

#### Description:

The Oventrop dry-build system “Cofloor” is co-ordinated for use in living areas, offices and business premises. The system components offer different options for an individual adaptation of the heat output capacity to the required conditions. The system is suitable for laying surface heating systems on solid timber beam floors or wood flooring as dry-build system (e.g. renovation of old buildings) or with heating screed according to DIN 18560 on polyethylene foil.

#### System components:

Composition pipes “Copipe” sized 14 x 2 mm.

Dry-build element with different laying distances.

Heat conducting strips and heat conducting elbows for laying the composition pipe “Copipe” 14 x 2 mm.

Edge insulating strip and expansion strip to provide edge and settlement joints.

Further accessories for pipe laying and fixing.

Pipe connection fittings “Cofit S” and “Cofit P”.

Stainless steel distributors/collectors “Multidis”, valves, controls and components for individual room temperature control, such as installation sets “Unibox”, electric thermostats and actuators as well as wireless controls.

System solutions for flow temperature control.

Calculation software with data records for all applications.

#### Tender specification:

**PE-Xc/AL/PE-Xb composition pipes “Copipe HS” and PE-RT/AL/PE-RT composition pipes “Copipe HSC” (sized 14 x 2 mm)**

The technical information is detailed in the technical data sheets of the composition pipes “Copipe HS” and “Copipe HSC”.

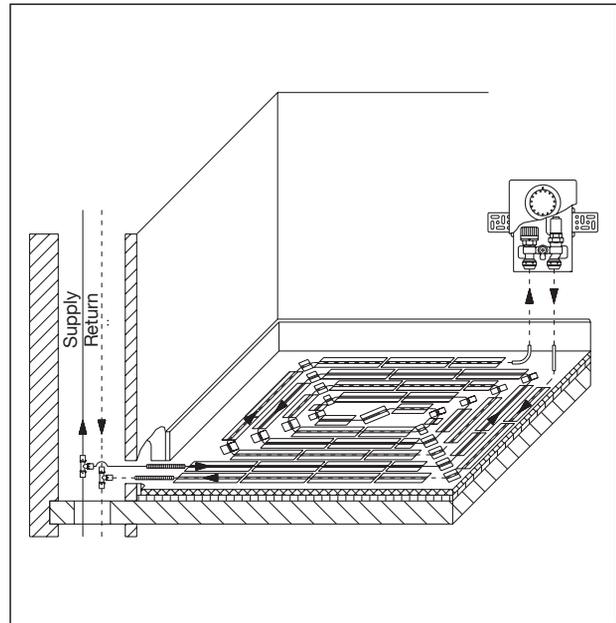
#### Function:

**PE-Xc/AL/PE-Xb composition pipes “Copipe HS” and PE-RT/AL/PE-RT composition pipes “Copipe HSC” (sized 14 x 2 mm)**

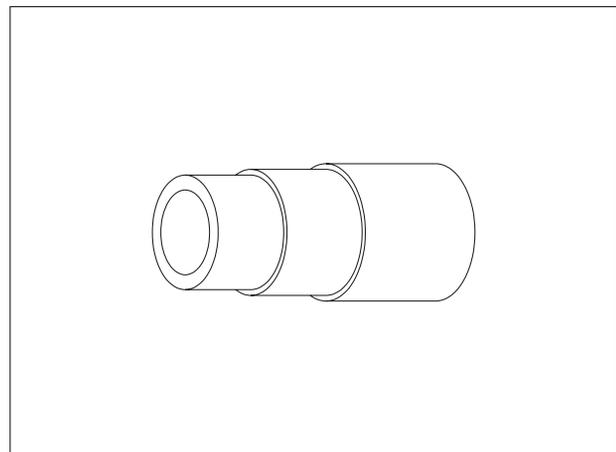
For surface heating and cooling systems with circulation pump. A system separation is not required as the pipes are protected from oxygen penetration by an aluminium layer welded end to end.

The flexible pipes allow for a quick laying of the pipe loops even at low temperatures.

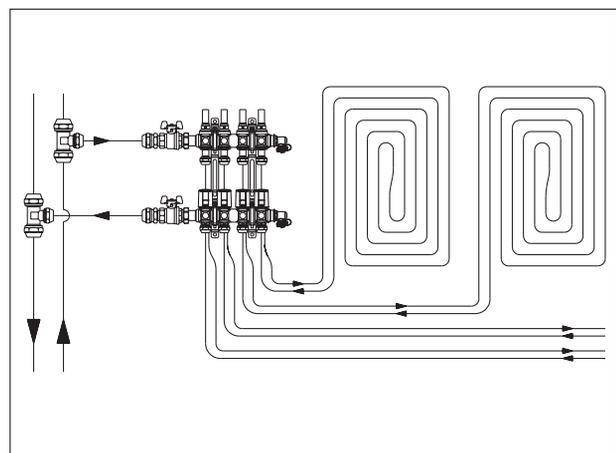
Oventrop recommends using the composition pipe “Copipe” in dry-build systems as it has a lower expansion coefficient than the PE-Xc pipes “Copex”.



Surface heating system “Cofloor” with installation set “Unibox”



“Copipe” pipe 14 x 2 mm for dry-build system “Cofloor”



System illustration with distributor/collector “Multidis”

**Tender specification:**

**Dry-build element**

Element for laying the heat conducting strips and heat conducting elbows. For composition pipes “Copipe” 14 x 2 mm.

