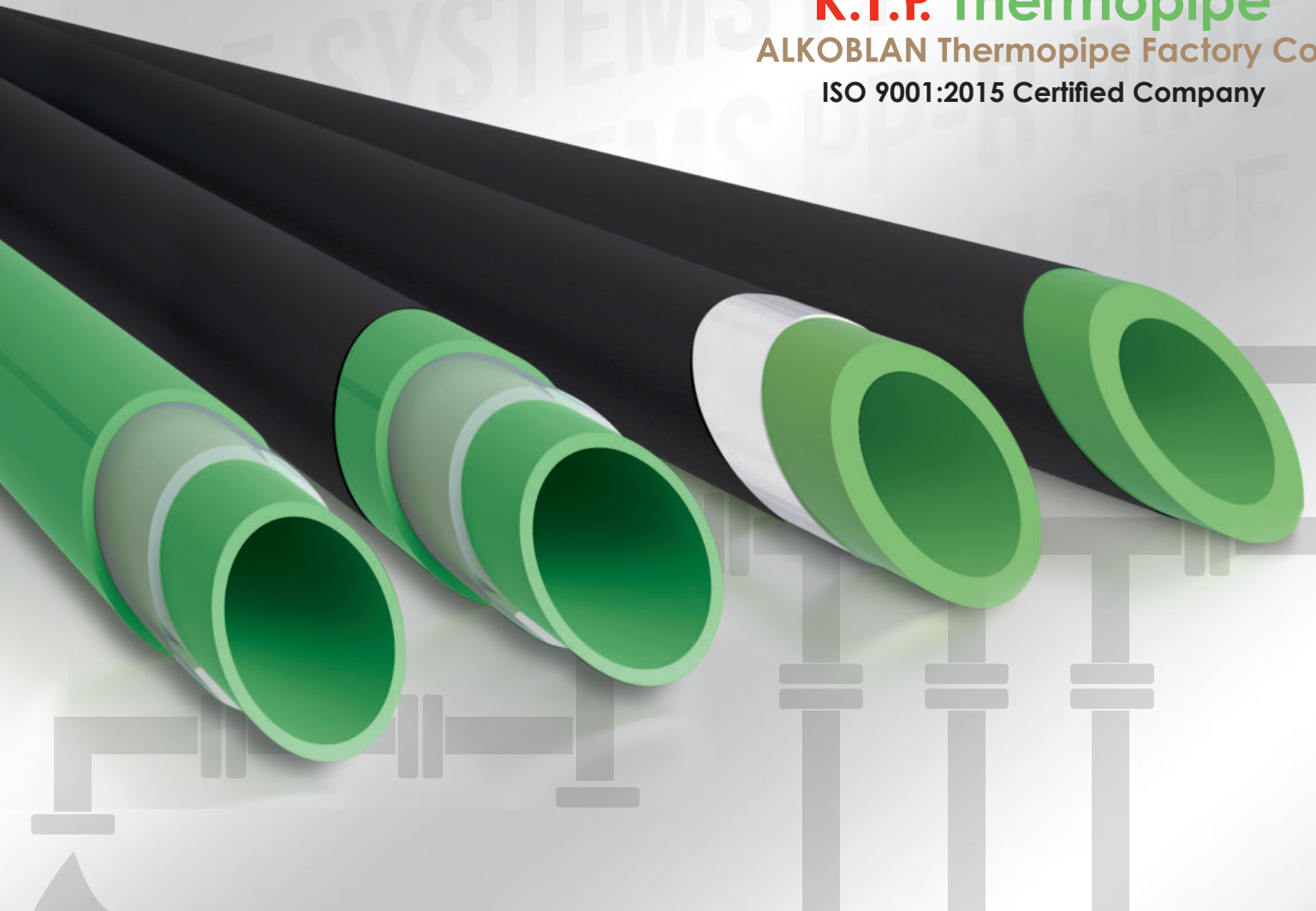
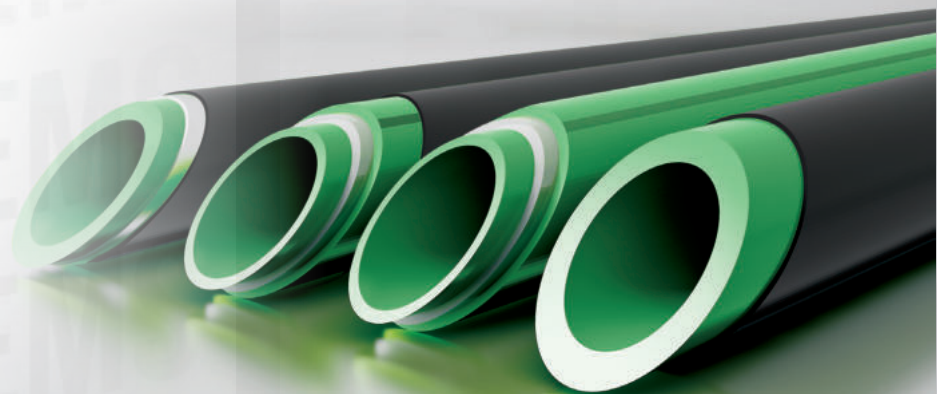




K.T.P. Thermopipe
ALKOBLAN Thermopipe Factory Co.
ISO 9001:2015 Certified Company



K.T.P. COMPOSITE PIPES





KTP PPr-Al-PPr Black Pipes

Pipe Structure: Multilayer

Pipe Materials: PPr; Aluminum, Adhesive

Pipe Series: Series 2.5; SDR 6

Standard Color: Carbon Black

Identification: Overlap Mark of Aluminum Layer
along the pipe length.

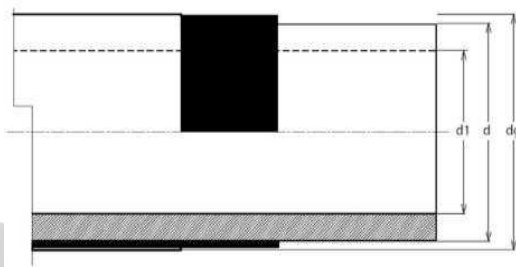
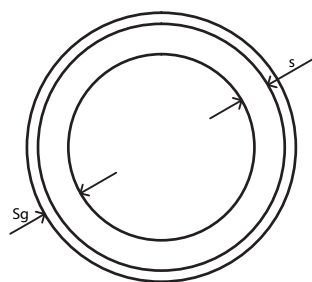
Standard Length: 4.0 M.

Brief Description:

KTP PPr-Al-PPr Black Pipes are comprised of 5 layers. The External and Internal Layers are of PPr Materials, the Middle Layer is an Overlapping Aluminum Layer. Between the PPr Layers and Aluminum Layer are Special Hot Melt Adhesive Layers to bond the layers together.

Technical Specifications

Pipe		Diameter	Wall Thickness	Internal Diameter	Total Diameter	Total Wall Thickness	Weight	
Dimension	Packing (Pcs./Pack)	d	s	d1	dg	Sg	kg/m	kg/4m
		mm	mm	mm	mm	mm		
20mm	25	20	3.40	13.20	21.70	4.25	0.240	0.960
25mm	20	25	4.20	16.60	27.10	5.25	0.380	1.520
32mm	10	32	5.40	21.20	33.70	6.25	0.576	2.304
40mm	8	40	6.70	26.60	41.90	7.65	0.866	3.464
50mm	5	50	8.30	33.40	51.90	9.25	1.256	5.024
63mm	3	63	10.50	42.00	65.65	11.83	1.926	7.704



Advantages:

- Reduced thermal expansion and expansion coefficient.
Linear expansion coefficient only 25% compared with normal PPr Pipes.
- Protect PPr piping from UV radiation.
- Greater impact and rupture resistance.
- Higher rigidity.
- Manufactured as per standard specification of SASO - ISO - 15874, DIN 8077, DIN 8078 and ISO - 21003.
- Fittings used for installation are similar to fittings used in Single Layer PPr Pipes.
- Resistance to Chemicals.
- PPr and Aluminum Outer Layers can be easily peeled off by either manual or mechanical means by using Aluminum Peeling Tools.

KTP PPr-Al-PPr Black Pipes





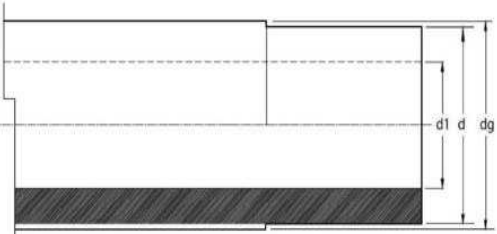
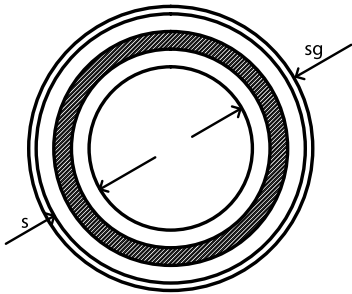
KTP PPr-FG-PPr-PE Pipes

Pipe Structure: Multilayer Pipes
 Pipe Materials: PPr; Fiberglass, Carbon Black PE
 Pipe Series: Series 2.5; SDR 6
 Standard Color: Carbon Black
 Identification: Black PE Outer layer.
 Standard Length: 4.0 M.

Brief Description:
 KTP PPr-FG-PPr-PE Pipes comprise of 4 layers. The external layer is Black PE to protect pipes from Ultra violet (UV) radiation, the middle layer is made of Fiberglass Composite Material. The inner layer of PPr material ensures hygienic performance of the pipe while the middle layer helps to strengthen pipe and reduce linear expansion coefficient.

