

# plastherm®

*Technical Catalogue*



## Company Profile

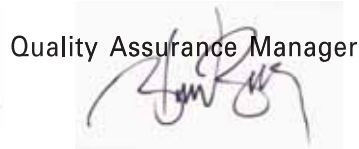
Plastherm has been the leader in the sector for over 12 years, producing PEX pipes with highest German technology agreeable to German DIN 16892-16893 standarts.

Our major concern has always been the quality and enviromentally harmless and non-polluting products, as well a satisfying customer service even after the sales.

Exporting our products to more that 27 countries throughout the world, our vision is to expand and offer this quality and safety to many as we can.

Hoping that this catalogue will be a bright guideline for you to overview our company, our products, application areas, our quality and hygiene standarts, we would like to thank you for choosing PLASTHERM quality and service. We are looking for perfectionism...

  
General Manager

  
Quality Assurance Manager

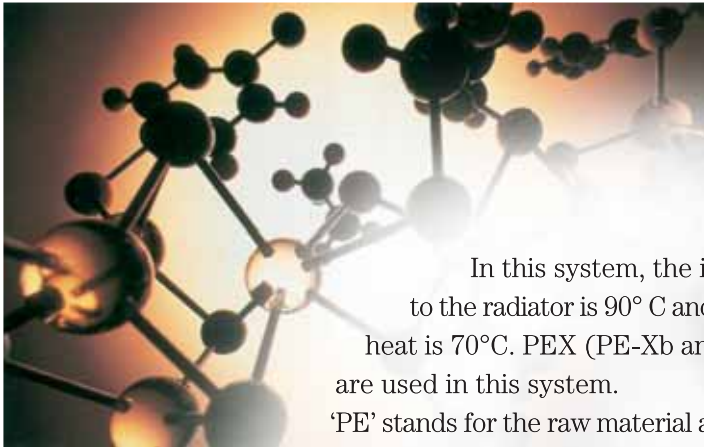


*A view of our production plant*

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## 1. PEX Cross-Link System



In this system, the incoming heat to the radiator is 90° C and the outgoing heat is 70°C. PEX (PE-Xb and Pe-Xc) pipes are used in this system.

'PE' stands for the raw material and 'X' indicates the cross linkage. PEX means cross-linked polyethylene. In this manner, a three dimensional molecular formation is achieved.

The main principle in cross-linking is to connect the Carbon atoms at the two polyethylene chains which normally stands individually. Cross-link system maintains high temperature and pressure resistancy for the pipes.



1. PEX Cross-Link System

## 2. PEX Types

Types regarding the cross-linkage and the density of the cross-links.

Standard	PEX Type	Definition	Cross link density
DIN16892	PE-Xa	Pipes cross-linked with peroxide	75%
DIN16892	PE-Xb	Pipes cross-linked with hydrosilicon	65%
DIN16892	PE-Xc	Pipes cross-linked with radiation (electron bombing)	60%
DIN16892	PE-Xd	Pipes cross-linked with azo	60%

### 2.1. PE-Xa PIPES

Formed with the peroxide that is mixed into the raw material during the extrusion. Peroxide is the chemical that is activated by heat and forms free radicals for the cross-link. These kind of pipes are called PE-Xa cross-link pipes.

### 2.2. PE-Xb PIPES

Pipes are connected crossly to the polyethylene Xylan with hydrosilicon during and after the process. These kind of pipes are called PE-Xb cross-link pipes.

### 2.3. PE-Xc PIPES

Radiation (electron bombarding) is applied to the polyethylene to maintain cross-linked chains. These kind of pipes are called PE-Xc cross-link pipes.

### 2.4. PE-Xd PIPES

The pipes that are maintained by cross linking the chains at the Azo (nitro-amine) environment are called PE-Xd cross-link pipes.

As being defined by the same standarts, all PEX pipes are proper functionally regardless of the production style. However depending on the cross- link method some differences are observed.

DIN 16892, DIN 16893 standarts defined the required cross-link density depending on the cross-link method. The higher cross-link density increases the material's strength. That helps it to be resistant to higher pressure and temperatures.

