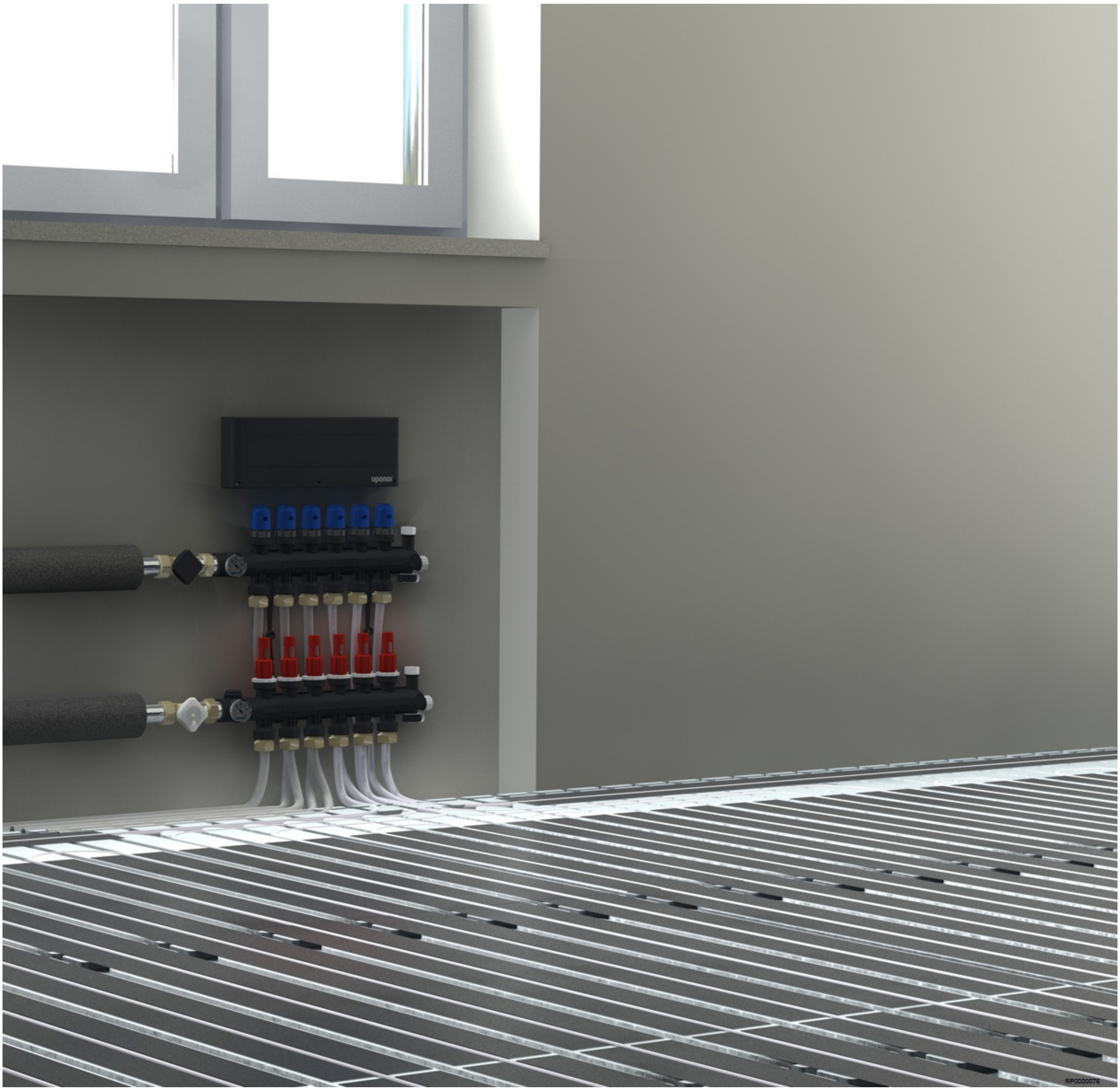
Uponor Siccus 14

EN Technical information



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1 System description

The versatility of the Uponor Siccus underfloor heating system makes it suitable for new constructions as well as for modernising buildings.

It can be installed on any type of floor construction and with a minimum construction height of 50 mm it is very compact. In new buildings, the height can be raised to 56 or 65 mm respectively, depending on the impact noise insulation requirements. In established buildings there is usually no need to remove the existing floor covering, provided that it is solid and even with the necessary load capacity.

Uponor Siccus can be combined with load distribution layers consisting of dry screed or asynthetic resin cement screed. Alternatively, it can be installed with suitable standard cement or self levelling screeds that meet the requirements of DIN 18560. The choice of load distribution layer must be based on the actual structural conditions of the building. When planning the construction, pay attention to the maximum thermal load capacity of the distribution layer.

Different floor coverings can be installed on Uponor Siccus, provided that they meet a thermal resistance of $R_{\lambda, B} \leq 0.15$ m²K/W and are approved by the manufacturer for use with underfloor heating installations.

1.1 Components

The Uponor Siccus system essentially consists of four components:

Installation panel

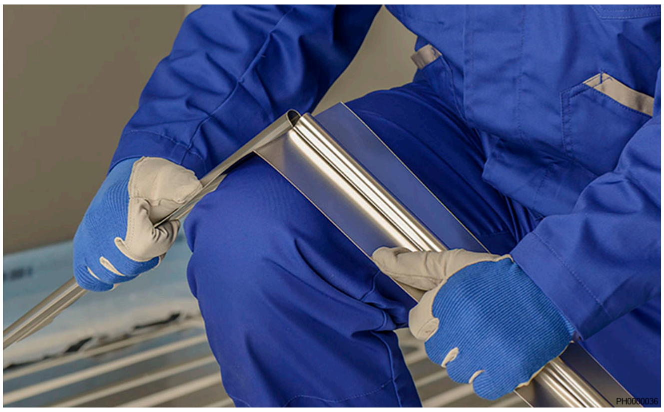
The installation panels made of EPS 150 are placed on the level bare floor unless additional insulation is needed. The dimensional tolerances of the bare floor must meet the requirements in DIN 18202, 07/2019, table 3 (line 3 for cement screeds, line 4 for dry screed panes).

The panels are laid edge to edge and can be adjusted to suit any room shape. If additional channels are required, they can be cut with any conventional electric cutting tool.

