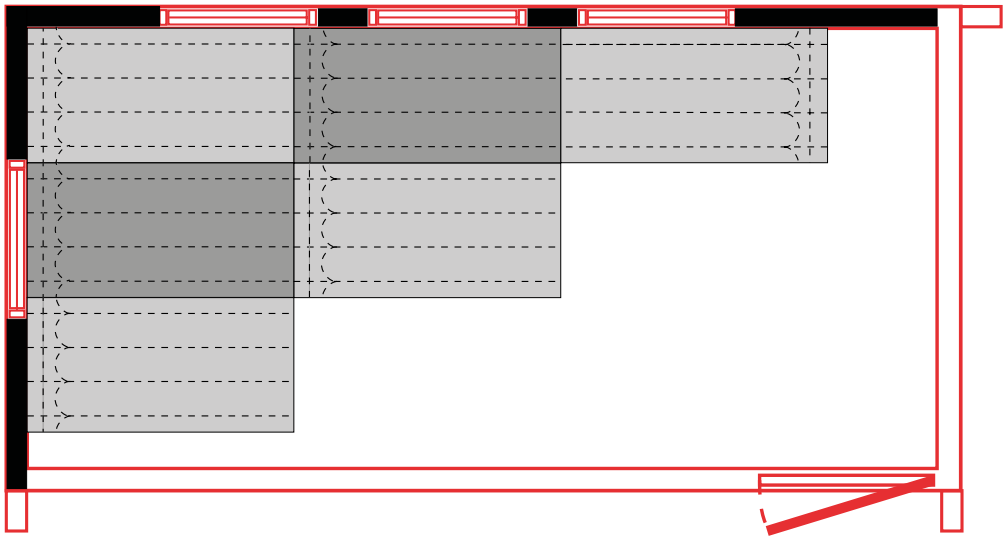
Laying method – procedure

ATTENTION!
Read through this section before starting work.

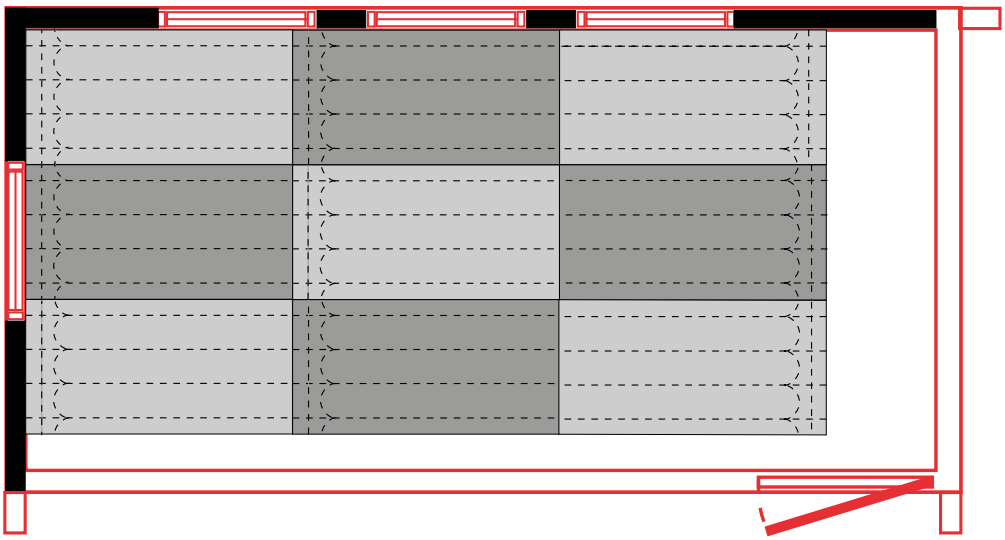
TIP!
Start by installing boards in the room furthest away from the manifold. If some EPS boards need to be cut to fit, use a circular saw or a plunge saw.

Step 1 – Test installation of LK CombiBoard EPS boards

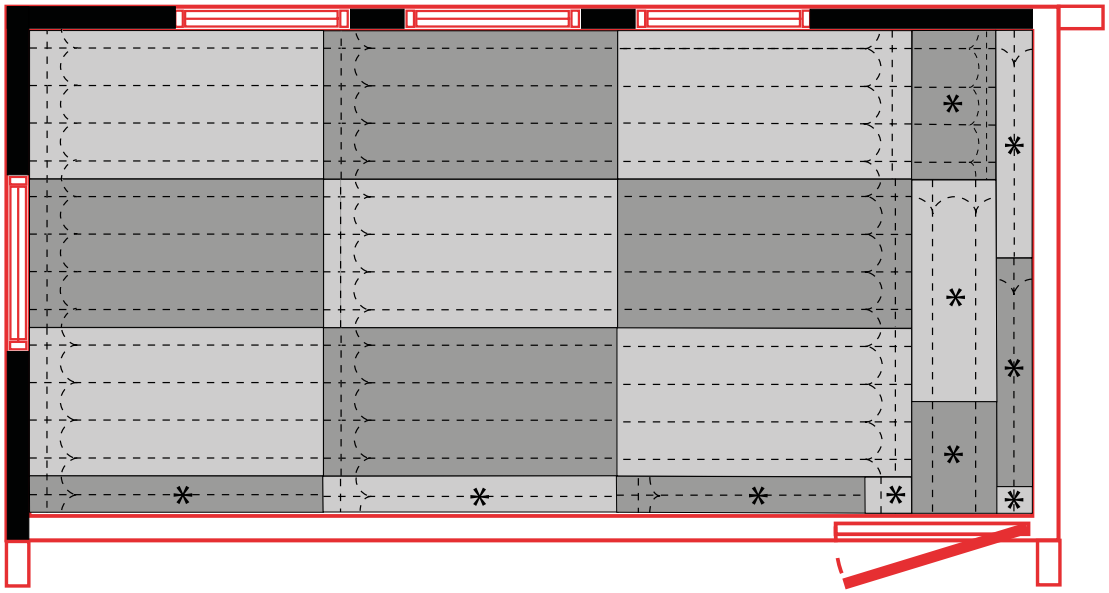
1. Lay out the boards without gluing/attaching the LK CombiBoard EPS boards. In the room, start the installation on a short side that only has pipe turns.



