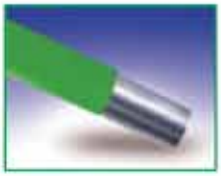
Emipipe
PPR
pipe and fittings

PP-Rc Pipes & Fittings Hygienic Solution for Hot & Cold Water Piping Networks



INDEX

Introduction

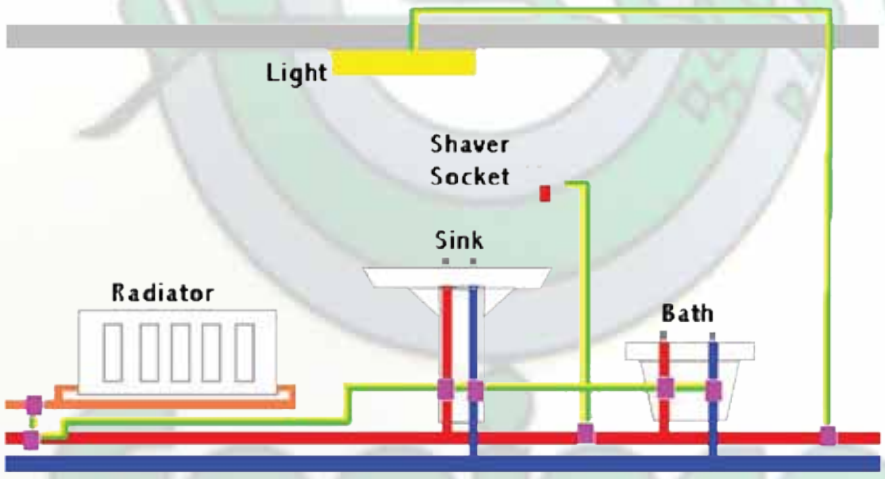
Emipipe® PPR system for conveying water / fluid with complete range of pipes and fittings. Used in many different applications.

Emipipe Areas of Applications

* Potable water
* Hot and cold water net works for sanitary
* Air conditioning, conveying cold water
* Chillers fluid
* Industrial fluid
* Central heating net works
* Swimming pools net works
* Compressed air net works for factories.

Emipipe® System Advantages

* High resistance to chemicals
* Low condensation and heat loss
* Smooth inner surface, hence no deposit or lime formation
* Smooth inner surface, hence lower pressure drop
* Low noise system, silent
* Hygienic and healthy
* Easy installation and maintenance
* Durable, hence long and trouble free service life
* Recyclable, hence environmental friendly



Standards

	Major European & Int'l Standards & Lab Test Certifications	
*	**DIN 8077**	**Polypropylene pipes dimensions**
*	**DIN 8078**	**General quality requirements for Polypropylene pipes**
*	**ISO EN 1167**	**Raw material, PP-Rc Type 3**
*	**DIN 8078/ Insert 1**	**Chemical resistance of pipes and fittings**
*	**DIN 16928**	**Pipes & fittings Installation connections**
*	**DIN 1988**	**DVGW practice code for drinking water installations**
*	**DIN 4046**	**DVGW water supply technical regulations**
*	**O-NORM B5174**	**Polypropylene pipes, dimensions, requirements, tests standard coefficient**
*	**O-NORM B5157**	**Plastic compound pipes system for hot & cold water dimensions, requirements, tests, standard coefficient.**
*	**DVS 2207**	**Thermoplastic pipes & fittings welding**
*	**DVS 2208**	**Welding machines & devices of thermoplastic**

Drinking Water Test Certificate
DWTC

Pressure Performance Certificate
DIN 8078:1996-04 SK

Quality Assurance

Emipipe® system provides the highest quality assurance to its clients since the system is produced according to highest international standards and regulations. The highest quality of Emipipe® is guaranteed by, among other things, state of the art reasearch laboratory. Our inner factory quality standards include raw materials testing, production survey and testing finished Products according to DIN standard. Tests are conducted continuously in our own laboratory guaranteeing maximum safety. Continuously we get the collaboration of the independent testing institutes to ensure that our products comply with other applicable specifications such as DIN, P - Norm & ISO.

Emipipe® pipes and fittings undergo the following tests

* Melting index test of raw materials
* Testing accuracy of dimensions and surface nature.
* Interior long term pressure test of 1 hour at 20 ˚C and up to 80 bar
* Notched bar impact thermal test
* Welding index of processed materials.
* Microscopic examination
* Samples of all feeds are submitted to a long term internal pressure test lasting 1,000 hours at 95 ˚C and up to 18 bar.

Certifications

* DVGW
* SKZ
* GTL
* CALTECH

Physical Properties

Properties		Test Method	Unit	Data
Density		ASTM D792	g/cm^3	0.91
Melt Index	230°c, 2.16kg	ASTM D1238	g/10min	0.25
	190°c, 5.0kg			0.45
Tensile Strength	yield point	ASTM D638	kg/cm^2	270
	break point			230
Elongation		ASTM D638	%	>400
Flexural Modulus		ASTM D790	kg/cm^2	8,500
Izod Impact Strength	23°c	ASTM D256	kg· cm/cm	30
	0°c			8
	-20°c			3
Vicat Softening Point		ASTM D1525	°c	130
Melting Temperature		HS Method	°c	141
Surface Resistance		HS Method	Ω	$>10^{13}$
Mean coefficient of linear thermal expansion (0°c - 110°c)		Dilatometer	K^{-1}	$1.5*10^{-4}$

* The data of table are relative and represent empirical values obtained in various tests.

Condition		Required	Typical Value of R200P	Test Method
20°c	16 MPa	1 hr	>10 hrs	ISO 1167
95°c	3.5 MPa	1,000 hrs	>5,000 hrs	ISO 1167
110°c	1.9 MPa	8,760 hrs	>10,000 hrs	ISO 1167

Service Life

Under regular operating conditions, **Emipipe®** PPR pipes and fittings have a service life of more than 50 years. Its actual life span can be calculated through the formula given below.

$$\delta = \frac{p \times (d-s)}{20 \times s}$$

Which :

p = working pressure (bar)
d = outside diameter (mm)
s = wall thickness (mm)
δ = hoop stress (N/mm2)

$$\delta = \frac{p \times (d-s)}{20 \times s}$$

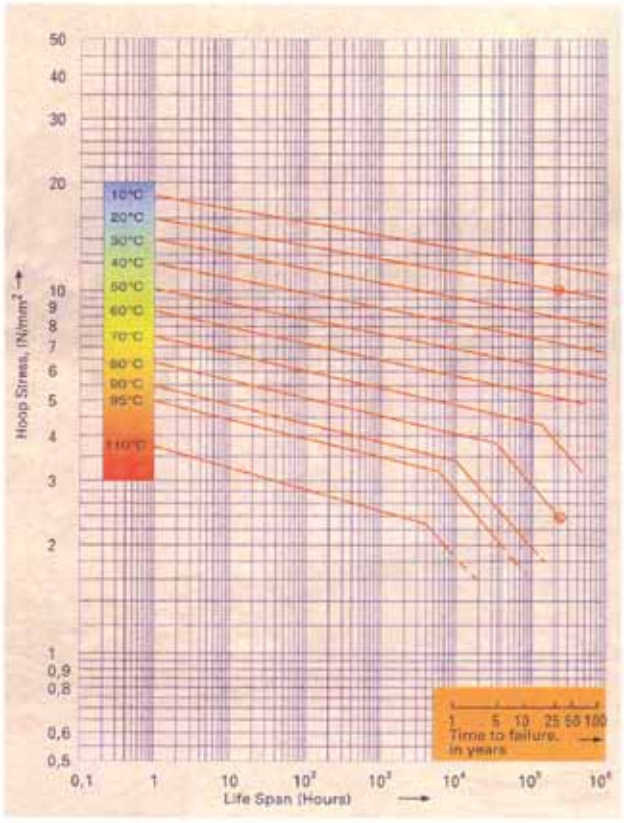
$$\delta = \frac{10 \times (20-3.4)}{20 \times 3.4} \quad = 2.4 N/mm^2$$

On the graph it's found the intersection point of 80ºC curve and 2.4 N/mm² hoop stress.

