



PPR PIPES & FITTINGS

For Hot & Cold Water Plumbing Application



About MEKOR

MEKOR Pipes Pvt. Ltd. company, specialises in supplying high-quality piping systems that consistently meet stringent international standards, ensuring unparalleled performance of the piping systems. Our experienced team, equipped with extensive technical knowledge, coupled with our efficient operations and fast turnaround time, enables us to provide top-tier supply of piping products tailored to your needs.

Our Mission

MEKOR mission is to supply high-quality piping systems worldwide, offering a complete solution that meets international standards to ensure superior performance in every project.

Product Range

Our stellar lineup of pipes, ready for every project:

- **PPR Pipes & Fittings**
- **PPR-FR Pipes & Fittings**
- **PPR-FRGF Pipes & Fittings**
- **PPR Electro Fusion Fittings**
- **HDPE Pipes & Fittings**
- **HDPE Electro Fusion Pipes & Fittings**
- **PPH Pipes & Fittings**

Complete Solution Concept

Our wide range of products represent our complete solution concept.

With our products intended for diverse sectors, we offer individual and comprehensive system solutions. Focusing on the needs of projects and entire system.

We provide high standards of products in the market at all times. We always stand by our piping systems and reliable service network.

As a global pipe supplying company that stands out with successful operations ever since our incorporation, we act as a solution point to meet all your needs based on our technical knowledge, specialization and reliability.

Quality Assurance

We are committed to excellence in every aspect of our operations. The products we supply comply with the international standards and certifications, ensuring reliability, durability, and safety in every application. With Mekor, you can trust that you're receiving top-notch piping solutions that meet your specifications and exceed your expectations.

Our Market Segments

Based on our experience and high-quality standard of products in the sector, **Mekor** Piping Systems supports its clients with a complete piping solutions for every project requirement.

- **HVAC Segment**
- **Chemical and Petrochemical**
- **Water and Wastewater**
- **Mining and Mineral Processing**
- **Power Generation**
- **Marine and Offshore**
- **Buliding and Construction**
- **Manufacturing Industries**
- **Agriculture**
- **Pharmaceuticals**
- **Infrastructure**



About Plastics

Plastics are polymers created by the chemical conversion of natural products or synthesized from organic materials. The primary components that make up the building blocks of plastics are long chains of carbon (C) and hydrogen (H) known as monomers.

The raw materials used for the production of plastics are natural compounds such as cellulose, coal, oil and natural gas. In the plastics industry, around 6 % of the petroleum products that come out from refineries is used.

Plastics fall into three main categories on the basis of their internal structure and the resulting mechanical characteristics: thermoplastics, thermosetting plastics and elastomers.

Advantages of Plastics

Thermoplastics obviously demonstrate different characteristics than those of the metals traditionally used for piping.

Metal	Plastic
High density <ul style="list-style-type: none">Crane is needed for transport.Requires wide spacing for fixings.High anchoring forces, fixing required.	Low density <ul style="list-style-type: none">Can be carried by hand up to d110.Requires minimal spacing for fixings.Simple and economical.
Thermal conductivity <ul style="list-style-type: none">Insulation is needed to limit heat loss.Formation may result in corrosion.	Low thermal conductivity <ul style="list-style-type: none">Limited heat loss.Low levels of condensation and resistance to corrosion.
Corrosion Behaviors <ul style="list-style-type: none">Galvanic corrosion can occur.Corrosion reduces internal diameter.Reduced diameter causes pressure losses.	High Corrosion Resistance <ul style="list-style-type: none">Galvanic Corrosion Free.Prevents corrosion and diameter reduction.No pressure losses.
Chemical resistance <ul style="list-style-type: none">Low Resistance to Acids.Damage from Incrustation.	High chemical resistance <ul style="list-style-type: none">A minimum of 25-years of life with correct jointing methods.Incrustation free.

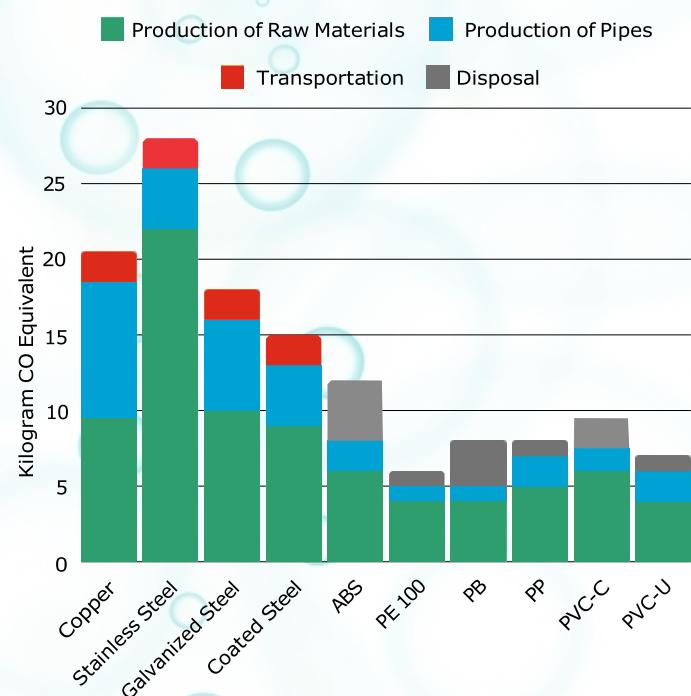
Thermoplastics in turn can be split into two main categories as partially-regulated (semi-crystalline) and irregular (amorphous) molecular structures.

- Semicrystalline thermoplastics, which have a partially ordered molecular structure: this category includes the polyolefins (polypropylene, polyethylene, polybutylene) and fluoropolymers (PP, PE, etc.)
- Amorphous thermoplastics, which have no crystalline regions and no packed molecular structure: this category includes the vinyl chlorides (PVC-U, PVC-C, etc.) and styrenes (ABS, polystyrene, etc.)

Semicrystalline materials are more suitable for hot welding, while amorphous thermoplastics are ideal for cementing or cold welding (solvent cementing).

Carbon Footprint of Plastics Vs Metal

It is the total of all greenhouse gases emitted to the atmosphere during the entire lifetime including the processes for extracting a product having carbon footprint from under the ground, refining, producing, using and disposing of that product.





PP-R Piping System

PP-R Piping Systems is a lightweight piping system made of PP-R copolymer material, with high mechanical strength and resistance to corrosion.

It is made from the latest scientific formula with high-quality polypropylene random copolymer, it's non-toxic, ensuring people safe drinking water, can be applied in both residential and commercial buildings.

Applications

Application ranges

- Distribution for cool and hot water.
- Pipes to connect kinds of low temperature heating system.
- Pipes for heating and cooling settings in solar energy system.
- Chilled water piping for air conditioners.

Application areas

- Residential apartments, condominiums and public housing.
- Commercial shopping centers and office buildings.
- Industrial plants dealing with chemicals, food processing and hospitals.
- Schools, laboratories and chemical sewerage.
- Hotels and resorts.

Advantages



Corrosion-resistant



Outstanding heat and sound insulation property



Light in weight



Smooth inner wall



Hygienic and non-toxic



Safe homogeneous connections



A lifetime up to 50 years under normal conditions





Range of **MEKOR** PP-R Pipes

Standard UV PP-R Pipe (Single-Layer)

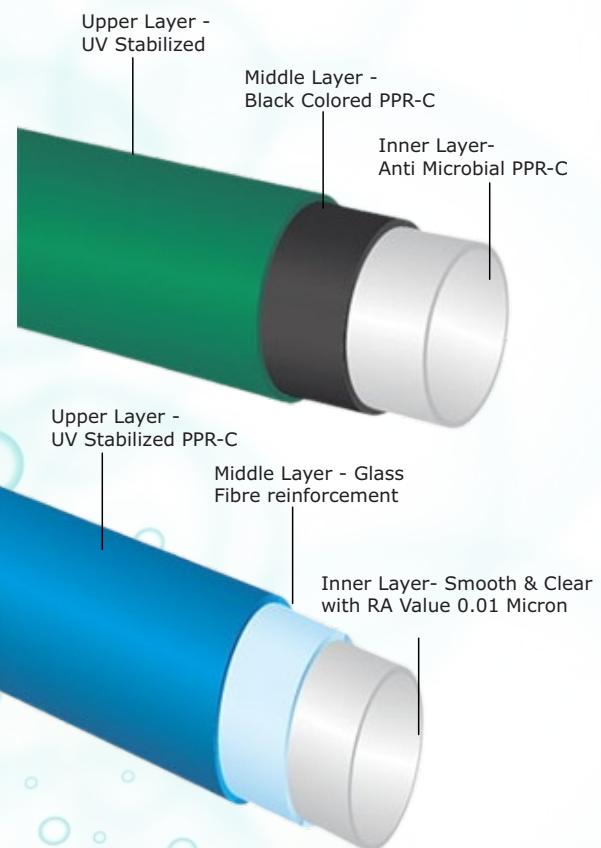
- Single layer of PP-R with anti-microbial inner layer.
- An outer layer of UV stabilising compound.

Multi-Layer PP-R Pipe (Triple-Layer)

- Three-layer structure with all layers consist of PP-R.
- The inner layer of PP-R is antimicrobial.
- Low linear expansion coefficient.
- Upgraded temperature resistance.

Glass Fiber Reinforced ML PP-R Pipe

- Three-layer structure with outer layer consists of PP-R and middle layer consists of reinforced glass fiber composite.
- The inner layer of PP-R is antimicrobial.
- Low linear expansion coefficient.
- Composite PP-R pipe has the advantages of three layers of materials with glass fiber reinforcement in middle which is much needed in industrial use.
- Upgraded temperature resistance.



Technical data

Working Temperature

- -5°C to 95°C or 23°F to 203°F

Pipe Standard

- DIN 8077
- DIN 8078
- IS 15801
- BS 6920-1

Fitting Standard

- DIN 16962



Food Grade



Hot & Cold Water



Industrial Supply



Residential Plumbing



Chemical Resistant

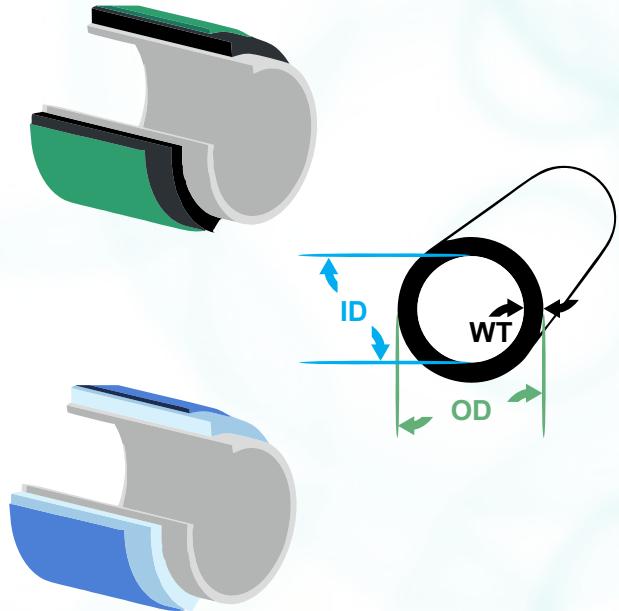


Air Supply



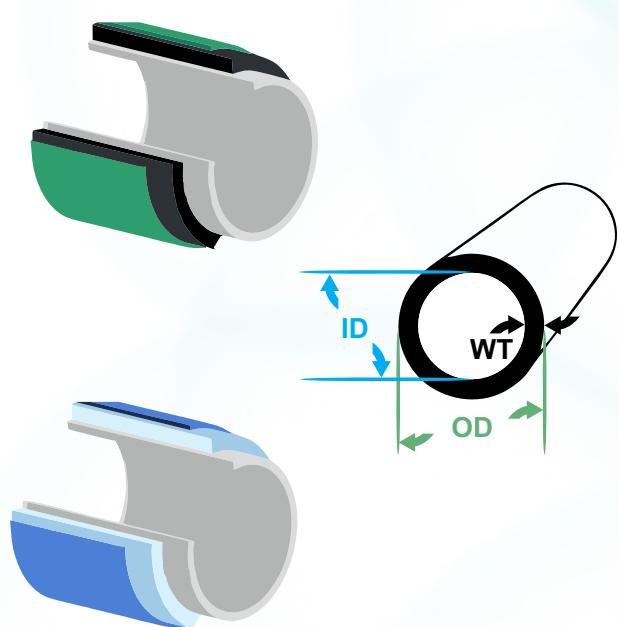
PP-R Pipe Range

Standard PP-R Pipe Triple Layer / Single Layer / PN-06 / SDR-17.5



CODE	SIZE(mm)	Tolerance Only +	Ovality	SDR-17.6/ PN-06		
				Min.W/T	Max.W/T	Pipe ID.
MKR-P3	63	0.6	1.6	3.6	4.2	55.8
MKR-P4	75	0.7	1.6	4.3	5.0	66.4
MKR-P5	90	0.9	1.8	5.1	5.9	79.8
MKR-P6	110	0.9	2.2	6.3	7.2	97.4
MKR-P7	125	1.2	2.5	7.1	8.1	110.8
MKR-P8	160	1.5	3.2	9.1	10.3	141.8
MKR-P9	200	1.8	4.0	11.4	12.8	177.2
MKR-P10	250	2.3	5.0	14.2	15.9	221.6
MKR-P11	315	2.5	11.1	17.9	19.9	279.2
MKR-P12	355	3.2	12.5	20.1	22.4	314.8
MKR-P13	400	3.6	14.0	22.7	25.2	354.6
MKR-P14	450	3.9	15.1	25.5	29.4	399.0
MKR-P15	500	4.1	15.9	28.4	32.5	443.2
MKR-P16	560	4.5	17.1	31.7	36.2	496.6
MKR-P17	630	4.8	18.2	35.7	40.5	558.6

