

### Description:

The Oventrop base mat, tacker and clamping rail systems “Cofloor” are 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 systems are suitable for concrete and liquid screed.

### System components:

PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe” sized 14 x 2, 16 x 2 and 17 x 2 mm.

Choice of four base mat systems with different laying distances.

Three compensation elements for fixing the connection pipes in front of the distributor/collector and for laying in doorways.

Choice of two tacker board systems with different laying distances.

Choice of two clamping rail systems with different laying distances.

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

Further accessories for pipe laying and fixing.

Pipe connection fittings “Cofit S”, “Cofit P” and “Ofix K”.

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

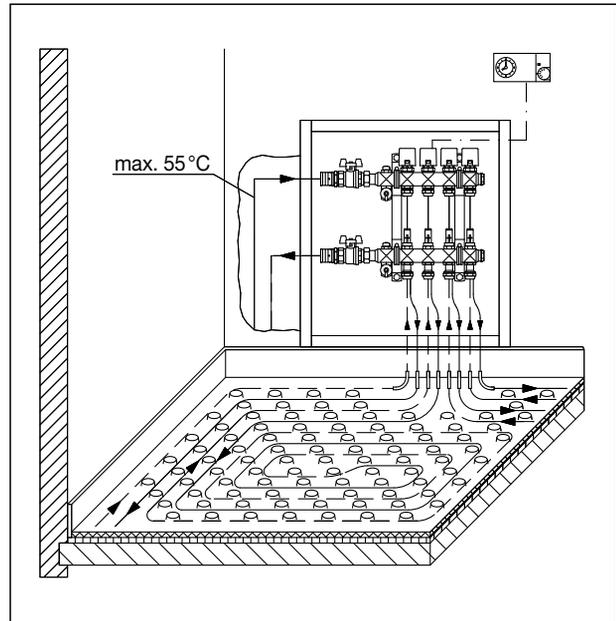
System solutions for flow temperature control.

Calculation software with data record for all applications.

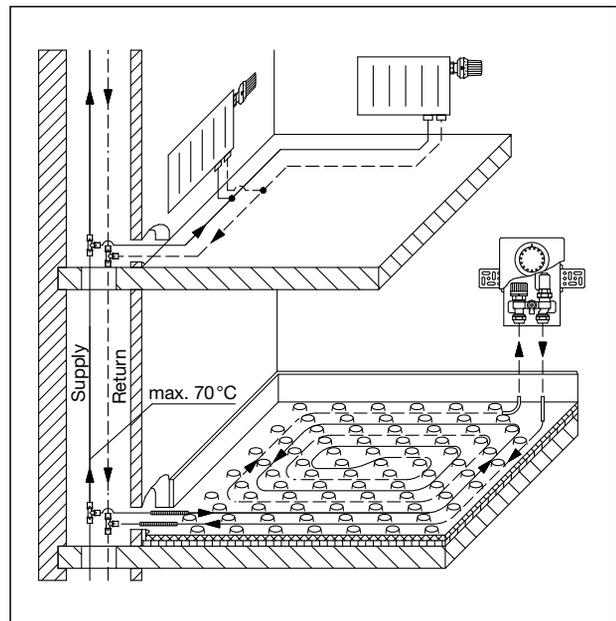
### Tender specification:

**PE-Xc plastic pipes “Copex”, PE-RT plastic pipes “Copert”, PE-Xc/AL/PE-Xb composition pipes “Copipe HS” and PE-RT/AL/PE-RT composition pipes “Copipe HSC”**

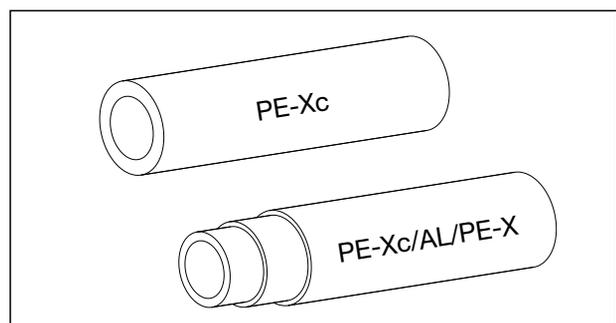
The technical information is detailed in the technical data sheets of the composition pipes “Copipe HS” and “Copipe HSC” as well as the plastic pipes “Copex” and “Copert”.



Surface heating system “Cofloor” with stainless steel distributor/collector “Multidis SF”



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



“Copex” and “Copert” pipes for surface heating and cooling systems “Cofloor”

**Tender specifications:**

**Base mat NP-35**

For fixing the PE-X pipes “Copex”, the PE-RT pipes “Copert” and composition pipes “Copipe” 14 x 2 mm and 16 x 2 mm with the possibility of 45° diagonal laying.

Suitable for pipe laying distances of 5, 10, 15, 20, 25, 30 cm.

With thermal and sound insulation made of expanded polystyrene (EPS), thermal conductivity group 040, thickness 35-2 mm, covered with a polystyrene membrane.

Maximum load: 5 kN/m<sup>2</sup>

Dynamic stiffness: ≤ 20 MN/m<sup>3</sup>

Sound improvement: 28 dB

Building material class B2 according to DIN 4102

Thermal resistivity R = 0.875 (m<sup>2</sup> K)/W

Suitable for standard concrete and liquid screed.

Effective size of base mat: 1.00 m x 1.00 m = 1.00 m<sup>2</sup>

Packing unit: 10 base mats per carton (= 10.00 m<sup>2</sup>)

**Item no.:** 1402210 (= 1 base mat)

**Base mat NP-30**

For fixing the PE-X pipes “Copex”, the PE-RT pipes “Copert” and composition pipes “Copipe” 14 x 2 mm and 16 x 2 mm with the possibility of 45° diagonal laying.

Suitable for pipe laying distances of 5, 10, 15, 20, 25, 30 cm.

With thermal and sound insulation made of expanded polystyrene (EPS), thermal conductivity group 040, thickness 30-2 mm, covered with a polystyrene membrane.

Maximum load: 5 kN/m<sup>2</sup>

Dynamic stiffness: ≤ 20 MN/m<sup>3</sup>

Sound improvement: 28 dB

Building material class B2 according to DIN 4102

Thermal resistivity R = 0.75 (m<sup>2</sup>K)/W

Suitable for standard concrete and liquid screed.

Effective size of base mat: 1.00 m x 1.00 m = 1.00 m<sup>2</sup>

Packing unit: 10 base mats per carton (= 10.00 m<sup>2</sup>)

**Item no.:** 1402410 (= 1 base mat)

**Base mat NP-11**

For fixing the PE-X pipes “Copex”, the PE-RT pipes “Copert” and composition pipes “Copipe” 14 x 2 mm and 16 x 2 mm with the possibility of 45° diagonal laying.

Suitable for pipe laying distances of 5, 10, 15, 20, 25, 30 cm.

With thermal insulation made of expanded polystyrene (EPS), thermal conductivity group 035, thickness 11 mm, covered with a polystyrene membrane.

Maximum load: 50 kN/m<sup>2</sup>

Building material class B2 according to DIN 4102

Thermal resistivity R = 0.314 (m<sup>2</sup>K)/W

Suitable for standard concrete and liquid screed.

Effective size of base mat: 1.00 m x 1.00 m = 1.00 m<sup>2</sup>

Packing unit: 10 base mats per carton (= 10.00 m<sup>2</sup>)

**Item no.:** 1402310 (= 1 base mat)

**Base mat NP**

For fixing the PE-X pipes “Copex”, the PE-RT pipes “Copert” and composition pipes “Copipe” 14 x 2 mm and 16 x 2 mm with the possibility of 45° diagonal laying.

Suitable for pipe laying distances of 5, 10, 15, 20, 25, 30 cm.

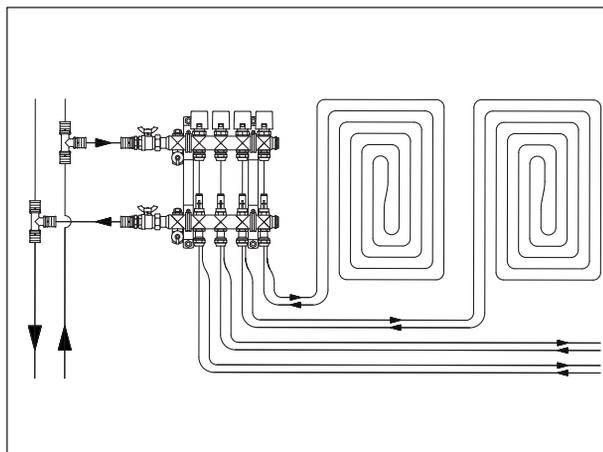
Made of moulded polystyrene foil, for laying on standard thermal and sound insulation.