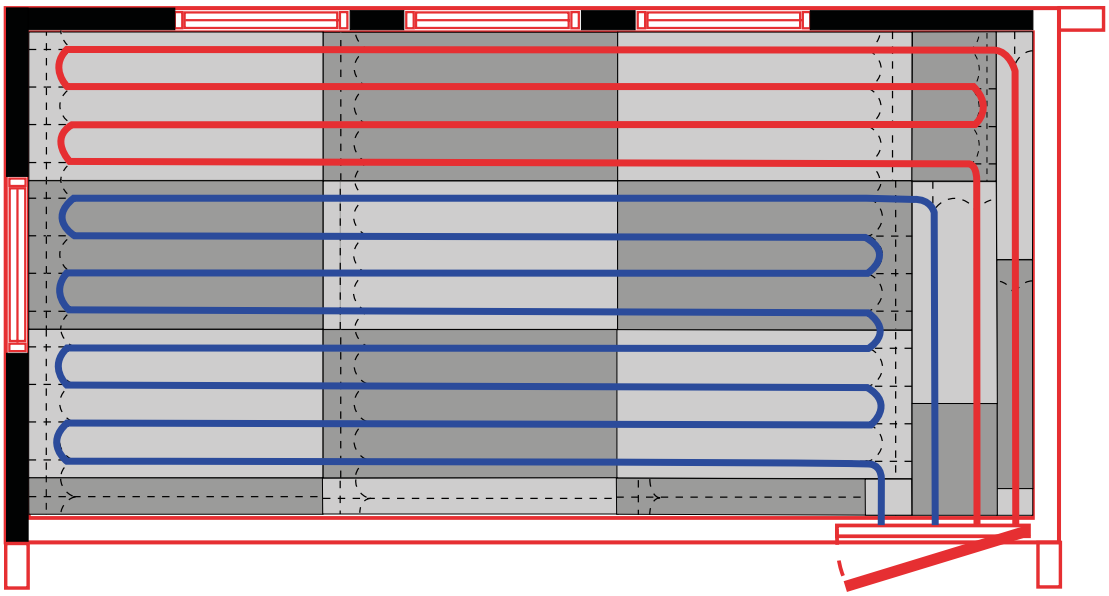
2. Lay out the LK CombiBoard EPS boards along the short side across the entire width of the room.



3. Adjust the pipe turns. It is possible to cut the LK CombiBoard EPS boards lengthwise and widthwise in order to create suitable pipe channels for the supply pipe.



*Example image. The image shows what a test layout may look like. * LK CombiBoard EPS boards that have been cut.*



Example image. The image shows the test layout with pipe system.

Step 2 – Installing LK CombiBoard EPS boards

4. Once all the LK CombiBoard EPS boards have been adjusted and are in place in the test layout, pick them up and select the installation method to be used. Choose from steps 3a, 3b and 3c on the next page.

5. Lay out the boards again.

6. Work from the short side towards the room's connection point, i.e. where the pipes arrive in the room.

Installation methods

NOTE! Any deviations between recommendations
Note that the text in this section only contains general recommendations. If LK Systems' recommendations and those of the floorfix and floor glue manufacturer differ, follow the manufacturer's instructions.

Step 3a – Gluing with floorfix or double gluing with recommended fix

TIP! Floorfix
If floorfix is used, the LK CombiBoard EPS boards must be installed before the fix has dried.
Once the LK CombiBoard EPS boards have been laid out, avoid putting any more load on them until the fix has dried.

See *"Installation, primer and fix in dry rooms – Table 1." on page 12* and "*Installation, primer and fix in wet rooms – Table 2." on page 15* for recommended floorfix products. Read the relevant supplier's instructions for correct installation.

1. Apply the floorfix using a 3-6 mm notched trowel or using the double gluing method (by applying a smooth layer to the board and a ridged layer of floorfix to the sub-floor).
2. Install the LK CombiBoard EPS boards before the fix dries.
3. Lay the LK CombiBoard EPS board in place, adjust it, then press on it. Remember also to press the LK CombiBoard EPS boards into the channels. Any excess fix will come up through the joints between the LK CombiBoard EPS boards. Remove this before it dries.
4. Gently walk on the LK CombiBoard EPS boards so that they stick fully to the sub-floor.
5. When gluing with floorfix, it is important that the fix spreads properly. Carry out a random check by lifting one of the LK CombiBoard EPS boards and making sure that the fix has properly spread. Always strive for 100 % coverage under the boards (no ridges/channels left).

Step 3b – Gluing with water-based floor glue

TIP! Floor glue
If LK CombiBoard EPS boards "glide" on the adhesive when the boards are laid out, you have laid them out too early. Allow the adhesive to get a little more sticky. If the floor glue has dried too much, add a new layer of adhesive to the old one, as the adhesion will be poor otherwise.

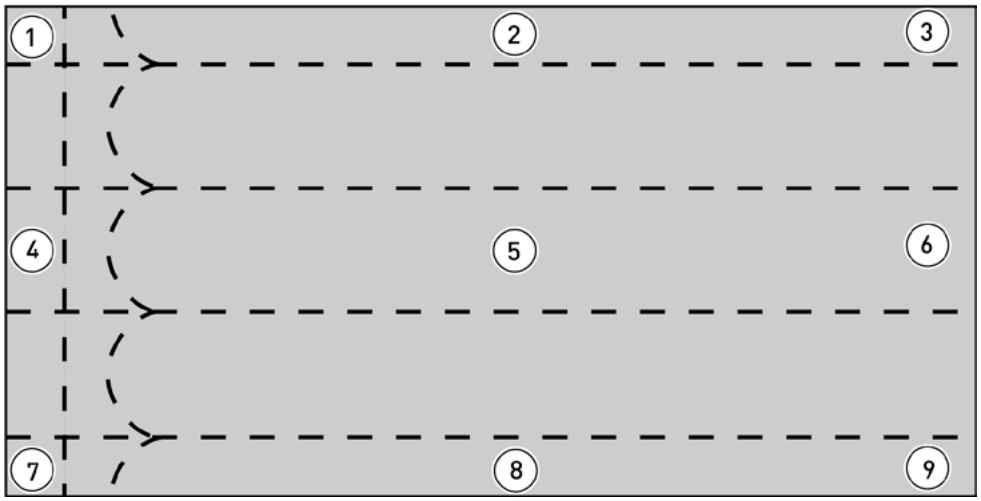
See *"Installation, primer and fix in dry rooms – Table 1." on page 12* and *"Installation, primer and fix in wet rooms – Table 2." on page 15* for recommended floor glues. Read the relevant supplier's instructions for correct installation. Water-based floor glue should be applied using a glue spreader. Consumption: 3-5m²/litre. The humidity in the concrete sub-floor should never be greater than 85 %.

