XORA GLOBE

XPORTEX
SERVICES FOR INTERNATIONAL BUYERS



BUILDING MATERIALS · PIPES & FITTINGS

PPR Pipes, Fittings & Valves

Hot & cold water · Pipes Ø20–110 mm · Brass-insert fittings · Ball, stop & corner valves

Made in Egypt. Sourced through XPORTEX, the export arm of XORA Globe — we verify the factory and follow the order to delivery.

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Every product in this catalogue is made in Egypt by a manufacturer in the XPORTEX supplier network. Quote the product name and size from each page when you ask for a price. We verify the factory and follow the order to delivery.

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Ask for a quote

Send the product names and sizes you need — see the last page for what to include.

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OUR MISSION

Our goal since we founded the plant is to provide our customers high quality products through manufacturing innovative high-quality molds, plastics, valves, and faucets employing high-tech CNC, injection molding, continous casting, forging, die casting, electroplating, polishing, and PTFE centers.

OUR VISION

We value time, skills, and the expert opinions of our staff. We aim to be the company that best understands and satisfies the customer's tailored needs nationally and internationally while providing the best quality and prices.

OUR VALUES

We strongly value honesty, efficiency, accountability, respect, and team work.

PPR Properties

PPR Pipe Production Factory

Types of PPR Pipes produced: • Normal Pipes.
• UV resistant coated Pipes.
• Fiberglass-reinforced Pipes.
• UV resistant + Fiberglass reinforcment pipes.
We use the latest laser printing technology to mark our original pipes with a wide yellow stripe on which the pipe specifications (along with other information) is printed. Pipes are produced starting from size 20 mm (DN20) up to 110 mm (DN110) according to the German standard specifications.

Features of PPR Pipes and Fittings

1- Easy to mount.
2- Resists heat from transported substances.
3- Resists abrasion from hard particles.
4- Smooth surface enhances flowrate of fluids.
5- Fiberglass-reinforced pipes to reduce deformation.
6- Resistance to Ultraviolet emmissions from sunlight.

PPR Pipe Characteristics

LOW THERMAL CONDUCTIVITY

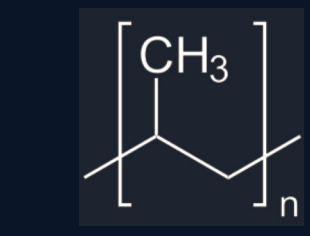
The thermal conductivity of PPR is very low, meaning temperature cannot easily be conducted from the outside environment to the liquid in the pipe, and vice versa. This factor reduces heat loss or gain during the transferring of hot or cold fluids respectively, resulting in energy efficient systems and lower insulation costs for PPR piping.

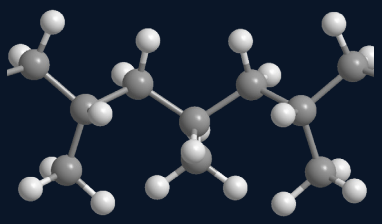


Polypropylene random, also know as PPR , has a molecular formula of (C3H6).

Density : - 0.855 g/cm3 Amurfi , 0.946 g/ cm3 crystal.

Polypropylene is a thermoplastic that is chemically manufactured and used in a wide range of applications including pack-aging and fabric car parts and speakers.







Polypropylene is harsh and highly resistant to many organic solvents, Alkaline and acidic substances. It also has sturdy mechanical properties, such as high resistance to erosion and shrinkage.

Therefore, PPR has become the first choice for plumbing workers in many countries.

Rust, Erosion and shrinkage due to weather conditions are common problems in the traditional metal pipe system, and these negative aspects are the main causes of the disruption of health facil-ities and have a detrimental impact on the quality of the water we consume.

During the production process of our PPR, no additives that may be harmful to human health are used.
In 2007, the global polypropylene market volume was about 45.1 million tons with a sales figure of nearly 65 billion US dollars (47.4 billion euros).

PPR products can be used in the water supply systems in large and small buildings and in the main water system in resitdential buildings, hospitals, schools, hotels, office buildings, shopping malls and even boats.
Our PPR products are manufactured in accordance with international standards: DIN 8077/78 UNI EN ISO 15874.

These standards are approved by the Ministry of Health in various countries around the world.



PPR Properties

Long Life & Durability

PPR piping systems can remain functional for over 50 years, at a wide range of fluid and environmental operating temperatures. Moreover, PPR pipe exhibits excellent durability in both hot and cold water systems. Firstly, it can endure the temperature and pressure strain of hot water systems.

At the same time PPR pipe is able to structurally withstand impacts even in cold weather installations without any risk of cracking or breaking, unlike other common types of plastic piping.

Effecient Inner Surface

The inner surface of PPR pipe is very smooth and boasts a very low friction coefficient, compared to traditional types of piping. This results in a reduction of pressure losses during fluid transport and distribution, further contributing to the energy efficiency of PPR piping systems. Moreover, unlike metal pipes PPR does not flake or scale, making them safer to use.

Chemical & Mechanical Endurance

Compared to traditional plastic piping systems, PPR offers very high resistance against abrasion by hard particles. This is especially important in cases of well water or industrial applications, where the transferred liquids may contain abrasive particles.
Moreover, unlike traditional metal piping, PPR is inert to most electrolytes and chemicals, over a wide range of temperatures. This electrolytic and chemical inertness makes PPR piping safe to use in cases of high water salinity (e.g. in pool applications that use sea water) or even highly corrosive chemicals (e.g. in industrial applications).

Ecological & Economic Effeciency

Due to the low density of PPR, transportation, handling, and installation of PPR pipes does not require high amounts of energy consumption or manual labor. At the same time, they are easy to cut, weld and work with, making them even more economically sustainable.

