wavin

Pilsa

PP-R PIPES AND FITTINGS

Pilsatherm Pipes and Fittings Technical Catalogue

Solutions for Essentials

April 2014

FORE WORD

Pilsa Plastic Products Inc. started production in 1971 and has always been a leader in the plastic sector in Turkey with a wide range of plastic pipe systems which are produced at the company's manufacturing site in Adana.

In the beginning of January 2008 Pilsa Products Inc. has become a member of WAVIN Group which is located in Netherlands. Wavin is now a global leader in the supply of plastic pipe systems and solutions for both above and below ground applications in projects around the world. Since the 1950's, we have built an unrivalled reputation for continuous innovation, intelligent problem-solving, dedicated technical support and the highest standards.

Today, as part of the Mexichem Group, around 5,500 Wavin employees deliver the benefits of our technology and service for our customers. We have sales and manufacturing operations in most European countries. Beyond Europe, we maintain an international network of approximately 120 agents, licensees and distributors with representation all over the world.

Quality is number one concern of Pilsa and all products conform with the Turkish Standards DIN Standards. Pilsa Products has received Certificates of Conformity and Production Accreditation and ISO 9000 Certificate for Plastic Pipe production also has ISO 9001 certificate besides TSE, TSEK, GOST-R and the global RAL certificates.

Pilsa is well known throughout Turkey not only with its top quality products, but also with the wide distribution system through the dealers' network and service organization.

Pilsa PP-R Pipes are manufactured in compliance with Turkish Standards (TS EN ISO 15874), DIN 8077, DIN 8078. Our products are approved and certified by GOST (Russia), Ukrania Standard (Ukrania), SJJ (CHINA) , Slovakia, Romania, Poland, Bulgaria and have the certificates of guarantee obtained from the Turkish Standards Institute (TSE).

Pilsa PP-R Pipes and Fittings also have the Hygiene certificate.

WHY PILSA?

Being one of the most powerful firms in the country in the plastics sector, PILSA gives the utmost importance to quality and:

- Uses the most appropriate raw material,
- Has the most advanced high technology,
- Produces pipes in compliance with Turkish (TS), European (EN) and German(DIN) Standards,
- Pipes produced can be used not only to carry water but a wide range of fluids,
- Has qualified technical staff at your service to solve your problems,
- Our name stands for quality.

WHY PILSATHERM PIPE?

Pilsatherm has got the following advantages:

- Light weight,
- Easy to carry,
- Easy to install,
- Not dangerous to human life, non-toxic, non-cancerous,
- Low cost of transportation, loading and unloading,
- Has much longer service life compared to other piping systems,
- Has high resistance against corrosion,
- Can easily be connected to any kind of pipe. Due to low cost of plumbing, it has a wide range of applications,
- Water is one of the most important compounds contributing to human life; PILSA. PP-R Pipes carry this vital fluid to your households in an easy, healthy way at a low cost.

TECHNICAL PROPERTIES OF PILSATHERM PIPES AND FITTINGS

- Raw material: Polypropylene Random Copolymer,
- Superior physical characteristics 90°C,
- High chemical resistance,
- Definite solutions to calcification and corrosion,
- No bacteria and moss reproduction within the pipes,
- Light, easy to install and low labor cost of installation,
- Safe to use various pressurized liquids and gas,
- No reduction in diameter at welding points,
- Longer service life (50 years)
- Isolation is not necessary in the buildings,
- Operation Pressure: 20 Bars at 20°C and 10 Bars at 90°C,
- Compared to the metal pipes it expands more and linearly,
- Operation temperature is between 70°C-90°C; it does not absorb water. It can easily be used in hot humid environment.
- Can be used in drinking water systems and has a quality certificate issued by the Ministry of Health and Hygiene-Institute

NEW BASALTTHERM PIPE

- Basalt fiber is made by pulping melted basalt stones of suitable composition.
- It is very durable and flexible and used in many different industries.
- Properties of basalt fiber significantly exceed glass fiber.
- Manufacturing of basalt fiber is very ecological and 100% recyclable
- 4-x lower linear thermal expansion,
- No need to shave before welding
- Higher pressure resistance at higher temperatures by up to 50%
- Temperature resistance up to 90°C
- Higher flow rate by up to 20%

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PHYSICAL AND MECHANICAL PROPERTIES OF RAW METARIAL (PP-R)

Propety		Unit	Test Method	Value
Density at	+23°C	g/cm³	ISO 1183	0,90-0,91
Melt flow index	MFR 190/5	g/10 min.	ISO 1133	0,4-0,6
	MFR 230/2,16	g/10 min.	ISO 1133	0,2-0,5
	MFR 230/5	g/10 min.	ISO 1133	0,8-1,3
Yield stress	50 mm/min.	Mpa	ISO 527	23-28
Elongation at yield	50 mm/min.	%	ISO 527	>10
Tensile modulus	secant	Mpa	ISO 527	800-1000
Ball indentation hardness	132 N/30s	N/mm²	ISO 2039/1	45-48
Shore hardness D	(3 sec value)		DIN 53505	65
Charpy impact strength at	+23°C	KJ / m²	ISO 179 /1eU	No Failure
	0°C	KJ / m²	ISO 179 /1eU	No Failure
	-30°C	KJ / m²	ISO 179 /1eU	43
Charpy notched impact strength at	+23°C	KJ / m²	ISO 179 /1eU	22-58
	0°C	KJ / m²	ISO 179 /1eU	4-5
	-30°C	KJ / m²	ISO 179 /1eU	2,5
Vicat softening temperature	VST / A / 50	°C	ISO 306/A	132
Melting range	-	°C	ISO 3146	140-150
Thermal conductivity	-	W/Mk	DIN 52612	0,24
Coefficient of linear thermal expansion (average, 20-90°C)	-	1/K	DIN 53752	$1,5.10^{-4}$
Surface resistance	-	Ohm	DIN VDE 0303	$>10^{14}$

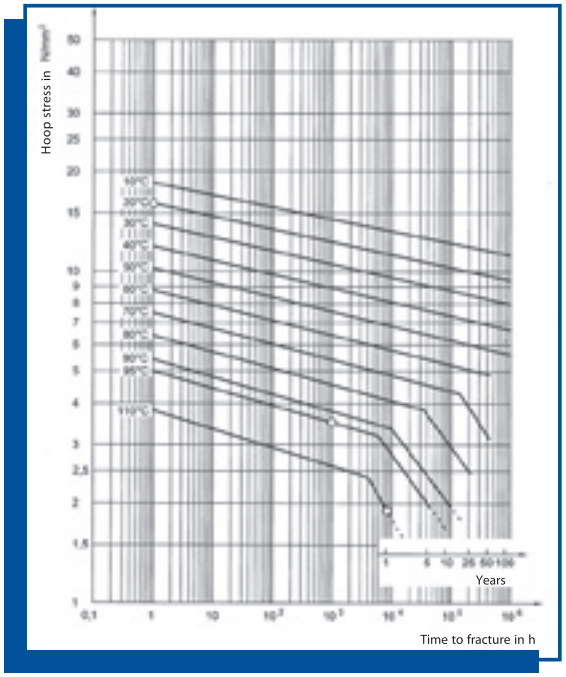
Table - 1

RAW METARIAL

Pilsatherm PP-R Pipes and Fitting are made of Polypropylene Random Copolymer and designed for hot and cold water supply systems and are also suitable for industrial water conveyance.