The integral channels in the Uponor Siccus installation panel fix the heat emission plates and heating pipes. The pipe spacing is based on the actual heating requirements: 15 cm, 22.5 cm or 30 cm.

Heat emission plate

The omega shape of the heat emission plate ensures optimal heat transfer.

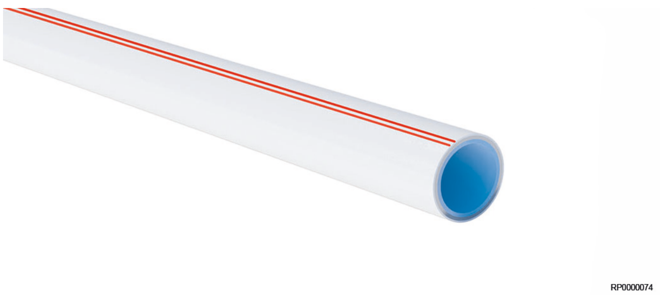


The heat emission plate can be divided by bending/snapping it in either of three perforated places along the plate.

The aluminium plates also serve as fixture for the heating pipe.

Approved pipe types

Uponor Comfort Pipe PLUS 14 x 2.0 mm



Uponor MLC Pipe RED 14 x 1.6 mm

Vapour barrier foil

The vapour barrier foil, a PE type 200 intermediate foil separates the heating system from the load distribution layer consisting of dry screed panels or heating screeds.

2 Planning/design

2.1 Dimensioning tables

The values in the dimensioning tables are based on the following key figures:

$R_{\lambda, ins}$ = 0.75 m²K/W, θ_u = 20 °C, 130 mm massive concrete floor, spread = 3-30 K, maximum heating circuit length = 150 m maximum pressure drop per heating circuit including 2 x 5 m connecting line Δp_{max} = 250 mbar

For other flow temperatures, thermal resistance values, etc. refer to the dimensioning diagrams.

Dry screed panel load distribution layer (nominal thickness 25 mm heat conductivity 0.25 W/mK) in tiled bathrooms

		$\theta_{V,des}$ = 56 °C[1)]		$\theta_{V,des}$ = 50 °C		$\theta_{V,des}$ = 45 °C	
$\theta_{F,m}$ [°C]	q_{des} [W/m²]	T [cm]	$AF_{max.}$ [m²]	T [cm]	$AF_{max.}$ [m²]	T [cm]	$AF_{max.}$ [m²]
32.2	90	**15**	**16.5**	15	6.0		
31.8	85	**15**	**19.0**	15	8.5		
31.3	80	**15**	**21.0**	15	11.0		
30.9	75	**22.5**	**21.0**	15	13.5		
30.5	70	**15**	**21.0**	15	16.0	**15**	**8.0**
≤30.1	≤65	**15**	**21.0**	15	18.0	**15**	**11.0**

1) For maximum temperature load see the instructions of the manufacturer.

(θ_i = 24 °C, $R_{\lambda,B}$ = 0.02 m²K/W)

Dry screed panel load distribution layer (nominal thickness 25 mm heat conductivity 0.25 W/mK)

		$\theta_{V,des}$ = 56 °C[1)]		$\theta_{V,des}$ = 50 °C		$\theta_{V,des}$ = 45 °C	
$\theta_{F,m}$ [°C]	q_{des} [W/m²]	T [cm]	$AF_{max.}$ [m²]	T [cm]	$AF_{max.}$ [m²]	T [cm]	$AF_{max.}$ [m²]
27.5	82.5	**15**	**7.5**				
27.3	80	**15**	**8.0**				
26.9	75	**15**	**13.0**				
26.5	70	**15**	**17.0**				
26.1	65	**22.5**	**12.5**	15	9.0		
25.7	60	**22.5**	**19.5**	15	13.0		
25.2	55	**22.5**	**26.0**	15	17.5	**15**	**8.0**
24.8	50	**30**	**16.0**	22.5	16.5	**15**	**13.0**
24.4	45	**30**	**27.5**	22.5	23.0	**15**	**18.0**
≤23.9	≤40	**30**	**38.0**	22.5	29.5	**15**	**21.0**

1) For maximum temperature load see the instructions of the manufacturer.

(θ_i = 20 °C, $R_{\lambda,B}$ = 0.15 m²K/W)

Cement screed load distribution layer with thin layered screed* (nominal thickness 30 mm, heat conductivity 1.2 W/mK) in tiled bathrooms

		$\theta_{V,des}$ = 53.9 °C[1)]		$\theta_{V,des}$ = 50 °C		$\theta_{V,des}$ = 45 °C	
$\theta_{F,m}$ [°C]	q_{des} [W/m²]	T [cm]	$AF_{max.}$ [m²]	T [cm]	$AF_{max.}$ [m²]	T [cm]	$AF_{max.}$ [m²]
32.6	95	**15**	**18.5**	15	15	**15**	**9.0**
32.2	90	**15**	**20.0**	15	16.5	**15**	**11.0**
31.8	85	**15**	**21.0**	15	18.0	**15**	**12.5**
31.3	80	**15**	**21.0**	15	19.5	**15**	**14.0**
30.9	75	**15**	**21.0**	15	21.0	**15**	**15.5**
30.5	70	**15**	**21.0**	15	21.0	**15**	**17.0**
≤30.1	≤65	**15**	**21.0**	15	21.0	**15**	**19.0**

1) At $\theta_{V, des}$ > 53,9 °C the heat flow density limit and thus the maximum floor surface temperature of 29 °C (33 °C for bathrooms) is exceeded.

(θ_i = 24 °C, $R_{\lambda,B}$ = 0.02 m²K/W)

* Does not comply with standard DIN 18560, approval and processing as defined by additiv supplier.