Technical Specifications

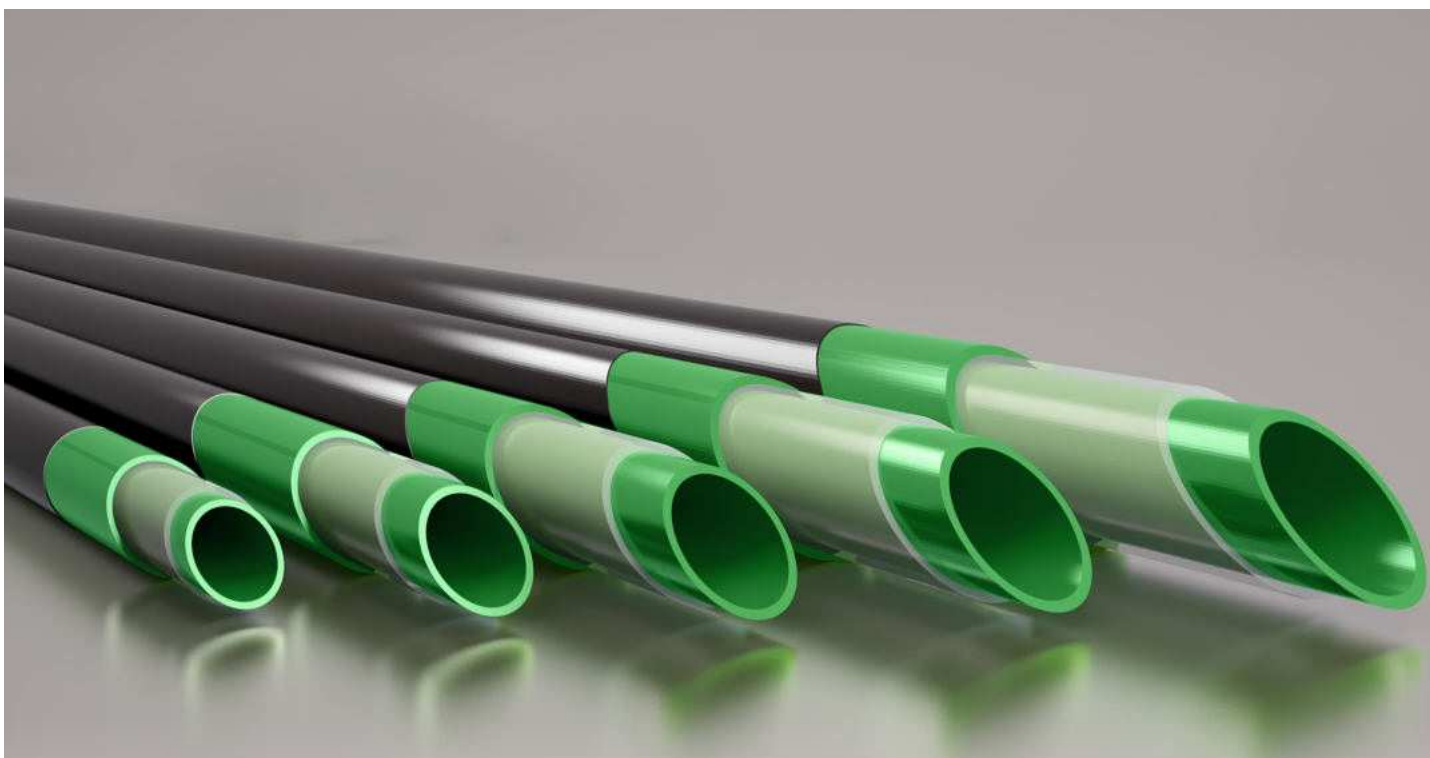
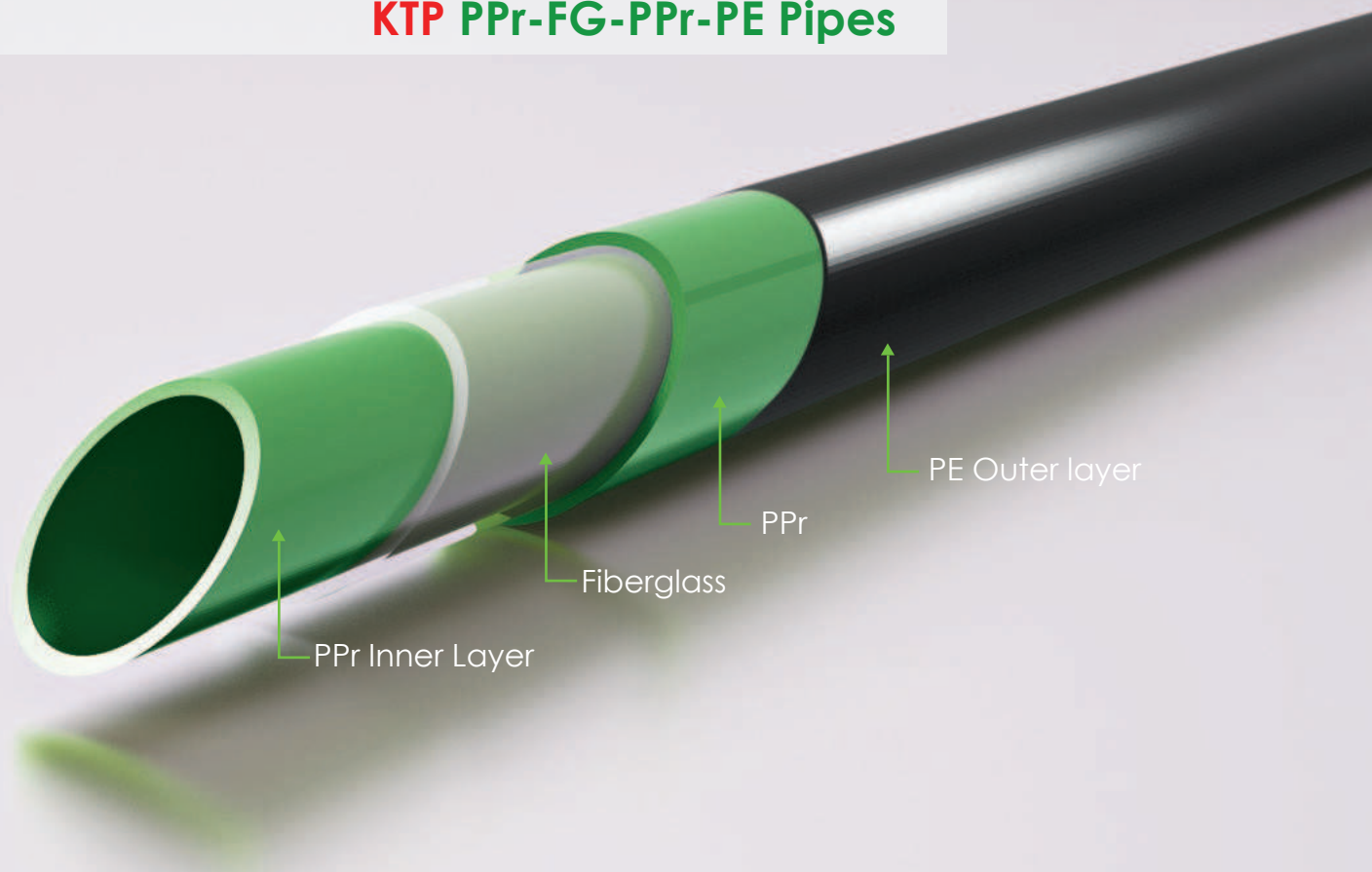
Pipe		Diameter	Wall Thickness	Internal Diameter	Total Diameter	Total Wall Thickness	Weight	
Dimension	Packing (Pcs./Pack)	d	s	d1	dg	Sg	kg/m	kg/4m
		mm	mm	mm	mm	mm		
20mm	25	20.00	3.40	13.20	20.44	3.62	0.195	0.779
25mm	20	25.00	4.20	16.60	25.56	4.48	0.307	1.226
32mm	10	32.00	5.40	21.20	32.48	5.64	0.483	1.932
40mm	8	40.00	6.70	26.60	40.56	6.98	0.762	3.046
50mm	5	50.00	8.30	33.40	50.48	8.54	1.232	4.927
63mm	3	63.00	10.50	42.00	63.48	10.74	1.830	7.320



Advantages:

- Composite of PPr-Fiberglass-PPr increases the stiffness of pipes and PE protects the pipe from UV radiation.
- Lower Linear expansion.
- High impact and rupture resistance at varying temperatures.
- Improve combined properties of PPr and Fiberglass by strengthening the composite and resist higher internal pressure.
- Manufactured as per standard specification of SASO - ISO - 15874, DIN 8077 and ISO - 21003.
- Outside diameter and combined wall thickness are similar to the normal pipe schedule.
- PE outer layer can be easily peel-off at the melting area prior to the melting and welding with fittings.

KTP PPr-FG-PPr-PE Pipes





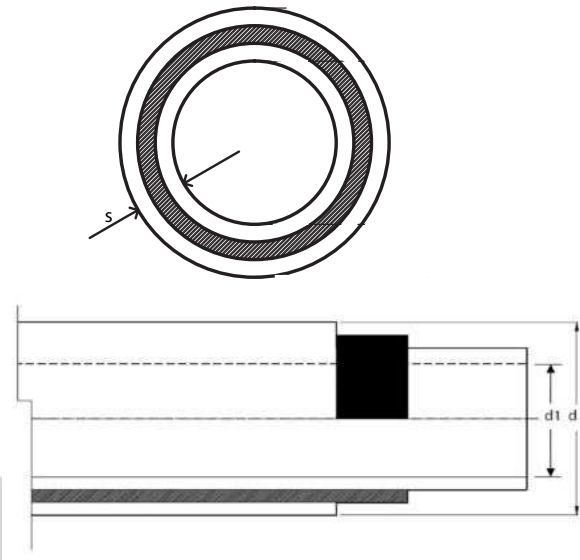
KTP PPr-FG-PPr Pipes

Pipe Structure: Multilayer Pipes
 Pipe Materials: PPr; Fiberglass
 Pipe Series: Series 2.5; SDR 6
 Standard Color: **KTP** Standard Green
 Identification: Two dark green color stripes along the pipe length. Standard Length: 4.0 M.

Brief Description:
KTP PPr-FG-PPr Pipes comprise of 3 layers. The external and internal layers are made of PPr materials, the middle layer is made of Fiberglass Composite Material. The inner layer of PPr material ensures hygienic performance of the pipe while the middle layer helps to strengthen pipe and reduce linear expansion coefficient.