CREEP RUPTURE - INTERNAL PRESSURE TEST ON PIPES MADE OF PILSATERM PIPES

Long - term resistance to hydrostatic pressure of pipes made of PP-R



LIFE TABLE OF PILSATHERM PIPES

Maximum permissible operating pressures for pipes made of PP-R, media water, C=1,25**

Temperature (°C)		PN10	PN20	PN25
20	1 10 50	18,0 16,4 15,4	35,9 32,8 30,9	45,2 41,4 38,9
30	1 10 50	15,3 13,9 13	30,5 27,8 26,1	38,5 35 32,9
40	1 10 50	13 11,8 11	25,9 23,5 22	32,6 29,6 27,7
50	1 10 50	11 9,9 9,2	21,9 19,8 18,5	27,6 25 23,3
60	1 10 50	9,2 8,3 7,7	18,5 16,6 15,5	23,3 21 19,5
70	1 10 50	7,8 7 5,1	15,5 13,9 10,2	19,6 17,5 12,8
80	1 10 25	6,5 4,8 3,9	13 9,7 7,8	16,4 12,2 9,8
95	1 5	4,6 3,1	9,2 6,2	11,6 7,8

Legend : *Pressure in bar **C = Safety Factor

Table - 2

COLOR OPTIONS

GREY WHITE GREEN

Pipe (L=4 Mt.)

Code: PPBB

DIA. (mm)	S(20 Bar)	S(10 Bar)
16	2.7	1.8
20	3.4	1.9
25	4.2	2.3
32	5.4	2.9
40	6.7	3.7
50	8.3	4.6
63	10.5	5.8
75	12.5	6.8
90	15.0	8.2
110	18.3	10.0
125	20.8	11.4
160	26.6	14.6
200	33.4	18.2

Basalttherm PP-RCT Pipe

(Ø20-63 S= 3,2 / Ø75-125 S=4,0)

Code: PPBB-BET

DIA. (mm)	S(20 Bar)
20	2.8
25	3.5
32	4.4
40	5.5
50	6.9
63	8.6
75	8.4
90	10.1
110	12.3
125	14.0

*Basalttherm Pipe is produced with unrivalled PP-RCT material.
For further details please check our Basalttherm catalogue.

Composite Pipe PN 20

(S 2,5) (L=4 Mt.)

Code: PPBB-CET

DIA. (mm)	S(20 Bar)
20	3.4
25	4.2
32	5.4
40	6.7
50	8.3
63	10.5
75	12.5
90	15.0
110	18.3
125	20.8

Socket

Code: PPYM

DIA. (mm)	d	D	L	k
20	19.5	28.0	34.0	4
25	24.5	33.5	37.0	4
32	31.5	42.5	41.0	4
40	39.5	53.5	45.0	4
50	49.5	67.0	52.0	4
63	62.5	84.0	60.0	4
75	74.5	101.5	65.0	5
90	89.5	120.0	71.0	5
110	109.5	147.0	80.0	6
125	123.2	168.0	85.0	6

Aluminium Foiled Pipe

(L=4 Mt.)

Code: AL.PP3

DIA. (mm)	s
16	3.2
20	3.9
25	4.7
32	5.9
40	7.3
50	9.0
63	11.2
75	13.3
90	16.4
110	19.5

Elbow (90°)

Code: PPYD - 90°

DIA. (mm)	d	D	L	t
20	19.5	28.0	34.0	14.5
25	24.5	33.5	37.0	16.0
32	31.5	42.5	41.0	18.0
40	39.5	53.5	45.0	20.5
50	49.5	67.0	52.0	23.5
63	62.5	84.0	60.0	27.5
75	74.5	101.5	65.0	30.5
90	89.5	120.0	71.0	33.0
110	109.5	147.0	80.0	37.0
125	123.2	168.0	85.0	40.0

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Elbow (45°)

Code: PPYD - 45°

DIA. (mm)	d	D	L	t
20	19.5	28.5	25.5	14.5
25	24.5	33.0	29.5	16.0
32	31.5	43.5	35.0	18.0
40	39.5	52.0	41.5	20.5
50	49.5	67.0	50.0	23.5
63	62.5	86.1	60.0	27.5
75	74.5	99.0	69.0	30.5
90	89.5	119.0	79.0	33.0
110	109.5	145.0	93.0	37.0

Elbow (Female-Male) 90°

Code: Elbow 90°

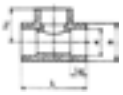
DIA. (mm)	d1	d2	D	L1	L2	L3
20	19.5	20	28.5	14.5	15.5	25.5
25	24.5	25	33.0	16.0	16.0	29.5
25/20	24.5	20	33.0	16.0	16.0	29.5

Bend

Code: Bend

DIA. (mm)	d1	D	L1	L2	R
20	19.5	28.0	14.5	56.0	52.0

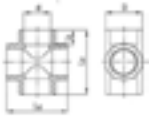
Tee



Code: PPYT

DIA. (mm)	d	D	L	L1	L2
20	19.5	30.0	51.0	28.0	14.5
25	24.5	35.0	59.0	32.0	16.0
32	31.5	43.0	70.0	28.0	18.0
40	39.5	53.4	83.0	41.5	20.5
50	49.5	66.5	105.0	55.5	23.5
63	62.5	84.0	126.0	70.0	28.0
75	74.5	101.5	160.0	81.0	30.0
90	89.5	120.0	158.0	79.0	33.0
110	109.5	147.0	186.0	93.0	37.0
125	123.2	168.0	210.0	105.0	40.0

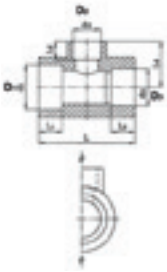
Cross



Code: Cross PPYT

DIA. (mm)	d	D	L1	L2	L3
20	19.5	30.0	14.5	51	56
25	24.5	34.5	16.0	62	64
32	31.5	42.5	18.0	71	76
40	39.5	52.5	20.5	83	84
50	49.5	68.0	24.0	83	84

