Uponor Nubos technical guide

UNDERFLOOR HEATING AND COOLING

05 | 2014

The Uponor Nubos product line

When it comes to underfloor heating and cooling installations in the newly built segment, Uponor Nubos is the all-round system for almost every task, from private residence to public and commercial buildings to industrial construction. The perfectly matching system components of Uponor Nubos enable customised solutions for all floor types, applications and room shapes.

Standardised installation in no time

The nub panels provide fast installation that complies with all relevant norms and regulations. The system pipes are positioned and fixed in the nub panels, thus ensuring that they are optimally enclosed in the screed. These features enable complete transmission of the pre-calculated heating output and they provide a flexible temperature control mechanism – all of which leads to an economical and energy-saving operation.
The Uponor Nubos product line provides comfort and safety at a low price.

Sandwich structure for practical use

A cross-sectional view of the Uponor nub panel 14-16 EPS 30-2 shows its sandwich structure. In the upper area a solid polystyrene insulation layer provides robust nubs that can be walked on while laying the pipes. Below this solid layer, an additional softer layer optimises sound insulation. Thanks to this smart combination, the panel achieves a thermal resistance of RD = 0.75 m^2 K/W. The impact sound according to DIN 4109 measures 28 dB, placing it in CP2 level of EPS compressibility classification, where an impact load of 5 kN max. can be applied.

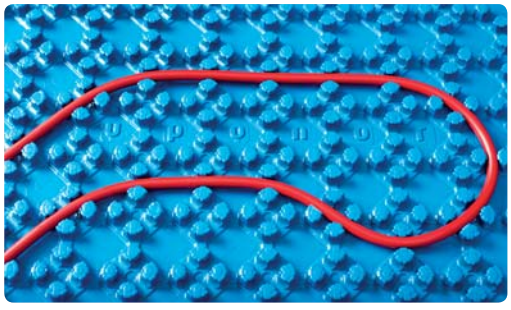
Uponor Nubos enables a quick, one-man installation

Quick one-man installation

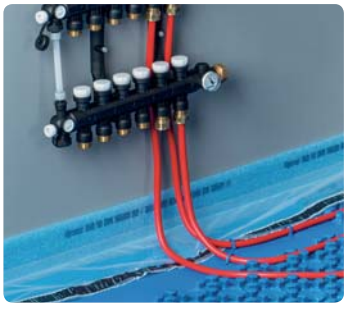
Larger system elements of about 1.25 m^2 are installed in the usual manner from left to right. Due to the smart cutting and overlapping technique there is virtually no waste. The installation of each row can start by using spare parts from the previous row.

Expert help for the perfect cut

The Uponor cutting tool provides practical help for cutting the panels. Its carriage guide allows the user to cut three pre-defined accurate lines - not only in the longitudinal direction, but also diagonally. The nub structure on one side of the panel and the grid structure on the other side provide additional guidance.

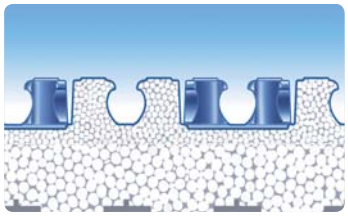


Small bend radii possible and no additional items needed to implement diagonal 45 degree pipe direction



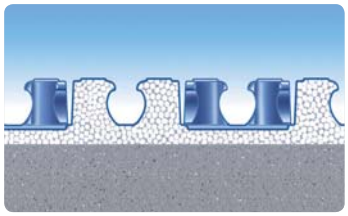
Pipe fixation in distribution areas

Uponor Nubos components



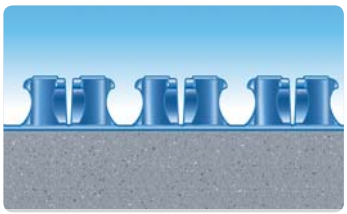
Uponor nub panel 14-16 EPS 30-2

- Ideal for residential and commercial buildings
- EPS 040 DES sg
- Panel thickness: 48 mm
- 28 dB sound insulation



Uponor nub panel 14-16 EPS 11

- For areas with high loads such as open spaces and industrial buildings
- EPS 040 DEO (100 kPa)
- Panel thickness: 29 mm
- No sound insulation



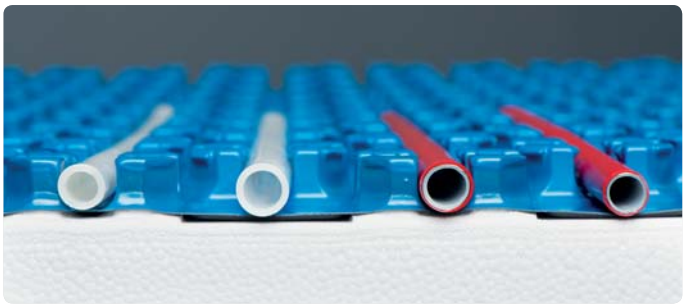
Uponor nub panel 14-16 foil

- For installation on on-site insulation*
- Panel thickness: 18 mm

* Sound insulation with max. 2 mm compression

Uponor nub panel 14-16 Add. Set 30-2

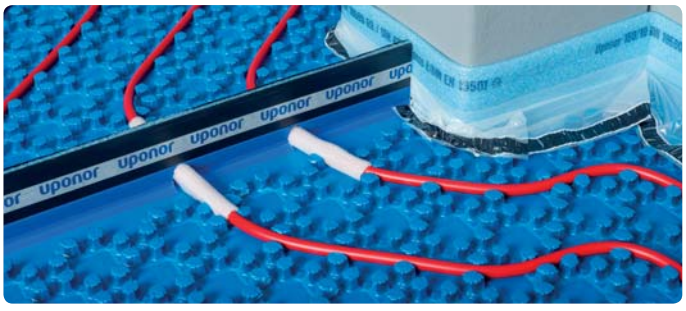
For pipe laying in doorways and distribution areas, Uponor Nubos offers additional panels with an optimised number of nubs. These panels can be easily integrated into the layout as their nubs overlap with existing ones. This is how a consistently dense surface is achieved even in difficult and complicated room areas.



Applicable pipe types

A range of 4 different pipe types is available:

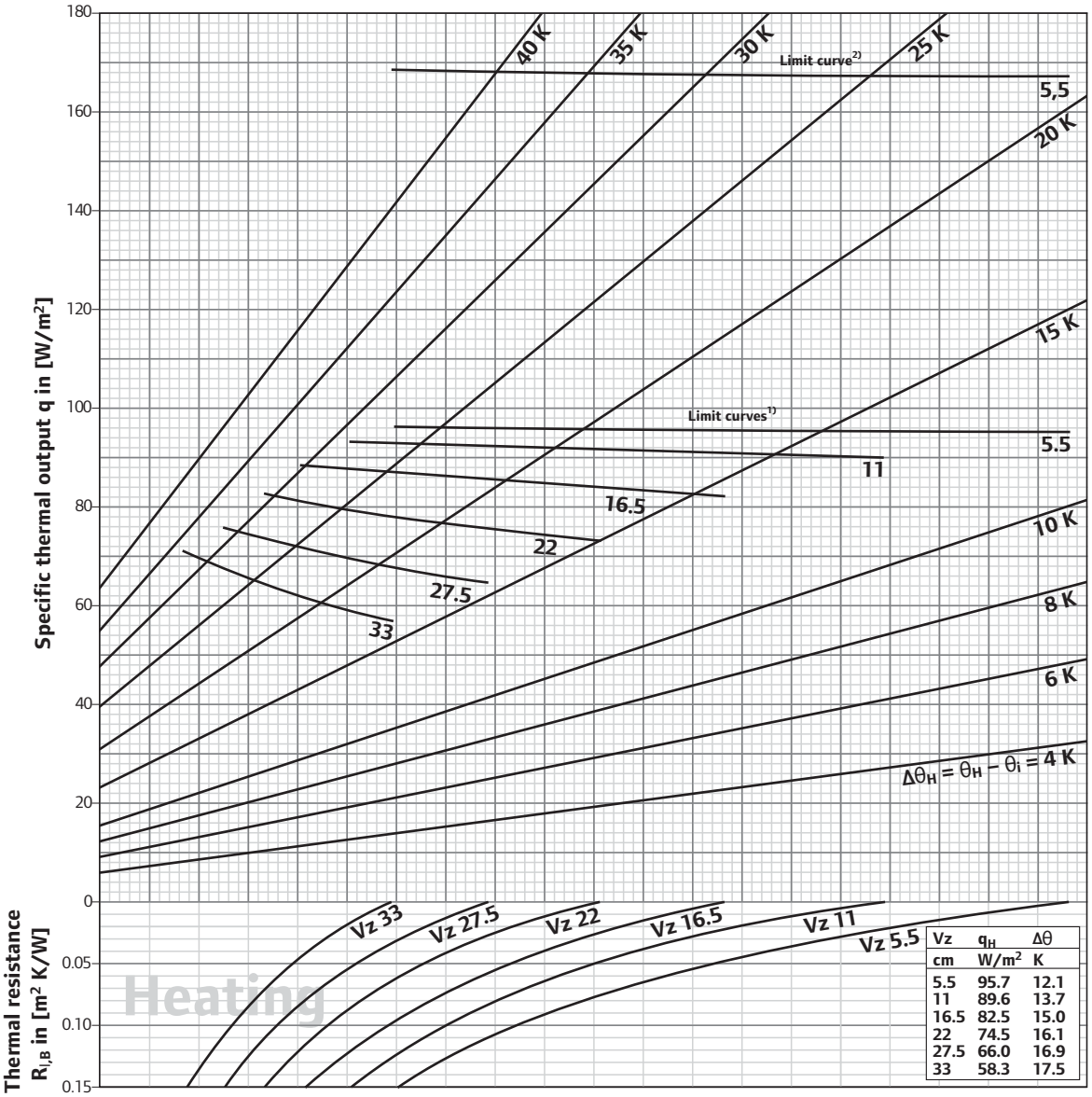
- Uponor Comfort Pipe 14 x 2 mm
- Uponor Comfort Pipe 16 x 1.8 mm
- Uponor MLCP RED 14 x 1.6 mm
- Uponor MLCP RED 16 x 2 mm



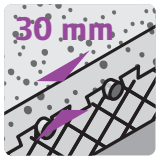
Additional accessories

- Uponor edging strip
- Uponor joint profile
- Uponor joint protection tube

Heating design diagram for Uponor Nubos and Uponor Comfort Pipe 14 x 2 mm with cement screed load distribution layer including VD 450/450N/550N
(s_u = 30 mm with λ_u = 1.2 W/mK)



Vz	q_H	Δθ
cm	W/m²	K
5.5	95.7	12.1
11	89.6	13.7
16.5	82.5	15.0
22	74.5	16.1
27.5	66.0	16.9
33	58.3	17.5



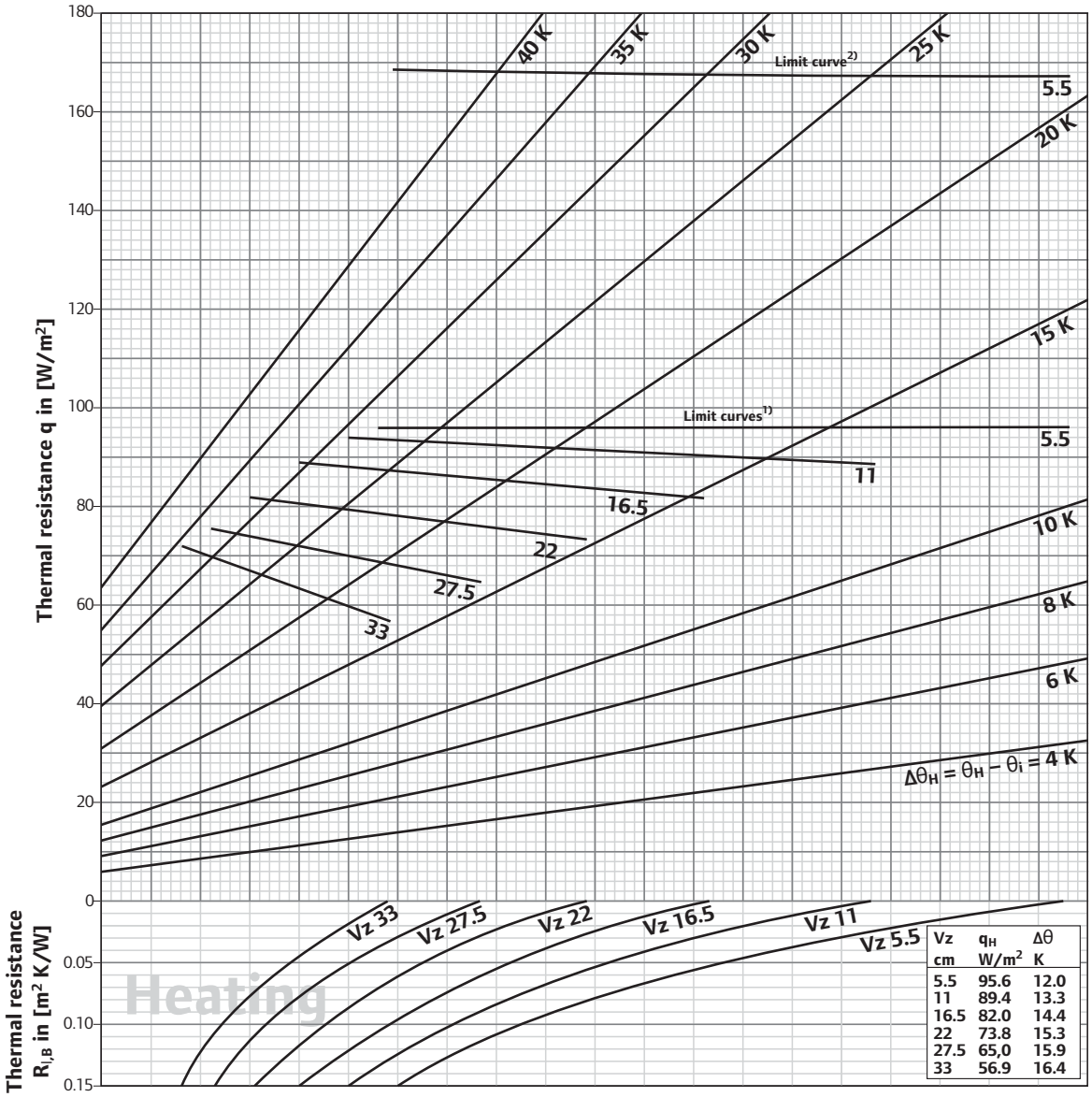
14 x 2 PE-Xa

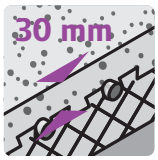
DIN Geprüft
7F 335 -F

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

Note: According to DIN EN 1264 baths, showers and toilets are not included.
Limit curves must not be exceeded.
Maximum design supply water temperature: $\theta_{V, des} = \Delta\theta_{H, g} + \theta_i + 2.5$ K
$\Delta\theta_{H, g}$ results from the limit curve for the occupied zone with the smallest pipe spacing.

