ALASEMA

PP-R

HOT & COLD WATER PIPING SYSTEMS

Technical Manual

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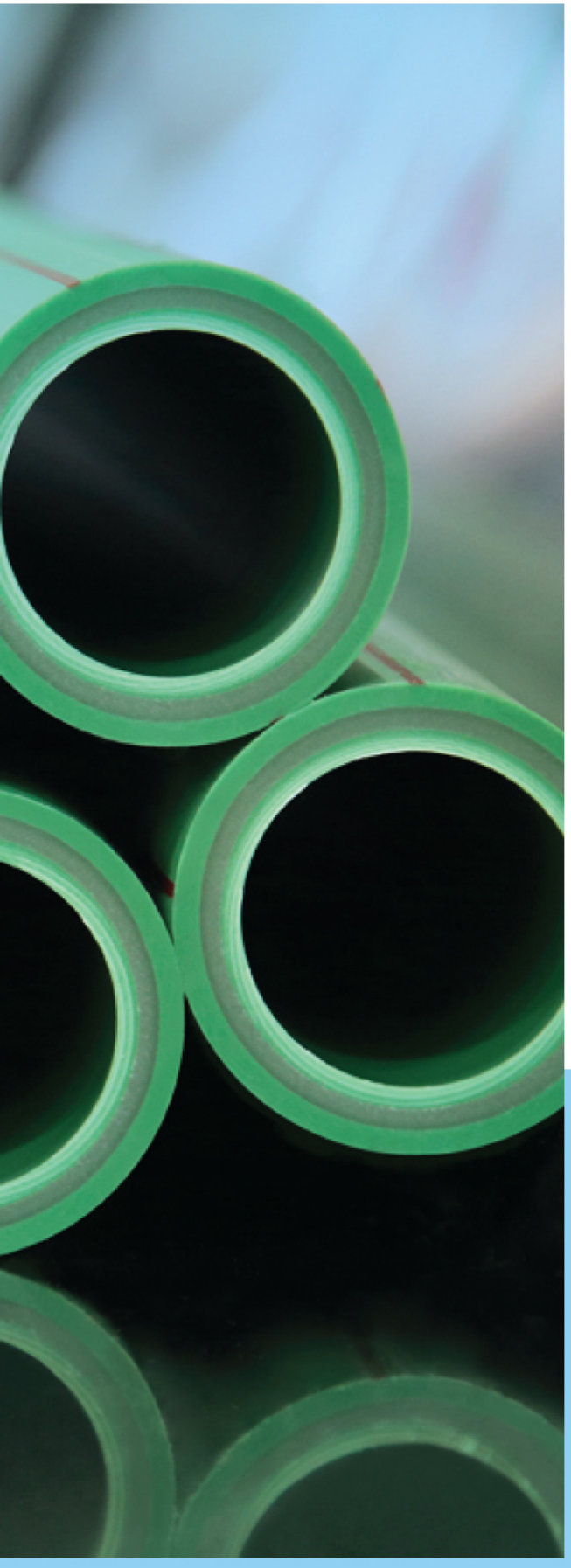


Introduction

Al ASEMA was established in 2017 with the aim of developing a professional UPVC/CPVC/HD-PE/PP-R and PP-H pipes and fittings industry.

Since its foundation, ALASEMA has a steady growth with high quality standards to fulfill the requirements of its customers especially for UPVC/HDPE/PP-R/ PP-H pipes with more than 30000 Tons per year, Fittings with more than 2500 Tons per year.

The pipes and fittings are produced according to DIN, BS, ASTM, ISO and Egyptian Standards, on demand.

HDPE pipes are produced with diameters starting from 16 mm up to 1600 mm.

There is also the facility of manufacturing prod-ucts with special specifications according to customer requirements.

UPVC/PP-R/HDPE Pipes are well accepted and widely used in domestic water system, warming, cooling, and all types of industrial process pipe works, water distribution and water treatment as well as irrigation systems.

A new range for the production of all systems required for **ALASEMA** customers has been taken into consideration in its near expanding plans.

Customers can depends completely on **ALASEMA** and consider as their partner in the business.

SYSTEM DESCRIPTION

1.1 ALASEMA Installation system

ALASEMA installation system consists of various pipes designed for various fields of application.
Connection Technique using Heated-Tool Socket Welding
When the pipe and the fitting are heated up, their plastic materials fuse together to form a homogeneous, firmly bonded whole. Special tools are used to heat up pipe and fitting, which are then just joined together. This connection is reliable and lasting leak-proof.

1.2 System components for pipes and fittings

All pipes and fittings of the installation system are made of PP-R, with only high-quality raw materials being used. This raw material contains high-grade stabilizers. The stabilizer package protects the polymer from oxidation, which may occur.
The metal threads of the brass components meet the requirements of the DIN EN 10226 standard and are manufactured from high-quality brass.

1.3 Fields of applications

For more than 30 years, polypropylene has been successfully used in supply lines for buildings in many countries worldwide. The combination of such excellent properties as chemical resistance, homogeneous connection resistance to pressure and easy laying make it a reliable and lasting system suitable for various applications. In many countries it is gradually replacing such traditional materials as copper and galvanized steel.

Possible uses

In drinking water installations for cold and hot water pipes in residential buildings, hospitals, hotels, office buildings, schools, etc., for example:

- Service connections
- Boiler connections
- Water distributing systems
- Rising lines
- Floor-level distribution
- Fittings

as well as piping networks for

- Rainwater systems
- Outside pipe laying
- Compressed systems
- Agriculture and horticulture
- Industries, for example the transportation of aggressive media (acids, alkaline solutions, etc.), taking into account its resistance to chemical agents
- Heating installations
- Shipbuilding
- Further media and possible applications upon request

PPR piping systems is not suitable for

- Industrial gases
- Flammable liquids and gases
- Coolants refrigerants

1.4 Types of polypropylene

PP has three different forms listed as follow

Type 1 - polyproplene homo polymer (PP-H)

Type 2 - polypropylene block polymer (PP-B)

Type 3 - polyproplene randam Copolymer (PP-R)

They have different applications as they are of different specifications , the type 3 is superior quality for the applications meant .

ADVANTAGES OF PP-R PIPING SYSTEM

1- Environment

PPR is friendly materials contain no toxic wastes which would expose any hazard to the ecosystem we are living in Polypropylene gives out no pollution when it is being produced or when disposed.

PPR products are 100% recyclable and can be ground and re-used. Recently, there has been an increasing demand for polypropylene recycling as it could be recycled many times and used in various applications.

2- Hygienic Suitability

Nowadays, health and safety have always been under a critical eye. Transfer of potable water has to be through a reliable network system, which ensures the delivered fluid would not be subject to influence by any interactions within the carrier.

PPR is completely non-toxic for it's production processess.

PPR products do not react with the fluids which flow inside, it gives no smell or taste difference to the transferred substance.

PPR products which are opaque, would prevent sun light penetration in its piping system and thus resisting bacterial and fungal growth.

3- Corrosion resistance

Compared to the old metallic pipes, PPR piping systems are corrosion free due to its material properties and thus, lesser exposed to contamination.

Also, the joints are connected through a weld-fusion process which eliminates not only the chances of corrosion within the plping system, but also gives PPR a longer service life.

4- Chemical resistance

Polypropylene by nature is highly chemical resistant at a wide range of temperature and pressure. Due to its higher molecular weight, It resists most of the acids, lime and cement.

