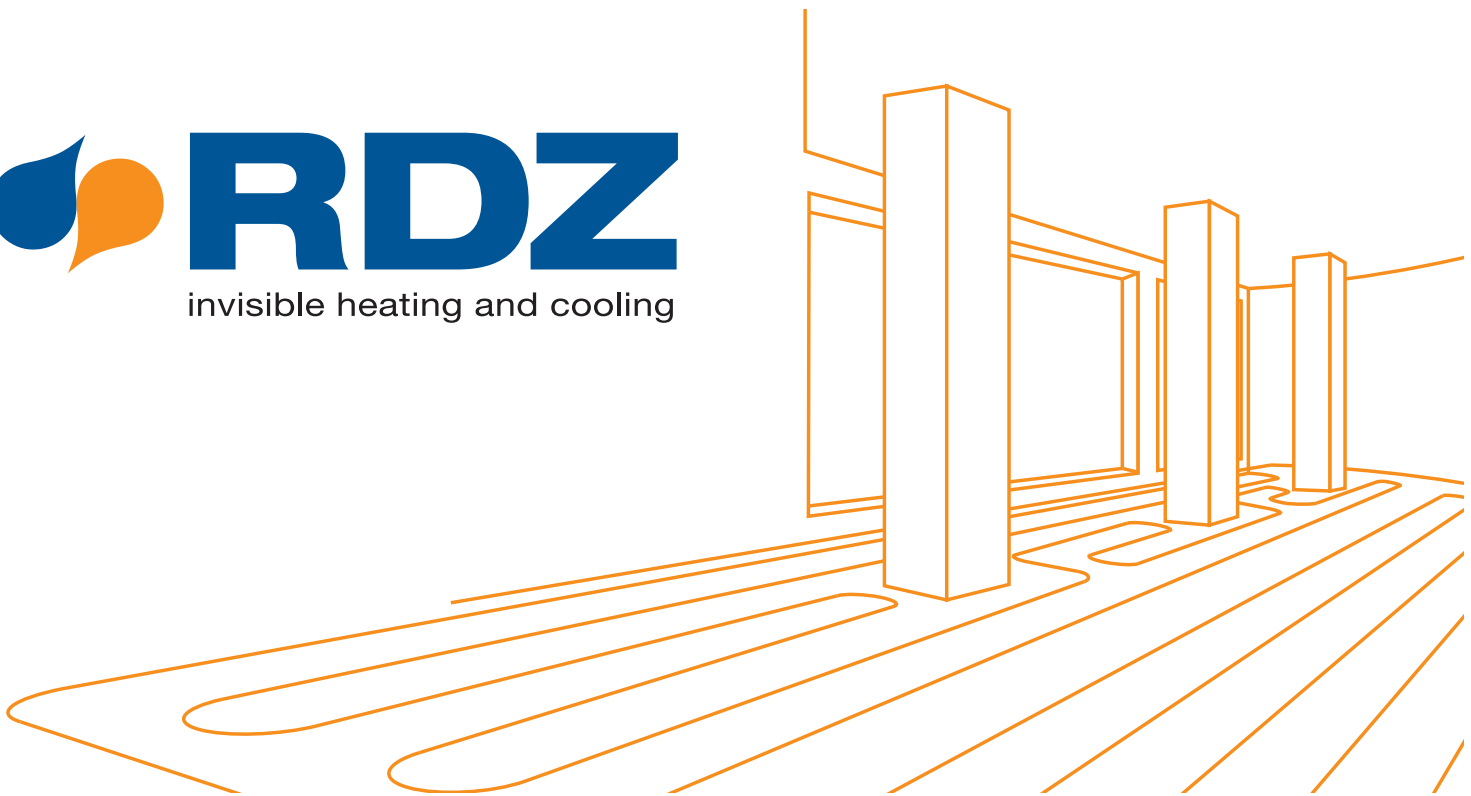


# Industrial Underfloor Heating





**We have been working in an ideal climate for thirty years.**

A climate that has brought us to a position of leadership in Italy in the field of radiant heating and cooling. RDZ was the first company to receive the UNI EN ISO 9001:2000 management system quality certification.

RDZ has been a quality-oriented company since its very beginning, by using the finest materials, developing new solutions, constantly providing excellent service. And also by creating a positive climate in the company to promote the exchange of ideas and stimulate cooperation for constant improvement.



# Underfloor industrial heating systems: Unparalleled comfort and energy-saving.

The choice as to the type of heating to use in industrial premises is essentially based on financial and comfort considerations.

Reductions in energy consumption are an essential element when it comes to considering an effective heating system, both in terms of the saving involved, as well as from the environmental point of view. Another factor of key importance in any heating system for industrial premises is the required level of comfort which enables users to work in a pleasant, healthy uncluttered environment without currents of air or dust. Comfort and energy saving are the two main factors when choosing RDZ industrial underfloor heating system.







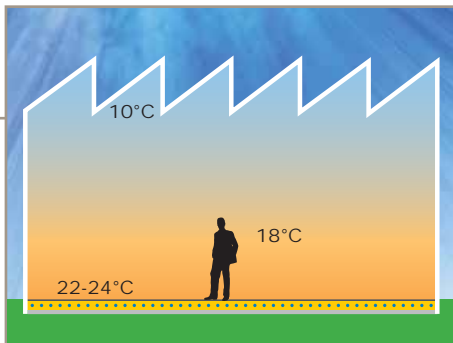
## The joy of working in a comfortable, spacious and healthy space.

Underfloor heating systems are especially suitable for industrial premises with particularly high ceilings, since heat diffusion due to radiation allows rooms to be heated to human height. Apart from maximum comfort, however, industrial premises show excellent results in terms of energy consumption with savings of up to 50% compared to a standard air heating system. Indeed, uniform temperature distribution not only guarantees the sensation of physical wellbeing but also allows the system to be operated at low temperatures, thus significantly reducing energy consumption compared to traditional systems.



# The reasons for choosing industrial underfloor heating.

1



## Energy-saving

Fuel consumption savings in industrial premises with underfloor heating can be as much as 50% compared to a traditional air system, as rooms are heated only to “human height” and, as a result, prevent heat loss towards the ceiling. Furthermore, the low temperature of the water and the opportunity to use specific heat sources (low temperature boilers or condensing boilers) allows further energy saving.

2



## Elevated comfort

Industrial underfloor heating allows users to create comfortable peaceful environment with uniformly-distributed temperatures, without bothersome currents of air and dust. Moreover, the well-distributed temperature and absence of dust particles also ensures excellent performance from the high-precision equipment involved in heating operations.