Heating design diagram for Uponor Nubos and Uponor Comfort Pipe 16 x 1.8 mm with cement screed load distribution layer including VD 450/450N/550N
(s_u = 30 mm with λ_u = 1.2 W/mK)





16 x 1.8 PE-Xa

DIN Geprüft
7F 336 -F

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
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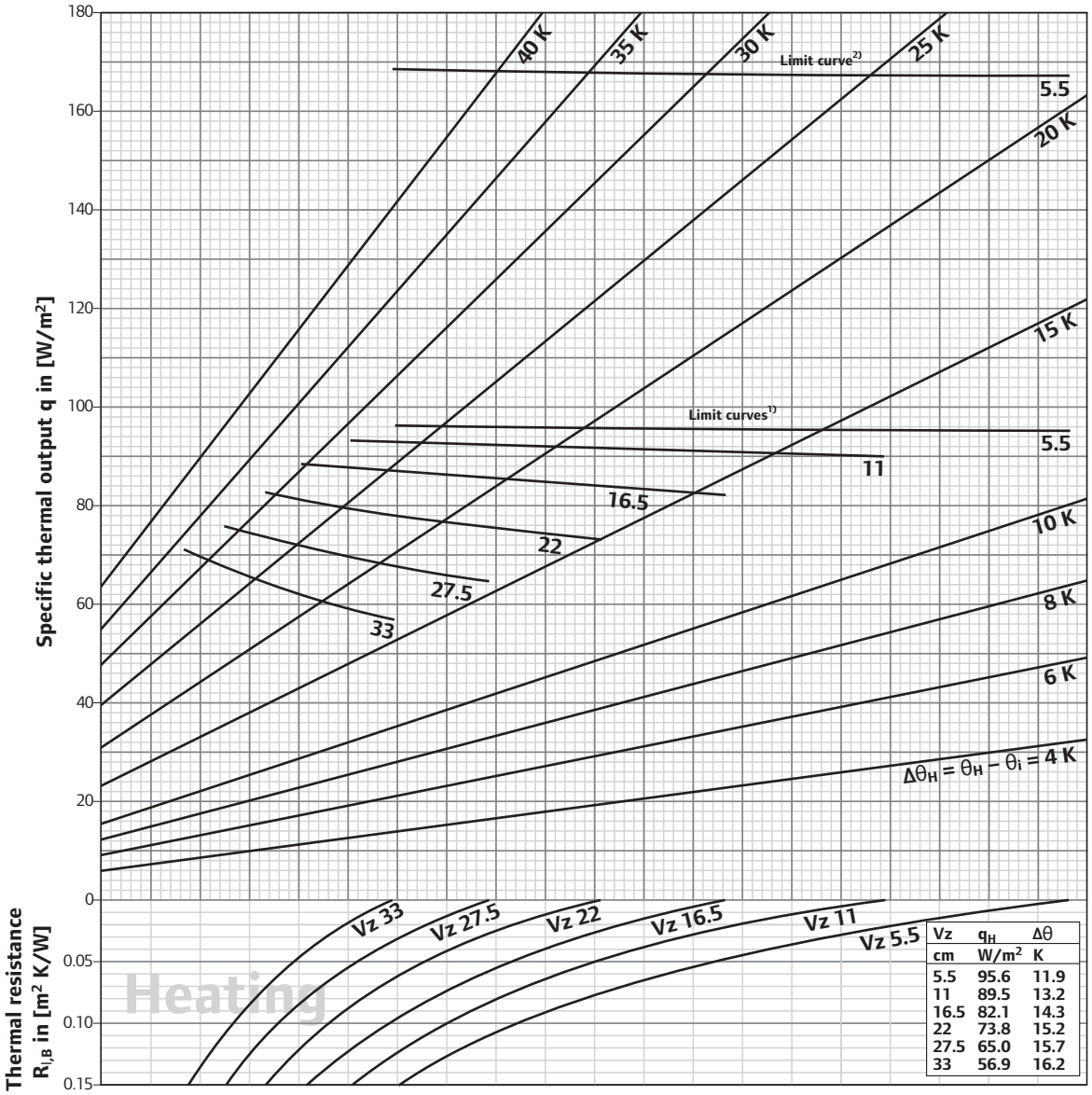
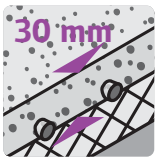
Heating design diagram for Uponor Nubos and Uponor MLCP RED 14 x 1.6 mm with cement screed load distribution layer including VD 450/450N/550N
(s_u = 30 mm with λ_u = 1.2 W/mK)





14 x 1.6 MLCP

DIN Geprüft
7F 337 -F

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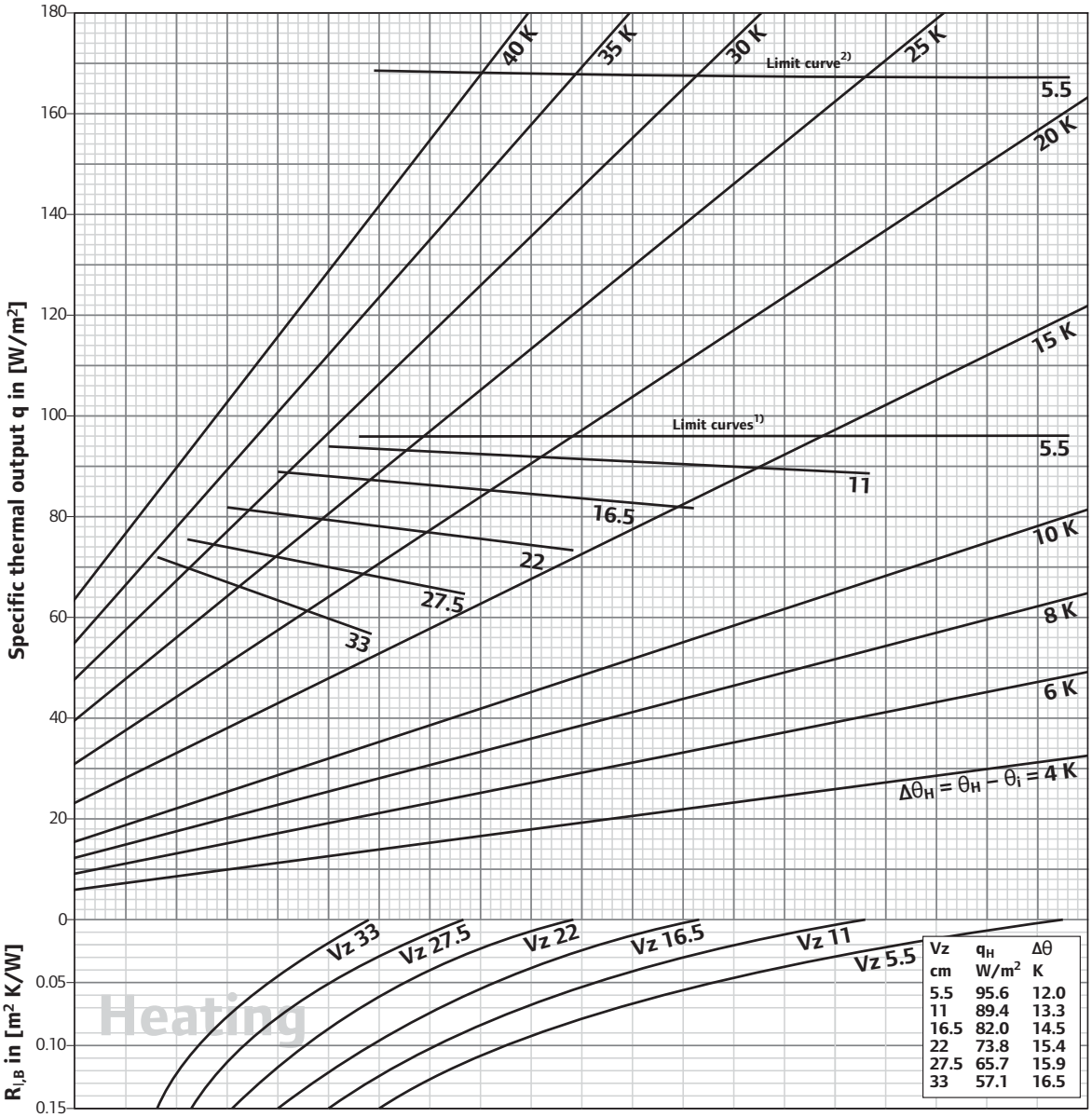
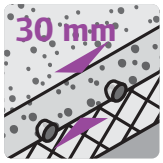
Heating design diagram for Uponor Nubos and Uponor MLCP RED 16 x 2 mm with cement screed load distribution layer including VD 450/450N/550N
(s_u = 30 mm with λ_u = 1.2 W/mK)