Unequal Tee



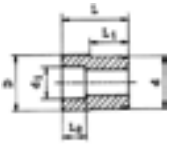
Code: PPRT

D1 D2 D3	d1	d2	d3	L	L1	L2	L3	L4
20x25x20	19.5	24.5	19.5	63.0	14.5	16.0	14.5	35.0
25x20x20	24.5	19.5	19.5	63.0	16.0	14.5	14.5	35.0
25x25x20	24.5	24.5	19.5	63.0	16.0	16.0	14.5	35.0
25x20x25	24.5	19.5	24.5	63.0	16.0	14.5	16.0	35.0
32x20x20	31.5	19.5	19.5	73.0	18.0	14.5	14.5	40.0
32x20x25	31.5	19.5	24.5	66.0	18.0	14.5	16.0	40.0
32x20x32	31.5	19.5	31.5	73.0	18.0	14.5	18.0	40.0
32x25x20	31.5	24.5	19.5	73.0	18.0	16.0	14.5	40.0
32x25x32	31.5	24.5	31.5	73.0	18.0	16.0	18.0	40.0
32x25x25	31.5	24.5	24.5	73.0	18.0	16.0	16.0	40.0
32x50x32	31.5	49.5	31.5	105.0	18.0	23.5	18.0	55.5
40x20x40	39.5	19.5	39.5	83.0	20.5	14.5	20.5	40.0
40x25x40	39.5	24.5	39.5	83.0	20.5	16.0	20.5	45.0
40x32x40	39.5	31.5	39.5	83.0	20.5	18.0	20.5	45.0
40x50x40	39.5	49.5	39.5	105.0	20.5	23.5	20.5	55.5
50x32x40	49.5	31.5	39.5	105.0	23.5	18.0	20.5	55.5
50x40x32	49.5	39.5	31.5	105.0	23.5	20.5	18.0	55.5
50x32x32	49.5	31.5	31.5	105.0	23.5	18.0	18.0	55.5
50x40x40	49.5	39.5	39.5	105.0	23.5	20.5	20.5	55.5
50x32x50	49.5	31.5	49.5	105.0	23.5	18.0	23.5	55.5
50x40x50	49.5	39.5	49.5	105.0	23.5	20.5	23.5	55.5
50x50x32	49.5	49.5	31.5	105.0	23.5	23.5	18.0	55.5
50x50x40	49.5	49.5	39.5	105.0	23.5	23.5	20.5	55.5
50x20x50	49.5	19.5	49.5	91.0	23.5	14.5	23.5	45.5
50x25x50	49.5	24.5	49.5	91.0	23.5	16.0	23.5	45.5
63x20x63	62.5	19.5	62.5	126.0	28.0	14.5	28.0	52.0
63x25x63	62.5	24.5	62.5	126.0	28.0	16.0	28.0	52.0
63x32x63	62.5	31.5	62.5	126.0	28.0	18.0	28.0	52.0
63x40x63	62.5	39.5	62.5	126.0	28.0	20.5	28.0	58.0
63x50x63	62.5	49.5	62.5	126.0	28.0	23.5	28.0	58.0
75x20x75	74.5	19.5	74.5	16.0	30.5	14.5	30.5	61.0
75x25x75	74.5	24.5	74.5	160.0	30.0	16.0	30.0	61.0
75x32x75	74.5	31.5	74.5	160.0	30.0	18.0	30.0	61.0
75x40x75	74.5	39.5	74.5	160.0	30.0	20.5	30.0	61.0
75x50x75	74.5	49.5	74.5	160.0	30.0	20.5	30.0	61.0
75x63x75	74.5	62.5	74.5	160.0	30.0	28.0	30.0	68.0
90x75x90	89.5	74.5	89.5	158.0	33.0	30.5	33.0	79.0
110x90x110	109.5	89.5	109.5	186.0	37.0	33.0	37.0	93.0

COLOR OPTIONS

GREY WHITE GREEN

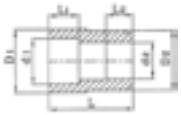
Female-Male Reducer



Code: PPR

DIA. (mm)	d	d1	D	L	L1	L2
20/16	22.0	15.5	25.0	39.0	19.0	13.0
25/20	25.0	19.5	30.0	39.0	19.0	14.5
32/20	32.0	19.5	34.0	41.0	24.0	14.5
32/25	32.0	24.5	34.0	45.0	24.0	16.0
40/20	30.0	19.5	40.0	47.5	23.0	16.0
40/25	35.0	24.5	40.0	47.5	28.0	18.0
40/32	40.0	31.5	42.0	47.5	28.0	18.0
50/20	50.0	19.5	50.0	48.0	20.5	25.5
50/25	50.0	33.2	50.0	48.0	20.5	25.5
50/32	50.0	33.2	50.0	48.0	20.5	25.5
50/40	50.0	33.2	53.5	48.0	23.5	23.5
63/25	63.0	41.5	63.0	52.0	24.5	27.0
63/32	63.0	41.5	63.0	52.0	24.5	27.0
63/40	53.5	41.5	63.0	52.0	24.5	27.0

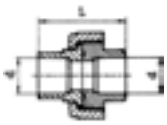
Female-Female Reducer



Code: PPR (F-F)

DIA. (mm)	d1	d2	D1	D2	L1	L2	L3
25/20	24.5	19.5	34.0	32.0	16.0	14.5	45
32/25	31.5	24.5	43.0	40.0	18.5	16.0	51

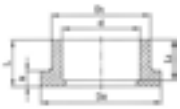
Manchon Union PN 10



Code: PPYR

d
20
25
32
40
50

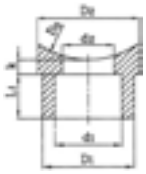
Flange Adaptor



Code: Flange Adaptor

DIA. (mm)	d	D1	D2	L1	L	k
40	39.45	50	61	20.5	23.5	8
50	49.45	61	73	23.5	26.5	8
63	62.50	76	90	27.0	30.5	9
75	74.90	90	106	30.0	38.0	15
90	89.90	109	125	31.0	42.0	17
110	110.00	131	150	37.0	50.0	20
125	123.20	165	188	40.0	63.0	20

Saddle



Code: Saddle

DIA. (mm)	D0	d1	d2	D1	D2	L1	k
63/20	63	19.5	19.0	28.5	37.0	14.5	7.5
75/20	75	19.5	19.0	28.5	37.0	14.5	7.5
90/20	90	19.5	19.0	28.5	37.0	14.5	7.5
110/20	110	19.5	19.0	28.5	37.0	14.5	7.5
63/25	63	24.5	19.0	33.5	37.0	16.5	5.5
75/25	75	24.5	19.0	33.5	37.0	16.5	5.5
90/25	90	24.5	19.0	33.5	37.0	16.5	5.5
110/25	110	24.5	19.0	33.5	37.0	16.5	5.5

Crossover Bridge

Code: Crossover Bridge

G	d	a
20	20	46
25	25	56.5

Bridge

Code: Bridge

G	d	a
16	16	32
20	20	40
25	25	50
32	32	64
40	40	80

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Omega

Code:Omega

d
16
20
25
32
40

Clips

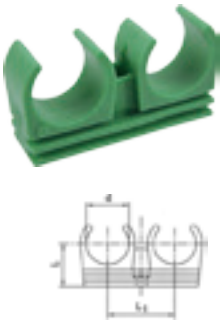
Code:Clips

d	L
16	16
20	20.5
25	24
32	32
40	37.2
50	46

Code:Alfolil Clips

d	L
22	20.5
27	24
34	32
42	37.2
52	46

Double Clips



Code:Double Clips

d	L	L1
20	20.5	32.0
25	23.75	37.5
32	31.80	47.0

Pipe Fixer

Code:Pipe Fixer

DIA. Ø	d	D1
50	75.2	5.8
75	103.5	8.4
110	147.05	8.4

End Cap

Code:PPYQ

DIA. (mm)	d	D	L
16	15.5	22.0	22.5
20	19.5	30.0	26.0
25	24.5	35.0	29.0
32	31.5	42.5	32.0
40	39.5	53.5	37.0
50	49.5	68.0	45.0
63	62.5	82.5	52.0
75	74.5	101.5	59.0
90	89.5	120.0	64.0
110	109.5	147.0	72.0

