

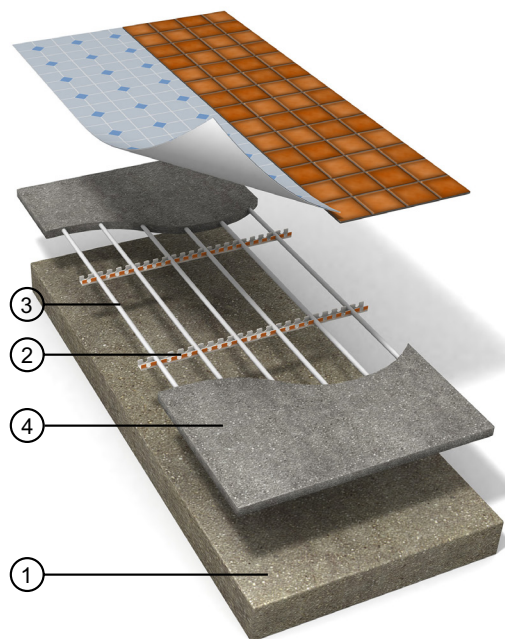
On load-bearing floors with LK Clip Rail 12

DESIGN

LK Under Floor Heating in conjunction with LK Clip Rail 12 for embedding in a levelling compound (screed) or in concrete. The system can be laid on insulation, existing concrete slabs or wooden floor joists using 22 mm floor grade chip-board with a batten spacing of max. c/c 600 mm.

This system is adjusted to LK Floor Heating Pipe 12 mm and primarily intended for under floor heating solution for smaller areas such as bathrooms, hallways or WC's.

LK Clip Rail 12 has a construction height of 14.0 mm including the under floor heating pipe, concrete and floor material will be added. The under floor heating rail is made of recovered plastic and designed for the under floor heating pipe to fully be encapsulated by the screed.



REQUIREMENTS

We recommend that to achieve optimum efficiency of under floor heating systems the use of weather dependent (weather compensation) flow temperature control, properly balanced and set in line with the design for adjustment of the primary and loop flow. We also recommend the settings are recorded for future reference.

In general the guidelines apply in accordance with local building codes and for selected bespoke design solutions.

In this type of under floor heating installation the under floor heating pipe is often embedded in a thin layer of concrete or screed levelling compound. To achieve good results it is important to follow the manufacturer's instructions.

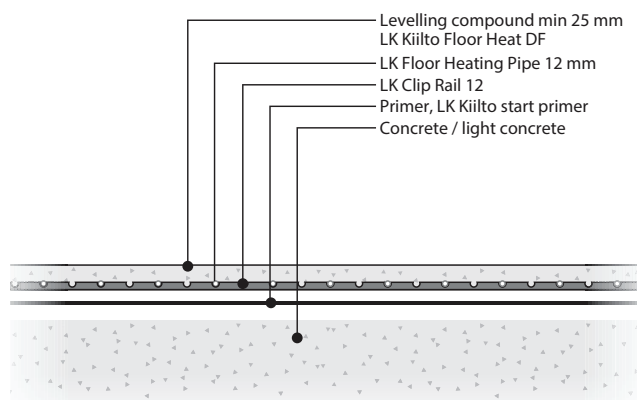
CONSTRUCTION OUTLINE

1. Sub floor
2. LK Clip Rail 12
3. LK Under Floor Heating Pipe dim. 12 mm
4. LK Kiilto Floor Heat DF (Screed)
Encapsulating pipe with levelling compound.

SUB FLOOR/UNDERLAY

Concrete and light concrete sub floor

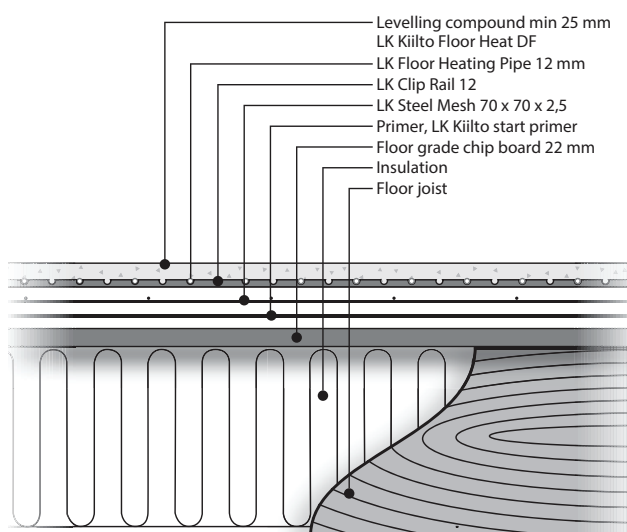
The sub floor should be free from dust, oil, grease, paint and other impurities. Prime the sub floor with LK Kiilto Start primer. Drying time 1-2 h. The light concrete underlay should be primed 2-3 times so that the light concrete is well saturated. Drying time between priming, approx. 1-2 h. Lay the clip rails and floor heating pipes, see headings below. Cover the installation with LK Kiilto Floor Heat DF. The screed should be at least 25 mm thick. The construction can be used in both wet and dry areas. In wet areas the sealing layer should be assembled in accordance with the supplier's instructions and local industry regulations for wet areas.