Technical Specifications

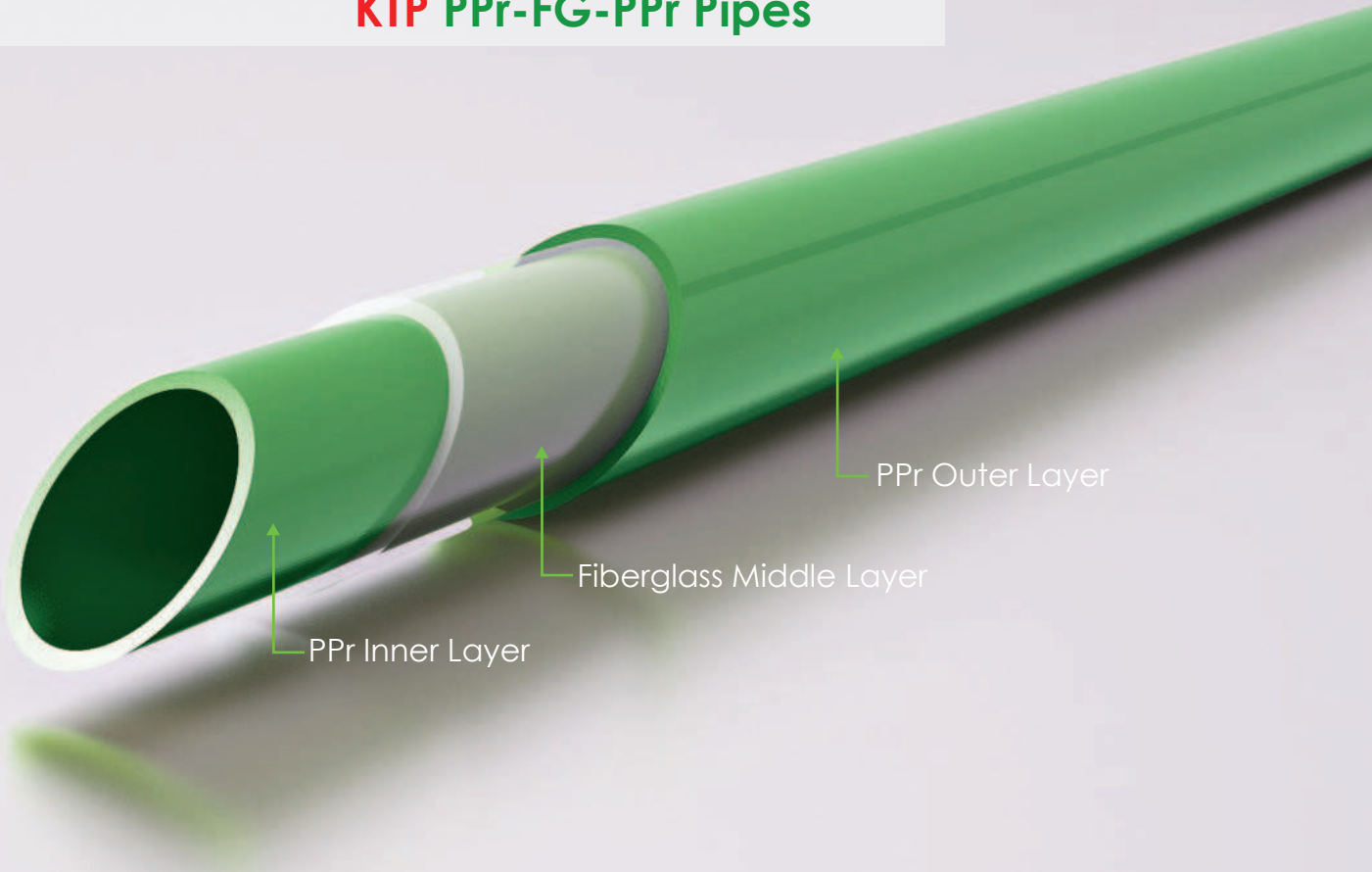
Pipe		Diameter	Wall Thickness	Internal Diameter	Weight	
Dimension	Packing (Pcs./Pack)	d	s	d1	kg/m	kg/4m
		mm	mm	mm		
20mm	25	20.00	3.40	13.20	0.181	0.724
25mm	20	25.00	4.20	16.60	0.287	1.148
32mm	10	32.00	5.40	21.20	0.453	1.812
40mm	8	40.00	6.70	26.60	0.713	2.852
50mm	5	50.00	8.30	33.40	1.182	4.728
63mm	3	63.00	10.50	42.00	1.740	6.960



Advantages:

- Composite of PPr-Fiberglass-PPr increases the stiffness of pipes.
- Lower Linear expansion.
- High impact and rupture resistance at varying temperatures.
- Improve combined properties of PPr and Fiberglass by strengthening the composite and resist higher internal pressure.
- Manufactured as per standard specification of SASO - ISO - 15874, DIN 8077 and ISO - 21003.
- Outside diameter and combined wall thickness are similar to the normal pipe schedule.
- Welding and joining with fittings are similar to normal PPr Pipes.

KTP PPr-FG-PPr Pipes





KTP PPr-PE Pipes

Pipe Structure: Multilayer

Pipe Materials: PPr, Carbon Black PE

Pipe Series: Series 2.5; SDR 6

Standard Color: Carbon Black

Identification: Black PE Outer Cover

Standard Length: 4.0 M. (For sizes 20mm—125mm)

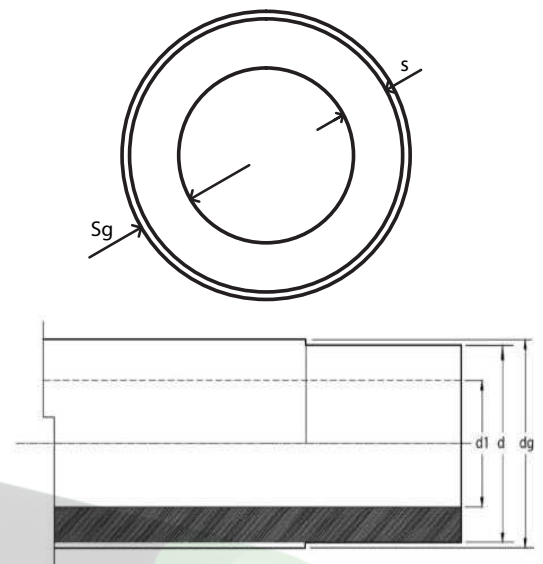
5.8 M. (For sizes 20mm—50mm)

Brief Description:

KTP PPr-PE Pipes are PPr Pipes with Black PE external layer to protect pipes from Ultraviolet (UV) radiation when installed outdoors.

Technical Specifications

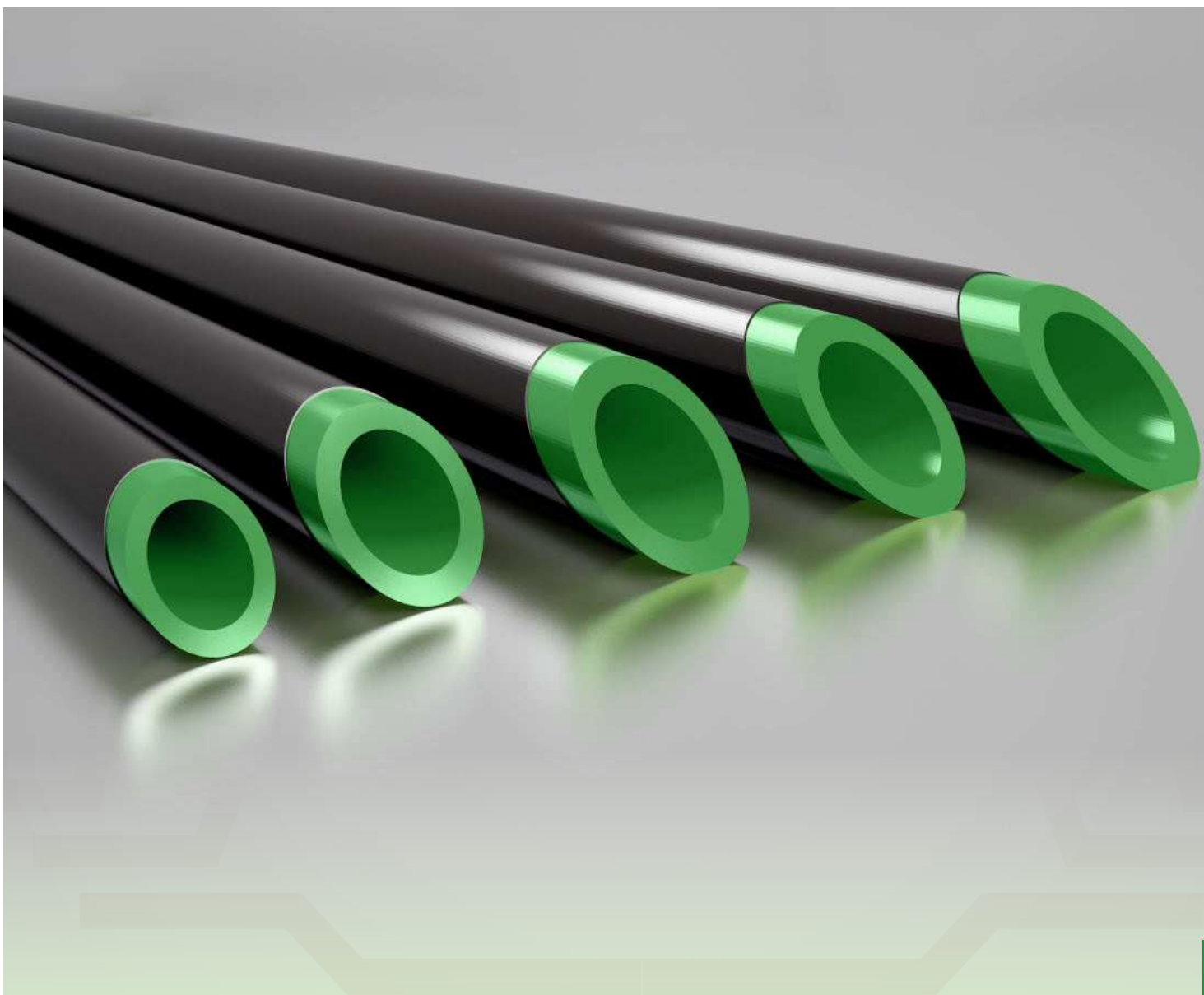
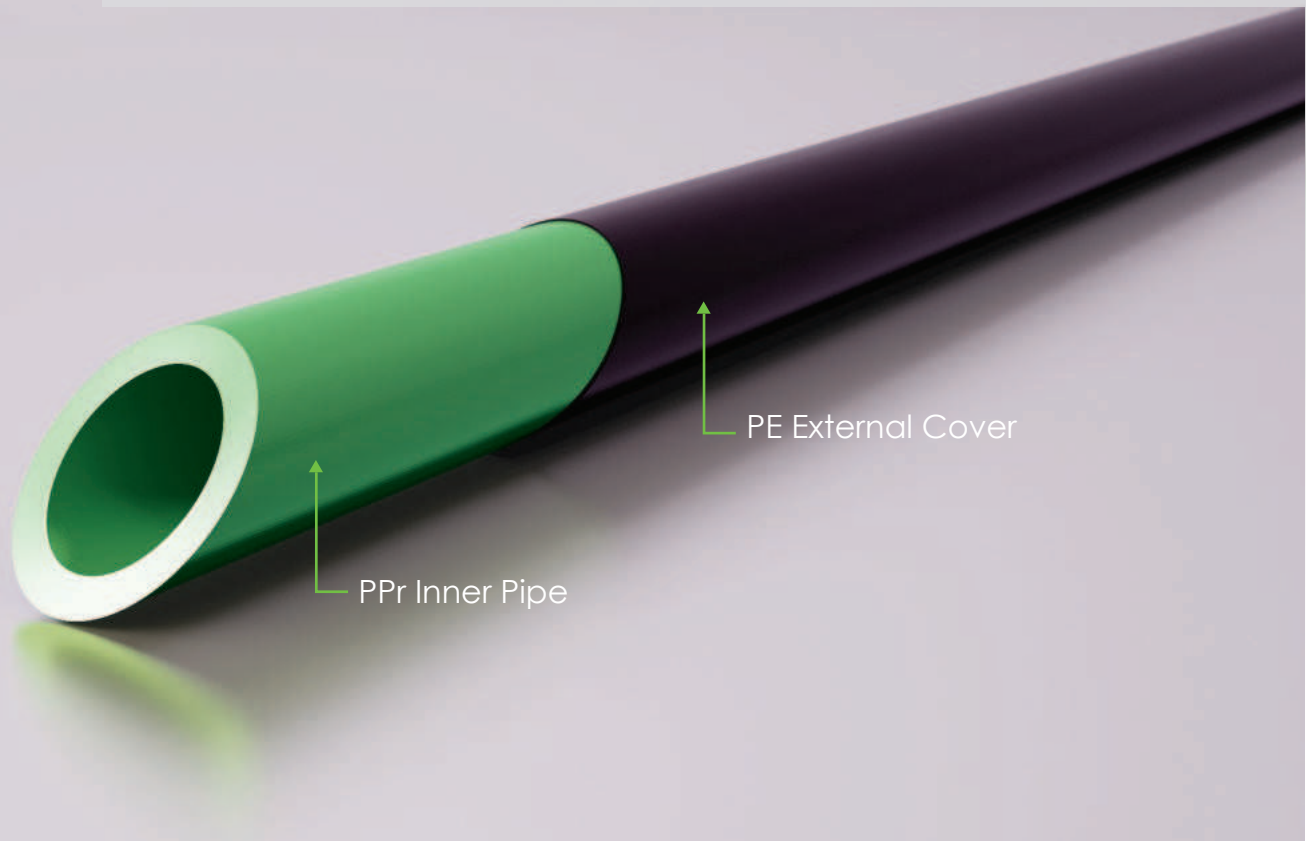
Pipe		Diameter	Wall Thickness	Internal Diameter	Total Diameter	Total Wall Thickness	Weight		
Dimension	Packing (Pcs./Pack)	d	s	d1	dg	Sg	kg/m	kg/4m	kg/5.8m
		mm	mm	mm	mm	mm			
20mm	25	20	3.40	13.20	20.44	3.62	0.186	0.744	1.079
25mm	20	25	4.20	16.60	25.56	4.48	0.286	1.144	1.659
32mm	10	32	5.40	21.20	32.48	5.64	0.464	1.856	2.691
40mm	8	40	6.70	26.60	40.56	6.98	0.719	2.876	4.170
50mm	5	50	8.30	33.40	50.48	8.54	1.090	4.360	6.322
63mm	3	63	10.50	42.00	63.48	10.74	1.740	6.960	10.092
75mm	2	75	12.50	50.00	75.48	12.74	2.440	9.760	14.152
90mm	2	90	15.00	60.00	90.66	15.33	3.476	13.904	20.161
110mm	1	110	18.30	73.40	110.56	18.58	5.146	20.584	29.847
125mm	1	125	20.80	83.40	125.48	21.04	6.610	26.440	38.338



