

Cosmoplast®

Cross Linked Polyethylene (PE-X) Pipes



 **WRAS**^{*}
Water Regulations Advisory Scheme
*applicable for Pex Pipe



Cosmoplast, a primary member of Group Harwal, has been at the forefront of the plastic industry in the Gulf region since its founding in 1976. Through constant growth and product diversification, the company continues to be the largest thermoplastic pipe manufacturer in the region.

Continuously enhancing its capabilities in plastic manufacturing technologies, Cosmoplast now utilizes a diverse range of materials such as uPVC, polyethylene (PE100, PE80, LLDPE), cross linked polyethylene (PEX), random copolymer polypropylene (PP-R), and glass-reinforced plastic (GRP), CPVC & RTP

Cosmoplast's ongoing research and development programs continue to add new products to its pipeline systems product range that now includes pre-insulated pipes, reinforced thermoplastic pipes, specialized plumbing systems and fabricated uPVC and GRP manhole systems. Its state of the art engineering, design and tool room facilities are fully capable of manufacturing moulds, dies, machinery equipments and other specialized tooling requirements to meet the company's continual expansion and product development requirements.

With this extended product range, Cosmoplast's pipeline systems cater to an extensive range of market sectors and applications covering infrastructure development, plumbing, oil & gas, district cooling, irrigation, landscaping and water extraction.

An ISO 9001 certified company, Cosmoplast has its production facilities based in Abu Dhabi converting over 75,000 metric tons of plastic per annum. In addition to these, Cosmoplast also has upcoming facilities in Saudi Arabia, Moscow and Kaliningrad.



COSMOPLAST PIPELINE SYSTEMS PRODUCT RANGE INCLUDES:

INFRASTRUCTURE PIPELINE SYSTEMS (uPVC, PE, GRP)

uPVC and Polyethylene pipeline systems with sizes ranging from 15mm up to 2000mm, well casings and screens and GRP pipeline systems with sizes from 100mm up to 1400mm for applications including

- Water extraction • Water distribution • Drainage • Sewerage • Gas distribution • Cable ducting

PLUMBING SYSTEMS (UPVC, PP-R, PEX, HDPE DRAINAGE and CPVC)

Comprehensive range includes uPVC systems for drainage, random polypropylene (PP-R) [plain, fiber and aluminium composite] and cross linked polyethylene (PEX) systems for water and sanitary applications and uPVC & CPVC high pressure pipes and fittings for water supply and A/C drain. Plumbing accessories such as pipe clamps, polyethylene compression fittings, solvent cements, lubricants and adhesives compliment this product range.

PRE-INSULATED PIPES (HDPE-HDPE, HDPE-GRP, HDPE-STEEL, GRP-HDPE, GRP-GRP, GRP-STEEL)

Jacket – core pipe combination with polyurethane insulation are used for applications such as District Cooling systems, Oil & Gas and other industrial applications. Cosmoplast provides HDPE and GRP pipes as jackets and HDPE, GRP and steel as core pipes.

IRRIGATION SYSTEMS (LLDPE)

Consists of high precision inline drip pipes and landscape and lawn edging. This range also includes saline resistant valves, drainage systems, sprinklers and central controllers.

REINFORCED THERMOPLASTIC PIPES (RTP)

Available in length of upto 500m, with a working pressure of 150 Bar at a temperature of 60 degrees celsius. RTP is used for gas distribution networks, oil flow lines and water injection lines.

Cosmoplast Cross- Linked Polyethylene (PE-X) Pipes

The expertise in manufacturing Plastic Piping systems in the Gulf region for more than four decades has further helped Cosmoplast to develop and deliver products with special consideration of exclusive needs of the Gulf region. One such need is to provide the user with cross-linked polyethylene pipes for long term applications in extreme levels of cold and hot fluid transmission.

Cosmoplast PE-X pipes allow the distribution of pressurized hot and cold water both sanitary and heating systems. The techniques of water distribution using PE-X pipes present many advantages in comparison to the traditional distribution systems using iron or copper pipes.