For pipe laying distances of 12.5 / 25 cm.

Made of expanded polystyrene (EPS).

Thermal conductivity group: 035

Thickness: 25 mm

Maximum load: 60 kN/m<sup>2</sup>

Building material class B1 according to DIN 4102

Thermal resistivity R = 0.5 (m<sup>2</sup> K)/W

Effective size of dry-build element: 1.00 m x 0.50 m = 0.5 m<sup>2</sup>

Packing unit: 10 dry-build elements wrapped up in a plastic foil (= 5 m<sup>2</sup>)

**Item no.:** 1402800 (= 1 dry-build element)

**Heat conducting strip**

For laying the composition pipes “Copipe” 14 x 2 mm.

Made of galvanised sheet steel, with pre-punched break points in the grooves, to be pushed into the dry-build elements.

Length: 998 mm

Width: 122 mm

Thickness: 0.4 mm

Packing unit: 48 strips per box

**Item no.:** 1402850 (= 1 heat conducting strip)

**Heat conducting elbow**

For serpentine laying of the composition pipe “Copipe” 14 x 2 mm in the peripheral areas with a laying distance of 12.5 mm.

Made of galvanised sheet steel, to be pushed into the dry-build elements.

Length: 110 mm

Width: 245 mm

Thickness: 0.5 mm

Packing unit: 25 elbows per box

**Item no.:** 1402855 (= 1 heat conducting elbow)

**Function:**

**Dry-build element, heat conducting strip and heat conducting elbow**

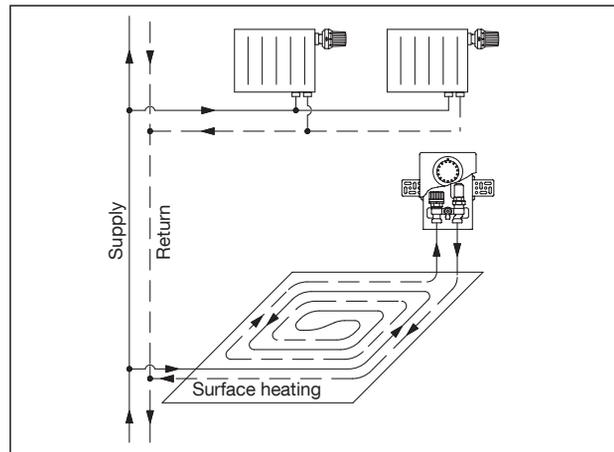
The dry-build elements serve as thermal insulation and, at the same time, as carrier for the heat conducting strips and heat conducting elbows. The specific order of the grooves of the element allows for the Oventrop composition pipe “Copipe” 14 x 2 mm to be laid either in a spiral or serpentine pattern.

The dry-build elements allow for an easy fixing of the heat conducting strips and elbows. The preformed channels of the heating conducting strips and elbows guarantee a secure fixing of the composition pipe “Copipe” 14 mm. The pipe can be laid by only one person.

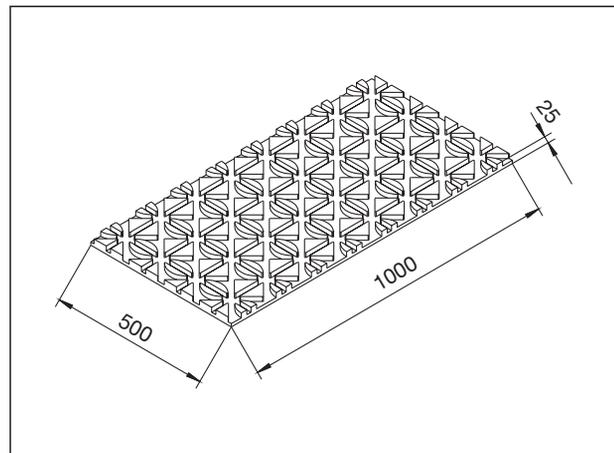
The calculated laying distances are kept exactly.

Due to the large-surface cover of the dry-build elements, the heat conducting strips allow for a constant temperature distribution. The pre-punched break points in the grooves allow for an optimum placement of the strips in any room.

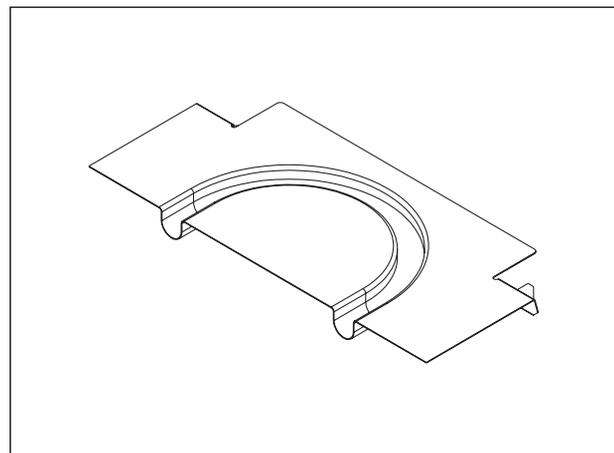
The heat conducting elbows do not only serve to achieve a better heat distribution in the peripheral areas but also as a perfect guide of the composition pipe “Copipe”, especially when laid in a serpentine pattern