Advantages:

- Increase the life period of pipes when installed and exposed under sunlight.
- Protect PPr Piping from UV radiation.
- Inner layer PPr Pipe satisfies with SASO - ISO - 15874, DIN 8077 and DIN 8078 Standards.
- Fittings used for installation are similar to fittings used in single layer PPr Pipes.
- PE outer layer can be easily peel-off at the melting area prior to the melting and welding with fittings.

KTP PPr-PE Pipes



COMPOSITE PIPE MATERIAL COMPOSITION

Pipe Description	1st Layer	2nd Layer	3rd Layer	4th Layer	5th Layer
PPr-Al-PPr Black Pipe	PPr Green	Hot Melt Adhesive	Aluminum	Hot Melt Adhesive	Black PPr
PPr-FG-PPr-PE Pipe	PPr Green	Fiberglass	PPr Green	Polyethylene	
PPr-FG-PPr Pipe	PPr Green	Fiberglass	PPr Green		
PP-PE Pipe	PPr Green	Polyethylene			

FIELD OF APPLICATIONS FOR KTP PPr PIPE SYSTEMS

Field of Application	Types of PPr Pipes				
	Single Layer PPr Pipes	PPr-FG- PPr Pipes	*PPr-Al- PPr Black Pipes	*PPr-PE Pipes	*PPr-FG-PPr PE Pipes
Potable Water and Food Grade	R	R	R	R	R
Swimming Pools	R	R	R	R	R
Compressed Air Systems	R	R	R	R	R
Heating Distribution	S	R	R	S	R
Marine Applications	R	R	R	R	R
Chilled Water Distribution	S	R	R	S	R
Direct Buried Applications	R	S but N.R.	S but N.R.	S but N.R.	S but N.R.
Industrial and Chemical Transport*	S	S	S	S	S
In-Floor Heating System	S	R	R	S	R

***Recommended for use in Piping System that are exposed to Ultra Violet Exposure.**

R - Recommended
S - Suitable
S but N.R. - Suitable but Not Recommended

***Please refer to table of Chemical Resistance of KTP Themopipe.**

CHEMICAL RESISTANCE OF KTP THERMOPIPE

The behavior of pipe and fitting material towards the flow substance may be classified as:

- 1. Resistant (R) - Material generally evaluated as suitable.
- 2. Conditionally Resistant (C) - The suitability of the material for the particular application can be investigated.
- 3. Non Resistant (NR) - The material is generally evaluated as unsuitable.
- 4. No data on the chemical resistance are available.

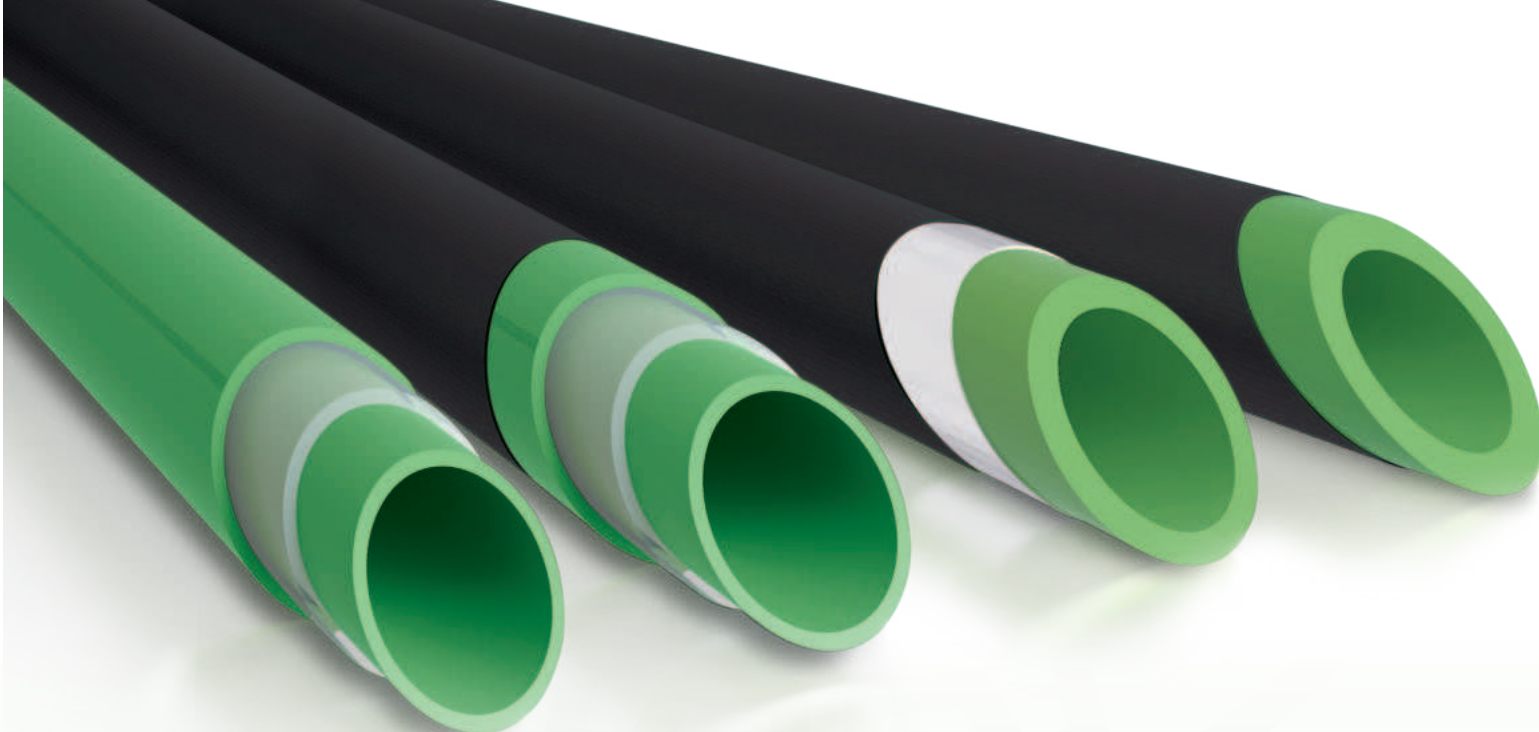
Flow Substance	Content %	Behavior at Different Temperature		
		20 °C	60 °C	100 °C
Waste gases / gas mixture				
- Containing Hydrogen Flouride	Traces	R	R	-
- Containing CO2	any	R	R	-
- Containing CO	any	R	R	-
- Contain Hydrochloric Acid	any	R	R	-
Caustic Soda	up to 60%	R	R	R
Formic Acid, aquaeous	10%	R	R	C
Formic Acid, aquaeous	85%	R	C	NR
Ammonia				
- Liquid	TR	R	-	-
- Gaseous	TR	R	R	-
Ammonia Solution	GL	R	R	-
Ammonia Chloride	GL	R	R	-
Ammonium Nitrate	GL	R	R	R
Benzene	TR	C	NR	NR
Beer	H	R	R	R
Bleaching Liquor (Sodium Hypochlorite)	20%	C	C	NR
Borax	L	R	R	-
Borax Acid	GL	R	R	R
All Type of Spirits	H	R	R	-
Calcium Carbonate	GL	R	R	R
Calcium Chloride	GL	R	R	R

CHEMICAL RESISTANCE OF **KTP** THERMOPIPE

Flow Substance	Content %	Behavior at Different Temperature		
		20 °C	60 °C	100 °C
Drinking water (Chlorinated)	TR	R	R	R
Magnesium Chloride	GL	R	R	R
Magnesium Hydroxide Carbonate	GL	R	R	R
Magnesium Salts	GL	R	R	-
Magnesium Sulphate	GL	R	R	R
Sea Water	H	R	R	R
Milk	H	R	R	R
Mineral Water	H	R	R	R
Naphtha	H	R	NR	NR
Sodium Acetate	GL	R	R	R
Sodium Carbonate, aqueous	50%	R	R	C
Sodium Chloride	VL	R	R	R
Sodium Dichromate	GL	R	R	R
Sodium Bicarbonate	GL	R	R	R
Sodium Bisulphate	GL	R	R	-
Sodium Bisulphite	L	R	-	-
Sodium Nitrate	GL	R	R	-
Sodium Hydroxide Solution	Up to 60%	R	R	R
Mercury	TR	R	R	-
Hydrochloride Acid, aqueous	Up to 20%	R	R	-
Sulphuric Acid, aqueous	10%	R	R	R
Silicone oil	TR	R	R	R
Detergents	VL	R	R	R
Water (Pure)	H	R	R	R
Citric Acid	VL	R	R	R
Wine vinegar, Table Vinegar	H	R	R	R
Sugar Syrup	H	R	R	-

NOTE:

- VL - Aqueous solution, weight content is less than 10%.
- L - Aqueous solution, weight content is greater than 10%.
- GL - Saturated aqueous solution (at 20° C).
- TR - Flow substance is at least technically pure.
- H - Commercially available composition.