1. Work in sections so that you can walk on the floor without stepping in the glue.
   It is best to start at the furthest point in the room.
2. Allow the floor glue to dry until it gets sticky. This will ensure a better bond when the LK CombiBoard EPS boards are laid. This can take between 10 minutes and half an hour, depending on the sub-floor, adhesive brand and room temperature.
3. Gently walk on the LK CombiBoard EPS boards so that they stick fully to the sub-floor.

Step 3c – Installation to the sub-floor using screws

NOTE!
Attaching LK CombiBoard EPS boards to the sub-floor using screws is not a suitable method when ceramic tiles are to be used as the surface layer.

1. Select screws suitable for the sub-floor, e.g. mounting screws. Screws with a large head are preferable, as this ensures the load is distributed. Use at least nine screws per LK CombiBoard EPS evenly distributed in three rows.



2. Lay the LK CombiBoard EPS board in place and adjust if necessary.
3. Attach the LK CombiBoard EPS board to the sub-floor. Make sure that the screw head is countersunk into the LK CombiBoard EPS board so that the screw does not risk contact with the future floor covering. Check the countersink of the screw heads by running a try square or ruler over the board.

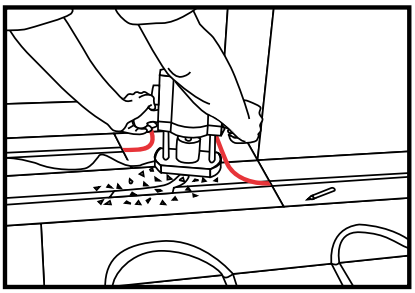
LK CombiBoard EPS	LK CombiBoard EPS, thickness	The recommended max. screw length
LK CB EPS 14	14 mm	25 mm
LK CB EPS 18	18 mm	32 mm
LK CB EPS 30	30 mm	45 mm
LK CB EPS 50	50 mm	65 mm
LK CB EPS 70	70 mm	85 mm

Step 4 – Supplement with new pipe channels

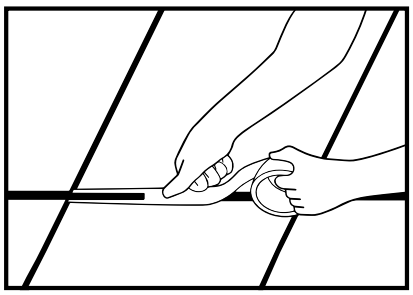
Boards
Before starting to cut/mill new pipe channels, make sure that any glue has dried and that the LK CombiBoard EPS boards are properly secured to the sub-floor.

Pipe channels
Arrange so that the underfloor heating pipe's supply and return pipes have pipe channels. If necessary, add new pipe channels.

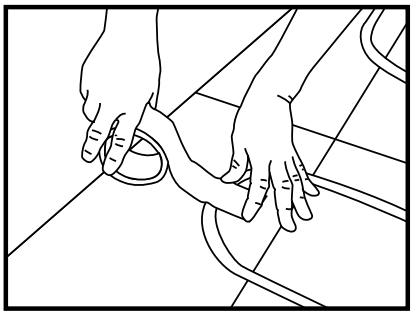
1. Mark the intended path for the pipe channel using a pen. The bend in the pipe must not be too tight. The minimum bend radius for 16 mm pipes is 90 mm.
2. Cut the new pipe channel using a plunge router. A suitable dimension is a 16 mm router cutter.



3. Fold the LK Aluminum Tape into the overhand milled pipe groove before mounting the underfloor heating pipe.



4. To attach the underfloor heating pipes, tape the pipe down using LK Aluminium Tape.



LK Manifold

ATTENTION!
Read through the manifold's assembly instructions before starting to install it.
See www.lksystems.se. The manifold is assembled in the designated place as per the drawing.

Laying the pipes

The pipe lay-out must be done as per the drawing. Check that the turning channels to be used are prepared for pipe laying. If necessary, cut the foil with a knife. Check that the foil is folded down into the turning channel.

1. Before starting to lay the pipes, check that the pipe channels/surface are free of debris. Vacuum clean if necessary.
2. Number and name the loops as per the drawing.
3. Cut the pipe using pipe cutters designed for underfloor heating pipes.
4. Press the pipes into the pipe channels, with your foot if necessary.
5. You can also use LK Aluminium Tape in the pipe turns and when the pipe sticks up out of the LK CombiBoard EPS board.
6. Note the direction of flow in the loop so that the supply pipe runs along outer walls.

Installation of flooring material

RISK! Loose LK CombiBoard EPS boards
Check that the LK CombiBoard EPS boards are properly secured. Attach any loose LK CombiBoard EPS boards before starting tiling or laying a floating floor.

RISK! Insufficient fix
Carry out a random check. Take up one ceramic tile. The degree of coverage of fix on the back should be 100 %.

NOTE! Any deviations between recommendations
Note that the text in this section only contains general recommendations. If LK Systems' recommendations and those of the manufacturer of the surface layer differ, follow the manufacturer's instructions.

Once the underfloor heating system has been installed and pressure-tested, it is time to lay the surface layer. **When the surface layer is being laid, the underfloor heating system must have been shut off.** This is particularly important when laying ceramic tiles, as temperature affects the drying time of the fixing compound and the grout, and so their long-term properties.