## 3. Advantages

- Munting is easy and fast, labour cost is low.
- PEX pipes that pass through protective sheath may be replaced in case of a failure.
- Resistant to high temperature and pressure.
- Strong resistance against stokes at low temperatures.
- Long lasting
- Odour free and silent
- Resistant to chemical substances
- Does not affected from acids and bases.
- No calcification and corrosion
- Hygenic
- Low friction coefficient
- Flexible



## 4. Application Areas



- Floor heating systems
- Central heating units
- Snow melting applications
- It is mainly used safely in each hot and cold water systems applications.

Basic points to be considered in order to have safe and problem free mounting

- Take in consideration of replacement in case of failure and mount horizontally and avoid the sharp twists while mounting.
- To avoid the damage from the metals like screw thread, remember to mark the pipe's coordinates that go through a closed area.
- Install the pipes at temperature that is over the freezing point.
- In order to avoid rust or powder get into the pipes, keep the ends closed until the installation is finished.
- Keep the conjunction points open in order to make adjustments
- Do not cover the system until the tests are proceeded
- Do not expose pipes to direct sunlight.
- Pass a protective sheath under the alum. This protective sheath will also act like an airbag and help heat isolation.
- Be careful of protection sheath being in spiral form in order not to cause cross section narrowing.

In order to determine the incoming and outgoing water directions, use red protective sheath for hot water and blue for cold water.



## 5. Technical Data

### 5.1. PEX Pipe Technical Properties

Property	Temp.	Standart	Value	Unit
Density		DIN1872	0.94	g/cm <sup>3</sup>
Breaking off Resistance	20°C	DIN 53455	290-300	kg/cm <sup>3</sup>
Impact Strenght		DIN 53453	No break	m.J.mm <sup>-2</sup>
Breaking off Elongation	20°C	DIN 53455	300-350	%
	100°C	DIN 53455	500-600	%
Elasticity Module		DIN 53457	600	N/mm <sup>2</sup>
Surface Resistancy		DIN 53453	Ω	>10 <sup>12</sup>
Operating Temperature			-100°C+100°C	°C
Linear expansion coefficient	20°C	DIN 53752	1.4 X 10 <sup>-4</sup>	°C
	100°C	DIN 53752	2.5 X 10 <sup>-4</sup>	°C
Softening Temperature			135	°C
Heat Conductivity		DIN 52612 Pr1	0.41	W.K <sup>-1</sup> .m <sup>-1</sup>
Specific Heat			0.50	Cal/gr

### 5.2. Operating Pressure Table

Outer Diameter	PN 12,5		PN 20	
	Thickness	kg/m	Thickness	kg/m
16	1,8	0,083	2,2	0,098
20	1,9	0,111	2,8	0,153
25	2,3	0,169	3,5	0,238
32	2,9	0,268	4,4	0,382
40	3,7	0,425	5,5	0,594
50	4,6	0,659	6,9	0,926
63	5,7	1,03	8,7	1,47
75	6,8	1,45	10,3	2,07
90	8,2	2,1	12,4	2,98
110	10	3	15,1	4,44



**5.3. Long - Term Behaviour**

Behaviour Plastherm of PE-X According to DIN 16892 Under Long-term Stressing

The service life of Plastherm PE-X depends on the internal hoop stress over time subject to the temperature. Hoop Stress is given as follow:

$$\delta = \frac{Px[ds]}{20xs}$$

Where  
 $\delta$  = hoop stress [N/mm<sup>2</sup> or MPa]  
 P = Internal Pressure (Bar)  
 d = Outer Diameters of Pipe (mm)  
 s = Wall Thickness of pipe (mm)