16 x 2 MLCP

DIN Geprüft
7F 338 -F

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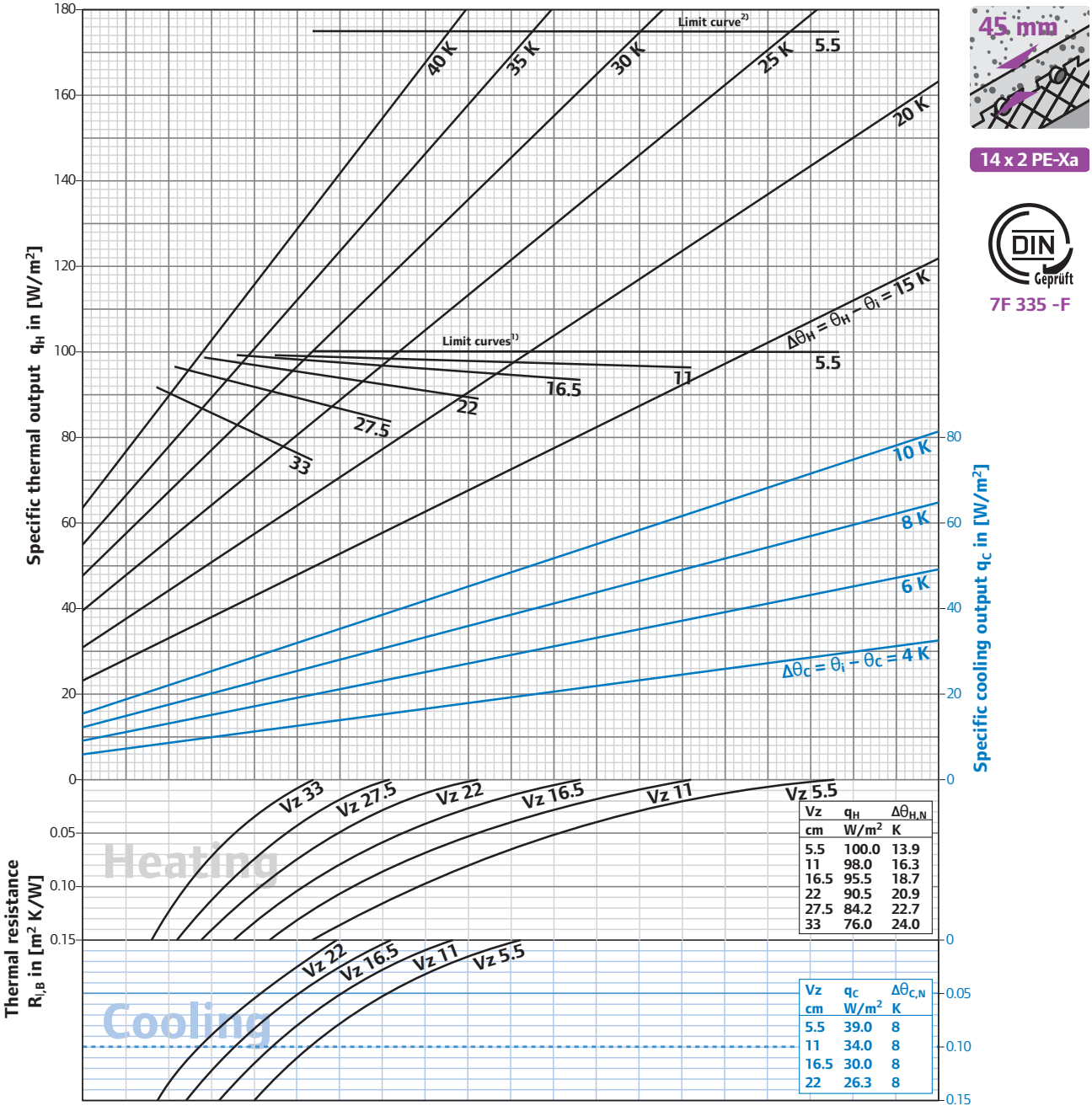
Heating/cooling design diagram for Uponor Nubos and Uponor Comfort Pipe 14 x 2 mm with cement screed load distribution layer including VD 450/450N/550N
(s_u = 45 mm with λ_u = 1.2 W/mK)



14 x 2 PE-Xa

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7F 335 -F

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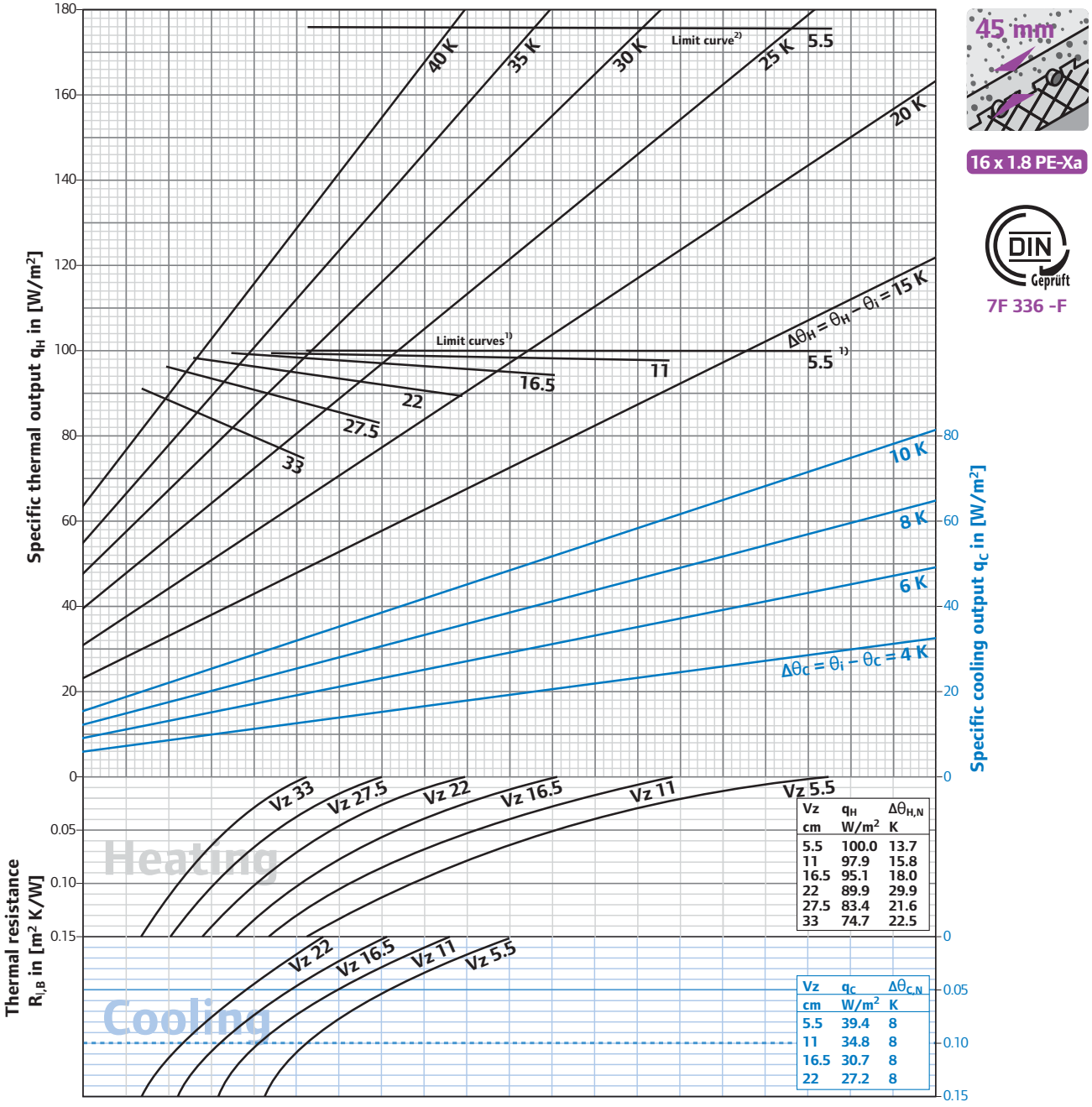
$\Delta\theta_{H,g}$ results from the limit curve for the occupied zone with the smallest pipe spacing.
When cooling, supply temperature should be higher than dew point temperature. A humidity sensor is to be used.