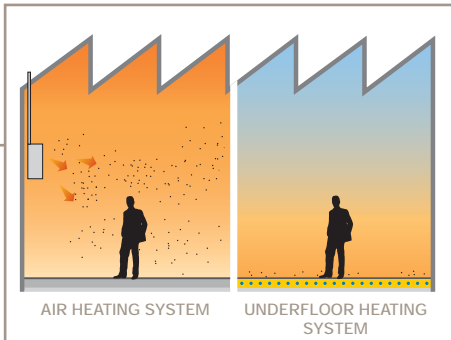
3



## Employing alternative energy sources

In underfloor heating systems, the low temperature of the water enables users to make full use of low potential energy sources from work processes, solar energy, heat pumps and condensing boilers, etc. This type of system will also become one of the few solutions guaranteeing good functioning when traditional fuels have to be replaced by inferior ones.

# 4



## Reduced air currents and movement of dust

The absence of convective air flows generally created by the difference in temperature between the heating body and surrounding environment limits any potential movement of dust or impurities in the air (possible cause of allergies). This not only improves the sanitary conditions of the premises, but also creates ideal working conditions. Since it is an integrated underfloor system, it also makes cleaning operations fast and efficient.

# 5



## Optimising space

As industrial underfloor systems are incorporated into the floor, all surface areas including floor, walls and ceiling are free from equipment requiring space (items such as air heaters, unit heaters, radiant panels and tubes, etc. used in other forms of heating systems), thus allowing the maximum use of available space for work operations.

# 6



## Fireproof

Industrial underfloor heating systems are ideal for all work activities with no potential fire hazards involved thanks to the absence of flammable components or machinery and equipment working at high temperatures.

# 7



## Zero maintenance costs

Industrial underfloor heating systems require no maintenance.

# Industrial flooring thermal insulation.

The question is often raised when it comes to installing industrial underfloor heating as to whether it is worthwhile thermally insulating the flooring or, alternatively, installing a system without thermal insulation. There is a series of technical and financial factors involved in this choice and any decision should be made depending on the specific case in question.

## Advantages of ground-level insulation (downwards):

- > Reduced heat loss at ground-level
- > Improved speed for the system to achieve optimal operating capacity (less inertia)

## Drawbacks of ground-level insulation (downwards):

- > Reduced mechanical strength of the floor surface
- > Increased system installation costs

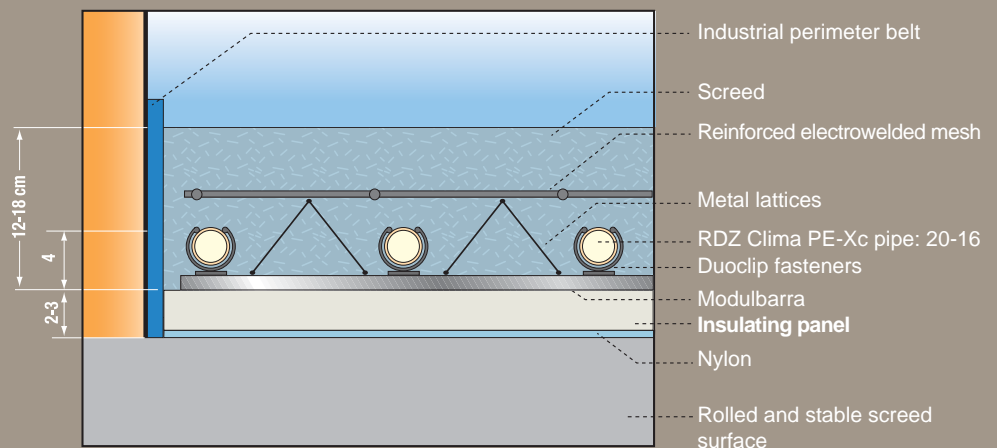
Note: structural design and dimensioning of concrete paving should always be carried out with the support of an expert in structural engineering calculations.

## Comparative Analysis

Technical-financial assessment for the employment of ground-level insulation in underfloor heating

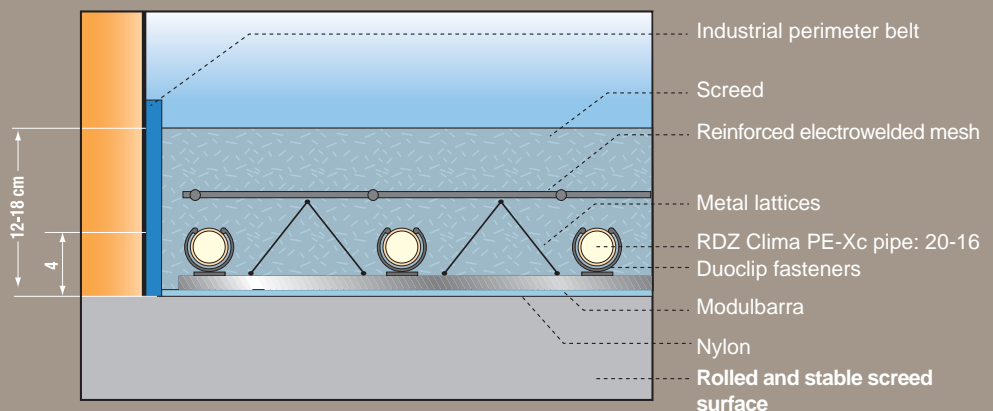
### Example A

System for industrial flooring with a thickness of 14 cm: ground-level (downward) insulation comprising 3 cm-thick insulating panels.  $R=0.8 \text{ (m}^2\cdot\text{K)/W}$



### Example B

System for industrial flooring with a thickness of 14 cm: no ground-level (downward) insulation employed; positioned on waterproofed rolled screed surface.



N.B.: Section thicknesses are purely indicative. People responsible for structural calculations are required to calculate casting thickness and the dimensions of the reinforced mesh.



It is clear that thermal insulation for underfloor heating, compared to the ground surface, provides higher operating cost-savings.

However, we recommend assessing the extent of this reduction in order to measure the real financial benefits to be gained.

**WARNING:** in case that room temperature for the project is higher than 17-18°C or underlying groundwater is less than 2 metres from the surface, ground-surface insulation is always recommended.

Apart from the purely financial considerations, mechanical aspects should be also taken into consideration when deciding to install insulation and the choice of system best suited to the project. The nature of work activities, for example, may require a mechanical strength for the flooring that is not compatible with the decision to install a compressible layer of insulation.

### System differences

**Example A:** "Modulbarra" system with PE-Xc  $\varnothing$  20-16 piping and insulating panels on a rolled screed surface. Insulating panel thermal resistance equivalent to 0.8 (m<sup>2</sup>\*K)/W. Overall screed thickness equal to 0.14 m (thickness above pipes equivalent to 0.1 m).

**Example B:** "Modulbarra" system with PE-Xc  $\varnothing$  20-16 piping with the same features as those described above but positioned directly on the rolled screed surface.