**Permissible Working Pressure Of Plastherm PEX Pipes (DIN 16893)**

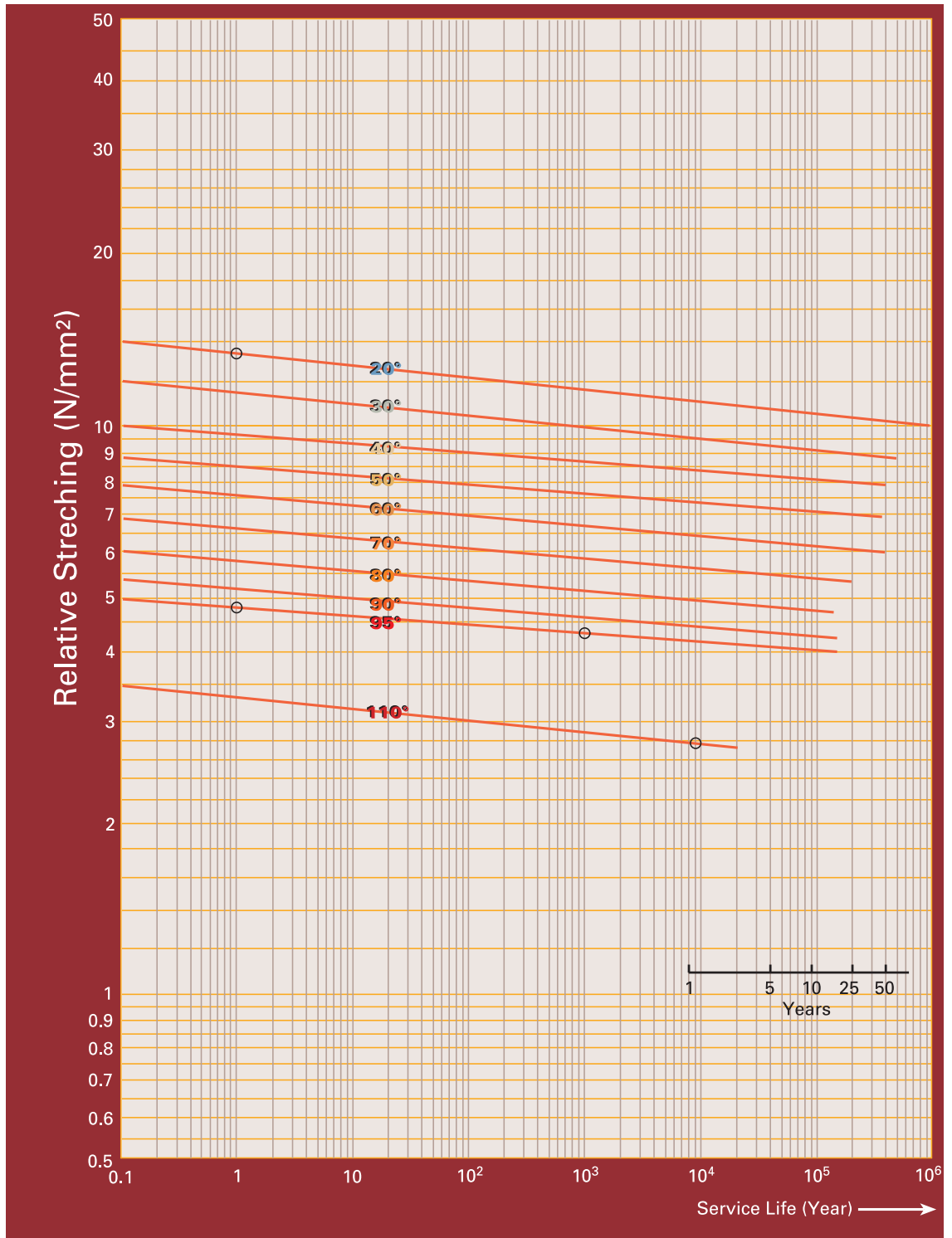
Service life (year)	Temperature (°C)	Pressure rating (Bar)	
		PN 12.5	PN 20
1	20	13.7	21.7
10	20	13.2	21.0
50	20	12.5	20.0
1	40	11.0	17.5
10	40	10.7	16.9
50	40	10.4	16.5
1	60	8.7	13.8
10	60	8.3	13.1
50	60	8.1	12.9
1	95	5.7	9.0
10	95	5.4	8.6
50	95	5.3	8.2

PN 12.5, hot water pipe, transporting water at a temperature of 95°C can last for more than 50 years under normal conditions with an operating pressure of 5.3 Bars

PN 20, hot water pipe, transporting water at a temperature of 95°C can last for more than 50 years under normal conditions with an operating pressure of 8.2 Bars



5.4. The Life Duration of The PEX Pipes



6. Certificates

6. Certificates



## 7. PPR-C Floor Heating System

Floor heating is the most suitable heating technique as it is economical and as it complies well with human health and heating techniques.

Unlike other heating techniques it works at low degrees like 50-60°C and maintains a homogenous heat disintegration in the residences.