LK Clip Rail 12 against the concrete or light concrete sub floor.

Sub floor of 22 mm floor grade chipboard on wooden joists with a maximum joist spacing of c/c 600 mm

The sub floor should be free from dust, oil, grease, paint and other impurities. Prime the sub floor with LK Kiilto Start primer. Drying time approx. 1-2 h. Lay LK Steel mesh 70x70x2,5 mm and affix it in the underlay using a staple gun. Allow the mesh mats to overlap one another by at least 70 mm. Screw LK Clip Rail 12 tightly above the reinforcement mesh using chipboard screws, with approx. 3-4 screws per clip rail. Once the clip rails and floor heating pipes have been laid, see headings below, the installation is covered with LK Kiilto Floor Heat DF. The screed should be at least 25 mm thick. The construction can be used in both wet and dry areas. In wet areas the sealing layer should be assembled in accordance with the supplier's instructions and local industry regulations for wet areas.

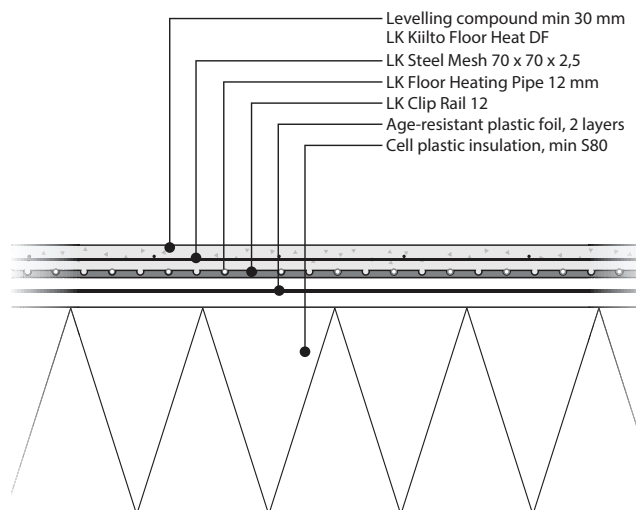


LK Clip Rail 12 on wooden joists with 22 mm floor grade chipboard mounted on the floor joist spacing max c/c 600 mm.

Cell plastic insulated underlay with a minimum quality of S80 (free-bearing construction)

Lay 2 layers of age-resistant plastic foil (0,2 mm) and turn up the plastic foil along the walls (approx. 100 mm). Affix the LK Clip Rail 12 mm through the plastic foil into the insulation using LK Pipe Holder, short. Approx 3-4 pipe holders should be used per clip rail. Assemble clip rails and floor heating pipes, see headings below. Lay the LK Steel mesh 70x70x2,5. Allow the mesh mats to overlap one another by at least 70 mm.

Cover the installation with LK Kiilto Floor Heat DF. The screed should be at least 30 mm thick. The construction can be used in dry areas.



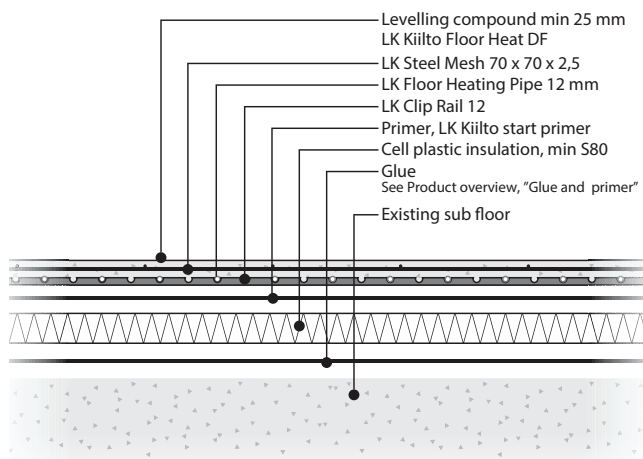
LK Clip Rail 12 on the cell plastic insulated underlay with a minimum quality of S80 (free-bearing construction)

Existing floor with cell plastic insulation minimum S80 quality (fixed construction)

Before the cell plastic boards are laid, the desired degree of evenness under the floor should be inspected. Maximum curvature ± 3 mm over a distance of 2 metres and $\pm 1,2$ mm over a distance of 0,25 metres. Make sure that the sub-floor is absorbent and clean and free from paint, oil grease and other impurities. Glue the cell plastic insulation with LK Kiilto Floorfix DF mixed with water. If the underlay is not absorbent e.g towards a ceramic-set concrete surface then LK Kiilto Floorfix DF should be mixed with LK Kiilto Fixbinder and water. Apply the glue with a putty knife, then work the mix in well before "combing" it up. Use a size 6-8 size comb on the boards. Lay the board on top of the mix and press it down hard.