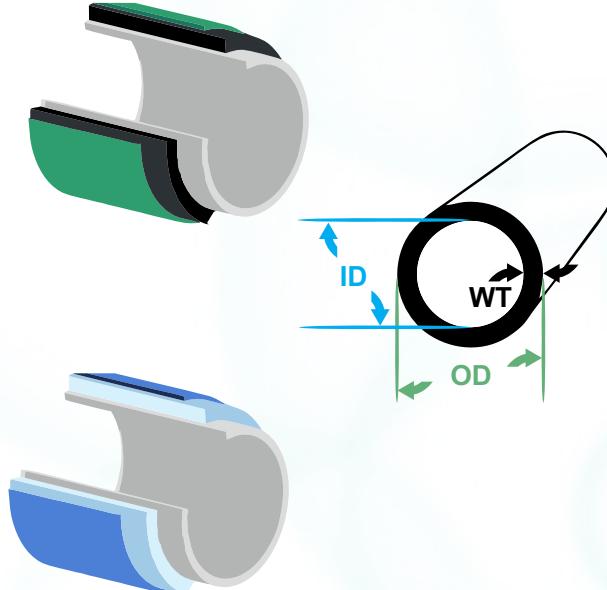
Standard PP-R Pipe Triple Layer / Single Layer / PN-10 / SDR-11



CODE	SIZE(mm)	Tolerance Only +	Ovality	SDR-11/ PN-10		
				Min.W/T	Max.W/T	Pipe ID.
MKR-P20	20	0.3	1.2	1.9	2.3	16.2
MKR-P21	25	0.3	1.2	2.3	2.8	20.4
MKR-P22	32	0.3	1.3	2.9	3.4	26.2
MKR-P23	40	0.4	1.4	3.7	4.3	32.6
MKR-P24	50	0.5	1.4	4.6	5.3	40.8
MKR-P25	63	0.6	1.6	5.8	6.6	51.4
MKR-P26	75	0.7	1.6	6.8	7.7	61.4
MKR-P27	90	0.9	1.8	8.2	9.3	73.6
MKR-P28	110	0.9	2.2	10.0	11.2	90.0
MKR-P29	125	1.2	2.5	11.4	12.8	.102.2
MKR-P30	160	1.5	3.2	14.6	16.3	130.8
MKR-P31	200	1.8	4.0	18.2	20.3	163.6
MKR-P32	250	2.3	.5.0	22.7	25.2	204.6
MKR-P33	315	2.5	11.1	28.6	31.7	257.8
MKR-P34	355	3.2	12.5	32.2	35.7	290.6
MKR-P35	400	3.6	14.0	36.3	40.2	327.4
MKR-P36	450	3.9	15.1	40.3	44.2	369.4
MKR-P37	500	4.1	15.9	44.8	48.9	410.4
MKR-P38	560	4.5	17.1	50.1	54.6	459.8
MKR-P39	630	4.8	18.2	56.2	61	517.6

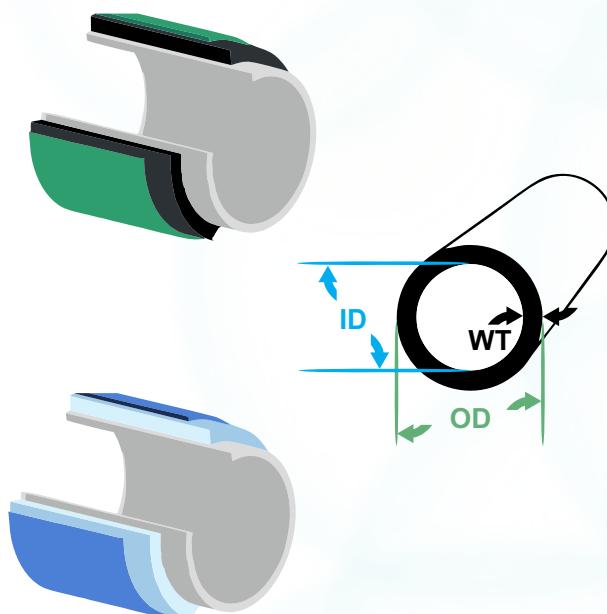


Standard PP-R Pipe Triple Layer / Single Layer / PN-12.5 / SDR-09



CODE	SIZE(mm)	Tolerance	Ovality	SDR-09/ PN-12.5		
		Only +		Min.W/T	Max.W/T	Pipe ID.
MKR-P40	20	0.3	1.2	2.3	2.8	15.4
MKR-P41	25	0.3	1.2	2.8	3.3	19.4
MKR-P42	32	0.3	1.3	3.6	4.2	24.8
MKR-P43	40	0.4	1.4	4.5	5.2	31.0
MKR-P44	50	0.5	1.4	5.6	6.4	38.8
MKR-P45	63	0.6	1.6	7.1	8.1	48.8
MKR-P46	75	0.7	1.6	8.4	9.5	58.2
MKR-P47	90	0.9	1.8	10.1	11.4	69.8
MKR-P48	110	0.9	2.2	12.3	13.8	85.4
MKR-P49	125	1.2	2.5	14.0	15.6	97.0
MKR-P50	160	1.5	3.2	17.9	19.9	124.2
MKR-P51	200	1.8	4.0	22.4	24.9	155.2
MKR-P52	250	2.3	5.0	27.9	30.9	194.2

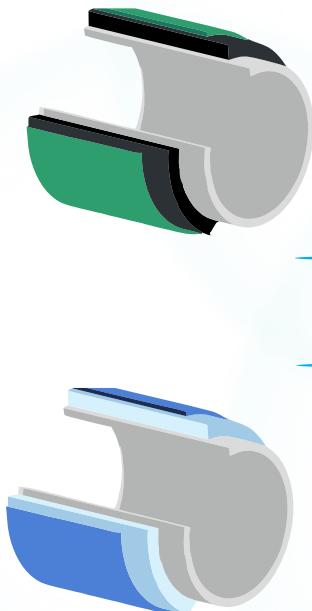
Standard PP-R Pipe Triple Layer / Single Layer / PN-16 / SDR-7.4



CODE	SIZE(mm)	Tolerance	Ovality	SDR-7.4/ PN-16		
		Only +		Min.W/T	Max.W/T	Pipe ID.
MKR-P57	20	0.3	1.2	2/8	3.3	14.4
MKR-P58	25	0.3	1.2	3.5	4.1	18.0
MKR-P59	32	0.3	1.3	4.4	5.1	23.2
MKR-P60	40	0.4	1.4	5.5	6.3	29.0
MKR-P61	50	0.5	1.4	6.9	7.8	36.2
MKR-P62	63	0.6	1.6	8.6	9.7	45.8
MKR-P63	75	0.7	1.6	10.3	11.6	54.4
MKR-P64	90	0.9	1.8	12.3	13.8	65.4
MKR-P65	110	0.9	2.2	15.1	16.9	79.8
MKR-P66	125	1.2	2.5	17.1	19.1	90.8
MKR-P67	160	1.5	3.2	21.9	24.3	116.2
MKR-P68	200	1.8	4.0	27.4	30.4	145.2
MKR-P69	250	2.3	5.0	34.2	37.9	181.6
MKR-P70	315	2.5	11.1	42.7	48.0	229.6
MKR-P71	355	3.2	12.5	48.0	53.0	259.0
MKR-P72	400	3.6	14.0	54.0	59.6	292.0



Standard PP-R Pipe Triple Layer / Single Layer / PN-20 / SDR-6



CODE	SIZE(mm)	Tolerance Only +	Ovality	SDR-06/ PN-20		
				Min.W/T	Max.W/T	Pipe ID.
MKR-P67	20	0.3	1.2	3.4	4.0	13.2
MKR-P68	25	0.3	1.2	4.2	4.9	16.6
MKR-P69	32	0.3	1.3	5.4	6.2	21.2
MKR-P70	40	0.4	1.4	6.7	7.6	26.6
MKR-P71	50	0.5	1.4	8.3	9.4	33.4
MKR-P72	63	0.6	1.6	10.5	11.8	42.0
MKR-P73	75	0.7	1.6	12.5	14.0	50.0
MKR-P74	90	0.9	1.8	15.0	16.7	60.0
MKR-P75	110	0.9	2.2	18.3	20.4	73.4
MKR-P76	125	1.2	2.5	20.8	23.1	83.4
MKR-P77	160	1.5	3.2	26:6	29.5	106.8
MKR-P78	200	1.8	4.0	33.2	36.8	133.6
MKR-P79	250	2.3	. 5.0	41.7	46.1	166.6
MKR-P80	315	2.5	11.1	52.5	58.0	210.0
MKR-P81	355	3.2	12.5	59.2	65.4	236.6



FIELDS OF APPLICATION



Portable water application



Under floor heating system



Connection heating and cooling



Wall heating



Ceiling heating and cooling



Fire protection sprinklers systems



Industrial floor heating



Chilled water technology



Sports floor heating and cooling



District heating pipeline systems



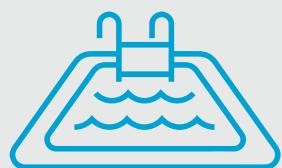
Chemical transport



Compressed air systems



Application in the field of ship building



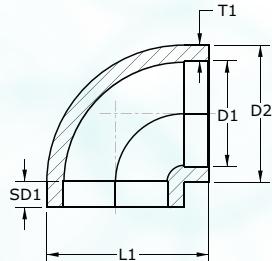
Swimming pool technology



PP-R Fittings Range

Elbow 90 DEG.

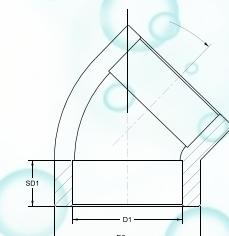
Material : PPR
 Standards : DIN 16962, EN ISO 15874
 Colour : 



SR.NO.	CODE	SIZE	D1(mm)	D2(mm)	L1(mm)	SD1(mm)
1	MKR-F0001	20 mm	20	27	44.5	16
2	MKR-F0002	25 mm	25	33.5	47.7	17
3	MKR-F0003	32 mm	32	43	57	19
4	MKR-F0004	40 mm	40	52.5	67.8	21
5	MKR-F0005	50 mm	50	65	82.2	24
6	MKR-F0006	63 mm	60	82.5	101.1	28
7	MKR-F0007	75 mm	75	98	116.8	32
8	MKR-F0008	90 mm	90	117	135.7	34
9	MKR-F0009	110 mm	110	143.5	163	37
10	MKR-F0010	125 mm	125	161.5	184	40
11	MKR-F0001	160 mm	160	192	217.3	44

Elbow 45 DEG.

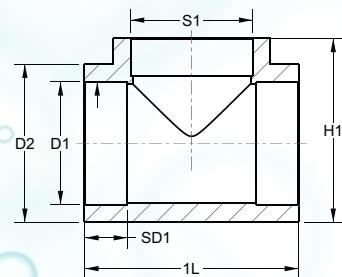
Material : PPR
 Standards : DIN 16962, EN ISO 15874
 Colour : 



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	SD1(mm)
1	MKR-F0021	20 mm	20	27	16
2	MKR-F0022	25 mm	25	33.5	17
3	MKR-F0023	32 mm	32	43	19
4	MKR-F0024	40 mm	40	52.5	21
5	MKR-F0025	50 mm	50	65	24
6	MKR-F0026	63 mm	63	82.5	28
7	MKR-F0027	75 mm	75	98	32
8	MKR-F0028	90 mm	90	117	34
9	MKR-F0029	110 mm	110	143.5	37
10	MKR-F0030	125 mm	125	161.5	40
11	MKR-F0031	160 mm	160	192	44

Equal Tee

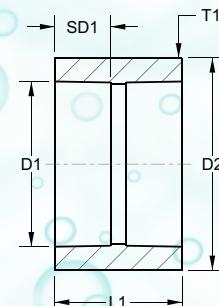
Material : PPR
Standards : DIN 16962, EN ISO 15874
Colour : 



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	L1(mm)	H1(mm)	SD1(mm)
1	MKR-F0041	20 mm	20	27	54	40.5	16
2	MKR-F0042	25 mm	25	33.5	61.5	48.2	17
3	MKR-F0043	32 mm	32	43	72.6	57.6	19
4	MKR-F0044	40 mm	40	52.5	86	69.5	21
5	MKR-F0045	50 mm	50	65	101.5	82.1	24
6	MKR-F0046	63 mm	63	82.5	120.5	101.6	28
7	MKR-F0047	75 mm	75	98	140.5	117.3	32
8	MKR-F0048	90 mm	90	117	159.4	136	34
9	MKR-F0049	110 mm	110	143.5	187.1	162.8	37
10	MKR-F0050	125 mm	125	161.5	214.7	186.7	40
11	MKR-F0051	160 mm	160	194.5	252	221.7	44

Coupler (socket)

Material : PPR
Standards : DIN 16962, EN ISO 15874
Colour : 



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	L1(mm)	SD1(mm)
1	MKR-F0061	20 mm	20	27	33.6	16
2	MKR-F0062	25 mm	25	33.5	38	17
3	MKR-F0063	32 mm	32	43	41.3	19
4	MKR-F0064	40 mm	40	52.5	45	21
5	MKR-F0065	50 mm	50	65	49.4	24
6	MKR-F0066	63 mm	63	82.5	59.3	28
7	MKR-F0067	75 mm	75	98	66.4	32
8	MKR-F0068	90 mm	90	117	70.5	34
9	MKR-F0069	110 mm	110	143.5	77.7	37
10	MKR-F0070	125 mm	125	161.5	95.2	40
11	MKR-F0071	160 mm	160	192	91.5	44



Reducer

Material

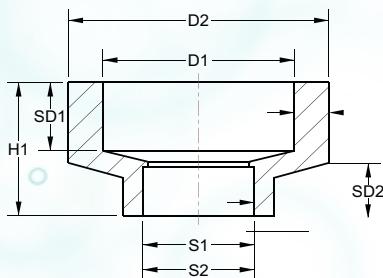
: PPR

Standards

: DIN 16962, EN ISO 15874

Colour

: 