5- Mechanical Properties

The mechanical properties of PPR products are :

- High Impact Resistance.
- Low Thermal conductivity.
- Resistance to current strays.
- High durability.
- Light Weight.

6- Sound Insulation

In comparison to the metallic pipes, the sound insulation qualities of PPR pipe system related to water flow and hydraulic shock within a building reduces the noise transmission to a larger scope.

7- Flow Performance

The inner surface finishing of PPR products is sleek, smooth and with very low irregularities which conveys a significant reduction in pressure loss.

8- Ease of Installation

One of the major attractions of PPR products is its capability to be welded by fusion, PPR pipes and fittings are comparatively lighter in weight to the metallic pipes, consequently this would require a shorter time to establish a permanent connection/ joint in the piping system.

9- Long Service Life

PPR piping systems are designed for a theoretical long service life of 50 years in application, subject to specific conditions. Though peak temperatures of 100 °C arising within the system for shorter period are harmless, permanent temperature from 70 °C up to 90 °C might marginally reduce the service life of the pipe

TRANSPORTATION AND STORAGE

3.1 Safety instructions and intended use

Carefully read the Technical Manual and the Operating instructions before starting work **ALASEMA** PPR installation Systems may only be planned assembled and started up as described in the present manual

- For any deviating fields of application, make sure to obtain our Technical after sale service .
- The national and international Safety regulations and regulations on accident prevention have to be observed.
- Planning, Installation and start-up have to be carried out pursuant to the current directives, standards and regulations, as intended and in accordance with the state of the art.
- Only **Al Asema** PP-R system components are slowed to be used. The use of other components entails loss of guarantee.
- Observe the general safety regulations when handing assembly tools. Danger of burn.

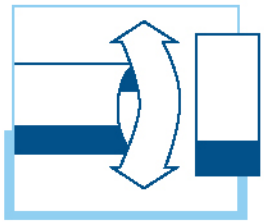
3.2 Handling instructions

- **ALASEMA** PP-R pipes can generally be stored at any ambient temperature.
- Nevertheless, the material must never be subject to impacts or blows, particulary at temperatures below 5 °C.
- Do not drop the pipes when unloading them and protect them from falling objects
- Select the place of storage so as to make sure that the pipes are always supported over the entire length.
- Observe cleanliness when storing and laying the pipes and fittings. In order to protect the pipes and fittings against contamination, do not remove the packaging material before the material is used.
- Pipes (except UV pipes) and fittings must not be exposed to UV radiation over prolonged periods as this reduces the durability and the special properties of the pipes: provide protection of the pipes from the Outside.
- At Temperatures below zero, water supply pipes must be protected from frost, and drained, if necessary.

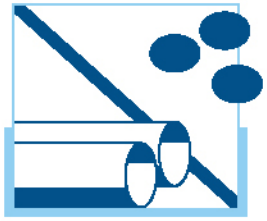
Avoid sharp impacts and blows to the pipes, especially at low temperatures.
Do not throw when unloading. Protect pipes from falling objects.

Do not use cracked or damaged pipes.

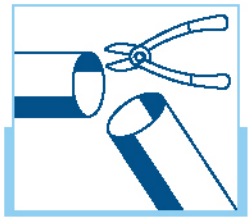
Do not expose pipes to UV-radiation for extended periods of time.



During polyfusion welding, do not twist the pipe or fitting push the pipe and fitting joint together in a straight manner.



Put downpipes or pipe bundles carefully. Cover pipes in areas of faling rocks, etc.



Only cut pipes with sharp cutters.

Protect stored pipes from sun and rain.

Protect pipes filled with water from freezing.

APPLICATION STANDARDS

PPR pipes and fittings are manufactured acc. to the German, international and Egyptian standards.

DIN 1988

Technical standards for drinking water installations

DIN 4725

Under floor heating with hot water
Concepts
Thermal testing
Heat potential and design

DIN 4726

Plastic pipes for hot water under floor heating, required Properties

DIN 4728

Polypropylene pipes for hot water under-floor heating, special

DIN 8076

Joining to metal fittings
Screw joints for polyethylene pipes

DIN 8077

Polypropylene pipes Dimensions

DIN 8078

General quality reqirements and testing

DIN 16962

Part 5 - General Quality and testing for pipes
Parts 2,4,6,7,8,9,10,13 - Dimension of Fitting

DIN 16960

Welding of thermoplastic materials principles

ES 3703

PPR pipes (dimensions and tests)

ISO 15874

plastic pipe system for hot and cold water installations

Chemical Resistance of PP-R

Chemicals	Conc.	Polypropelene C°		
A	%	20	60	100
Acetic Acid	100	+	0	-
Acetic Acid aq.	50	+	+	
Acetic Anhydride	100	+		
Acetone	100	+	0	
(boiling point 56.3°C)				
Alcoholic iodine		+		
Aluminim salts aq.	any	+	+	+
Ammonia gaseous	100	+	+	
	10	+	+	
Ammonium nitrate aq.	any	+	+	+
Ammonium phosphate aq.	any	+	+	+
Ammonium sulphate aq.	any	+	+	
Amyl alcohol, pure				
(fermentation amyl) alchohol		+	+	
Apple juice		+	+	
Apple sauce		+	+	(+)
B				
Barium salts	any			
Benzene	100	+		
Benzoic acid	100	(-)	-	
Benzoic acid aq.	sat.	+	+	
Benzoic acid ag.	100	+	+	
Boric Acid		+	+	
Brake Fluid** Δ	100	+	+	
Butane, gaseous	100	-	-	

Chemicals	Conc.	Polypropelene C°		
B	%	20	60	100
Butane liquid	100			
Butter				
Buttermilk	100			
C				
Cake	100	+	+	(+)
Calcium chloride aq.	sat.	+	+	+
Calcium nitrate aq.	sat.	+	+	+
Carbon bisulphide	100	0		
Carbon tetrachloride Δ	100	0	-	
Caustic soda solution Δ	50	+	+	
	52	+	+	
	10	+	+	
Cheese		+		
Chloride of lime		+	+	
Chlorine liquid	100	+		
Chlorine water	sat.	0	+	
Chromium salts	sat.	+	0	
Citric acid aq.	sat.	+	+	
Clove oil		+	0	+
Coca-cola		+		
Cocoa(powdered)		+		
Cocoa(ready to drink)		+	+	(+)
Coconut oil		+	(+)	
Cod-liver oil		+	+	
Coffee (beans and ground)		+		
Coffee (ready to drink)		+	+	

Chemicals	Conc.	Polypropelene C°		
C	%	20	60	100
Cominon salt, dry		+	+	
Copper salts aq.		+	+	
Corn seed oil		+	0	
Cream, whipped cream		+		
Cresol solution				
Cresol		+	0	
Cresols aq		+	0	
Cyclohexane Δ		+		
cyclohexanol Δ		+	+	
cyclohexanone		+	+	
D				
Detergents Synthetic	high	+	+	
(With solvents, plastic-izers and other additives)	ready for use			
Diesel all see fuels				
E				
Ethyl acetate	100			
Ethyl alcohol Δ	100			
not denatured				
Ethyl alcohol aq				
not denatured				
F				
Flour		+		
Fluoric acid	40	+	+	
formle acid Δ	98	+	0	
	90	+		
	50	+	+	
	10		+	+
Fruit juice			+	
Fruit salad				