The Cosmoplast PE-X pipe is made from carefully selected raw material supplied by the world's renowned resin manufacturers.



Cross-linked polyethylene

Cosmoplast PE-X pipe is manufactured from high density Polyethylene, which is a thermoplastic material formed by numerous long chains. This high quality material is thus limited by the relatively low working temperature.

With the cross-linking process, the molecules of the polyethylene are cross-linked to form a more complex structure, which transforms the product from thermoplastic to thermo setting. This process guarantees the improvement of all thermal, mechanical and chemical properties. Therefore, Cosmoplast PE-X pipes are able to transport hot (and cold) water under high pressure for very long periods of time. The cross linking in Cosmoplast PE-X pipes is produced using Sillane Method, and therefore they are classified as PE-Xb.

Fields of Applications:

Cosmoplast PE-X Pipes are used for:

- ◆ Hot and Cold water supply using the "Pipe In Pipe" technique with manifolds.
- ◆ Hot and Cold water supply using the "Pipe In Pipe" technique with PP-R mains.
- ◆ Traditional water supply systems.
- ◆ Traditional heating systems using radiators and convectors.
- ◆ Under- floor heating systems.
- ◆ Compressed air distribution networks.
- ◆ Air conditioning applications.
- ◆ Transportation of chemicals in the industry.



Advantages of Cosmoplast PE-X Pipes:

Cosmoplast PE-X pipe has many characteristics and advantages which make it an ideal pipe for the modern water distribution systems.

- ◆ Nontoxic and Physiologically harmless material.
- ◆ Long duration due to the high resistance to aggressive elements, which gives the system extremely long service life of 50 years and more.
- ◆ Easy and quick installation with obvious saving.
- ◆ Lack of bends due to high flexibility of Cosmoplast PE-X pipe.
- ◆ Very smooth internal surface with complete absence of cracking and porosity. This results in a very low pressure loss and absence of scaling.
- ◆ Low thermal conductivity, which keeps heat losses/gains to the minimum, owing to the raw material used for producing Cosmoplast PE-X pipes, which has low coefficient of thermal conductivity.
- ◆ Resistance to electrochemical corrosion, because the PE-X material is chemically inert, with high resistance to wide range of chemicals.
- ◆ High acoustic insulation against fluid noise, even if water hammers are present.
- ◆ Cosmoplast PE-X pipe is characterized by the Thermal Memory, which enables the pipe to return to its original shape in case of crushing or bending errors. This is carried out by heating the pipe to the softening point.
- ◆ No perforation caused by electrical currents, because the PE-X material is a bad electric conductor.

Thermal & Mechanical Properties

Properties	Testing	Test method	Units Temperature	Typical Value
Density	ISO-DIS 1872	-	g/cm ³	0.94
Ultimate Tensile Strength	DIN 53455	+23 °C	Kg/mm ²	2.0 - 2.9
		+100 °C	Kg/mm ²	1.0 - 1.9
Ultimate Elongation	DIN 53455	+23 °C	%	170 - 250
		+100 °C	%	300 - 500
Modulus of Elasticity	DIN 53457	0 °C	Kg/cm ²	15
		+80 °C	Kg/cm ²	5
Impact Resistance	B.S.	-150 °C	Kgm/cm ²	No Breakage
		+20 °C	Kgm/cm ²	No Breakage
Temperature Range	-	-	°C	10-95°C
Linear Expansion Coefficient	-	+23 - 100°C	K-1	1.5 X 10 ⁻⁴
Softening Temperature	-	0-70°C	°C	135
Thermal Conductivity Coefficient	-	-	Kcal/hm°C	0.38

Quality Control:

Cosmoplast PE-X pipes are produced through a well laid down process consisting of systematic strict inspections on incoming raw materials, process monitoring, strict testing and final inspections.

Furthermore Cosmoplast is an ISO 9001 certified company exercising all appropriate tests on the pipes and fittings as per the various required international standards.



Dimensions of Cosmoplast PE-X Pipes:

Cosmoplast PE-X pipes are manufactured according to the German Standards DIN 16892 and DIN 16893 which list the general requirements for PE-X pipes. The following table shows the dimensions of Cosmoplast PE-X pipes.