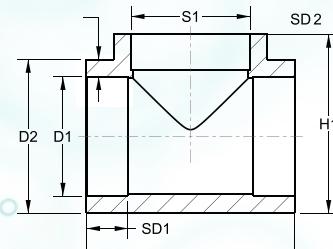
SR.NO	CODE	SPEC	D1(mm)	D2(mm)	S1(mm)	S2(mm)	H1(mm)	SD1(mm)	SD2(mm)
1	MKR-F0072	25/20 mm	25	33.5	20	27	38	17	16
2	MKR-F0073	32/20 mm	32	43	20	27	40.5	19	16
3	MKR-F0074	32/25 mm	32	43	25	33.5	40.5	19	17
4	MKR-F0075	40/20 mm	40	52.5	20	27	45	21	16
5	MKR-F0076	40/25 mm	40	52.5	25	33.5	45	21	17
6	MKR-F0077	40/32 mm	40	52.5	32	43	45	21	19
7	MKR-F0078	50/20 mm	50	65	20	27	50	24	16
8	MKR-F0079	50/25 mm	50	65	25	33.5	50	24	17
9	MKR-F0080	50/32 mm	50	65	32	43	50	24	19
10	MKR-F0081	50/40 mm	50	65	40	52.5	50	24	21
11	MKR-F0082	63/20 mm	63	82.5	20	-	57	28	-
12	MKR-F0083	63/25 mm	63	82.5	25	-	57	28	-
13	MKR-F0084	63/32 mm	63	82.5	32	43	57	28	19
14	MKR-F0085	63/40 mm	63	82.5	40	52.5	57	28.	21
15	MKR-F0086	63/50 mm	63	82.5	50	65	57	28	24
16	MKR-F0087	75/20 mm	75	98	20	-	63	32	-
17	MKR-F0088	75/25 mm	75	98	25	-	63	32	-
18	MKR-F0089	75/32 mm	75	98	32	-	63	32	-
19	MKR-F0090	75/40 mm	75	98	40	52.5	63	32	21
20	MKR-F0091	75/50 mm	75	98	50	65	63	32	24
21	MKR-F0092	75/63 mm	75	98	63	82.5	63	32	28
22	MKR-F0093	90/20 mm	90	117	20	-	70.5	34	-
23	MKR-F0094	90/25 mm	90	117	25	-	70.5	34	-
24	MKR-F0095	90/32 mm	90	117	32	-	70.5	34	-
25	MKR-F0096	90/40 mm	90	117	40	-	70.5	34	-
26	MKR-F0097	90/50 mm	90	117	50	65	70.5	34	24
27	MKR-F0098	90/63 mm	90	117	63	82.5	70.5	34	28
28	MKR-F0099	90/75 mm	90	117	75	98	70.5	34	32
29	MKR-F0100	110/20 mm	110	143.5	20	-	77	37	-
30	MKR-F0101	110/25 mm	110	143.5	25	-	77	37	-
31	MKR-F0102	110/32 mm	110	143.5	32	-	77	37	-
32	MKR-F0103	110/40 mm	110	143.5	40	-	77	37	-
33	MKR-F0104	110/50 mm	110	143.5	50	-	77	37	-
34	MKR-F0105	110/63 mm	110	143.5	63	82.5	77	37	28
35	MKR-F0106	110/75 mm	110	143.5	75	98	77	37	32
36	MKR-F0107	110/90 mm	110	143.5	90	117	77	37	34
37	MKR-F0108	125/20 mm	125	161.5	20	-	92.5	40	-
38	MKR-F0109	125/25 mm	125	161.5	25	-	92.5	40	-
39	MKR-F0110	125/32 mm	125	161.5	32	-	92.5	40	-
40	MKR-F0108	125/40 mm	125	161.5	40	-	92.5	40	-
41	MKR-F0109	125/50 mm	125	161.5	50	-	92.5	40	-
42	MKR-F0110	125/63 mm	125	161.5	63	-	92.5	40	-
43	MKR-F0111	125/75 mm	125	161.5	75	-	92.5	40	-
44	MKR-F0112	125/90 mm	125	161.5	90	-	92.5	40	-
45	MKR-F0113	125/110 mm	125	161.5	110	143.5	92.5	40	37
46	MKR-F0114	160/20 mm	160	192	20	-	93	44	-
47	MKR-F0115	160/25 mm	160	192	25	-	93	44	-
48	MKR-F0116	160/32 mm	160	192	32	-	93	44	-
49	MKR-F0117	160/40 mm	160	192	40	-	93	44	-
50	MKR-F0118	160/50 mm	160	192	50	-	93	44	-
51	MKR-F0119	160/63 mm	160	192	63	-	93	44	-
52	MKR-F0120	160/75 mm	160	192	75	-	93	44	-
53	MKR-F0121	160/90 mm	160	192	90	117	93	44	34
54	MKR-F0122	160/110 mm	160	192	110	143.5	96	44	37
55	MKR-F0123	160/125 mm	160	192	125	161.5	85	44	40

Reducer Tee

Material : PPR

Standards : DIN 16962, EN ISO 15874

Colour : 



SR.NO	CODE	SPEC	D1(mm)	D2(mm)	S1(mm)	S2(mm)	L1(mm)	H1(mm)	SD1(mm)	SD2(mm)
1	MKR-F0181	25/20/25 mm	25	33.5	20	27	57	46.6	17	16
2	MKR-F0182	32/20/32 mm	32	43	20	27	62	53.2	19	16
3	MKR-F0183	32/25/32 mm	32	43	25	33.5	66.6	55.5	19	17
4	MKR-F0184	40/20/40 mm	40	52.5	20	27	68.9	62.5	21	16
5	MKR-F0185	40/25/40 mm	40	52.5	25	33.5	72.9	64.5	21	17
6	MKR-F0186	40/32/40 mm	40	52.5	32	43	66.4	78.6	21	19
7	MKR-F0187	50/20/50 mm	50	65	20	27	76.8	74.6	24	16
8	MKR-F0188	50/25/50 mm	50	65	25	33.5	76.5	75.7	24	17
9	MKR-F0189	50/32/50 mm	50	65	32	43	82.3	77.5	24	19
10	MKR-F0190	50/40/50 mm	50	65	40	52.5	90	79.3	24	21
11	MKR-F0191	63/20/63 mm	63	82.5	20	-	-	-	28	-
12	MKR-F0192	63/25/63 mm	63	82.5	25	33.5	92.5	84.8	28	-
13	MKR-F0193	63/32/63 mm	63	82.5	32	43	91.4	93.1	28	19
14	MKR-F0194	63/40/63 mm	63	82.5	40	52.5	98.3	93	28.	21
15	MKR-F0195	63/50/63 mm	63	82.5	50	65	107.9	97.8	28	24
16	MKR-F0196	75/20/75 mm	75	98	20	-	-	-	32	-
17	MKR-F0197	75/25/75 mm	75	98	25	33.5	107.8	107.4	32	-
18	MKR-F0198	75/32/75 mm	75	98	32	43	107.3	107.7	32	-
19	MKR-F0199	75/40/75 mm	75	98	40	52.5	107.1	106.6	32	21
20	MKR-F0200	75/50/75 mm	75	98	50	65	117.2	112.8	32	24
21	MKR-F0201	75/63/75 mm	75	98	63	82.5	128.3	115.2	32	28
22	MKR-F0202	90/20/90 mm	90	117	20	-	-	-	34	-
23	MKR-F0203	90/25/90 mm	90	117	25	-	-	-	34	-
24	MKR-F0204	90/32/90 mm	90	117	32	43	121.2	127.5	34	-
25	MKR-F0205	90/40/90 mm	90	117	40	52.5	120.8	127.3	34	-
26	MKR-F0206	90/50/90 mm	90	117	50	65	121.3	127.6	34	24
27	MKR-F0207	90/63/90 mm	90	117	63	82.5	132.2	130.1	34	28
28	MKR-F0208	90/75/90 mm	90	117	75	98	144.6	134.5	34	32
29	MKR-F0209	110/20/110 mm	110	143.5	20	-	-	-	37	-
30	MKR-F0210	110/25/110 mm	110	143.5	25	-	-	-	37	-
31	MKR-F0211	110/32/110 mm	110	143.5	32	43	130	134.5	37	-
32	MKR-F0212	110/40/110 mm	110	143.5	40	52.5	130	154.5	37	-
33	MKR-F0213	110/50/110 mm	110	143.5	50	65	131.3	155.3	37	-
34	MKR-F0214	110/63/110 mm	110	143.5	63	82.5	136	155.8	37	28
35	MKR-F0215	110/75/110 mm	110	143.5	75	98	151.4	156.9	37	32
36	MKR-F0216	110/90/110 mm	110	143.5	90	117	166.3	158.7	37	34
37	MKR-F0217	125/20/125 mm	125	161.5	20	-	-	-	40	-
38	MKR-F0218	125/25/125 mm	125	161.5	25	-	-	-	40	-
39	MKR-F0219	125/32/125 mm	125	161.5	32	-	-	-	40	-
40	MKR-F0220	125/40/125 mm	125	161.5	40	-	-	-	40	-
41	MKR-F0221	125/50/125 mm	125	161.5	50	-	-	-	40	-
42	MKR-F0222	125/63/125 mm	125	161.5	63	92.2	215.3	189	40	-
43	MKR-F0223	125/75/125 mm	125	161.5	75	98	211.3	189	40	-
44	MKR-F0224	125/90/125 mm	125	161.5	90	117	214.4	189	40	-
45	MKR-F0225	125/110/125 mm	125	161.5	110	143.5	195.7	215	40	37
46	MKR-F0226	160/20/160 mm	160	192	20	-	-	-	44	-
47	MKR-F0227	160/25/160 mm	160	192	25	-	-	-	44	-
48	MKR-F0228	160/32/160 mm	160	192	32	-	-	-	44	-
49	MKR-F0229	160/40/160 mm	160	192	40	-	-	-	44	-
50	MKR-F0230	160/50/160 mm	160	192	50	-	-	-	44	-
51	MKR-F0231	160/63/160 mm	160	192	63	-	-	-	44	-
52	MKR-F0232	160/75/160 mm	160	192	75	98	196.2	216	44	-
53	MKR-F0233	160/90/160 mm	160	192	90	117	195.3	211.6	44	34
54	MKR-F0234	160/110/160 mm	160	192	110	143.5	195.5	215.6	44	37
55	MKR-F0235	160/125/160 mm	160	192	125	161.5	-	-	44	40

Ball Valve (Socket Weld) Heavy Duty

Material

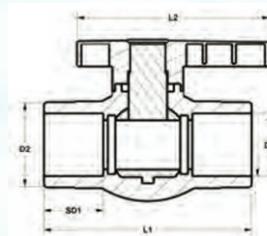
: PPR

Standards

: DIN 16962, EN ISO 15874

Colour

:



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	L1(mm)	L2(mm)	SD1(mm)
1	MKR-F0301	20 mm	19	27	73.5	79.5	16
2	MKR-F0302	25 mm	23.5	33.5	77.5	87.4	17
3	MKR-F0303	32 mm	30.5	43	87.2	99.3	19
4	MKR-F0304	40 mm	38.5	52.5	102.7	114.7	21
5	MKR-F0305	50 mm	48.5	65	121.4	134.3	24
6	MKR-F0306	63 mm	61.5	82.5	141	158.8	28
7	MKR-F0307	75 mm	73.5	98	-	-	32

Four Way Tee (Cross)

Material

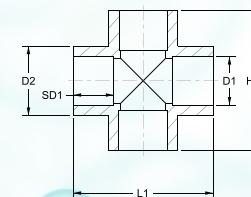
: PPR

Standards

: DIN 16962, EN ISO 15874

Colour

:



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	L1(mm)	SD1(mm)
1	MKR-F0321	20 mm	20	27	55	16
2	MKR-F0322	25 mm	25	33.5	63.8	17
3	MKR-F0323	32 mm	32	43	72.2	19
4	MKR-F0324	40 mm	40	52.5	85.7	21
5	MKR-F0325	50 mm	50	65	100.3	24
6	MKR-F0326	63 mm	63	82.5	-	28
7	MKR-F0327	75 mm	75	98	-	32
8	MKR-F0328	90 mm	90	117	-	34

End Cap

Material

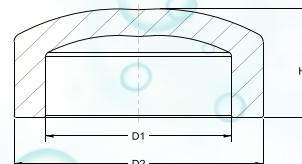
: PPR

Standards

: DIN 16962, EN ISO 15874

Colour

:



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	H1(mm)
1	MKR-F0330	20 mm	20	27	22.6
2	MKR-F0331	25 mm	25	33.5	25.3
3	MKR-F0332	32 mm	32	43	28
4	MKR-F0333	40 mm	40	52.5	32.1
5	MKR-F0334	50 mm	50	65	38
6	MKR-F0335	63 mm	63	82.5	43.5
7	MKR-F0336	75 mm	75	98	48.6
8	MKR-F0337	90 mm	90	117	54
9	MKR-F0338	110 mm	110	143.5	66.1
10	MKR-F0339	125 mm	125	161.5	78.3
11	MKR-F0340	160 mm	160	192	76.8
12	MKR-F0341	200 mm	200	-	-
13	MKR-F0342	250 mm	250	-	-
14	MKR-F0343	315 mm	315	-	-

PPRc Flange

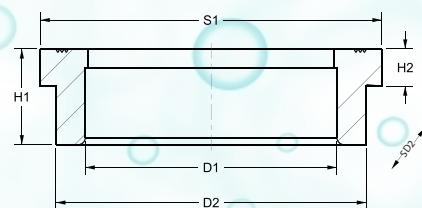
Material : PPR
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	D3(mm)	D4(mm)	S1(mm)	H1(mm)	No. of Holes
1	MKR-F0351	32 mm	42.9	82.6	118	17.2	52.3	21.1	4
2	MKR-F0352	40 mm	50.8	93.4	131.2	17.2	60.8	21.3	4
3	MKR-F0353	50 mm	62.6	106.4	144.3	17.2	73.8	22.4	4
4	MKR-F0354	63 mm	77.7	120.9	159.6	17	88	25.5	4
5	MKR-F0355	75 mm	92.7	137.7	176.5	16.8	106.2	27.3	6
6	MKR-F0356	90 mm	111.8	158.8	198.7	17.2	125.9	30.3	8
7	MKR-F0357	110 mm	131.2	180.9	221	17.1	148.5	31.3	8
8	MKR-F0358	125 mm	165.7	220.7	260	17.4	185.7	34.3	8
9	MKR-F0359	160 mm	193.6	246.3	288.1	17.6	217	36.3	8
10	MKR-F0360	200 mm	-	-	-	-	-	-	-
11	MKR-F0361	250 mm	-	-	-	-	-	-	-
12	MKR-F0362	315mm	-	-	-	-	-	-	-

Flange Core

Material : PPR
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	S1(mm)	H1(mm)	H2(mm)	SD1(mm)
1	MKR-F0351	20 mm	-	-	-	-	-	-
2	MKR-F0352	25 mm	-	-	-	-	-	-
3	MKR-F0353	32 mm	32	43	51.2	27.8	9.9	19
4	MKR-F0354	40 mm	40	52.5	59.5	29.2	11.8	21
5	MKR-F0355	50 mm	50	65	72.5	30.2	11.8	24
6	MKR-F0356	63 mm	63	82.5	88.5	31.4	12.1	28
7	MKR-F0357	75 mm	75	98	104.3	35.1	13.9	32
8	MKR-F0358	90 mm	90	117	124.2	36.8	15.8	34
9	MKR-F0359	110 mm	110	143.5	144.7	40.6	15.7	37
10	MKR-F0360	160 mm	160	192	211.4	52.8	19.9	44