Broad overlap of the base mats, therefore suitable for standard concrete and liquid screed.

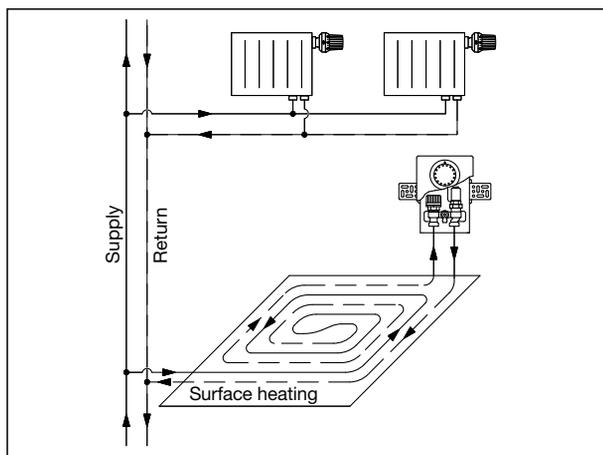
Effective size of base mat: 1.00 m x 1.00 m = 1.00 m<sup>2</sup>

Packing unit: 18 base mats per carton (= 18.00 m<sup>2</sup>)

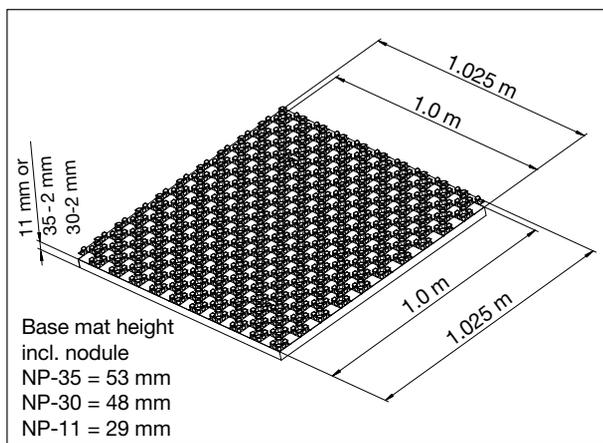
**Item no.:** 1402110 (= 1 base mat)



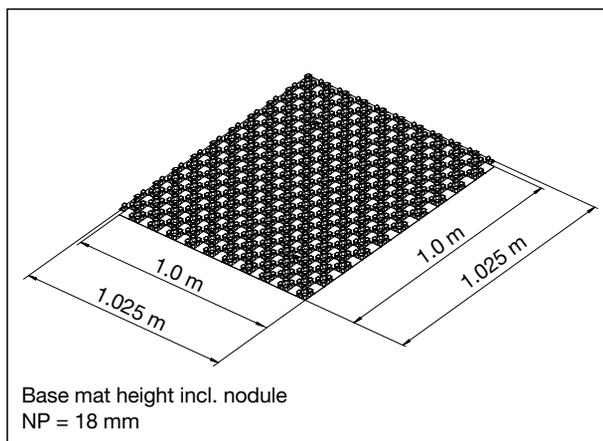
System illustration with stainless steel distributor/collector “Multidis SF”



System illustration with installation set “Unibox”



Dimensions base mat NP-35, NP-30 and NP-11



Dimensions base mat NP

**Function:**

**Base mats NP-35, NP-30, NP-11 and NP**

The base mats guarantee a safe fixing of the “Copex”, “Copert” and “Copipe” pipes sized 14 and 16 mm. Laying can be carried out by one person.

The calculated laying distances are kept exactly.

45° diagonal laying of the pipes is possible without auxiliary material.

The base mats are suitable for concrete and liquid screed without additional bonding. The processing instructions of the manufacturer must be observed when applying the screed.

Due to the high thermal resistivity of the base mats NP-35 and NP-30, an additional insulation between identically heated rooms is not necessary.

The base mat NP is laid on a commercial thermal and sound insulation.

**Tender specifications:**

**Compensation element 35 mm**

For fixing the connection pipes in front of the distributor/collector and for laying in doorways.

With thermal and sound insulation made of expanded polystyrene (EPS), thermal conductivity group 040, thickness 35-2 mm, covered with a tissue membrane.

Thermal resistivity  $R = 0.875 \text{ (m}^2\text{K)/W}$

Suitable for standard concrete and liquid screed.

Effective size of base mat:  $1.00 \text{ m} \times 1.00 \text{ m} = 1.00 \text{ m}^2$  (folded)

**Item no.:** 1402290 (= 1 compensation element)

**Compensation element 30 mm**

For fixing the connection pipes in front of the distributor/collector and for laying in doorways.

With thermal and sound insulation made of expanded polystyrene (EPS), thermal conductivity group 040, thickness 30-2 mm, covered with a tissue membrane.

Thermal resistivity  $R = 0.75 \text{ (m}^2\text{K)/W}$

Suitable for standard concrete and liquid screed.

Effective size of base mat:  $1.00 \text{ m} \times 1.00 \text{ m} = 1.00 \text{ m}^2$  (folded)

**Item no.:** 1402490 (= 1 compensation element)

**Compensation element 11 mm**

For fixing the connection pipes in front of the distributor/collector and for laying in doorways.

With thermal insulation made of expanded polystyrene (EPS), thermal conductivity group 035, thickness 11 mm, covered with a tissue membrane.

Thermal resistivity  $R = 0.31 \text{ (m}^2\text{K)/W}$

Suitable for standard concrete and liquid screed.

Effective size of base mat:  $1.00 \text{ m} \times 1.00 \text{ m} = 1.00 \text{ m}^2$  (folded)

**Item no.:** 1402390 (= 1 compensation element)

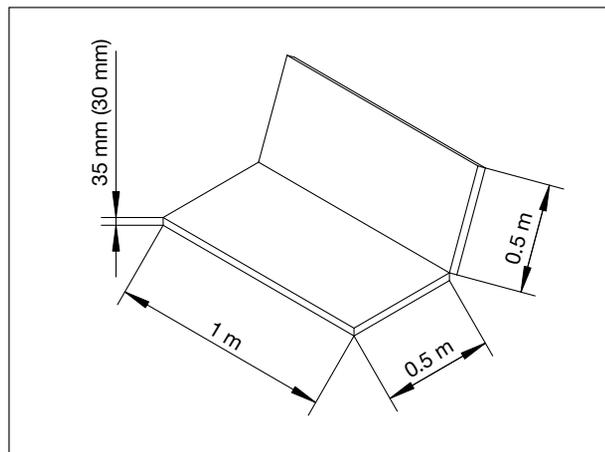
**Function:**

**Compensation elements 35 mm, 30 mm and 11 mm**

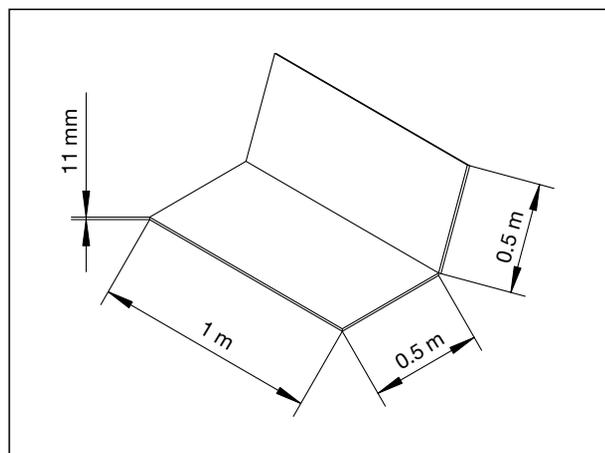
The “Copex”, “Copert” and “Copipe” pipes sized 14 and 16 mm can be directly fixed onto the compensation elements in front of the distributor/collector and in doorways without fixed laying distances by use of the fixing hooks, item no. 1409082.