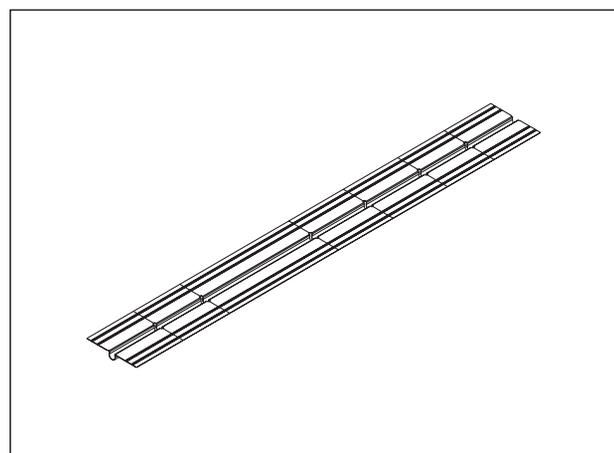
System illustration with installation set “Unibox”



Dimensions dry-build element



Heat conducting elbow



Heat conducting strip

**Tender specification:**

**Edge insulating strips**

Made of closed-cell polyethylene foam, with perforation. It allows for a movement or expansion of the screed of more than 5 mm according to DIN EN 1264-4 and DIN 18560-2.

With bonded foil for sealing the gap between the dry-build element and the edge insulating strip.

The edge insulating strip, item no. 1402191, additionally features an adhesive strip on the wall side and a self-adhesive polyethylene flap.

Suitable for concrete and liquid screed complying with standards as well as dry flooring elements.

Item no.: see below table

Height	Thick-ness	Adhesive strip	Length of roll	Packing unit	Item no.: (=1 roll)
150 mm	10 mm	No	25 m	8 rolls (= 200 m)	1402090
150 mm	10 mm	Yes	25 m	8 rolls (= 200 m)	1402191

**Function:**

**Edge insulating strips**

To provide a sound absorbing joint between the screed and the walls. The flexible edge insulating strip permits sufficient movement or expansion of the screed.

Non-absorbent, the polyethylene foam keeps its characteristics even after application of the screed.

The bonded foil prevents the concrete from flowing underneath the insulation.

The edge insulating strip is suitable for concrete and liquid screed complying with standards.

After all flooring work has been completed, the projecting edge of the insulating strip can be easily torn off at the perforation.

**Tender specification:**

**Expansion strip**

Made of closed-cell polyethylene foam, reinforced by a bonded plastic layer, with adhesive edge.

To absorb expansion of the screed and to provide settlement joints according to DIN EN 1264-4 and DIN 18560-2.

Height: 120 mm

Thickness: 10 mm

Length: 1.20 m

Packing unit: 20 strips per carton (= 24 m)

Item no.: 1402091 (= 1 expansion strip)

**Function:**

**Expansion strip**

To provide settlement joints, for instance above construction joints and in doorways. The strong construction allows for a safe separation of the screed surfaces.

The adhesive edge ensures a safe and simple installation onto the upper insulation layer.

Non-absorbent, the expansion strip keeps its characteristics even after application of the screed.

**Tender specification:**

**Infill panel**

Panel for filling small irregular spaces and the distributor/collector area.

Made of expanded polystyrene (EPS).

Thermal conductivity group: 035

Thickness: 25 mm

Maximum load: 60 kN/m<sup>2</sup>

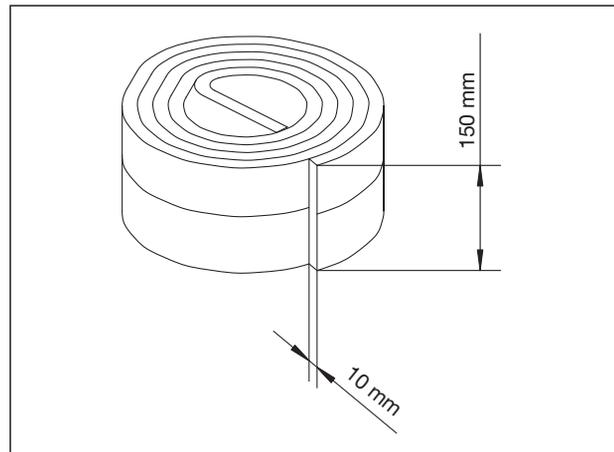
Building material class B1 according to DIN 4102

Thermal resistivity R = 0.71 (m<sup>2</sup> K)/W

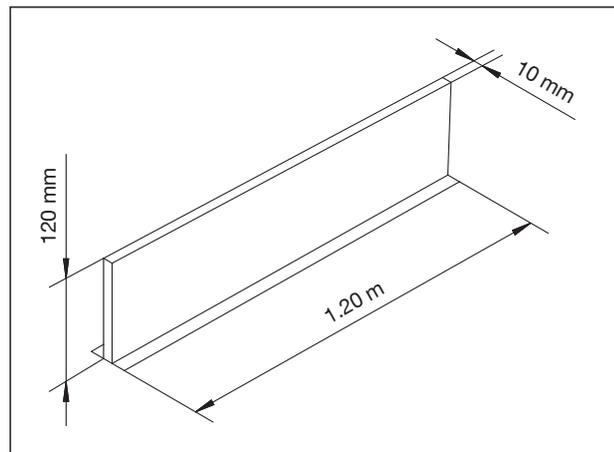
Effective size of panel: 1.00 m x 0.50 m = 0.5 m<sup>2</sup>

Packing unit: 19 panels wrapped up in a plastic foil (= 9.5 m<sup>2</sup>)