Male Threaded End Cap

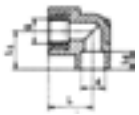
Code:PPDQ

DIA. (mm)	G	L
20x1/2	1/2"	34
25x3/4	3/4"	31
32x1	1"	40

COLOR OPTIONS

GREY WHITE GREEN

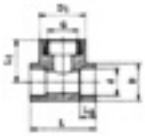
Underplaster Female Elbow



Code: SABB- F

DIA. (mm)	d	G	L	L1	L2
16x1/2	15.5	1/2"	36.0	31.0	13.0
20x1/2	19.5	1/2"	36.0	31.0	14.5
25x1/2	24.5	1/2"	39.5	31.5	16.0

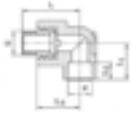
Female Threaded Tee



Code:PPIT

DIA. (mm)	d	G	D	D1	L1	L2	L3
20x1/2x20	19.5	1/2"	30.0	40.0	51.0	37.0	14.5
20x3/4x20	19.5	3/4"	30.0	30.0	51.0	37.0	14.5
25x1/2x25	24.5	1/2"	35.0	40.0	74.0	37.5	16.0
25x3/4x25	24.5	3/4"	35.0	40.0	74.0	37.5	16.0
32x1x32	24.5	1"	35.0	53.0	75.0	48.5	18.0

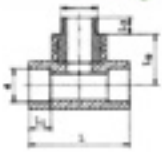
Underplaster Male Elbow



Code: SABB- M

DIA. (mm)	d	G	L	L1	L2
16x1/2	15.5	1/2"	36.0	31.0	13.0
20x1/2	19.5	1/2"	36.0	31.0	14.5
25x1/2	24.5	1/2"	39.5	31.5	16.0

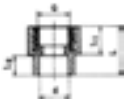
Male Threaded Tee



Code:PPDT

DIA. (mm)	d	G	L	L1	L2	L3
20x1/2x20	19.5	1/2"	51.0	14.5	37.0	13.5
20x3/4x20	19.5	3/4"	51.0	14.5	37.0	13.5
25x1/2x25	24.5	1/2"	74.0	16.0	37.5	13.5
25x3/4x25	24.5	3/4"	74.0	16.0	37.5	13.5
32x1x32	24.5	1"	74.0	18.0	37.5	13.5

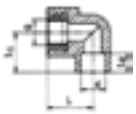
Female Threaded Adaptor



Code:PPIA

DIA. (mm)	d	G	L	L1	L2
16x1/2	15.5	1/2"	44.0	28.0	13.0
20x1/2	19.5	1/2"	40.0	24.5	15.0
20x3/4	19.5	3/4"	40.0	23.5	16.5
25x1/2	24.5	1/2"	40.0	23.5	16.5
25x3/4	24.5	3/4"	40.0	24.5	16.5
32x1	31.5	1"	44.0	27.0	16.0
32x3/4	31.5	3/4"	44.0	27.0	17.0

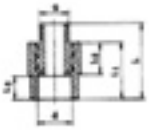
Female Threaded Elbow



Code:PPID

DIA. (mm)	d	G	L	L1	L2
16x1/2	15.5	1/2"	36.0	31.0	13.0
16x3/4	15.5	3/4"	36.0	31.0	13.0
20x1/2	19.5	1/2"	36.0	31.0	14.5
20x3/4	19.5	3/4"	39.5	31.5	16.0
25x1/2	24.5	1/2"	39.5	31.5	16.0
25x3/4	24.5	3/4"	39.5	31.5	16.0
32x1	31.5	1"	46.0	34.0	18.0
32x3/4	31.5	3/4"	46.0	34.0	18.0

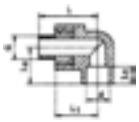
Male Threaded Adaptor



Code:PPDA

DIA. (mm)	d	G	L	L1	L2	L3
16x1/2	15.5	1/2"	59.0	40.0	24.0	13.0
20x1/2	19.5	1/2"	53.5	40.0	24.5	15.0
20x3/4	19.5	3/4"	53.5	40.0	24.5	15.0
25x1/2	19.5	3/4"	49.5	36.0	31.0	14.5
25x1/2	24.5	1/2"	53.5	40.0	24.5	16.5
25x3/4	24.5	3/4"	53.5	40.0	24.5	16.5
32x1	31.5	1"	62.5	44.0	27.0	17.0
32x3/4	31.5	3/4"	62.5	44.0	27.0	17.0

Male Threaded Elbow



Code:PPDD

DIA. (mm)	d	G	L	L1	L2	L3
16x1/2	15.5	1/2"	49.0	36.0	31.0	13.0
16x3/4	15.5	3/4"	49.0	36.0	31.0	13.0
20x1/2	19.5	1/2"	49.0	36.0	31.0	14.5
20x3/4	19.5	3/4"	49.5	36.0	31.0	14.5
25x1/2	24.5	1/2"	52.5	39.5	31.5	16.0
25x3/4	24.5	3/4"	52.5	39.5	31.5	16.0
32x1	31.5	1"	59.5	46.0	34.0	18.0
32x3/4	31.5	3/4"	59.0	46.0	34.0	18.0

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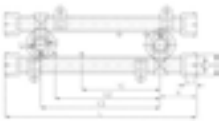
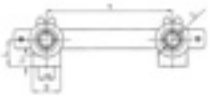
Adjustable Underplaster Female Elbow



Code: SABB-ID TK

DIA. (mm)	d1	D	L1	L	G	H
20x1/2	19.5	28.0	14.5	248	1/2"	47

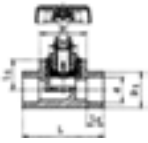
Double Stable Underplaster Female Elbow



Code: SABB-ID(Double)

DIA. (mm)	d1	D	L1	L	G	t
20x1/2	19.5	34	14.5	32	1/2"	150
25x1/2	24.5	34	16	32	1/2"	150

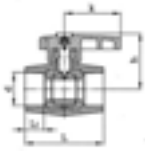
Valve



Code: PP-V

DIA. (mm)	d	D	D1	L1	L2	L3
20	19.5	44.5	34.0	77.0	28.0	14.5
25	24.5	44.5	34.0	77.0	28.0	16.0
32	31.5	52.0	42.5	81.0	38.0	18.0
40	37.0	56.0	48.0	92.0	48.0	20.0

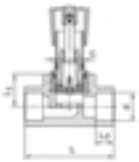
PP-R Ball Valve



Code: PP-V

DIA. (mm)	d	L1	L	k	h
20	19.5	14.5	67.0	102.0	59.0
25	24.5	16.0	75.0	102.0	62.0
32	31.5	18.0	85.0	102.0	69.0
40	39.5	20.5	89.0	102.0	69.0
50	49.5	23.5	112.0	117.4	76.0
63	62.5	27.5	128.0	117.4	84.0
75	74.9	31.0	148.0	117.4	92.0

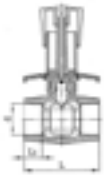
Chrome Valve



Code: PP-V Chrome Valve

DIA. (mm)	d	G	L1	L2	L
20	19.5	3/4"	28.0	14.5	77.0
25	24.5	3/4"	28.0	16.0	77.0
32	31.5	1"	38.5	18.0	81.0

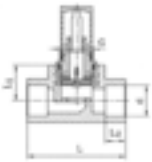
Chrome Ball Valve



Code: PP-V Chrome Ball Valve

DIA. (mm)	d	G	L	L1
20	19.5	1/2"	68.0	15.0
25	24.5	3/4"	68.0	16.5

Decorative Valve



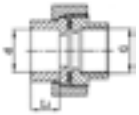
Code: PP-V Decorative

DIA. (mm)	d	G	L1	L2	L
20	19.5	3/4"	28.0	14.5	77.0
25	24.5	3/4"	28.0	16.0	77.0
32	31.5	1"	38.5	18.0	81.0