Outside Diameter (mm)	Series	
	5	3.2
	Pressure Rating	
	PN 12.5	PN 20
	SDR	
	11	7.4
	W.T. (mm)	W.T. (mm)
16	1.5 *	2.2
20	1.9 *	2.8
25 *	2.3 *	3.5 *
32 *	2.9 *	4.4 *
40 *	3.7 *	5.5 *

*These sizes are not stock items and produced on special order only with minimum order quantity



Cosmoplast corrugated conduits are made of virgin High Density Polyethylene material to insure high flexibility. In case the conduit is accidentally squeezed with a load; it is capable to regain its original shape after the load is removed.

Working Conditions:

The following table shows the maximum working conditions of PE-X pipes at various selected temperatures and pressures as listed in DIN 16893

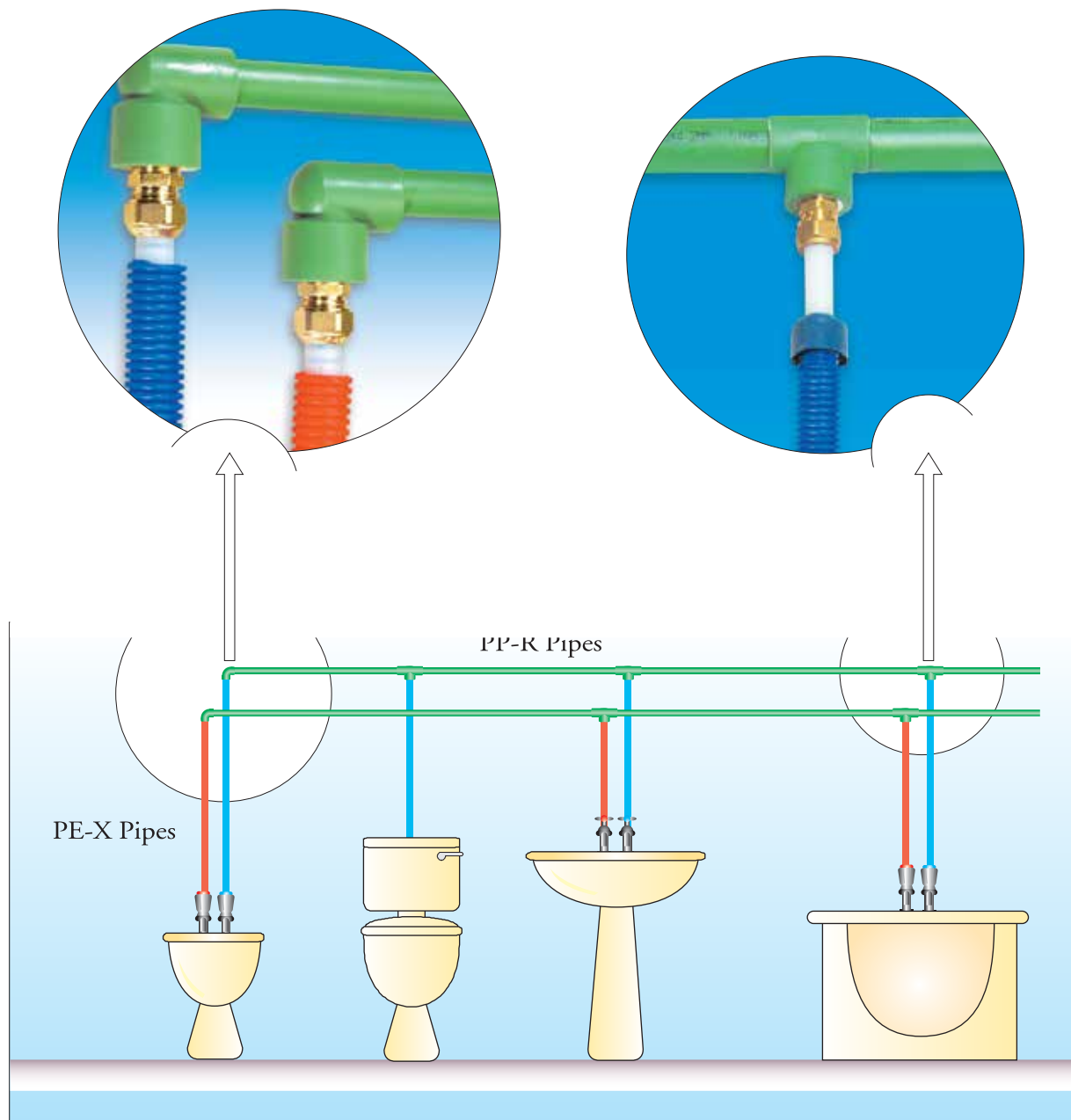
Temperature, °C	Years of service	SF 1.25		SF 1.5	
		Pipe series (S)		Pipe series (S)	
		5	3.2	5	3.2
		Standard dimension ratio (SDR)		Standard dimension ratio (SDR)	
		11	7,4	11	7,4
		Allowable working pressure, in bar		Allowable working pressure, in bar	
10	1	17.9	28.3	14.9	23.6
	5	17.5	27.8	14,6	23.2
	10	17.4	27.6	14,5	23.0
	25	17.2	27.3	14,4	22,8
	50	17.1	27.1	14.2	22.6
	100	17.0	25.9	14.1	22.4
20	1	15.8	25.1	13.2	20.9
	5	15.5	24.6	12,9	20,5
	10	15.4	24.4	12.8	20.4
	25	15.2	24.2	12,7	20,1
	50	15.1	24.0	12.6	20,0
	100	15.0	23.8	12.5	19.8
30	1	14.0	22.3	11,7	18,5
	5	13.8	21.9	11,5	18,2