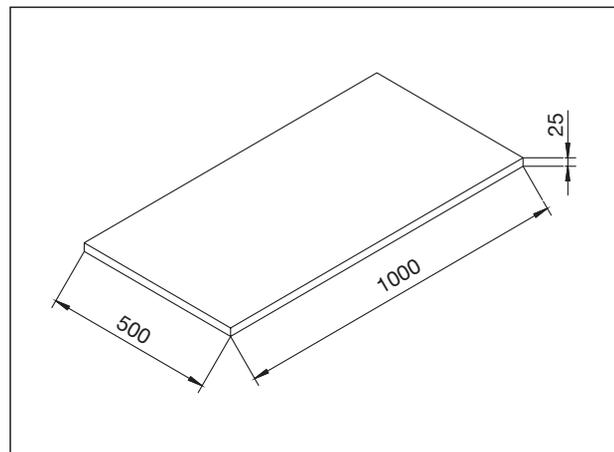
Item no.: 1402857 (= 1 panel)



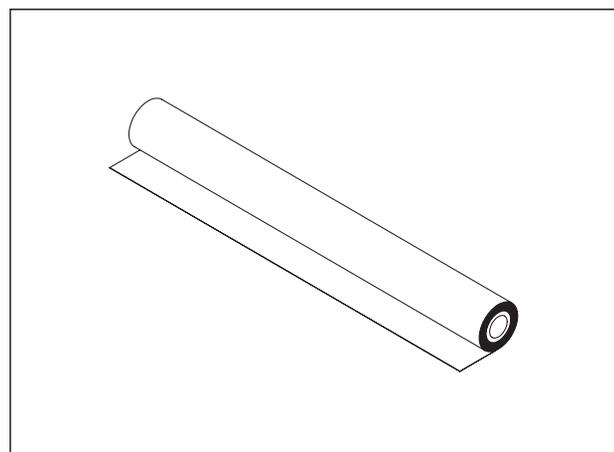
Dimensions edge insulating strip



Dimensions expansion strip



Dimensions infill panel



Membrane

**Function:**

**Infill panel**

Small spaces which may not be completely covered by the dry-build elements, can be filled with pieces of the infill panel. Infill panels can be laid in the area of supply pipes where several pipes are guided towards the distributor/collector. Pipe channels can be produced with the cutting machine.

**Tender specification:**

**Membrane**

Made of polyethylene.

It is used as separation layer before applying the screed.

Thickness: 0.2 mm

Dimension of roll: 25 m x 4 m

Packing unit: 1 roll

**Item no.:** 1402895 (= 1 roll)

**Function:**

**Membrane**

The membrane is laid between the dry-build system and the screed. It serves to prevent a contact between the screed and the heat conducting strips and allows for movement between both layers. Moreover, the penetration of screed water into the insulation is avoided when applying wet screed.

**Tender specification:**

**Hot cutting machine**

Manual tool to produce pipe channels.

Power supply cord 2 m long with European plug.

Heating-up time of the cutting point: about 6-8 seconds

Supply voltage: 230 V – 50 Hz

Absorbed power: 60 W

Protective system: II

**Item no.:** 1402891 (= 1 hot cutting machine)

**Function:**

**Hot cutting machine**

Individual pipe channels are cut into the infill panel with the help of the hot cutting machine.

**Tender specification:**

**Marker point for measuring screed humidity**

Made of plastic.

To mark the points of measurement of screed humidity.

Set = 5 marker points for measuring screed humidity

Packing unit: 10 sets per carton

**Item no.:** 1409090 (= 1 set with 5 marker points)

**Function:**

**Marker point for measuring screed humidity**

To mark the points of measurement for the determination of the residual humidity in heated concrete or anhydrite screed.

By positioning the marker point at the right location, for instance in a return loop, it is guaranteed that the heating pipe is not damaged when withdrawing screed samples.

**Tender specification:**

**Coil unwinders and transport chart**

For composition pipes “Copipe”.

Fixed coil unwinder

**Item no.:** 1402096

Mobile coil unwinder

**Item no.:** 1402098

Transport chart

**Item no.:** 1402099

**Function:**

**Coil unwinders and transport chart**

Facilitates the untwisted laying of the composition pipes “Copipe” even if it is laid by only one person.

**Standards and regulation:**

EnEV	German Energy Saving Directive
DIN V 4108-6	Thermal insulation and energy saving in buildings
DIN V 4701-10	Energetic evaluation of heating, ventilation and air conditioning systems
DIN EN 1264	Room integrated water based heating and cooling systems
DIN EN 12831	Heating systems in buildings - Procedure for the calculation of the standard heat load
DIN EN 13162- DIN EN 13171	Thermal insulation materials for buildings
DIN 4102	Behaviour in fire of building materials and components
DIN 4108	Thermal insulation and energy saving in buildings
DIN 4109	Sound insulation in building construction
DIN 18195	Sealing of buildings
DIN 18202	Dimensional tolerances in building construction
DIN 18336	VOB, part C: sealing work
DIN 18560	Screed in the building industry

**Installation and assembly:**

**Design and calculation**

Before installing the Oventrop surface heating system “Cofloor”, a calculation of the standard heat load or the heat demand has to be carried out.

On DVD and on the Internet ([www.ventrop.com](http://www.ventrop.com)), Oventrop offers software for the design of the Oventrop surface heating system “Cofloor” with due consideration of the DIN EN 1264 standard and the German Energy Saving Directive (EnEV). Apart from the calculation results, the printout also shows the required components.