Linear Expansion or Change in Length of Pipe:

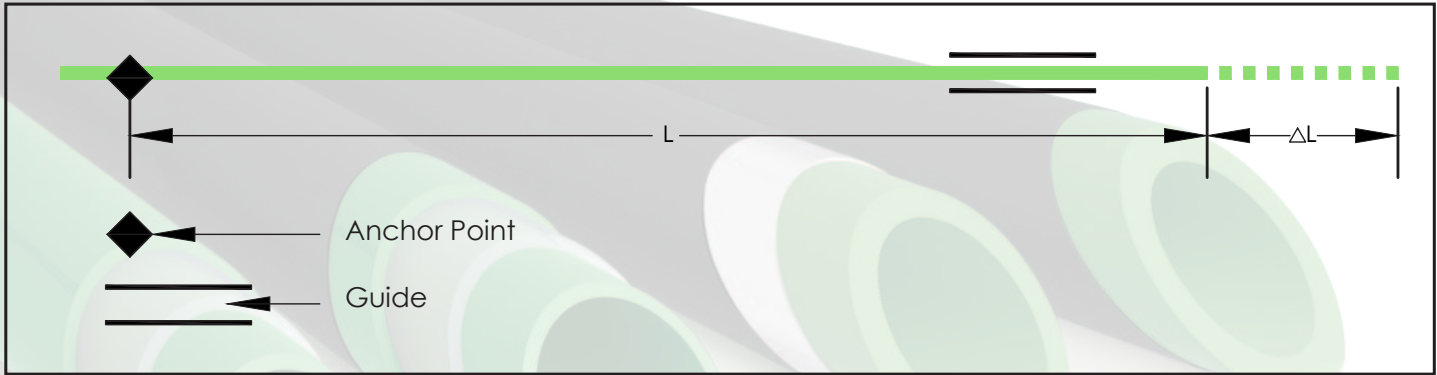
Linear Expansion or Change in Length of PPr Pipe is calculated according to the following formula:

$\Delta L = \alpha \times L \times \Delta T$ (Equation 1)

Where:

- ΔL - Linear Expansion or Change in Length, mm
- α - Coefficient of Linear Expansion, mm/m-K
 - = 0.15mm/m-K - for KTP PPr Pipes
 - = 0.03mm/m-K - for KTP PPr-Al-PPr Black Pipes
 - = 0.035mm/m-K - for KTP PPr-FG-PPr Pipes/PPr-FG-PPr-PE Pipes
- L - Initial Pipe Length, m.
- ΔT - Difference in Temperature, K (°C)
 - = $T_w - T_i$
 - T_w - Working Temperature, °C
 - T_i - Installation Temperature, °C

Figure 1. Change in Length - Expansion



A pipe anchored at one end will expand in length when subjected to a higher temperature.

ΔL - Change in length, refer to Equation 1

The following are the most common methods of absorbing thermal expansion/contraction in plastic pipelines:

1) Bending Side:

This is to allow for linear expansion/contraction of the Pipe (for minor expansion/contraction).

2) Expansion Loop:

This is to allow for linear expansion/contraction when there is additional expansion/contraction and the bending side is not enough to allow for expansion/contraction.

Expansion Loop, as a rule, should be located in the center of the distance between two anchors.

Expansion Loops are primarily used with pipes that are supported periodically, such as by hangers.

The height of the Expansion Loop is normally twice the width.

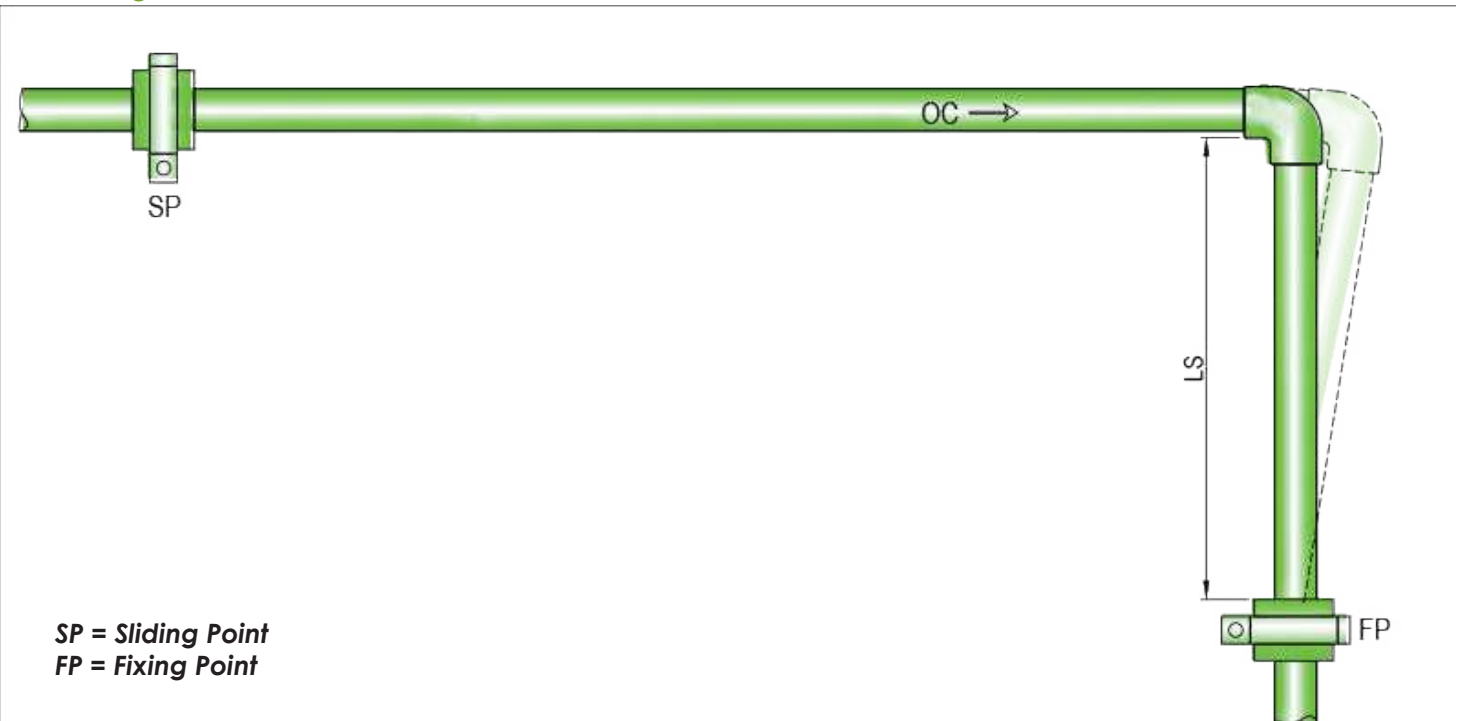
The exception to this rule occurs when more than one line runs parallel in common trench. The dimensions of the loops for the additional line must be increased to allow nesting of the loops.

3) Lateral Deflection:

Lateral deflection (allowing the pipes to deflect laterally) is employed with pipes that have continuous support such as by racks or when installed on grade, which could either be above or below water. In such cases there must be sufficient supporting room on either side of the pipe to accommodate lateral deflection. The pipe is confined in its right-of-way by anchoring it periodically.

Bending Side:

a. Bending Side



Calculation of Bending Side, Ls

The minimum length of Bending Side, LS is calculated using the following formula:

$$L_s = K \times \sqrt{d \times \Delta L}$$

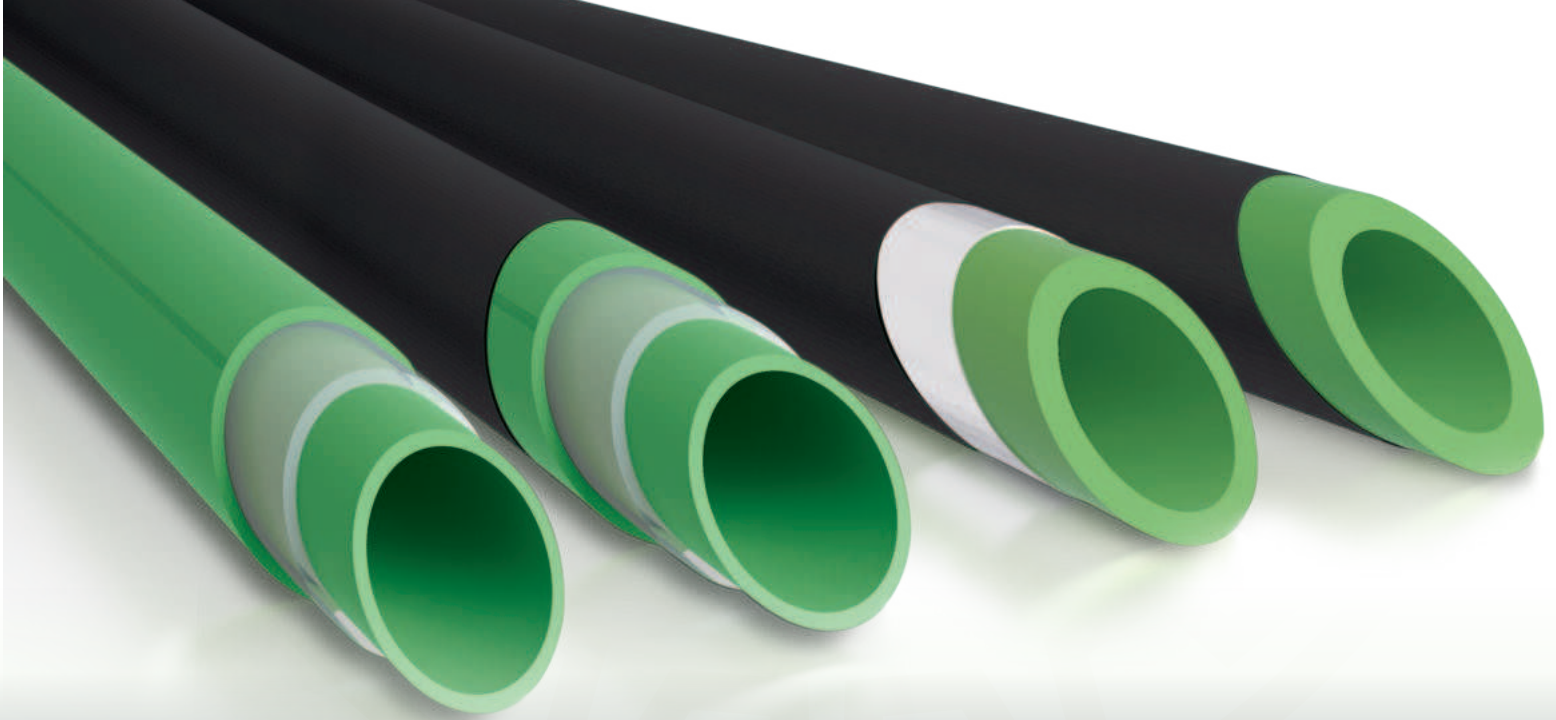
Where:

Ls - Bending Side Length, mm

K - material dependent constant for pipes = 15

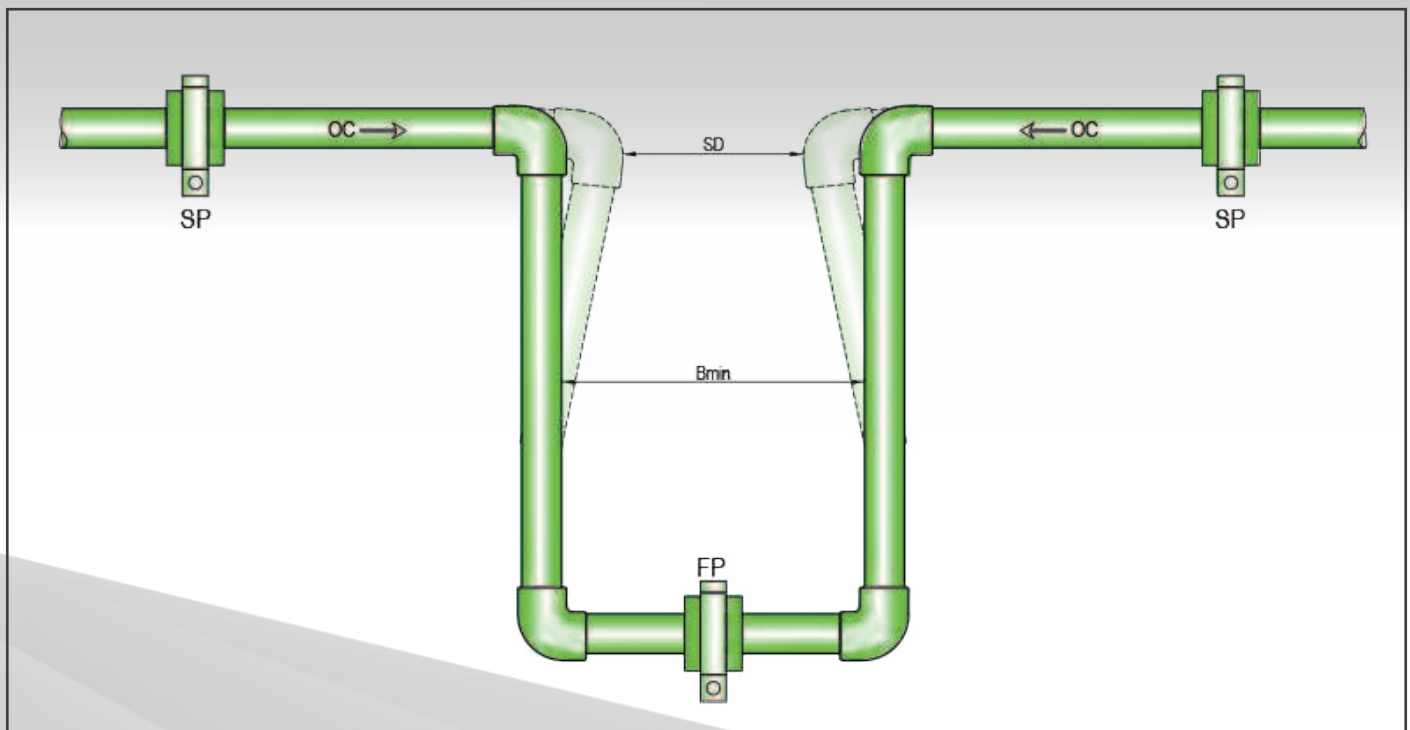
d - pipe outside diameter, mm

ΔL - linear expansion or change in length, mm



Expansion Loop:

b. Expansion Loop



SP = Sliding Point
FP = Fixing Point

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

Where:

B_{min} - minimum Width of Expansion Loop, mm.
 ΔL - Linear Expansion or Change in Length, mm.
 SD - Safety Distance = 150mm.

The width of the expansion loop, B_{min} , should be at least 210mm.
 The height of the expansion loop is normally twice its width, B_{min} .

Linear Expansion for Different PPr Pipe Types

Formula: $\Delta L = \alpha \times L \times \Delta t$

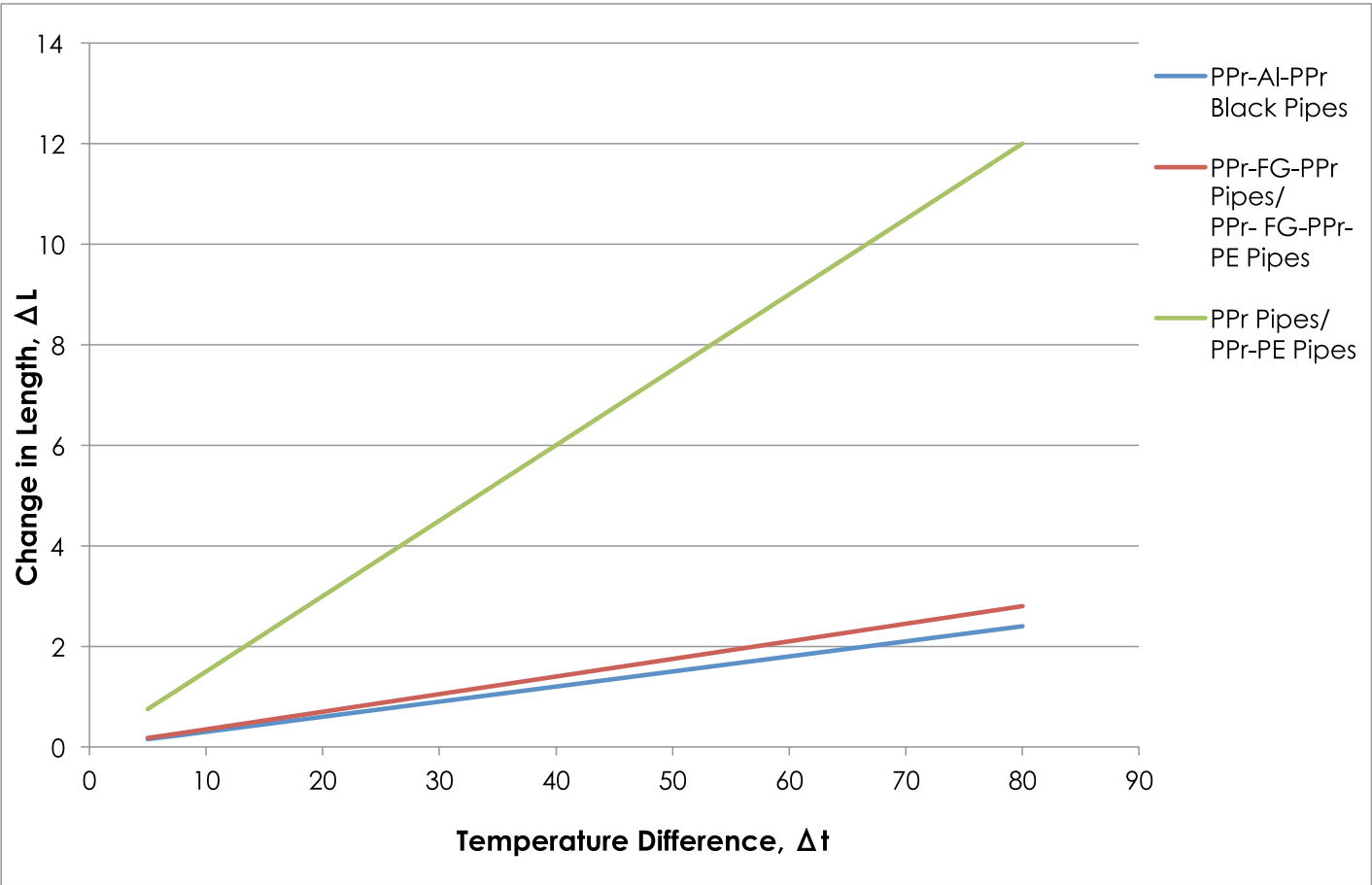
$\alpha = 0.15 \text{ mm/M-K}$ - For PPr Pipes / PPr- PE Pipes
 $= 0.030 \text{ mm/M-K}$ - For PPr-Al-PPr Black Pipes
 $= 0.035 \text{ mm/M-K}$ - For PPr-FG-PPr Pipes / PPr-FG-PPr-PE Pipes
Length: 1.0 Meter