In the floor heating systems, Polypropylene Random Copolymer (PPR-C) pipes are used

## 8. Advantages

The comfort heat in the environment is the arithmetical mean of the average heat of the wall's inner surface heat and the heat of the environment. In floor heating, as the walls are heated homogeneously and as the heat difference is rather low, the comfort heat is easy to achieve.

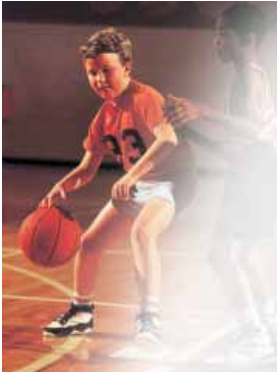
In floor heating the heat loss from the ceiling is also not a matter of discussion contrary to other systems because the heat is not collected at the ceiling. It is not harmful for human health as surface heat does not exceed 24°C. The floor being warm results in healthy and comfortable heating.

The other advantage is saving space as the floor heating system does not have visible unesthetic material parts like connectors, mounting pipe, radiator, etc. which narrows the interior.

The transport and the mounting of the floor heating pipes are easy. No regular care is necessary as no corrosion, rust, diameter contraction and calcification occurs. It provides more economical heating as it has more energy conservation considering other systems



## 9. Application Areas

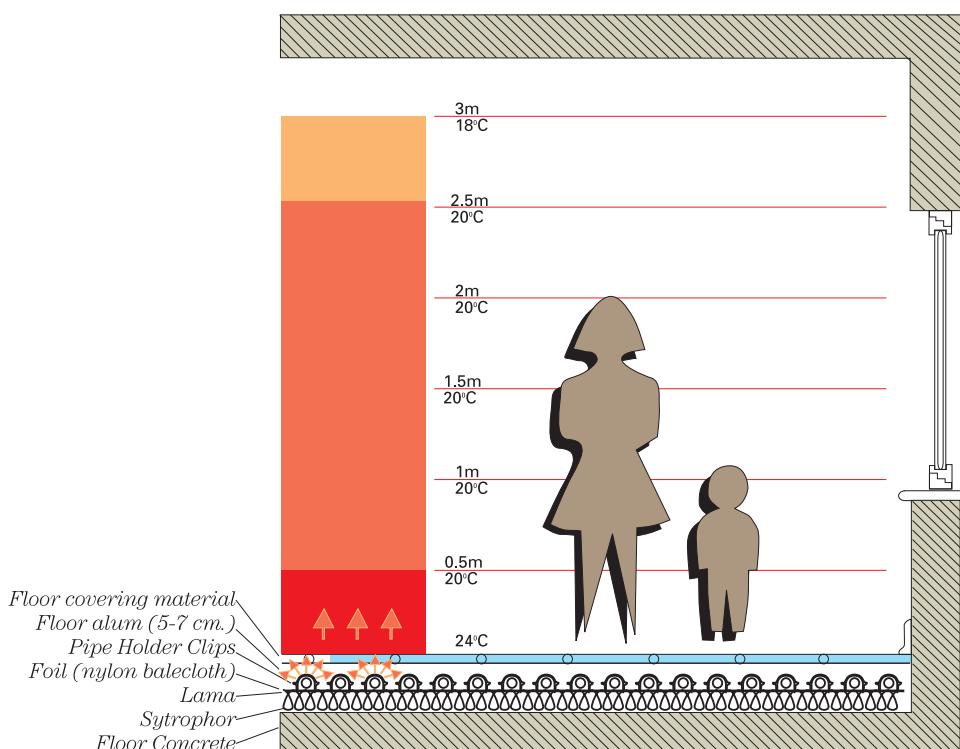


- Residences
- Villadom
- Schools
- Crèches
- Hospitals
- Laboratories
- Factories
- Greenhouses
- Public Baths
- Saunas
- Swimming Pools

It mainly can be used in places where dust circulation and sterility is required.

## 10. Application Prpcess

Insulator sytrophor is spreaded over the refined concrete. The sytrophor on the floor is covered up with nylon balecloth. After the best fit lamas for the floor form is fixed, pipe holder clips whose appropriateness for the modulation is previously calculated are attached to lamas. The floor heating pipes are mounted suitably ve pipes are connected to the collector. The important next step required is to perform the pressure tests and only after that covering the pipes with alum and floor paving.