**Constructional conditions**

As condition for the installation of a hot water surface heating system, the DIN EN 1264-4 standard calls for the completion of all interior plastering as well as the draught free closure of openings in the building, such as windows and external doors.

According to DIN 18560-2, paragraph 4, “Constructional conditions”, further demands must be fulfilled.

Regarding the structural base these are:

- Sufficient state of dryness of the bare floor
- Level surface
- No punctual elevations, pipework or similar which could cause sound bridges and/or variations in the thickness of the screed
- Pipework on the bare floor must be fixed, a level surface has to be provided by a compensation layer, loose ballast/filler may be used if their suitability is proven
- Construction joints must run in a straight line

Tolerances in level and fall must comply with DIN 18202.

According to DIN 18195, a seal has to be provided against rising damp before laying the screed, for instance where base mats are laid on bare ground. Any seal made of polyvinyl chloride and bituminous material must be covered with a polyethylene membrane if the insulation material used is made of polystyrene.

If solid storey floorings still contain residual humidity, a barrier against humidity has to be provided underneath the complete surface heating construction in order to avoid future constructional faults.

All measures taken to prevent a transfer of humidity have to be specified by the planner.

Sealing and protective measures which have to be taken by individual trades in a cooling system, also have to be specified by the planner.

The processing instructions of the manufacturer must be observed when applying the screed.

### Distributor/collector

Before installing the surface heating/cooling system “Cofloor”, a “Multidis” stainless steel distributor/collector must be fitted at a suitable location. When using a cabinet, the compact over-all dimensions of additional components, such as actuators, current supply and connecting block, heat meter, control unit with pump, have to be considered.

For individual room temperature control, the current supply and cabling to the room thermostats must be completed.

### “Unibox”

If a “Unibox” is used for temperature control, it has to be placed into the wall before laying the heating circuits. It can be advantageous to pre-install the return connection on the right hand side of the “Unibox”.

### Edge insulating strip

Walls and other vertical construction elements have to be equipped with an Oventrop edge insulating strip. Starting from the structural base, it has to reach the upper edge of the finished floor. In case of a multilayer insulation, the edge insulating strip may be placed before laying the upper insulation layer.

To provide clean edges, it is recommended to cut the edge insulating strip to half its strength from the back.

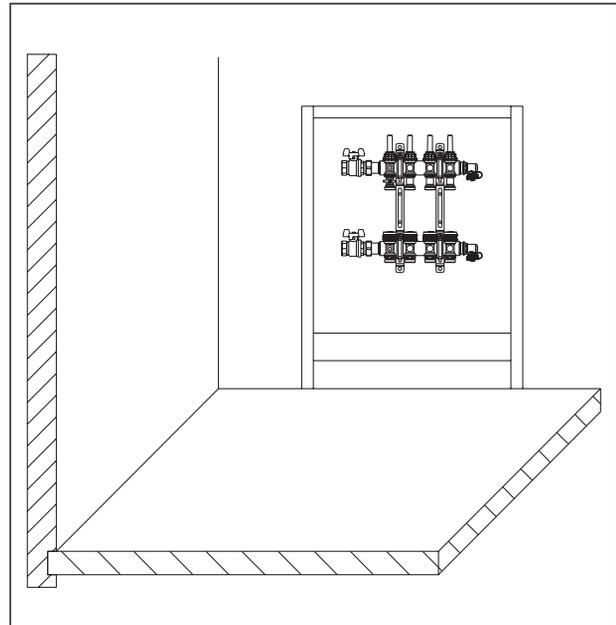
The joint between the edge insulating strip and the insulation board will be sealed by the foil at the edge of the insulating strip.

The perforation facilitates the removal of protruding material after having laid the floor covering.

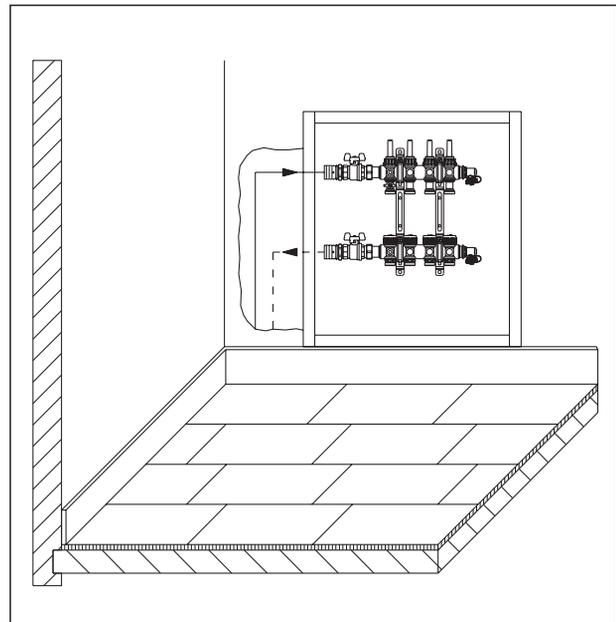
### Thermal and sound insulation

The dry-build element does not improve the impact sound. For static reasons, soft sound insulation boards may not be used in combination with dry flooring elements. The instructions of the manufacturer of the dry flooring elements are to be observed or be asked for.