Temp. Diff., K, bet. Working and Installation Temperature (°C)	Linear Expansion, ΔL , mm/M.		
	PPr Pipes/ PPr PE Pipes	PPr-Al-PPr Black Pipes	PPr-FG-PPr Pipes/PPr- FG-PPr- PE Pipes
(Δt)	$\alpha = 0.15$	$\alpha = 0.030$	$\alpha = 0.035$
1	0.15	0.03	0.035
2	0.30	0.06	0.070
3	0.45	0.09	0.105
4	0.60	0.12	0.140
5	0.75	0.15	0.175
6	0.90	0.18	0.210
7	1.05	0.21	0.245
8	1.20	0.24	0.280
9	1.35	0.27	0.315
10	1.50	0.30	0.350
11	1.65	0.33	0.385
12	1.80	0.36	0.420
13	1.95	0.39	0.455
14	2.10	0.42	0.490
15	2.25	0.45	0.525
16	2.40	0.48	0.560
17	2.55	0.51	0.595
18	2.70	0.54	0.630
19	2.85	0.57	0.665
20	3.00	0.60	0.700
21	3.15	0.63	0.735
22	3.30	0.66	0.770
23	3.45	0.69	0.805
24	3.60	0.72	0.840
25	3.75	0.75	0.875
26	3.90	0.78	0.910
27	4.05	0.81	0.945
28	4.20	0.84	0.980
29	4.35	0.87	1.015
30	4.50	0.90	1.050
31	4.65	0.93	1.085
32	4.80	0.96	1.120
33	4.95	0.99	1.155
34	5.10	1.02	1.190
35	5.25	1.05	1.225
36	5.40	1.08	1.260
37	5.55	1.11	1.295
38	5.70	1.14	1.330
39	5.85	1.17	1.365
40	6.00	1.20	1.400

Temp. Diff., K, bet. Working and Installation Temperature (°C)	Linear Expansion, ΔL , mm/M.		
	PPr Pipes/ PPr PE Pipes	PPr-Al-PPr Black Pipes	PPr-FG-PPr Pipes/PPr- FG-PPr- PE Pipes
(Δt)	$\alpha = 0.15$	$\alpha = 0.030$	$\alpha = 0.035$
41	6.15	1.23	1.435
42	6.30	1.26	1.470
43	6.45	1.29	1.505
44	6.60	1.32	1.540
45	6.75	1.35	1.575
46	6.90	1.38	1.610
47	7.05	1.41	1.645
48	7.20	1.44	1.680
49	7.35	1.47	1.715
50	7.50	1.50	1.750
51	7.65	1.53	1.785
52	7.80	1.56	1.820
53	7.95	1.59	1.855
54	8.10	1.62	1.890
55	8.25	1.65	1.925
56	8.40	1.68	1.960
57	8.55	1.71	1.995
58	8.70	1.74	2.030
59	8.85	1.77	2.065
60	9.00	1.80	2.100
61	9.15	1.83	2.135
62	9.30	1.86	2.170
63	9.45	1.89	2.205
64	9.60	1.92	2.240
65	9.75	1.95	2.275
66	9.90	1.98	2.310
67	10.05	2.01	2.345
68	10.20	2.04	2.380
69	10.35	2.07	2.415
70	10.50	2.10	2.450
71	10.65	2.13	2.485
72	10.80	2.16	2.520
73	10.95	2.19	2.555
74	11.10	2.22	2.590
75	11.25	2.25	2.625
76	11.40	2.28	2.660
77	11.55	2.31	2.695
78	11.70	2.34	2.730
79	11.85	2.37	2.765
80	12.00	2.40	2.800

Change in Length, ΔL comparison for Different PPr Pipe Types:

Temperature diff. K, (°C)	Change in Length, ΔL (mm/M)		
	PPr-Al-PPr Black Pipes	PPr-FG-PPr Pipes/ PPr FG-PPr-PE Pipes	PPr Pipes/PPr-PE Pipes
5	0.15	0.175	0.75
10	0.3	0.35	1.5
15	0.45	0.525	2.25
20	0.6	0.7	3.0
25	0.75	0.875	3.75
30	0.9	1.05	4.5
35	1.05	1.225	5.25
40	1.2	1.4	6.0
45	1.35	1.575	6.75
50	1.5	1.75	7.5
55	1.65	1.925	8.25
60	1.8	2.1	9.0
65	1.95	2.275	9.75
70	2.1	2.45	10.5
75	2.25	2.625	11.25
80	2.4	2.8	12.0



Installation Instruction:

Steps in Welding of PPr-Al-PPr-Black Pipes and Fittings:

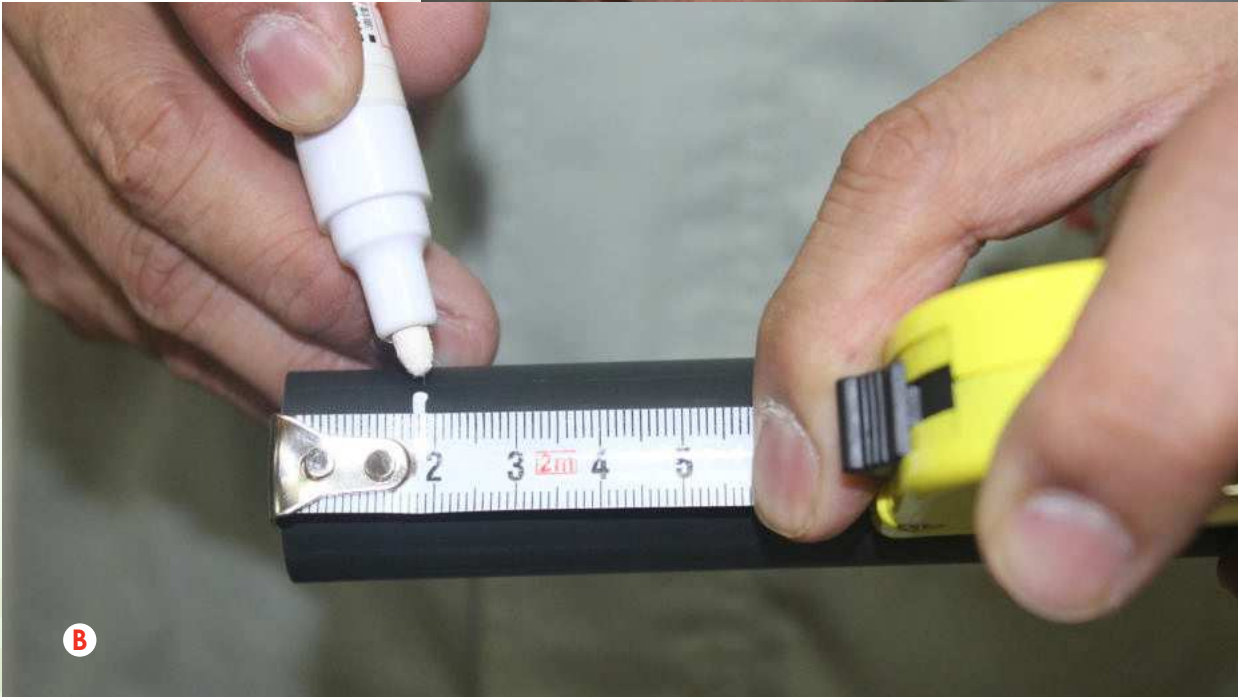
1. Cut the PPr-Al-PPr Black Pipe according the length required. (Fig.1)
Make sure that the cutting edge is perpendicular to the axis of the pipe. The cut end of the pipe should then be perpendicular to the pipe axis.

Figure 1



2. Measure the socket depth (Fig. 2A) and mark the socket depth of the welding distance at the end of the pipe. (Fig.2B)

Figs. 2



3. Using the Peeling Tool, peel the “PPr Outermost Layer” and the “Aluminum Middle Layer” up to the marked distance either by “manual peeling” (Figs. 3 & 4) or by “mechanical peeling” (Figs. 5) process. Peeling Tools are available for different pipe sizes.

Fig. 3: Manual peeling for sizes 20mm, 25mm, 32mm, 40mm

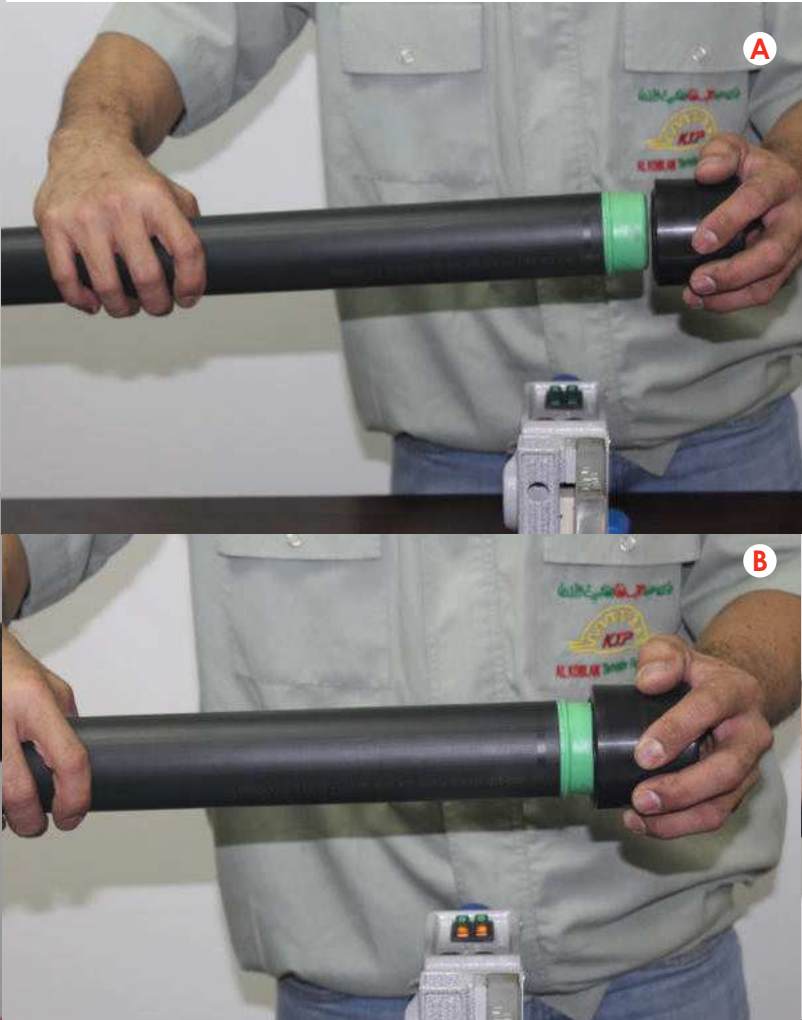
Fig. 4: Manual peeling for sizes 50mm & 63mm

Figs. 5: Mechanical peeling process for sizes 20mm to 63mm



4. Insert and push the pipe end and the fitting socket into the heating tools. (Figs. 6) This after making sure that the welding machine has reach the right set temperature which is 260 deg. C. Table 1 provide information on the suggested Heating Time, (sec), Joining Time (sec), and Cooling Time (min) for different pipe sizes.

Figs. 6



5. Insert the melted end of the pipe into the fitting to be joined as quickly as possible, at the same time pay attention to the alignment. Avoid rotating the pipe during this process. (Figs. 7).