Draw a vertical line to find the life span for current application, which is around 25 years.

Example :

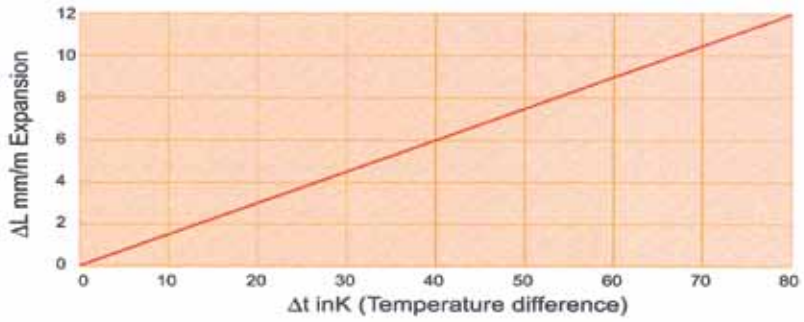
working temperature = 80C
working pressure = 10 bar
outside diameter = 20mm
wall thickness = 3.4 mm
what is the life span = ?



Service life of **Emipipe®** PP-Rc Pipes

Thermal Expansion of Emipipe® PP-Rc Pipes

Below is the trend when **Emipipe®** PPR-Rc pipes expand. Expansion rates and longitudinal changes caused by varying temperature on pipes PN 20 and on the stable pipe PN 25.



Longitudinal Changes for **Emipipe®** PN20 Pipes

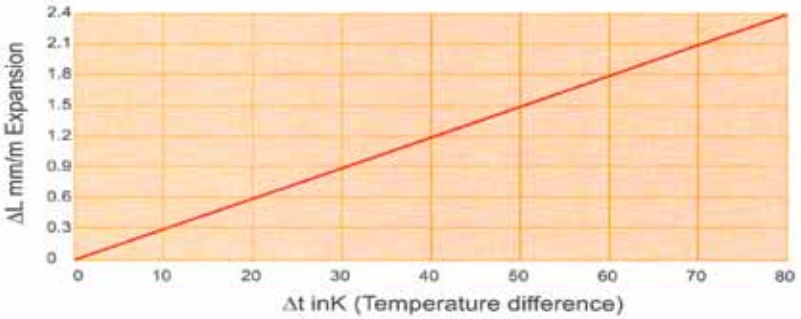
Example
For **Emipipe®** PN20

Temperature difference
Δt = 40 K

Length of pipe
L = 5 m

Amount of expansion
Δt = 6.0 mm/m x 5.0 m = 30mm

Specifications and Technical Data



Longitudinal Changes for Emipipe® PN25 Pipes

Example
For Emipipe® PN25 (Stable Pipe)

Temperature difference
Δt = 40 K

Length of pipe
L = 5 m

Amount of expansion
Δt = 1.2 mm/m x 5.0 m = 6mm

Pipe Support intervals for Emipipe® Pipes PN25									
Temp (°C)	Emipipe® PP-Rc Pipe Diameter (in mm)								
	20	25	32	40	50	63	75	90	110
20	1200	1300	1500	1700	1900	2100	2200	2300	2500
30	1200	1300	1500	1700	1900	2100	2200	2300	2400
40	1100	1200	1400	1600	1800	2000	2100	2200	2300
50	1100	1200	1400	1600	1800	2000	2100	2200	2100
60	1000	1100	1300	1500	1700	1900	2000	2100	2000
70	900	1000	1200	1400	1600	1800	1900	2000	2000

Pipe Support intervals for Emipipe® Pipes PN20 (SDR6)									
Temp (°C)	Emipipe® PP-Rc Pipe Diameter (in mm)								
	20	25	32	40	50	63	75	90	110
20	600	750	90	1000	1200	1400	1500	1600	1800
30	600	750	900	1000	1200	1400	1500	1600	1800
40	600	700	800	900	1100	1300	1400	1500	1700
50	600	700	800	900	1100	1300	1400	1500	1700
60	550	650	750	850	1000	1150	1250	1400	1600
70	500	600	700	800	950	1050	1150	1250	1400

Pipe Support Intervals (in mm)

Pipe Sizes and Dimensions

Emipipe® are produced according to the DIN standards 8077/8078 ,so comply with the General Quality and Dimensional requirements in additional to DIN 16962 standards of pipe joints and elements , here by the pipe sizes and wall thicknesses according to the pressure rating :

PN20 PP-Rc Pipe

Outside Diameter (mm)	Inner Diameter (mm)	Wall Thickness (mm)
20	13.20	3.40
25	16.60	4.20
32	21.20	5.40
40	26.60	6.70
50	33.40	8.30
63	42.00	10.50
75	50.00	12.50
90	60.00	15.00
110	73.40	18.30

PN25 PP-Rc Pipe with Aluminum layer

Outside Diameter (mm)	Inner Diameter (mm)	Wall Thickness (mm)
20	12.20	3.90
25	15.60	4.70
32	20.20	5.90
40	25.60	7.20
50	32.20	8.90
63	41.00	11.00
75	48.00	13.50

Emipipe® Permissible Working Pressure

The table below shows the life span parameters of Emipipe® PP-Rc Pipes

The working pressure of Emipipe® PP-Rc Pipes can be calculated based on temperature and intended life span.

