uponor

Uponor Minitec Technical Guide

RADIANT HEATING AND COOLING

The Uponor Minitec product line

Fast installation, short heat-up time: Uponor Minitec offers you a range of advantages. The Uponor Minitec panel for laying the Uponor PE-Xa pipes 9.9 x 1.1 mm can be installed on any existing screed, timber or tiled floor. Thanks to the low panel height of 10mm, it is particularly suitable for integration into existing buildings.

The panel is equipped with punched holes in and between the castellations, which ensure that the levelling compound can spread easily and bonds firmly with the substructure. The rear side of the Minitec panel is equipped with an adhesive surface, ensuring proper fixture to the floor during installation. The self-adhesive edging strip with self-adhesive panel is available in L and I profile allows for a proper seal along the walls and the bottom surface.

The levelling layer is installed just above the raised castellation, resulting in a possible total installation height of only 15 mm. After a short drying time, the desired floor covering can be placed directly onto the surface.



Panel height approximately 10mm

As the pipe is just right below the top floor layer, heat-up times are short and Uponor Minitec can be operated at low heating water temperatures, responding quickly to temperature adjustments.



7F 170 -F PE-Xa 9.9x1.1

Minitec components



Uponor Minitec panel

The sturdy Minitec panel can be walked on instantly and ensures fast and efficient installation of the Uponor PE-Xa pipes by a single installer. They are suitable for all room geometries and do not need to be installed right to the edge of the floor.



Uponor PE-Xa pipe

The flexible Uponor PE-Xa pipes $9.9 \times 1.1 \text{ mm}$ are placed in the prepared grooves of the Uponor Minitec panels. They are held in place by the castellations of the panel, ensuring that the installation meets the relevant standards. The panel is equipped with specially designed castellations for the laying of the pipe in 90° and also in 45° bends.



Uponor edge insulation strip

The self-adhesive edging strip with self-adhesive panel is available in L and I profile allows for a proper seal along the walls and the bottom.

In the first installation step, the edging strip should be glued to the bottom. Then, the Minitec panel on it should be glued along the edge.



Uponor movement joint profile

The Uponor Minitec product line contains all components for a proper mounting in doorways and for creating joint profiles for the design shape of individual covering layers.

Design basics

Temperatures

Floor surface temperature

Special attention must be paid to the floor surface temperature, taking into account medical and physiological considerations.

The difference between the mean surface temperature of the floor and the design indoor temperature, together with the basic characteristic, form the basis on which the capacity of the heating floor surface is calculated. The maximum surface temperatures are determined by the limit heat flow density defined in BS EN 1264, which is taken into account as the theoretical design limit in the design tables and diagrams. Max. surface temperatures according to BS EN 1264:

- 29 °C in comfort zone
- 35 °C in edge zone
- 33 °C in comfort zone

Room temperature, perceived temperature and mean radiation temperature

With radiant heating systems such as the Uponor underfloor heating systems, one can expect significant energy savings compared with less efficient heating systems.

This energy efficiency is mainly due to a better adjusted room temperature and the optimal vertical temperature profile in the room. To feel comfortable, the room air temperature ϑ_{L} as well as the mean radiation temperature ϑ_{s} of the surfaces enclosing the room are relevant factors. They result in a so called perceived operative temperature. That means that people, living in rooms with underfloor heating, feel more comfortable even when the room air temperature is reduced.

Standard design room				
temperatures:				
Living rooms	21 °C			
Corridors	18 °C			
Bedrooms	18-21 °C			
Bathrooms	24 °C			

Pipe specification: Floor construction: Screed depth: Screed thermal conductivity: Water temperature drop [K]: 9.9mm O/D PEX - MINITEC Solid floor 15mm Self-Levelling Compound 1.0 W/mK 10