Moreover, joining PPR pipes and fittings is performed through heat or mechanical fixation and doesn't require any additional chemicals or materials. All of these factors contribute to PPR low environmental impact and usage cost.

Where to use PPR ?

Home Usage

PPR adds value - with more than 50 years of useful life, it avoids degradation of walls due to humidity stains. Furthermore, the low thermal conductivity offers less condensation than other alternative materials.

Commercial & Resendential buildings

Reduced labor time - the Fusion coupling system allows serial installation in housing and building plans with identical distribution. With no maintenance issues, hotel rooms can remain occupied all year round. Tenant benefits - higher resistance, more quality, better service, no maintenance.

Industrial Usage

Due to its high chemical resistance, pressure and temperature ranges, PPR is ideal for industrial use. The antioxidant internal layer makes it particularly suitable for food and beverage production.





Why choose PPR?

We are always at the forefront of technological investigation in thermo-plastic products and are committed to the development of the industry. Through this, we obtain a firm recognition of our products in the domestic and foreign markets.

Fusion Technology

We use RANDOM copolymer polypropylene (PPR), which is designed in Europe as raw material, to manufacture our PPR System components. This is the best suited material to join by molecular fusion. Structural integrity is maintained by using only virgin polypropylene instead of recycled material.

Brass insert properties

- Brass alloy properties matched with global health and safety specifications.
- Inserts are designed to have the highest mechanical fixation with PPR fittings and to eliminate leakage.
- Experiments are being carried out on the brass alloy and tests to make sure it is fit for human use.
- It does not react with water and has great resistance to rust.