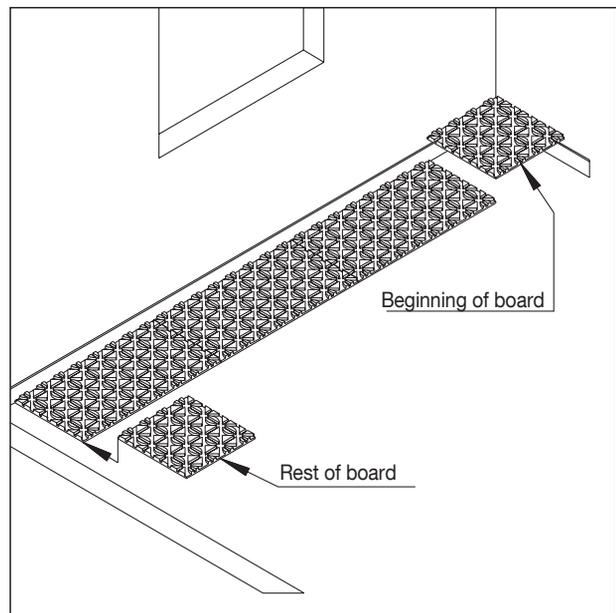
When using wet screed, a thermal and sound insulation according to the calculation has to be laid on the plain bare floor. The insulation boards have to be laid tightly with staggered joints. Where multiple layers are required, the sound insulation should be laid underneath the thermal insulation.



Stainless steel distributor/collector “Multidis” in a cabinet



Installation of the edge insulating strip



Laying of dry-build elements

### Dry-build element, heat conducting strip and heat conducting elbow

The dry-build elements are laid with very tight joints with the longest side running down the longest wall. The element is cut to size at the end of the wall. The next row is started at the opposite end with the off cut of the last element. It may be necessary to adjust the size of the element so that the grooves for laying the heat conducting strips are in alignment. Small irregular spaces and the distributor/collector area are filled with the infill panels.

The heat conducting strips and elbows are laid according to the design (serpentine or spiral pattern). The pre-punched break points in the grooves allow for a quick laying. The dry-build elements being manufactured without overlap are connected by the heat conducting strips.

The foil at the edge of the insulating strip is placed onto the dry-build element. The whole dry-build surface is covered with a polyethylene membrane (thickness = 0.2 mm) as separation layer. The individual lanes of the membrane must overlap. If wet screed is to be used, then the membrane joints have to be bonded with adhesive tape. To avoid the penetration of screed or screed water in peripheral areas, the skirting of the edge insulating strip must also be bonded the same way.

### Pipe laying

Next, the heating pipes are laid untwisted and according to the design layout. Due to its lower expansion coefficient compared to the PE-Xc pipes “Copex”, the composition pipe “Copipe” should be used for the dry-build system.

The Oventrop coil unwinders are aiding in laying pipes. The heat conducting strips may only be laid where pipes run in a straight line at a sufficient distance from the beginning of the bend. Please ensure a proper deburring when shortening the strips as otherwise pipes may be damaged due to their movement caused by temperature changes. The joints of the dry-build elements must be covered by the heat conducting strips.

The pipe channels in the infill panels in the distributor/collector area are produced with the hot cutting machine. In small spaces, pipe channels for the connecting pipes can be produced with the help of the hot cutting machine, too.

### Types of laying and advice

Different types of laying are possible, for instance in a spiral pattern which should always be chosen in combination with a “Unibox”. A constant temperature distribution is thus guaranteed.

Serpentine laying results in a decreasing temperature from the supply to the return pipe. This pattern should not be chosen when using a “Unibox”.

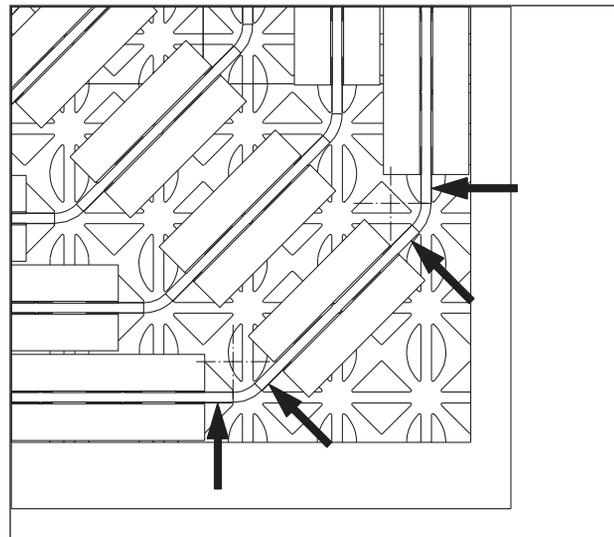
Depending on the application, different variants and mixtures can be of advantage.

When bending by hand, a minimum pipe bending radius of 5 x outer pipe diameter has to be kept where bends and 180° elbows are produced. By using bending tools, a pipe bending radius of 3 x outer pipe diameter can be achieved with the composition pipe “Copipe”.