Before starting to lay the surface layer, make sure that:

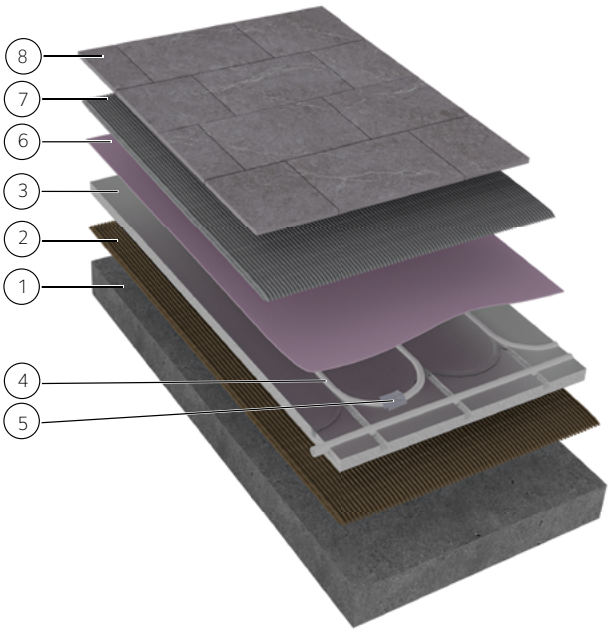
- The LK CombiBoard EPS boards are securely adhered to the sub-floor.
- The installation is not springy.
- The installation does not make a noise against the sub-floor.
- The pipes are situated correctly in their pipe channels.

Ceramic flooring

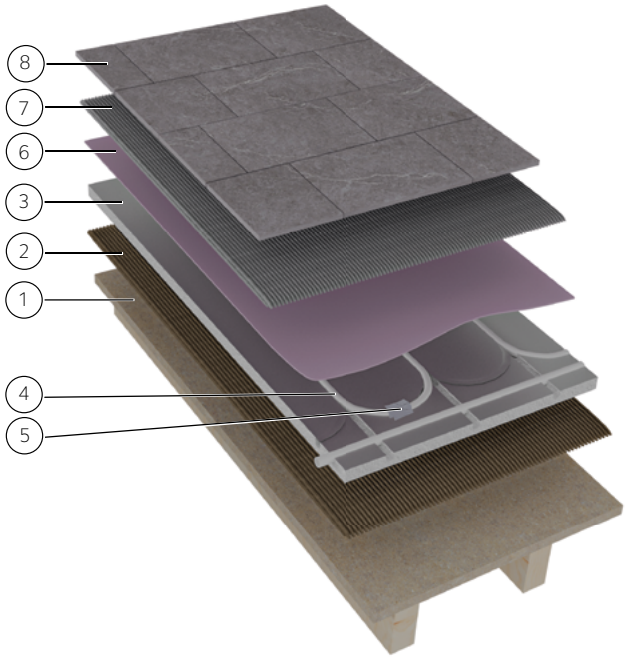
Ceramic flooring in dry rooms

NOTE!
With this construction, you must glue LK CombiBoard EPS to the sub-floor. The surface of the LK CombiBoard EPS boards must be cleaned with methylated spirits to remove any dust, oil, grease, etc. from the surface. Do not use any other solvents, as these may damage the cellular plastic.

Construction principle



1. Concrete.
2. Recommended fix/adhesive compound or glue from the supplier.
3. LK CombiBoard EPS.
4. LK Underfloor Heating Pipe in diameter. 16.
5. LK Aluminium Tape.
6. The supplier's recommended special primer or as per the supplier's recommendations.
7. Fix/Adhesive compound.
8. Ceramic tiles.



1. Wooden joists with floor-grade chipboard.
2. Recommended glue as per the supplier's instructions.
3. LK CombiBoard EPS.
4. LK Underfloor Heating Pipe in diameter. 16
5. LK Aluminium Tape.
6. The supplier's recommended special primer or as per the supplier's recommendations.
7. Fix/Adhesive compound.
8. Ceramic tiles.

Requirements

In dry rooms, it is possible to lay ceramic tiles directly onto the underfloor heating system. This requires that:

- The floor structure is stable.
- There is no springiness in the construction. Any movement in the floor structure may eventually cause cracks in the joints or the tiles to come loose.

The primer should be applied undiluted, unless otherwise indicated in the supplier's instructions. For products, see *"Installation, primer and fix in dry rooms – Table 1." on page 12* the next page. Not all types of primer work on the laminated heat distribution layer (aluminium). If you have any questions, contact the relevant supplier.

The size of the ceramic tiles

Fix/adhesive compound in combination with the ceramic tiles distributes point loads.

- The ceramic tiles ***must*** be no smaller than 150x150 mm.
- For smaller ceramic tiles or mosaic tiles, a load-distributing board or a layer of fibre-reinforced spackle should be applied on top of the heating system.
- Levelling compound on top of LK CombiBoard EPS can also be used to reinforce the sub-floor before the ceramic tiles are laid.

Installing ceramic tiles

1. The surface of the LK CombiBoard EPS boards must be cleaned with methylated spirits to remove any dust, oil, grease, etc. from the surface. Do not use any other solvents, as these may damage the cellular plastic.
2. Apply a primer in accordance with the supplier's instructions. Make sure that the primer spreads and covers the entire surface. Make sure that no puddles form. It is important that the primer is applied evenly and in the correct quantity.
3. Allow the primer to dry as per the instructions.
4. Mix the fix/adhesive compound as per the manufacturer's instructions.
5. Use a suitable notched trowel (this will depend on the size of the ceramic tiles, the pattern on the back, etc.)
6. Begin by test-laying a few ceramic tiles. You must be able to create ridges in the fix/adhesive compound without it spreading out again (it is too wet) or forming clumps (it is too dry). Lay and press the ceramic tiles firmly down but slightly displaced. Lift up and check the saturation in between. The degree of coverage of fix/adhesive compound on the back should be 100 %.

Installation, primer and fix in dry rooms – Table 1.