Pipe Clamp

Material : PPR
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE
1	MKR-F0391	20 MM
2	MKR-F0392	25 MM
3	MKR-F0393	32 MM
4	MKR-F0394	40 MM
5	MKR-F0395	50 MM
6	MKR-F0396	63 MM

MS-Flange

Material : MS
Standards : DIN 16962, EN ISO 15874

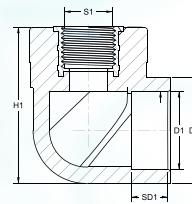


SR.NO	CODE	SIZE
1	MKR-MSF0391	20 MM
2	MKR-MSF0392	25 MM
3	MKR-MSF0393	32 MM
4	MKR-MSF0394	40 MM
5	MKR-MSF0395	50 MM
6	MKR-MSF0396	63 MM
7	MKR-MSF0397	75 MM
8	MKR-MSF0398	90 MM
9	MKR-MSF0399	110 MM
10	MKR-MSF0400	160 MM

BRASS PART ITEM

Female Threaded Elbow (FTE)

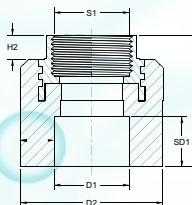
Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour : 



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	S1(mm)	H1(mm)	SD1(mm)
1	MKR-BF0401	20x1/2" mm	20	27	1/2"	50.3	16
2	MKR-BF0402	25x1/2" mm	25	33.5	1/2"	56	17
3	MKR-BF0403	25x3/4" mm	25	33.5	3/4"	57.7	17
4	MKR-BF0404	32x1/2" mm	32	43	1/2"	63	19
5	MKR-BF0405	32x3/4" mm	32	43	3/4"	64.4	19
6	MKR-BF0406	32x1" mm	32	43	1"	76.3	19
7	MKR-BF0407	40x1-1/4" mm	40	52.5	1-1/4"	90.8	21

Female Threaded Socket (FTA)

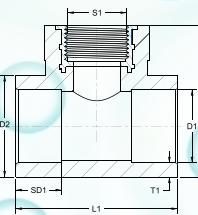
Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour : 



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	S1(mm)	H1(mm)	H2(mm)	SD1(mm)
1	MKR-BF0411	20x1/2"mm	20	27	1/2"	41.1	-	16
2	MKR-BF0412	25x1/2"mm	25	33.5	1/2"	41.5	-	17
3	MKR-BF0413	25x3/4"mm	25	33.5	3/4"	43.3	-	17
4	MKR-BF0414	32x1/2"mm	32	43	1/2"	44.7	-	19
5	MKR-BF0415	32x3/4"mm	32	43	3/4"	44.4	-	19
6	MKR-BF0416	32x1"mm	32	43	1"	54.6	9.9	19
7	MKR-BF0417	40x1-1/4"mm	40	52.5	1-1/4"	64.2	12	21
8	MKR-BF0418	50x1-1/2"mm	50	65	1-1/2"	67.6	12	24
9	MKR-BF0419	63x2"mm	63	82.5	2"	80.00	14	28
10	MKR-BF0420	75x2-1/2"mm	75	98	2-1/2"	90.00	14.5	32
11	MKR-BF0421	90x3"mm	90	117	3"	102.7	17.85	34
12	MKR-BF0422	110x4"mm	110	143.5	4"	113.9	20.6	37

Female Threaded Tee (FTT)

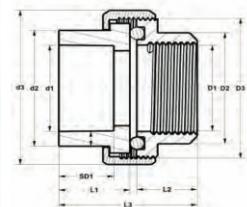
Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour : 



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	S1(mm)	L1(mm)	H1(mm)	SD1(mm)
1	MKR-BF0425	20x1/2"mm	20	27	1/2"	57.8	49.9	16
2	MKR-BF0426	25x1/2"mm	25	33.5	1/2"	61.8	55.55	17
3	MKR-BF0427	25x3/4"mm	25	33.5	3/4"	62.7	56	17
4	MKR-BF0428	32x1/2"mm	32	43	1/2"	64	62.5	19
5	MKR-BF0429	32x3/4"mm	32	43	3/4"	68.6	64	19
6	MKR-BF0430	32x1"mm	32	43	1"	77	64.4	19
7	MKR-BF0431	40x1-1/4"mm	40	52.5	1-1/4"	92.9	82.5	21

Female Threaded Union (FTU)

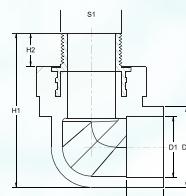
Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE	d1(mm)	d2(mm)	d3(mm)	D1(mm)	D2(mm)	D3(mm)	SD1(mm)	L1(mm)	L2(mm)	L3(mm)	H1(mm)
1	MKR-BF0436	20x1/2"mm	20	27	43	1/2"	27.5	35.5	16	21.6	16.1	40	10
2	MKR-BF0437	25x3/4"mm	25	33.5	50	3/4"	34.2	42	17	24.3	17	43.2	10.6
3	MKR-BF0438	32x1"mm	32	43	61.4	1"	41.3	52	19	25.6	18.6	46.7	11.2
4	MKR-BF0439	40x1-1/4"mm	40	52.5	74.3	1-1/4"	52.2	63.8	21	27.7	22.6	54	14.7
5	MKR-BF0440	50x1-1/2"mm	50	65	91.5	1-1/2"	59.8	78.8	24	32.35	25	58.8	16.6
6	MKR-BF0441	63x2"mm	63	82.5	110.2	2"	75.5	95.85	28	33.7	27.25	62.5	16.3

Male Threaded Elbow (MTE)

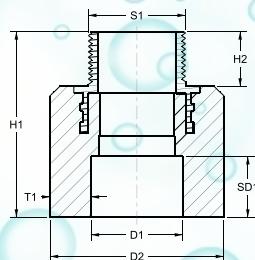
Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	S1(mm)	H1(mm)	H2(mm)	SD1(mm)
1	MKR-BF0446	20x1/2"mm	20	27	1/2"	64.42	14.5	16
2	MKR-BF0447	25x1/2"mm	25	33.5	1/2"	70.55	15	17
3	MKR-BF0448	25x3/4"mm	25	33.5	3/4"	71.12	14.9	17
4	MKR-BF0449	32x1/2"mm	32	43	1/2"	78.28	15.05	19
5	MKR-BF0450	32x3/4"mm	32	43	3/4"	79.2	15	19
6	MKR-BF0451	32x1"mm	32	43	1"	83	18	19
7	MKR-BF0452	40x1-1/4"mm	40	52.5	1-1/4"	-	-	21

Male Threaded Socket (MTA)

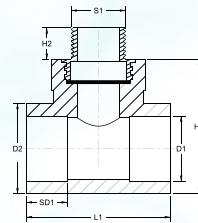
Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	S1(mm)	H1(mm)	H2(mm)	SD1(mm)
1	MKR-BF0456	20x1/2"mm	20	27	1/2"	55.8	15	16
2	MKR-BF0457	25x1/2"mm	25	33.5	1/2"	57	15	17
3	MKR-BF0458	25x3/4"mm	25	33.5	3/4"	58.2	15	17
4	MKR-BF0459	32x1/2"mm	32	43	1/2"	59.1	15	19
5	MKR-BF0460	32x3/4"mm	32	43	3/4"	62.7	15	19
6	MKR-BF0461	32x1"mm	32	43	1"	63.1	17	19
7	MKR-BF0462	40x1-1/4"mm	40	52.5	1-1/4"	69.7	18	21
8	MKR-BF0463	50x1-1/2"mm	50	65	1-1/2"	74.9	18.7	24
9	MKR-BF0464	63x2"mm	63	82.5	2"	82.8	20	28
10	MKR-BF0465	75x2-1/2"mm	75	98	2-1/2"	101.6	25	32
11	MKR-BF0466	90x3"mm	90	117	3"	109.5	25.2	34
12	MKR-BF0467	110x4"mm	107.5	143.5	4"	120	25.2	37

Male Threaded Tee (MTT)

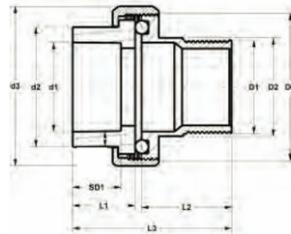
Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE	D1(mm)	D2(mm)	S1(mm)	L1(mm)	H1(mm)	H2(mm)	SD1(mm)
1	MKR-BF0471	20x1 1/2"mm	20	27	1/2"	56.8	49.9	14.5	16
2	MKR-BF0472	25x1 1/2"mm	25	33.5	1/2"	61.6	55.85	14.5	17
3	MKR-BF0473	25x3/4"mm	25	33.5	3/4"	62.4	56	15	17
4	MKR-BF0474	32x1 1/2"mm	32	43	1/2"	64.4	62.5	14.5	19
5	MKR-BF0475	32x3/4"mm	32	43	3/4"	66.4	63.6	15	19
6	MKR-BF0476	32x1"mm	32	43	1"	77.25	64.2	15	19
7	MKR-BF0477	40x1 1/2"mm	40	52.5	1-1/2"	-	-	-	21

Male Threaded Union (MTU)

Material : PPR, BRASS
Standards : DIN 16962, EN ISO 15874
Colour :



SR.NO	CODE	SIZE	D1	D2	D3	D1	D2	D3	SD1	SD2	L1	L2	L3
1	MKR-BF0481	20x1 1/2"mm	20	27	43	20	27.4	36	16	16	21	21	44
2	MKR-BF0482	25x3/4"mm	25	33.5	50	25	30.7	42	17	17	23	23	48.5
3	MKR-BF0483	32x1"mm	32	43	61.2	32	48	48	19	19	26	26	54.3
4	MKR-BF0484	40x1 1/4"mm	40	52.5	74.3	40	54	64	21	21	29	29	60.4
5	MKR-BF0485	50x1 1/2"mm	50	65	91.5	50	66.8	72	24	24	32	32	66.7
6	MKR-BF0486	63x2"mm	63	82.5	110.4	63	84.2	88	28	28	45	32	69.2



FABRICATED & MOULDED FITTINGS

Elbow 90 Deg. PN-06/PN-10

SR.NO	CODE	SIZE
1	MKR-F0012	200 MM (M)
2	MKR-F0013	250 MM (M)
3	MKR-F0014	315 MM (M)
4	MKR-F0015	355 MM (F - B/W)
5	MKR-F0016	400 MM (F - B/W)
6	MKR-F0017	450 MM (F - B/W)
7	MKR-F0018	500 MM (F - B/W)
8	MKR-F0019	560 MM (F - B/W)
9	MKR-F0020	630 MM (F - B/W)

Reducer PN-06/PN-10

SR.NO	CODE	SIZE
1	MKR-F0127	200 MM X 63 MM
2	MKR-F0128	200 MM X 75 MM
3	MKR-F0129	200 MM X 90 MM
4	MKR-F0130	200 MM X 110 MM
5	MKR-F0131	200 MM X 125 MM
6	MKR-F0132	200 MM X 160 MM
7	MKR-F0133	250 MM X 75 MM
8	MKR-F0134	250 MM X 90 MM
9	MKR-F0135	250 MM X 110 MM
10	MKR-F0136	250 MM X 125 MM
11	MKR-F0137	250 MM X 160 MM
12	MKR-F0138	250 MM X 200 MM
13	MKR-F0139	315 MM X 75 MM
14	MKR-F0140	315 MM X 90 MM
15	MKR-F0141	315 MM X 110 MM
16	MKR-F0142	315 MM X 125 MM
17	MKR-F0143	315 MM X 160 MM
18	MKR-F0144	315 MM X 200 MM
19	MKR-F0145	315 MM X 250 MM
20	MKR-F0146	355 MM X 90 MM
21	MKR-F0147	355 MM X 110 MM
22	MKR-F0148	355 MM X 125 MM
23	MKR-F0149	355 MM X 160 MM
24	MKR-F0150	355 MM X 200 MM
25	MKR-F0151	355 MM X 250 MM
26	MKR-F0152	355 MM X 315 MM
27	MKR-F0153	400 MM X 90 MM
28	MKR-F0154	400 MM X 110 MM
29	MKR-F0155	400 MM X 125 MM
30	MKR-F0156	400 MM X 160 MM
31	MKR-F0157	400 MM X 200 MM
32	MKR-F0158	400 MM X 250 MM
33	MKR-F0159	400 MM X 315 MM
34	MKR-F0160	400 MM X 355 MM

Reducing Tee (RT) PN-06/PN-10

SR.NO	CODE	SIZE
1	MKR-F0235	200 MM X 63 MM
2	MKR-F0236	200 MM X 75 MM
3	MKR-F0237	200 MM X 90 MM
4	MKR-F0238	200 MM X 110 MM
5	MKR-F0239	200 MM X 125 MM
6	MKR-F0240	200 MM X 160 MM
7	MKR-F0241	250 MM X 75 MM
8	MKR-F0242	250 MM X 90 MM
9	MKR-F0243	250 MM X 110 MM
10	MKR-F0244	250 MM X 125 MM
11	MKR-F0245	250 MM X 160 MM
12	MKR-F0246	250 MM X 200 MM
13	MKR-F0247	315 MM X 75 MM
14	MKR-F0248	315 MM X 90 MM
15	MKR-F0249	315 MM X 110 MM
16	MKR-F0250	315 MM X 125 MM
17	MKR-F0251	315 MM X 160 MM
18	MKR-F0252	315 MM X 200 MM
19	MKR-F0253	315 MM X 250 MM
20	MKR-F0254	355 MM X 90 MM
21	MKR-F0255	355 MM X 110 MM
22	MKR-F0256	355 MM X 125 MM
23	MKR-F0257	355 MM X 160 MM
24	MKR-F0258	355 MM X 200 MM
25	MKR-F0259	355 MM X 250 MM
26	MKR-F0260	355 MM X 315 MM
27	MKR-F0261	400 MM X 90 MM
28	MKR-F0262	400 MM X 110 MM
29	MKR-F0263	400 MM X 125 MM
30	MKR-F0264	400 MM X 160 MM
31	MKR-F0265	400 MM X 200 MM
32	MKR-F0266	400 MM X 250 MM
33	MKR-F0267	400 MM X 315 MM
34	MKR-F0268	400 MM X 355 MM