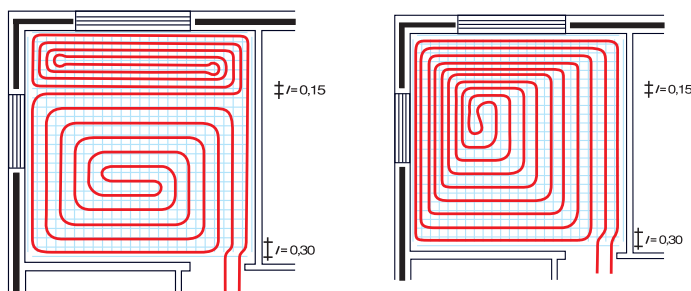
### 11. Application Modules

In these systems, application modules are of first rate importance to achieve the optimum heat.

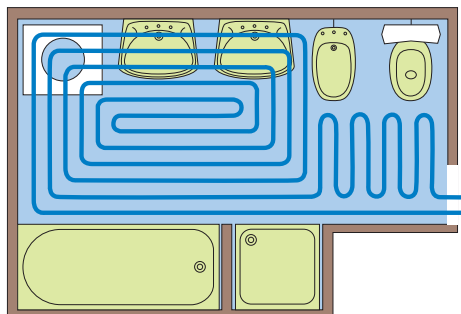
If modulations are to be nourished from the same source pipe, the water heat and flow balance must be well considered. The incoming water should first be addressed to multi piped modulations or the parts that has outer wall surfaces and/or windows. To obtain this multiple or different modulations can be applied within one room.



### 12. Modulation Examples



As shown in the picture the heating pipes are mounted with dense modules that oncomes to the windows. In that way, the cold coming from the window or outer wall is prevented. The pipes that are floored in helixes help to maintain the same temperature for every point in the room.