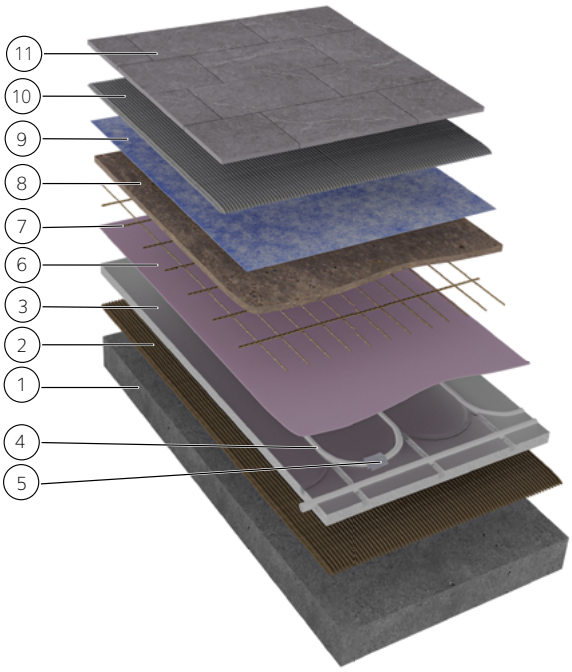
This table shows the laying methods and products that have been tested and are recommended. See the relevant supplier's instructions for correct installation. If you have any questions, contact the relevant supplier.

Supplier	Installing LK CombiBoard EPS boards	Primer on the laminated heat distribution layer (aluminium)	Tiling
Alfix A/S	Alfix Ready Flex	Alfix UniversalPrimer	Alfix ProFix/ProFix Plus or Alfix QuickFix Premium
Bostik AB	**On chipboard or concrete below 85 % RH:** Bostik STIX A511 Combi Air or STIX A800 Premium. **Concrete sub-floor:** Bostik 8070 Light LT (double glued) or Bostik 8040 Flow LT.	Bostik GRIP A936 Xpress	Bostik 8070 Light LT or Bostik 8040 Flow LT
Kiilto AB	Kiilto Floorfix DF together with Kiilto Pro Fixbinder.	Kiilto Fix Pro Primer	Kiilto Floorfix DF, Kiilto Highflex S2 DF, Kiilto Superfix DF, Kiilto Pro Lightfix.
LIP	Mount the boards using LIP XXL Large Format Adhesive.	LIP Supergrund	**Ceramics** are installed using LIP Multi Tile Adhesive, LIP XXL Large Format Adhesive, or LIP Rapid Adhesive. **Natural stone** is installed using LIP Natural Stone Adhesive or LIP Rapid Adhesive. In all cases, the adhesive must be reinforced with a mixture of LIP Multibinder and water, pre-mixed in equal parts. This mixture replaces the specified amount of water.
PCI	**Installation on concrete:** Mount the boards with PCI Flexmortar S1 Flott. **Installation on wooden beams:** Mount the boards with PCI Flexmortar S1 Flott.	**Installation on concrete:** Prime with PCI Gisogrund 303. **Installation on wooden beams:** Prime with PCI Gisogrund 303. Putty min. 15mm with PCI Periplan CF35 / PCI FT Plan Pro, use ROT mesh or equivalent, use PCI Pecitape SIlent (Edge tape).	**Installation on concrete:** Tiling can be done with PCI Flexmörtel S1 Flott / PCI Flexmörtel S1 / PCI Flexmörtel S2, PCI Nanorapid Tiling with **natural stone** is carried out with PCI Carraflex. **Installation on wooden beams:** Tiling can be done with PCI Flexmörtel S1 Flott, PCI Flexmörtel S1, PCI FT Extra, PCI Nanolight, PCI Nanorapid. Tiling with natural stone is carried out with PCI Carraflex.
Mapei AB	**Dry areas, level sub-floors:** Mapei Ultrabond Eco V4SP Evo **Cement-based sub-floors:** Ultralite S2 Flex Zero or Ultralite S2 Flex Quick Zero	EcoPrim T or EcoPrim Grip Plus	Ultralite S2 Flex Zero or Ultralite S2 Flex Quick Zero
SCHÖNOX	**Installation on concrete:** Mount the boards with Schönox FS. **Installation on wooden beams:** Mount the boards with Schönox FS.	**Installation on concrete:** Prime the discs with Shönox SHP. **Installation on wooden beams:** Prime the boards with Schönox SHP. Putty with Schönox SP and use Schönox PZG (reinforcing mesh) with Schönox RS 50 (Edge strip). my. 15 mm.	**Installation on concrete:** Perform tiling with Shönox Q12 **Installation on wooden beams:** Tiling can be done with Schönox Q6, Q6W, Q8, Q9W, Q12, TT S8 and TT S8 Rapid.
SikaCeram	Mount the boards with Casco Husfix Rapid.	Prime with SikaFloor-02 Primer. Putty with SikaCeram-450 Thermo Level and with a root net. my. 20mm.	Tiling can be done with SikaCeram-260 StarFlex and 275 Marble & Stone.