BASIC FEATURES	Solution with insulation	Solution without insulation	Symbol	Unit of measurement
Overall screed thickness	0.14	0.14	S	m
Screed thickness above piping	0.10	0.10	S <sub>u</sub>	m
Screed thickness under piping	0.04	0.04	S <sub>i</sub>	m
Screed lambda value	1.8	1.8	$\lambda_F$	W/(m*K)
Outside pipe diameter	0.02	0.02	D	m
Thermal resistance insulation	0.8	0	R <sub><math>\lambda_{ins}</math></sub>	(m <sup>2</sup> *K)/W
Ground thickness	2	2		m
Ground lambda value	1.48	1.48	$\lambda_t$	W/(m*K)
Ground temperature	10	10	$\theta_u$	°C

The figures reported above provide the following results (for 25-cm pitch only):

CALCULATED RESULTS	Solution with insulation	Solution without insulation	Symbol	Unit of measurement
	25-cm spacing	25-cm spacing		
Thermal performance coefficient upwards	3.8	3.8	K <sub>H</sub>	W/(m <sup>2</sup> *K)
Thermal performance coefficient downwards	2.2	1.4	R <sub>U</sub>	(m <sup>2</sup> *K)/W
Thermal resistance upwards	0.1	0.1	R <sub>0</sub>	(m <sup>2</sup> *K)/W

Design conditions:

- Exterior temperature for the design ( $\theta_e$ ): -5 °C
- Average temperature (Winter) ( $\theta_m$ ): +7 °C
- Specific heat rating for the design ( $q$ ): 100 W/m<sup>2</sup>
- Room temperature for the design ( $\theta_i$ ): 16 °C
- Ground temperature ( $\theta_u$ ): 10 °C

Given the above figures, the average thermal load for winter can be calculated as being equivalent to:  $q_m = q * \frac{\theta_i - \theta_m}{\theta_i - \theta_e} = 100 * \frac{16 - 7}{16 - (-5)} = 42.9$  [W/m<sup>2</sup>]

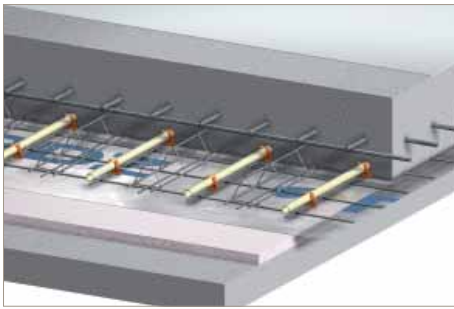
CALCULATED RESULTS	Solution with insulation	Solution without insulation	Symbol	Unit of measurement
	25-cm spacing	25-cm spacing		
Average water temperature	27.3	27.3	$\theta_m$	°C
Water heat drop	5.0	5.0	$\sigma$	K
Discharge temperature	29.8	29.8	$\theta_v$	°C
Thermal performance upwards	42.9	42.9	$q$	W/m <sup>2</sup>
Heat loss downwards	5.6	8.9	$q_u$	W/m <sup>2</sup>
Overall heat rating	48.5	51.8		W/m <sup>2</sup>
% difference for heat loss downwards		59%		%

N.B. Insulation thickness should be assessed by a thermal engineer and considering the regulations currently in force.

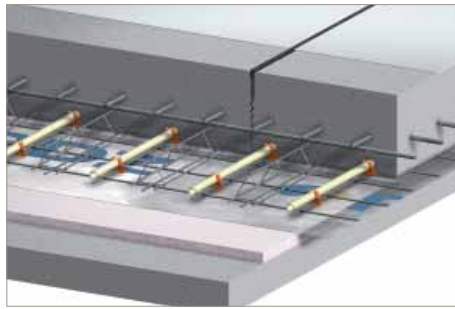
# Examples of industrial underfloor heating systems.



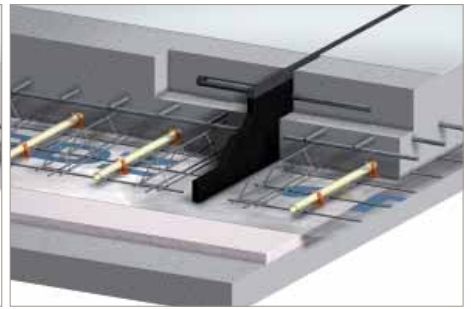
*NB. The example and section shown are purely indicative.  
Specific requirements should be assessed for each individual project by the person responsible  
for statistical analysis and calculations.*