Chemicals	Conc.	Polypropelene C°		
F	%	20	60	100
Fuel				
Fuel q				
Petrol normal		+	0	
Petrol, regular		(+)	-	
Patrol, super q		0	-	
Diesel oil** q		+	0	
Fuel all q		+	0	
G				
Glycerine	10	+	+	
	low	+	+	+
Glycol	100	+	+	
H				
Hair shampoo**		+	+	
Honey		+	+	
Hydrochloric acid	conc.	+	+	
Hydrogan chloride,gaseous	10	+	+	
		-	-	
Hydrogen peroxide ng	low	+	+	
	90			
	30	+	0	
	10	+	+	
	3	+	+	+
Hydrogen sulphide	low	+	+	
(colouration with lead				
stabiliters)				
I				
Ink**		+	+	
Iron salts aq	sat.	+	+	+

Chemicals	Conc.	Polypropelene C°		
J	%	20	60	100
Jam		+	+	(+)
Jelly		+	+	(+)
L				
Lactic Acid aq.	90	+	+	
	50	+	+	
	10.00	+	+	+
Lemon juice		+	+	
M				
Magnesium salts aq.	sat.	+	+	
Margarine		+	+	
	5	+		
Mashed potatoes		+	+	(+)
Mayonnaise		+		
Mercury	100	+	+	(+)
Methyl alcohol	100	(+)	+	
Methyl alcohol aq.	50	+	+	
Methylene chloride Δ	100	0		
(Boiling point 40.7°c)				
	90	+	+	
Methyl ethyl Ketone Δ	100	+	0	
Milk			+	(+)
Milk food			+	(+)
Mineral oil**			0	-
(without armomatic				
hydrocarbons)				
		+		
		+	0	-
Motor oli (cars)**				
(see also Two-stoko all and oli)				

Chemicals	Conc.	Polypropelene C°		
N	%	20	60	100
Naphtalene	100	+		
Nickel watu aq.	sat.	+	+	
Natrie acid	50	0	-	
	25	+	+	
	10	+	+	
O				
Olive Oil		+	+	
Orange Juice		+	+	
P				
Palm oil		+	0	
Paralin	100	+	+	+
Paralin oli	100	+	0	+
Peanut oll		+	+	
Pactin	sat.	+	+	
Pepper		+	+	
Perfume				
Petroieum	100	+	0	
	50	+	+	
	10	+	+	+
Pineapple juice		+	+	
	(7.30)			
Potassium chloride aq.	sat.	+	+	+
	(12)			
	(6.4)	+		
Potato salad				
Propane , gaseous	100	+	+	
Proparte , liquid	100	+	+	

Chemicals	Conc.	Polypropelene C°		
S	%	20	60	100
Salad oil , animal		0		
Salad oil , vegitable		0		
Salted water	any	+	+	+
Sausage		+	+	
Sea water		+	+	+
Shoe polish**		+	0	
Silicone oil**		+	(+)	
Silver salts aq.	sat.	+	+	
Soap, cake soap		0		
Soap solution	sat.	+	+	
	10	+	+	+
Soda (see sodium, carbonate)				
Soda water				
Sodium bocarboirlate aq.	sat.		+	+
Sodium carbonate aq.	sat.		+	
	10		+	
Sodium chloride aq.	sat.	+	+	+
Sodium nitrate aq.	sat.	+	+	
Sodium nitrite aq.	sat.	+		
Sodium phospatis aq.	sat.	+		+
Sodium sulphate aq.	sat.	+	+	+
(Glauber's salt)				
Sodturn sulphide aq,	sat.	+	+	
Soft soap		+	+	
Starch, starcg solution aq.	any	+	+	
Stoaric acid	100	+		
Sugar (dry)		+	+	
Sugar beet sirup		+	+	
Sugar solution aq.	any	+	+	+
Sulphuric acid	96	+	0	
	50	+	+	
	25	+	+	
	10	+	+	+
T				
Tea (leaves)	100	+	+	
Tea(ready-to-drink)		+	+	
Tomato juice		+	+	
Tomato Ketchup		+	+	
Toothpastes		+	+	
Transformer oil**	100	0	+	
U				
Unra sq.	sat.	+	+	
V				
Vanilla		+	+	
Vaseline		+	0	
Vegetables(ready-to-eat)			+	(+)
Vinegar	comm.		+	
W				
Water	100	+	+	+
Water glass		+	+	
Z				
Zinc salts aq.	sat.	+	+	

Resistances

(+) = partically resistant
0 = poorly resistant
+ = resistant
- = not resistant

Concentration

sat. = saturated at room temperature

PP-R Properties

General Properties

- **ALASEMA** PPR pipes system stops corrosion damages with no effect on to flow rate.
- PPR pipes system have no danger of algae development installation.
- PPR pipes system offers an unique and unrivalled connection process material by fusion.
- PPR pipes system connection can be hydraulic pressure tested or put in to operation directly after their fusion there are no waiting times. Flow rate is increased due to larger inner diameter.

Characteristics	Methods	Units	Values
Physical Characterstics			
Specific weight 23°c	ISO 1183	g/cm3	0,895
Melt index at 190°c with 5 KG.	ISO 1133	g/10 min	0,5
Melt index at 230°c with 2.16 KG.	ISO 1133	g/10 min	0,3
Melting point	Polarizing. microscape	°C	140-150
Thermal Characterstics			
Thermal conductivity at 20°C	Din 52612	W/m°K	0,24
Specific heat at 20°C	Adiabatic calorimeter	Kj/Kg°K	2,0
Coefficient of liner expansion	Din 53752	K^{-1}	1,5 x 10
Heart deflection temperature B (0.45 MPa)	ISO 75B-1, -2	°C	70
Vicat softning temperature (A/50)	ISO 306	°C	132
OIT (200°C)	EN 1451	Min	58

Characteristics	Methods	Units	Values
Mechanical Characterstics			
Yield strength	ISO/R 527	N/mm^2	21
Ultimate tensile strength	DIN 53455	N/mm^2	40
Ultimate elongation	DIN 53455	%	600
Modulus of elasticity	ISO 178	N/mm^2	800
Hardness test	ISO 2039	N/mm^2	40
Impact strength 0°C	DIN 8078		Does not break
Charpy Impact Strength, notched (23°c)	ISO 179/1 eU	KJ/m^2	20
Charpy Impact Strength, notched (-0°c)	ISO 179/1 eU	KJ/m^2	3,5
Charpy Impact Strength, notched (-20°c)	ISO 179/1 eU	KJ/m^2	2
Shore hardness D	ISO 868	R Scale	65
Electrical Characterstics			
Surface resistance	DIN 53482	$> 10^{13}$	ohm.cm
Rheology Characterstics			
Melt Mass Flow Rate MFR (230°C/2.16 kg)	ISO 1133	0.3	g/10 min