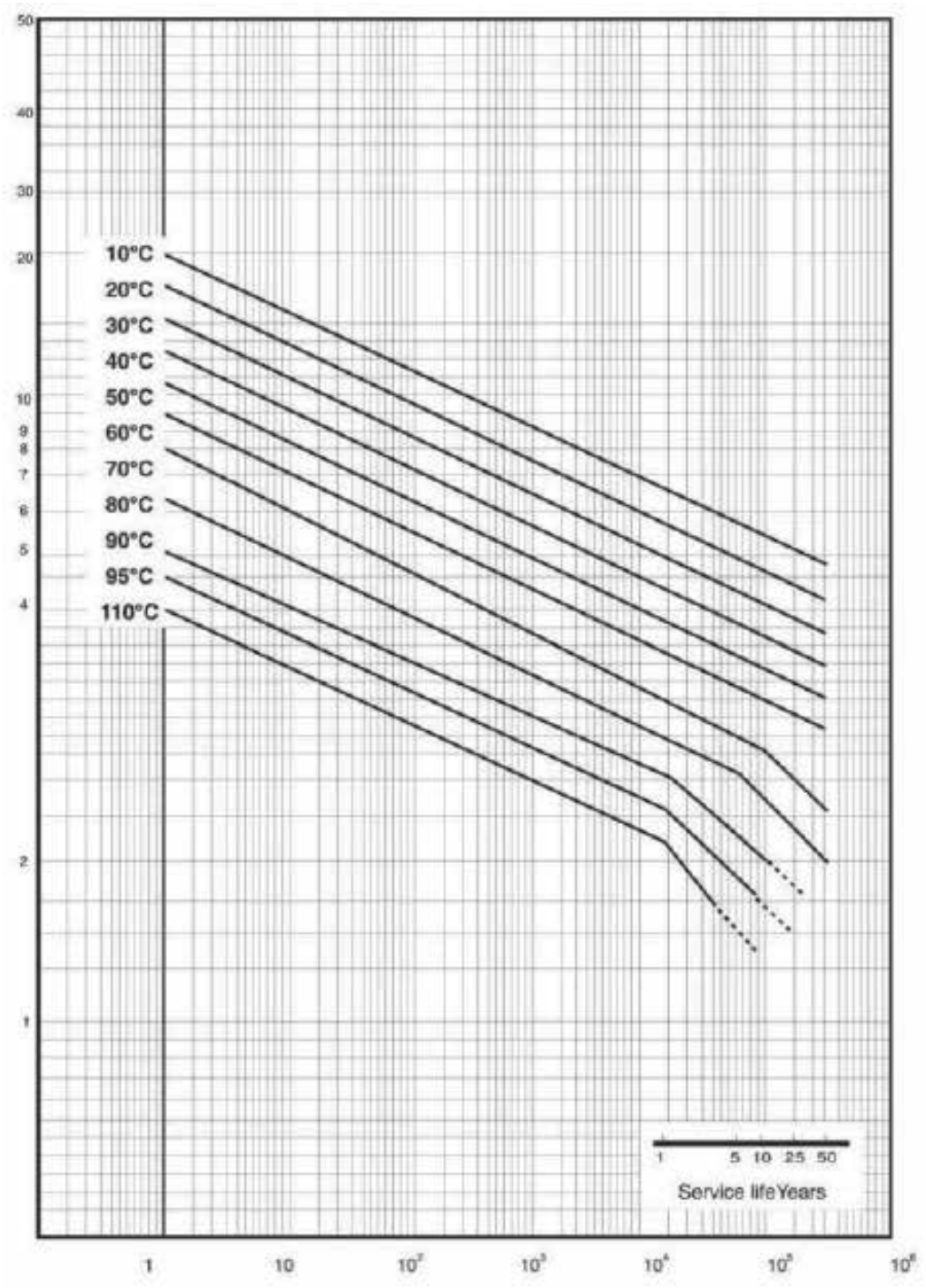


PPR Physical Properties

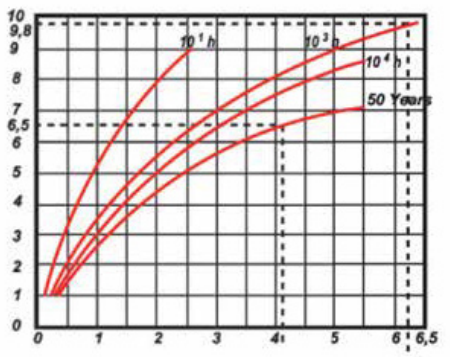
Typical Value	Test Method	Units	Main Value
Physical Properties			
Density 23° C	ISO 1183	g/cm2	.896
Melting Point	ISO 306	°C	140 - 150
Thermal Properties			
Thermal Conductivity at 20°C	DIN 52612	W/m°K	0.24
Heat Deflection temperature B (0.45 MPa)	ISO 75 - 1.2	°C	88
Mean Coefficient of linear (Thermal Expansion 0:110 ° C)	DIN 53752	K-1	1.5 x 10 -4
Mechanical Properties			
Tensile Modules	ISO 527 - 1.2	MPa	900
Tensile Stress yield (50mm/min)	ISO 527 - 1.2	MPa	24.3
Tensile Strain yield	ISO 527 - 1.2	%	11.7
Charpy Impact strength at 23°C	ISO 1791/eU	KJ/m2	Does Not Break
Charpy Impact strength at 20°C	ISO 1791/eU	KJ/m2	30
Charpy Impact strength Notched at 23°C	ISO 1791/eU	KJ/m2	38
Charpy Impact strength Notched at 20°C	ISO 1791/eU	KJ/m2	2
Resistance to internal pressure at 20°C	ISO 1167 - 1	Bar	53.1 No Failure
Impact Resistance at 0°C	ISO 9854 - 1 ISO 9854 - 2	%	≤ 10
Rheology			
Melting Index MFR 230/ 2.16	ISO 1133	G/10MIN	0.3
Electrical properties			
Surface resistance	DIN 53482	OHM.CM	≤ 101

The PPR Physical Properties graph visualizes material properties across thermal, physical, mechanical, electrical, and rheological domains, aiding in efficient selection and performance analysis for various applications.

Diagram of Pressure tests



Hoop Stress, O, in / mm²

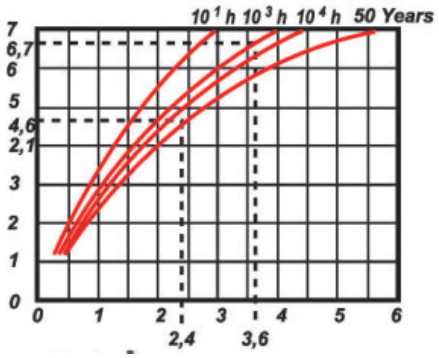


Strain, E_1, as a Percentage

Stress-strain Diagram for PPR 80 Fittings at 20°C

Note: We use RANDOM copolymer polypropylene (PPR), which is designed in Europe as raw material, to manufacture our PPR System components. This is the best suited material to join by molecular fusion. Structural integrity is maintained by using only virgin polypropylene instead of recycled material.

Hoop Stress, O, in / mm²

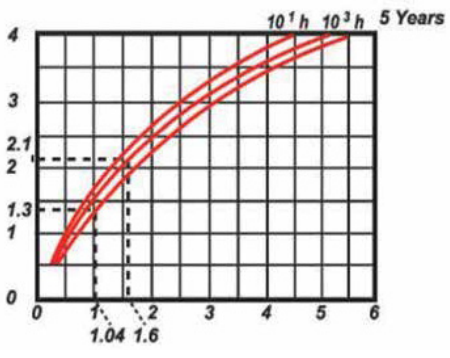


Strain, E_1, as a Percentage

Stress-strain Diagram for PPR 80 Fittings at 95°C

Note: We use RANDOM copolymer polypropylene (PPR), which is designed in Europe as raw material, to manufacture our PPR System components. This is the best suited material to join by molecular fusion. Structural integrity is maintained by using only virgin polypropylene instead of recycled material.

Hoop Stress, O, in / mm²



Strain, E_1, as a Percentage

Allowable Operating Pressures for PPR Pipes Conveying Water, Safety Factor (SF) = 1.5