The junctions between the base mats and the compensation elements must be sealed, for instance with adhesive tape, in order to prevent the penetration of screed under the insulation layer. They are suitable for standard concrete and liquid screed.

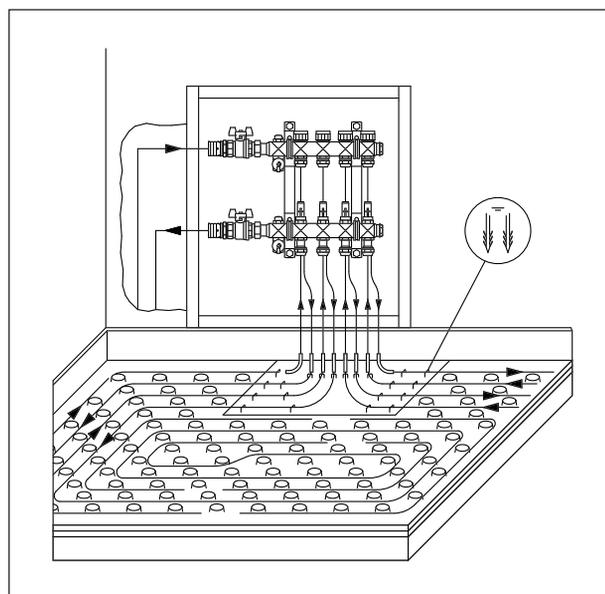
The processing instructions of the manufacturer must be observed when applying the screed.



Dimensions compensation element 35 mm, 30 mm for base mats NP-35 and NP-30



Dimensions compensation element 11 mm for base mat NP-11



Compensation element in front of the stainless steel distributor/collector “Multidis SF”

**Tender specification:**

**Base mat rolls**

For fixing the PE-XC pipes “Copex”, the PE-RT pipes “Copert” and the composition pipes “Copipe” sized 14 x 2 mm, 16 x 2 mm and 17 x 2 mm.

Suitable for pipe laying distances of 5, 10, 15, 20, 25, 30 cm.

With thermal and sound insulation made of expanded polystyrene (EPS), thermal conductivity group 045 for item no. 1402500/05/10/20 and 040 for item no. 1402507/15.

Dynamic stiffness:

- ≤ 15 MN/m<sup>3</sup> item no. 1402500/05
- ≤ 20 MN/m<sup>3</sup> item no. 1402507/10/20
- ≤ 30 MN/m<sup>3</sup> item no. 1402515

covered with a tissue membrane.

Maximum load: 4 kN/m<sup>2</sup> for item no. 1402500/05/10 and 5 kN/m<sup>2</sup> for item no. 1402507/15

Building material class B2 according to DIN 4102

Suitable for standard concrete and liquid screed.

Effective size of base mat roll: 10.00 m x 1.00 m = 10.00 m<sup>2</sup>

Packing unit: 1 roll in a plastic bag (= 10.00 m<sup>2</sup>)

Thickness	Thermal resistivity	Sound improvement	Item no.: (=1 roll)
35 - 3 mm	R = 0.78 (m <sup>2</sup> K/W)	29 dB	1402500
30 - 3 mm	R = 0.67 (m <sup>2</sup> K/W)	29 dB	1402505
25 - 2 mm	R = 0.56 (m <sup>2</sup> K/W)	28 dB	1402510
30 - 2 mm	R = 0.75 (m <sup>2</sup> K/W)	28 dB	1402507
20 - 2 mm	R = 0.50 (m <sup>2</sup> K/W)	26 dB	1402515
20 - 2 mm	R = 0.44 (m <sup>2</sup> K/W)	28 dB	1402520

**Folded board**

For fixing the PE-XC pipes “Copex”, the PE-RT pipes “Copert” and the composition pipes “Copipe” sized 14 x 2 mm, 16 x 2 mm and 17 x 2 mm.

Suitable for pipe laying distances of 5, 10, 15, 20, 25, 30 cm.

With thermal and sound insulation made of expanded polystyrene (EPS), thermal conductivity group 045, thickness 35-3 mm, covered with a tissue membrane.

Maximum load: 4 kN/m<sup>2</sup>

Dynamic stiffness: ≤ 15 MN/m<sup>3</sup>

Sound improvement: 28 dB

Building material class B2 according to DIN 4102

Thermal resistivity R = 0.78 (m<sup>2</sup>k)/W

Suitable for standard concrete and liquid screed.

Effective size of folded board: 2.00 m x 1.00 m = 2.00 m<sup>2</sup> (folded)

Packing unit: 5 boards in a plastic bag (=10.00 m<sup>2</sup>)

Item no.: 1402600 (=1 folded board)

**Function:**

**Base mat rolls, folded board**

Combined with the tacker hooks, item no. 1402591, or the clamping rails, item no. 1402580 and 1402581, the base mat rolls and the folded board guarantee a safe fixing of the “Copex”, “Copert” and “Copipe” pipes 14, 16 and 17 mm. Laying can be carried out by one person.

The printed grid facilitates trimming of the lanes to be laid and serves to keep the laying distances when laying the pipe.

One longitudinal edge of the base mat rolls/folded board has a foil overlap and the opposite edge is equipped with an adhesive tape. The overlaps bonded this way and the linings bonded with adhesive tape prevent the penetration of water into the insulation layer.

Due to the high thermal resistivity of the base mat roll/folded board with a thickness of 35-3 mm (item no. 1402500 and 1402600), an additional insulation between identically heated rooms is not necessary.

**Tender specification:**

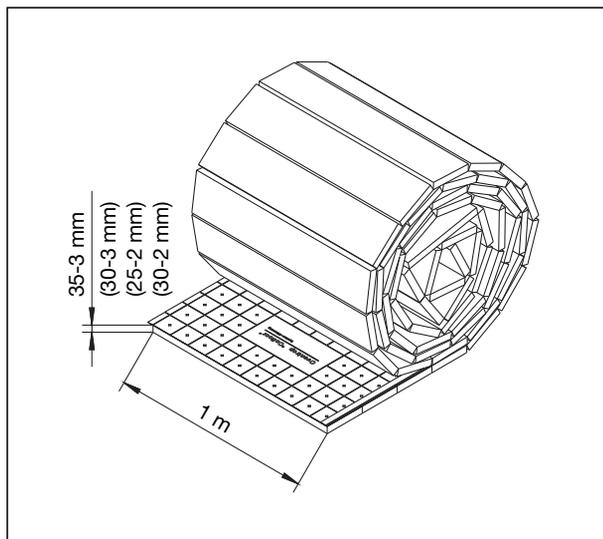
**Edge insulating strip**

Made of perforated closed-cell polyethylene foam. It allows a movement or expansion of the screed of more than 5 mm according to DIN EN 1264-4, DIN 18560-T2.

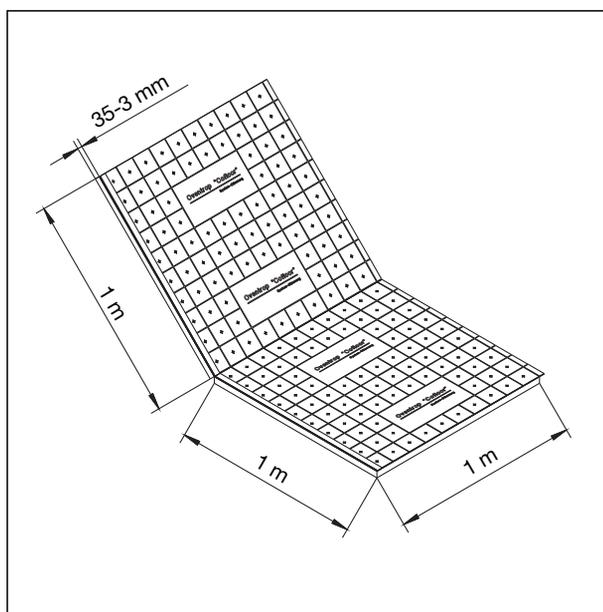
With bonded foil for sealing of the gap between the base mat roll/folded board and the edge insulating strip.

The edge insulating strip, item no. 1402190, additionally features an adhesive strip.