PP-R Dimensions

7.1 PPR pipes dimensions acc. to Din 8077

Dimension in millimeters

d	Pressure Rating									
	PN 6		PN 10		PN 16		PN 20		PN 25	
	Standard dimension ratio (SDR)									
	17.6		11		7.4		6		5	
	S	mass in kg/m	S	mass in kg/m	S	mass in kg/m	S	mass in kg/m	S	mass in kg/m
16	-	-	-	-	2.2	0.095	2.7	0.110	3.3	0.128
20	-	-	1.9	0.107	2.8	0.148	3.4	0.172	4.1	0.198
25	-	-	2.3	0.164	3.5	0.230	4.2	0.266	5.1	0.307
32	1.8	0.172	2.9	0.261	4.4	0.370	5.4	0.434	6.5	0.498
40	2.3	0.273	3.7	0.412	5.5	0.575	6.7	0.671	8.1	0.775
50	2.9	0.422	4.6	0.638	6.9	0.896	8.3	1.04	10.1	1.21
63	3.6	0.659	5.8	1.01	8.6	1.41	10.5	1.65	12.7	1.91
75	4.3	0.935	6.8	1.41	10.3	2.01	12.5	2.34	15.1	2.70
90	5.1	1.33	8.2	2.03	12.3	2.87	15.0	3.36	18.1	3.88
110	6.3	1.00	10.0	3.01	15.1	4.30	18.3	5.01	22.1	5.78
125	7.1	2.55	11.4	3.91	17.1	5.53	20.8	6.47	25.1	7.46
140	8.0	3.20	12.7	4.87	19.2	6.95	23.3	8.12	28.1	9.35
160	9.1	4.17	14.6	6.38	21.9	9.04	26.6	10.6	32.1	12.2

PPR Pipes single layer (PPR green)

PPR Pipes Two layers (PPR green - PPR UV Black)

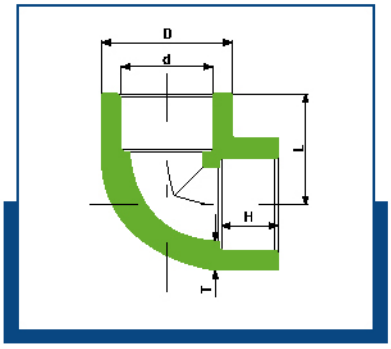
PPR Pipes Three layers (PPR green - PPR Fiber Red - PPR green)

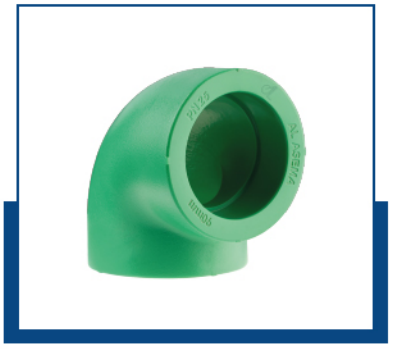
PPR Pipes Four layers (PPR green - PPR Fiber Red - PPR green - PPR UV Black)

7-2 PP-R Pipe fittings dimensions

Elbow 90°

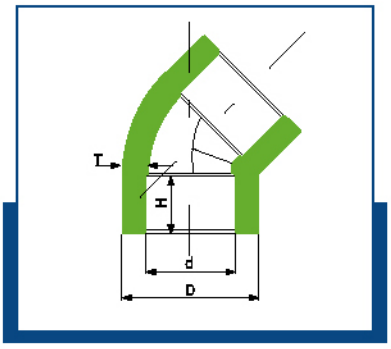
Size	d	D	L	H	T
20	19	30	28	15	6
25	24	37	32	16	7
32	31	46	38	20	9
40	39	53	44	22	10
50	49	69	52	25	12
63	62	84	65	28	14
75	74	101	75	31	17
90	89	127	90	34	20
110	109	145	100	38	22





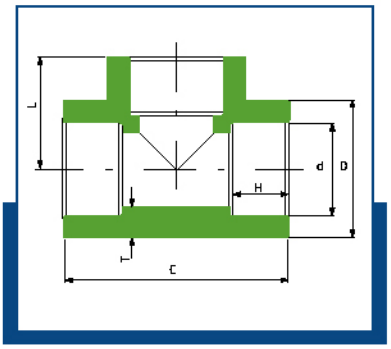
Elbow 45°

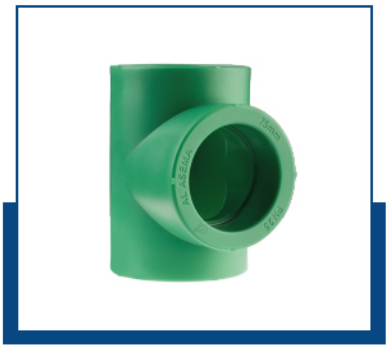
Size	d	D	H	T
20	19	30	15	6
25	24	37	16	7
32	31	46	20	9
40	39	53	22	10
50	49	69	25	12
63	62	84	28	14



TEE

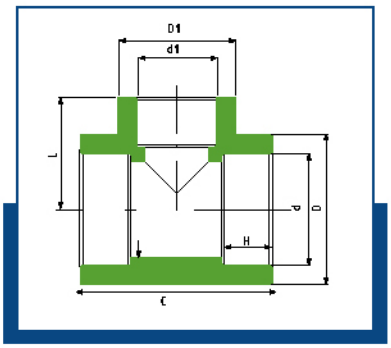
Size	d	D	L	H	T	C
20	19	30	28	15	6	56
25	24	37	32	16	7	64
32	31	46	38	20	9	76
40	39	53	44	22	10	88
50	49	69	52	25	12	104
63	62	84	65	28	14	130
75	74	101	75	31	17	130
90	89	122	90	34	20	180
110	109	145	100	38	22	200

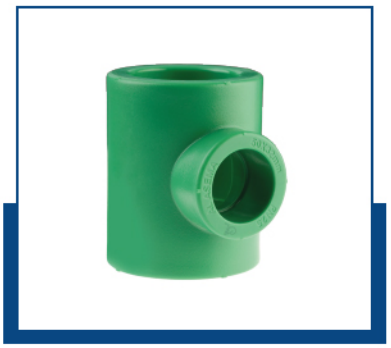




Tee Reducer

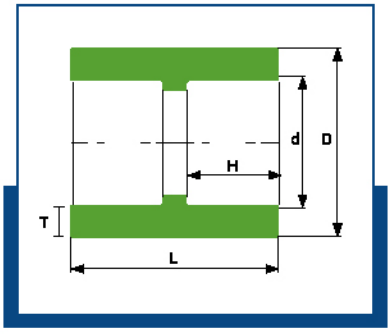
Size	d	D	d1	D1	H	L	C
25/20	24	37	19	31	16	28	59
32/20	31	46	19	31	16	36	69
32/25	31	46	24	37	20	36	69
40/20	39	46	19	35	21	39	88
40/25	39	53	24	35	21	39	88
40/32	39	53	31	46	21	40	88
50/25	49	53	24	36	24	48	92
50/32	49	68	31	46	24	48	92
63/20	62	68	34	34	29	57	130
63/25	62	84	34	34	29	57	130
63/32	62	84	53	53	29	60	130
63/40	62	84	53	53	29	60	130
63/50	62	84	67	67	29	63	130
75/20	74	100	34	34	31	66	140
75/25	74	100	34	34	31	66	140
75/32	74	100	55	53	31	67	140
75/40	74	100	53	53	31	67	140
75/50	74	100	67	67	31	69	140
75/63	74	100	84	84	31	69	140
90/32	89	121	53	53	34	78	163
90/40	89	121	53	53	34	80	163
90/50	89	121	67	67	34	80	163
90/63	89	121	84	84	34	80	163
90/75	89	121	100	100	34	81	163
110/63	109	147	67	67	40	97	196
110/75	109	147	84	84	40	97	196
110/90	109	147	100	100	40	97	196





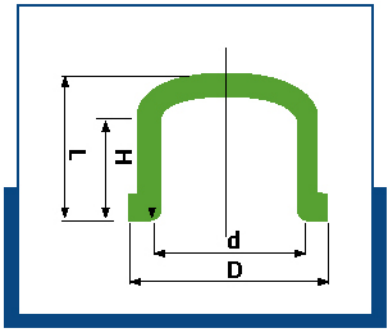
Coupling

Size	d	D	L	H	T
20	19	30	34	15	6
25	24	37	37	16	7
32	31	46	44	20	9
40	39	53	48	22	10
50	49	69	54	25	12
63	62	84	65	28	14
75	74	101	68	31	17
90	89	122	75	34	20
110	109	145	89	38	22