COLOR OPTIONS

GREY WHITE GREEN

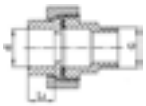
Metal Female Threaded Union

Code: M-PPIR

DIA. (mm)	d	G	L1
20	19.5	1/2"	14.5
25	24.5	3/4"	16.0
32	31.5	1"	18.0
40	39.2	1.1/4"	20.5
50	49.5	1.1/2"	23.5
63	62.5	2"	28.0

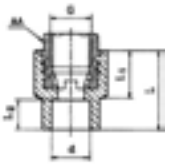
Metal Male Threaded Union

Code: M-PPDR

DIA. (mm)	d	G	L1
20	19.5	1/2"	14.5
25	24.5	3/4"	16.0
32	31.5	1"	18.0
40	39.2	1.1/4"	20.5
50	49.5	1.1/2"	23.5
63	62.5	2"	28.0

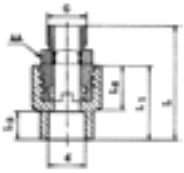
Female Threaded Adaptor

Code: PPIA-AA

DIA. (mm)	d	G	L	L1	L2
16x1/2	15.5	1/2"	38.5	25.5	13.0
20x1/2	19.5	1/2"	40.0	24.5	15.0
20x3/4	19.5	3/4"	40.0	23.5	15.0
25x1/2	24.5	1/2"	40.0	23.5	16.5
25x3/4	24.5	3/4"	40.0	24.5	16.5
32x1	31.5	1"	44.0	27.0	17.0
32x3/4	31.5	3/4"	44.0	27.0	17.0
40x1.1/2	39.5	1.1/4"	47.0	25.0	20.5
50x1.1/2	49.5	1.1/2"	54.0	29.0	23.5
63x2	62.5	2"	76.0	30.0	26.0
75x2.1/2	74.5	1.1/2"	82.0	30.0	31.5
90x3	89.5	3"	76.0	44.0	33.0
110x4	109.5	4"	85.0	48.0	37.0

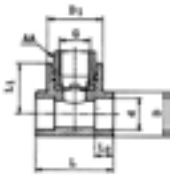
Male Threaded Adaptor

Code: PPDA-AA

DIA. (mm)	d	G	L	L1	L2	L2
16x1/2	15.5	1/2"	53.5	40.0	24.5	13.0
20x1/2	19.5	1/2"	61.5	40.0	24.5	15.0
20x3/4	19.5	3/4"	61.5	40.0	24.5	15.0
25x1/2	24.5	1/2"	63.0	40.0	24.5	16.5
25x3/4	24.5	3/4"	63.0	40.0	24.5	16.5
32x1	31.5	1"	63.5	44.0	27.0	17.0
32x3/4	29.5	3/4"	63.5	44.0	27.0	17.0
40x1.1/2	39.5	1.1/4"	81.0	25.0	20.5	20.5
50x1.1/2	49.5	1.1/2"	90.0	54.0	29.0	23.5
63x2	62.5	2"	101.0	57.0	30.0	26.0
75x2.1/2	74.5	1.1/2"	107.0	61.0	30.0	31.0
90x3	89.5	3"	120.0	76.0	44.0	33.0
110x4	109.5	4"	130.0	85.0	49.0	37.0

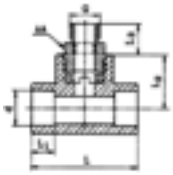
Female Threaded Tee

Code: PPIT-AA

DIA. (mm)	d	G	D	D1	L	L1	L2
20x1/2x20	19.5	1/2"	30.0	40.0	51.0	37.0	14.5
20x3/4x20	19.5	3/4"	30.0	40.0	51.0	37.0	14.5
25x1/2x25	24.5	1/2"	35.0	40.0	74.0	37.5	16.0
25x3/4x25	24.5	3/4"	35.0	40.0	74.0	37.5	16.0
32x1x32	31.5	1"	43.0	53.0	75.0	48.5	18.0

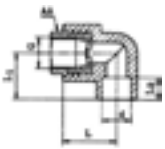
Male Threaded Tee

Code: PPDT-AA

DIA. (mm)	d	G	L	L1	L2	L3
20x1/2x20	19.5	1/2"	51.0	14.5	37.0	21.5
20x3/4x20	19.5	1/2"	51.0	14.5	37.0	23.0
25x1/2x25	24.5	1/2"	74.0	16.0	37.5	21.5
25x3/4x25	24.5	3/4"	74.0	16.0	37.5	23.0
32x1x32	31.5	1"	74.0	18.0	37.5	31.0

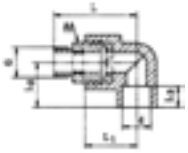
Female Threaded Elbow

Code: PPID-AA

DIA. (mm)	d	G	L	L1	L2
20x1/2	19.5	1/2"	36.0	31.0	14.5
20x3/4	19.5	1/2"	36.0	31.0	14.5
25x1/2	24.5	1/2"	39.5	31.5	16.0
25x3/4	24.5	3/4"	39.5	31.5	16.0
32x1	31.5	3/4"	46.0	34.0	18.0
32x3/4	31.5	3/4"	46.0	34.0	18.0

Male Threaded Elbow

Code: PPDD-AA

DIA. (mm)	d	G	L	L1	L2	L3
20x1/2	19.5	1/2"	60.0	36.0	31.0	14.5
20x3/4	19.5	1/2"	60.0	36.0	31.0	14.5
25x1/2	24.5	1/2"	61.5	39.5	31.5	16.0
25x3/4	24.5	3/4"	61.5	39.5	31.5	16.0
32x1	31.5	1"	74.0	46.0	34.0	18.0
32x3/4	31.5	3/4"	77.0	46.0	34.0	18.0

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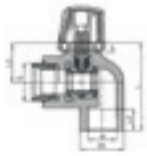
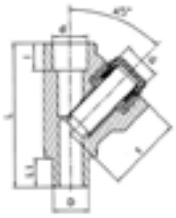
PP-V Radiator Valve-Elbow



Code:PP-V Radiator Valve - Elbow

DIA. (mm)	d	G	D	D1	L	L1	L2
20	19.5	3/4"	26.5	30.0	66	26.8	14.5

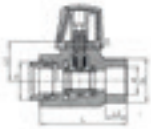
Male Filter



Code:PPPT

DIA. (mm)	d	D	G	l	L1	L	t
20	19.5	20	1/2"	15.0	16.0	80	42
25	24.5	25	3/4"	16.5	19.5	100	50

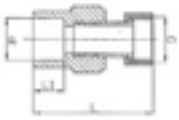
PP-V Radiator Valve



Code:PP-V Radiator Valve

DIA. (mm)	d	G	D	D1	L	L1	L2
20	19.5	3/4"	26.5	30.0	60	26.8	14.5

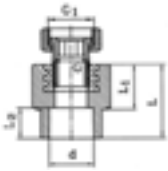
Shifting Nipple



Code:PPOR

DIA. (mm)	d	L1	L	G
20x1/2	19.2	14.5	57.0	1/2"
20x3/4	19.2	14.5	58.0	3/4"
25x1/2	24.2	16.0	59.0	1/2"
25x3/4	24.2	16.0	59.0	3/4"