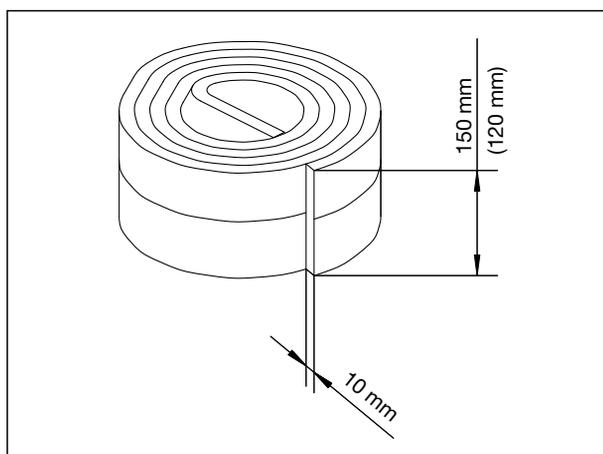
Suitable for standard concrete and liquid screed.



Dimensions base mat roll



Dimensions folded board



Dimensions edge insulating strip

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
120 mm	10 mm	Yes	50 m	10 rolls (= 500 m)	1402190

**Function:**

**Edge insulating strip**

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 can be used for standard concrete and liquid screed.

After having finished all flooring works, the projecting edge of the insulation strip can be easily torn off at the perforation.

**Tender specification:**

**Expansion strip**

Made of close-celled 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, DIN 18560-2.

Height: 120 mm, thickness: 10 mm

Length: 1.20 m

Packing unit: 20 pieces 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 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 event after application of the screed.

**Tender specification:**

**Round profile made of polystyrene foam**

Serves as sealing between base mat and edge insulating strip (for liquid screed) and between base mat and expansion strip (for concrete and liquid screed).

Diameter: 20 mm, length: 150 mm

Packing unit: 150 m in a dispenser

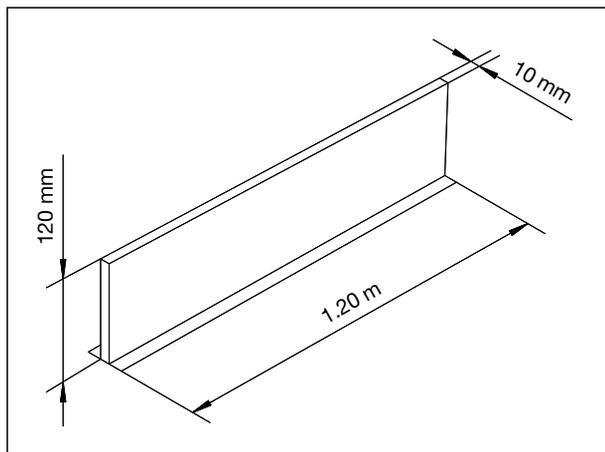
**Item no.:** 1402092 (=1 dispenser)

**Function:**

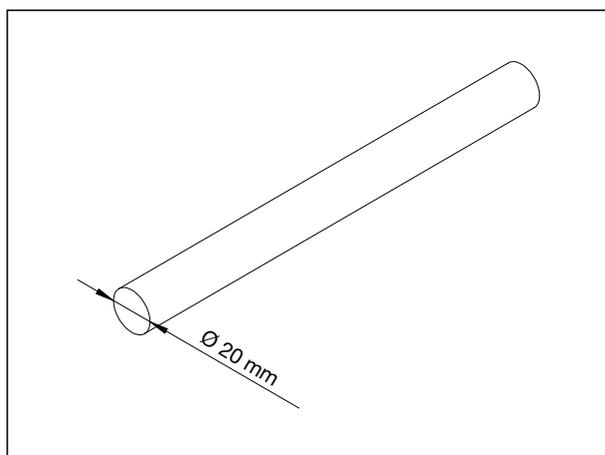
**Round profile made of polystyrene foam**

The foil of the edge insulating strip may be wedged into the base mats with the help of the round profile. The penetration of liquid screed between base mat and edge insulating strip is prevented.

If settlement joints run above base mats, the round profile is first wedged between the nodules, then the expansion strip is bonded onto it.



Dimensions expansion strip



Dimensions round profile made of polyethylene foam

**Tender specification:**

**Protective tube, slotted**

Made of LDPE.

Length: 300 mm, for pipe diameters 14, 16 and 17 mm

For the protection of the heating pipes when crossing screed joints, according to DIN EN 1264-4, DIN 18560-2.

Packing unit: 20 pieces in a plastic bag

**Item no.:** 1501184 (= 1 protective tube)

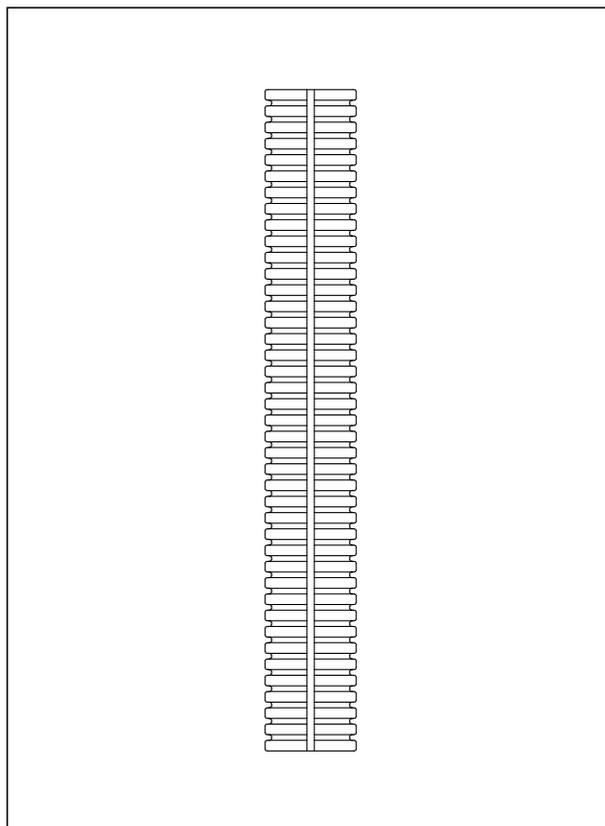
**Function:**

**Protective tube, slotted**

The protective tube protects the pipe from being damaged or kinked. It is prescribed where the surface heating pipes cross screed joints.

Use is also recommended at the entry and exit of the screed where the flexibility of the pipes is restricted.

Due to the protective tube having a length of 300 mm, the mobile length is sufficient to avoid inadmissible kinking of the pipes should the screed surface move.



Protective tube

**Tender specification:**

**Fixing hook**

Made of plastic.

For pipe diameters 14 and 16 mm.

For the additional fixing of the pipes.

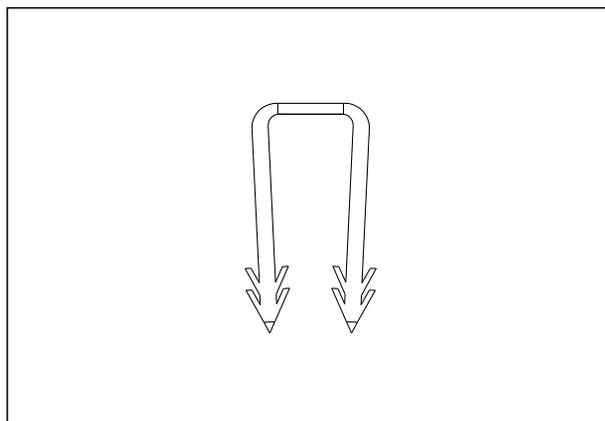
Set = 200 fixing hooks

**Item no.:** 1409082 (= 1 set / 200 fixing hooks)

**Function:**

**Fixing hook**

For fixing the pipes onto insulation boards with a minimum thickness of 30 mm, for instance in front of the distributor/collector and in doorways by simply pushing it into the insulation boards made of expanded polystyrene or polyurethane.



Fixing hook

**Tender specification:**

**Pipe guiding elbow**

Made of plastic.

For pipe diameters 14, 16 and 17 mm.

To guide the pipes in bends of 90°.