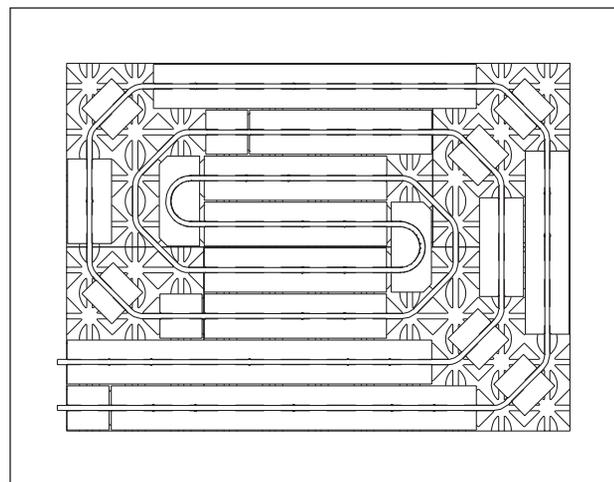
Kinked parts of the composition pipe “Copipe” have to be cut out. The pipe has to be re-connected with a coupling of permanent tightness (double nipple “Cofit S” + 2 compression fittings “Cofit S” or press fittings “Cofit P”).

The coupling has to be protected from direct contact with the screed by wrapping a polyethylene foil around it. The position of the coupling has to be marked in the laying plan.

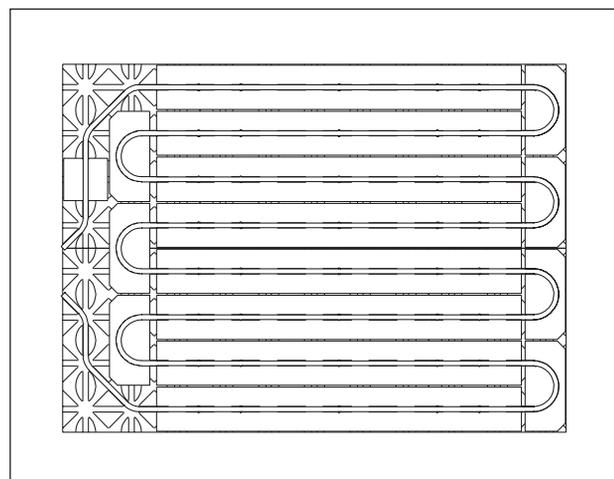
If required, pipes are lengthened using the same procedure.



Spiral patterned layout with 90 ° bend



Spiral laying of pipes



Serpentine laying of pipes

### Screed joints

Expansion joints in the structural base also have to be designed as joints in the heating screed (wet screeds and screed flooring elements).

When using concrete or anhydrite screed, DIN EN 1264-4 calls for further expansion joints for screed surfaces larger than 40 m<sup>2</sup> and with an edge length of more than 8 m. Depending on the instructions of the screed manufacturer, joints should also be designed in doorways and at protruding walls which are prone to cracks.

The Oventrop expansion strip fulfils the demands for the formation of the required screed joints.

The self-adhesive edge of the expansion strip is bonded onto the membrane covering the insulation board.

After laying and drying of the screed, the expansion strip is cut off flush with the screed surface. Elastic joints also have to be provided in the floor covering above the expansion joints.

When combined with dry flooring elements, the Oventrop dry-build system only requires edge joints (edge insulating strip) in rooms with a length up to 20 m. The instructions of the manufacturer of the dry flooring elements are to be observed.

### Connection of the pipework and test

The composition pipe “Copipe” is connected to the stainless steel distributor/collector “Multidis” or the “Unibox” with the help of a compression fitting “Cofit S” with due consideration of the installation instructions.

Before laying the screed, a pressure test according to DIN EN 1264-4 with a test pressure of at least 4 bar but not more than 6 bar has to be carried out. A test report has to be produced. A form can be downloaded from the Internet ([www.owntrop.com](http://www.owntrop.com)).

The pipes have to be protected against frost.

Please ensure that the dry-build elements or the insulation layer are level. Elevated parts have to be fastened, for instance by use of plastic nails, dowels or by bonding them onto the surface.

Provide at least 3 marker points for measuring screed humidity per dwelling or per screed surface of 200 m<sup>2</sup>. At least 1 marker point per room is recommended.

By placing the Oventrop marker point for measuring screed humidity at an appropriate location, for instance in the return loop, it is guaranteed that the pipe will not be damaged when withdrawing screed samples.

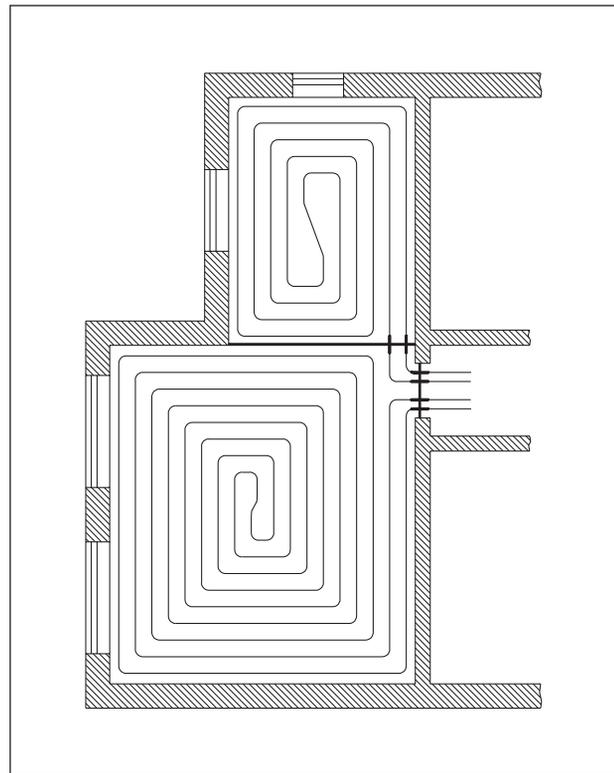
### Wet screed and dry-flooring elements

Before laying the heating screed, the surface heating pipes must be filled with water, if required with antifreeze liquid. The test pressure of the pressure test must be maintained.