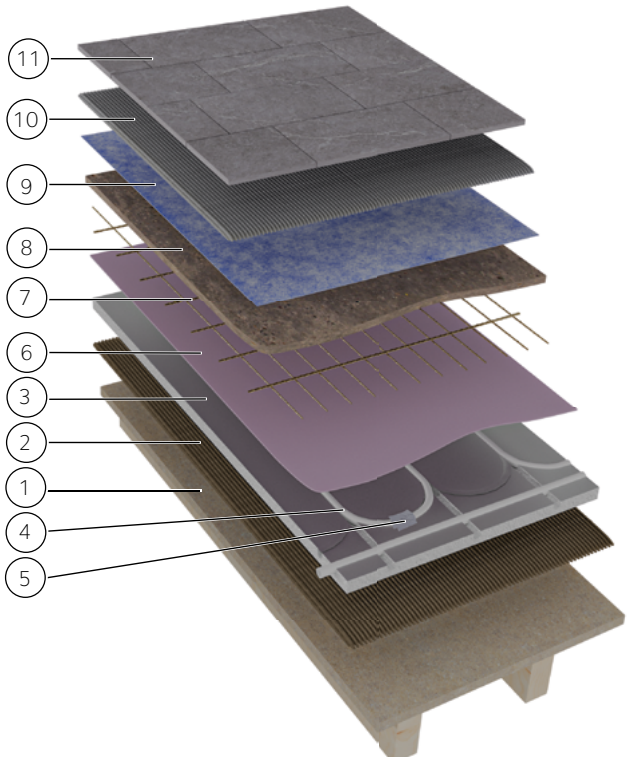
Ceramic flooring in wet rooms

ATTENTION!
When laying ceramic tiles in wet rooms, the floor must comply with BBV's (Construction Ceramic Council's industry rules for wet rooms) requirements for the flexural rigidity of the floor structure. Detailed information about the rules for moisture barriers, floor structures, junctions, inclines to floor drains, etc. can be found on Construction Ceramic Council's website www.bkr.se.

Construction principle



1. Concrete.
2. Recommended fix/adhesive compound or glue from the supplier.
3. LK CombiBoard EPS.
4. LK underfloor heating pipe in diameter. 16.
5. LK Aluminium Tape.
6. The supplier's recommended special primer or as per the supplier's recommendations.
7. Reinforcement.
8. Drainage slope.
9. Moisture barrier.
10. Fix/Adhesive compound
11. Ceramic tiles.



1. Wooden joists with floor-grade chipboard.
2. Recommended glue as per the supplier's instructions.
3. LK CombiBoard EPS.
4. LK underfloor heating pipe in diameter. 16.
5. LK Aluminium Tape.
6. The supplier's recommended special primer or as per the supplier's recommendations.
7. Reinforcement.
8. Drainage slope.
9. Moisture barrier.
10. Fix/Adhesive compound
11. Ceramic tiles.

Checklist

NOTE! Requirements for levelling compound
When LK CombiBoard EPS boards are to be installed in a wet room with ceramic tiles, ***a layer of levelling compound (floor spackle) must be applied to the underfloor heating system***, which is then covered with an approved moisture barrier for floors.

NOTE! Requirements for gluing
LK CombiBoard EPS ***must always be glued to the sub-floor in wet rooms***.

- Check that the floor structure fulfils the BBV's (Construction Ceramic Council) requirements.
- Install the underfloor heating system (LK CombiBoard EPS boards and pipes, etc.).
- Carry out a pressure and leak test of the underfloor heating system. Follow the instructions in *the assembly instructions for LK PE-X, PAL and PE-RT pipes* and the industry rules for *Safe Water Installation* www.sakervatten.se .
- For the floor drain, leave at least 150 mm that is not covered with LK CombiBoard EPS. Floor spackle should be applied so that a hard edge forms at the junction with the floor drain.
- Ensure that the floor spackle cannot adhere to walls and other fixed objects, e.g. pedestals. This can be done using an edge strip made from foamed plastic or equivalent. As all concrete products shrink during curing, it is important that the underfloor heating system can move away from the wall. Otherwise, there may be problems with cracks and adhesion, and the LK CombiBoard EPS boards may come loose. Make sure that the spackle supplier's conditions for room and surface temperatures are met.
- Clean the LK CombiBoard EPS boards with methylated spirits (do not use other solvents, as these may damage the cellular plastic) and apply undiluted primer.

Allow the primer to dry. Check that the primer spreads and forms a film providing complete coverage, as not all makes adhere to the laminated heat distribution layer (aluminium). See ***"Installation, primer and fix in wet rooms – Table 2." on page 15***.

- ***In the case of wooden sub-floors regardless of the joist spacing (but not more than 600 mm), reinforcement of flexural stiffness and measures to prevent moisture movement from being transferred to the ceramic layer must be carried out.*** Reinforcement can be done with screed min. 12 mm at floor drain. Reinforcement shall be carried out at the lower edge of the screed with spot-welded steel mesh or equivalent in accordance with the supplier's instructions.
- Lay the mesh reinforcement on the underfloor heating. Any joints must be overlapping.
- Apply the levelling compound (spackle) as per the manufacturer's instructions. Before beginning, check the floor temperature to ensure it meets the manufacturer's requirements. Always follow the spackle manufacturer's instructions regarding thickness, mixture, drying time and temperatures.
- Apply the moisture barrier system to the spackled/levelled surfaces as per the supplier's instructions.
- Use products recommended by the supplier for the moisture barrier system you have chosen.

Installation, primer and fix in wet rooms – Table 2.

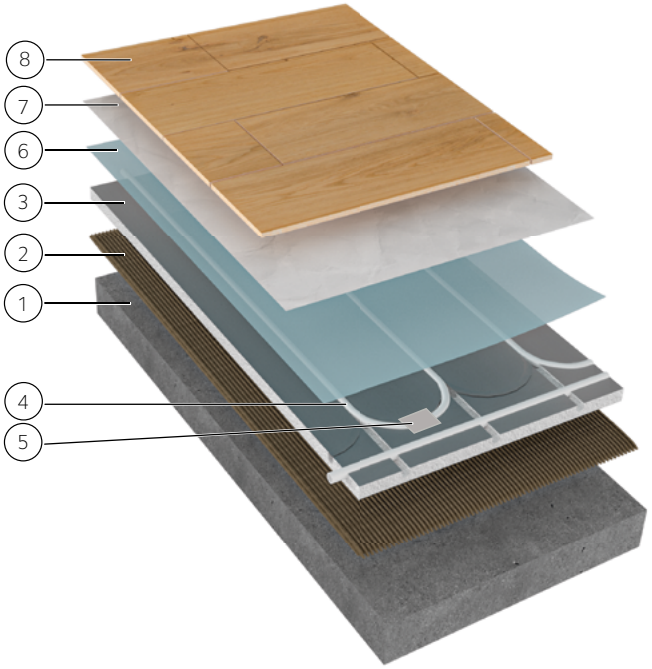
This table shows the laying methods and products that have been tested and are recommended. See the relevant supplier's instructions for correct installation. If you have any questions, contact the relevant supplier.