Set = 10 pipe guiding elbows

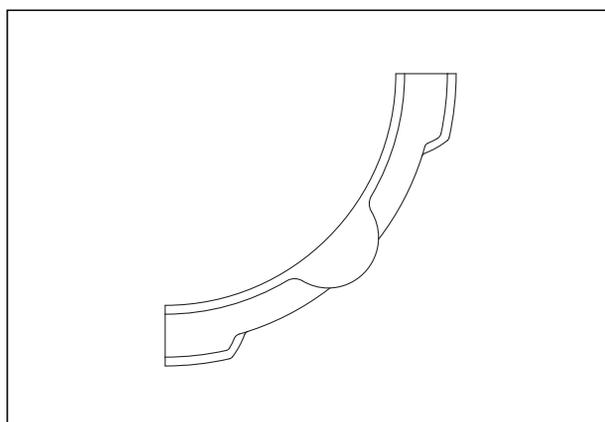
Packing unit: 50 sets per carton

**Item no.:** 1409085 (= 1 set / 10 pipe guiding elbows)

**Function:**

**Pipe guiding elbow**

For the inversion and fixing of the PE-Xc pipe “Copex” and PE-RT pipes “Copert” at 90° bends, for instance in front of the distributor/collector and in screed passages.



Pipe guiding elbow

**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

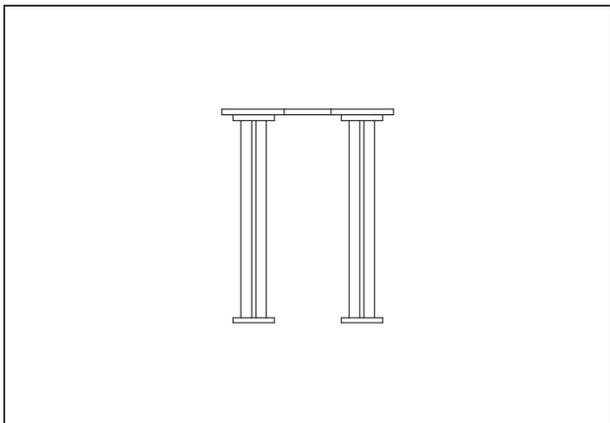
Item no.: 1409090 (=1 set / 5 marker points for measuring screed humidity)

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



Marker point for measuring screed humidity

**Tender specification:**

**Coil unwinder**

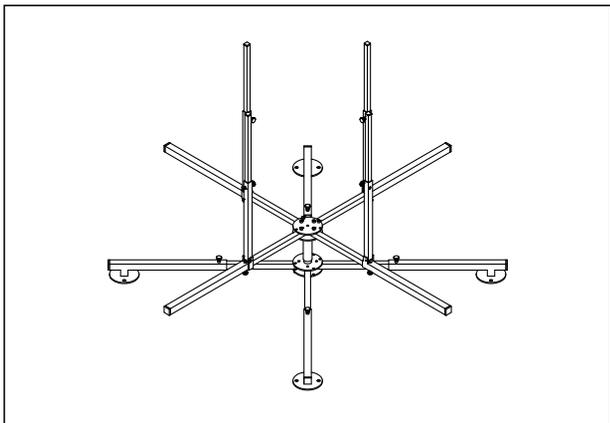
For PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe”.

Item no.: 1402096

**Function:**

**Coil unwinder**

Facilitates the untwisted laying of the PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe” even if it is laid by only one person.



Coil unwinder

**Tender specification:**

**Tacker machine**

Machine for fixing the tacker hooks.

For tacker hooks R2, R1PP, R1PPL.

Magazine quantity: 120 tacker hooks

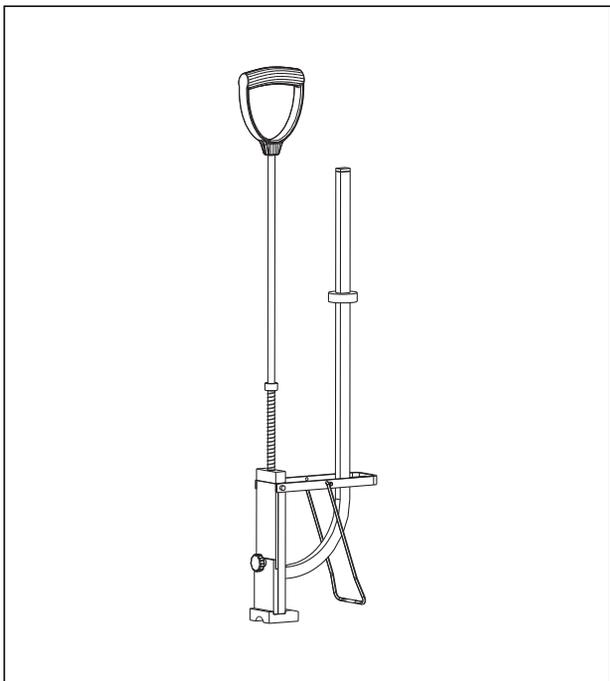
Length: 92 cm

Item no.: 1402597 (= 1 machine)

**Function:**

**Tacker machine**

For fixing the PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe” onto the base mat roll or the folded board with the help of the tacker hooks, item no. 1402591.



Tacker machine

**Tender specification:**

**Tacker hook**

Made of plastic.

For pipe diameters 14, 16, 17 and 20 mm.

For fixing the pipes.

Magazine of 30 tacker hooks.

Packing unit: 10 magazines per carton

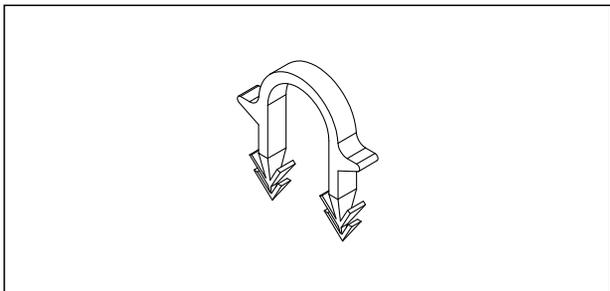
Item no.: 1402591 (= 1 magazine / 30 tacker hooks)

Item no.: 1402592 (= 10 magazines / 300 tacker hooks)

**Function:**

**Tacker hook**

For fixing the PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe” onto the base matt roll or the folded board with the help of the tacker machine, item no. 1402597.



Tacker hook

**Tender specification:**

**Tape gun**

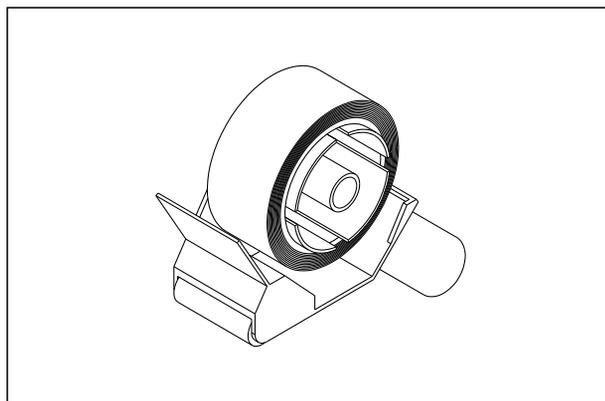
For tape width 50 mm.

**Item no.:** 1402598 (=1 tape gun)

**Function:**

**Tape gun**

For bonding the linings of the base mat rolls and insulation boards with the help of the adhesive tape, item no. 1402599.



Tape gun

**Tender specification:**

**Adhesive tape**

White, waterproof.

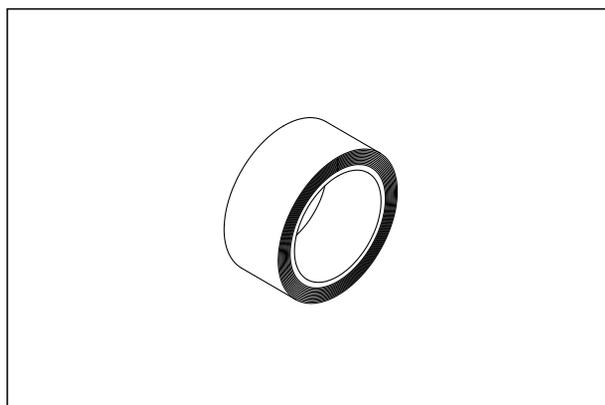
Dimensions: 50 mm x 66 m

**Item no.:** 1402599 (= 1 roll)

**Function:**

**Adhesive tape**

For bonding the linings of the base mat rolls and insulation boards and for bonding the foil of the edge insulating strip onto the insulation to prevent the penetration of screed water.