 Suitable for occupied zone

 Suitable for perimeter zone only

			50	50		Pipe pitch, Vz [mm] 100		150		
					Floor coveri	Floor covering resistance, $R_{\lambda,\beta}[m^2K/W]$				
Mean water temperature	Design room temperature	0.05	0.1	0.15	0.05	0.1	0.15	0.05	0.1	0.15
MWT °C	Rt °C	W/m ²	W/m ²	W/m ²	W/m ²	W/m ²				
	16	82	63	52	71	56	46	61	50	42
	18	69	53	44	60	47	39	52	42	35
30	20	56	43	35	48	38	32	42	34	28
	22	42	32	27	36	28	24	31	25	21
	24	26	20	16	22	17	14	19	16	13
	16	114	87	72	98	77	64	85	69	58
	18	102	78	64	87	70	57	76	61	52
35	20	90	68	56	76	60	50	66	54	45
	22	76	59	48	65	51	42	57	46	39
	24	63	48	40	54	43	35	47	38	32
	16	146	111	92	125	99	90	108	88	74
	18	133	102	84	114	90	75	99	80	68
40	20	121	92	76	104	82	68	90	73	61
	22	108	83	68	93	73	61	80	65	55
	24	95	73	60	82	65	54	71	57	48
Maximum heat Output for Comfort Zone, q _H [W/m ²]		95	95	96	85	87	90	76	80	85

Note: Values given are for guidance only, actual performance is dependant on the 'as installed' floor construction and finish specification.

Installation

General

Uponor Minitec must be installed by approved installers only. Observe the following assembly instructions and additional instructions which are provided with the components and tools or which can be downloaded from www.uponor.co.uk

Overview of the installation steps



Installation steps for Minitec panel



Installing pipes in Minitec panel



Connecting PE-Xa pipes

Get to know more about Uponor Minitec

This QR code leads you to the film:



Technical data



Uponor Minitec panel	
Material	Polystyrene
Max. traffic load (including levelling compound)	5,0 kN/m ²
Pipe spacing	Vz 5, 10, 15
Panel dimensions (l x w)	1,120 mm x 720 mm
Total element height	12 mm
System type	Wet system*
Volumetric share of levelling layer (at layer thickness 15 mm)	Vz 5 Vz 10 Vz 15 approx. 12.4 l/m² approx. 13.2 l/m² approx. 13.5 l/m²
DIN reg. no.	7F170-F

* on existing load distribution layer



Uponor PE-Xa pipe	
Pipe dimensions	9.9 x 1.1 mm
SDR (Standard Dimension Ratio)	Value 9 (acc. EN ISO 15875)
S (Pipe Series)	Value 4 (acc. EN ISO 15875)
Material	PE-Xa (acc. EN 16892)
Colour	Nature
Manufactured	According to DIN EN 16892 / DIN EN ISO 15875-2
Oxygen tightness	According to DIN 4726, section 3.5
Density	0.94 g/cm ³ (acc. EN 16892)
Thermal conductivity	0.35 W/mK
Mean thermal linear expansion coefficient at	70 °C: 0.15 mm/m K (acc. EN 16892)
Crystallite melting temperature	133 °C
Building material class	B2
Min. bending radius	50 mm
Pipe roughness	0.007 mm
Water content	0.0465 l/m
Pipe marking	[length] m PE-Xa 9.9 x1.1 oxygen-tight according to DIN 4726 EN ISO 15875 class 4/8 bar [DIN approval mark] 3V279 PE-X
Max. continuous operating pressure (water at 20 °C)	19.1 bar (safety factor SF = 1.25 (according to DIN EN ISO 15875 for 20 °C), for 50 operating years
Max. continuous operating pressure (water at 70 °C)	8.8 bar (safety factor SF = 1.5 (according to DIN EN ISO 16893), for 50 operating years
Application class according to DIN EN ISO 15875	4 (underfloor heating)
At permissible operating pressure	8 bar
DIN CERTCO reg. no.	3V 279 PE-Xa
Pipe couplings Uponor	9.9 x 1.1 type couplings
Optimum installation temperature	≥0°C
UV protection	lightproof cardboard box (unused piping must be stored in cardboard box!)

Uponor Limited ("Uponor") guarantees [to the original purchaser/ customer] that pipes and fittings sold by it are free of defects in materials or manufacture under normal conditions of use for a period of 25 years and in case of electrical and mechanical products for 2 years from the date of installation. This guarantee only applies to the products stored, installed, tested and operated in accordance with the fitting instructions issued by Uponor and valid at the time the products were installed.

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