Heating design diagram for Uponor Nubos and Uponor Comfort Pipe 16 x 1.8 mm with cement screed load distribution layer including VD 450/450N/550N
(s_u = 45 mm with λ_u = 1.2 W/mK)



16 x 1.8 PE-Xa

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Heating/cooling design diagram for Uponor Nubos and Uponor MLCP RED 14 x 1.6 mm with cement screed load distribution layer including VD 450/450N/550N
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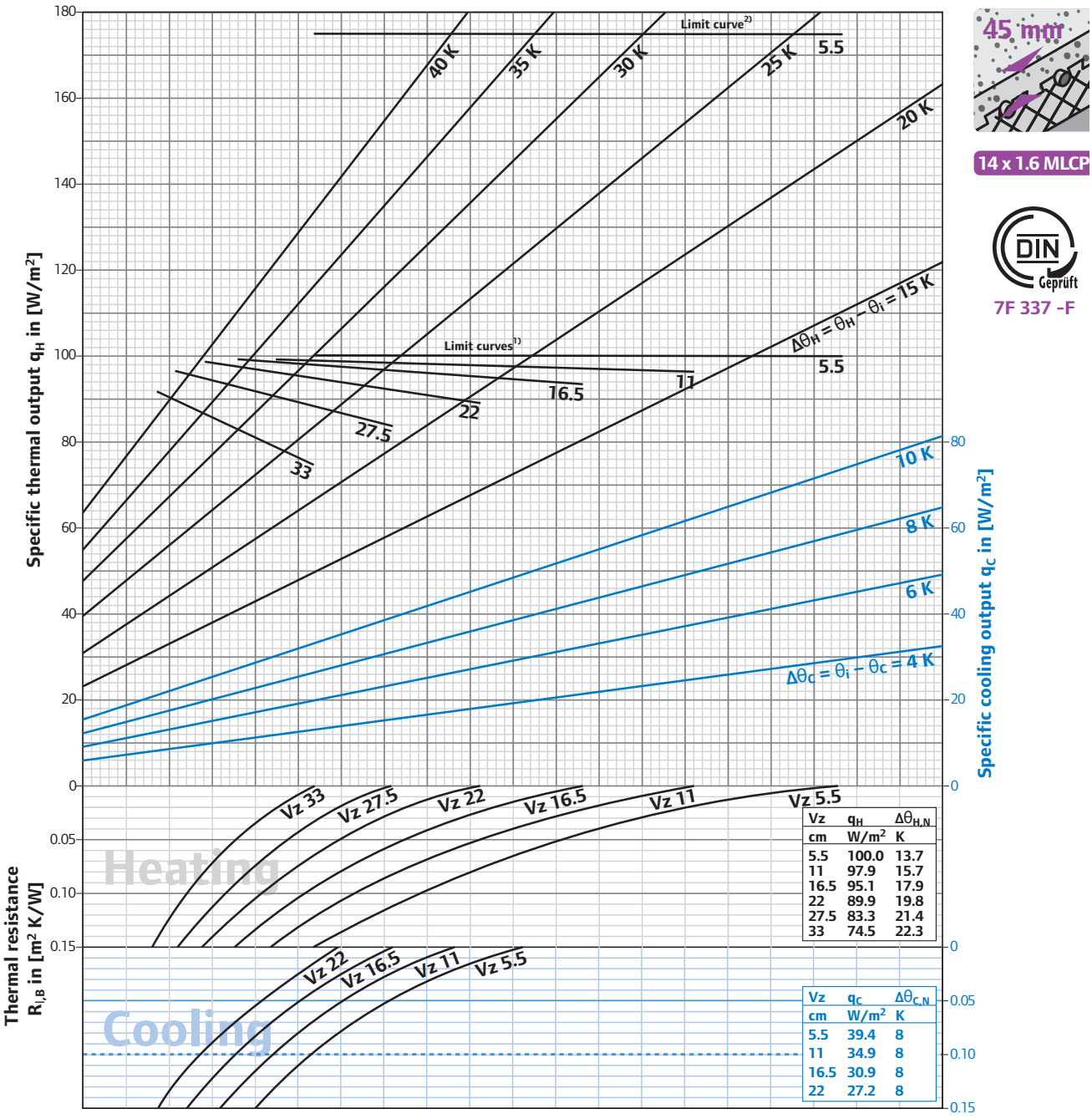

14 x 1.6 MLCP

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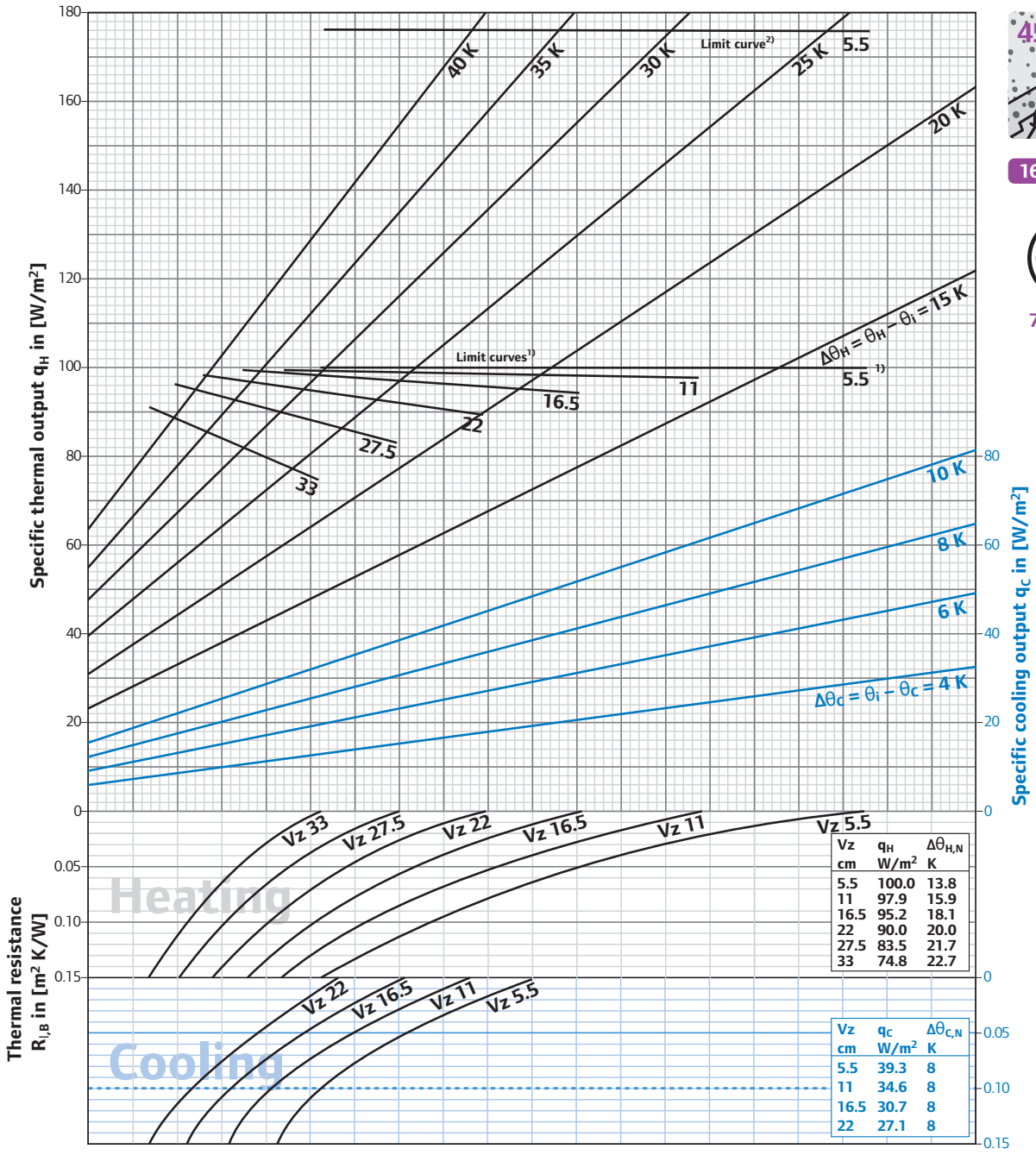