Adaptor With Nut



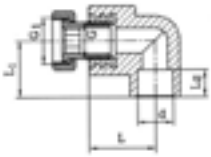
Code:PPHA

DIA. (mm)	d	G	G1	L	L1	L2
20x3/4	19.5	1/2"	3/4"	40.0	24.5	15.0
25x3/4	24.5	1/2"	3/4"	40.0	23.5	16.5
25x1	24.5	3/4"	1"	40.0	24.5	16.5
32x1	31.5	3/4"	1"	44.0	27.0	17.0

Welding Machine Set

Code:Welding Machine Set
Welding Machine Set - Big Plate

Elbow With Nut



Code:PPHD

DIA. (mm)	d	G	G1	L	L1	L2
20x3/4	19.5	1/2"	3/4"	36.0	31.0	14.5
25x3/4	24.5	1/2"	3/4"	39.5	31.5	16.0
25x1	24.5	3/4"	1"	39.5	31.5	16.0
32x1	31.5	3/4"	1"	46.0	34.0	18.0

Welding Head

Code:Welding Head

DIA. (mm)
20
25
32
40
50
63
75
90
110
125

COLOR OPTIONS

GREY WHITE GREEN

JOINING PRINCIPLES OF PILSATHERM PIPES

Figure 2.

PIPES IS CUT...

Welding machine is heated up to 260°C. When the control light is switched off, (at 260°C) welding process is started. Pipes should be cut at appropriate length perpendicular to the pipe center. Welding distance should be marked from the pipe.

IF IT IS ALUMINIUM FOILED PIPE...

A special shaver is used to take off the PP-R layer and Aluminium Foil.

For composite pipes

No need to shave
There is no need to shave the end of the pipe.
Proceed to welding process directly.

PIPE AND FITTINGS ARE HEATED...

Joining surfaces of pipes and fittings should be clean. If necessary, welding parts should be cleaned with alcohol and should be dried with a dry cloth. During welding, neither the pipe nor the fittings should be moved. Duration of heating should be determined as shown in Table 3.

AND ARE JOINED NOT BE SEPERATED AGAIN...

Pipes and fittings should be heated simultaneously after process ends, they should be taken out quickly and without turning they should be joined by pressing one to another axially. Welding machines should be cleaned after every operation for the next use.

PILSATHERM PIPE WELDING PRINCIBLES

Pipe Dia. (mm.)	Welding Depth (mm.)	Heating Time (sec.)	Processing Time (sec.)	Cooling Time (min)	
16	13	5	3	2	Manual Welding
20	14	6	4	2	
25	16	7	4	2	
32	18	8	6	4	
40	20	12	6	4	
50	23	18	6	4	Welding Machine
63	26	24	8	6	
75	28	30	10	8	
90	30	40	11	8	
110	33	50	12	8	
125	35	60	13	10	

Welding Head For Saddle

Code:Welding Head For Saddle

DIA. (mm)
63
75
90
110

Shaver

Code:Shaver

DIA. (mm)	pcs./BAG	pcs./BOX
20-25	1	1
32-40	1	1
50-63	1	1
75	1	1

Cutter

Code:Cutter

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ASSEMBLY OF PIPE AND FITTINGS

Beside the raw material of the pipe, the reliability of plumbing systems depends on the fittings and how they are joined. Since the pipes and fittings are produced from the same material, connections which are usually homogeneous:

There are two main coonections:

a) Threaded connections: Same as in galvanized pipes

b) Fusion welding:

1) Welding done by heating outer surface of the pipe and inner surface of the fitting.

2) Electrofusion welding.

Since the electrofusion technique is quite expensive, socket welding is commonly used. When a tensile test is applied to the welded pipe and fitting segment, it is absorved that welding points are not effected even when the pipe segment reaches of the fracture point. These welded parts are as strong as the pipe itself.

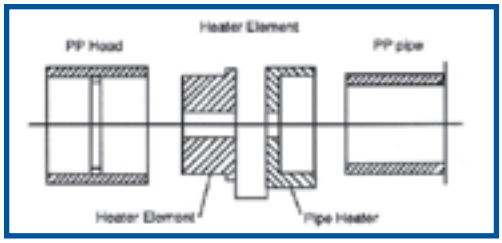
APPLICATION OF SOCKET WELDING

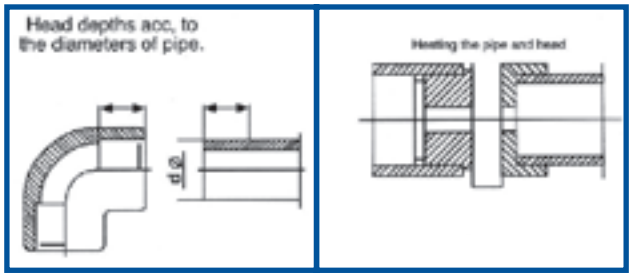
1- Preparation of welding:

Both ends of pipes are cut as perpendicularly to the pipe axis in required length. Chamfers should be given to the outer ends of the pipe by a knife. Parts to be welded should be cleaned by alcohol and dried by clean fabric or paper before welding. Socket depth (welding distance) is marked from the end of the pipe. Temperature is adjusted to 260 (+) 10 ºC in the welding machine. Turning off red light on the welding machine indicates that welding temperature is reached. Heaters in the welding machine should always be kept clean.

2- Welding:

Pipes and fitting are pushed axially towards the heaters of the welding machine. Then they are pulled out simultaneously and joined to each other in axial direction. During this, the operation pipe never should be turned radially. After welding heaters should be cleaned for the next use.





RECOMMENDATIONS FOR PROTECTION AND CORRECT USE OF MATERIAL

- The plastic pipes and fittings should not be stored in open storage area. The sun light , rain and cold weather may harm and spoil the qualities of the pipes and fittings. Therefore , we recommend that meterials are stored and kept with their original packing and should be covered by plastic covers or canvas.

- Pilsatherm pipes and fittings must be well preserved from shocks or cuts by metal. Hard strokes to the ends of the pipes must be avoided. Extra care must be given during transportation and stacking of the packed bundles.

- Do not weld dirty pişpes and parts. If the parts to be welded are dirt, oily or filthy,clean them with a damp cloth or with alcohol and dry until it is perfectly clean.

- Do not use conic threaded items as joints or attachments. Always try to use straight threaded fittings or armatures. Whwn tightening do not place too much effort which will cause the pipe to twist.

- When curving or bending the pipe do not apply direct heat or flame on to the pipe. Heating by bowling or exposing to hot air is the best, but should not exceed 140 ° C.

- Do not use hemp on the theards whwn joining to armatures. Teflon tap may be used but do not forget that using Teflon needs experience and technique. İf no Teflon is used, you may try to use special plastic gaskets.

- Pipes and fittings that have been stored in open storage places and cold weather must be first warmed up to normal temperatues since low temperature may have spoiled the cystal structure of the plastic material. Therefore, they must be preheating is not made sudden heating up to high temperatures may cause a shock on the plastic material and may there by crack it. Pre heating process must not be neglected .

- The preheating process may be done by giving hot air with an air gun to heat the material up to 100 °C.

- Polypropylene pipes and fittings should never be allowed to contact or be subject to direct heat and refrain from direct fire or flame.