Cement screed load distribution layer with thin layered screed* (nominal thickness 30 mm, heat conductivity 1.2 W/mK)

		$\theta_{V,des}$ = 53.9 °C 1)		$\theta_{V,des}$ = 50 °C		$\theta_{V,des}$ = 45 °C	
$\theta_{F,m}$ [°C]	**q_{des} [W/m²]**	**T [cm]**	**$AF_{max.}$ [m²]**	**T [cm]**	**$AF_{max.}$ [m²]**	**T [cm]**	**$AF_{max.}$ [m²]**
28.6	95	**15**	**6.0**				
28.2	90	**15**	**9.0**				
27.8	85	**15**	**11.5**	15	5.5		
27.3	80	**15**	**14.5**	15	8.5		
26.9	75	**22.5**	**13.0**	15	12.0		
26.5	70	**22.5**	**17.0**	15	15.0	**15**	**6.0**
26.1	65	**22.5**	**21.0**	22.5	14.0	**15**	**10.0**
25.7	60	**30**	**14.5**	22.5	18.5	**15**	**14.0**
25.2	55	**30**	**21.0**	22.5	23.0	**15**	**17.0**
24.8	50	**30**	**28.0**	30	19.0	**22.5**	**18.5**
24.4	45	**30**	**34.5**	30	26.5	**22.5**	**24.0**
≤23.9	≤40	**30**	**42.0**	30	34.0	**30**	**22.0**

1) At $\theta_{V, des}$ > 53,9 °C the heat flow density limit and thus the maximum floor surface temperature of 29 °C (33 °C for bathrooms) is exceeded.

(θ_i = 20 °C, $R_{\lambda,B}$ = 0.15 m²K/W)

* Does not comply with standard DIN 18560, approval and processing as defined by additiv supplier.

Knauf Calcium sulfate floating screed FE load distribution layer (nominal thickness 30 mm, heat conductivity 1.4 W/mK) in tiled bathrooms

		$\theta_{V,des}$ = 53.9 °C 1)	
$\theta_{F,m}$ [°C]	**q_{des} [W/m²]**	**T [cm]**	**$AF_{max.}$ [m²]**
33.1	95	15	19.5
32.6	90	15	20.6
32.1	85	15	22.5
31.7	80	15	24.5
31.7	75	15	24.5
31.7	70	15	24.5

		$\theta_{V,des}$ = 53.9 °C 1)	
$\theta_{F,m}$ [°C]	**q_{des} [W/m²]**	**T [cm]**	**$AF_{max.}$ [m²]**
31.7	65	15	24.5

1) At $\theta_{V, des}$ > 53,9 °C the heat flow density limit and thus the maximum floor surface temperature of 29 °C (33 °C for bathrooms) is exceeded.

(θ_i = 24 °C, $R_{\lambda,B}$ = 0.02 m²K/W)

Knauf Calcium sulfate floating screed FE load distribution layer (nominal thickness 30 mm, heat conductivity 1.4 W/mK)

		$\theta_{V,des}$ = 53.9 °C 1)	
$\theta_{F,m}$ [°C]	**q_{des} [W/m²]**	**T [cm]**	**$AF_{max.}$ [m²]**
28.8	95	15	6.2
28.3	90	15	9.3
27.9	85	15	12.2
27.4	80	15	15.2
27.0	75	15	18.0
26.6	70	22.5	18.7
26,1	65	22.5	23.0
25.7	60	22.5	27.5
25.5	55	30	28.8
25.0	50	30	35.4
24.5	45	30	42.6
24.0	40	30	50.4

1) At $\theta_{V, des}$ > 53,9 °C the heat flow density limit and thus the maximum floor surface temperature of 29 °C (33 °C for bathrooms) is exceeded.

(θ_i = 20 °C, $R_{\lambda,B}$ = 0.15 m²K/W)

2.2 Dimensioning diagrams

According to DIN EN 1264 bathrooms, showers, toilets and the like are excluded when determining the design flow temperature.

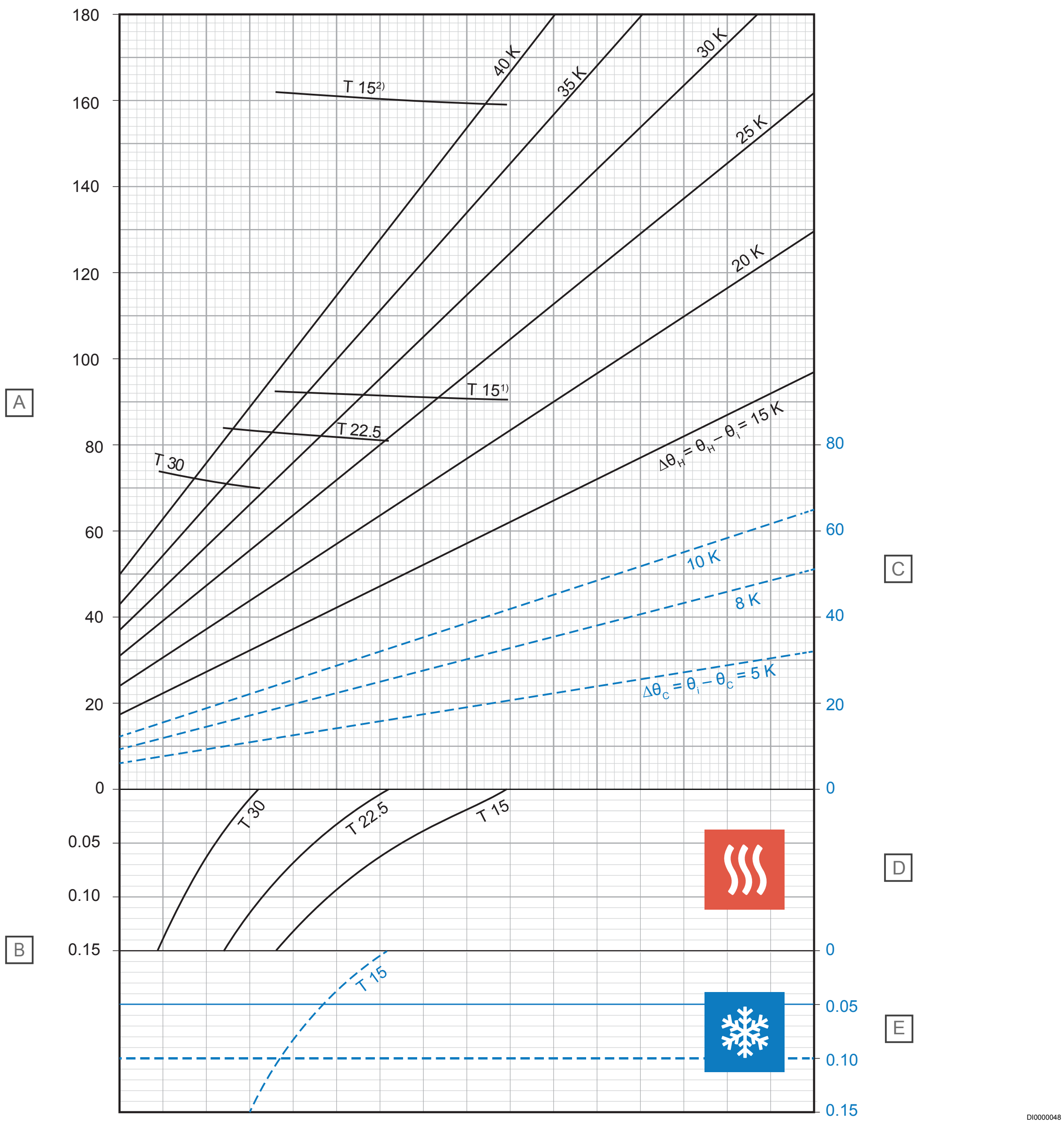
The limit curves must not be exceeded.