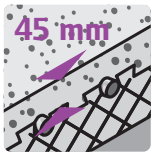

16 x 2 MLCP

DIN Geprüft
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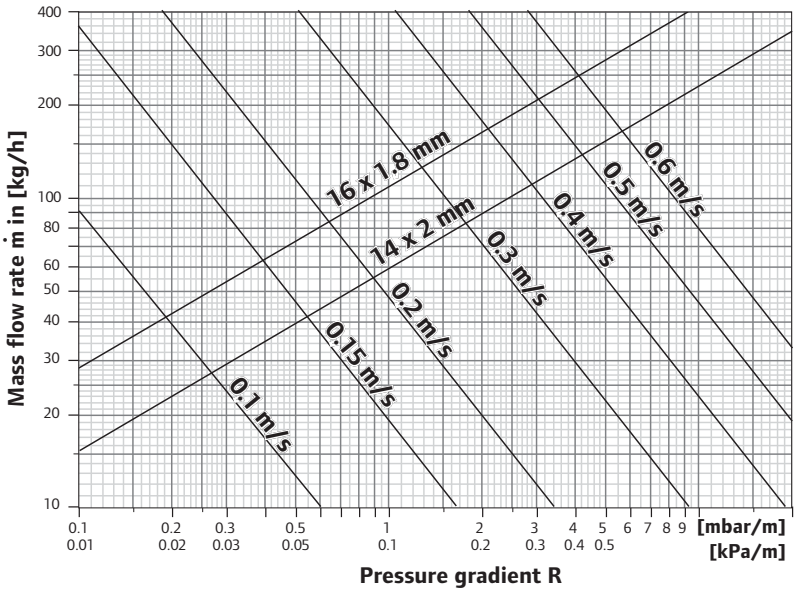
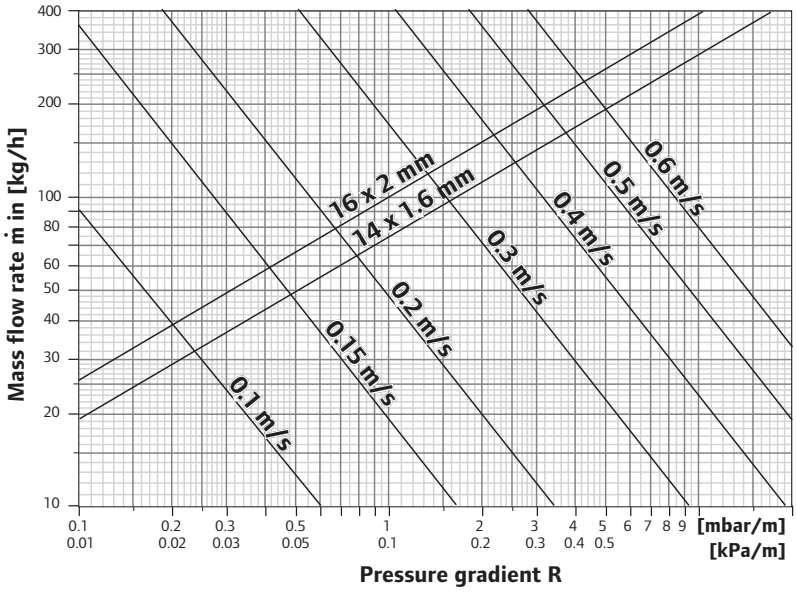
Pressure drop diagrams

Pressure losses in the Uponor Comfort Pipes can be determined with the aid of this diagram.



Pressure losses in the Uponor MLCP RED can be determined with the aid of this diagram.



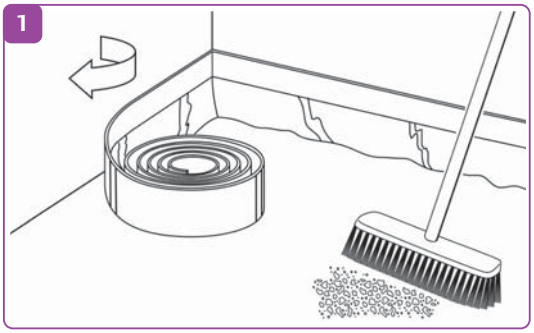
Installation

General

Uponor Nubos should be installed by expert installers only. It is essential to observe the following installation instructions as well as the additional instructions provided with the components and tools or downloadable from www.uponor.com

Installation of nub panels

1



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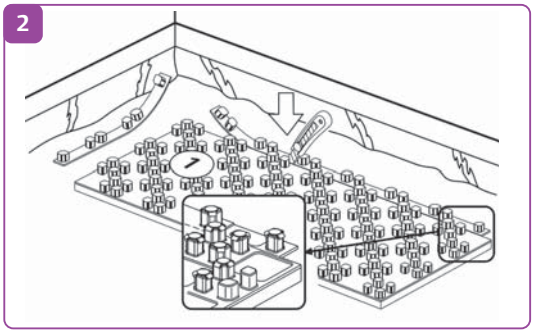

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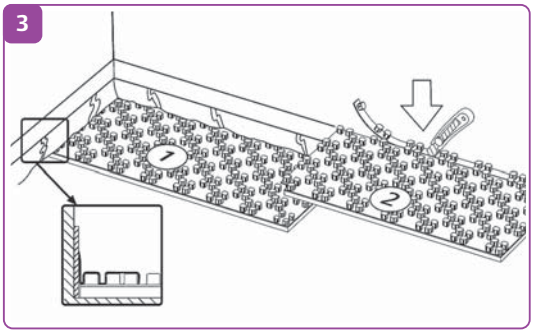

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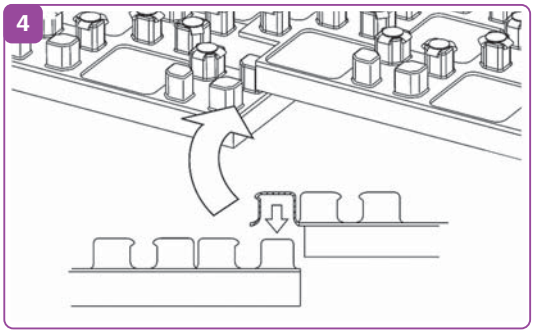