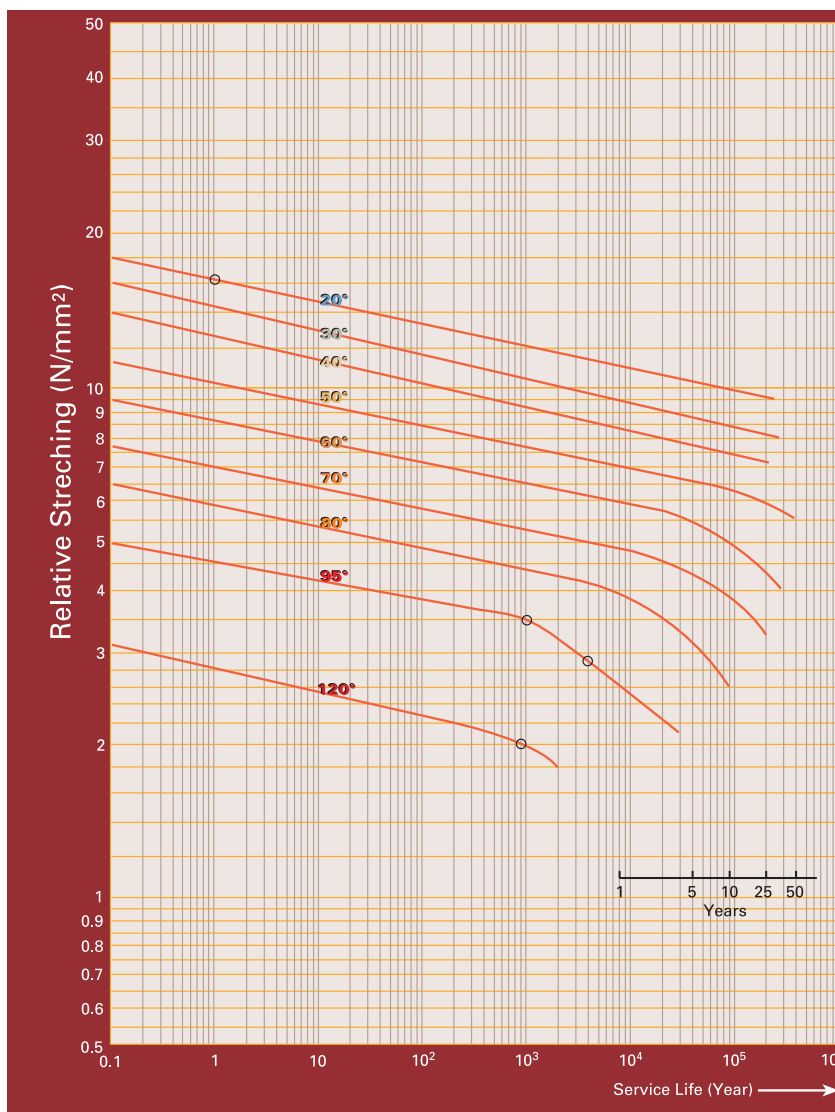


In bathrooms, the heating pipes should not be mounted under the bath tub or under closet. They might come to harm during mounting and heating.

**13. Technical Specifications of the PPR-C pipes**

S/N	Specification	Result
1	Usage heat temperature	60°C - 50°C
2	Homogeneity	0,02 mm <sup>2</sup>
3	Melting flow rate	1,2 g/10 min.
4	Oxigen permeability	0,10 g/m <sup>3</sup> X D <sub>0</sub>
5	Bending ratio	808 MPA
6	Pressure usage	10 Bar
7	Linear expansion coefficient	1.5 X 10 <sup>-4</sup> k <sup>-1</sup>
8	Softening heat	135°C
9	Technical conductivity	0.24 Wk <sup>-1</sup> m <sup>-1</sup>
10	Density	0.900 gr/cm <sup>3</sup>
11	Elasticity module	800 N/m <sup>2</sup>

**13.1. The Life Duration of The PPR-C Pipes**



13. Technical Specifications of the PPR-C pipes

**14. Our Products**

**PPR-C FLOOR HEATING PIPE**



Code	Measure	Rollo
C0101	16x1.8 mm	100
C0102	16x2.0 mm	100
C0103	16x2.2 mm	100
C0104	16x2.3 mm	100
C0105	17x1.8 mm	100
C0106	17x2.0 mm	100
C0107	18x2.0 mm	100
C0108	18x2.5 mm	100
C0109	20x1.9 mm	100
C0110	20x2.0 mm	100
C0111	20x2.8 mm	100

**PE-Xb CROSS - LINK PIPE**



Code	Measure	Rollo
C0201	16x1.8 mm	100
C0202	16x2.0 mm	100
C0203	16x2.2 mm	100
C0204	16x2.3 mm	100
C0205	17x1.8 mm	100
C0206	17x2.0 mm	100
C0207	18x2.0 mm	100
C0208	18x2.5 mm	100
C0209	20x1.9 mm	100
C0210	20x2.0 mm	100
C0211	20x2.8 mm	100
C0212	25x2.3 mm	50
C0213	25x3.5 mm	50
C0214	32x2.9 mm	50
C0215	32x3.0 mm	50
C0216	32x4.4 mm	50

**PE-Xc CROSS - LINK PIPE**



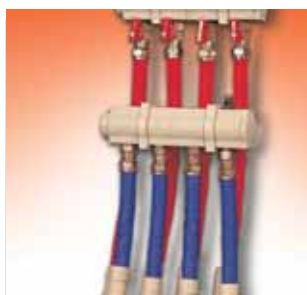
Code	Measure	Rollo
C0301	16x1.8 mm	140
C0302	16x2.0 mm	140
C0303	16x2.2 mm	140
C0304	16x2.3 mm	140
C0305	17x1.8 mm	100
C0306	17x2.0 mm	100
C0307	18x2.0 mm	100
C0308	18x2.5 mm	100

**SPIRAL HOSE**



Code	Measure	Rollo
C0401	24 mm (Blue)	100
C0402	24 mm (Red)	100

**PPR MANIFOLD**



Code	Measure	Box
C0501	1 OUTLET	1
C0502	2 OUTLET	1
C0503	3 OUTLET	1
C0504	4 OUTLET	1
C0505	5 OUTLET	1
C0506	6 OUTLET	1
C0507	7 OUTLET	1
C0508	8 OUTLET	1
C0509	9 OUTLET	1
C0510	10 OUTLET	1
C0511	11 OUTLET	1
C0512	12 OUTLET	1