	10	13.7	21.7	11,4	18.1
	25	13.5	21.4	11,3	17,9
	50	13.4	21.3	11,2	17,7
	100	13.3	21.1	11,1	17,6
40	1	12.5	19.8	10.4	16.5
	5	12.2	19.4	10.2	16,2
	10	12.1	19.3	10.1	16.1
	25	12.0	19.1	10.0	15,9
	50	11.9	18.9	9.9	15,7
	100	11.8	18.7	9.8	15,6
50	1	11.1	17.7	9,3	14,7
	5	10.9	17.3	9,1	14,4
	10	10.8	17.2	9.0	14.3
	25	10.7	17.0	8.9	14.1
	50	10.6	16.8	8.8	14.0
	100	10.5	16.7	8.8	13.9
60	1	9.9	15.8	8,3	13.1
	5	9.7	15.5	8.1	12,9
	10	9.7	15.3	8.0	12.8
	25	9.5	15.2	7,9	12,6
	50	9.5	15.0	7.9	12,5
70	1	8.9	14.1	7,4	11.8
	5	8.7	13.8	7.3	11.5
	10	8.6	13.7	7.2	11,4
	25	8.5	13.6	7.1	11,3
	50	8.5	13.4	7.0	11,2
80	1	8.0	12.7	6,6	10.5
	5	7.8	12.4	6.5	10.3
	10	7.7	12.3	6.4	10.2
	25	7.6	12.1	6.4	10,1
90	1	7.2	11.4	6,0	9.5
	5	7.0	11.1	5.8	9.3
	10	6.9	11.0	5.8	9.2
	15	6.9	11.0	5.7	9.10
95	1	6.8	10.8	5,7	9.0
	5	6.6	10.6	5,5	8,8
	10	6.6	10.5	5.5	8.7

PEX Pipes - PPR Header System:

In this system, manifolds are replaced by PPR headers installed above the false ceiling. The sanitary fixtures are supplied with hot and cold water through PEX pipes laid inside corrugated polyethylene conduits connected directly to the header.

This system combines the advantages of both PPR system and PEX system, by maintaining the pliability and easy replacement of PEX pipes along with the outstanding performance and characteristics of PPR pipes.