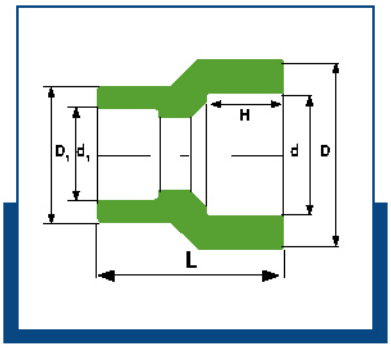
End cap

Size	d	D	H	L
20	19	34	6	15
25	24	37	7	16
32	31	46	9	20
40	39	54	10	22
50	49	69	12	25
63	62	84	14	28
75	74	96	44	64
90	89	115	51	77
110	109	132	65	92



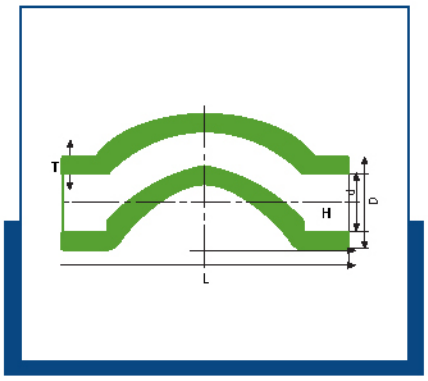
Reducer

Size	d	D	d1	D1	H	L
25/20	16	24	16	31	14	36
32/20	19	31	19	31	14	37
32/25	24	31	19	36	16	38
40/20	19	39	21	29	15	48
40/25	24	39	21	34	17	48
40/32	31	39	21	44	20	48
50/25	24	49	22	36	16	48
50/32	31	49	27	45	20	52
63/25	24	62	28	36	16	55
63/32	31	62	29	45	20	59
63/50	49	62	28	67	25	56
75/20	19	74	31	29	15	68
75/25	24	74	31	34	17	68
75/32	31	74	31	44	20	68
75/40	39	74	31	53	22	68
75/50	49	74	31	67	34	68
75/63	62	74	31	84	29	68
90/50	49	89	34	67	24	75
90/63	62	89	34	84	29	75
90/75	74	89	34	100	31	75
110/63	62	109	40	84	29	89
110/75	74	109	40	100	31	89
110/90	89	109	40	121	34	89



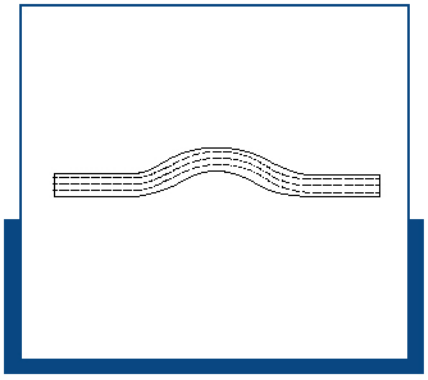
A- Cross-over short (Injection)

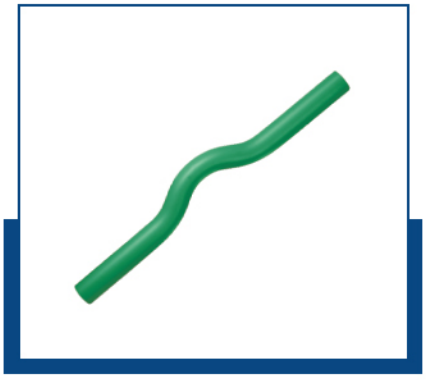
Size	d	D	L	H	T
20	19	31	95	15	6
25	24	36	115	16	9



B-Cross-over long (Fabrication, made from pipes)

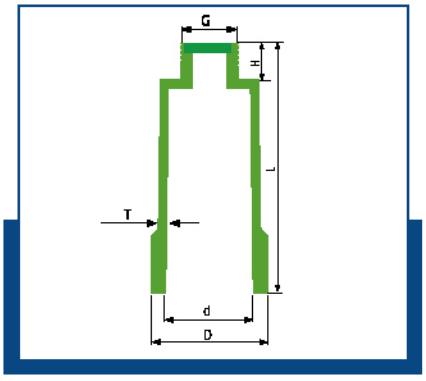
Size mm	20	25	32	40	50	63





Test plug ½"

Size G	d	D	H	T	L
½"	23	36	13	3	87

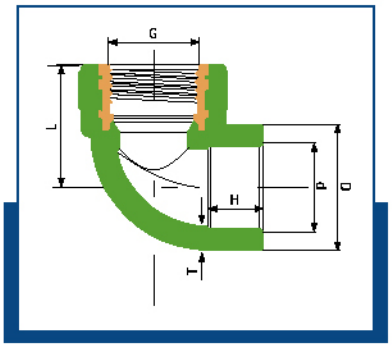


Pipe clamp

Size (mm)	20	25	32

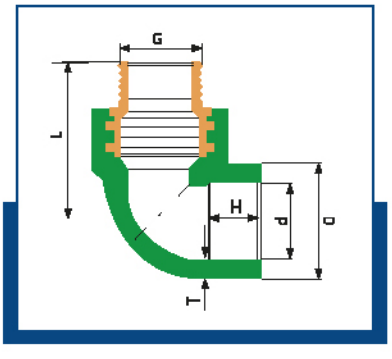
Elbow with Brass Insert (Female)

Size	d	D	L	H	T	G
20 – ½"	19	30	28	15	6	½"
25 – ½"	24	37	35	16	7	½"
25 – ¾"	24	37	36	16	7	¾"
32 – ¾"	31	46	38	20	9	¾"
32 – 1"	31	46	41	20	9	1"



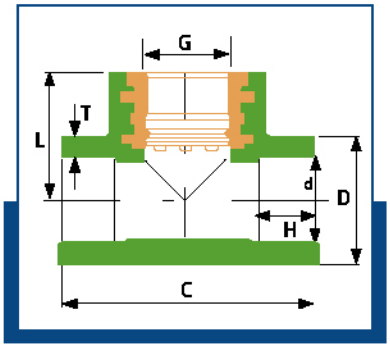
Elbow with Brass Insert (Male)

Size	d	D	L	H	T	G
20 – ½"	19	30	45	15	6	½"
25 – ½"	24	37	49	16	7	½"
25 – ¾"	24	37	49	16	7	¾"
32 – ¾"	31	46	51	20	9	¾"
32 – 1"	31	46	55	20	9	1"



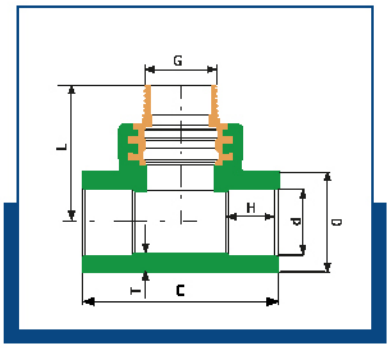
Tee with brass insert (Female)

Size	d	D	L	H	T	C	G
20 – ½"	19	30	28	15	5	56	½"
25 – ½"	24	37	35	16	7	64	½"
25 – ¾"	24	37	36	16	7	68	¾"
32 – ¾"	31	46	38	20	9	80	¾"
32 – 1"	31	46	41	20	9	80	1"