Temperature in °C	Years of Service	Pipe Series (S)									
		20	16	12.5	8.3	8	5	4	3.2	2.5	2
		Standard dimension ratio (SDR)									
		41	33	26	17.6	17	11	9	7.4	6	5
		Allowable working pressure, in bar									
10	1	4.4	5.5	7.0	10.5	11.1	17.5	22.1	27.8	35.1	44.1
	5	4.1	5.2	6.6	9.9	10.4	16.5	20.8	26.2	33.0	41.6
	10	4.0	5.1	6.4	9.7	10.1	16.1	20.3	25.6	32.2	40.5
	25	3.9	4.9	6.2	9.3	9.8	15.6	19.6	24.7	31.1	39.2
	50	3.8	4.8	6.0	9.1	9.6	15.2	19.1	24.1	30.3	38.2
	100	3.7	4.6	5.9	8.9	9.3	14.8	18.6	23.5	29.6	37.2
20	1	3.7	4.7	5.9	9.0	9.4	15.0	18.8	23.7	29.9	37.7
	5	3.5	4.4	5.6	8.4	8.9	14.1	17.7	22.3	28.1	35.4
	10	3.4	4.3	5.4	8.2	8.6	13.7	17.2	21.7	27.4	34.5
	25	3.3	4.1	5.2	7.9	8.3	13.2	16.6	21.0	26.4	33.3
	50	3.2	4.0	5.1	7.7	8.1	12.9	16.2	20.4	25.7	32.4
	100	3.1	3.9	5.0	7.5	7.9	12.5	15.8	19.9	25.0	31.5
30	1	3.2	4.0	5.2	7.6	8.0	12.7	16.0	20.2	25.4	32.0
	5	3.0	3.7	4.7	7.2	7.5	11.9	15.0	18.9	23.8	30.0
	10	2.9	3.6	4.6	7.0	7.3	11.6	14.6	18.4	23.2	29.2
	25	2.8	3.5	4.4	6.7	7.0	11.2	14.1	17.7	22.3	28.1
	50	2.7	3.4	4.3	6.5	6.8	10.9	13.7	17.2	21.7	27.4
	100	2.6	3.3	4.2	6.3	6.6	10.6	13.3	16.8	21.1	26.6
40		2.7	3.4	4.3	6.5	6.8	10.8	13.6	17.1	21.6	27.2
	5	2.5	3.2	4.0	6.0	6.3	10.1	12.7	16.0	20.2	25.4
	10	2.4	3.1	3.9	5.9	6.2	9.8	12.3	15.5	19.6	24.7
	25	2.3	2.9	3.7	5.6	5.9	9.4	11.9	15.0	18.8	23.7
	50	2.3	2.9	3.6	5.5	5.8	9.2	11.5	14.5	18.3	23.1
	100	2.2	2.8	3.5	5.3	5.6	8.9	11.2	14.1	17.8	22.4

The Allowable Operating Pressures for PPR pipes conveying water, with a safety factor (SF) of 1.5, represent the maximum pressure limits the pipes can withstand safely during operation.

These values ensure the pipes' durability, reliability, and performance in various water transport applications under standard conditions.

Allowable Operating Pressures for PPR Pipes Conveying Water, Safety Factor (SF) = 1.5

Temperature in °C	Years of Service	Pipe Series (S)									
		20	16	12.5	8.3	8	5	4	3.2	2.5	2
		Standard dimension ratio (SDR)									
		41	33	26	17.6	17	11	9	7.4	6	5
		Allowable working pressure, in bar									
50	1	2.3	2.8	3.6	5.5	5.7	9.1	11.5	14.5	18.2	23.0
	5	2.1	2.7	3.4	5.1	5.3	8.5	10.7	13.5	17.0	21.4
	10	2.0	2.6	3.3	4.9	5.2	8.2	10.4	13.1	16.5	20.8
	25	2.0	2.5	3.1	4.7	5.0	7.9	10.0	12.6	15.9	20.0
	50	1.9	2.4	3.0	4.6	4.8	7.7	9.7	12.2	15.4	19.4
	100	1.8	2.3	2.9	4.5	4.7	7.5	9.4	11.8	14.9	18.8
60	1	1.9	2.4	3.0	4.6	4.8	7.7	9.7	12.2	15.4	19.4
	5	1.8	2.2	2.8	4.3	4.5	7.1	9.0	11.3	14.3	18.0
	10	1.7	2.2	2.7	4.1	4.3	6.9	8.7	11.0	13.9	17.5
	25	1.6	2.1	2.6	4.0	4.2	6.6	8.4	10.5	13.3	16.7
	50	1.6	2.0	2.5	3.8	4.0	6.4	8.1	10.2	12.9	16.2
70	1	1.6	2.0	2.5	3.9	4.1	6.5	8.1	8.1	12.9	16.3
	5	1.5	1.9	2.4	3.6	3.8	6.0	7.5	7.5	12.0	15.1
	10	1.4	1.8	2.3	3.5	3.6	5.8	7.3	7.3	11.6	14.6
	25	1.2	1.5	2.0	3.0	3.1	5.0	6.3	6.3	10.0	12.7
	50	1.0	1.3	1.7	2.5	2.6	4.2	5.3	5.3	8.5	10.7
80		1.3	1.7	2.1	3.2	3.4	5.4	6.8	8.6	10.8	13.7
	5	1.2	1.5	1.9	2.9	3.0	4.8	6.0	7.6	9.6	12.1
	10	1.0	1.2	1.6	2.4	2.5	4.0	5.1	6.4	8.1	10.2
	25	0.8	1.0	1.2	1.9	2.0	3.2	4.1	5.1	6.5	8.1
95	1	0.9	1.2	1.5	2.3	2.4	3.8	4.8	6.1	7.6	9.6
	5	0.96	0.8	1.0	1.5	1.6	2.6	3.2	4.1	5.2	6.5
	(10)B	(0.5)	(0.6)	(0.8)	(1.3)	(1.3)	(2.2)	(2.7)	(3.4)	(4.3)	(5.5)

The Allowable Operating Pressures for PPR pipes conveying water, with a safety factor (SF) of 1.5, represent the maximum pressure limits the pipes can withstand safely during operation.

These values ensure the pipes' durability, reliability, and performance in various water transport applications under standard conditions.