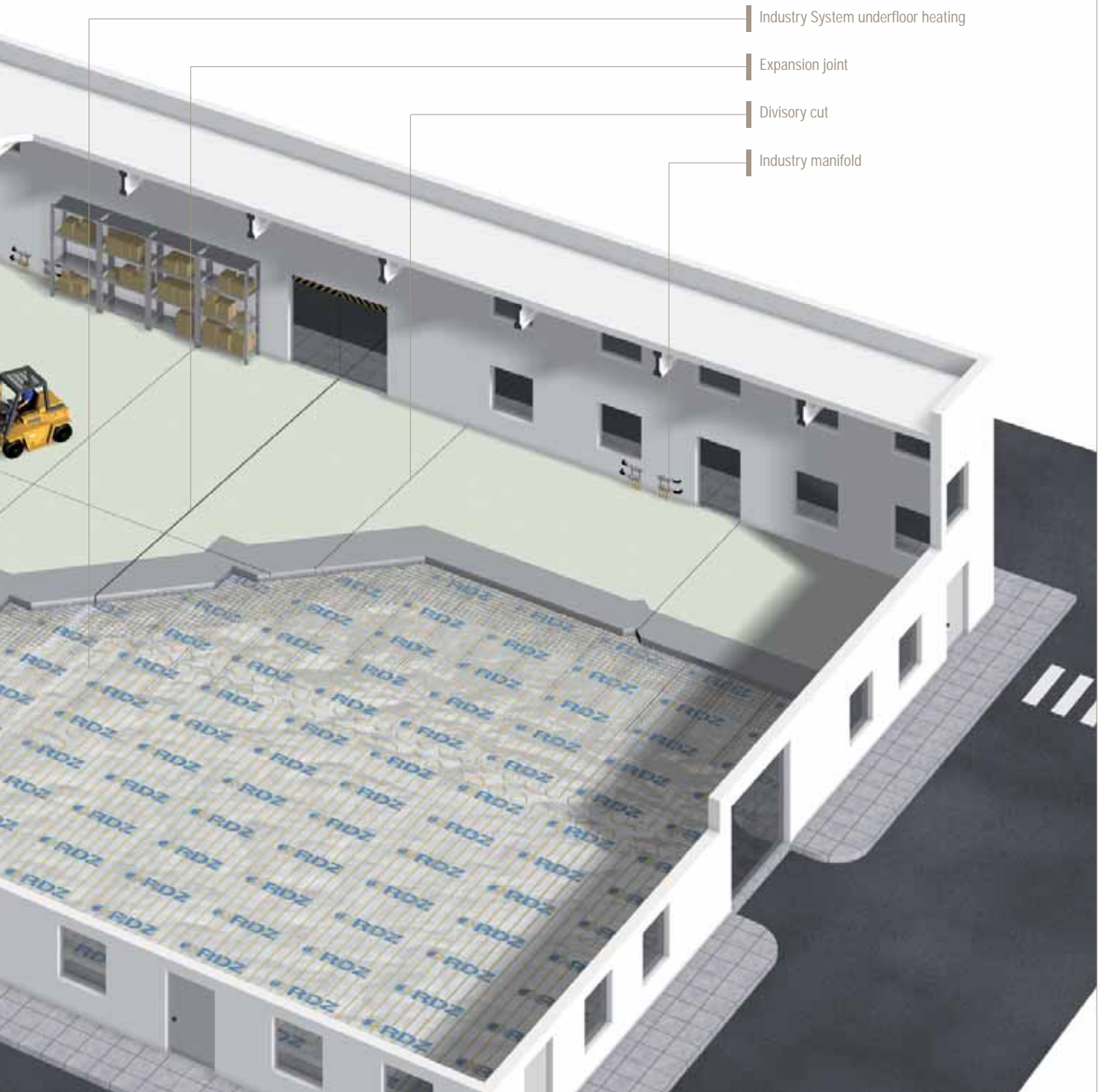
Industry System section



Divisory cut



Expansion joint



Industry System underfloor heating

Expansion joint

Divisory cut

Industry manifold



## Shaped-panel Industry System

The high-density industry SHAPED PANEL system by RDZ is highly recommended for heating large covered industrial premises where it is essential to guarantee the thermal performance of the area and reduce inertia to a minimum. The insulating panel can be positioned directly on the rolled screed surface and fixed after the required sealing operations have been carried out.

This system is especially recommended when there is ground water in the subsoil or subsurface.

- > Excellent panel strength.
- > High performing thermal insulation
- > Reduced thermal inertia.
- > Quick and easy to install.

### System features

Panel:	Industry shaped
Piping:	PE-Xc diam.20-16
Manifold:	Top Control / Control
Overall dimensions:	15-20 cm
Application sector:	Industry



# Technical features

## INDUSTRIAL SHAPED PANEL code 1040240

Flooring type	Required distance		
Industrial flooring	15 - 20 cm		
		<b>FEATURES</b>	Thermal conductivity: 10 °C (UNI EN 12667) 0.033 W/(m·K)
			Compressive strength: 10% (UNI 826) 200 kPa
			Compressive strength: 5% (UNI 826) 180 kPa
			Compressive strength: 2% (UNI 826) 130 kPa
			Thermal resistance (UNI EN 13163) 0.80 (m <sup>2</sup> ·k)/W
			Total equivalent thickness (UNI EN 1264/3) 26.4 mm
			Temperature: range of use 70 °C
		<b>DIMENSIONS</b>	Length (UNI 822) mm 1170
			Width (UNI 822) mm 837
			Insulating thickness mm 20
Nominal thickness (UNI 823) mm 48			
Package	n. panels: 20 (20 m <sup>2</sup> ) – approx. weight: 20.5 kg		

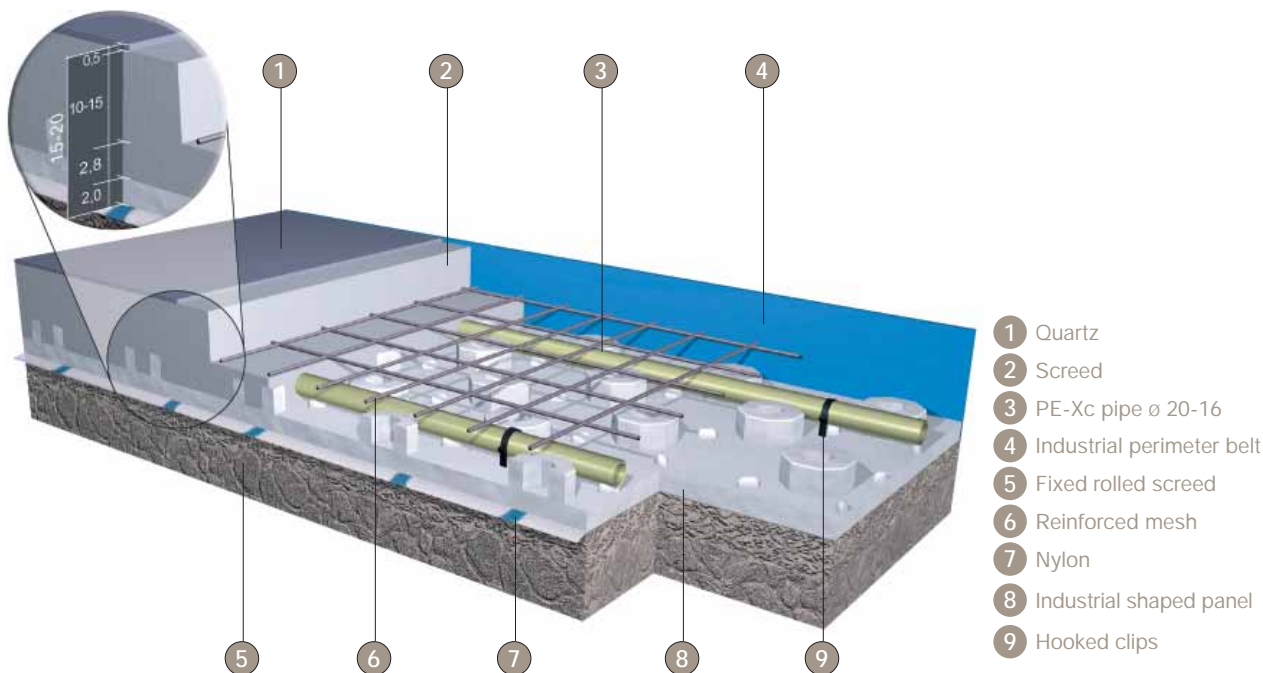
# PE-Xc pipe technical data sheet

Diameter 20		Outside diameter: (mm)	Thickness (mm)	Weight (kg/m)	PN a 20 °C	PN a 60 °C	PN a 95 °C	Water content: l/m
Pack	Code							
240 m	1012524	20	2	0.112	15 bar	10 bar	6 bar	0.20
600 m	1012560							

Features	Value	Unit of measur.	Rule
Standard			EN 15875
Density	940/950	Kg/m <sup>3</sup>	
Failure load at 20 °C	> 20	N/mm <sup>2</sup>	EN 60811-1
Modulus of elasticity at 20 °C	900	N/mm <sup>2</sup>	
Breaking strain at 20 °C	> 200	%	EN 60811-1
Thermal conductivity coefficient	0.35	W/(m·K)	
Oxygen permeability	OK		DIN 4726
Linear thermal expansion at 20 °C	1.4 ÷ 2·10 <sup>-4</sup>	m/(m·K)	



## Industrial Shaped System Section



- 1 Quartz
- 2 Screed
- 3 PE-Xc pipe ø 20-16
- 4 Industrial perimeter belt
- 5 Fixed rolled screed
- 6 Reinforced mesh
- 7 Nylon
- 8 Industrial shaped panel
- 9 Hooked clips

## System Components



### Industrial shaped panel 20

Expanded polystyrene panels produced in compliance with European standard UNI 13163; moulded as closed water resistant cells, with excellent mechanical strength. Thermal conductivity equivalent to 0.033 W/(m·K); insulating thickness of 20 mm; overall thickness 48 mm; total equivalent thickness of 26.4 mm; thermal resistance in accordance with EN 1264 of 0.80 (m<sup>2</sup>·K)/W. Tongue along the perimeter for optimal coupling; shaped surface raised of 28 mm for Ø 20-mm cross-linked polyethylene piping (8.3 cm).