Adhesive tape

**Tender specification:**

**Clamping rails 14 and 16 mm**

Made of polypropylene.

For pipe diameters 14 mm (item no. 1402580) and 16 mm (item no. 1402581).

For fixing the pipes.

Clamping distance: 5 cm

Length of rail: 1 m

Packing unit: 100 pieces per carton

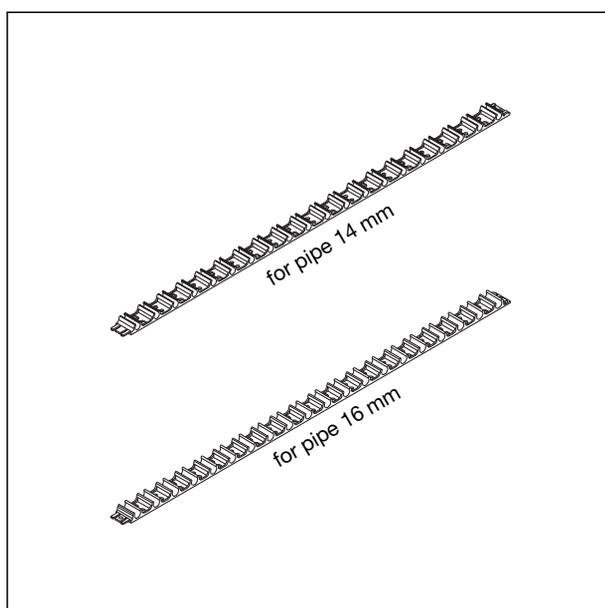
**Item no.:** 1402580 (= 1 clamping rail)

**Item no.:** 1402581 (= 1 clamping rail)

**Function:**

**Clamping rails 14 and 16 mm**

Self-adhesive clamping rails with integrated pipe grip for laying the PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe” with a diameter of 14 and 16 mm. The clamping rails can be extended endlessly. Use in combination with the base mat roll or folded board. Also suitable for the construction of a wall heating/cooling system.



Clamping rails 14 mm and 16 mm

**Installation and assembly:**

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

**Constructional conditions**

As condition for the installation of a hot water heating system, the DIN EN 1264-4 standard mentions 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 requirements”, 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 by 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 to be taken to prevent a transfer of humidity, have to be specified by the planner.

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

**Standards and regulations:**

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
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

**Distributor/collector**

Before installing the surface heating/cooling system “Cofloor”, a “Multidis SF” stainless steel distributor/collector must be fitted at 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, has 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 of 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**

A thermal and sound insulation according to the calculation has to be laid on the level bare floor. The insulation boards have to be laid tightly with staggered joints. Multilayered insulation layers have to be laid in compound. The sound absorbing floor board should be laid underneath the thermal insulation.

**Base mats NP-35 and NP-30 (with sound insulation)**

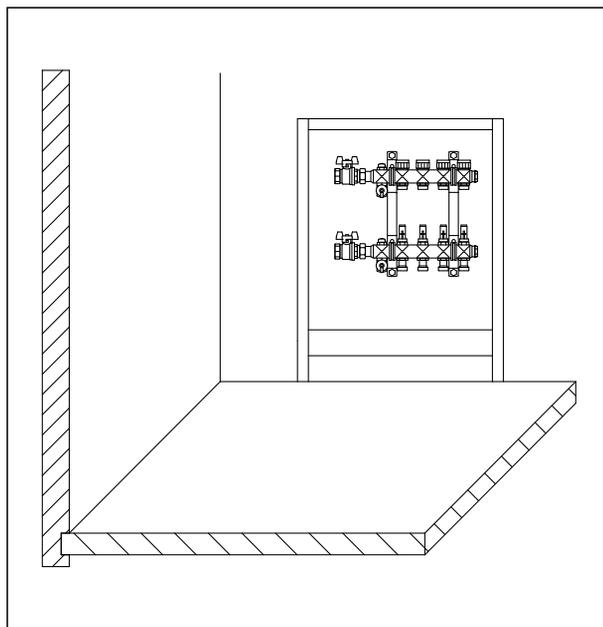
The base mats NP-35 and NP-30 fulfil the demands on the thermal and sound insulation between identically heated rooms. An additional insulation is not required.

During laying, the overlap at the base mats in the first row is torn off to avoid any hollow spaces. Begin in the left hand corner of the room. Connect the individual base mats by over-lapping the first rows like a press button closure. The last base mat is cut to size on the right hand side of the room. Start again with the rest of the base mat on the left hand side. If required, the base mat has to be shortened so that the nodule rows are in alignment.

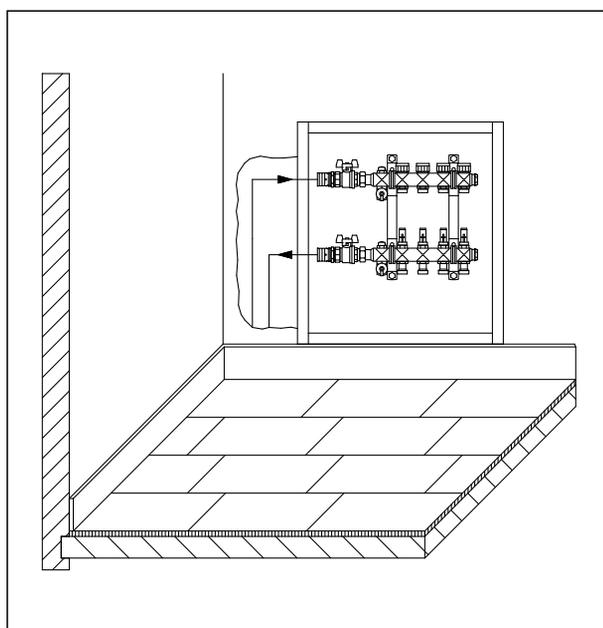
The foil at the edge insulating strip is placed onto the base mat and, when using liquid screed, it is fixed with the round profile, item no. 1402092, or the heating pipes so that no screed may penetrate between the edge insulating strip and the insulation layers.

**Base mat NP-11 (without sound insulation)**

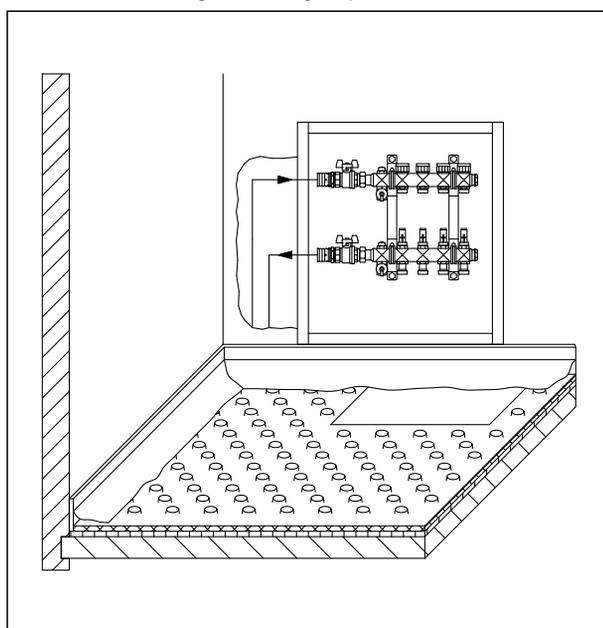
The base mats NP-11 are laid on commercial thermal and sound insulation boards and can, amongst others, be used for refurbishment and heavy duty applications, for instance industrial laying. Laying is identical to that of the base mats NP-35 or NP-30.



Stainless steel distributor/collector “Multidis SF” in a cabinet



Installation of the edge insulating strip



Laying of the base mats

**Base mat NP**

The base mats NP are laid on commercial thermal and sound insulation boards.