Example:

$$p = \frac{20 x s x \delta}{d - s}$$

Based on the Service Life graph (see page 5), we may calculate the corresponding expansion of Emipipe® PP-Rc Pipes in 20 years at 80°C in this manner:

δ: 2.5 N/mm^2

$$p = \frac{20 x 3.4 x 2.6}{20 - 3.4} = 10.65 \text{ bar}$$

Applying this figure to the formula and by dividing this figure to a safety factor of 1:5 will result to figure of maximum working pressure.

$$P_{max} = \frac{P}{sf} \qquad P_{max} = \frac{10.65}{1.5}$$

Pmax = 7.1 bar

Example:
Intended life span = 25 years
Outside diameter = 20 mm
Wall thickness = 3.4 mm
Working temperature = 20°C
P = ?
The intersection point between 20°C and 25 years curve is plotted on on long-term behaviour of PPR. The ordinate of the plotted point (on DIN 8077, 1996-04) shows a hoop stress of 9.8 N/mm^2.
The corresponding permissible pressure is obtained through the given formula below:

$$p = \frac{9.8 x 20 x 3.4}{(20 - 3.4)} = 40.14 \text{ bars}$$

$$P_{max} = \frac{P}{sf} = \frac{40.14}{1.5} = 26.76 \text{ bars}$$

Temperature (°C)	Service Life	Nominal Pressure (bar)		
		PN 10	PN 20	PN 25
20	1	15.0	30.0	37.8
	5	14.1	28.0	35.4
	10	13.7	27.3	34.4
	25	13.3	26.5	33.4
	50	12.9	25.7	32.4
30	1	12.8	25.5	32.1
	5	12.0	23.9	30.1
	10	11.6	23.1	29.1
	25	11.2	22.3	28.1
	50	10.9	21.8	27.4
40	1	10.8	21.5	27.1
	5	10.1	20.2	25.4
	10	9.8	19.6	24.7
	25	9.4	18.8	23.7
	50	9.2	18.3	23.1
50	1	9.2	18.3	23.1
	5	8.5	17.0	21.4
	10	8.2	16.5	20.7
	25	8.0	15.9	20.0
	50	7.7	15.4	19.4
60	1	7.7	15.4	19.4
	5	7.2	14.3	18.0
	10	6.9	13.8	17.4
	25	6.7	13.3	16.7
	50	6.4	12.7	16.0
70	1	6.5	13.0	16.4
	5	6.0	11.9	15.0
	10	5.9	11.7	14.7
	25	5.1	10.1	12.7
	50	4.3	8.5	10.7
80	1	5.5	10.9	13.7
	5	4.8	9.6	12.0
	10	4.0	8.0	10.0
	25	3.2	6.4	8.0

Permissible Working Pressure for Emipipe® PP-Rc Pipes

Emipipe® Welding Operation

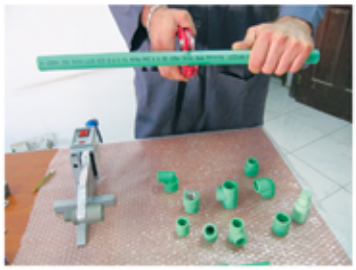
The process of jointing Emipipe® PPR pipes and fittings is very simple and fast.

Tools Required:

Welding Adaptor
Peeling Tool
Pipe Cutter
Welding Machine

Welding Instructions:

1. Prepare the welding machine by inserting the appropriate welding die of the diameters to be fused.
2. Connect the plug into the power supply socket and wait until the welding machine reaches the working temperature of 260ºC.
3. Cut the pipe perpendicular to its axis using suitable pipe cutter. To prevent any error, you may mark with a pencil the point where the depth of fusion should be.
4. Heat the pipe and the fitting simultaneously up to the marked welding depth.
5. After heating, remove both the pipe and the fitting from the welding device.
6. Within the allowed time interval, connect the pipe and the fitting without twisting.
7. Allow the joint to cool down completely before using. (please refer to the heating and cooling time recommended below)



CUT

HEAT

WELD

Emipipe® Welding & Cooling Time

The following table shows the recommended heating time for both pipes & fittings and the essential cooling time to get the best welding joints between the pipes and fittings

Pipe Diameter (mm)	Welding Depth (mm)	Heating Time (seconds)	Welding Time (seconds)	Cooling Time (minutes)
20	14.0	5	4	2
25	15.0	7	4	2
32	16.5	8	6	4
40	18.0	12	6	4
50	20.0	18	6	4
63	24.0	24	8	6
75	26.0	30	8	8
90	29.0	40	8	8
110	32.5	50	10	8

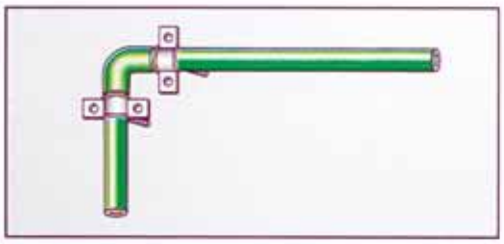
Emipipe® Proper Handling :

- Avoid hard impact at the end of the pipes.
- Avoid heavy and sharp loads on the pipes.
- Use appropriate and sharp cutting tools to cut the pipes.
- Do not twist the pipe or the fitting after these have been joined together.
- Protect the pipes from direct exposure to sunlight and rain during storage.
- Do not use direct flame to bend the pipes.
- Heating with hot air up to 140ºC may be applied when necessary.
- Use Teflon sealing tapes where necessary.

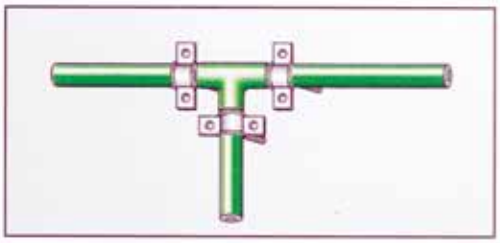
Pipe Fixing

There are two types of pipe fixing techniques, but the best one is :

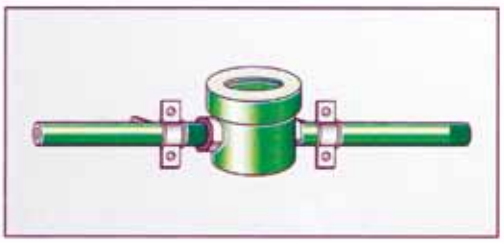
Fixed Points This is a type of fixing where no allowance for pipe expansion is made on specific points, such as:



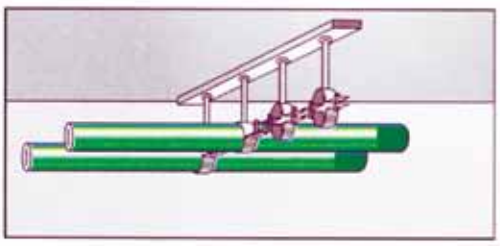
At pipe bend



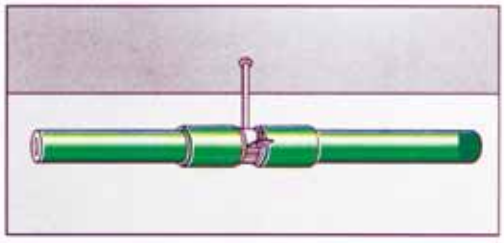
At pipe branch



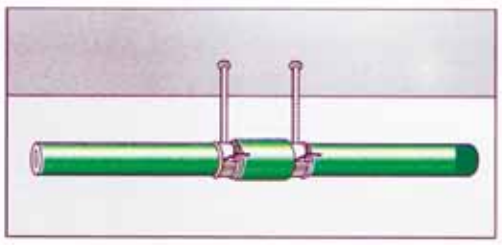
At the place of pipe fitting



By tightly drawn pipe straps



By clips between pipe fittings



By fixing at fitting places

List of Chemical Products

+ = resistant
(+) - less resistant
0 = limited chemical resistance
(-) = poor resistance
- = not resistant
aq = aqueous solution
sat. = saturated solution at room temperature
c = colour