Code	1040240
Dimensions	1170x837x20 mm
Pack	of m <sup>2</sup> 20

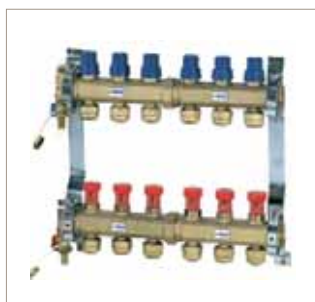


### RDZ Clima PE-Xc pipe ø 20-16

High-density electronically cross-linked polyethylene piping, complete with anti-oxygen barrier in compliance with DIN EN 15875 and DIN 4726, guaranteeing even stable cross-links and constant product characteristics during its lifespan.

Code	1012524
Pack	m 240

Code	1012560
Pack	m 600



### Preassembled Control manifold (d. 20)

Manufactured in brass for pipe distribution in buildings. Control manifolds are equipped with intercepting valves (suitable for electrothermal heads), micrometric lockshields with data labels to locate rooms, end fittings with ball air vent valves and ball waste valves with hose nozzles and plugs, brackets with rubber holders which can be installed into cabinets or fixed to the wall, and push-fit fittings for 20-16 polyethylene pipes.

Code 1153903	3+3
Code 1153904	4+4
Code 1153905	5+5
Code 1153906	6+6

Code 1153907	7+7
Code 1153908	8+8
Code 1153909	9+9
Code 1153910	10+10

Code 1153911	11+11
Code 1153912	12+12
Code 1153913	13+13



## External cabinet

Dust spray painted steel cabinet for Control and Top Control manifolds with 20-mm pipe joints for industrial systems. Depth 20 cm; height 80 cm. Open rear for post-system layout positioning and drilled holes for side entry; white dust spray painted door with lock.

<b>Code</b>	<b>1158075</b>
<b>lxhxd</b>	75x80x20 cm
<b>Manifold</b>	5 - 10 outlets
<b>Pack</b>	single
<b>Code</b>	<b>1158100</b>
<b>lxhxd</b>	100x80x20 cm
<b>Manifold</b>	11 - 13 outlets
<b>Pack</b>	single



## Industrial perimeter belt

Made of 100% closed-cell expanded polyethylene with an adhesive strip on one side for easy application. Thickness and height make it suitable for industrial systems. The main function of the industrial perimeter belt is to absorb any floor swelling and to provide thermal and acoustic insulation for the walls.

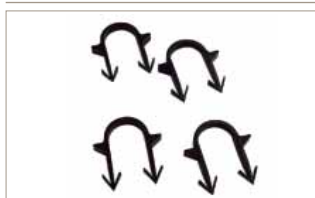
<b>Code</b>	<b>1071110</b>
<b>Thickness</b>	10 mm
<b>Height</b>	250 mm
<b>Length</b>	50 m (rolls)
<b>Colour</b>	blue



## Supporting elbows

Made of plastic, diameter 32 mm, with the dual purpose of both supporting in vertical position the pipes close to the manifolds and protecting them from potential knocks or damage.

<b>Code</b>	<b>1130032</b>
<b>Dimension Ø</b>	32 mm
<b>Pack</b>	single



## Hooked clips

Made of plastic and used to secure the pipe to the panel.

<b>Code</b>	<b>1017000</b>
<b>Pack</b>	100 items



## Humidity barrier sheet

RDZ branded polyethylene sheet; blue with a thickness of 0.18 mm. It is laid under the insulating panel in order to protect against moisture.

<b>Code</b>	<b>1901100</b>
<b>Pack</b>	to size
<b>Code</b>	<b>1901200</b>
<b>Pack</b>	100 m <sup>2</sup> rolls

### Manifold alternative



## Preassembled Top Control manifold (d. 20)

Manufactured in brass for pipe distribution in buildings. Top Control manifolds are equipped with flow meters, temperature control and self cleaning for each individual circuit, including initial pipe connection with inflow and counterflow (0-60°C) thermometer and pockets, intercepting valves (suitable for electrothermal heads), micrometric lockshields with data labels to locate rooms, end fittings with ball air vent valves and ball waste valves with hose nozzles and plugs, brackets with rubber holders which can be installed into cabinets or fixed to the wall, and push-fit fittings for Ø 20-16 polyethylene pipes.

<b>Code 1153803</b>	3+3
<b>Code 1153804</b>	4+4
<b>Code 1153805</b>	5+5
<b>Code 1153806</b>	6+6

<b>Code 1153807</b>	7+7
<b>Code 1153808</b>	8+8
<b>Code 1153809</b>	9+9
<b>Code 1153810</b>	10+10

<b>Code 1153811</b>	11+11
<b>Code 1153812</b>	12+12
<b>Code 1153813</b>	13+13



## Modulbarra System

RDZ MODULBARRA industrial system is recommended for the heating of warehouses and industrial premises where it is necessary to optimise screed compressive strength.

The system includes modular metal bars with plastic mounting clips to fix the heating pipes. The bars can be positioned directly onto the rolled screed and fixed into position after the required sealing operations have been carried out, or simply onto an insulating layer.

- > High strength screed.
- > Easy installation.