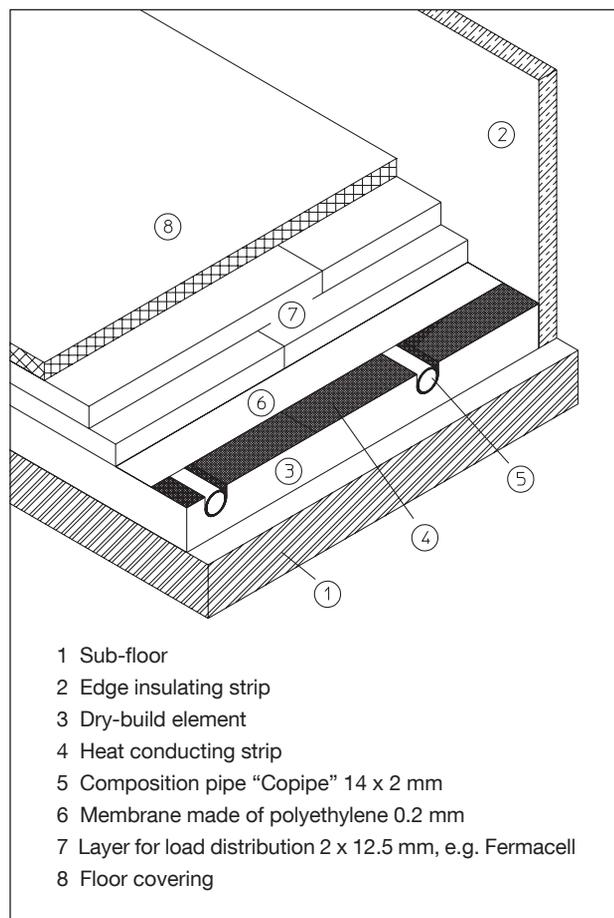
The concrete or liquid screed to be used must comply with the valid standards, regulations and the directives of the calculation. Normally, the pipe covering amounts to 45 mm. The instructions of the screed manufacturer must be observed.

Any heating screed additives approved by the heating screed manufacturer for PE-Xc pipes may be used, for instance to improve the thermal conductivity and flexional strength, to reduce the drying period or for thin layered screed with a pipe covering of 30 mm.

Dry flooring elements (e.g. Fermacell boards) with a thickness of 12.5 mm which are laid in two layers with staggered joints are used as floor covering. Processing has to be in accordance with the instructions of the manufacturer. The flow temperatures have to be set in such a way that the temperature below the dry flooring elements does not exceed 55 °C. When laying additional insulation layers, these must show a compressive stress of at least 150 kPa.



Heating circuits with positions of expansion joints



- 1 Sub-floor
- 2 Edge insulating strip
- 3 Dry-build element
- 4 Heat conducting strip
- 5 Composition pipe “Copipe” 14 x 2 mm
- 6 Membrane made of polyethylene 0.2 mm
- 7 Layer for load distribution 2 x 12.5 mm, e.g. Fermacell
- 8 Floor covering

Floor construction with dry-build elements

**Commissioning:**

The individual heating circuits are hydraulically balanced according to the calculation.

Before laying the floor covering, the incremental heating test of the screed is to be carried out and to be documented in a log. A form and a description of the procedure can be downloaded from the Internet ([www.oventrop.com](http://www.oventrop.com)).

Start incremental heating at the earliest:

- 21 days after laying of concrete screed
- 7 days after laying of calcium sulphate screed

Heat up slowly!

3 days with a flow temperature of about 25 °C, then

4 days with the maximum design temperature

The flow temperature is regulated via the boiler control. The valve setting should allow the nominal flow rate.

In surface heating systems, the maximum permissible temperature near the heating pipes for concrete and calcium sulphate screed is 55 °C.

In surface cooling systems, the temperature near the cooling pipes must not reach the dew point.

Deviating instructions of the screed manufacturer must be observed.

The floor covering must be suitable for the surface heating. Before laying the floor covering, a second heating to dry the screed may have to be carried out. Regarding procedure and documentation, the instructions of the manufacturer of the floor covering are to be observed.

The maximum floor surface temperatures amount to:

29 °C in residential areas

35 °C in fringe areas

33 °C in bathrooms

When using dry flooring elements, a functional heating test according to DIN 1264-4 has to be carried out, too. It can be started after having laid the dry flooring elements. The maximum admissible flow temperatures of the manufacturers of the dry flooring elements must be observed.

**Advantages:**

- complete system from one supplier, from boiler connection to room temperature control
- safe fixing of the composition pipe “Copipe” 14 x 2 mm in the dry-build system
- laying can be carried out by one person, especially when using the coil unwinder
- quick laying of the pipes as the laying distances can be easily kept
- reduced overall thickness compared to the wet screed system
- the heat conducting strips and elbows allow for an optimum heat distribution
- sizing of the heat conducting strips to the required length without tools due to the pre-punched break points in the grooves
- the floor can be walked on immediately when combined with dry flooring elements
- also suitable for wall surfaces
- extensive system guarantee

Subject to technical modifications without notice.

Product range 2  
ti 173-EN/10/MW  
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