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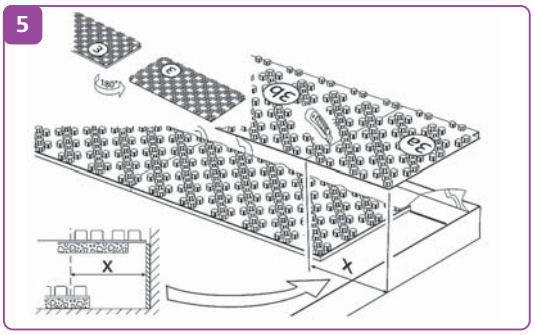

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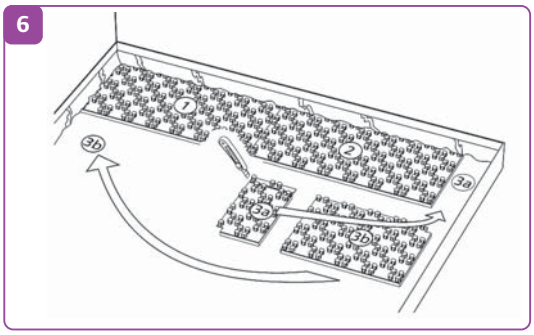

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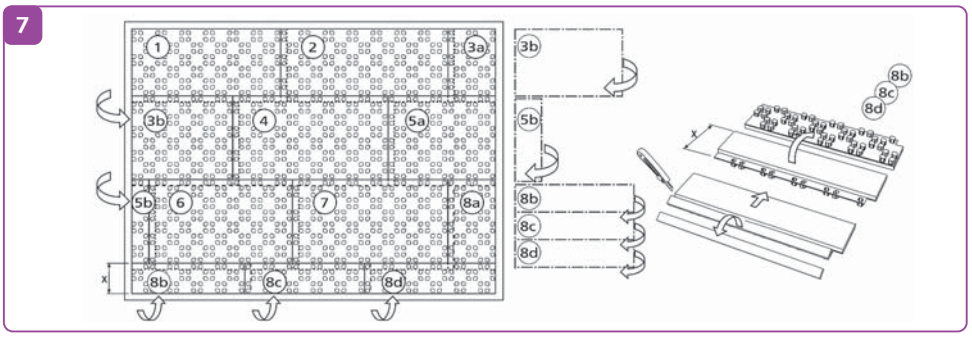
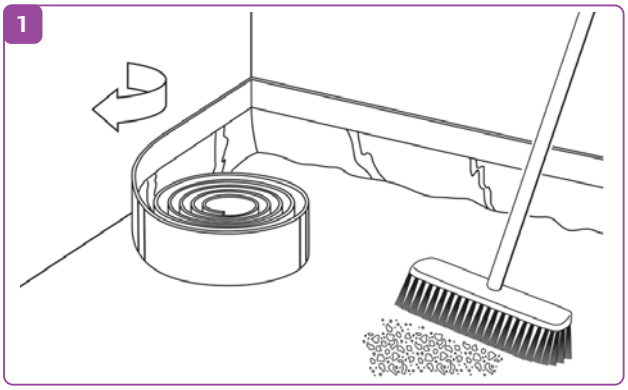
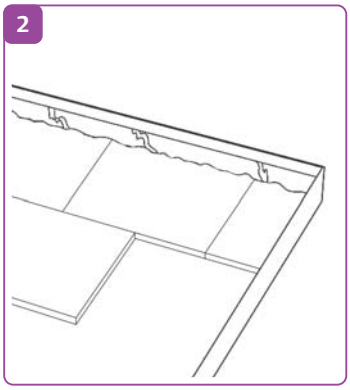
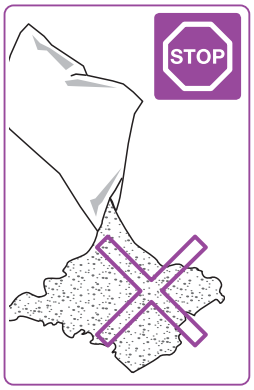
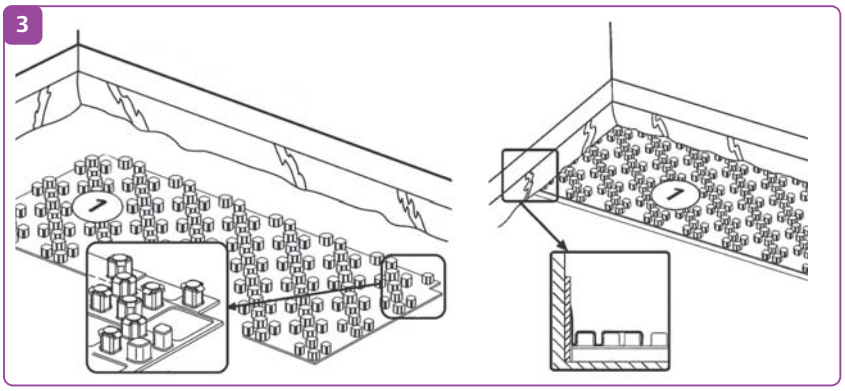