Chemical Resistance of Polypropylene (PPR): Concentrations, Temperatures, and Performance

Chemicals	Conc, %	Polypropylene °C		
		20	60	100
Acetone	TR	+	+	
Alum	GL	+	+	
Alum of all kinds, hydr.	All	+	+	
Formic acid		+	•	-
Ammonia, gaseous	TR	+	+	
Ammonia, hydr	Conc.	+	+	
Ammonium acetate	GL	+	+	
Ammonium carbonate	GL	+	+	
Ammonium cloride	GL	+	+	
Ammonium nitrate	GL	+	+	+
Ammonium Phosphate	GL	+	+	+
Ammonium Sulphate	GL	+	+	+
Amylalcohol, Pure	TR	+	+	+
Aniline	TR	-	-	
Apple Juice	H	+	+	+
Batterie Acid		+	+	
Barium salts	GL	+	+	
Benzaladehyde	GL	+	+	+
Benzine	H	•	-	
Benzoic acid	GL	+	+	-
Banzene	TR	•	-	
Succinic acid, hydr	GL	+	+	-
Beer	H	+	+	
Bleaching Solution	20	•	•	+
Borax	L	+	+	-
Boric acid	GL	+	+	
Bromine, liquid	TR	-	-	+
Bromine, vapours	All	•	-	-
Bromine water	GL	•	-	-
Botane gas	TR	+	+	-
Butyle acetate				
Calcium Cloride	GL	+	+	
Calcium nitrate	GL	+	+	+

Chemical Resistance of Polypropylene (PPR): Concentrations, Temperatures, and Performance

Chemicals	Conc. %	Polypropylene °C		
		20	60	100
Com oil	TR	+	•	
Chior, liquid	TR	-	-	
Chorine, gaseous wet	1	-	-	-
Chloroform	TR	•	-	-
Chlorosulphonic acid	TR	-	-	-
Chlorine water	GL	•	-	-
Hydrogen chloride, gaseous	TR	+	+	
Chromic sulphuric acid		-	-	-
Cyclohexane	TR	+		
Cyclohexanol	TR	+	•	
Cyclohexanone	TR	•	-	
Dekahydronaphtaline	TR	•	-	-
Dibutyl phthalate	TR	•	-	-
Diesel oil	H	+	•	-
Diethylether	TR	+	•	
1,4- Dixane	TR	•	•	
Peanut oil	TR	+	+	
Vinegar	H	+	+	
Acetic acid (glacial acetic acid)	TR	+	•	+
Acetic acid, hydr	50	+	+	-
Acetic acid anhydride	TR	+		•
Ethyl acetate	TR	+	•	-
Butyl acetate	TR	•	-	-
Ether				
Ethyl Benzene	TR	•	-	-
Ethyl chloride	TR	-	-	-
Pine needle oil	H	+	•	
Hydrofluoric acid solution	40	+	+	
Formaldehyde, hydr	40	+	+	
Antifreezing solution (motor vehicles)	H	+	+	+
Fruit juices	H	+	+	+
Glycrine	TR	+	+	+
Urea, hydr.	GL	+	+	
Fuel oil	H	+	•	
Heptone	TR	+	•	-

Chemical Resistance of Polypropylene (PPR): Concentrations, Temperatures, and Performance

Chemicals	Conc. %	Polypropylene °C		
		20	60	100
Hexane	TR	+	•	
Iso-octane	TR	+	•	-
Jodine solution	H	+	•	
Caustic potash solution				
(Potassium hydroxide)	50	+	+	+
Potassium carbonate (potash)	GL	+	+	
Potassium chlorate	GL	+	+	
Potassium chlorate	GL	+	+	
Bichromate of potash	GL	+	+	
Potassium Iodide	GL	+	+	
Potassium nitrate, hydr	GL	+	+	
Potassium permanganate	GL	+	-	
Potassium persulphate	GL	+	+	
Coconut oil	TR	+		
Cresol	90	+	+	
Lanolin	H	+	•	+
Linseed oil	H	+	+	
Lactic acid	90	+	+	
Magnesium salts	GL	+	+	
Menthol	TR	+	•	
Methylene chloride	TR	•	+	-
Methyl ethyl ketone	TR	+	•	
Milk	TR	+	+	+
Motor oil	H	+	•	
Nickle salts, hydr	TR	+	+	
Sodium carbonate	GL	+	+	•
Sodium chlorate	50	+	+	
Sodium chloride	GL	+	+	+
Sodium chlorite, hydr	VL	+	•	-
Sodium hydrochlorite, hydr	2 - 20	+		
Sodium nitrate	10	+	+	
Sodium nitrite	GL	+	+	+
Sodium phosphate	G	+	+	
Sodium phosphate	GL	+	+	
Sodium sulphide	GL	+	+	

Chemical Resistance of Polypropylene (PPR): Concentrations, Temperatures, and Performance

Chemicals	Conc. %	Polypropylene °C		
		20	60	100
Sodium sulphite	GL	+	+	+
Sodium thiosulphate	40	+	+	
Caustic soda solution	GL	+	+	+
Oleum	UP to 60	+	-	-
Olive oil	TR	-	+	•
Oliec acid	TR	+	•	-
Oxalic	GL	+	+	•
Ozone	GL	+	•	
Paraffin	0.5 ppm	+	+	
Paraffin oil	H	+	•	-
Perchlorethylene	TR			
Petroleum ether	TR	+	•	
Petroleum	TR	+	•	
Peppermint oil	TR	+		
Phenol (hydr.phase)	5	+	+	
Phosphoric acid	85	+	+	+
Photographic developer	H	+	+	
Propane, gaseous	TR	+	•	
Pyridine	TR	•	•	
Mercury	TR	+	+	
Mercury salts	GL	+	+	
Castor oil	TR	+	+	
Nitric acid, hydr.	10	+	•	-
Hydrochloric acid, hydr	UP to 20	+	+	
	20 - 36	+	•	
Sulphur dioxide	TR	+	+	
Carbonum disulphide	TR	-	-	-
Sulphuric acid, hydr.	80 - TR	•	-	
Hydrogen sulphide	TR	+	+	
Sea water	H	+	+	+
Silver saltes	GL	+	+	
Silicon oil	TR	+	+	+
Sodium carbonate (soda)	50	+	+	•

Chemical Resistance of Polypropylene (PPR): Concentrations, Temperatures, and Performance