		Conc. %	Temp. (°C) 20	60	100
A					
Acetic acid		100	+	0	-
(Glacial acetic acid)					
Acetic acid aq.		50	+	+	
(see also vineger)		10	+	+	+
Acetic anhydride		100	+		
Acetone*		100	+	0	
Alcoholic iodine			+	0	
Alum		sat	+	+	
Alums aq		any	+	+	
Aluminium salts aq		any	+	+	+
Ammonia gaseous		100	+	+	
Ammonia aq		cone	+	+	
		10	+	+	
Ammonium acetate aq.		any	+	+	+
Ammonium carbonate aq.		any	+	+	+
Ammonium chloride aq.		any	+	+	+
Ammonium nitrate aq.		any	+	+	+
Ammonium phosphate aq.		any	+	+	+
Ammonium sulphate aq.		any	+	+	+
Amly alcohol, pure			+	+	
Aniline		100	+	(+)	
Antifreeze agent. (cars)**			+	+	
Apple Juice			+	+	
Apple sauce			+	+	(+)
Aqua regia			+	-	
Asphall**			+	0	
ASPIRIN8			+		
B					
Barium salts		any	+	+	+
Beef suet			+	+	
beer			+		
benzaldhyde		100	+		
Benzaldehyde aq.		sat.	+		
		(0.3)			
Benzene		100	(-)	-	
Benzoic acid		100	+	+	
Benzoic acid aq.		sat	+	+	+
Bleaching solution			0	0	
(12.5 % active chlorine)					
Boneoi			+	(+)	
Borax aq		sat.	+	+	
Boric acid		100	+	+	
Boric acid aq.		sat.(4.9)	+	+	
Brake fluid*			+	+	
Brendly			+		
Bromine, liquid		100	-		
Bromine, vapours		high	-	-	
		Low	0	+	
Bromine water		sat.	-	-	
Butene, gassous		100	+	+	
Butane, liquid		100	+		
Butter			+	+	
Buttermik			+		
Butylacetate		100	+	0	
n-Butyl alcohol |n-butanol		100	+	+	
C					
Cake			+	+	(+)
Calcium chloride aq.		sat.	+	+	+
Calcium nitrate aq.		sat.	+	+	
Camphor			+		
Carbon bisulphide**		100	0		
Carbon tetrachlonde		100	0	-	
Caustic potash solution		50	+	+	
		25	+	+	
		10	+	+	+
Caustic soda solution		50	+	+	
		25	+	+	
		10	+	+	
Cheese			+		
Chloride of lite			+	+	
(aquesous suspension)					
Chlorine, gas, dry		100	-	-	-
Chlorine, gas humid		10	0		-
Chlorine, liquid		100	-		
Chlorine water		sat.	0		
Chlorobenzene		100			
Chloroform		100	(-)	-	
Chlrosulphonic acid		100	-	-	
Chromic acid		sat.	+	-	
		20	+	0	
Chromic/sulphuric acid			-	-	
Chromium plating solution*			+	+	

List of Chemical Products

	Conc. %	Temp. (°C) 20	60	100
Chromium salts (bi-and trivalent) aq.	sat.	+	+	
Cinnamon (cane)		+		
Cinnamon (ground)		+		
Citric acid aa.	sat.	+	+	+
Clove oil		+	0	
Cloves				
Coca-cola®		+		
Cocoa (powdered)		+		
Cocoa		+	+	(+)
(ready-to-drink)				
Coconut oil		+	(+)	
Cod-liver oil		+	+	
Coffee (beans and ground)		+		
Coffee (ready-to-drink)		+	+	+
Common salt, driy		+	+	+
Copper salts aq.	sat.	+	+	+
Com seed oil		+	0	
Cream, whipped cream		+		
Cresol solution		+		
Cresol	100	+	0	
Cresols aq.	sat.	+	0	
	(0.25)			
Curds		+		
Cyclohexane	100	+		
Cyclohexanol	100	+	+	
Cyclohexanone	100	+	-	
D				
Decahydronaphthalene	100	0	-	-
Detergents. synhetic**	high	+	+	
	ready-for-use	+	+	+
Dibutylphthatate				
(see plasticizers)				
Diesel oil, see Fuels				
Dimethylformamide	100	+		
I .4-Dioxane	100	+	0	-
Dish-washing agents,				
liquid*		+	+	+
DIXAN® solution	ready-for-use	+	+	+
E				
Eggs |uncooked & cooked)	100	+	+	(+)
Ether* (diethylene ether)	100	0		
Ethyl acetate		0	0	
Ethyl alcohol not denatured	100	+		
Ethyl alcohol aa.. not denatured	96	+	+	
	50	+	+	
	10	+	+	
Ethyl benzene	100	0	-	
Ethyl chloride***	100	-		

	Conc. %	Temp. (°C) 20	60	100
Ethylene chloride	100	(-)	(-)	
2-Ethyl hexanoi	10	+		
F				
Flxing salt (see also	100	+	+	
Sodium thiosulphat)				
Floor wax***		+	0	
Flour		+		
Flouric acid	40	+	+	
Folmaldehyde aq	40	+	+	
	30	+	+	
	10	+	+	
FORMALIN®		+	+	
Formie acid	98	+	0	
	90	+		
	50	+	+	
	10	+	+	+
FruitJuice		+	+	
Fruit salad		+		
Fuel				
Petrol normal		+	0	
according to DIN 5 1 635				
petrol, regular		(+)	-	
petrol, super		0	-	
Diesel oil*		+	0	
Fuel oil*		+	0	
Furniture pofeh*		+	0	
G				
Gin	40	+		
Glycerine	100	+	+	
Glycerine aq.	high	+	+	
	Iow	+	+	+
Glycol	100	+	+	
Glycol aq.	high	+	+	
	Iow	+	+	+
Grapefruitjuice		+	+	
Gravy		+	+	(+)
H				
Hair shampoo*		+	+	
Heptane	100	+	0	
Hexane	100	+	0	
Honey		+	+	
Horse-radish, ready-to-eat		+		
Hydrocloric,chloride gaseous	conc.	+	+	
(see also Hydrocloric acid)	10	+	+	
Hydrogen perioxide aq.	high	+	+	
	low	+	+	
	90			
	30	+	0	
	10	+	+	
	3	+	+	+
Hydrogen sluphide**	low	+	+	