Elbow 45 Deg. PN-06/PN-10

SR.NO	CODE	SIZE
1	MKR-F0032	200 MM (M)
2	MKR-F0033	250 MM (M)
3	MKR-F0034	315 MM (M)
4	MKR-F0035	355 MM (F - B/W)
5	MKR-F0036	400 MM (F - B/W)
6	MKR-F0037	450 MM (F - B/W)
7	MKR-F0038	500 MM (F - B/W)
8	MKR-F0039	560 MM (F - B/W)
9	MKR-F0040	630 MM (F - B/W)

Equal Tee PN-06/PN-10

SR.NO	CODE	SIZE
1	MKR-F0052	200 MM (M)
2	MKR-F0053	250 MM (M)
3	MKR-F0054	315 MM (M)
4	MKR-F0055	355 MM (F - B/W)
5	MKR-F0056	400 MM (F - B/W)
6	MKR-F0057	450 MM (F - B/W)
7	MKR-F0058	500 MM (F - B/W)
8	MKR-F0059	560 MM (F - B/W)
9	MKR-F0060	630 MM (F - B/W)

Flange Core (Stub End)

SR.NO	CODE	SIZE
1	MKR-F0381	200 MM
2	MKR-F0382	250 MM
3	MKR-F0383	315 MM
4	MKR-F0384	355 MM
5	MKR-F0385	400 MM
6	MKR-F0386	450 MM
7	MKR-F0387	500 MM
8	MKR-F0388	560 MM
9	MKR-F0389	630 MM

MS-Flange

SR.NO	CODE	SIZE
1	MKR-MSF0401	200 MM
2	MKR-MSF0402	250 MM
3	MKR-MSF0403	315 MM
4	MKR-F0404	355 MM
5	MKR-F0405	400 MM
6	MKR-F0406	450 MM
7	MKR-F0407	500 MM
8	MKR-F0408	560 MM
9	MKR-F0409	630 MM





Tools

Welding Saddle Die



Size
40x20mm / 1/2"
50x20mm / 1/2"
63x25/32mm / 1/2"/3/4"
75x25/32mm / 1/2"/3/4"
90x25/32mm / 1/2"/3/4"
110x25/32mm / 1/2"/3/4"
125x32mm / 1/2"/3/4"
125x40mm
160x32mm
160x40/50mm
160x63/75mm
200x63/75/90/110 mm
250x63/75/90/110mm
315x63/75/90/110mm
200x25/32mm / 1/2"/3/4"
250x25/32mm / 1/2"/3/4"
315x25/32mm / 1/2"/3/4"

Pipe Cutter



Size
20-40mm
20-63mm

Repair Set



Size
9mm
11mm

Welding Machine



Size
20-63mm
75-110mm
160mm
Welding Die Only
125mm

Welding Device (Hydraulic Pump)



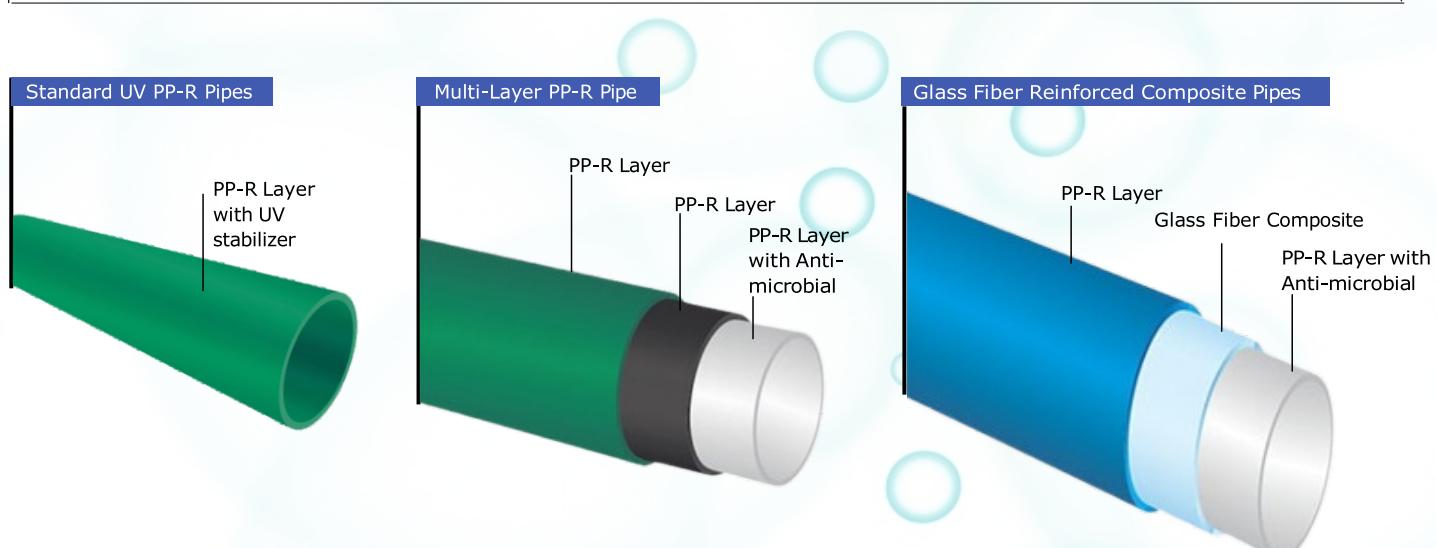
Size
160mm



Technical Properties

Technical Characteristics

Pipe Structure	Standard PP-R Pipes - Single Layer Standard UV PP-R Pipes - Single Layer Multi-Layer PP-R Pipe - Triple Layer Glass Fiber Reinforced Composite PP-R Pipes (Triple-Layer)
Diameters (mm)	d20, d25, d32, d40, d50, d63, d75, d90, d110, d125, d160, d200, d250, d315
Pipe Classes	Standard PP-R Pipes: PN10 (SDR11), PN16 (SDR7.4), PN20 (SDR6), PN25 (SDR5), PN06 (SDR17.5), PN04 (SDR26) Standard UV PP-R Pipes: PN10 (SDR11), PN16 (SDR7.4), PN20 (SDR6), PN25 (SDR5), PN06 (SDR17.5), PN04 (SDR26) Multi-Layer PP-R Pipe - Triple Layer: PN16 (SDR7.4), PN20 (SDR6), PN25 (SDR6) Glass Fiber Reinforced Composite PP-R Pipes: PN12.5 (SDR11), PN20 (SDR7.4), PN16 (SDR9), PN08 (SDR14), PN06 (SDR17.5)
Pipe Length	3m / 10 foot, 6m / 20 foot (Also in coil form in 30m or 100 foot).
Jointing Methods	Socket Fusion Welding, Butt-Welding, Electrofusion Welding, Mechanical Connection, Flange Connection
Color	White, Blue, Green and Black
Chemical Resistance	Resistant to organic and inorganic chemical environments for pH values between 2 and 12
Installation Temperature	Minimum: +5°C Maximum: +40°C
Operating Temperature	Standard PP-R Pipes: -5°C - +95°C Standard UV PP-R Pipes: -5°C - +95°C Multi-Layer PP-R Pipe - Triple Layer: -5°C - +95°C Glass Fiber Reinforced Composite PP-R Pipes: -5°C - +95°C
Standards	DIN 8077-78, IS 15801, BS 6920-1
Thermal Expansion Coefficient	Standard PP-R Pipes: 0.15 mm/moK Standard UV PP-R Pipes: 0.15 mm/moK Multi-Layer PP-R Pipe - Triple Layer: 0.035 mm/moK Glass Fiber Reinforced Composite PP-R Pipes: 0.035 mm/moK
Thermal Conductivity Coefficient	0.24 W/moK
Approvals and Certificates	UK: WRAS, India: ISI, BIS



Temperature, Pressure and Service Life Tables

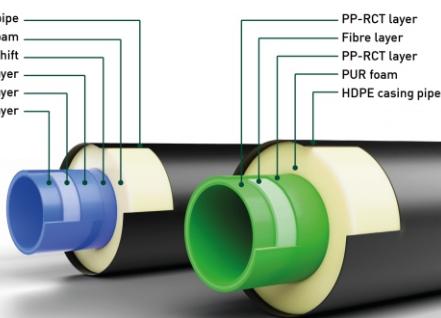
Temperature	Service Life				Thermoking	
		PPR SDR 11 PN 10	PPR SDR 7.4 PN 16	PPR SDR 6 PN 20	PPR - FR SDR - 11	PPR - FR SDR - 7.4
0°C	1	35	37.2	47	27.8	43.2
	5	22.3	35.5	45.5	26.2	40.7
	10	21.3	34.2	43.6	26.6	39.7
	25	20.0	33.7	42.5	24.7	38.3
	50	19.6	32.2	41.8	24.1	37.4
	100	19.6	31.3	40.4	23.5	36.4
10°C	1	21.1	33.4	42.0	25.7	39.5
	5	20.0	31.6	39.8	24.2	37.5
	10	19.3	30.6	38.5	23.6	36.6
	25	18.7	29.6	37.3	22.8	35.3
	50	18.2	28.8	36.3	22.2	34.4
	100	17.7	28.1	35.4	21.6	33.5
20°C	1	18.0	28.6	36.0	23.8	36.8
	5	16.9	26.8	33.8	22.3	34.6
	10	16.4	26.1	32.8	21.7	33.7
	25	16.0	25.3	31.8	21	32.5
	50	15.5	24.5	30.9	20.4	31.7
	100	15.0	23.8	29.9	19.9	30.9
30°C	1	15.3	24.3	30.6	20.2	31.3
	5	14.4	22.8	28.7	18.9	29.4
	10	13.9	22.0	27.7	18.4	28.6
	25	13.3	21.3	26.8	17.8	27.5
	50	13.1	20.7	25.1	17.3	26.8
	100	12.8	20.2	25.5	16.8	26
40°C	1	12.9	20.5	25.8	17.1	26.6
	5	12.1	19.2	24.2	16	24.9
	10	11.8	18.7	23.6	15.6	24.1
	25	11.3	18.0	22.6	15	23.2
	50	11.0	17.5	22.0	14.8	22.6
	100	10.7	16.9	21.3	14.1	21.9
50°C	1	11.0	17.5	22.0	14.5	22.5
	5	10.2	16.2	20.4	13.5	21
	10	9.9	15.7	19.7	13.1	20.4
	25	9.6	15.2	19.1	12.6	19.6
	50	9.3	14.7	18.5	12.2	19
	100	8.9	14.2	17.8	11.9	18.4
60°C	1	9.3	14.7	18.5	12.2	a
	5	8.0	13.7	17.2	11.4	17.7
	10	8.3	13.2	16.6	11	17.1
	25	8.0	12.6	15.9	10.6	16.4
	50	7.7	12.1	15.3	10.3	15.9
	100	7.4	11.6	14.7	10.0	15.5
70°C	1	7.8	12.4	15.6	10.3	16
	5	7.2	11.4	14.3	9.6	14.8
	10	7.0	11.1	14.0	9.2	14.3
	25	6.1	9.6	12.1	8	12.5
	50	5.1	8.1	10.2	9.2	10.5
	100	4.8	7.6	9.7	8.5	9.8
80°C	1	6.5	10.4	13.1	8.6	13.4
	5	5.7	9.1	11.5	7.7	11.9
	10	4.8	7.6	9.6	6.5	10
	25	3.8	6.1	7.6	5.2	8
	50	3.1	5.1	6.8	4.5	7.5
	100	2.8	4.6	6.3	3.8	7.0
90°C	1	5.4	9.3	10.8	7.2	11.2
	5	4.9	8.0	10	5.1	7.8
	10	6.5	6.5	8.5	4.3	6.6
	25	4.0	7.3	9.2	5.2	9.5
	50	3.0	4.8	6.1	4.5	6.6
	100	2.6	4.0	5.1	3.9	5.8

INSULATION FOR CHILLING WATER

Metal Pipe



PPR-C Pipes



PPR - FRP Thermoking

Thermoking PPR-FR Composite Pipes

MEKOR Pipes Pvt. Ltd. PPR - FRP COMPOSITE Pipes are specially designed for various industrial needs. It is basically with innovative composite technology of plastic with extremely low thermal coefficient fibre reinforcement. It will control the linear thermal expansion to about 70% so that PPR pipe line sagging is controlled.

Advantages

- Low thermal conductivity. It requires very thin insulation or no insulation when using chilled water & hot water/chemical applications.
- High resistance to corrosion, acids & chlorides.
- Very good chemical resistance
- High heat stability
- High impact strength
- High Environmental Stress Cracking Ratio (ESCR)
- Very good welding property which ensure leak proof joints, energy savings
- Smooth inner surface, less friction, no noise
- Thermal expansion is controlled by 70%, line sagging is controlled
- Hygienic and Non-Toxic food grade

Applications

- Compressed air lines for Hot and Cold air
- Chilled water application & air conditioning
- Transportation of chemicals & aggressive fluids
- Effluent treatment plants (ETP)
- Ship buildings and swimming pools
- Pharmaceuticals and food grade applications
- Solar heaters and under floor heating
- Vacuum Pipelines
- R.O. Water Pipeline

Support Intervals

Temperature	Pipe Diameter(m/m)												
	20	25	32	40	50	63	75	90	110	160	200	250	315
Support Intervals (cm)													
0	120	140	160	180	205	230	245	260	290	340	370	400	440
20	90	105	120	135	155	175	185	195	215	270	300	340	375
30	90	105	120	135	155	175	185	195	210	255	285	310	340
40	85	95	110	125	145	165	175	185	200	245	280	300	320
50	85	95	110	125	145	165	175	185	190	205	240	270	300
60	80	90	105	120	135	155	165	175	180	195	220	250	280
70	70	80	95	110	130	145	155	165	170	185	210	240	270

Testing

Standard For Pipe Fittings

Standards	Fields
DIN 1998	Drinking water line installation
DIN 2999	Whitworth pipe threads for tubes and fittings
DIN 4109	Sound insulation in building construction
DIN 8077	Polypropylene (pp) pipes dimensions
DIN 8078	Polypropylene (pp) pipes general quality requirements and testing
DIN 16962	Polypropylene (pp) pipes Fittings
DIN 16928	Pipe connections and components - pipes of thermoplastic materials, pipe joints, element for pipe, laying, general directions
DIN 16928 (6-9)	Pipe joints and elements for polypropylene (pp) pressure pipelines, types 1 and 2; injection molded elbows for socket - welding dimension
DIN 16925.5	Pipe joints and elements for polypropylene (pp) for pipes under, - part 5, general quality
DIN 2207.11	Welding regulations for plastic pipes
DIN 2203	Test of thermoplastic pipe fitting for weld
DIN 2208.1	Machines and devices for welding thermoplastic pipes
EN ISO 15874 (1-7)	Plastic piping systems for hot and cold water installation polypropylene(pp)
IS 15801: 2008/BIS	BUREAU OF INDIAN STANDARDS - ISI



We have well equipped in house testing facility for the control of quality by

1. Testing of incoming raw Materials & additives.
2. Inspection and Testing during production as per standards.
3. Final Inspection and dispatch
4. Periodical calibration of Testing Equipments.