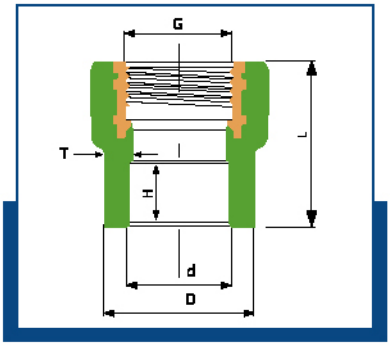
Tee with brass insert (Male)

Size	d	D	L	H	T	C	G
20 – ½"	19	30	45	15	6	56	½"
25 – ½"	24	37	49	16	7	64	½"
25 – ¾"	24	37	49	16	7	68	¾"
32 – ¾"	31	46	51	20	9	80	¾"
32 – 1"	31	46	55	20	9	80	1"



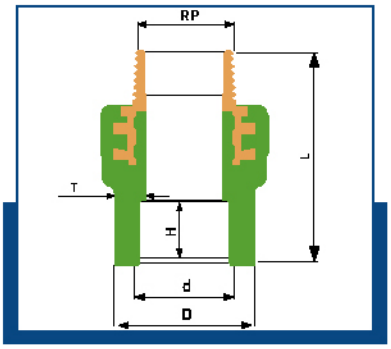
Adaptor with Brass insert (Female)

Size	d	D	L	H	T	G
20 – ½"	19	30	34	15	6	½"
25 – ½"	24	37	40	16	9	½"
25 – ¾"	24	37	40	16	7	¾"
32 – ¾"	31	46	44	20	13	¾"
32 – 1"	31	46	49	20	9	1"
50 – 1 ½"	49	69	55	25	12	1½"
63 – 2"	62	69	60	28	.14	2"



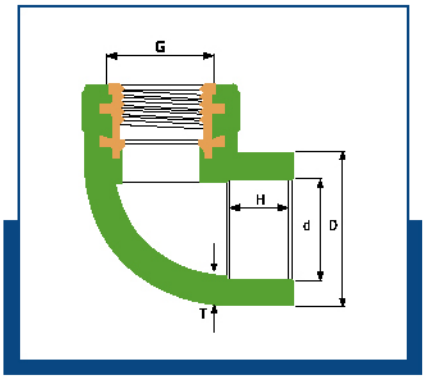
Adaptor with Brass insert (Male)

Size	d	D	L	H	T	RP
20 – ½"	19	30	39	15	6	½"
25 – ½"	24	37	54	16	9	½"
25 – ¾"	24	37	54	16	7	¾"
32 – ¾"	31	46	57	20	12	¾"
32 – 1"	31	46	58	20	10	1"
50 – 1 ½"	49	69	72	25	12	1½"
63 – 2"	62	85	82	28	15	2"



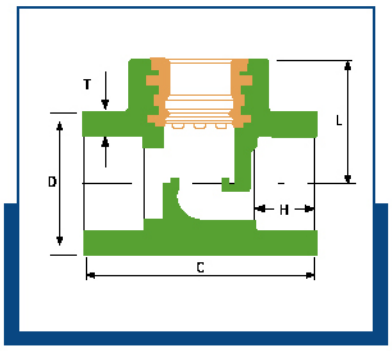
Ruler Elbow (Female)

Size	d	D	H	T	G
20mm/½"	19	30	15	6	½"
25mm/½"	24	37	16	7	½"



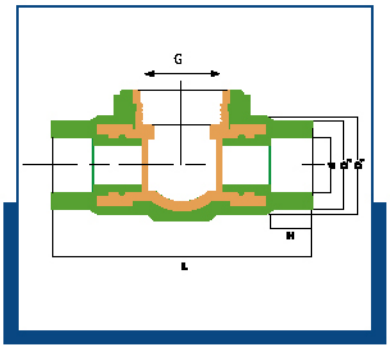
Tee Valve

Size	D	H	L	T	C
20mm/3/4"	31	15	36	6	80
25mm/3/4"	36	16	36	6	90
32mm/3/4"	46	20	40	7	92



Bullet Valve

Size	D_1	D_2	d	H	L	G
20	34	31	19	15	90	¾"
25	37	36	24	16	97	¾"



Extension Socket (Brass)

Size(Inch)	1/2"X10	1/2"X15	1/2"X20

Angle Valve

Size(Inch)	1/2"

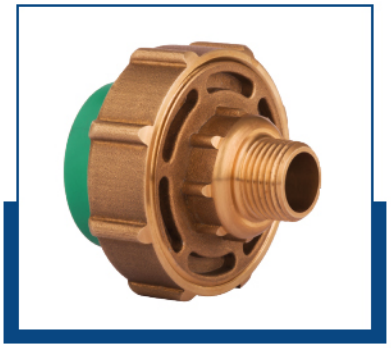
Brass Union

Brass Union With Two PPR Adaptors

Size (mm)	20	25	32	50	63

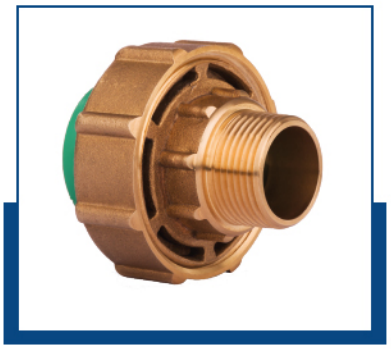
Red.male Brass Union With PPR Adaptor

Size (mm/inch)	25/½"	32/½"	32/¾"



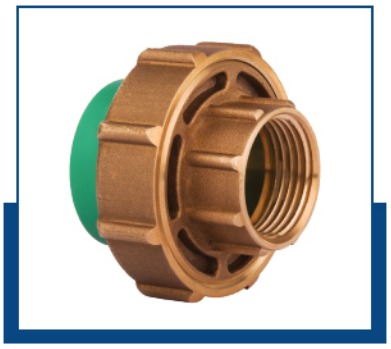
Male Brass Union With PPR Adaptor

Size (mm/inch)	20/ ½"	25/ ¾"	32/ 1"	50/ ½"	63/ 2"



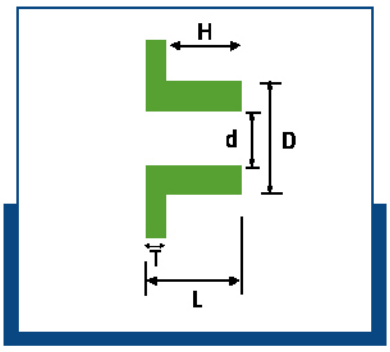
Female Brass Union With PPR Adaptor

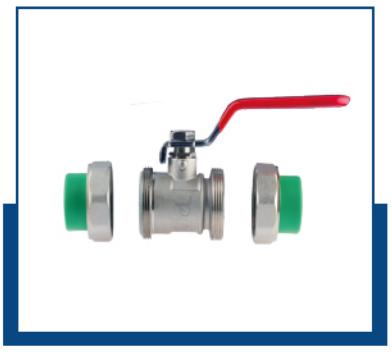
Size (mm/inch)	20/ ½"	25/ ¾"	32/ 1"	50/ ½"	63/ 2"



Ball Valve

Size	d	D	L	H	T
20	19	28	26	20	6
25	24	35	28	21	7
32	31	45	35	26	9
50	49	70	43	33	10
63	62	89	53	41	12
75	73	103	46	31	15
90	88	117	51	34	17
110	108	145	58	38	20





AL ASEMA Welding Machine

Socket welding machine up to 63 mm "professional / normal"

Working range: 20-63 mm
Power supply: 230 V-50/50 H
Working temperature. 260 °C±10 °C

welding machine	Absorbed power	Diameter (d) mm	Wight kg/pc	Supply unit card board box/package
professional	800 W	20- 63	2200	1
normal	500 W	20- 63	1850	1

The Connection of PPR Pipe System

8.1 How to connect the PPR

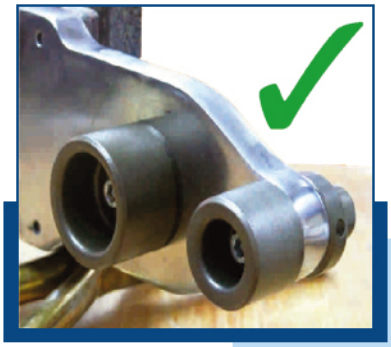
The connection of PPR pipes system is very easy method that done by fusing the two ends and connecting them by using AL ASEMA connection tools.