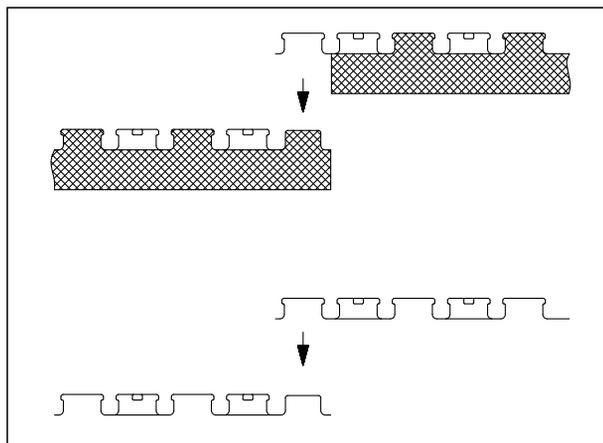
Start in the left hand corner of the room. Connect the individual base mats by overlapping the first row like a press button closure. The last base mat is cut to size on the right hand side of the room.

Between the nodules it is sufficient to slit the base mat slightly from behind. The material can be easily separated by simply breaking it.

Start again with the rest on the left hand side. If required, shorten the base mat so that the nodule rows are in alignment.

The overlap of the base mats prevents the penetration of humidity. Towards the wall, this is ensured by the foil of the edge insulating strip as for the base mats NP-35, NP-30 and NP-11.

The compensation elements 35 mm, 30 mm or 11 mm should be used in front of the distributor/collector and in doorways. The junctions between the base mats have to be sealed, for instance with the help of adhesive tape.

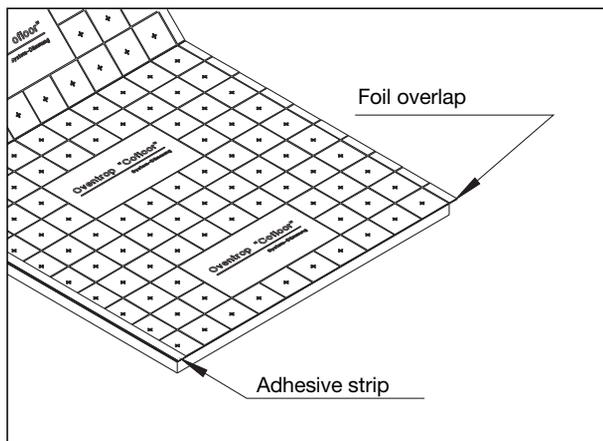


Connection of the base mats NP-35 and NP

**Base mat roll, folded board**

The base mat roll and the folded board of 35-3 mm thickness fulfil the demands on the thermal and sound insulation between identically heated rooms. An additional insulation is not required.

Laying of the base mat roll/folded board is started in the left hand corner of the room. The longitudinal edge with the foil overlap is running along the wall. The base mat roll/folded board is cut to size on the right hand side of the room. Start again with the rest on the left hand side of the room and continue with a complete base mat roll/folded board. Ensure that the base mat/folded board covers the foil overlap of the adjoining mat/board. The latter is equipped with an adhesive strip being protected by a foil. By tearing off this foil, the foil overlap is bonded onto the insulation board. The junctions between the insulation boards are sealed with an adhesive tape. When using liquid screed, the foil overlap of the edge insulating strip has to be bonded, too.



Foil overlap and adhesive strip on base mat and folded board

**Laying the pipes**

Now the heating pipes are laid untwisted according the design layout. The base mat systems as well as the base mat roll and folded board of the tacker system are suitable for PE-Xc pipes “Copex”, PE-RT pipes “Copert” and the composition pipes “Copipe” 14 x 2 mm and 16 x 2 mm (tacker system also for “Copex” and “Copert” pipes 17 x 2 mm).

The minimum distance towards the wall is 50 mm.

Peripheral areas with increased surface temperature along walls, windows and doors may have a maximum width of 1 m.

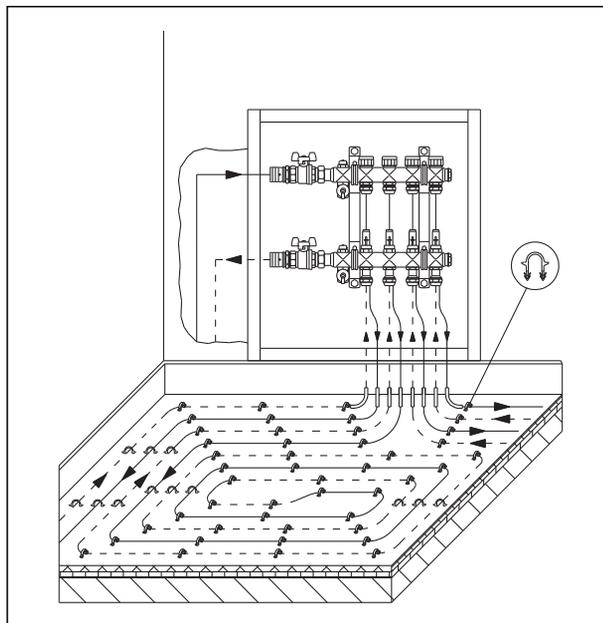
The coil unwinder is aiding in laying pipes.

A 45 ° diagonal laying of the pipes on the base mats is possible without auxiliary material.

On the compensation elements, for instance in front of the distributor/collector and in doorways, the heating pipes are fixed with fixing hooks (item no. 1409082).

As for the tacker system, the PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe” 14 x 2 mm, 16 x 2 mm and 17 x 2 mm are fixed onto the base mat roll/folded board with the help of the tacker hooks (item no. 1402591) and a floating of the pipes is prevented. At least 2 tacker hooks per meter should be used for fixing.

With the clamping rail system 14 mm (item no. 1402580) and 16 mm (item no. 1402581), the PE-Xc pipes “Copex”, PE-RT pipes “Copert” and composition pipes “Copipe” 14 x 2 mm and 16 x 2 mm are fixed onto the base mat roll/folded board and a floating of the pipes is prevented. The clamping rails are bonded onto the base mat roll/folded board in parallel at a max. distance of 2 m.



Laying of “Copex”, “Copert” and “Copipe” pipes, tacker system

**Types of laying and information**

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 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.

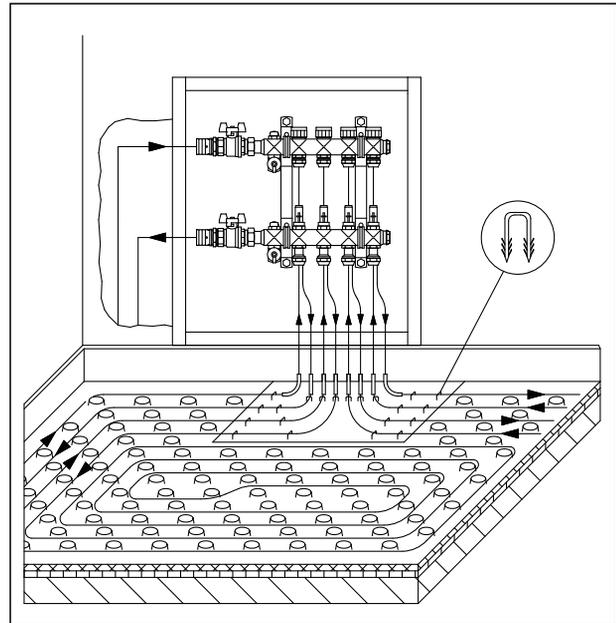
Kinked parts of the composition pipe “Copipe” have to be cut out. The pipe has to be re-connected with a coupling of permanent tightness (double nipple “Cofit S” + 2 compression fittings “Cofit S” or press coupling “Cofit P”).

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.

Kinked parts of the PE-Xc pipe “Copex” can be returned to their initial round shape by warming them up.

The heating circuits and screed areas have to be co-ordinated.



Laying of “Copex”, “Copert” and “Copipe” pipes, base mat system

**Screed joints**

Expansion joints in the structural base also have to be designed as joints in the heating screed. They may only be crossed by connecting pipes.

According to DIN EN 1264-4 further expansion joints are required 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.

Normally, plain insulation boards covered with a membrane are laid in doorways. At the lower side of the expansion strip, allowances for the crossing pipework are provided, for instance with the help of a knife.

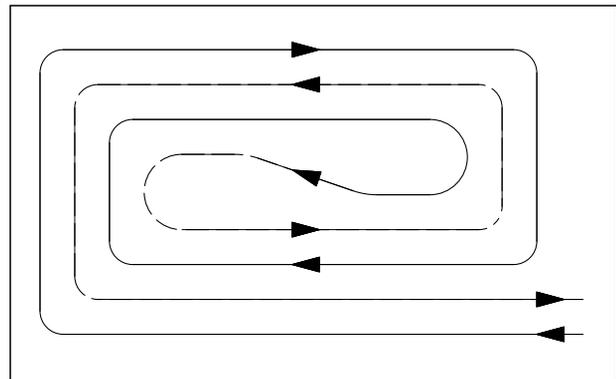
It must be observed that the heating pipes at this location have to be protected. This can be done with the slotted protective tubes with a length of 300 mm.