The connection between the PEX pipes and PPR header is achieved by using brass Male Threaded Adapters on the PEX pipes, connected to either Female Threaded PPR Tee or Female Threaded PPR Elbow on the PPR header, as demonstrated in the following figures.



Pipe-In-Pipe Systems Using Manifolds:

This system has been inspired from the parallel electricity distribution systems, as each tap is supplied with two pipes, one for hot and the other for cold water directly from manifolds. The hot and cold water manifolds are installed in a cabinet embedded into the wall (Fig. 1), or directly fixed on the wall above the false ceiling (Fig. 2). The hot and cold water manifolds should be selected with number of outlets equal to the number of hot and cold water taps involved in each zone respectively. The size of the manifold should be suitable for the required flow rate in each zone.

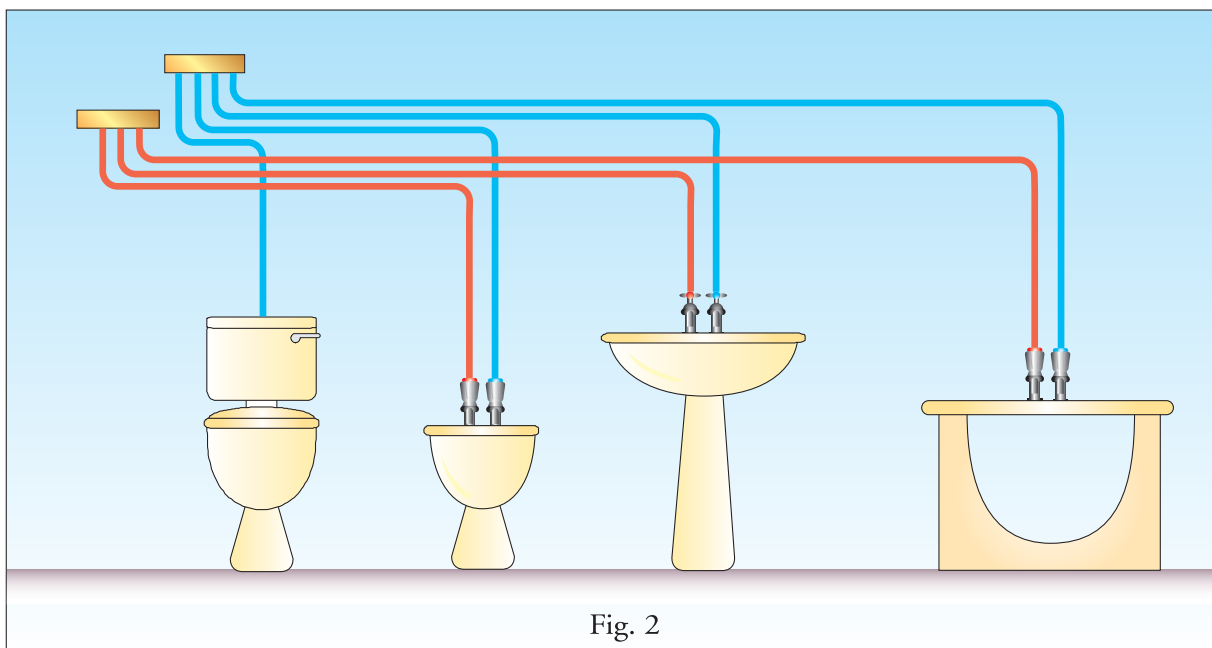
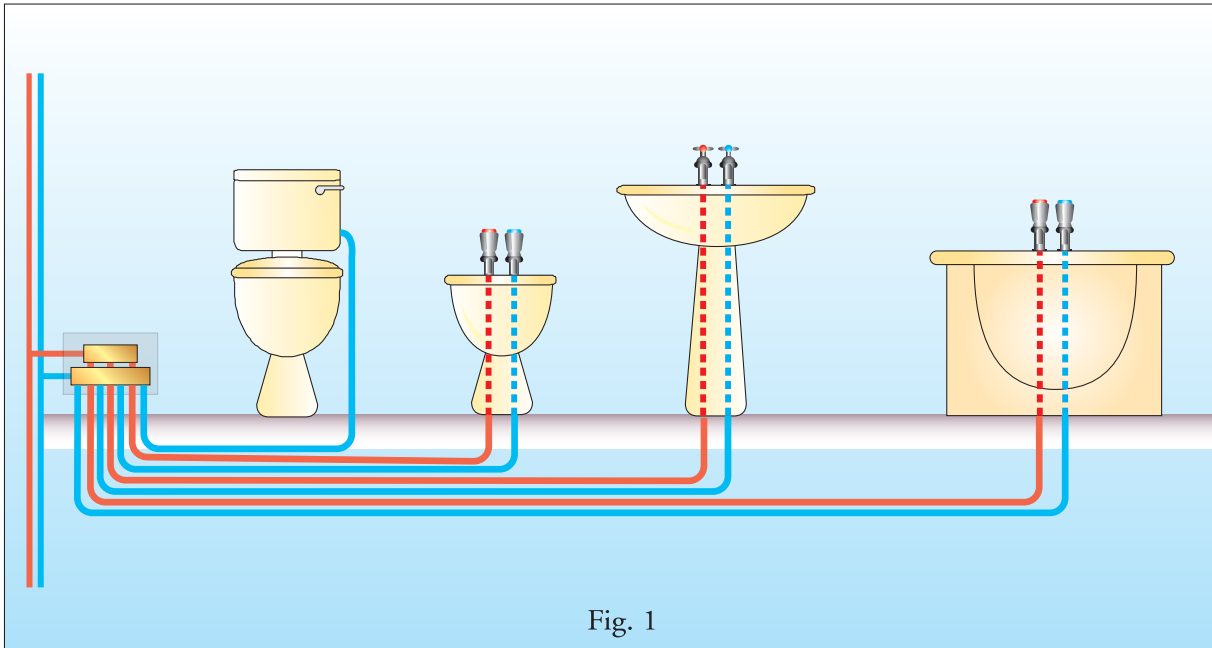