Mounting tools

Preferable to use AL ASEMA welding devices and welding tools notes must be taken in to consideration.

-Assemble and tighten the cold welding tools manually.

-Before fusing distributions blocks where two connections are welded at the same time.Place the welding tool into the corresponding holes of the heating surface.



-All welding tools must be free from impurities. Check if they are not clean before assembling

-If necessary, clean the welding tools with a non fibrous coarse tissue.

- Place the welding tools on the device that there is full surface contact between the welding tools and heating surface. Welding tools over 40mm must always be fitted to rear bore of the heating surface.

- Plug in the welding device. Depending on the ambient temperature it takes 10-30 minutes to heat up the heating surface.

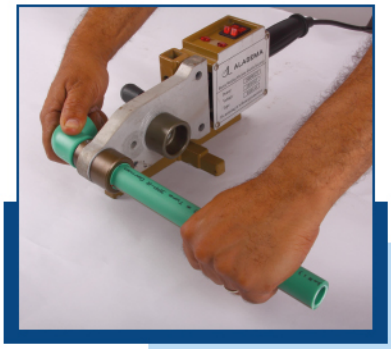
The heating up process is finished

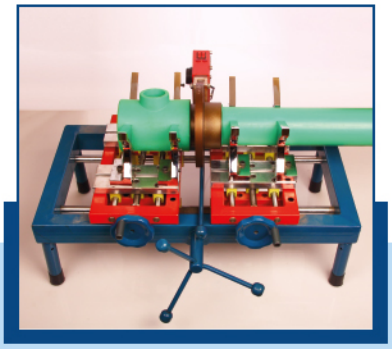
- When the temperature pilot light goes off.
- The temperature pilot light is blinking.

8.2 Process of the fusion

- Cut the pipe at right angles to the pipe only use AL ASEMA pipe cutters or other suitable cutting pliers take care that the pipe axis is free from burrs of cutting debris and remove where necessary.

- Mark the welding depth at the end of the pipe.
- Push the end of the pipe. Without turning up to the marked welding depth into the welding tool.





Setting and Alignment

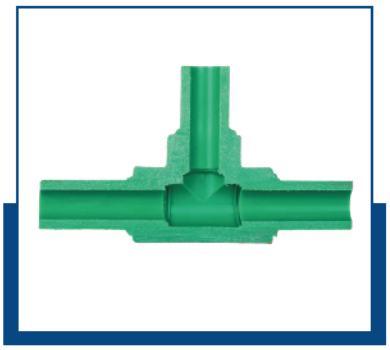
- After the heating time quickly remove pipe and fitting from the welding tools. Join them immediately and without turning until the marked welding depth is covered by the bead of PP-R from the fitting.

Attention:

- Do not push the pipe too far into the fitting as this would reduce the bore and in an extreme case close the pipe.

- The joint elements have to be fixed during the specified assembly time. Use this time to correct the connection the correction is only restricted to the alignment of pipe and fittings. Never turnthe elements or align the connection after the processing time.

- After the cooling period the fused joint is ready for use.

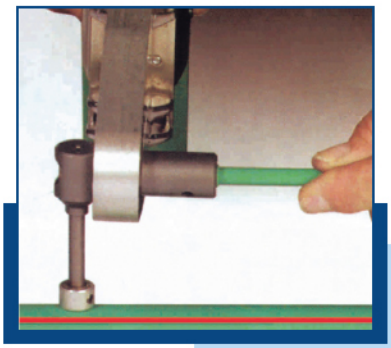


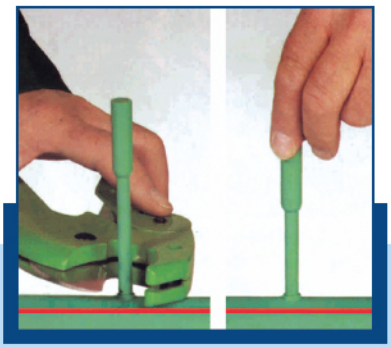
8-3 Repair

Damaged pipes may be repaired as already mentioned - by means of :

- Fusion
- Electro socket fusion.

In addition to this, AL ASEMA program offers the possibility of the repair pin.
The necessary welding tool and repair pin are described as shown the installation information is enclosed with the welding tool but may also be ordered separately.





8.4 Operation Manual for ALASEMA Welding Machine

1. a. Before the mounting sockets and assembly parts are to be wiped with a clean piece of cloth and the end of pipes are to be cut straight.
   b. Take out the welding machine from the bag and set it on the floor base.
   c. Adjust the temperature indicator of the machine to 260 degrees C.
2. Try the first use of the newly purchased machine at outdoors. The reason is that a special material is used that provides insulation between the iron part of the machine and the trunk.
3. Do not let children and animals {pets} to come near the machine.
4. When the machine starts to operate. Machine iron is heated. Therefore do not touch the machine iron in any way with your hands or arms, etc.....
5. Connect the machine to a grounded socket of 220 Volts.
6. The machine is equipped with an on/off button and RED SIGNAL lamps are lighted at the first start when the set temperature is reached, these lamps go off.
7. The machine is equipped with double resistance. You can put on and use both keys for fast heating after the machine is heated you may put of one of the keys.
8. When the machine reaches the set temperature, hold the plastic pipe for heating slowly without losing the angle and not turning the plastic pipe to female socket more the connection part to male socket.
9. Do not let the heaters contact with the electric cable and plug.
10. The machine is not to be subjected to strokes in any way.
11. Cooling of the machine is to be by itself using air. Avoid using water cooling at all.
12. Do not let the machine contact with water.
13. Use battery connection scale (balance) and fitting element in connecting the battery.
14. After your welding work is finished, carry out the sealing test by applying compressed water into the welded piped.
15. Do not use the welding machine and fork for any other purpose than plastic pipes.
16. After you are finished with the machine, wait for the machine and its iron to cool and then pack it into the bag.
17. The machine is not be disassemble for repair in any way.
18. When the machine is used not in accordance with operating instructions, responsibility fully belongs to the customer.
19. Socket with worn Teflon are not be used in welding operation.
20. Socket are to be cleaned using a clean piece of cloth with water-alcohol mixture.