PPR vs Other Products

PROPERTIES	PP-R	GI	COPPER	PE	CPVC	ALUMINIUM
Service Life (Years)	50 Years Plus	2-5 Years	10-25 Years	20-30 Years	20-30 Years	20-30 Years
Temperature Resistance	Very Good	Excellent	Excellent	Good	Good	Poor
Food Grade	Excellent - Hygienic	Non-Hygienic	Non-Hygienic	Good	Non-Hygienic	Non-Hygienic
Heat Loss	Very Negligible	Very High	Very High	Moderate	Moderate	High
Chemical Resistance	Excellent	Very Weak	Weak	Good	Good	Weak
Maximum Safe working Temp "C"	100	High	High	80	80	High
Easiness in Repair/ Maintenance	Easy/Nil	Huge Cost	Huge Cost	Expensive	Expensive	Very Expensive
Corrosion / Abrasion Resistance	Excellent	Very Low	Very Low	Good	Moderate	Good
Friction Factor	Very Low	High	High	Low	Low	Moderate
Reliability	Very Good	Poor	Ok/Expensive	Average	Average	Moderate
Joint Reliability/Leak Proof (Max:100, Mn:0)	100	0 - 50	0 - 50	0 - 80	0 - 80	0 - 50
Jointing Method	Simple Heat Fusion	Conventional	Conventional	Butt Fusion	Special Solvent Chemical	0 - Ring
Jointing Skill	Very Simple & even unskilled labour can do this job easily"	Needs Skilled Labour	Needs Skilled Labour	Needs Skilled Labour	Needs Special Attention & Skilled Labour	Needs Special Attention & Skilled Labour
Jointing Time	Few Seconds	Few Hrs	Few Hrs	Few Min	Few Min	Few Min
Jointing Life Commissioning	Immediate	24 Hours	24 Hours	Few Hrs	24 Hours	Immediate
Easiness in Fittings	Very Easy	Difficult	Difficult	Easy	Easy	Ok
Laying (Easiest =100 & Hardest =0)	100	0 - 50	0 - 50	0 - 80	0 - 80	0 - 50
Electrical Conductivity)	Nil	More	More	Nil	Nil	More

Temp°C	PN10 / SDR 11		PN16 / SDR 7.4		PN20 / SDR 6		PN25 / SDR 5	
	Mpa	Kg/Cm ²	Mpa	Kg/Cm ²	Mpa	Kg/Cm ²	Mpa	Kg/Cm ²
10	1.91	19.10	3.02	30.20	3.80	38.00	4.78	47.80
20	1.63	16.30	2.58	25.80	3.24	32.00	4.09	40.90
30	1.37	13.70	2.17	21.70	2.73	27.30	3.44	34.40
40	1.15	11.50	1.84	18.40	2.30	23.00	2.90	29.00
50	0.98	9.80	1.55	15.50	1.95	19.50	2.46	24.60
60	0.82	8.20	1.28	12.80	1.62	16.20	2.04	20.40
70	0.62	6.20	0.98	9.80	1.23	12.30	1.55	15.50
80	0.39	3.90	0.98	9.80	0.77	7.70	0.98	9.80
95	0.27	2.70	0.41	4.10	0.52	5.20	0.65	6.50

Water Content & Weight / MTR Details

PPR PN10 / SDR 11/S5			PPR PN16 / SDR 7.4/S3.2		PPR PN20 / SDR 6/S2.5	
Dimension	Lit/m	Kg/mtr	Lit/m	Kg/mtr	Lit/m	Kg/mtr
20mm	0.21	0.107	0.16	0.148	0.14	0.7172
25mm	0.32	0.164	0.25	0.23	0.22	0.266
32mm	0.53	0.261	0.43	0.37	0.35	0.434
40mm	0.83	0.412	0.65	0.575	0.56	0.671
50mm	1.31	0.638	1.03	0.896	0.87	1.04
63mm	2.08	1.01	1.65	1.41	1.38	1.65
75mm	2.96	1.41	2.33	2.01	1.96	2.36
90mm	4.24	2.03	3.35	2.87	2.83	3.36
110mm	6.33	3.01	5.11	4.3	4.23	5.01
125mm	10.1	3.9	9.1	5.53	8.3	6.47
160mm	13.45	6.38	10.61	9	13.3	10.6
200mm	16.3	9.95	14.5	14.1	—	—
250mm	20.3	15.5	18.1	22.1	—	—
315mm	25.7	24.6	—	—	—	—

Fusion Welding Data

Dimension mm	Welding Depth mm	Heating Time Sec	Welding Time Sec	Cooling Time Min
20	14	5	4	3
25	15	7	4	3
32	17	9	6	5
40	18	13	6	5
50	20	19	6	5
63	25	26	9	7
75	27	32	9	8
90	30	42	9	9
110	34	54	10	9
160	42	65	12	140
200		Butt Fusion		
250		Butt Fusion		
315		Butt Fusion		

Thermal Conductivity

Material	(W/m k)
20	14
25	15
32	17
40	18
50	20
63	25

Material	(W/m k)
PPR	1
HDPE	1.6
Concrete	3.3
Steel/Gi	200
Copper	1600
Aluminum	25

Important Datas

Indoor Hot & cold water Plumbing Pipe & Fittings Pipe Selection Chart

The table lists the permissible working pressure for pipes with different pressure class under specific temperature and work life. Under normal work pressure and condition, the life of **MEKOR Pipes Pvt. Ltd.** can reach 50 years at least.

Important Data

Manufacturers Best Report of PPR Raw Material

Typical Properties	Method	Value	Unit
Physical			
Melt flow rate (230°C/2016Kg)	ASTM D 1238	0.3	g/10 min
(190°C/5.0Kg)		0.5	g/10 min
(230°C/5.0Kg)		1.3	g/10 min
Density	ASTM D 1505	0.9	g/cm 3
Mechanical			
Tensile strength @ yield	ASTM D 638	270	Kg/ cm 2
Flexural Modulus (23°C)	ASTM D 790	8500	Kg/ cm 2
Tensile Elongation @ Yid	ASTM D 638	10	%
Impact			
Notched izod impact (23°C)	ASTM D 256	23	Kg-cm/cm
Thermal			
Vicat Softening Point	ASTM D 1525	123	°C
Thermal Conductivity	ASTM C 177	0.24	
Note : Unit : W/m/K			
Melting Temperature	DSC	141	°C
Note : ISO 11357-3; heating rate : 10 K/min, 2nd heating			
CLTE, Flow (23°C to 80°C)	ISO 11359 -1, 2	0.00015	Cm/cm / °C
Note : Coefficient of linear thermal expansion			
Heat deflection temperature at 0.46	ASTM D 648	83	°C
Electrical			
Specific Surface Resistvity	ASTM D 257/EC 93	>10 >14	Ohm

Determination of The Long-Term Hydrostatic Strength

ISC1980:2003-evaluation of the pipe grade following strength valves at 20, 70°C and 50 years

T	Time	LPL	LTHS
20°C	50 yrs	11.38 MPa	12.72 MPa
70°C	50 yrs	3.21 MPa	3.57 MPa

By its LPL value of 11.38 MPa at 20°C and 50 years the PPR pipe grade hostalen PP H5416 K from LyondeBasell industries Has a Minimum Required Strength (MRS) of 11.2 MPa and its thereby designated PPR 112 according to ISO 12162:2009.

-Thanks to LYONDELLBASEL, GERMANY

Control Point testing according to DIN 8078

of Topilene R 200P from

Hyosung Corporation (KOREA)

A Summary of the requirements for PPR pipes and the results obtained are given in the table below:

Characteristics	Requirement (DIN From 1996 -04	Result
Creep Strength	20°C 16.0MPa 21h	>1h Pass
	95°C 3.5MPa 21 000h	>1000h Pass
	110°C 1.9MPa 28 760h	>8760h Pass

The test date obtained for the Topilene R200P pipes are in conformity with the requirements regarding creep strength according to DIN 8078:1996-04, Paragraph 4.4

-Thanks to HYOSUNG CORPORATION, KOREA

Resistance to Internal Pressure

- Borouge Pte Ltd (U.A.E)

Summary of the resistance to internal Pressure according ISO 15874-2 : 2013 and DIN 8078 : 2008 are presented below

Resistance to internal Pressure of PPR RA 140E

T	Requirement		Testing Time to Burst	Result
	Hoop Stress	Time to Burst		
20°C	18.0 MPa	>1h	505 h	Pass
95°C	4.3 MPa	>22 h	979 h	Pass
95°C	3.8 MPa	>16	2123 h	Pass
95°C	3.5 MPa	>100	1953 h	Pass
110°C	1.9 MPa	>8760	10409 h	Pass

Thanks to BOROUGE Pte. Ltd. U.A.E.

Chemical Resistance

Rating System

This chart rates the chemical resistance of polypropylene according to the following code:

Note: The User is advised to make his or her own tests to determine the suitability of polypropylene in the particular environment.

A = Negligible effect

Should be suitable for all applications where these environmental Conditions exist

B = Limited absorption or attack

Should be suitable for most applications, but the user is advised to make his own tests to determine the suitability of polypropylene in the particular environment.

C = Extensive absorption and /or rapid permeation

Should be suitable for all applications where only intermittent service is involved, or where the swelling produced has no detrimental effect on the part. The user should make his or her own tests to determine the suitability of polpropylene in the particular environment.

D = Extensive attack

The specimen dissolves or disintegrates. polypropylene is not recommended.

Environment	Conc.%	TEMP°C		
		20°	60°	100°
Acetic Acid (glacial)	97	A	B (80°C)	-
Acetic Acid	50	A	A (80°C)	-
Acetic Acid	40	A	-	-
Acetic Acid	10	A	A	-
Acetone	100	A	A	-
Acetophenone	100	B	B	-
Acriflavine (2% solution in H ₂ O)	2	A	A (80°C)	-
Acrylic emulsions		A	A	-
Aluminium chloride		A	A	-
Aluminium fluoride		A	A	-
Aluminium sulfate		A	A	-
Alums (all type)		A	A	-
Ammonia (aqueous)	30	A	-	-
Ammonia gas (dry)		A	A	-
Ammonium carbonate	Satd	A	A	-
Ammonium chloride	Satd	A	A	-
Ammonium fluoride	20	A	A	-
Ammonium hydroxide	10	A	A	-
Ammonium metaphosphate	Satd	A	A	-
Ammonium nitrate	Satd	A	A	-
Ammonium persulfate	Satd	A	A	-
Ammonium sulfate	Satd	A	A	-
Ammonium sulfide	Satd	A	A	-
Ammonium thiocyanate	Satd	A	A	-
Amyl acetate	100	B	C	-
Amyl alcohol	100	A	B	-
Amyl chloride	100	C	C	-
Aniline	100	A	A	-
Anisole	100	B	B	-
Antimony chloride		A	A	-
Aviation fuel (115/145 octane)	100	B	C	-
Aviation turbine fuel	100	B	C	-

Chemical Resistance

Environment	Conc.%	TEMP°C		
		20°	60°	100°
Barium carbonate	satd	A	A	-
Barium chloride	satd	A	A	-
Barium hydroxide		A	A	-
Barium Sulfate	satd	A	A	
Barium Sulfide	satd	A	A	-
Beer		A	A	-
Benzene	100	B	C	C
Benzoic acid	A	A	A	-
Benzyl alcohol		A	A (80°C)	-
Bismuth carbonate	Satd	A	A	-
Borax		A	A	-
Boric acid		A	A	-
Brine	Satd	A	A	-
Bromine liquid	100	D	-	-
Bromine water	(a)	C	-	-
Butyl acetate	100	C	C	-
Butyl alcohol	100	A	A	-
Calcium carbonate	Satd	A	A	-
Calcium chlorate	Satd	A	A	-
Calcium chloride	50	A	A	-
Calcium hydroxide		A	A	-
Calcium Hypochlorite Bleach	20(a)	A	B	-
Calcium nitrate		A	A	-
Calcium phosphate	50	A	-	-
Calcium sulfate		A	A	-
Calcium sulfite		A	A	-
Carbon dioxide (dry)		A	A	-
Carbon dioxide (wet)		A	A	-
Carbon disulfide	100	B	C	-
Carbon Monoxide		A	A	-
Carbon tetracholride	100	C	C	C
Carbonic acid		A	A	-
Castor Oil		A	-	-
Cetyl alcohol	100	A	-	-
Chlorine (gas)	100	D	D	-
Chlorobenzene	100	C	C	-
Chloroform	100	C	D	D
Chlorosulfonic acid	100	D	D	D
Chrome alum		A	A	-
Chromic acid	80(a)	A	-	-
Chromic acid	50(a)	A	A	-
Chromic acid	10(a)	A	A	-
Chromic/sulfuric acid		D	D	-
Cider		A	A	-
Citric acid	10	A	A	-