$\Delta\theta_{H,\,g}$ is found through the limit curve for the occupied zone with the smallest pipe spacing.

The design supply water temperature maximum must be: $\theta_{V,\,des} = \Delta\theta_{H,\,g} + \theta_i + 2.5$ K.

In cooling mode the supply water temperature depends on the dew point temperature, therefore a humidity sensor has to be installed.

Uponor Comfort Pipe PLUS 14 x 2.0 mm with dry screed



Item	Description
A	Specific thermal output q_H [W/m²]
B	Thermal resistance $R_{\lambda,B}$ [m²K/W]
C	Specific cooling output q_C [W/m²]

D - Heating

T [cm]	q_H [W/m²]	$\Delta\theta_{H,N}$ [K]
15	90.8	21.7
22.5	81.0	25.0
30	70.1	30.9

E - Cooling

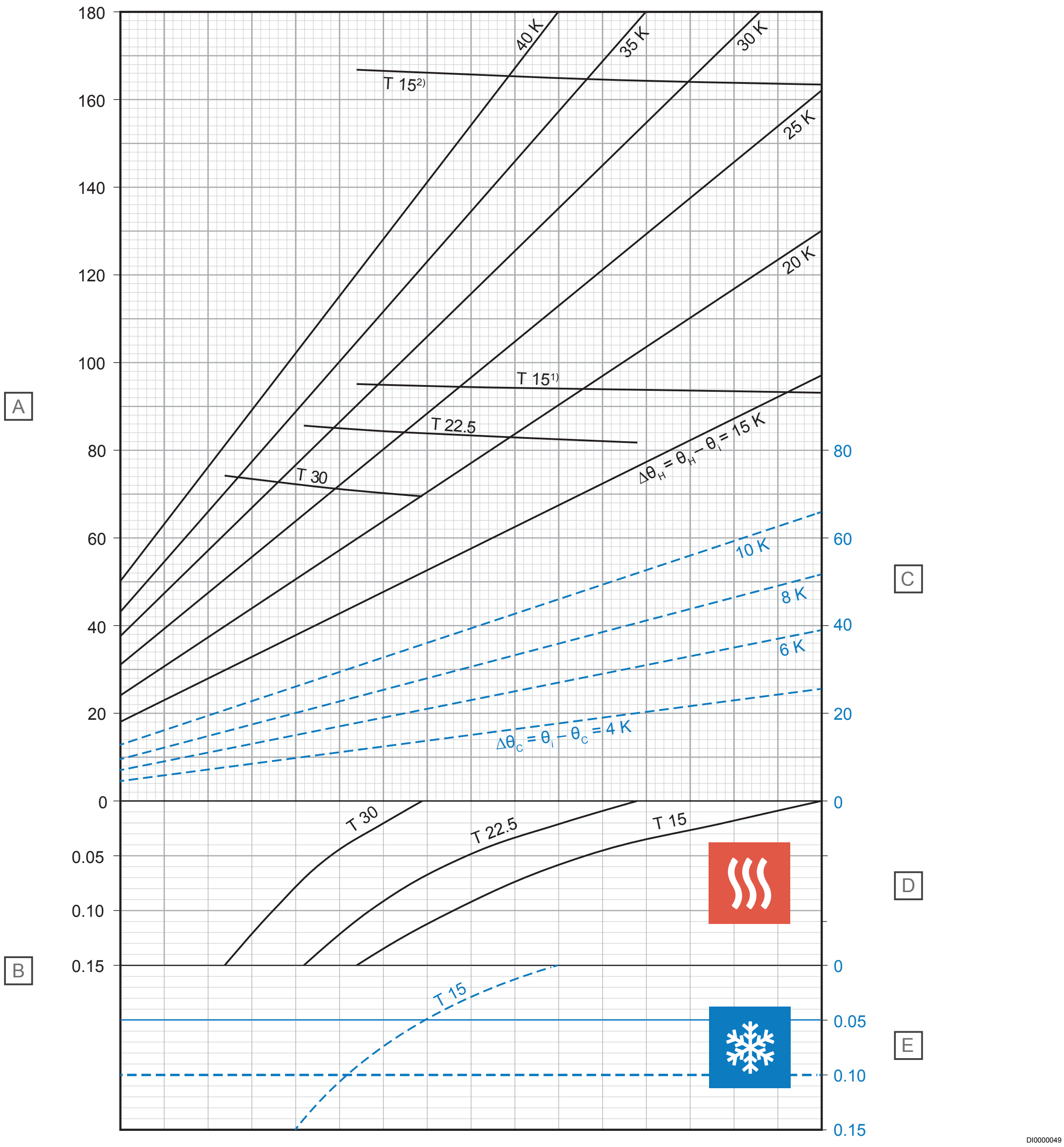
T [cm]	q_C [W/m²]	$\Delta\theta_{C,N}$ [K]
15	25.8	8

[1] Limit curve valid for θ_i 20 °C and $\theta_{F,\,max}$ 29 °C or θ_i 24 °C and $\theta_{F,\,max}$ 33 °C

[2] Limit curve valid for θ_i 20 °C and $\theta_{F,\,max}$ 35 °C

Uponor Comfort Pipe PLUS 14 x 2.0 mm with dry screed load distribution layer ($s_ü$ = 25 mm with $l_ü$ = 0.28 W/mK)