**PE-Xb OXYGEN BARRIER PIPE**



Code	Measure	Rollo
C5001	16x2.0 mm	100
C5002	16x2.2 mm	100
C5003	17x2.0 mm	100
C5004	18x2.0 mm	100
C5005	20x2.0 mm	100
C5006	20x2.8 mm	100

**MINI VALVE**



Code	Measure	Box
C0601	1/2" 16x2 mm	100
C0602	1/2" 17x2 mm	100

**STRAIGHT NIPPLE FEMALE**



Code	Measure	Box
C0701	16X1/2	125
C0702	18X1/2	125
C0703	20X1/2	75
C0704	20X3/4	75

**STRAIGHT NIPPLE MALE**



Code	Measure	Box
C0801	16X1/2	125
C0802	18X1/2	125
C0803	20X1/2	75
C0804	20X3/4	75

**ROD CONNECTOR (One Way)**



Code	Measure	Box
C0901	1/2" x16	100

**ROD PIPE CONNECTOR**



Code	Measure	Box
C1001	1/2" x16	100

**AIR -OUT (Mechanical)**



Code	Measure	Box
C1101	1/4"	24

**BRASS- EXTENSION ROD**



Code	Measure	Box
C1201	H 40 cm-15-1 mm	10
C1202	H 60 cm-15-1 mm	10
C1203	H 90 cm-15-1 mm	10

**BY-PASS COLLECTOR**



Code	Measure	Box
C1301		50

**PP-R COLLECTOR COLLAR**



Code	Measure	Box
C1401		50

**CORNER BENDER (Plastic)**



Code	Measure	Box
C1501	16-18 mm	100

**PIPE HOLDER (Plastic)**



Code	Measure	Box
C1601	50 cm (With Clips)	250
C1602	1 mt	250



**CLIPS (Plastic)**



Code	Measure	Box
C1701	16-17 mm	500
C1702	E (Clips)	500
C1703	U (Clips)	500

**PIPE LID**



Code	Measure	Box
C1801	16-17 mm	100

**FLOOR FIX HOLDER**



Code	Measure	Box
C1901	25 mm	40

**COLLECTOR REDUCER**



Code	Measure	Box
C2001	40/32 mm	10

**BRASS FEMALE ELBOW**



Code	Measure	Box
C2101	16X2	50
C2102	16X2.2	50
C2103	18X2	50
C2104	18X2.5	50

**WALL PLATE ELBOW FEMALE**



Code	Measure	Box
C2201	16X1/2	50
C2202	18X1/2	40
C2203	20X1/2	30
C2204	20X3/4	30

**RING + NUT + WINNY-PEX**



Code	Measure	Box
C2301	16x2	300
C2302	16x2.2	300
C2303	18x2	300
C2304	20x2	300
C2305	20x2.3	300
C2306	25x2.5	300
C2307	32x3	300

**FEMALE ELBOW SHORT**



Code	Measure	Box
C2401	16x2 mm	50
C2402	16x2.2	50

**PLASTIC CASING**



Code	Measure	Box
C2501	25 mm	500

**ELBOW MALE**



Code	Measure	Box
C2601	16x1/2 mm	100
C2602	18x1/2 mm	75
C2603	20x1/2 mm	50
C2604	20x3/4 mm	50

**STRAIGHT NIPPLE DOUBLE**



Code	Measure	Box
C2701	16x16	75
C2702	18x18	75
C2703	20x20	50

**CORNER PROTECTION (Plastic White)**



Code	Measure	Box
C2801	16-18 mm	100

**CORNER PROTECTION (Plastic Chrome)**



Code	Measure	Box
C2901	16-18 mm	100

**BENDING ELBOW**



Code	Measure	Box
C3001	16-18 mm	100

**TEE EQUAL**



Code	Measure	Box
C3101	16X16X16	50
C3102	18X18X18	40
C3103	20X20X20	30

**TEE FEMALE**



Code	Measure	Box
C3201	16X1/2X16	40
C3202	18X1/2X18	40
C3203	20X1/2X20	30
C3204	20X3/4X20	30

**ELBOW EQUAL**



Code	Measure	Box
C3301	16X1/2X16	65
C3302	18X1/2X18	50
C3303	20X1/2X20	35

**TEE MALE**



Code	Measure	Box
C3401	16X1/2X16	60
C3402	18X1/2X18	50
C3403	20X1/2X20	35
C3404	20X3/4X20	35



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