List of Chemical Products

	Conc. %	Temp. (°C) 20	60	100
I				
Ink*		+	+	
Iron salts aq.	sat.	+	+	+
Isooctone	100	+	0	
Isoproply alcohol	100	+	+	
J				
Jam		+	+	(+)
Jelly		+	+	(+)
L				
Lactic acid aq.	90	+	+	
	50	+	+	
	10	+	+	+
LANOLIN®		+	0	
Lard		+	+	0
Lemonadas		+		
Lemon arome		+		
Lemon peel		+	+	
Lemon peel oil		+		
Linseed oil		+		
LITEX®		+	+	
Liqueur	any	+		
LYSOL		+	0	
M				
Magnesiurn salts aq.	sat.	+	+	+
Margarine		+	+	
MARLIPAL MG	50	+	+	
MARLON (42 % active detergent)	100	+	+	
MARLOPHEN 83	20	+		
MARLOPHEN 89	100	+		
	5	+		
MARLOPHEN 810	100	+		
	20	+	+	
	5	+	+	
Mashed potatoes		+	+	(+)
Mayonnaise		+		
Menthol		+		
Mercurie salta aq.	salt.	+	+	
Mercury	100	+	+	
Methyl alcohol	100	+	+	
Methl alcohol aq.	50	+	+	
Methylene chloride*	100	0		
Methyl ethyl ketone	100	+		
Milk		+		
Milk food		+	+	(+)
Mineral oil (whitout aromatic hydrocarbons)**		+	0	-
Moth bals***		+		
Motor oil (cars)** (see also Two-stroke oil and oil according to ASTM)		+	0	-
Mustard		+		

	Conc. %	Temp. (°C) 20	60	100
N				
Nail polish*		+	0	
Nail polish remover*		+	0	
Naphtalane	100	+		
Nickel salts. aq.	sat.	+	+	
Nitric acid	50	0		
	25	+	+	
	10	+	+	
Nitrobenzene	100	0	0	
O				
Octane (see leoctane) Oil no. 3 according to ASTMD38O59	100	+	0	-
Oil of bitter almonds		+		
Oleic acid	100	+		
Oleum	any	-	-	
Olive oil		+	+	
Orangejuice		+	+	
Orange peell		+		
Orange peel oil		+		
Oxalix acid aq.	sat	+	+	+
Ozone (0,5 ppm)		+	-	
P				
Palm oil		+	0	
Paperika		+	+	
Paraffin	100	+	+	
Paraffin oil	100	+	0	
Peanul oil		+	(+)	(-)
Pectin	sat.	+	+	
Pepper		+	+	
Peppermint oil		+		
Perchlorethylene		+		
(see Tetrachlorettylene)				
Perfume**		+		
Petrol (see Fuels)				
Petroleum	100	+	0	
Petroleum ether	100	+	0	
Phenol (agueous phase)	sat.	+	+	
	(appr.9)			
(Phenolic Phase)	sat.	+		
	(appr70)			
Phosphoric acid	sat.(85)	+	0	
	50	+	+	
	10	+	+	+
Phosphorous pentoxide	100	+		
Photographic developers*	comm.	+	+	
	ready-	+	+	
	for-			
	use			
Pickled cabbage, ready-to-sat		+	+	(+)
Picled fish		+	+	(+)

List of Chemical Products

	Conc. %	Temp. (°C) 20	60	100
Pickled heming				
Pineapplejuice		+	+	
Pine needle oil	100	+	(+)	
Plasticizers				
Dibuthyphthalate		+	0	
(VESTINOL C)				
Dibuthyleebacate		+		
Dlhexylphathalate		+		
Dinonyladipate		+		
Dleonylphtalase		+		
VESTINOL N)				
Dloctyladipate				
(VESTINOLOA)				
Dloctylphthalate		+		
(VESTINOLAH)				
Tricresylphoapate		+		
Tricotylphosphate		+		
Porridge		+	+	(+)
Potassium carbonade aq. (Potash)	sat.	+	+	
Potassium chlorate ag.	sat	+	+	
	(7.3)			
Potassium chloride aq.	sat.	+	+	+
Potassium dichromate aq.	sat.	+	+	+
Potassium lodide aq.	sat.	+	+	
Potassium nitrateaq.	sat.	+	+	
Potassium	sat.	+	(+)	
Permanagate aq.	(6.4)			
Potassium persulphate aq.	sat.	+		
	(0.5)			
Potasssium sulphate aq.	sat.	+	+	+
Potato salad		+		
Propane, gassous	100	+	+	
Propane, liguid	100	+		
Pudding		+	+	0
Pyridine	100	+	0	
Q				
Quinine				
R				
Rum	40	+	+	
Rum aroma		+		
S				
SAGRATON		+	0	
Salad oil, animal		+	0	
Salad oil vegetable		+	+	' +
Salted water	any	+	+	
Sausage		+	+	+
Sea water		+	0	
Shoe polish*		+	(+)	
Siliconeoil*		+	+	
Silver salts aq.	sat.	+	+	
Soap, solution	sat.	+	+	
	10	+	1 +	+
Soda (see Sodium carbona-te)				
Soda water		+		
Sodium bicarbonate aq.	sat.	+	+	+
Sodium busilphite aq.	sat.	+	+	
Sodium carbonate aq.	sat.	+	+	
	10	+	+	
Sodium chlorateaq.(common salt)	sat.	+	+	+

	Conc. %	Temp. (°C) 20	60	100
Sodium chlorite aq.	5	+		
Sodium hydroxide (caustic soda;				
Sodium hyphochlorite aq.	5	+	+	
Sodium nitrate aq.	sat.	+	+	
Sodium nitride aq.	sat.	+		
Sodium parbrot aq.	sat.	+	+	+
	(1.4)			
Sodium phosphates aq.	sat.	+	+	+
Sodium sulphate aq.	sat.	+	+	+
(Glauber's salt)				
Sodium sulphite ag.**	sat.	+	+	
Sodium sulphite ag.	sat.	+	+	
Sodium thlosulphate aq.	sat.	+	+	+
(Photographic fixer)				
Soft soap		+	+	
Soybaan oil		+	0	
Stannous chloride	sat.	+	+	
Starch, starch solution aq.	any	+	+	
Stearic acid	100	+		
Storage-battery acid		+	+	
Succinic acid aq.	sat.	+	+	
Sugar (dry)		+	+	+
Sugar beet sirup		+	+	(+)
Sugar solution aq.	any.	+	+	(+)
Sulphur	100	+	+	+
Sulphur dioxide	Iow.	+	+	
(Sulphurous anhydride)				
Sulphuric acid	96	+	0	
	50	+	+	
	25	+	+	
	10	+	+	+
T				
Tar*		+	0	
Tarta ric acide aq.	sat.	+	+	
Tea (leaves)		+	+	
Tea (ready-to-drink)		+	+	(+)
Tetrachlorethane	100	0	-	
Tetrachloorethylene	100	0	-	
(Perchlorethylene)				
Tetrahydrofuran Ghc	100	0	-	
Tetrahydronaphtlens	100	0	-	
Thick (semolina) gruel		+	+	0
Thlophene	0			
Toluene		0		
Tomatajuice		+	+	
Tomata ketchup		+	+	
Toothpastes		+	+	
Transformer oil*		+	0	
Trichlorsthylene	100	0	0	
Turpentine oil		0	-	
Two-stroke oil		0	0	
Typewritero oil		+	(+)	
U				
Uree aq.	sat.	+	+	
V				
Vanills		+	+	
Vaseline		+	0	
Vegetables		+	+	
Vinegar		+	+	
Vinegar essence**		+	+	
W				
Water		+	+	
Water glass		+	+	
X				
Xylene		+	0	-
Z				
Zinc salts aq.		+	+	+