Chemicals	Conc. %	Polypropylene °C		
		20	60	100
Soybean oil	TR	+	•	
Starch solution, hydr	All	+	+	-
Turpentine oil	TR	-	-	-
Turpentine substitute	TR	+	•	-
Tetrachloroethane	TR	•	-	
Tetrachloroethylene	TR	•	•	-
Carbon tetrachloride	TR	-	-	-
Tetrachydrofurane	TR	•	-	-
Tetrahydronaphthalene	TR	-	-	-
Toluene	TR	•	-	
Transformer oil	TR	•	-	-
Trichloroethlene	TR	-	-	
Petroleum jelly	TR	+	•	
Detergent	VL	+	+	+
Water	H	+	+	
Hydrogen peroxide, hydr	30	+	•	
Tricresyl phosphet	TR	+	•	
Trioctyl phosphate	TR	+		
Wine	H	+	+	
Xelene	TR	•	-	-
Zinc salts, hydr.	GL	+	+	
Stannous chloride	GL	+	+	
Citric acid	VL	+	+	+
Suger sirup	H	+	+	

Sign & Symbols

VL = moderate loosening, mass-part ≤ 10%.
L = moderate loosening, mass-part < 10%.
GL = saturate (with 20 °C), hydrous solution.
TR = medium rate flow is minimum-technical pure.
H = usual in trade composition.
+ = resistant.
• = limited resistant.
- = inconstant.

Thermal Expansion in PPR Pipes

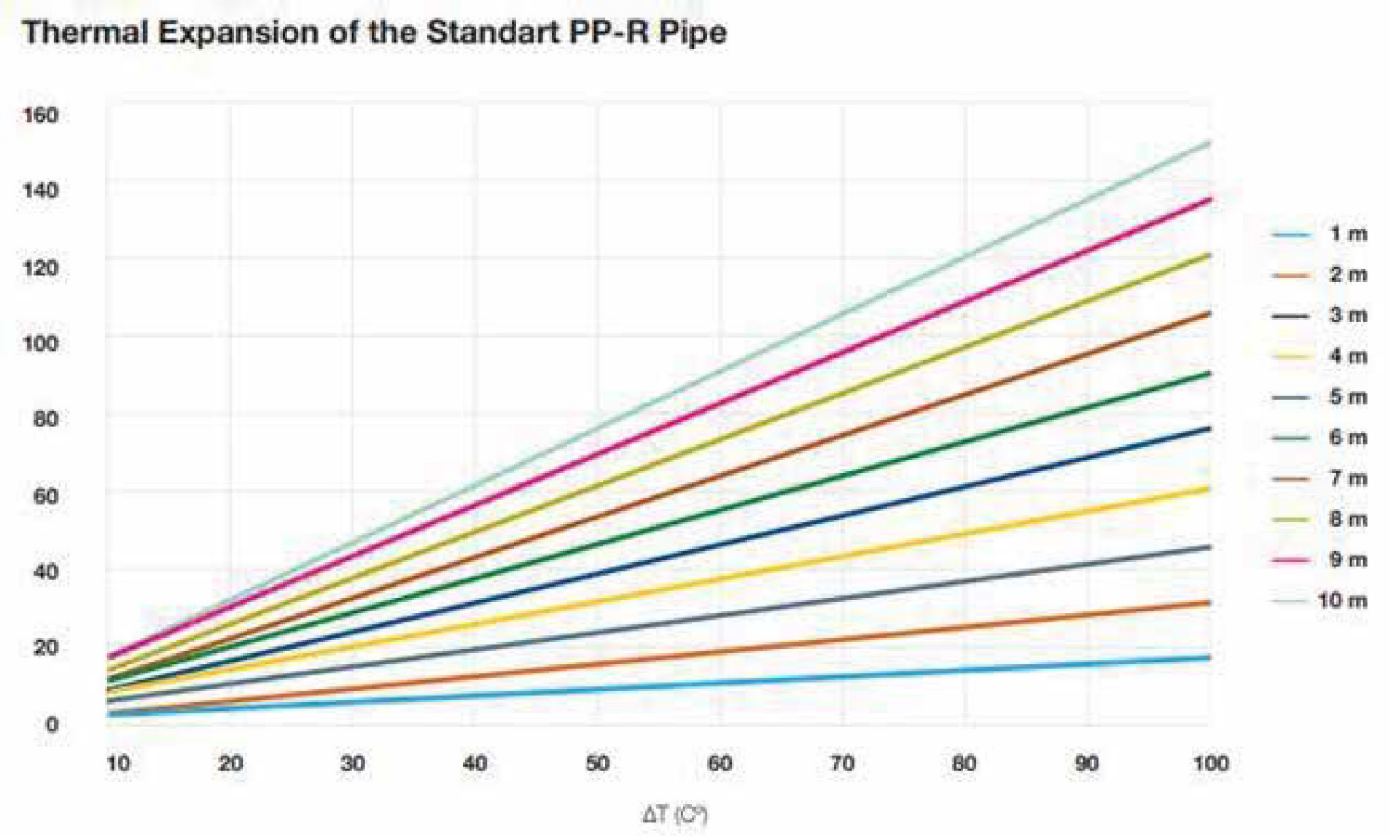
PPR pipes have an expansion coefficient that is much higher than the metal pipes. So, this characteristic should be taken into consideration during installations.

Calculation of thermal expansion is as follows:

$\Delta L = L * \Delta T * \partial$
where :
ΔT = The difference between environmental temperature and water temperature in Kelvin degrees (K) or Celsius (°C).
ΔL = Variation of length in mm.
L = Initial length of the pipe in m.
∂ = Coefficient of linear thermal expansion. The value of ∂ is 1,5 * 104-(K-1) for PPR pipes.