Uponor Comfort Pipe PLUS 14 x 2.0 mm with cement screed



Item	Description
A	Specific thermal output q_H [W/m²]
B	Thermal resistance $R_{\lambda,B}$ [m²K/W]
C	Specific cooling output q_C [W/m²]

D - Heating

T [cm]	q_H [W/m²]	$\Delta\theta_{H,N}$ [K]
15	93.1	14.3
22.5	81.8	16.1
30	69.5	19.8

E - Cooling

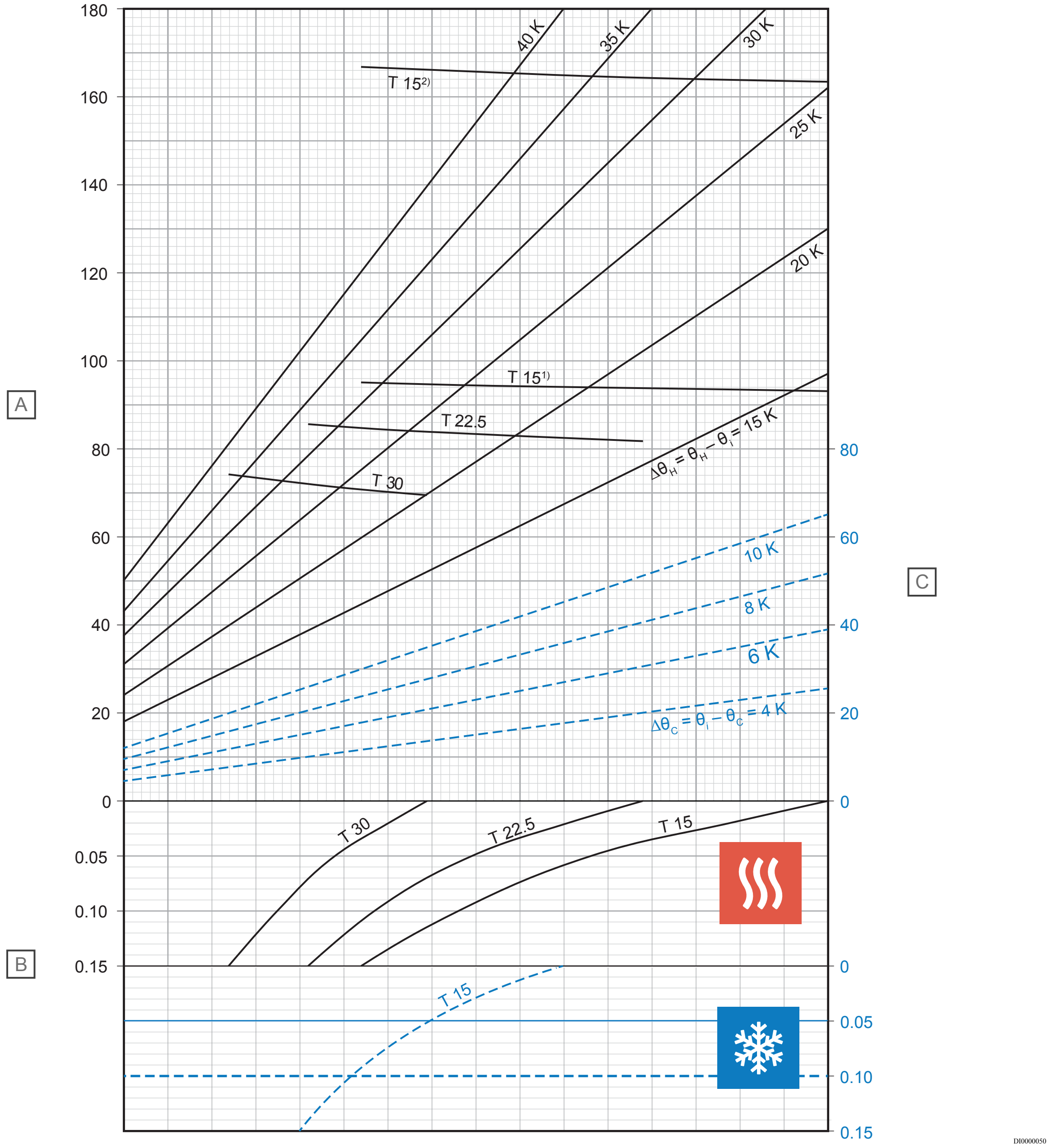
T [cm]	q_C [W/m²]	$\Delta\theta_{C,N}$ [K]
15	35.5	8

[1] Limit curve valid for θ_i 20 °C and $\theta_{F,\,max}$ 29 °C or θ_i 24 °C and $\theta_{F,\,max}$ 33 °C

[2] Limit curve valid for θ_i 20 °C and $\theta_{F,\,max}$ 35 °C

Uponor Comfort Pipe PLUS 14 x 2.0 mm with cement screed load distribution layer ($s_ü$ = 25 mm with $l_ü$ = 0.28 W/mK)

Uponor MLCP RED 14 x 1.6 mm with cement screed



Item	Description
A	Specific thermal output q_H [W/m²]
B	Thermal resistance $R_{\lambda,B}$ [m²K/W]
C	Specific cooling output q_C [W/m²]