### System features

Panel:	Smooth extruded
Support	'Modulbarra'
Piping:	PE-Xc, diam. 20-16
Manifold:	Top Control / Control
Overall dimensions:	15-20 cm
Application sector:	Industry





# Technical features

		SMOOTH EXTRUDED INSULATING PANEL			
		code 1030230		code 1030330	
Flooring type	Required distance				
Industrial flooring	15 - 20 cm				
FEATURES	Thermal conductivity: 10°C	(UNI EN 12667)	0.032 W/(m·K)	0.033 W/(m·K)	
	Compressive strength: 10%	(UNI 826)	200 kPa	300 kPa	
	Fire behaviour	(DIN 4102)	Class B1	Class B1	
	Reaction-to-fire	(EN 13501/1)	Class E	Class E	
	Thermal resistance	(UNI EN 13163)	0.60 (m²·k)/W	0.90 (m²·k)/W	
	Total equivalent thickness	(UNI EN 1264/3)	20 mm	30 mm	
	Temperature: range of use		75 °C	75 °C	
DIMENSIONES	Length	(UNI 822)	mm 1250	mm 1250	
	Width	(UNI 822)	mm 600	mm 600	
	Insulating thickness		mm 20	mm 30	
	Package	n. panels approximate weight	20 (15 m²) Kg 10.6	15 (11.5 m²) Kg 10.3	

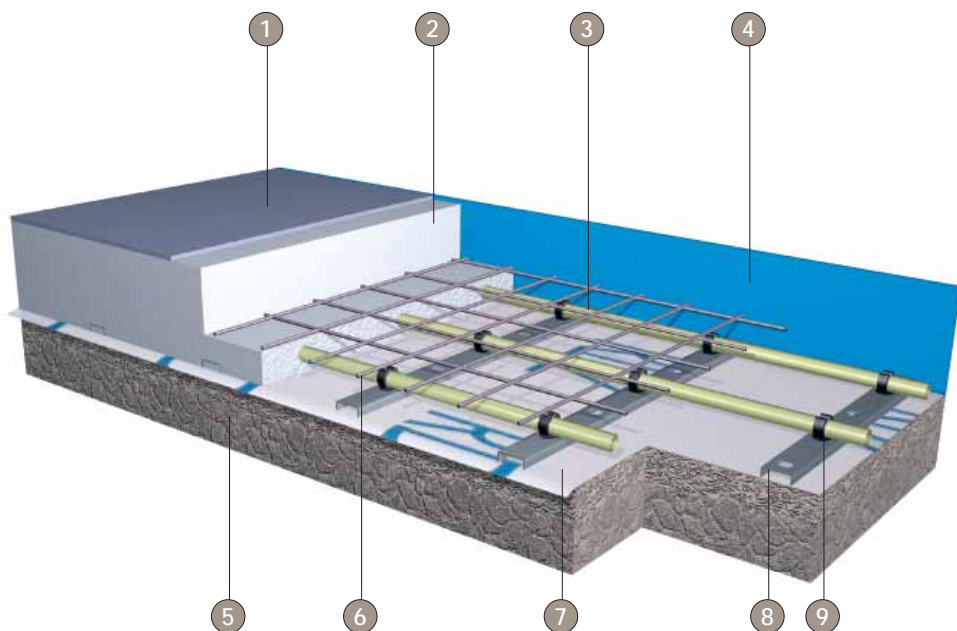
## PE-Xc pipe technical data sheet

Diameter 20		Outside diameter (mm)	Thickness (mm)	Weight (kg/m)	PN a 20 °C	PN a 60 °C	PN a 95 °C	Water content: l/m
Pack	Code							
240 m	1012524	20	2	0.112	15 bar	10 bar	6 bar	0.20
600 m	1012560							

Features	Value	Unit of measu.	Rule
Standard			EN 15875
Density	940/950	Kg/m³	
Failure load at 20 °C	> 20	N/mm²	EN 60811-1
Modulus of elasticity at 20 °C	900	N/mm²	
Breaking strain at 20 °C	> 200	%	EN 60811-1
Thermal conductivity coefficient	0.35	W/(m·K)	
Oxygen permeability	OK		DIN 4726
Linear thermal expansion at 20 °C	1.4 ÷ 2·10 <sup>-4</sup>	m/(m·K)	



## Modulbarra System Section



- 1 Quartz
- 2 Screed
- 3 PE-Xc pipe: 20-16
- 4 Industrial perimeter belt
- 5 Fixed rolled screed
- 6 Reinforced mesh
- 7 Nylon
- 8 Modulbarra
- 9 Duoclips

## System Components



### Modulbarra

Modular metal bar, preholed in order to house duoclip fasteners. The bars function as a support for pipes, therefore allowing the use of the same 8.3-cm pitch. Ideal solution for industrial systems. Bar length: 2 m.

Code	1062000
Pack	2 m



### RDZ Clima PE-Xc pipe Ø 20-16

High-density electronically cross-linked polyethylene piping, complete with anti-oxygen barrier in compliance with DIN EN 15875 and DIN 4726, guaranteeing even stable cross-links and constant product characteristics during its lifespan. Diameter 20 mm - Thickness 2 mm.

Code	1012524
Pack	m 240
Code	1012560
Pack	m 600



### Preassembled RDZ Control manifold (d. 20)

Manufactured in brass for pipe distribution in buildings. Control manifolds are equipped with intercepting valves (suitable for electrothermal heads), micrometric lockshields with data labels to locate rooms, end fittings with ball air vent valves and ball waste valves with hose nozzles and plugs, brackets with rubber holders which can be installed into cabinets or fixed to the wall, and push-fit fittings for Ø 20-16 polyethylene pipes.

Code 1153903	3+3	Code 1153907	7+7	Code 1153911	11+11
Code 1153904	4+4	Code 1153908	8+8	Code 1153912	12+12
Code 1153905	5+5	Code 1153909	9+9	Code 1153913	13+13
Code 1153906	6+6	Code 1153910	10+10		

## System components



### External cabinet

Dust spray painted steel cabinet for Control and Top Control manifolds with 20-mm pipe joints for industrial systems. Depth 20 cm; height 80 cm. Open rear for post-system layout positioning and drilled holes for side entry; white dust spray painted door with lock.

<b>Code</b>	<b>1158075</b>
<b>lxhxd</b>	75x80x20 cm
<b>Manifolds</b>	5 - 10 outlets
<b>Pack</b>	single
<b>Code</b>	<b>1158100</b>
<b>lxhxd</b>	100x80x20 cm
<b>Manifolds</b>	11 - 13 outlets
<b>Pack</b>	single



### Industrial perimeter belt

Made of 100% closed-cell expanded polyethylene with an adhesive strip on one side for easy application. Thickness and height make it suitable for industrial systems. The main function of the industrial perimeter belt is to absorb any floor swelling and to provide thermal and acoustic insulation for the walls.

<b>Code</b>	<b>1071110</b>
<b>Thickness</b>	10 mm
<b>Height</b>	250 mm
<b>Length</b>	50 m (rolls)
<b>Colour</b>	blue



### Supporting elbows

Made of plastic, diameter 32 mm, with the dual purpose of both supporting in vertical position the pipes close to the manifolds and protecting them from potential knocks or damage.

<b>Code</b>	<b>1130032</b>
<b>Dimensions Ø</b>	32 mm
<b>Pack</b>	single



### Duoclips

Plastic clips used to fix the pipe to the "Modulbarra".