PP-R Pipe PN10 / SDR 11

PPR Series	Pressure	Standard	Application
SDR 11	PN 10	DIN 8077/78	Potable cold water Air conditioning Rain water Fluid transfer

Dimensions mm	Thickness mm	Weight kg/m	DN mm
20	1.9	0.109	15
25	2.3	0.165	20
32	2.9	0.265	25
40	3.7	0.415	32
50	4.6	0.645	40
63	5.8	1.015	50
75	6.8	1.415	65
90	8.2	2.045	80
110	10.0	3.136	80
125	11.4	3.927	100
160	14.6	6.416	125

PP-R Pipe PN16 / SDR 7.4

PPR Series	Pressure	Standard	Application
SDR 7.4	PN 16	DIN 8077/78	Hot & cold water Air conditioning Central heating Fluid transfer

Dimensions mm	Thickness mm	Weight kg/m	DN mm
20	2.8	0.148	15
25	3.5	0.232	20
32	4.4	0.376	25
40	5.5	0.583	32
50	6.9	0.896	40
63	8.6	1.420	50
75	10.3	2.020	65
90	12.3	2.190	65
110	15.1	4.320	80
125	17.1	5.580	100
160	21.9	9.120	125

PP-R Solid

PP-R Pipe PN20 / SDR 6

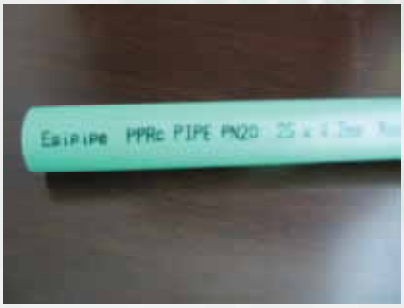
PPR Series	Pressure	Standard	Application
SDR 6	PN 20	DIN 8077/78	Hot & cold water Air conditioning Central heating Fluid transfer

Dimensions mm	Thickness mm	Weight kg/m	DN mm
20	3.4	0.171	13.2
25	4.2	0.266	16.6
32	5.4	0.472	21.2
40	6.7	0.66	26.6
50	8.3	1.054	33.4
63	10.5	1.697	42
75	12.5	2.328	50
90	15	3.415	60
110	18.3	5.15	75
160	26.6		110

PP-R Pipe PN25 / SDR 5

PPR Series	Pressure	Standard	Application
SDR 5	PN 25	DIN 8077/78	Potable cold water Air conditioning Central heating Fluid transfer

Dimensions mm	Thickness mm	Weight kg/m	DN mm
20	4.0	0.201	12
25	5.0	0.317	15
32	6.4	0.56	20
40	8.0	0.788	25
50	10.0	1.27	32
63	12.6	2.036	40
75	15.0	2.794	45
90	18.0	4.098	55
110	22.0	6.191	66
160	32.0		100



PP-R Stabi Multilayer AL - PPR

Stabi AL - PP-R Pipe PN 20 / SDR 6

PPR Stabi	Pressure	Standard	Application
SDR 6	PN 20	DIN 8077/78	Hot & cold water Air conditioning Central heating Fluid transfer

Dimensions mm	Thickness mm	Weight kg/m	DN mm
20	2.8	0.192	15
25	3.5	0.297	20
32	4.4	0.456	25
40	5.5	0.679	32
50	6.9	1.044	40
63	8.6	1.576	50
75	10.3	2.197	60
90	12.3	3.230	65
110	15.1	4.875	80

Stabi AL - PP-R Pipe PN 25 / SDR 5

PPR Stabi	Pressure	Standard	Application
SDR 5	PN 25	DIN 8077/78	Potable cold water Air conditioning Central heating Fluid transfer

Dimensions mm	Thickness mm	Weight kg/m	DN mm
20	3.4	0.215	13
25	4.2	0.329	17
32	5.4	0.515	22
40	6.7	0.775	27
50	8.3	1.198	34
63	10.5	1.816	42
75	12.5	2.527	50
90	15	3.720	60
110	18.3	5.372	74

Climate PP-RCT Air Conditioning Piping System

Characteristics

Best Solution for Central Air Conditioning Piping System

Low Temperature down to - 40 C
Low Heat Loss, Hence Less Insulation Layer
Low Thermal Expansion
No UV effect
Lighter Compared to Standard PPR
Higher Flow Compared to Standard PPR

PP-RCT Pipe PN16

PPR Series	Pressure	Standard	Application	Note
SDR 7.4	PN 16	DIN 8077/78	Air conditioning Piping System	

Code	Dimensions mm	Thickness mm	Weight kg/m	DN mm
EMI CT	20	1.9	0.11	15
	25	2.3	0.17	20
	32	2.9	0.27	25
	40	3.7	0.42	32
	50	4.6	0.65	40
	63	5.8	1.10	50
	75	6.8	1.40	65
	90	8.2	2.10	80
	110	10.0	3.10	80
	125	11.4	3.90	100
	160	14.6	6.40	125

Emipipe PN10 (SDR 11) Cold Water Pipes		
Code	**Size (mm)**	**(Pipe/Bundle)**
EPR2010	Emipipe PN10 pipe 20x2.0	25
EPR2510	Emipipe PN10 pipe 25x2.3	25
EPR3210	Emipipe PN10 pipe 32x2.9	15
EPR4010	Emipipe PN10 pipe 40x3.7	10
EPR5010	Emipipe PN10 pipe 50x4.6	5
EPR6310	Emipipe PN10 pipe 63x5.6	4
EPR7510	Emipipe PN10 pipe 75x6.8	3
EPR9010	Emipipe PN10 pipe 90x8.2	2
EPR11010	Emipipe PN10 pipe 110x10.0	1
EPR16010	Emipipe PN10 pipe 160x14.6	1
Emipipe PN16 (SDR 7.4) Hot & Cold Water Pipes		
Code	**Size (mm)**	**(Pipe/Bundle)**
EPR2016	Emipipe PN16 pipe 20x2.8	25
EPR2516	Emipipe PN16 pipe 25x3.5	25
EPR3216	Emipipe PN16 pipe 32x4.4	15
EPR4016	Emipipe PN16 pipe 40x5.5	10
EPR5016	Emipipe PN16 pipe 50x6.9	5
EPR6316	Emipipe PN16 pipe 63x8.6	4
EPR7516	Emipipe PN16 pipe 75x10.3	3
EPR9016	Emipipe PN16 pipe 90x12.3	2
EPR11016	Emipipe PN16 pipe 110x15.1	1
EPR16016	Emipipe PN16 pipe 160x21.9	1
Emipipe PN20 (SDR 6) Hot & Cold Water Pipes		
Code	**Size (mm)**	**(Pipe/Bundle)**
EPR2020	Emipipe PN20 pipe 20x3.4	25
EPR2520	Emipipe PN20 pipe 25x4.2	25
EPR3220	Emipipe PN20 pipe 32x5.4	15
EPR4020	Emipipe PN20 pipe 40x6.7	10
EPR5020	Emipipe PN20 pipe 50x8.4	5
EPR6320	Emipipe PN20 pipe 63x10.5	4
EPR7520	Emipipe PN20 pipe 75x12.5	3
EPR9020	Emipipe PN20 pipe 90x15.0	2
EPR11020	Emipipe PN20 pipe 110x18.3	1
EPR16020	Emipipe PN20 pipe 160x26.6	1
Emipipe PN25 (SDR 5) Hot & Cold Water Pipes		
Code	**Size (mm)**	**(Pipe/Bundle)**
EPR2025	Emipipe PN25 pipe 20x4.0	25
EPR2525	Emipipe PN25 pipe 25x5.0	25
EPR3225	Emipipe PN25 pipe 32x6.4	15
EPR4025	Emipipe PN25 pipe 40x8.0	10
EPR5025	Emipipe PN25 pipe 50x10.0	5
EPR6325	Emipipe PN25 pipe 63x12.6	4
EPR7525	Emipipe PN25 pipe 75x15.0	3
EPR9025	Emipipe PN25 pipe 90x18.0	2
EPR11025	Emipipe PN25 pipe 110x22.0	1
EPR16025	Emipipe PN25 pipe 160x32.0	1
Emipipe PN25 Pipes W/Aluminium		
Code	**Size (mm)**	**(Pipe/Bundle)**
EPPR20A	Emipipe PN25 Pipe 20x3.4	25
EPPR25A	Emipipe PN25 Pipe 25x4.2	25
EPPR32A	Emipipe PN25 Pipe 32x5.4	15
EPPR40A	Emipipe PN25 Pipe 40x6.7	10
EPPR50A	Emipipe PN25 Pipe 50x8.3	5
EPPR63A	Emipipe PN25 Pipe 63x10.5	4
EPPR75A	Emipipe PN25 Pipe 75x12.5	3
EPR90A	Emipipe PN25 pipe 90x15.0	2
EPR110A	Emipipe PN25 pipe 110x18.3	1