Chemical Resistance

Environment	Conc.%	TEMP°C		
		20°	60°	100°
Copper chloride	Satd	A	A	-
Copper cyanide	Satd	A	A	-
Copper fluoride	Satd	A	A	-
Copper nitrate	Satd	A	A	-
Copper sulfate	Satd	A	A	-
Cottonseed oil		A	A	-
Cuprous chloride	Satd	A	A	-
Cyclohexanol	100	A	B	-
Cyclohezanone	100	B	C	-
Decalin	100	C	C	C
Detergents	2	A	A	A
Developers (photographic)		A	A	-
Dibutyl phthalate	100	A	B	D
Dichoroethylene	100	A	-	-
Diethanolamine	100	A	A	-
Diisoctyl phthalate	100	A	A	-
Emulsifiers		A	A	-
Ethanolamine	100	A	A	-
Ethyl acetate	100	B	B	-
Ethyl alcohol	96	A	A	-
Ethyl chloride	100	B	C	-
Ethylene dichloride	100	B	-	-
Ethylene glycol		A	A	-
Ethylene oxide	100	B	-	-
Ethyl ether	100	B	-	-
Fatty acids (C6)	100	A	A	-
Ferric chloride	Satd	A	A	-
Ferric Nitrate	Satd	A	A	-
Ferric Sulfade	Satd	A	A	-
Ferrous chloride	Satd	A	A	-
Ferrous Sulfade	Satd	A	A	-
Fluorosilicic acid		A	A	-
Formaldehyde	40	A	A	-
Formic acid	100	A	-	-
Formic acid	10	A	A	-
Fructose		A	A	-
Fruit Juices		A	A	-
Furfural	100	C	C	-
Gas liquor		C	-	-
Gasoline	100	B	C	C
Gearbox oil	100	A	B	-
Gelatin		A	A	-
Glucose	20	A	A	-
Glycerin	100	A	A	A
Glycol		A	A	-
Hexane	100	A	B	-

Chemical Resistance

Environment	Conc. %	TEMP°C		
		20°	60°	100°
Hydrobomic acid	50(a)	A	A	-
Hydrochloric acid	30(a)	A	B	D
Hydrochloric acid	20	A	A (80°C)	-
Hydrochloric acid	10	A	A (80°C)	B
Hydrochloric acid	2	A	A	A
50-50 HCl-HNO ₃	(a)	B	D (80°C)	-
Hydrofluoric acid	40	A	-	-
Hydrofluoric acid	60(a)	A	A (40°C)	-
Hydrogen chloride gas (dry)	100	A	A	-
Hydrogen peroxide	30	A	-	D
Hydrogen peroxide	10	A	B	-
Hydrogen peroxide	3	A	-	-
Hydrogen sulfide		A	A	-
Hydroquinone		A	A	-
Inks		A	A	-
Lodine tincture		A	-	-
Isooctane	100	C	C	-
Isopropyl alcohol	100	A	A	-
Ketones		A	-	-
Lactic acid	20	A	A	-
Lanolin	100	A	A	-
Lead acetate	Satd	A	A	-
Linseed Oil	100	A	A	-
Lubricating Oil	100	A	B	-
Magenta dye (aqueous solution)	2	A	A Some Staining	-
Magnesium carbonate	Satd	A	A	-
Magnesium chloride	Satd	A	A	-
Magnesium hydroxide	Satd	A	A	-
Magnesium nitrate	Satd	A	A	-
Magnesium sulfate	Satd	A	A	-
Magnesium sulfite	Satd	A	A	-
Meat Juices		A	A	-
Mercuric chloride	40	A	A	-
Mercuric cyanide	Satd	A	A	-
Mercurous nitrate	Satd	A	A	-
Mercury	100	A	A	-
Methyl alcohol	100	A	A	-
Methylene chloride	100	A	-	-
Methyl Ethyl ketone	100	A	B	-
Milk and its products		A	A	A
Mineral Oil	100	A	B	-

Chemical Resistance

Environment	Conc. %	TEMP°C		
		20°	60°	100°
Molasses			A	A
Motor oil	100	A	B	-
Naphthalene	100	A	A	A
Nickel chloride	Satd	A	A	-
Nickel Nitrate	Satd	A	A	-
Nickel sulfate	Satd	A	A	-
Nitric acid	Fuming	D	D	D
Nitric acid	70(a)	C	D	-
Nitric acid	60	A	D (80°C)	-
Nitric acid	10	A	A	A
50-50 HNO ₃ HCl	(a)	B	D (80°C)	-
50-50 HNO ₃ H ₂ SO ₄	(a)	C	D (80°C)	-
Nitrobenzene	100	A	A	-
Oleic acid		A	B	-
Oleum		-		D
Olive Oil	100	A	A	-
Oxalic acid (aqueous)	50	A	-	-
Oxygen	99%	A	-	-
Paraffin	100	A	B	-
Paraffin Wax	100	A	A	-
Petrol	100	B	C	-
Petroleum ether boiling point 100-140 C)	100	C	C	-
Phenol	100	A	A	-
Phosphoric acid	95	A	A	-
Plating solutions, brass		A	A	-
Plating solutions, cadmium		A	A	-
Plating solutions, chromium		A	A	-
Plating solutions, copper		A	A	-
Plating solutions, gold		A	A	-
Plating solutions, Indium		A	A	-
Plating solutions, lead		A	A	-
Plating solutions, nickel		A	A	-
Plating solutions, rhodium		A	A	-
Plating solutions, Silver		A	A	-
Plating solutions, tin		A	A	-
Plating solutions, Zinc		A	A	-
Potassium bicarbonate	Satd	A	A	-
Potassium borate	1	A	A	-
Potassium bormate	10	A	A	-
Potassium bromide	satd	A	A	-
Potassium carbonate	satd	A	A	-
Potassium chlorate	satd	A	A	-
Potassium chloride	satd	A	A	-
Potassium chromate	40	A	A	-

Chemical Resistance

Environment	Conc. %	TEMP. °C		
		20°	60°	100°
Potassium cyanide	Satd	A	A	-
Potassium dichromate	40	A	A	-
Potassium ferri-/ferrocynaide		A	A	-
Potassium fluoride		A	A	-
Potassium hydroxide	50	A	A	-
Potassium hydroxide	10	A	A	A
Potassium nitrate	Satd	A	A	-
Potassium perborate	Satd	A	A	-
Potassium perchlorate	10	A	A	-
Potassium permanganate	20	A	A	-
Potassium sulfate		A	A	-
Potassium sulfide		A	A	-
Potassium sulfite		A	A	-
propyl alcohol	100	A	A	-
Pyridine	100	A	-	-
Silicone oil	100	A	A	-
Soap Solution (concentrated)		A	A	-
Sodium acetate		A	A	-
Sodium bicarbonate	Satd	A	A	-
Sodium bisulfate	Satd	A	A	-
Sodium bisulfite	Satd	A	A	-
Sodium borate		A	A	-
Sodium bromide oil Solution		A	A	-
Sodium carbonate	Satd	A	A	-
Sodium chlorate	Satd	A	A	-
Sodium chloride	Satd	A	A	A
Sodium chlorite	2	A	A(80°C)	-
Sodium chlorite	5	A(80°C)	A	-
Sodium chlorite	10	A(80°C)	A	-
Sodium chlorite	20	A(80°C)	A	-
Sodium cyanide	Satd	A	A	-
Sodium dichromate	Satd	A	A	-
Sodium ferricyanide	Satd	A	A	
Sodium ferrocyanide	Satd	A	A	-
Sodium fluoride	Satd	A	A	-
Sodium hydroxide	50	A	A	-
Sodium hydroxide	10	A	A	A
Sodium hypochlorite	20	A	B	B
Sodium nitrate		A	A	-
Sodium nitrite		A	A	-
Sodium silicate		A	A	-
Sodium sulfate	Satd	A	A	-
Sodium sulfide	25	A	A	-
Sodium sulfite	Satd	A	A	-
Stannic chloride	Satd	A	A	-
Stannous chloride	Satd	A	A	-

Chemical Resistance

Environment	Conc. %	TEMP. °C		
		20°	60°	100°
Starch		A	A	-
Sugars and syrups		A	A	-
Sulfamic acid		A	A(80°C)	-
Sulfates of calcium & Magnesium		A	A	-
Sulfates of Potassium & Sodium		A	A	-
Sulfur		A	A	-
Sulfuric acid	98(a)	C	-	D
Sulfuric acid	60	A	B(80°C)	-
Sulfuric acid	50	A	B	-
Sulfuric acid	10	A	A	A
50-50 H ₂ SO ₄ /HNO ₃	(a)	C	D(80°C)	-
Tallow		A	A	-
Tannic acid	10	A	A	-
Tartaric acid		A	A	-
Tetrahydrofuran	100	C	C	C
Tetralin	100	C	C	C
Toluene	100	C	C	-
Transformer oil	100	A	C	-
Trichloroacetic acid	10	A	A	-
Trichloroethylene	100	A	A(80°C)	-
Turpentine	100	C	C	C
Urea		A	A	-
Urine		A	A	-
Water (distilled, soft, hard and vapor)		A	A	A
Wet chlorine gas		-	D(80°C)	-
Whiskey		A	A	A
White praffin	100	A	B(80°C)	A
White spirit	100	B	C	-
Wines		A	A	-
Xylene	100	C	C	C
Yeast		A	A	-
Zinc Chloride	Satd	A	A	-
Zinc Oxide		A	A	-
Zinc Sulfate	Satd	A	A	-

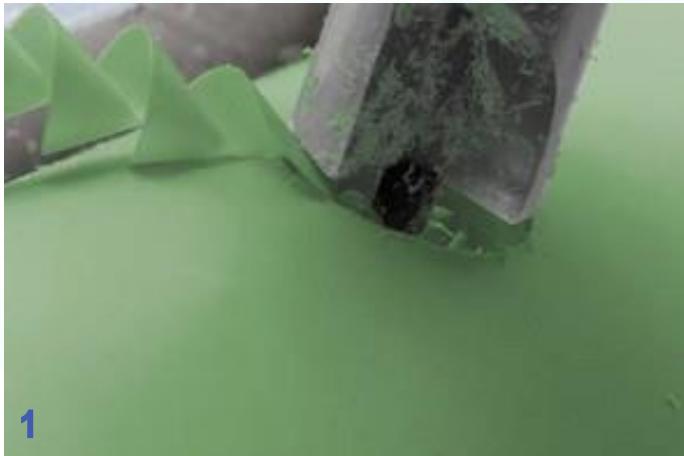
PP-R Pipes Installation Instructions

Installation of PP-R Saddle Fittings

Saddle welds in PP-R pipes are both the outer surface of the tube and the wall thickness of the tube to create a strong, waterproof and reliable joint.

Advantage

Adds additional tees on distribution pipelines (without the hassle of having to cut out parts of existing pipelines and add expensive fittings such as tees, couplings and reducers. Ideal for adding more access points to the main pipeline. Addition of sensors or manometers. Cost-effective and simple way to manufacture geothermal manifolds.



1. Drilling a hole under the pipe saddle fitting.



2. Processing the hole – removing the burrs made when drilling.



3. Welding the pipe saddle fitting by heating up the weld in saddle and use proper die.

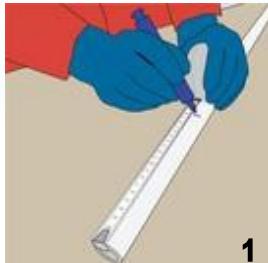


4. Ready connection. (Available in 40mm to 315mm)

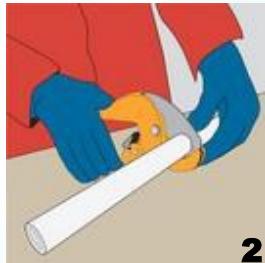


Installation of PP-R Piping Systems

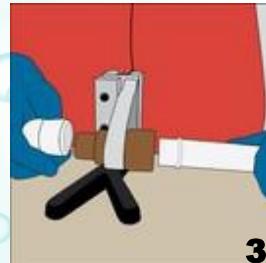
Make sure that pipes, fittings and welding machine are clean. Before operating the socket fusion machine, make sure that the working area is safe. To avoid the rotation and movement of parts, welding plates should be appropriately placed into the welding machine. Connect the welding machine to 220 Volts standard socket. Adjust the temperature as 260°C (500 °F). Push the power button. Heating will take 1 to 3 minutes. When the temperature reaches 260°C (500°F), thermostat light will switch off automatically.



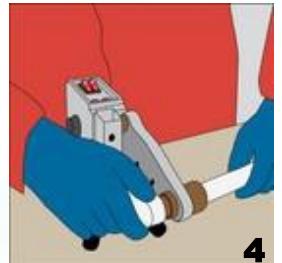
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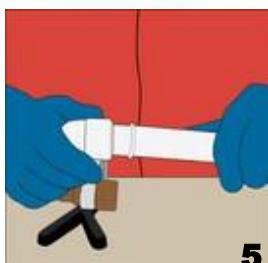
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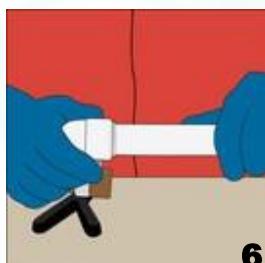
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Pipes and fittings should be heated at the same time. Heating times vary depending upon the diameters of pipes. If you do not follow the times indicated in the table, this will cause reduction in the welding quality. If you heat them for too much time, it will cause the pipe to tighten so much and the fitting to expand extremely, resulting in loose connection.

After heating, take out the pipes and fittings from the welding mould carefully.



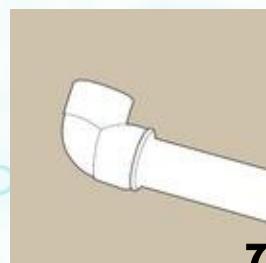
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6

Push the pipe into the fitting at straight angle without rotating it, and joint it quickly.

After jointing it, wait for the cooling process by following the cooling times indicated.



7

After cooling, the connection will be ready for use.

Do not perform welding operation in ambient temperatures below 5°C. As PP-R material is fragile in cold weather conditions, treat the pipes with more attention in those conditions.

Test Instructions

Upon completion of the pipe installation, the installation should be absolutely tested according to the following testing method. After making the controls, the installation should be switched off.

Testing Method

- All valves in the installation are switched off.
- During the supply of water into the installation, the main valve is switched on, but it should not be switched on too much. To protect the installation against strong pressure impacts, the air of the installation is carefully released at the highest and the farthest point of the line.
- Fill the installation with water slowly until water comes out at such point.
- The valves of each area of the installation to be tested are switched on and separately tested.

Starting the Test

Pressure test is carried out in two steps.

Step 1: Testing is conducted for 30 minutes by 1.5 times more of the highest operating pressure prescribed in the entire piping installation within the building. During this period of time, the installation is observed in terms of pressure drop and leakage in the minute 10 and 20. If there is pressure drop but not leakage, then water is re-supplied and restored to the testing pressure.

Step 2: Pressure is applied for 2 hours by 1.5 fold of the highest operating pressure prescribed in the entire piping installation within the building. There should not be any pressure drop at the end of such 2 hours.