Fig 3

The PE-X pipes are installed inside corrugated sleeves with suitable diameter (Fig. 3), therefore in case of perforation or leakage of the pipe due to accidental causes, it is possible to replace the

damaged pipe simply by pulling it out of the conduit and installing a new pipe instead quickly, without damaging the floors or walls. This simple replacement is not possible with other traditional iron or copper pipe installations.




Fig 4

The location of the manifolds should be selected in a suitable central position in relation to the various taps connected, so as to guarantee equal pipe lengths as much as possible. Long Runs should be avoided in order to reduce pressure and heat losses.


Connecting the pipe to the manifold is carried out using suitable compression adapter with size suitable to the pipe dimensions, while the connections to the tap is performed using sanitary elbow connections installed inside the plastic box (Fig. 4). It is necessary to cut the pipe precisely and perpendicularly to its axis by using a proper pipe cutter with sharp edges.




System Components

PE-X Pipe	Art. No.	Size (mm)	Thickness (mm)	Roll (m)
	PX-P-16-2.2	16	2.2	100
	PX-P-16-1.8	16	1.8*	100
	PX-P-20-2.8	20	2.8	50
	PX-P-20-1.9	20	1.9*	50
	PX-P-25-3.5	25	3.5*	50
	PX-P-25-2.3	25	2.3*	50
	PX-P-32-4.4	32	4.4*	50
	PX-P-32-2.9	32	2.9*	50
	PX-P-40-5.5	40	5.5*	50
	PX-P-40-3.7	40	3.7*	50

*These sizes are not stock items and produced on special order only with minimum order quantity


PE Corrugated Conduit	Art. No.	Size (mm)	Roll (m)
	PX-CC-25B	25 (Blue)	50
	PX-CC-25R	25 (Red)	50
	PX-CC-32B	32 (Blue)	50
	PX-CC-32R	32 (Red)	50

PEX Protection Cap	Art. No.	Size
	PX- PC-25-16B	25-16 Blue
	PX- PC-25-16R	25-16 Red