Equal Socket		
Code	**Size (mm)**	**Packing (Pcs.)**
EPS1	Equal Socket 20 mm	500
EPS2	Equal Socket 25 mm	320
EPS3	Equal Socket 32 mm	200
EPS4	Equal Socket 40 mm	100
EPS5	Equal Socket 50 mm	60
EPS6	Equal Socket 63 mm	32
EPS7	Equal Socket 75 mm	24
EPS9	Equal Socket 90 mm	16
EPS10	Equal Socket 110 mm	10
EPS16	Equal Socket 160 mm	4

Reduced Socket		
Code	**Size (mm)**	**Packing (Pcs.)**
EPRS21	Reduced Socket 25/20 mm.	500
EPRS31	Reduced Socket 32/20 mm.	300
EPRS32	Reduced Socket 32/25 mm.	300
EPRS43	Reduced Socket 40/32 mm.	160
EPRS54	Reduced Socket 50/40 mm.	100
EPRS65	Reduced Socket 63/50 mm.	40
EPRS76	Reduced Socket 75/63 mm.	32
EPRS96	Reduced Socket 90/63 mm.	5
EPRS97	Reduced Socket 90/75 mm.	5
EPRS109	Reduced Socket 110/90 mm.	3
EPRS1610	Reduced Socket 160/110 mm.	2

90° Elbow		
Code	**Size (mm)**	**Packing (Pcs.)**
EPE190	Elbow 90° - 20 mm	400
EPE290	Elbow 90° - 25 mm	200
EPE390	Elbow 90° - 32 mm	100
EPE490	Elbow 90° - 40 mm	75
EPE590	Elbow 90° - 50 mm	40
EPE690	Elbow 90° - 63 mm	20
EPE790	Elbow 90° - 75 mm	12
EPE990	Elbow 90° - 90 mm	8
EPE1090	Elbow 90° - 110 mm	3
EPE1690	Elbow 90° - 160 mm	2

45° Elbow		
Code	**Size (mm)**	**Packing (Pcs.)**
EPE145	Elbow 45° - 20 mm	400
EPE245	Elbow 45° - 25 mm	250
EPE345	Elbow 45° - 32 mm	150
EPE445	Elbow 45° - 40 mm	80
EPE545	Elbow 45° - 50 mm	40
EPE645	Elbow 45° - 63 mm	20

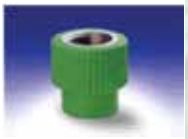
Equal Tee		
Code	**Size (mm)**	**Packing (Pcs.)**
EPT1	Equal Tee 20 mm	250
EPT2	Equal Tee 25 mm	150
EPT3	Equal Tee 32 mm	80
EPT4	Equal Tee 40 mm	50
EPT5	Equal Tee 50 mm	30
EPT6	Equal Tee 63 mm	20
EPT7	Equal Tee 75 mm	10
EPT9	Equal Tee 90 mm	5
EPT10	Equal Tee 110 mm	3
EPT16	Equal Tee 160 mm	2

End Cap

Code	Size (mm)	Packing (Pcs.)
EPEC1	End Cap 20 mm	500
EPEC2	End Cap 25 mm	500
EPEC3	End Cap 32 mm	300
EPEC4	End Cap 40 mm	160
EPEC5	End Cap 50 mm	100
EPEC6	End Cap 63 mm	50
EPEC7	End Cap 75 mm	32

Female Adaptor

Code	Size (mm)	Packing (Pcs.)
EPFA10	Fem. Adaptor 20 x ½ "	200
EPFA20	Fem. Adaptor 25 x ½"	150
EPFA21	Fem. Adaptor 25 x ¾"	150



Hexa. Female Adaptor

Code	Size (mm)	Packing (Pcs.)
EPFA32H	Hex.Fem. Adaptor 32 x 1"	80
EPFA43	Hex.Fem. Adaptor 40 x 1 ¼"	50
EPFA54	Hex.Fem. Adaptor 50 x 1 ½"	40

Male Adaptor

Code	Size (mm)	Packing (Pcs.)
EPMA10	Male Adaptor 20 x ½ "	200
EPMA20	Male Adaptor 25 x ½"	100
EPMA21	Male Adaptor 25 x ¾"	100
EPMA32	Male Adaptor 32 x 1"	80

Hexa. Male Adaptor

Code	Size (mm)	Packing (Pcs.)
EPMA32H	Hex.Male Adaptor 32 x 1"	80
EPMA43	Hex.Male Adaptor 40 x 1 ¼"	40
EPMA54	Hex.Male Adaptor 50 x 1 ½"	32
EPMA65	Hex.Male Adaptor 63 x 2"	16

Female Elbow

Code	Size (mm)	Packing (Pcs.)
EPFE10	Female Elbow 20 x ½"	200
EPFE20	Female Elbow 25 x ½"	150
EPFE21	Female Elbow 25 x ¾"	150
EPFE31	Female Elbow 32 x ¾"	50
EPFE32	Female Elbow 32 x 1"	50

Female Tee

Code	Size (mm)	Packing (Pcs.)
EPFT10	Female Tee 20x1/2"x20 mm.	160
EPFT20	Female Tee 25x1/2"x25 mm.	100
EPFT21	Female Tee 25 x 3/4" x 25	100
EPFT31	Female Tee 32 x 3/4" x 32	50
EPFT32	Female Tee 32 x 1" x 32	50