Figs. 7



Steps in Welding of PPr-FG-PPr Pipes, PPr-FG-PPr-PE Pipes and PPr-PE Pipes and Fittings:



1. Cut the kind of Pipe according the length required. Make sure that the cutting edge is perpendicular to the axis of the pipe. The cut end of the pipe should then be perpendicular to the pipe axis. (Fig. 8 & Fig. 9)

Fig. 8: PPr-PE Pipe & PPr-FG-PPr PE Pipes Cutting



Fig. 9: PPr-FG-PPr Pipe Cutting



2. Mark the socket depth of the welding distance at the end of the pipe. (Fig. 10 & 11)

Fig. 10: PPr-PE Pipe & PPr-FG-PPr-PE Pipes Socket Depth Marking

Fig. 11: PPr-FG Pipe Socket Depth Marking



Making a cut on PE layer using a knife.



3. For PPr-FG-PPr Pipes, proceed to Step #4. For PPr-PE Pipes and PPr-FG-PPr-PE Pipes, proceed as follows: Using a knife or a circular edge cutting tool, make a cut on the PE layer on the marked point around the pipe circumference (Figs. 12). Then remove or peel the loosened PE Layer as required.

Removing of the loosened PE Layer

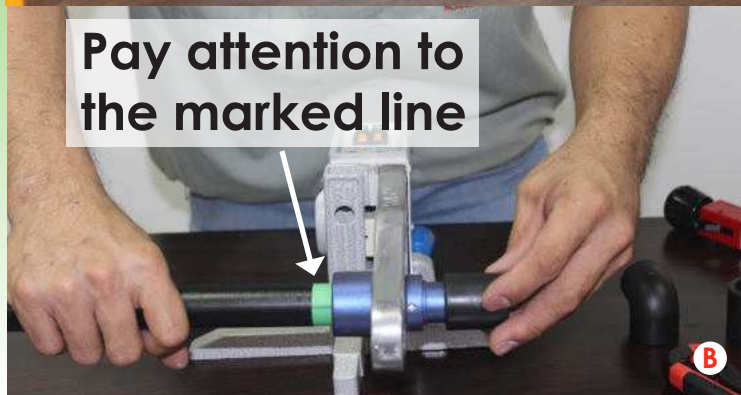


Fig. 12



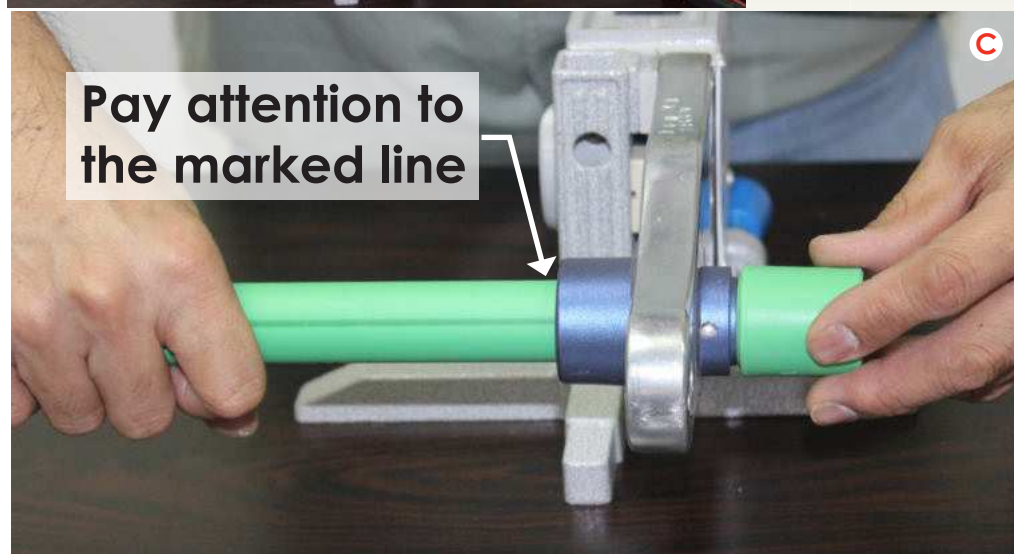
4. Insert and push the pipe end and the fitting socket into the heating tools (Figs. 13). This after making sure that the welding machine has reach the right set temperature which is 260 deg. Celsius. Table 1 provide information on the suggested Heating Time, (sec), Joining Time (sec), and Cooling Time (min) for different pipe sizes.

PPr-PE Pipe/PPr-FG-PPr-PE Pipe and Fitting heating process.



Pay attention to the marked line

Fig. 13



Pay attention to the marked line

PPr-FG-PPr Pipe and Fitting heating process

5. Insert the melted end of the pipe into the fitting to be joined as quickly as possible, at the same time pay attention to the alignment (Figs. 14). Avoid rotating the pipe during this process.

Welding / Joining of Pipe and Fitting

Fig. 14



Table 1—Recommended Welding Processing Time for KTP Products.

Pipe Size, mm	Welding Depth,mm	Heating Time, sec.	Joining Time, sec.	Cooling Time, min.
20	14	7	4	2
25	16	7	4	2
32	18	8	6	4
40	20	12	6	4
50	23	18	6	4
63	27	24	8	6
75	30	30	8	6
90	33	40	8	6
110	37	50	10	8
125	40	60	10	8

Notes:

- 1. For each of the welding process, always make sure that the welding machine has reached the required temperature of 260 deg. C.
- 2. Do not push the pipe on the welding bushing more faster than fitting. (Since for pipes the melted material is coming out from the bushing, it is easier to push the pipe more faster than fitting.)
- 3. Any tests on the assembled parts should be done only after two (2) hours of the last welding.
- 4. Always make sure that welding bushing used are KTP's recommended Types.
- 5. After the whole welding process is finished, allow the welding machine to cool naturally.
Never ever use water to cool down the welding machine as this may destroy the heating resistances.
- 6. The heating time only starts when pipe and fitting have been pushed to the correct welding depth on the welding tool.

Advices on the Storage, Handling, and Delivery of Multilayer Pipes:

A. Storage:

- 1. The pipes should be stacked on shelves with an even horizontal flooring which are free from any dents and/ or sharp edges. Storing the pipes with supports at every meter of the length will be acceptable.
- 2. The pipes should be kept straight and avoid bending and twisting or overlapping on each other.
- 3. Store the pipes in a position where it will not be exposed to direct sunlight.

B. Handling:

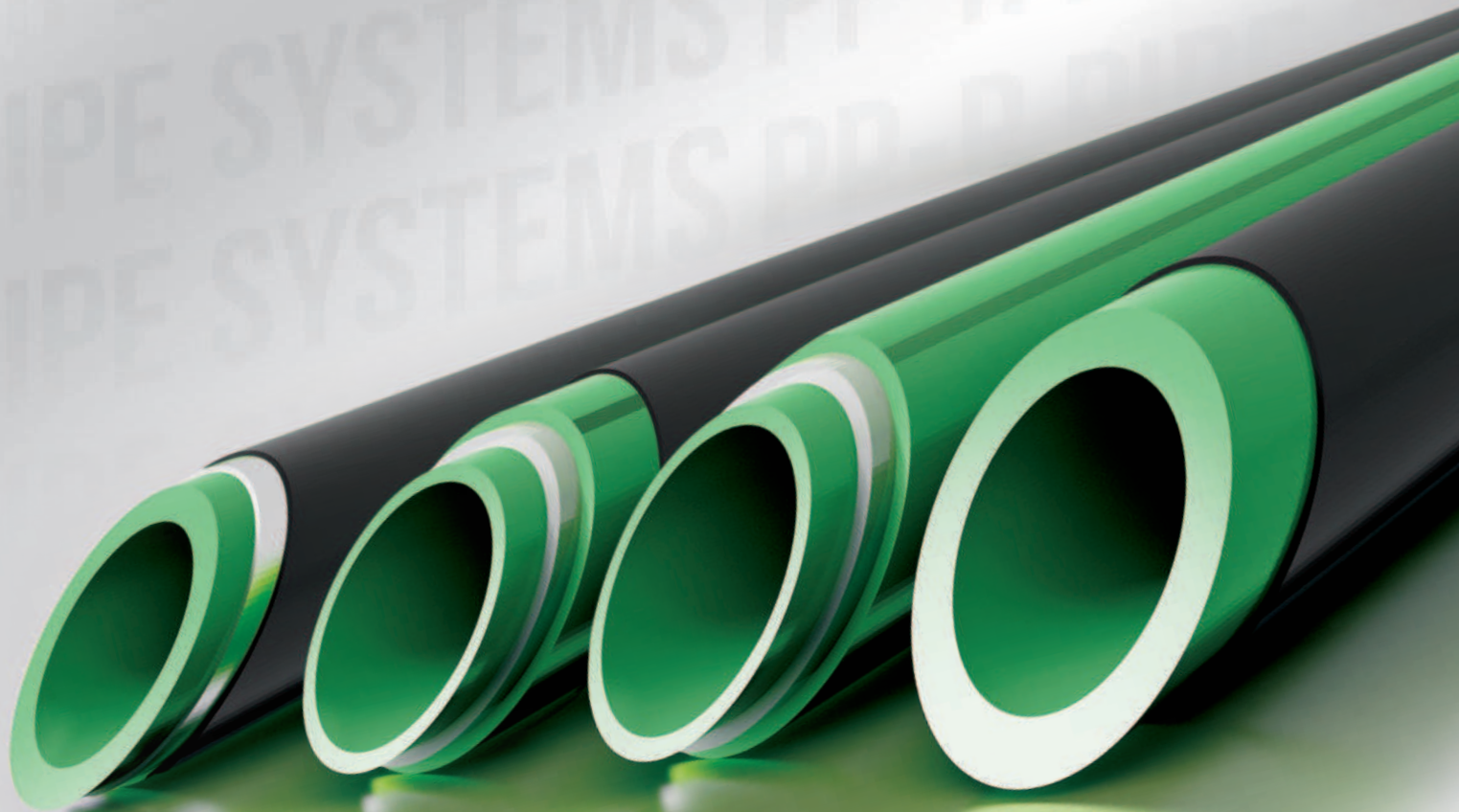
- 1. Lift these pipes from both ends and have another person to lift at the middle portion to prevent them from sagging/bending.
- 2. Avoid tossing the pipe bundles! Lift them up and put them down carefully.

C. Delivery:

- 1. Never bend the pipes inside the delivery trucks! Place them down on the horizontal truck bed.
- 2. The pipes should be kept straight and avoid bending and twisting or overlapping on each other during transportation.

Note:

The same proper care should be done on all customers' sites to maintain the good quality of these pipes.



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