Supplier	Installing LK CombiBoard EPS boards	Primer on the laminated heat distribution layer (aluminium)	Levelling on boards
Alfix A/S	Alfix Ready Flex	Alfix UniversalPrimer	Alfix PlaneMix 60, min. 12 mm.
Bostik AB	**On chipboard or concrete below 85 % RH:** Bostik STIX A511 Combi Air or STIX A800 Premium. **Concrete sub-floors:** Bostik 8070 Light LT (double glued) or Bostik 8040 Flow LT	Bostik GRIP A936 Xpress	SL C500 Fiber Quick or SL C700 Fiber Quick+. min. 12 mm
Kiilto AB	Kiilto Floorfix DF together with Kiilto Pro Fixbinder.	Kiilto Fix Pro Primer	Kiilto Floor Heat DF, Plan Rapid, Kombiflyt, Rotavjämning K. Min 12 mm.
LIP	Mount the boards using LIP XXL Large Format Adhesive.	LIP Supergrund	Apply LIP Reinforcement Mesh over the entire surface, extending to the floor drain. The minimum leveling compound thickness on the panel must be 12 mm, continuing all the way to the drain, using LIP 210, 220, or 226 Self-Leveling Compound.
PCI	Mount the boards with PCI Flexmortar S1 Flott.	Prime with PCI Gisogrund 303. Putty (min. 12mm at floor drain) with PCI Periplan CF35 / PCI FT Plan Pro, use ROT net or equivalent, use PCI Pecitape Silent (Edge tape).	Tiling can be done with PCI Flexmörtel S1 Flott, PCI Flexmörtel S1, PCI FT Extra, PCI Nanolight, PCI Nanolight Tiling with **natural stone** is carried out with PCI Carraflex.
Mapei AB	Ultralite S2 Flex Zero or Ultralite S2 Flex Quick Zero	Primer EcoPrim T or EcoPrim Grip Plus	Uniplan Eco, min 12 mm.
SCHÖNOX	**Installation in wet rooms:** Mount the boards with Schönox FS.	**Installation in wet rooms:** Excellent with Schönox SHP. Putty with Schönox TX and use Schönox PZG (reinforcement mesh)) with Schönox RS 50 (Edge strip). my. 12mm locally at the well, max. floor area 10 square meters.	**Installation in wet rooms:** Tiling can be done with Schönox Q6, Q6W, Q8, Q9W, Q12, TT S8 and TT S8 Rapid.
SikaCeram	Mount the boards with Casco Husfix Rapid.	Prime with SikaFloor-02 Primer. Putty with SikaCeram-450 Thermo Level and with a root net. my. 20mm.	Tiling can be done with SikaCeram- 260 StarFlex and 275 Marble & Stone.

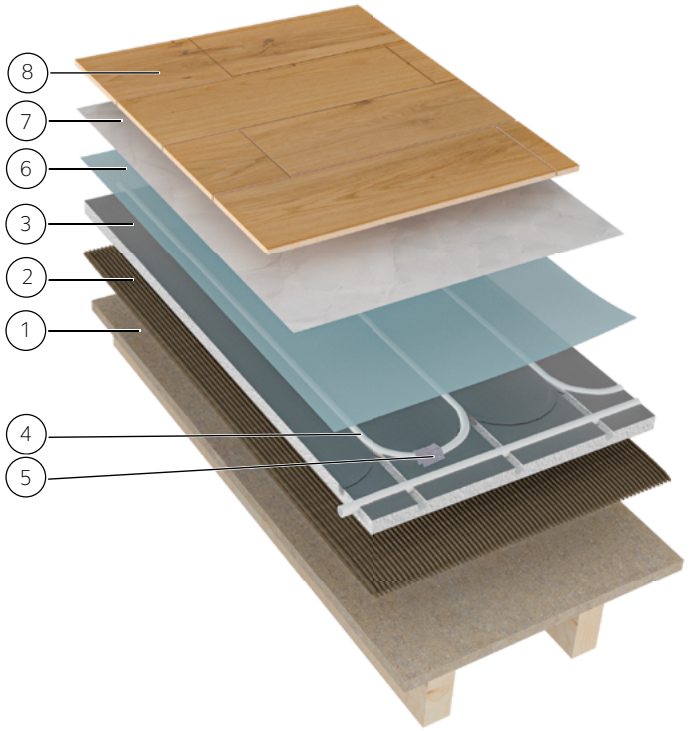
Other types of flooring material

Floating floors can have various types of flooring material, such as vinyl flooring or various wood products. An intermediate layer is required when laying vinyl flooring.

Construction principle



1. Concrete.
2. Glue recommended by the supplier.
3. LK CombiBoard EPS.
4. LK Underfloor Heating Pipe in diameter. 16.
5. LK Aluminium Tape.
6. Vapour barrier.
7. Paper felt.
8. Wooden floor.



1. Wooden joists with chipboard.
2. Screw or glue recommended by the supplier.
3. LK CombiBoard EPS.
4. LK Underfloor Heating Pipe in diameter. 16.
5. LK Aluminium Tape.
6. Vapour barrier.
7. Paper felt.
8. Wooden floor.

Wood products

ATTENTION! Expansion gaps
Follow the flooring supplier's instructions. When laying wood products onto underfloor heating systems, ***it is especially important to follow the instructions in terms of expansion gaps***.

ATTENTION! Industry guidelines
Industry guidelines can be downloaded from the website of the Swedish Flooring Trade Association (GBR) www.golvbranschen.se in the form of a handbook entitled "Trägolv på golvvärme" (Wooden flooring on underfloor heating systems). (GBR, edition 3: 2022).

ATTENTION! Flooring thicknesses above 25 mm
Adhere to the flooring manufacturer's instructions and the guidelines from the Swedish Flooring Trade Association for wood floors on underfloor heating. Seek advice from LK if the flooring thickness exceeds 25 mm.