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

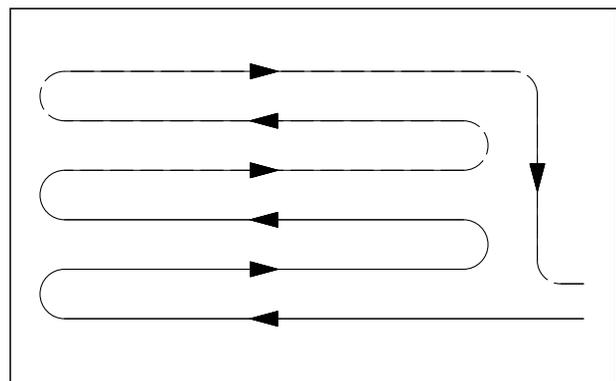
If the expansion strip is to be placed onto the nodules, the hollow spaces lying below have to be sealed.

Near crossing connection pipes, the round profile has to be pushed against the heating pipes.

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.



Spiral patterned laying of pipes



Serpentine patterned laying of pipes

**Connection of the pipework, test**

Depending on the pipe used, the connection to the stainless steel distributor/collector “Multidis SF” or the “Unibox” is carried with the help of a compression fitting “Cofit S” or “Ofix K” with due consideration of the operating instructions.

Pipe guiding elbows facilitate the inversion of the PE-Xc pipes “Copex” and the PE-RT pipes “Copert” from horizontal to vertical direction.

Where several heating pipes are bundled at a smaller than calculated distance, for instance in front of the distributor/collector, the pipes should be covered with a protective tube (corrugated pipe) or the pipework should be covered with an insulation layer. This prevents surface temperatures from being too high.

Before laying the screed, a pressure test according to DIN EN 1264-4 with a test pressure of 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.oventrop.de](http://www.oventrop.de)).

The pipes have to be protected against frost.

Please ensure that the base mats, base mat rolls and folded boards 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 m². At least 1 marker point per room is recommended.

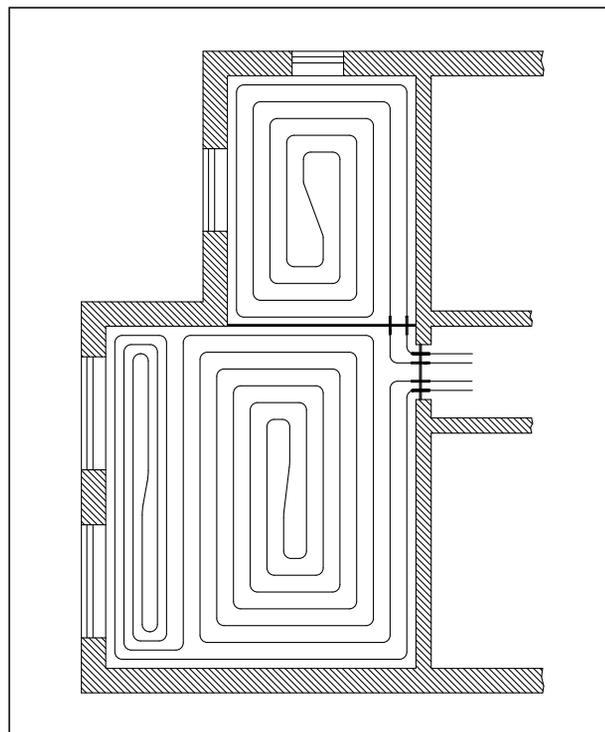
By placing the Oventrop marker point for measuring screed humidity at an appropriate location, for instance in the return loop, it is guaranteed that the heating pipe will not be damaged when withdrawing screed samples.

**Heating screed**

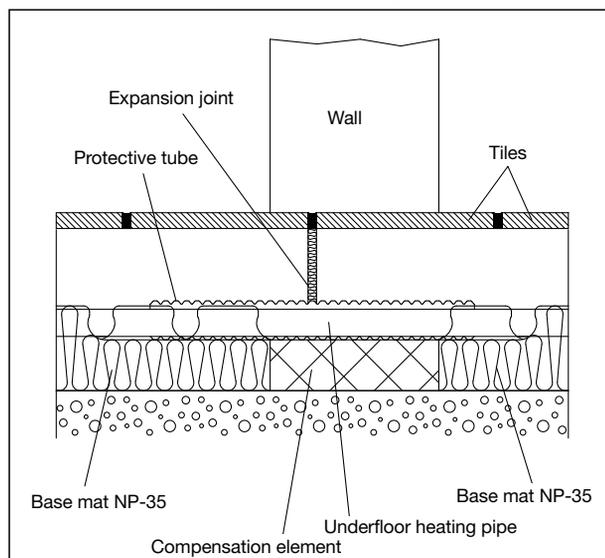
Before laying the heating screed, the surface heating pipes must be filled with water, if required with antifreeze liquid. The test pressure of the pressure test must be maintained.

The concrete or liquid screed 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 manufacturer must be observed.

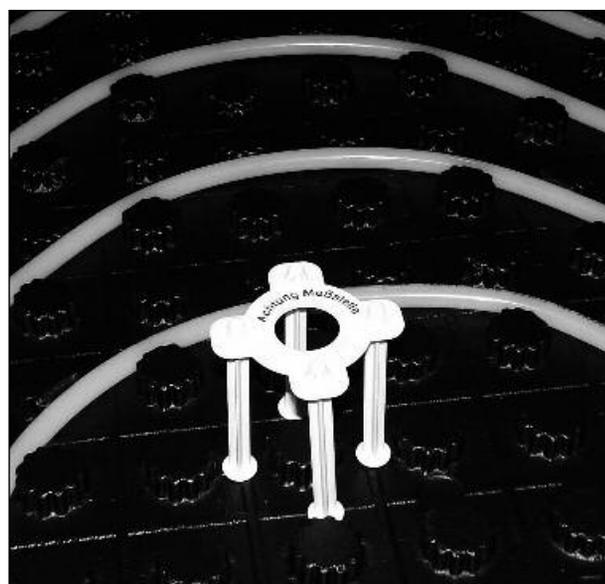
Any heating screed additives approved by the heating screed manufacturer for PE-Xc and PE-RT pipes may be used, for instance to improve the thermal conductivity and flexional strength, to reduce the drying period or for thin layered screed with a pipe covering of 30 mm.



Distribution of heating circuits, positioning of expansion joints



Expansion joint in a doorway



Marker point for measuring screed humidity

### Initial operation

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 production log. A form and a description of the procedure can be downloaded from the internet ([www.oventrop.de](http://www.oventrop.de)).

Heating-up 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 (max. 55 °C)

The flow temperature is regulated via the boiler control. The flow 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 are to be observed.

The floor covering must be suitable for the underfloor 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 the bathroom

### Advantages base mat system:

- complete system from one supplier, from boiler connection to room temperature control
- safe fixing of the pipes on the base mats
- laying can be carried out by one person, especially when using the coil unwinder
- quick laying of the pipes as the laying distances can easily be kept
- fitting of the pipe in clear and straight lines with the help of the fixing points of the base mat
- 3 types of base mats suitable for 4 types of pipe allow several variations
- due to the special type of connection, the base mat types are suitable for liquid screed without additional bonding
- pipes and base mats can be recycled
- extensive system guarantee

### Advantages tacker/clamping rail system with base mat roll/folded board:

- complete system from one supplier, from boiler connection to room temperature control
- base mat roll and folded board ready for laying
- foil overlap on the longitudinal edge of the base mat roll/folded board and adhesive tape on the opposite edge for bonding of the individual insulation layers
- safe fixing of the pipes by use of tacker hooks or by wedging them into the clamping rails
- laying can be carried out by one person, especially when using the coil unwinder
- quick and simple laying of the pipes with the help of the printed grid pattern
- extensive system guarantee

Subject to technical modification without notice.

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