Plain Sanitary Elbow	Art. No.	Size
	PX-SE-1/2-16	1/2" x 16 mm
	PX-SE-1/2-20	1/2" x 20 mm


Sanitary Elbow With Nipple	Art. No.	Size
	PX-SEN-1/2-16	1/2" x 16 mm


Plastic Box For Sanitary Elbow	Art. No.	Colour
	PX-BSE-W	White
	PX-BSE-R	Red
	PX-BSE-B	Blue


Male Adapter For PE-X Pipes	Art. No.	Size
	PX-MA-1/2-16	1/2" x 16 mm
	PX-MA-1/2-20	1/2" x 20 mm
	PX-MA-3/4-20	3/4" x 20 mm

All fittings can be made of brass or from DZR brass

Female Adapter For PE-X Pipes	Art. No.	Size
	PX-FA-1/2-16	1/2" x 16 mm
	PX-FA-1/2-20	1/2" x 20 mm
	PX-FA-3/4-20	3/4" x 20 mm


Brass Manifold	Art. No.	Size
	PX-BM-3/4-16-2	3/4" x 16 mm/2
	PX-BM-3/4-16-3	3/4" x 16 mm/3
	PX-BM-3/4-16-4	3/4" x 16 mm/4

Linear Manifold With Ball Valves	Art. No.	Size
	PX-LMBV-1-16-2	1" x 16 mm/2
	PX-LMBV-1-20-2	1" x 20 mm/2
	PX-LMBV-1-20-3	1" x 20 mm/3
	PX-LMBV-1-20-4	1" x 20 mm/4

Brass Manifold With Regulating Valves	Art. No.	Size
	PX-BMBV-3/4-16-2	3/4" x 16 mm/2
	PX-BMBV-3/4-16-3	3/4" x 16 mm/3
	PX-BMBV-3/4-16-4	3/4" x 16 mm/4
	PX-BMBV-1-16-2	1" x 16 mm/2
	PX-BMBV-1-16-3	1" x 16 mm/3
	PX-BMBV-1-16-4	1" x 16 mm/4

All fittings can be made of brass or from DZR brass


Male / Female Union Valve	Art. No.	Size
	PX-MFV-3/4	3/4"

Female / Female Valve	Art. No.	Size
	PX-FFV-3/4	3/4"


Straight Connector	Art. No.	Size
	PX-SC-16	16 mm
	PX-SC-20	20 mm

90° Elbow	Art. No.	Size
	PX-90°E-16	16 mm
	PX-90°E-20	20 mm

All fittings can be made of brass or from DZR brass

Female Elbow	Art. No.	Size
	PX-FTE-1/2-16	1/2" x 16 mm
	PX-FTE-1/2-20	1/2" x 20 mm

Male Elbow	Art. No.	Size
	PX-MTE-1/2-16	1/2" x 16 mm
	PX-MTE-1/2-20	1/2" x 20 mm


Wall Plate Elbow	Art. No.	Size
	PX-WPE-1/2-16	1/2" x 16 mm
	PX-WPE-1/2-20	1/2" x 20 mm

Tee	Art. No.	Size
	PX-T-16	16 mm
	PX-T-20	20 mm

All fittings can be made of brass or from DZR brass



Female Tee	Art. No.	Size
	PX-FTT-1/2-16	1/2" x 16 mm
	PX-FTT-1/2-20	1/2" x 20 mm


Nipple	Art. No.	Size
	PX-N-1/2	1/2"


Male End Cap	Art. No.	Size
	PX-MEC-1/2	1/2"
	PX-MEC-3/4	3/4"

All fittings can be made of brass or from DZR brass

Female End Cap	Art. No.	Size
	PX-FEC-1/2	1/2"
	PX-FEC-3/4	3/4"

Plastic Cabinet For Sanitary	Art. No.	Size cm L-W-H
	PX-PCS	48 x 27 x 9 cm

Pressure Reducing Valve	Art. No.	Size
	PX-PRV-1/2	1/2"
	PX-PRV-3/4	3/4"

Bracket	Art. No.	Size
	PX-PB-3/4-1 1/4	3/4" x 1" x 1 1/4"

Recommendations

Special attention should be paid to the bend of the pipe avoiding sharp bends, it is recommended to bend the pipe with a minimum radius eight times more than outside diameter of the pipe.