Requirements

- Underfloor heating means that the wood dries out more during the period of the year when the heating is on compared to if underfloor heating has not been installed.
- The underfloor heating will cause slightly larger gaps between the floorboards during the driest winter months.
- As a rule, a vapour barrier (polythene with a thickness of 0.2 mm) should be laid over the underfloor heating system first. A layer of paper felt, Airolen (foamed plastic) or cork underlay should then be laid.
- The underfloor heating should first be covered with a vapour barrier as per the floor supplier's instructions, and then paper felt or cellfoam. ***Adhere to the floor manufacturer's instructions and the instructions from the Swedish Flooring Trade Association for wood floors on underfloor heating.***

Laminated parquet

ATTENTION!
Follow the flooring supplier's instructions. When laying wood products onto underfloor heating systems, it is especially important to follow the instructions in terms of expansion gaps.

- Normally, LK CombiBoard EPS is covered with a vapour barrier. Paper felt is then placed on top. The laminated parquet is laid floating on top of the paper felt.

Laminate and click lock flooring

ATTENTION!
Follow the flooring supplier's instructions. When laying wood products onto underfloor heating systems, it is especially important to follow the instructions in terms of expansion gaps.

NOTE! Floating installation and laminate floor thickness
8 mm is the minimum thickness of the laminate floor when an intermediate floor is not laid.
6 mm is the minimum thickness of the laminate floor when an intermediate floor is laid.
Laminate flooring must be laid floating if it is thicker than 8 mm.
Laminate floors that are at least 8 mm thick can be laid directly against the LK CombiBoard EPS board.

- The underneath of some laminate flooring is covered with a sliding layer, such as cork, paper felt or cellfoam and can be supplemented with a vapour barrier. Paper felt is preferable due to its lower heat resistance.

Solid wood (floorboards)

ATTENTION!
Follow the flooring supplier's instructions. When laying wood products onto underfloor heating systems, it is especially important to follow the instructions in terms of expansion gaps.

- The wooden floorboards must be laid at right angles to the main direction of the pipe loop.
- The thermal conductivity of the wood is almost twice as great in the direction of the grain compared to the radial direction. Using the natural properties of the wood in this way ensures a more even surface temperature.

Plastic mats

NOTE! When an intermediate layer is required
An intermediate layer is required when laying vinyl flooring and LVT (Luxury Vinyl Tiles).
Paper felt must be laid before the intermediate layer is laid.

There are various types of vinyl flooring, e.g:

- LVT (Luxury Vinyl Tiles), also known as PVC flooring. An LVT floor consists of easy-to-handle boards or tiles that can either be laid floating (i.e. without glue) or glued.
- Plastic, vinyl and linoleum flooring. These are supplied on rolls and are securely glued to the surface.

The properties of the flooring Before laying the flooring, always check the floor supplier's recommendations.

- If the flooring is flexible and pliable, it should be handled as "vinyl flooring", and LK recommends laying a hard board (intermediate layer) on top of the LK CombiBoard EPS boards.
- If the vinyl flooring is a thicker variant that has an MDF/HDF backing, it may be possible to lay the floor floating in the same way as for laminate flooring.
- It is important that the intermediate layer is thin and has good thermal conductivity so that it can transfer the heat upwards effectively. For instance choose 6 mm "Funktion Mellangolv" from Moelven, 7 mm Forbo Quickfit or equivalent.
- If you choose a floating chipboard sub-floor, the minimum thickness must be 10 mm or 16 mm, depending on the load category/building type. In public buildings, it may be necessary to use a stronger/thicker intermediate layer due to the higher load. In public buildings, there may be a need to use a stronger/thicker one. Contact a structural engineer or other expert in case of uncertainty.
- The underfloor heating system can also be thinly spackled with fibre-reinforced floor spackle (approx. 10 mm) before the top flooring is laid.
- The underfloor heating system must be primed to better enable the spackle to adhere to the laminated heat distribution layer (aluminium). Select the primer and spackle as per *"Installation, primer and fix in dry rooms – Table 1." on page 12*.

Environment/recycling

Once the LK CombiBoard EPS boards reach the end of their life, they should be sorted for energy recycling and taken to a recycling centre.

Miscellaneous

The LK CombiBoard EPS boards may contain traces of black EPS beads. **Protection during transport:** During transport and storage, the discs must be protected against dirt and moisture. The boards must be transported and stored on a flat surface. LK CombiBoard EPS must be stored indoors.

Technical data

Essential properties	Performance	EN-Standard
Thermal conductivity	λ_D = 0,033 W/mK	EN 12667:2001
Thermal resistance LK CombiBoard 14 LK CombiBoard 18 LK CombiBoard 30 LK CombiBoard 50 LK CombiBoard 70	R (m²·K/W) 0,397 0,507 0,870 1,476 2,082	EN 1264-3 2021
Compressive stress at 10% deformation	CS(10) = 300 kPa	EN ISO 29469:2022
Bending strength	450 kPa	Cf. annex C*
Shear strength	225 kPa	Cf. annex F.3*
Shear strength, long term (2 %)	CC = 90 kPa	Cf. annex F.2*
Water absorption long term (water absorption at full immersion)	WL(T) 5	EN/ISO 16535:2019
Watervapor transmission μ	40 - 100	Cf. annex F.4*
Watervapor permeability δ mg/(Pa.h.m)	0,006 - 0,015	Cf. annex F.4*
Fire class (Reaction to fire)	NPD (Euroclass F)	
Continous glowing combustion	NPD	
Durability of thermal conductivity against heat, weathering and ageing/degradation	No change over time and NPD (c)	
Durability of compressive strength against ageing/degradation – Freeze-thaw resistance	NPD	
Durability of compressive strength, ageing and degradation – long term thickness reduction	NPD	
Tensile strength	NPD	
Deformation under specific load	NPD	
Acoustic absorption indexes	NPD (b)	
Release of dangerous substances	NPD (a)	

**See SS/EN 13163:2012+A2:2016 for reference.*
NPD = Non Proven Data
Compare = Cf.

(a) Test method is not available.
(b) EPS products have no significant airborne sound absorption properties.
(c) The fire performance of EPS does not detoriate with time.

Dimension drawings