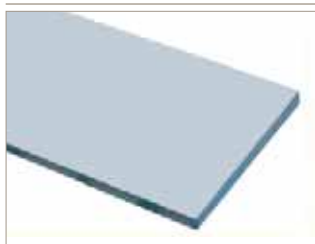
<b>Code</b>	<b>1016000</b>
<b>For pipe Ø</b>	17 mm
<b>Pack</b>	500 items
<b>Code</b>	<b>1016020</b>
<b>For pipe Ø</b>	20 mm
<b>Pack</b>	500 items



### Humidity barrier sheet

RDZ branded polyethylene sheet; blue with a thickness of 0.18 mm. It is laid under the insulating panel in order to protect against moisture.

<b>Code</b>	<b>1901100</b>
<b>Pack</b>	to size
<b>Code</b>	<b>1901200</b>
<b>Pack</b>	100 m <sup>2</sup> rolls



### Smooth extruded insulating panel

Insulating panels made of extruded expanded polystyrene, produced with eco-friendly gas (CFC and HCFC free) in compliance with European regulations EC 2037/2000. They have a closed-cell structure, with European Class E fire behaviour. Insulating thickness of 20-30 mm; 200-300 kPa compressive strength with 10% deformation according to EN 826, and thermal conductivity of 0.032/0.033 W (m·K).

<b>Code</b>	<b>1030230</b>
<b>Thickness</b>	20 mm
<b>Dimensions</b>	1250x600x20 mm
<b>Pack</b>	15 m <sup>2</sup>
<b>Code</b>	<b>1030330</b>
<b>Thickness</b>	30 mm
<b>Dimensions</b>	1250x600x30 mm
<b>Pack</b>	11.5 m <sup>2</sup>

### Manifold alternative



### Preassembled Top Control manifold (d. 20)

Manufactured in brass for pipe distribution in buildings. Top Control manifolds are equipped with flow meters, temperature control, and self cleaning, for each individual circuit, including initial pipe connection with inflow and counterflow (0-60°C) thermometer and pockets, intercepting valves (suitable for electrothermal heads), micrometric lockshields with data labels to locate rooms, end fittings with ball air vent valves and ball waste valves with hose nozzles and plugs, brackets with rubber holders which can be installed into cabinets or fixed to the wall, and push-fit fittings for ø 20-16 polyethylene pipes.

<b>Code 1153803</b>	3+3	<b>Code 1153807</b>	7+7	<b>Code 1153811</b>	11+11
<b>Code 1153804</b>	4+4	<b>Code 1153808</b>	8+8	<b>Code 1153812</b>	12+12
<b>Code 1153805</b>	5+5	<b>Code 1153809</b>	9+9	<b>Code 1153813</b>	13+13
<b>Code 1153806</b>	6+6	<b>Code 1153810</b>	10+10		



## Industry System: industrial solutions

RDZ INDUSTRY SYSTEM is the ideal system for large-scale industrial applications. Its special feature lies in the use of 25-mm diameter PE-Xa piping and 2"-diameter stainless steel manifolds. The system can be positioned directly onto the rolled screed after the required sealing operations have been carried out, or simply onto an insulating layer (smooth panels or insulating casting). INDUSTRY SYSTEM is particularly suitable for heating large areas with a limited number of circuits, and consequently, fewer manifolds.

- > Simplified manifold positioning.
- > Reduced installation costs.
- > High-performance screed strength.



### System features

Panel:	Smooth extruded
Support:	6-mm metal wire mesh
Piping:	PE-Xc, diam. 25-20.4
Manifold:	2" Industry System
Overall dimensions:	> 15 cm
Application sector:	Industry



# Technical features

		SMOOTH EXTRUDED INSULATING PANEL		
		code 1030230	code 1030330	
Flooring type	Required distance			
Industrial flooring	> 15 cm			
FEATURES	Thermal conductivity: 10°C	(UNI EN 12667)	0.032 W/(m·K)	0.033 W/(m·K)
	Compressive strength: 10%	(UNI 826)	200 kPa	300 kPa
	Fire behaviour	(DIN 4102)	Class B1	Class B1
	Reaction-to-fire	(EN 13501/1)	Class E	Class E
	Thermal resistance	(UNI EN 13163)	0.60 (m <sup>2</sup> ·k)/W	0.90 (m <sup>2</sup> ·k)/W
	Total equivalent thickness	(UNI EN 1264/3)	20 mm	30 mm
	Temperature: range of use		75 °C	75 °C
DIMENSIONS	Length	(UNI 822)	mm 1250	mm 1250
	Width	(UNI 822)	mm 600	mm 600
	Insulating thickness		mm 20	mm 30
	Package	n. panels approximate weight	20 (15 m <sup>2</sup> ) Kg 10.6	15 (11.5 m <sup>2</sup> ) Kg 10.3

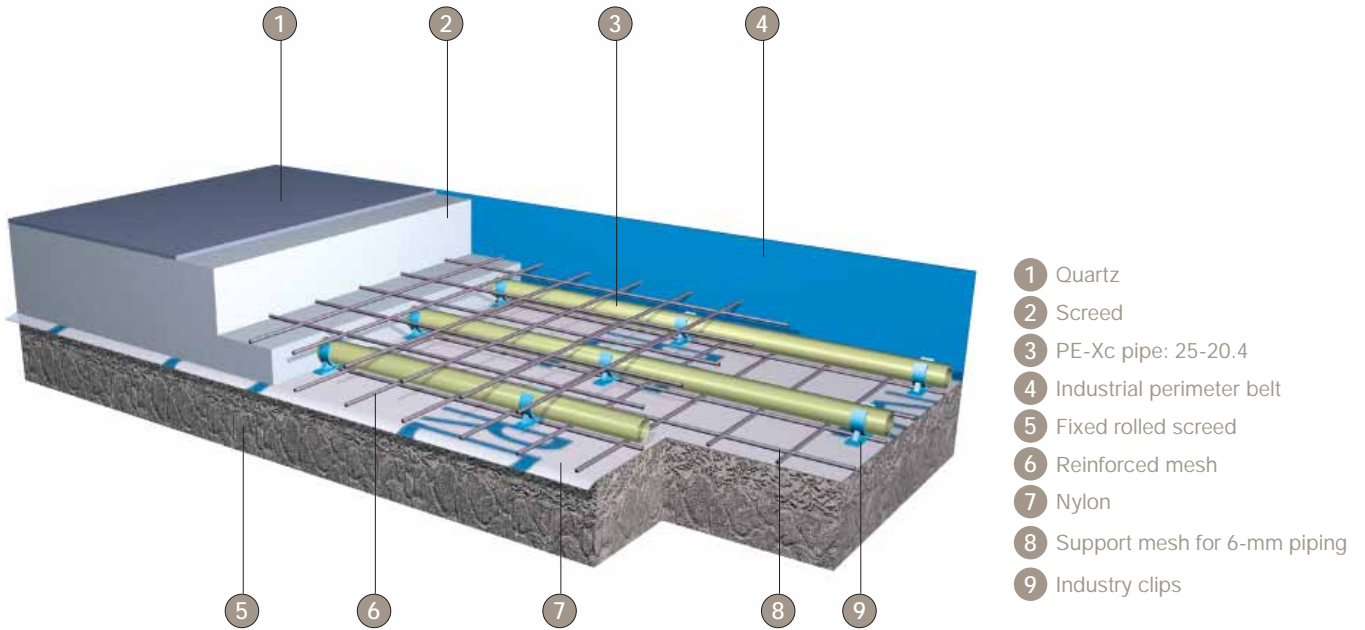
## PE-Xc pipe technical data sheet

Diameter 25		Outside diam. (mm)	Thickness (mm)	Weight (kg/m)	PN a 20 °C	PN a 60 °C	PN a 95 °C	Water content l/m
Pack	Code							
200 m	1013520	25	2.3	0.165	15 bar	10 bar	6 bar	0.32
600 m	1013560							