Heating the pipe with naked flame or with any heating element of high temperature should not be used, as this will damage the pipe and cause it to melt.

It is a must to protect visible pipes from ultra violet rays and direct sunlight, as this may change the chemical-physical features of the PE-X material and cause it to lose its characteristics.

Suitable compression adapters with o-rings should be used, which give a guarantee against any possible leakage.

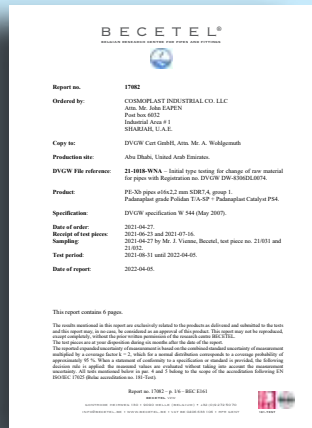
Over-tightening should be avoided when installing the PE-X pipe to the manifold or the PP-R main, in order not to damage the sensitive brass threads.

Joints under concrete or inside the corrugated conduits should not be used, in order to guarantee the possibility of removing the pipe from inside the conduit whenever maintenance is needed.

Reasonable excess pipe length should be taken into consideration when connecting the pipes to the manifolds or to the PP-R mains. Therefore, allowing the pipe to expand and contract freely inside the conduit. Exact lengths may cause the pipe to go out of the connection when exhibiting contraction.

Special care should be given to the pipes during the stocking and installation phases, avoiding direct contact with sharp edges. Sharp scratches might cause future water leakages.

It is recommended to perform pressure test after finishing the installation, to ensure that the system is installed properly and not suffering from leakage.



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Your Quality Partner

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

COSMOPLAST INDUSTRIAL COMPANY LLC

Main Site: Plot No. 35H5,36H5,H5 ICAD-1, P.O. Box 8593, Abu Dhabi, United Arab Emirates

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Manufacture and Sale of Pipeline System Products covering: Polyvinyl Chloride (PVC) Pipes and Fittings, Polyethylene (PE) Pipes and Fittings, Cross linked Polyethylene (PEX) Pipes and Fittings, Poly Propylene (PP) Pipes and Fittings, Pre Insulated Pipes and Fittings.

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 Valid Until: 28 May 2024

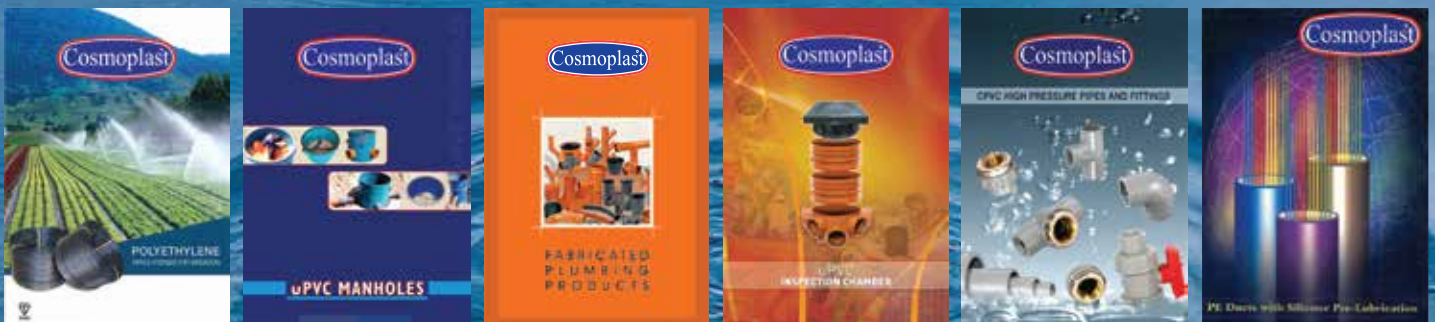
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President, Business Assurance

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Pipeline Systems



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