- The distances between the two clips in horizontal and vertical pipes should be so adjusted as to leave enough space and free moving area against extension in one direction.

- Vertical piping must give ample space for upwart expansion of the pipes installed in columns so that it will not bend when expanded due to heat.

- Fixed supports and sliding supports should be chosen and be adjusted in such a way that they do not damage the outer surface of the pipe.

- The expansion areas should be equally adjusted by placing fixed supports wherever possible.

- A welting should be done with precaution in cold and windy weather. (+5 °C and under +5°C)

TECHNICAL PROPERTIES OF PILSA ALUMINIUM FOILED PIPE

* Raw Material: PP-R and Aluminium foil.
* Ideal for central heating and plumbing systems.
* Sound resistant.
* Resistance to acids and chlorine.
* Never deflects under heat, minimum strecthing.
* Pressure tolerance: for water at 20 ºC 20 bars, for water at 90 ºC 10 bars.
* It is easy to scrape the outer surface and aluminium foil by a simple pipe shaver.

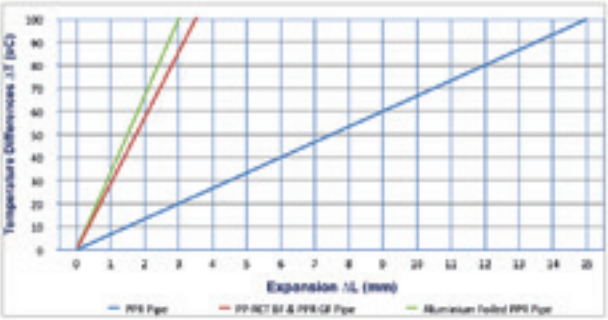
The linear coefficient of thermal expansion is (0,030mm/mK)
Thermal transmission is 1.10W/mK.

TECHNICAL PROPERTIES OF PILSA COMPOSITE PIPES

- Consists of PPR-C inner and outer layers and a special
- mixture of GF PP middle layer.
- The GF within the two layers of PPR-C activates as an agent to reduce extension capability of the pipes nearly to the level of metal pipes. GFR pipe bears all of the physical qualifications of PN 20 plastic pipes and can be safely used under 10 bar pressure at 90°C liquid or air transmissions.
- Purpose of Pilsatherm GFR PPR-C Pipe is to present the advantages of PPR-C and Aluminium Foiled Stable Pipes.
- The mixture of Polypropylene and Glass Fiber minimizes elongation from heat.
-
- It provides high efficiency and ease of use.
-
- Alternative solution to conventional pipe systems suitable for e.g. cooling and air conditioning systems, sanitary installations, industrial pipeline construction and rainwater utilization systems.
- Unlike alumunium foiled pipes; there is no need to shave
- the end of the pipe. Welding process should begin directly.
- This provides ease of install.

The linear coefficient of thermal expansion is (0,035mm/mK)
Thermal transmission is 1.10W/mK.

LINEAR EXPANSION GRAPH OF PILSATHERM PIPES



EXPANSION

Heat Expansion coefficient of the Pilsatherm composite pipes, with respect to metal pipes is higher. This should specifically be considered in Project calculations.

Expansion Calculations
$\Delta l = L \times \Delta t \times \propto$

Δl= Change in pipe length (mm)
Δt= Change in operating (working) temperature (Kelvin-K) (Celsius-C°)
$\propto$= Coefficient of pipe-Pipe Length (mm/mK)
L= Lenght of Pipe (m)

PPRC Pipes for
The linear coefficient of thermal expansion (0.15mm/mK)
Thermal transmission is 0.24W/mK.

Example for PPRC Pipe

Temperature Disparity (Δt) = 40 K
Length of pipe (L) = 5m
Amount of extension (ΔL) = 40x5x0,15= 30mm

Example for Al. PPRC Pipe

Temperature Disparity (Δt) = 40 K
Length of pipe (L) = 5m
Amount of extension (ΔL) = 40x5x0,030= 6 mm

Example for Composite PPRC and PP-RCT Pipes

Temperature Disparity (Δt) = 40 K
Length of pipe (L) = 5m
Amount of extension (ΔL) = 40x5x0,035= 7 mm

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PLUMBING / DESIGN

PP-R pipes installed in the same way as conventional galvanized metal pipes. However special attention should be paid to the higher expansion rate of PP-R pipes compared to the metal pipes. Pipes can be installed in/on the wall. Since the weights of the PP-R pipes and fittings are about one ninth of the metal pipes, installation of PP-R pipes is easier, adjustment for expansion can be done in one direction. However, one should make it certain that pipes move freely in axial direction. If the expansion can't be managed in one direction U bend or OMEGA compensators should be added to the design. Fixed supports and sliding supports should be chosen in such a way that they do not damage the outer surface of the pipe.

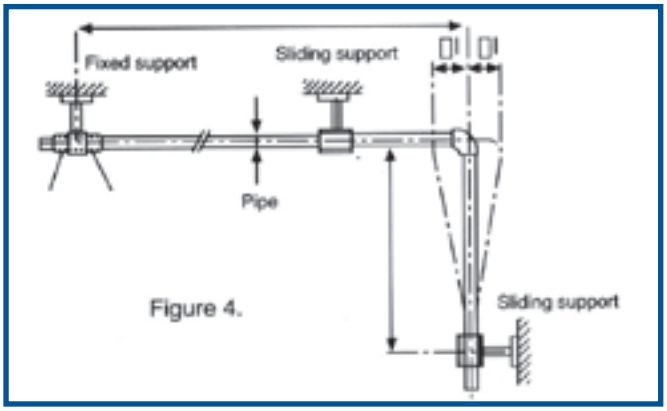


Figure 4.

Expansion pipe segments can be produced during the installation. Four elbows and length of pipe are usually sufficient to do this. The pipe length, necessary for free bend (Ls) is calculated by using the formula; $Ls=C\sqrt{d}\,\Delta L$ where,

Ls= free bend lenght in mm.
d = outer diameter of the pipe in mm.
L = elongation in mm.
C = material coefficient (3 for PP-R)

or it can directly be determined by using Figure 8.

When the length of the pipe exceeds 5 meters, it is absolutely recommended to use expansion pipe segment. During installation, bridges are used at the intersection points of pipes so that they lay in the same plane.

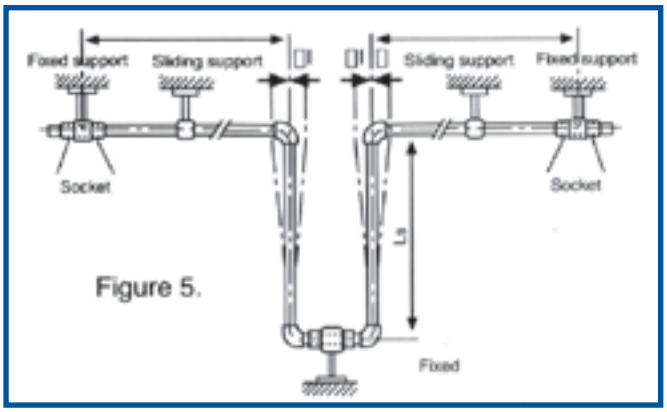


Figure 5.