Features	Value	Unit of measur.	Rule
Standard			EN 15875
Density	935	Kg/m <sup>3</sup>	
Failure load at 20 °C	40	N/mm <sup>2</sup>	EN 60811-1
Modulus of elasticity at 20 °C	400	N/mm <sup>2</sup>	
Breaking strain at 20 °C	> 400	%	EN 60811-1
Thermal conductivity coefficient	0.40	W/(m·K)	
Oxygen permeability	OK		
Linear thermal expansion at 20 °C	1.4 ÷ 2·10 <sup>-4</sup>	m/(m·K)	



## Industry System Section



- 1 Quartz
- 2 Screed
- 3 PE-Xc pipe: 25-20.4
- 4 Industrial perimeter belt
- 5 Fixed rolled screed
- 6 Reinforced mesh
- 7 Nylon
- 8 Support mesh for 6-mm piping
- 9 Industry clips

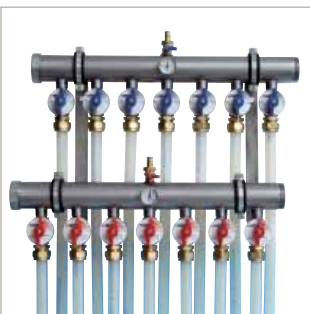
## System components



### RDZ Clima PE-Xa pipe

High-density polyethylene piping, electronically cross-linked through "a" process, complete with anti-oxygen barrier in compliance with DIN EN 16892 and DIN 4726, guaranteeing even stable cross-links and constant product characteristics during its lifespan.  
Diameter 25 mm - Thickness 2.3 mm.

Code	1013520
Pack	m 200
Code	1013560
Pack	m 600



### Industry System manifolds

2-inch RDZ Industry System stainless steel manifolds to distribute 25-mm pipes in warehouses. The system includes interception ball valves and regulation valves, an air vent cock and a load cock, inflow and counterflow thermometers (0-60 °C), and fittings for 25-mm pipes.

Code 1145005	5+5	Code 1145009	9+9	Code 1145013	13+13
Code 1145006	6+6	Code 1145010	10+10	Code 1145014	14+14
Code 1145007	7+7	Code 1145011	11+11	Code 1145015	15+15
Code 1145008	8+8	Code 1145012	12+12		



### Industry System manifolds

Galvanised steel brackets for Industry System manifolds, with dished head and equipped with clips and anti-vibration rubber mount.

Code	1141000
Pack	1 pair

## System components



### External cabinet

Dust spray painted steel cabinet for Control and Top Control manifolds with 25-mm pipe joints for industrial systems. Depth 20 cm; height 80 cm. Open rear for post-system layout positioning and drilled holes for side entry; white dust spray painted door with lock.

<b>Code</b>	<b>1158075</b>
<b>lxhxd</b>	75x80x20 cm
<b>Manifolds</b>	5 - 7 outlets
<b>Pack</b>	single

<b>Code</b>	<b>1158100</b>
<b>lxhxd</b>	100x80x20 cm
<b>Manifolds</b>	8 - 11 outlets
<b>Pack</b>	single



### Industrial perimeter belt

Made of 100% closed-cell expanded polyethylene with an adhesive strip on one side for easy application. Thickness and height make it suitable for industrial systems.

The main function of the industrial perimeter belt is to absorb any floor swelling and to provide thermal and acoustic insulation for the walls.

<b>Code</b>	<b>1071110</b>
<b>Thickness</b>	10 mm
<b>Height</b>	250 mm
<b>Length</b>	50 m (rollos)
<b>Colour</b>	blue



### Industry system elbow

Made of plastic for 25-mm pipes, with the dual purpose of both supporting in vertical position the pipes close to the manifolds and protecting them from potential knocks or damage.

<b>Code</b>	<b>1140025</b>
<b>Pack</b>	single



### Industry Clips

Mounting clips for 25-mm pipes in plastic and designed to support the pipe on a 6-mm electrowelded mesh.

<b>Code</b>	<b>1140625</b>
<b>Dimension Ø</b>	25 mm for wire 6 mm
<b>Pack</b>	50 m (rolls)

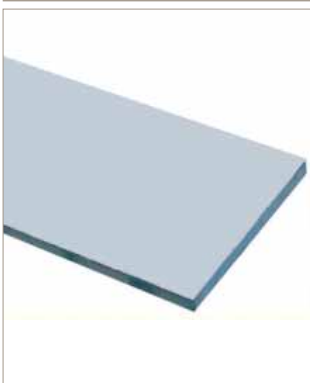


### Humidity barrier sheet

RDZ branded polyethylene sheet; blue with a thickness of 0.18 mm. It is laid under the insulating panel in order to protect against moisture.

<b>Code</b>	<b>1901100</b>
<b>Pack</b>	to size

<b>Code</b>	<b>1901200</b>
<b>Pack</b>	100 m <sup>2</sup> rolls



### Smooth extruded insulating panel

Insulating panels made of extruded expanded polystyrene, produced with eco-friendly gas (CFC and HCFC free) in compliance with European regulations EC 2037/2000. They have a closed-cell structure, with European Class E fire behaviour. Insulating thickness of 20-30 mm; 200-300 kPa compressive strength with 10% deformation according to EN 826; and thermal conductivity of 0.032/0.033 W (m\*K).

<b>Code</b>	<b>1030230</b>
<b>Thickness</b>	20 mm
<b>Dimensiones</b>	1250x600x20 mm
<b>Pack</b>	15 m <sup>2</sup>

<b>Code</b>	<b>1030330</b>
<b>Thickness</b>	30 mm
<b>Dimensiones</b>	1250x600x30 mm
<b>Pack</b>	11.5 m <sup>2</sup>



# Reference Projects.



Industrial warehouse of 10,000 m<sup>2</sup>

RDZ underfloor heating employing industrial shaped system





# Reference Projects.



Industrial building of 5,500 m<sup>2</sup>

RDZ underfloor heating employing  
'Modulbarra' system



# Reference Projects.



Industrial warehouse of 7,500 m<sup>2</sup>

RDZ underfloor heating employing  
Industry System





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