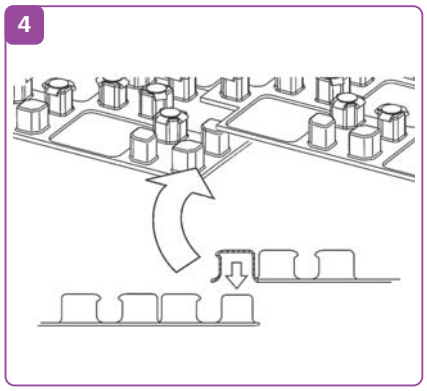
Installation of nub foil

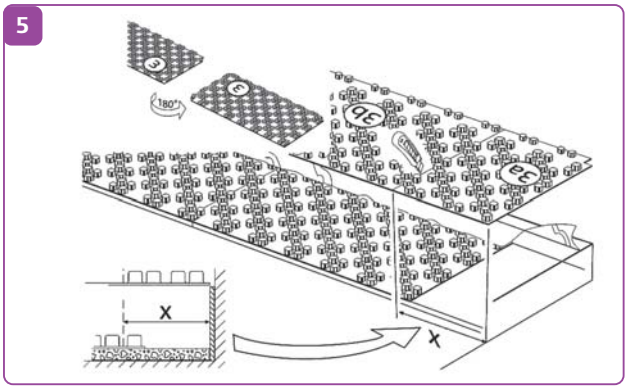


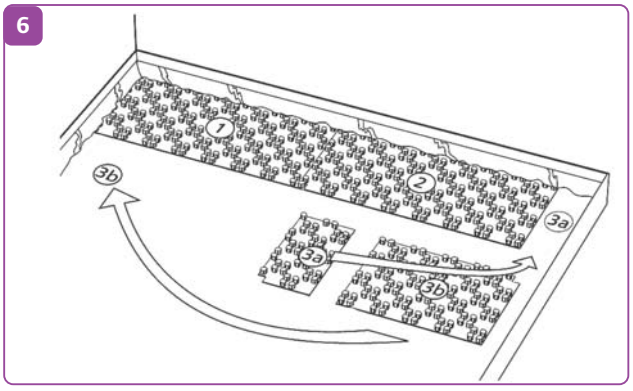


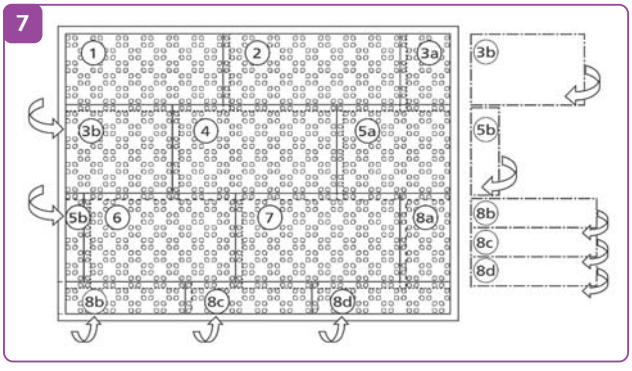






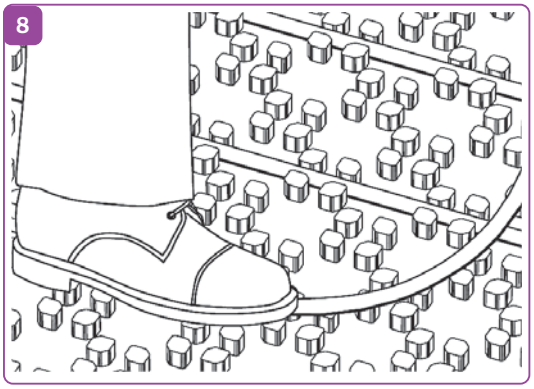






Pipe laying

8



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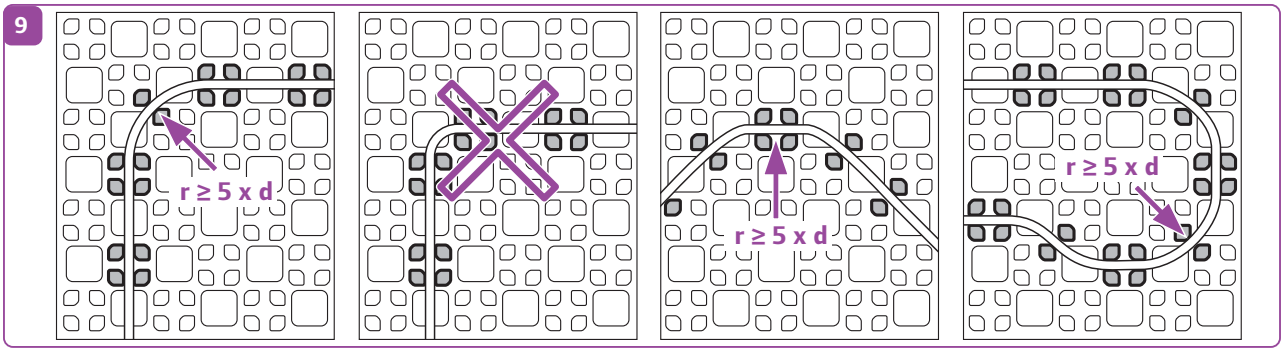
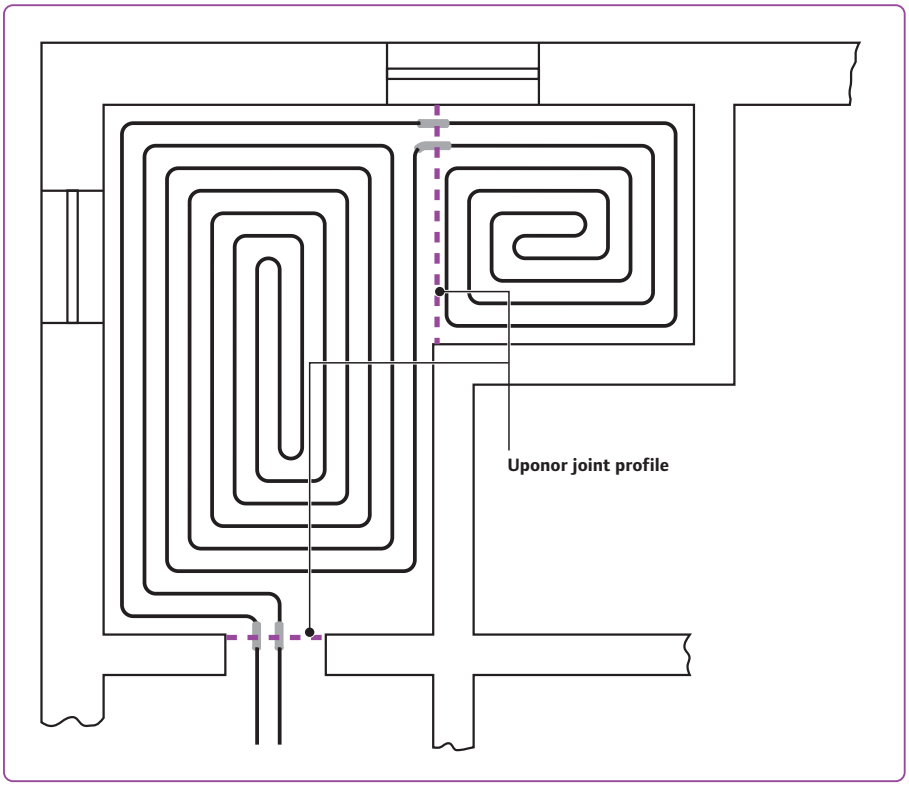
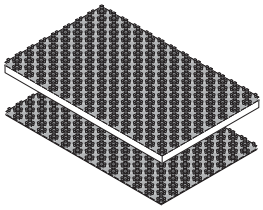
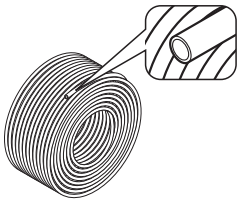




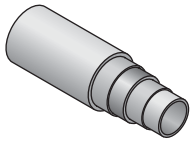
Technical data



Uponor nub panel 14-16	Type: 11	Type: 30-2	Nub foil
Material (insulation, nub foil)	EPS 035 DEO dm, PS	EPS 040 DES sg, PS	PS
Foil element dimensions (l x w)	1447 mm x 900 mm		
Active surface	1420 mm x 873 mm		
Max. traffic load	30 kN/m²	5.0 kN/m²	Depending on insulation
Thermal resistivity	0.314 m²K/W	0.75 m²K/W	–
Sound insulation optimisation	–	28 db	–
Dynamic stiffness	/	20 MN/m³	–
Pressure tension	≥ 100 kPa	/	–
Pipe distance (rectangle)	RA 5.5/11/16.5/22/27.5/33		
Pipe distance (diagonal)	RA 7.5/15/22.5/30		
Height	29 mm	48 mm	18 mm
System type	Wet system	Wet system	Wet system
Load distribution layer	Cement or anhydrite screed	Cement or anhydrite screed	Cement or anhydrite screed



Uponor Comfort Pipe	14 x 2 mm	16 x 1.8 mm
Material	PE-Xa	
Colour	Natural with red longitudinal stripes	
Production	corr. DIN EN ISO 15875	
Oxygen resistance	corr. DIN 4726	
Denseness	0.938 g/cm³	
Heat conductivity	0.35 W/mK	
Expansion coefficient	at 20 °C 1.4 x 10^{-4} 1/K, at 100 °C 2.05 x 10^{-4} 1/K	
Crystallite melting temperature	130 °C	
Fire classification	B2	
Min. bending radius	70 mm	85 mm
Water content	0.076 l/m	0.12 l/m
Pipe roughness	0.0005 mm	
Application class	4 / 6 bar	
Max. operating temperature	70 °C	
DIN CERTCO registration number	3V350 PE-Xa	
Pipe connections	Uponor composite coupling and Uponor compression fitting	
Optimal installation temperature	≥ 0 °C	
UV protections	Lightproof cardboard box (remaining pipe must be stored in the cardboard box!)	



Uponor MLCP RED 14 x 1.6 mm / 16 x 2 mm	
Material	Multi-layer composite pipe (PE-RT - adhesive layer - longitudinal safety overlap welded aluminium pipe - adhesive layer - PE-RT), SKZ-controlled, oxygen-resistant acc. DIN 4726
Max. operating temperature	60 °C
Max. operating pressure	4 bar
DIN CERTCO registration number	3V286 PE-RT/AL/PE-RT

05_2014_EN Production: Uponor GmbH, WS, Hamburg, Germany

Uponor Corporation
www.uponor.com

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