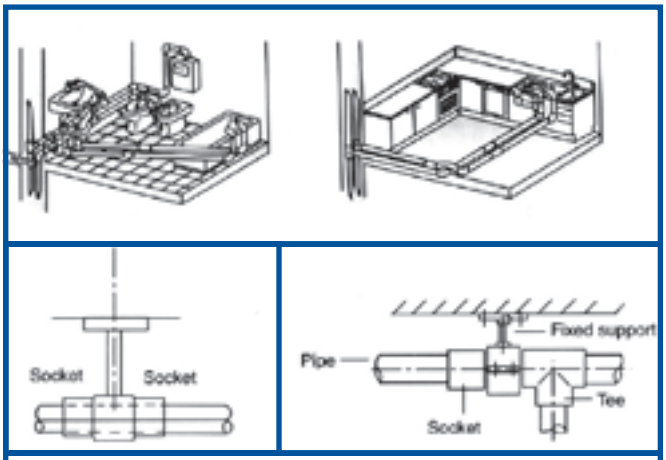


Figure 6.

FIXED SUPPORT

Fixed support are used to fix the pipe at certain points against undesired pipe movements. Fixed supports should be stronger compared to the sliding supports.

Fittings are used to construct fixed supports. At the points where direction changes, fixed supports should not be used. The distance between the fixed supports should be chosen in such a way that pipe elongation is not effected. In general elongationof the pipes is provided by free bending section. Figure 4 and 5 show the effect of elongation an how it is handled in the system.

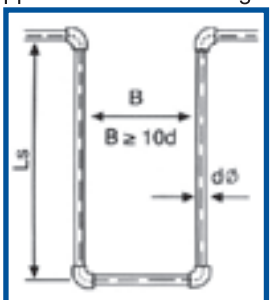


Figure 7.

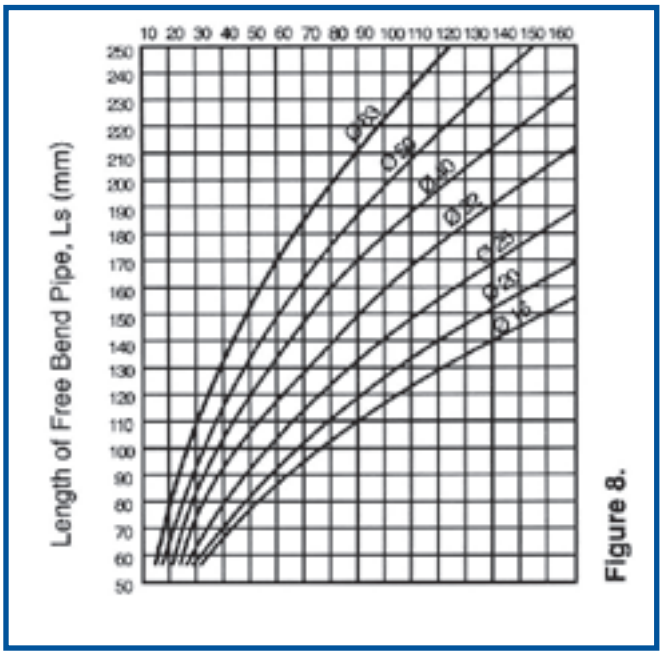


Figure 8.

In some cases pipes are bent by heating. However, pipes should never be allowed to conctact to flame, instead heating should be carried out by blowing air. A temperature of 140°C is sufficient to bend the pipes. Recommended radius of curvatures are shown in Table 5.

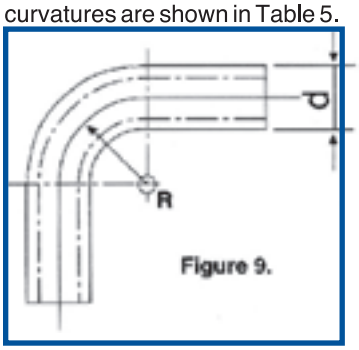
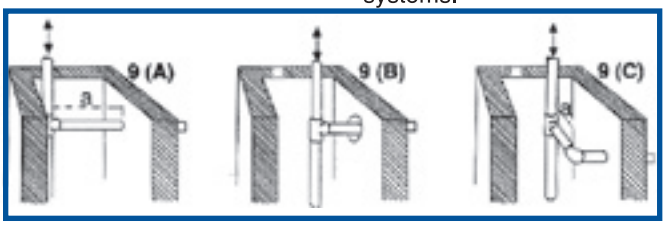


Figure 9.

The distance between the two clips in horizontal pipes. depends on the factors such as the raw material that pipe is produced from, wall thickness, weight of the pipe and temperature. Table 5 shows recommended distances between the clips. Practically, same distances can be used for vertical systems.



d	Supported Lengths (water - filled pipes) in cm at						
mm	20ºC	30ºC	40ºC	50ºC	60ºC	70ºC	80ºC
16	75	70	70	65	65	60	55
20	80	75	70	75	65	60	60
25	85	85	85	80	75	75	70
32	100	95	90	85	80	75	70
40	110	110	105	100	95	90	85
50	125	120	115	110	105	100	90
63	140	135	130	125	120	115	105

Table 5.

d	Radius, min. (R=8xd)
20	160
25	200
32	256
40	320
50	400
63	500

Table 6.

APLICATIONS IN THE MAIN CHIMNEY

During installation of pipes from the main line to apartments in a building one of the following techniques are used to allow the pipes expand linearly.

Figure 9A : Distance ``a`` between the tee and wall hole should be provided.

Figure 9B : The hole diameter inside the wall should be bigger than the pipe diameter which crosses the wall.

Figure 9C: L shapen pipe segment is used.

STANDARDS AND CODES OF PRACTICE

E DIN
Potable water pipes in private properties Technical requirements for potable water İnstallation (TRWI)

E DIN 4725
Warm water flor heating systems
Part 1 Terms
Part 2 Thermal testing
Part 3 Thermal performance and desing

E DIN 4726
Pipelines of plastic materials used in warm. Water floor heating systems. Requirements special requirements and testing

E DIN 4728
Pipelines of polyporpylene type 2 used in warm water floor heating systems ; special requirements and testing

DIN 8076
Part 1
Pressure pipes thermoplastic materials-metal compression fittings.

DIN 8077
Pipes of polypropylene, dimensions

DIN 16928
Pipes of thermoplastıc, pipe fitting elements for pipes, laying

DIN 16972
Pipes connectıons and fitting for pressure pipes of PP-R General quality requirements, testing. Injectin moulded elbows for socket welding dimensions.T- pieces injection moulded for socket welding , dimensions.
Sockets and caps injection moulded for socket welding

DIN 16960
Welding of thermoplastıc materials ; principles

DVS 2203
Testing of welds of thermoplastıc materials

DVS 2207
Part 11
Welding of thermoplastic materials, PP-R Type 1 And Type 2, pipes and pipe fittings

DVS 2208
Part 1
Machines and equipment for the welding of thermoplastıc materials, fusion tool welding

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СЕРТИФИКАТ СООТВЕТСТВИЯ

Pilsa

PP-R PIPES AND FITTINGS

Wavin provides effective solutions for essential needs of daily life: safe distribution of drinking water; sustainable management of rainwater and waste water; energy-efficient heating and cooling for buildings. Wavin's European leadership, local presence, commitment to innovation and technical support, all benefit our customers. We consistently achieve the highest sustainability standards and ensure total reliability of supply to support our customers to achieve their objectives.

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