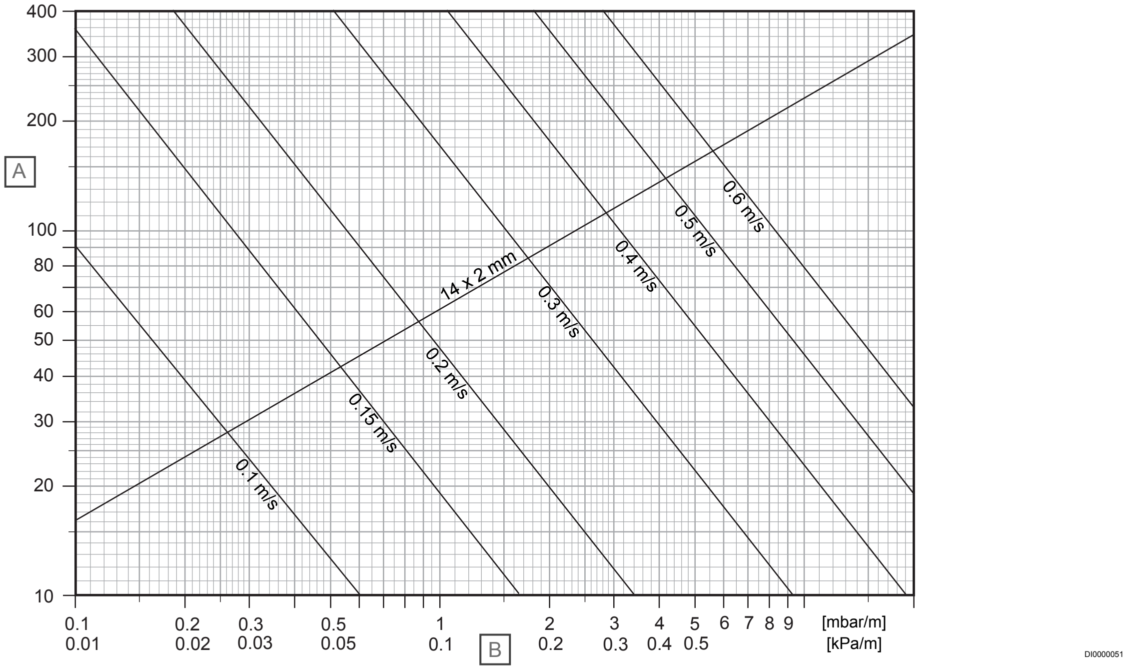
1) Limit curve valid for θ_i 20 °C and $\theta_{F,\ max}$ 29 °C or θ_i 24 °C and $\theta_{F,\ max}$ 33 °C

2) Limit curve valid for θ_i 20 °C and $\theta_{F,\ max}$ 35 °C

Uponor MLCP RED 14 x 1.6 mm with cement screed load distribution layer ($s_ü$ = 30 mm with $l_ü$ = 1.2 W/mK)

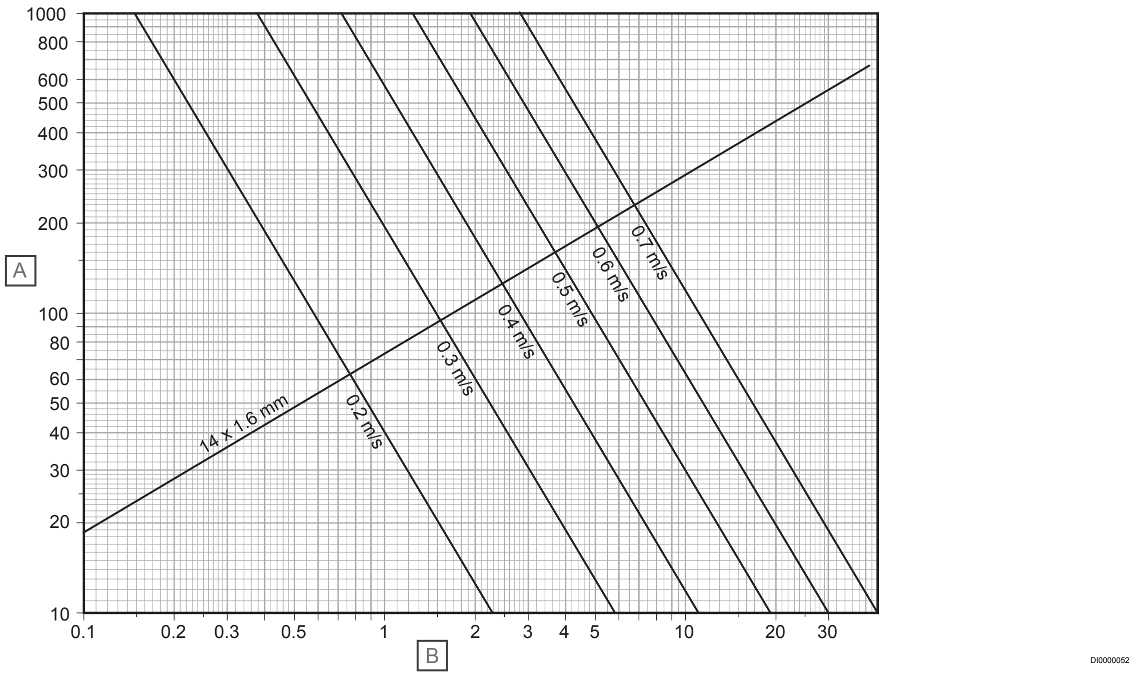
2.3 Pressure drop diagrams

Uponor Comfort Pipe PLUS 14 x 2.0 mm



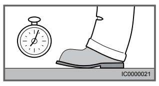
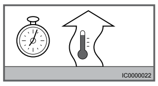
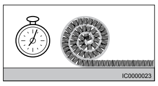
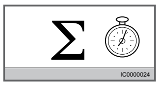
Item	Description
A	Mass flow rate [kg/h]
B	Pressure gradient R

Uponor MLCP RED 14 x 1.6 mm



Item	Description
A	Mass flow rate [kg/h]
B	Pressure gradient R

2.4 Time planning

	Activity	Time
	Accessibility (ready to walk on)	Immediately
	Functional heating period	Immediately
	Readiness for covering	Immediately
	Total period (without covering)	1 - 2 days

2.5 Service and support

Uponor offers various service and support during the planning process of a new underfloor heating system.

	Service and support
	**Design software and individual planning support for radiant heating and cooling applications**
	**Planning manuals and information brochures**
	**Tendering support**
	**Declaration of Performance (DoP) online** www.uponor.com/services/ download-centre IC0000060
BIM uponor	**BIM database for Revit**
	**Download center with documentation** www.uponor.com/services/ download-centre IC0000060

3 Installation

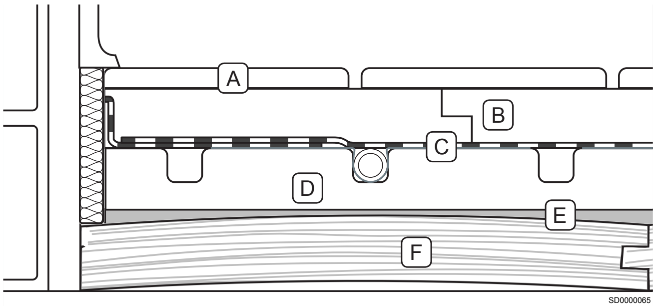
3.1 Examples of floor construction

Note

For standard constructions, the maximum payload is 2.0 kN/m².