After the cell plastic insulation has been glued, the upper surface of the insulation is primed with LK Kiilto Start primer. Drying time 1-2 h. Assemble the clip rails and floor heating pipes, see headings below. Secure the clip rails by inserting short LK Pipe Holder into the insulation, using approx. 3-4 pipe holders per clip rail. Lay out LK Steel mesh 70x70x2,5 mm. Allow the mesh mats to overlap one another by at least 70 mm.

Cover the installation with LK Kiilto Floor Heat DF at least 15 mm over the top of the pipe. The construction can be used in both wet and dry areas. In wet areas the sealing layer should be assembled in accordance with the supplier's instructions and local industry regulations for wet areas.



LK Clip Rail 12 on the existing floor with cell plastic insulation minimum S80 quality (fixed construction).

SURFACE LAYER

Parquet, solid wood or laminated floor

For floating applications, concrete surfaces are covered with a vapour barrier (DPM) and then, dependent on floor finish, with rag paper or cell foam. The flooring should be installed in line with manufacturer's instructions. Always consult the flooring manufacturer. Always consult LK for floor thicknesses above 25 mm.

Vinyl or linoleum flooring

Are laid according to the supplier's instructions. In wet areas the sealing layer should be assembled in accordance with the supplier and local valid requirements.

Ceramics or natural stone

Lay according to the supplier's instructions. In wet areas the sealing layer should be assembled in accordance with the supplier and local valid requirements.

LK HEATING CIRCUIT MANIFOLD

The LK Heating Circuit Manifold should be installed as shown in the design drawing. Please read the instructions enclosed with the manifold.

LAYING CLIP RAILS

Begin assembly by laying out LK Clip Rail at right angles to the design loop direction. At the turning zones, lay the rail at least 150 mm from the wall in order to allow enough room for the pipe to be turned. Space out all further rows of rail at a max. distance of 500 mm.

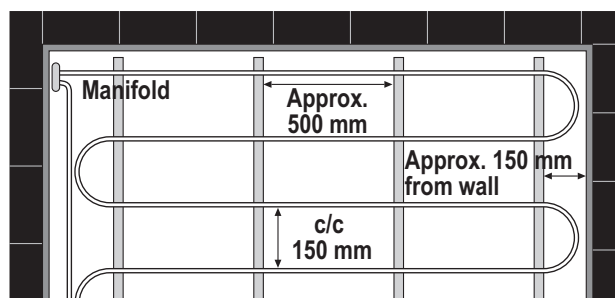
Fasten the clip rails to the underlay with its double-stick tape. It may be necessary to complete the attachment to the concrete underlay with e.g. concrete nails, screws for attachment to chipboards, and short LK Pipe Holders for cell plastic insulation.

LAYING THE PIPE

Lay the supply line for the under floor heating pipe approx. 50 mm from the wall and then lay the pipe at design spacing, typically c/c 150 mm. When mounting close to a floor drain the pipe should not be closer than 100 mm, in order to enable repairing parts of the floor drain.

Using LK Pipe Decoiler aids pipe laying.

Pipes should be cut using pipe shears intended for PE-X.



OUTLINE SECTION

To achieve an even floor temperature, a screed depth of at least 10 mm is required above the crown of the pipe, i.e. approx. 24 mm in total. Please note that this is a guide. When laying over insulation a thicker screed depth than 24 mm is generally required. The screed depth should be calculated in consultation with the supplier of the concrete/levelling compound.

PRODUCT OVERVIEW, GLUE, PRIMER AND LEVELLING COMPOUND

The products below have been tested on the LK Floor Heating System 12 mm

LK Art . no.	Product name	Usage	Notes	Consumption	Drying time
33525	Kiilto Floorfix DF, 20 kg	Gluing cell plastic boards	For absorbent underlays: Mix 5,8-6,5 l water with 20 kg Floorfix DF. For non-absorbent underlays: Mix 5 l Fixbinder and 2 l water with 20 kg Floorfix DF	3,5 kg/m ²	32-48 h
33521	Kiilto Start Primer, 3 litres	Priming underfloor and cell plastic	Combine only with Kiilto products	1l/10 m ² . On light concrete 2,5 l/10m ²	1-2 h
33522	Kiilto Fixbinder, 5 litres	Gluing cell plastic boards	Mix 5 l Fixbinder and 2 l water with 20 kg Floorfix DF	5 l/20 kg Floorfix DF (+2 l water)	Not applicable
33524	Kiilto Floor Heat DF 20 kg	Embedding of floor heating pipe and for creating drainage slopes	Only used with Kiilto startprimer	1,7 kg/m ² /mm	3-5 days
8912	Steel mesh 70x70x2,5 1200x800 mm	Reinforcement	For underlay of chipboard and cell plastic	1,3 st/m ²	Not applicable