8.5 Compenents of AL ASEMA Welding Machine

1. Carrying bag
2. Welding machine
3. Floor base
4. Welding sockets (sizes 20 - 25 - 32 - 40 - 50 mm)
5. Battery fitting element and battery balance scale
6. Plastic pipe shear
7. Steel tape measure
8. Socket opener and alliance key

8.6 Table of heating, Welding and Cooling Time

Note : it is essential to observe the below mentioned heating times

Pipe external	Welding depth	Heating time		Welding time	Cooling time
mm	mm	sec. indoor	Sec. outdoor	Sec.	min.
20	14.0	5	8	4	2
25	15.0	7	11	4	2
32	16.5	8	12	6	4
40	18.0	12	18	6	4
50	20.0	18	27	6	4
63	24.0	24	36	8	6
75	26.0	30	45	8	8
90	29.0	40	60	8	8
110	32.5	50	75	10	8

Quality Control

9.1 Lab Equipment and tests

ALASEA has built a modern and efficient Laboratory with high performance Equipment from Europian suppliers to cover the pressure test, charpy impact tensile tests in order to accept raw materials it is very important to carry out density and fluidity test on polypropylene deliveries.

product dimensional Test of dimensional variation Test after heat exposure. Microscope check about the homogeneity of the modified material. Temperature and pressure resistance tests as follow:

- Melting from index.
- Density Control
- Shock tests
- Tensile strength tests.
- Heat resistance test.

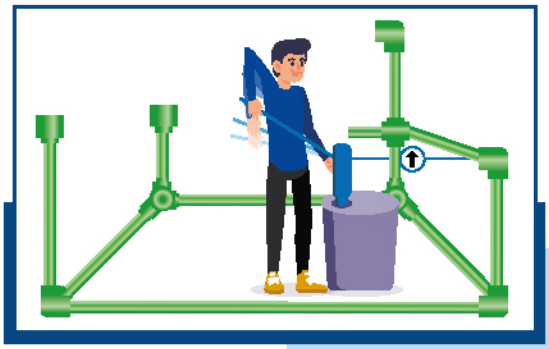
The audit quality manager checks all the results and give the approval to proceed with the production.

9.2 Pressure test

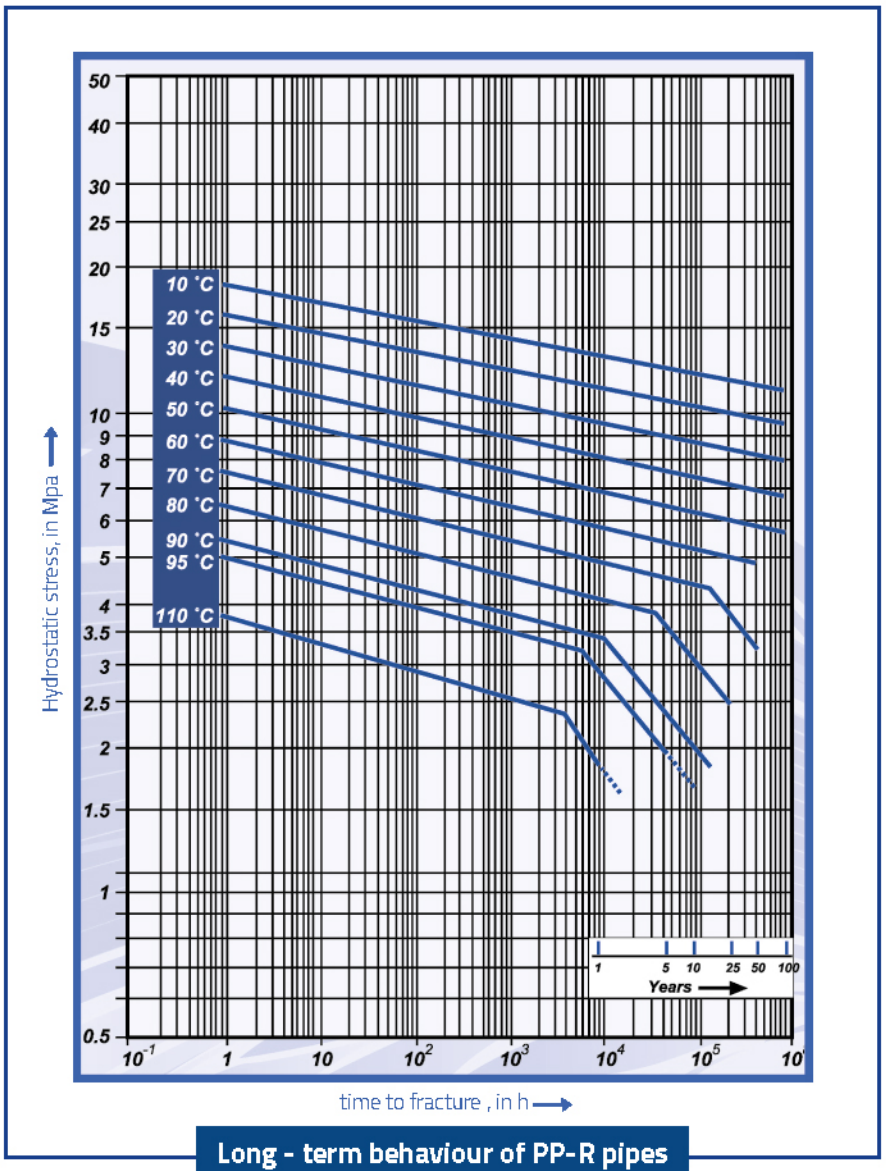
Technical rules for potable water installation DIN 1988, All pipelines have to be hydraulically pressure tested.

The test pressure has to be 1.5 times of the operating pressure.
For the preliminary test a test pressure of 1.5 times of the highest possible operating pressure has to be produced. This test pressure has to be reestablished twice within 30 minutes within an interval of 10 minutes.

After a test time of a further 30 minutes the test pressure must not drop more than 0.6 bar and no leakage should have appeared.

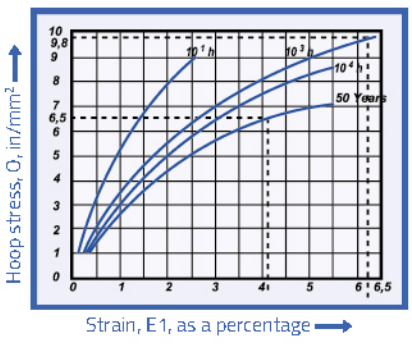


9.3 Hydrostatic stress diagram for PPR

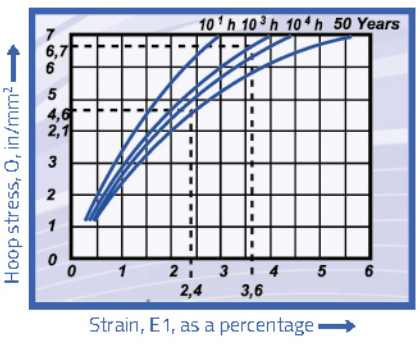


Long - term behaviour of PP-R pipes

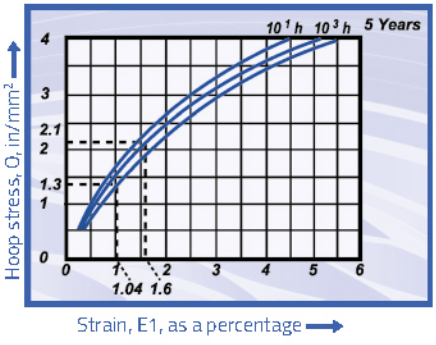
9.4 Stress - strain diagram for PPR



Stress- strain diagram for PP-R 80 fittings at 20°



Stress- strain diagram for PP-R 80 fittings at 40°



Stress- strain diagram for PP-R 80 fittings at 95°

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