Diameter mm	Welding Depth mm	Heating Time mm	Welding Time Sec	Cooling Time Min
20	14	5	4	2
25	15	7	4	2
32	16.5	8	5	3
40	18	12	6	4
50	20	18	7	4
63	24	24	8	6
75	28	30	8	6
90	29	40	8	8
110	32.5	50	10	8
125	40	70	10	8
160	45	90	12	10

The lines not to be used in the testing should be switched off and each area should be separately tested. If, at the end of the testing, the installation will not be used, it should be absolutely discharged. In terms of freezing, no water should be available in the line not to be used.

Thermal Expansions

Linear expansion of pipes depends upon the difference between the operating temperature and installation temperature:

$$\Delta T = T_{\text{Operating Temperature}} - T_{\text{Installation Temperature}}$$

Therefore, thermal expansion values of cold water applications could be neglected. For hot water applications, the expansions should be calculated due to the linear expansion depending upon the temperature of the material, and the clamp distances should be adjusted based on the tables.

It should be taken into account that the critical parameter is thermal expansion coefficient.

- Linear expansion coefficient of Mono Layer PP-R pipes is 0.150 mm/m°K.
- Linear expansion coefficient of Triple Layer PP-R pipes is 0.030 mm/m°K.
- Linear expansion coefficient of Fiberglass Reinforced PP-R pipes is 0.035 mm/m°K.

Total linear expansion of PP-R system is calculated according to the following formula:

$$\Delta L = L_0 \times \alpha \times \Delta T$$

ΔL ; Linear Expansion (mm)

L_0 ; Pipe Installation Length (m)

α ; Linear coefficient of thermal expansion

ΔT ; Temperature Difference Between Operating and Installation Temperature
(°K, °C or °F)

For example, 2 m-long Fiber Reinforced PP-R pipe operates at 65°C and installed at 25°C, rectilinear expansion is calculated as follows:

$$\Delta L = L_0 \times \alpha \times \Delta T$$

$$\Delta L = 2 \times 0,035 \times 40$$

$$\Delta L = 2,8 \text{ mm}$$

Briefly, if a 2 meter long system is made with Glass Fiber Reinforced PP-R product and is exposed to 40°C temperature difference, the system demonstrates 2.8 mm thermal expansion.

The following table indicate the example expansion calculations with different thermal expansion coefficients

Pipe Length (m)	Thermal Expansion of Standard PP-R Pipes [mm] $\alpha = 0,15 \text{ mm/m} \cdot \text{°K}$							
	Temperature Difference (°C)							
	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C
1.0	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0
2.0	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0
3.0	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0
4.0	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0
5.0	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0
6.0	9.0	18.0	27.0	36.0	45.0	54.0	63.0	72.0
7.0	10.5	21.0	31.5	42.0	52.5	63.0	73.5	84.0
8.0	12.0	24.0	36.0	48.0	60.0	72.0	84.0	96.0
9.0	13.5	27.0	40.5	54.0	67.5	81.0	94.5	108.0
10.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0	120.0

Pipe Length (m)	Thermal Expansion of Triple Layer PP-R Pipes [mm] $\alpha = 0,035 \text{ mm/m} \cdot \text{°K}$							
	Temperature Difference (°C)							
	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C
1.0	0.4	0.7	1.1	1.4	1.8	2.1	2.5	2.8
2.0	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6
3.0	1.1	2.1	3.2	4.2	5.3	6.3	7.4	8.4
4.0	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2
5.0	1.8	3.5	5.3	7.0	8.8	10.5	12.3	14.0
6.0	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8
7.0	2.5	4.9	7.4	9.8	12.3	14.7	17.2	19.6
8.0	2.8	5.6	8.3	11.2	14.0	16.8	19.6	22.4
9.0	3.2	6.3	9.5	12.6	15.8	18.9	22.1	25.2
10.0	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0

Pipe Length (m)	Thermal Expansion of Glass Fiber Reinforced (Faser) PP-R Pipes [mm] $\alpha = 0,035 \text{ mm/m} \cdot \text{°K}$							
	Temperature Difference (°C)							
	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C
1.0	0.4	0.7	1.1	1.4	1.8	2.1	2.5	2.8
2.0	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6
3.0	1.1	2.1	3.2	4.2	5.3	6.3	7.4	8.4
4.0	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2
5.0	1.8	3.5	5.3	7.0	8.8	10.5	12.3	14.0
6.0	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8
7.0	2.5	4.9	7.4	9.8	12.3	14.7	17.2	19.6
8.0	2.8	5.6	8.3	11.2	14.0	16.8	19.6	22.4
9.0	3.2	6.3	9.5	12.6	15.8	18.9	22.1	25.2
10.0	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0

Thermal Elongation Compensation

All piping systems need adequate gap for thermal expansion. The necessary gaps should be created on the system through thermal expansion compensation so that no extra tension is created on the system due to temperature differences and the system is not damaged. In the vertical lines (riser), thermal expansion compensation is not required. However, in the horizontal lines, thermal expansion compensations should be included into the system by using the following calculations and designs.

Free Expansion

Fixed Points (FP) blocks the undesired movements of the system. These fixed points are created by using fasteners. Fixed points should be more resistant and stable than sliding points (SP). It is not recommended to use fixed points at bending areas.

Thermal expansion compensation can be calculated according to the following formula by taking the free movements into consideration:

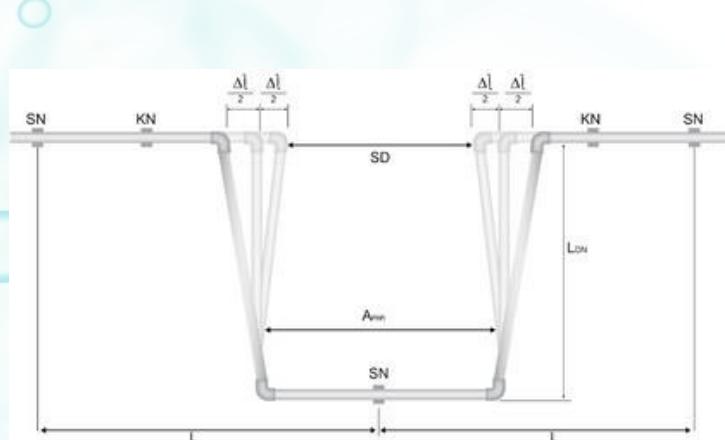
$$A_{\min} = 2 \times \Delta L + SD$$

Amin; Minimum thermal expansion compensation width (mm)
SD; Safety gap (150 mm)
ΔL; Total elongation of the system from fixed point (mm)

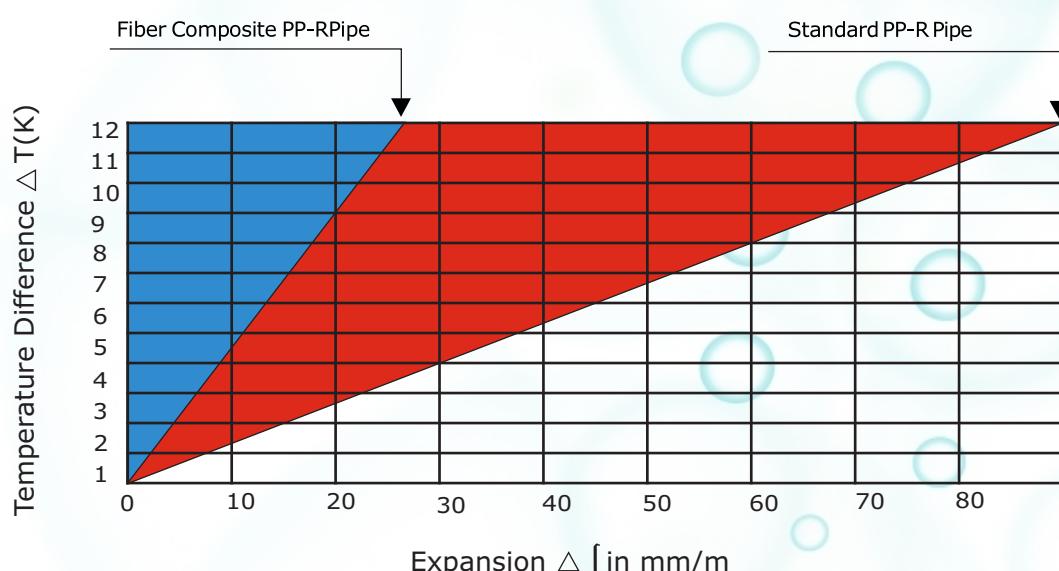
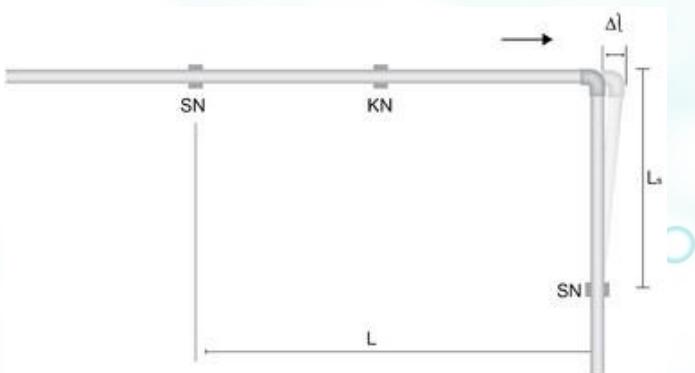
The adjustments of thermal expansion compensation are generally calculated as uniaxial (along the pipe). To avoid any additional stress in the system, PP-R pipes should freely expand in the axial direction.

- Safety gap specified as 150 mm should be increased if there are temperature difference fluctuations in the system.

If the system is biaxial (horizontal and vertical) and longer than 5 m, thermal expansions should be calculated and the following expansion cycles should be used.



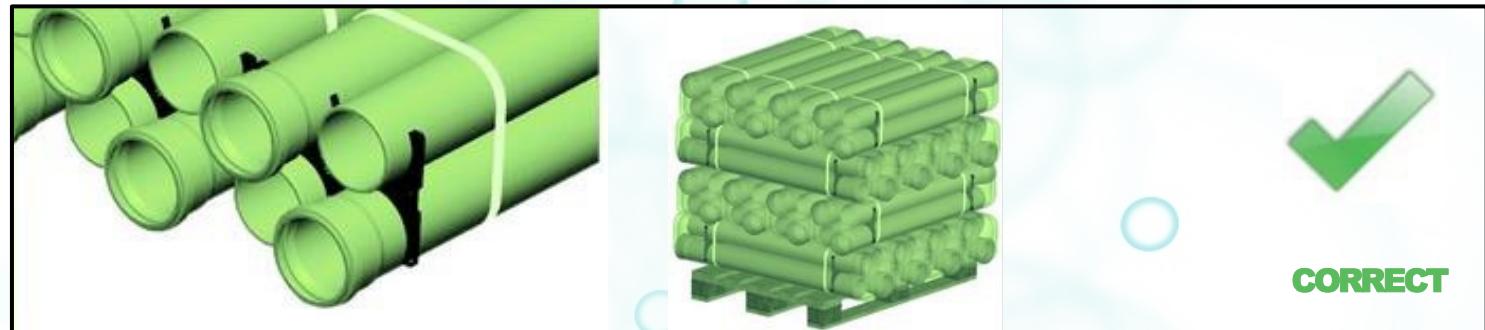
SF; Fixed Point
 SP; Sliding Point
 LDN; Length of free bending part (mm)
 d; External diameter of pipe (mm)
 L; Length of pipe
 ΔL; Total thermal expansion (or contraction) (mm)
 L; Pipe Length (m)
 K; Material constant (K=30)



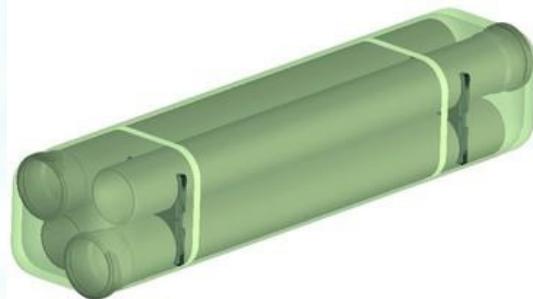
Packaging, Storage and Transportation

Packaging

Our pipes and fittings are packed as ready for transport in a customer-friendly way. Packing ensures safety, efficient storage and easy transport.

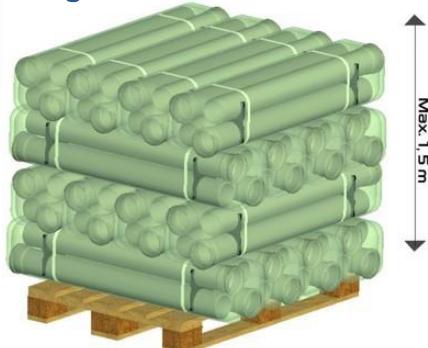


Short parts with the length of 150, 250 and 500 mm are packed in carton boxes like connection parts.



Pipes are packed by plastic clamps to hold them together. Stretch film is applied to protect pipes from pipes dust and stains.

Storage

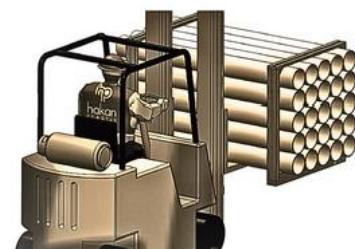
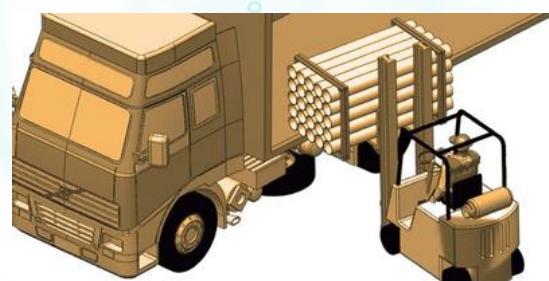


Method of storage should not cause any outflow and should not damage the pipes. As long as they are stored properly, no permanent deformations or damages will occur on the pipes and fittings. Pipes should not be stacked above 1,5 m. Pipes should be safe against sliding.



Pipes and fittings packed in carton boxes should be protected against moisture. Carton boxes should be sealed and stored in a dry area.

Transportation



Pipes should be carefully transported to prevent any damages. Avoid sudden and hard pressures on pipes and fittings that might cause freezing in cold weather conditions. Ensure that pipes are not滑动和dropped on the floor. Loading and unloading and packing of pipes in a block should be carried out by means of forklifts having flat threads and extensions.



MEKOR
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Efficiency Simplified



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