Female Union

Code	Size (mm)	Packing (Pcs.)
EPFU21	Fem. Union 25 x 3/4" Fem	100
EPFU32	Fem. Union 32 x 1" Fem	100
EPFU43	Fem. Union 40 x 1 ¼" Fem	50
EPFU54	Fem. Union 50 x 1 1/2" Fem	40
EPFU65	Fem. Union 63 x 2" Fem	20
EPFU76	Fem. Union 75 x 2 1/2" Fem	15
EPFU97	Fem. Union 90 x 3" Fem	8
EPFU108	Fem. Union 110 x 4" Fem	5

Male Union

Code	Size (mm)	Packing (Pcs.)
EPMU21	Male Union 25 x 3/4" M	100
EPMU32	Male Union 32 x 1" M	100
EPMU43	Male Union 40 x 1 ¼" M.	40
EPMU54	Male Union 50 x 1 1/2" M.	32
EPMU65	Male Union 63 x 2" M.	16
EPMU76	Male Union 75 x 2 1/2" M.	12
EPMU97	Male Union 90 x 3" M.	8
EPMU108	Male Union 110 x 4" M.	5

Pipe Bridge

Code	Size (mm)	Packing (Pcs.)
EPB1	Pipe Bridge 20 mm	100
EPB2	Pipe Bridge 25 mm	60
EPB3	Pipe Bridge 32 mm	40

PP- Threaded End Cap

Code	Size (mm)	Packing (Pcs.)
EPMC0	Plastic Thread Cap ½" Male	500
EPMC1	Plastic Thread Cap ¾" Male	500
EPMLC0	Plastic Thread Cap ½" Male (Long)	300
EPMLC1	Plastic Thread Cap ¾" Male (Long)	200

Pipe Clamp

Code	Size (mm)	Packing (Pcs.)
EPPC1	Pipe Clamp 20 mm	800
EPPC2	Pipe Clamp 25 mm	600
EPPC3	Pipe Clamp 32 mm	400

Reduced Tee

Code	Size (mm)	Packing (Pcs.)
EPRT212	Reduced Tee 25 x 20 x 25 mm.	160
EPRT313	Reduced Tee 32 x 20 x 32 mm	100
EPRT323	Reduced Tee 32 x 25 x 32 mm.	100
EPRT414	Reduced Tee 40 x 20 x 40 mm	50
EPRT424	Reduced Tee 40 x 25 x 40 mm	50
EPRT434	Reduced Tee 40 x 32 x 40 mm	50

Brass Gate Valve

Code	Size (mm)	Packing (Pcs.)
EPGV1	Brass Gate Valve 20 mm	80
EPGV2	Brass Gate Valve 25 mm	50
EPGV3	Brass Gate Valve 32 mm	42

Chrom. Gate Valve

Code	Size (mm)	Packing (Pcs.)
EPCV1	Chrom. Gate Valve 20 mm	50
EPCV2	Chrom. Gate Valve 25 mm	50
EPCV3	Chrom. Gate Valve 32 mm	30

Ball Valve

Code	Size (mm)	Packing (Pcs.)
EPBV1	PP Ball Valve 20 mm	80
EPBV2	PP Ball Valve 25 mm	50
EPBV3	PP Ball Valve 32 mm	42
EPBV4	PP Ball Valve 40 mm	30

Fem. Tee for Gate Valve

Code	Size (mm)	Packing (Pcs.)
EPTV11	Tee for Gate Valve 20mmx¾" Fem	100
EPTV21	Tee for Gate Valve 25mmx¾" Fem	100
EPTV32	Tee for Gate Valve 32mmx 1" Fem	50

Chrom. Handle for Gate Valve

Code	Size (mm)	Packing (Pcs.)
EPCH1	Chrom. Handle ¾" Male	50
EPCH2	Chrom. Handle 1" Male	30

Brass Handle for Gate Valve

Code	Size (mm)	Packing (Pcs.)
EPBH1	Brass Handle ¾" Male	100
EPBH2	Brass Handle 1" Male	50

Pipe Flange

Code	Size (mm)	Packing (Pcs.)
EPF4	Pipe Flange 40 mm	100
EPF5	Pipe Flange 50 mm	60
EPF6	Pipe Flange 63 mm	32
EPF7	Pipe Flange 75 mm	24
EPF9	Pipe Flange 90 mm	16
EPF10	Pipe Flange 110 mm	10

PPR - Union

Code	Size (mm)	Packing (Pcs.)
EPPU1	Plastic Union 20 mm	200
EPPU2	Plastic Union 25 mm	100
EPPU3	Plastic Union 32 mm	100
EPPU4	Plastic Union 40 mm	50
EPPU5	Plastic Union 50 mm	50
EPPU6	Plastic Union 63 mm	40

PPRc - Tools & Accessories

Welding Adaptor	
Code	**Size**
WA1	20 mm
WA2	25 mm
WA3	32 mm
WA4	40 mm
WA5	50 mm
WA6	63 mm
WA7	75 mm
WA9	90 mm
WA10	110 mm
WA16	160 mm

Pipe Cutters	
Code	**Size**
SPC	20-40 mm
GM012	20-50 mm
GM027	20-75 mm
GM028	20-63 mm

Pipe Repair Tool	
Code	**Size**
PRT	2-8 mm

Peeling Tool (Sharpner)	
Code	**Size**
PSH12	Ø20-25 mm
PSH34	Ø32-40 mm
PSH56	Ø50-63 mm
PSH67	Ø63-75 mm
PSH109	Ø90-110 mm

Welding Machines	
Code	**Weld. Dia**
WMT	20-90 mm
Welding Machine Only	
WMR	20-90 mm
Resistance for Welding Mach.	

COBRA Welding Machine	
Code	**Weld. Dia**
GMCO	20-90 mm
Temp.	50-300 C
Power	1500 W

TEST PRESSURE PUMP	
Code	**Size**
TPP	52x30x19 cm
Test Pressure : 0-50 Bar	
Tank Volume : 12 Litre	

GM Welding Machine Set	
Code	**Weld. Dia**
GM021	20-160 mm
Temp.	50-300 C
Power	2000 W

GM Welding Table	
Code	**Weld. Dia**
GM003	50-200 mm
Temp.	50-300 C
Power	2000 W

Eppinco is a mid-size, owner-managed company characterized by the people involved, has been manufacturing and distributing quality piping for water industry for almost a decade now. Eppinco was established by a group of professional engineers, managers and strategists from different disciplines particularly management and financing sector.

With distribution centres and distributors across GCC countries, Middle East, and with highly qualified and experienced management, Eppinco remains committed to providing customers with quality products and professional services.

We are very proud of what we have been able to achieve in such a short period, and we could have not done it without the support and backing of our customers and partners. We are committed to manufacture quality products, locally and globally, to serve water industry for long time to come.

General Manger **Advisor**

Notes

Quality is our Profession

Over 1.5 million meters of pipes produced every month for customers all over the Middle East.