Outside Ø mm	Tolerance mm	Thickness mm	Tolerance mm	Inside Ø mm
20	+0.3/-0	3.4	+0.5/-0	13.20
25	+ 0.3/-0	4.2	+0.6/-0	16.60
32	+ 0.3/-0	5.4	+0.7/-0	21.20
40	+0.4/-0	6.7	+0.8/-0	26.60
50	+0.5/-0	8.3	+1.0/-0	33.40
63	+0.6/-0	10.5	+1.2/-0	42.00
75	+0.7/-0	12.5	+1.4/-0	50.00
90	+0.7/-0	15	+1.7/-0	60.00
110	+0.7/-0	18.3	+2.0/-0	73.40
125	+1.2/-0	20.8	+2.2/-0	83.40

Pipe Length L (m)	Linear Expansion ΔL (mm)									
	Temperature Difference ΔL (°C)									
	10	20	30	40	50	60	70	80	90	100
	1.5	3	4.5	6	7.5	8	10.5	10.5	13.5	15
1	3	6	9	12	15	18	21	21	27	30
2	4.5	9	13.5	18	22.5	27	31.5	31.5	40.5	45
3	6	12	18	24	30	36	42	42	54	60
4	7	15	22.5	30	37.5	45	52.5	52.5	67.5	75
5	9	18	27	36	45	54	63	63	81	90
6	10.5	21	31.5	42	52.5	63	73.5	73.5	94.5	105
7	12.5	24	36	48	60	72	84	84	108	120
8	13.5	27	40	54	67.5	81	94.5	94.5	121.5	135
9	15	30	45	60	75	90	105	105	135	150
10										



Example; at 70 °C for 8m PPR pipe, ΔL=?
$\Delta L = L * \Delta T * \partial$
ΔL=8000 mm*70*0,00015
ΔL=84 mm
PP-R Glass fiber Reinforced Pipe (PP-R/GF/PP-R) consist of three layers where the inner and outer layers are produced of PP-R and the middle.
layer is produced of the special mixture of PP-R and Glass fiber raw material.

Main Advantages of the PP-R Glass fiber Reinforced Pipe

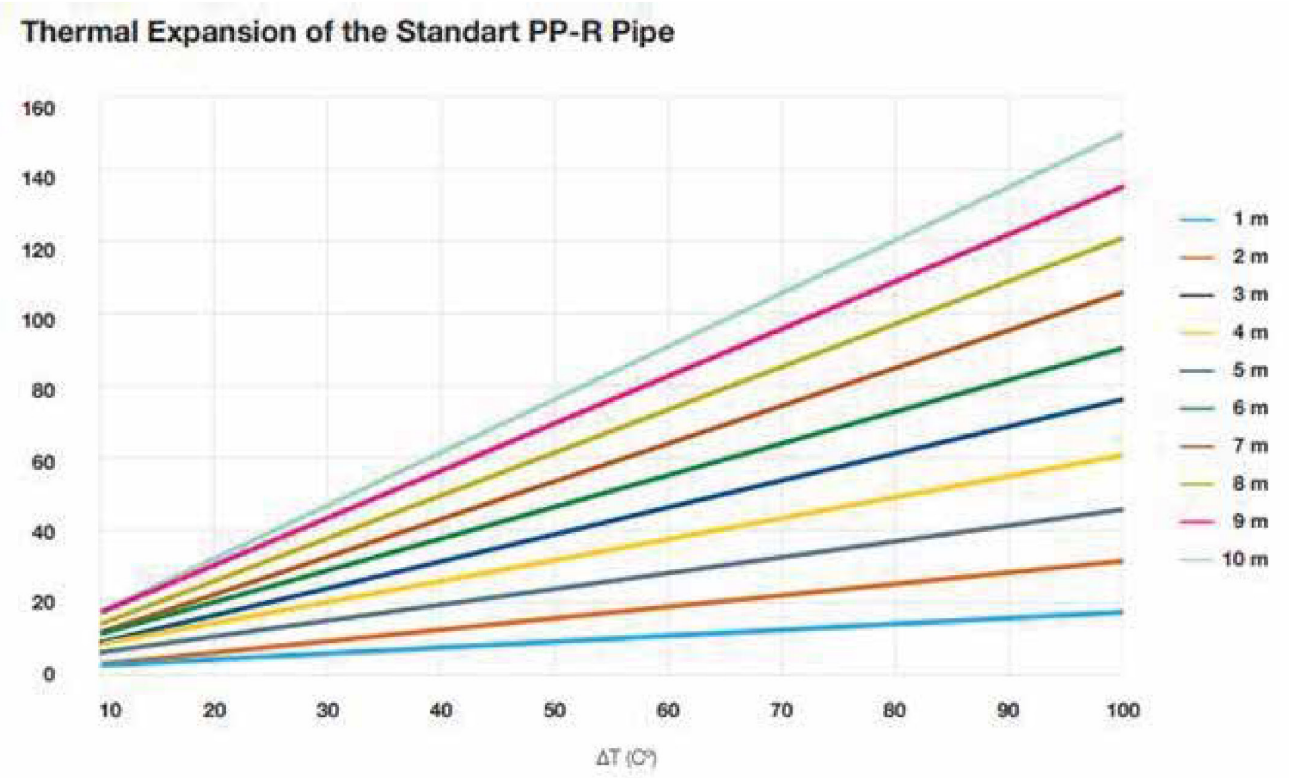
1) Easier and faster installation since it does not require peeling before the welding operation.
2) It has 75 % less linear expansion than the standard PP-R pipe.
3) Higher stiffness than standard PP-R pipe.
4) Glass fiber PP-R pipes have thermal expansion co-efficient close to foil pipes, they can conveniently be used in the areas where foil pipes
are used. Expansion co-efficient:
For Glass fiber Reinforced PP-R pipe: 0,035 mm/mK
For Standard PP-R Pipe: 0,15 mm/mK 5) Lighter than standard PP-R pipes.