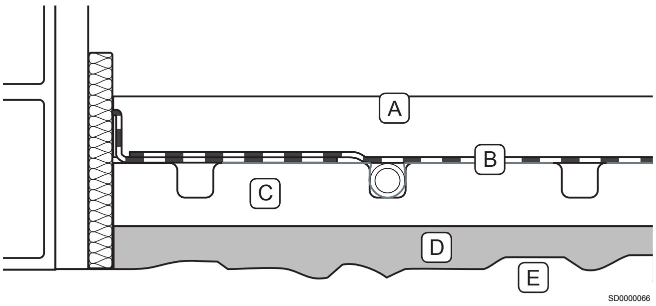
The Uponor Siccus installation panel is made of EPS 150 and can thus be used for payloads up to 7.5 kN/m², provided that the load distribution layer, the additional insulation and the load-bearing base are adequately dimensioned.

Construction on timber joist floor



Item	Description
A	Floor covering
B	Load distribution layer
C	Vapour barrier foil
D	Installation panel
E	Self levelling compound
F	Timber joist floor

Construction on bare concrete floor



Item	Description
A	Load distribution layer
B	Vapour barrier foil
C	Installation panel
D	Levelling screed
E	Concrete floor

3.2 Installation in brief

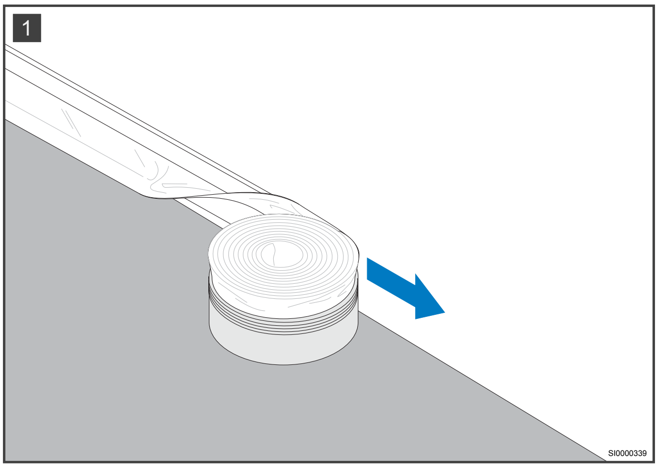
Note

Installation must be performed by a competent person in accordance with local standards and regulations.

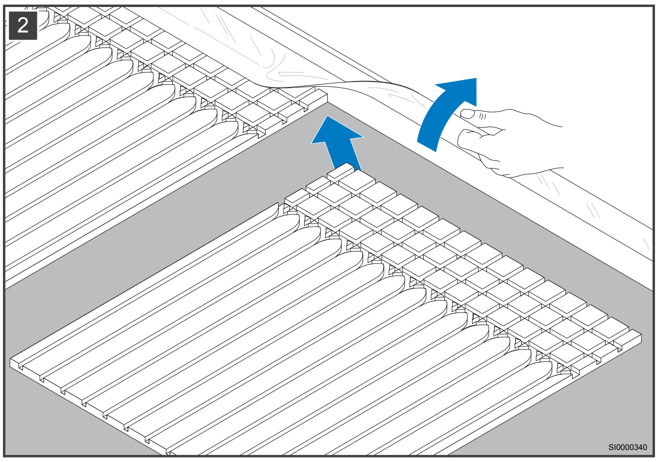
Note

Follow the instructions given here and additional instructions provided with the components and tools or downloaded from www.uponor.com.

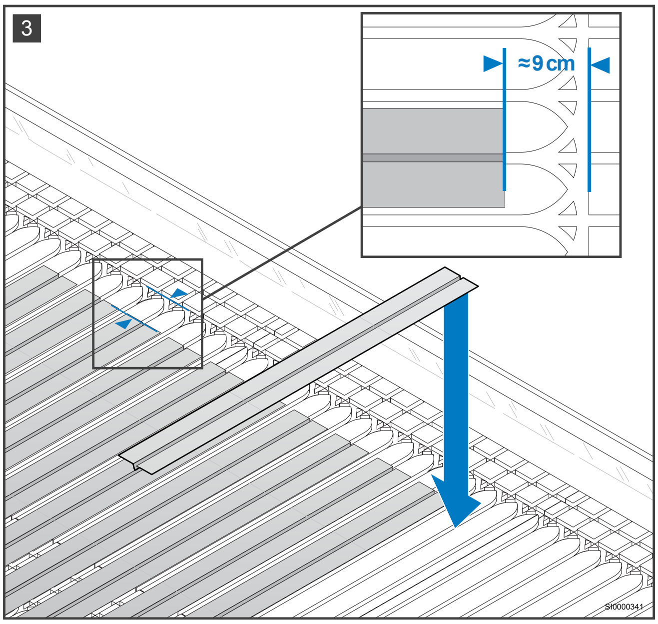
1. Edging strip installation



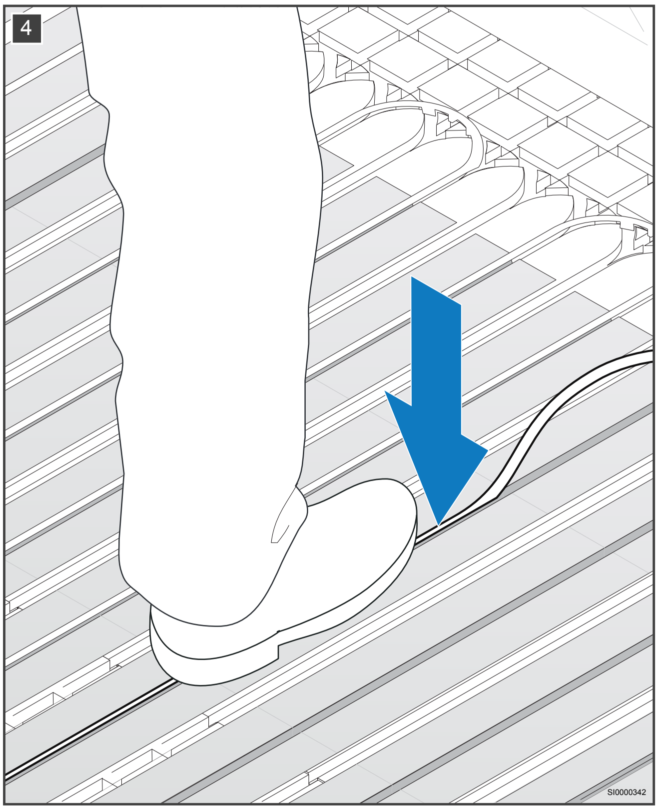
2. Mounting the installation panels



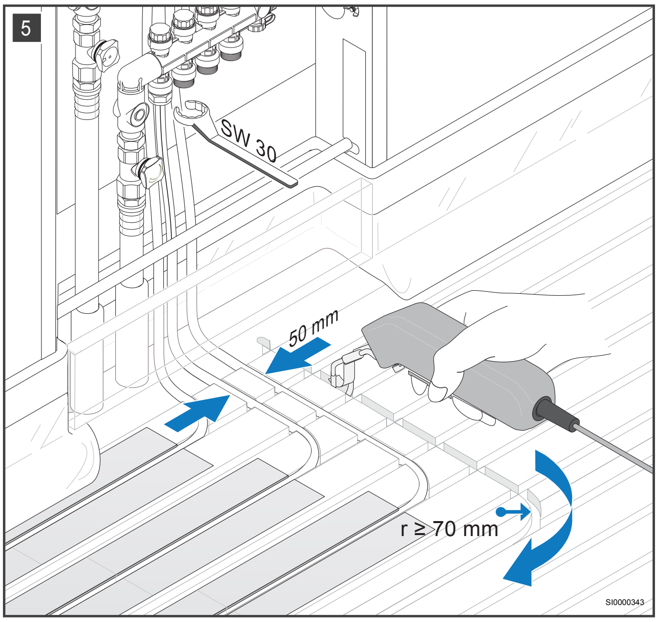
3. Installing the heat emission plates



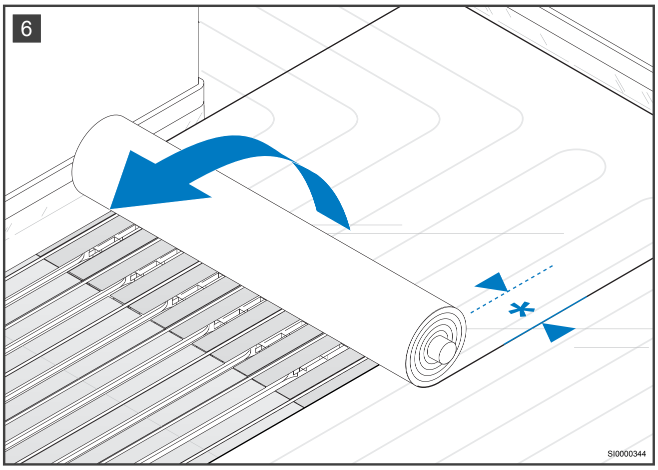
4. Installing the pipes



5. Connecting pipes to the manifold



6. Installing the PE foil



4 Technical data

4.1 Technical characteristics of load distribution layers

Note

High temperature fluctuations might cause expansion noises.

Load distribution layer	Normal thickness [mm]	Min. static weight [kg/m²]	Max. supply temperature [°C]	Curing and initial heating time
Dry screed board	25	ca. 25	45 to 55 2)	3 days
Cement screed + KB 650 N	30	ca. 61	55	28 days
Cement screed 1)	45	ca. 91	55	28 days
Anhydrite screed 1)	45	ca. 91	55 2)	14 days 2)

1) DIN 18560
2) Depending on product

4.2 Uponor Siccus element

Description	Value
Material (installation panel, heat emmission plate, pipe)	EPS, Aluminium, PE-Xa
Max. payload	7.5 kN/m²
Thermal resistance	0.622 m²K/W
Pipe spacing	150 mm, 225 mm, 300 mm
Min. height	50 mm
System type	Dry underfloor heating installation
Load distribution layer	Dry - or wet screed
DIN CERTCO registration	7F008-F, 7F009-F, 7F332-F, 3V 372 PE-Xa, 3V 286 MvR (M)

4.3 Uponor MLCP RED composite pipes

Description	Value
Material (multi-layer composite pipe)	PE-RT - adhesive - aluminium with longitudinal safety overlap - adhesive - PE-RT, SKZ controlled, oxygen-tight according to DIN 4726.
Max. operating temperature	60 °C
Max. operating pressure	4 bar

Supplied in reels for use as radiant heating pipe, connected with press fittings or compression fittings.

4.4 Uponor Comfort Pipe PLUS 14 x 2.0 mm

Description	Value
Pipe dimension	14 x 2.0 mm and 16 x 2.0 mm
Pipe length	240; 640 m
Material	PE-Xa, 5-layer pipe
Colour	White outer layer with 2 blue longitudinal stripes
Marking	Logo: Uponor Comfort pipe PLUS 14x2.0 EN ISO 15875 C PE-Xa Oxygen diffusion tight/DIN 4726 DIN CERTCO 3V372 AENOR 001/006217 Class 5/6 bar KOMO K79614 ATG 3027 IIP-307-UNI MPA-DA (Country code, Material code pipe,Material code evoh,Machine,Year,Month,Date) Made in (country)
Manufactured	According to EN ISO 15875
DIN CERTCO registration	3V372
Area of application	Class 4 + 5 / 6 bar (EN ISO 15875)
Max. operating temperature	90 °C (EN ISO 15875)
Short term operating temperature	100 °C (EN ISO 15875)
Pipe jointings	Uponor screw connection, Uponor Q&E technology
Weight	0.079 kg/m
Water content	0.079 l/m
Oxygene tightness	According to ISO 17455 / DIN 4726
Density	0.934 g/cm³
Material class	B2 / E (DIN 4102 / EN 13501 respectively)
Min. bending radius	8 x ∅ free-hand bending 5 x ∅ supported bending (70 mm)
Pipe roughness	0.0005 mm
Ideal installation temperature	> 0 °C
UV protection	Opaque cardboard (store remaining quantities in the cardboard box)
Approved water additive	Uponor anti-freeze agent GNF, material class 3 (DIN 1988, part 4)

Uponor GmbH

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1118340 v1_09_2020_EN
Production: Uponor/DCO