Application Areas

1) All kinds of hot and cold water installations.
2) Air pressure installations.
3) Heating installations and radiator connections. 4) Industry.

Thermal Expansion in Glass fiber Reinforced PP-R pipe!

Calculation of Glass fiber Reinforced PP-R pipe thermal expansion is as follows:
$\Delta L = L * \Delta T * \partial$
where
ΔT = The difference between environmental temperature and water temperature in Kelvin degrees (K) or Celsius (°C).
ΔL = Variation of length in mm.
L = Initial length of the pipe in m.
ΔT = The difference between environmental temperature and water temperature in Kelvin degrees (K) or Celsius (°C).
∂ = Coefficient of linear thermal expansion. The value of ∂ is 0,35 * 104- (K-1) for Glass fiber Reinforced PPR pipe.



Example; at 70 °C for 8m Glass fiber Reinforced PP-R pipe, ΔL=? $\Delta L = L * \Delta T * \partial$
ΔL=8000 mm*70*0,000035
ΔL=19,6 mm

Welding Techniques

The quality of an installation depends on the tightness, stability and lifetime of its connections. Fusion welding technique is safe because parts made of polypropylene create a homogenous connection within the process. When the welded joint cools down, it can be fully loaded.

The resulting joints are very reliable, and they are as strong as the pipe itself. The pipe may even break before the socket welded joint under tension.

Welding takes only a few seconds. After cutting the pipe perpendicularly to its axis, both the pipes and the fittings (these must be clean if not please clean it with a cloth or alcohol-water solution) are heated with the welding machine (generally up to 260 °C +/- 10 °C) and they are joined without twisting. For proper connections please follow the table given below.

Outer Diameter (mm)	Heating Time (Secs)	Joining Time (Secs)	Cooling Time (Minutes)	Cooling Time (Minutes)
20	5	4	2	14.5
25	7	4	3	16
32	8	6	4	18
40	12	6	4	20.5
50	18	6	5	23.5
63	24	8	6	27.5
75	30	8	8	31
90	40	8	8	35.5
110	50	10	8	41.5
125	60	10	8	46.5

Length of the bending part is calculated by following equation

Le=k * d *xL
Le = Length of the bending part (U part, mm)
d = Outside diameter of the pipe (mm)
XL = Variation of length (mm)
k = Material dependent constant (15 for PP)
FP: Fixing point, support point, SP: Sliding point, support point.

Welding Techniques

After assembling to start the test procedure system should be checked please see the steps below.

• Whole valves in the system must be turned off.
• While filling the system, first main valve is opened slightly. Welding Technique :
• In order to avoid strong pressure impacts, pipe lines must be reduced air pressure from the utilization points at the highest and farthest sections.
• Separate tests are made by opening the valves of every zone. When finishing the assembly of the installation, quality control of the system must be made by following below test procedure. Pressure testing shall be carried out in two stages.

1) For the first stage, a test pressure equal to the permissible working pressure plus 5 bar shall be produced twice within 30 minutes at 10 minute intervals. Than it shall be checked whether, over a further period of 30 minutes, the pressure has dropped by more than 0,6 bar and leakage has occurred.

2) The second stage shall follow the first stage without interval and shall last 2 hours. Then, it shall be checked whether the pressure has dropped by more than 0.2 bar and the pipework shows any signs of leakage.

Finally, If pressure drops more than the values given above in the manometer where test is observed, then leakage occurs. Leaking pipe line must be controlled and replaced or re-tightened.

Installation and Expansion Compensation

Pipes can be installed under or above the floor. The installation is very easy and quick. However, one has to pay attention to the following simple points when installing polypropylene pipes.
Pipes have to discharge the radial and axial extensions; compensation may be done by using Omega and U parts. As an alternative, metal compensation also can used instead of the omega and U parts.

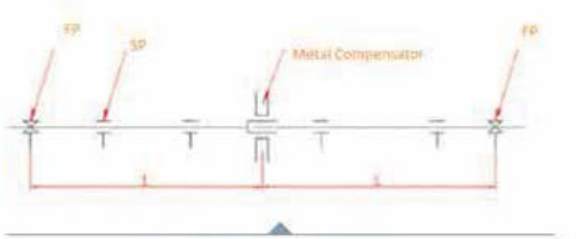


Figure 2- Metal Compensator

Figure 3-Distance of bending part

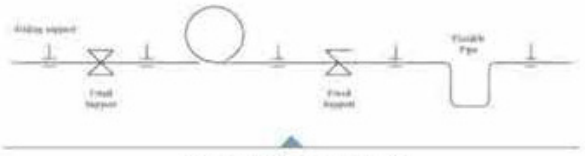
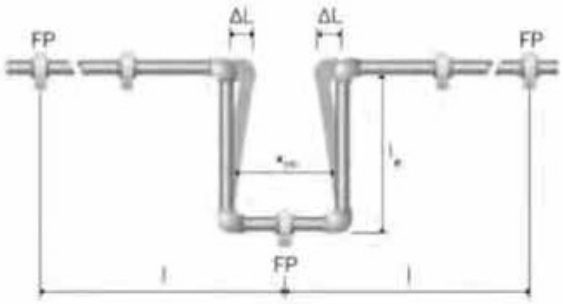
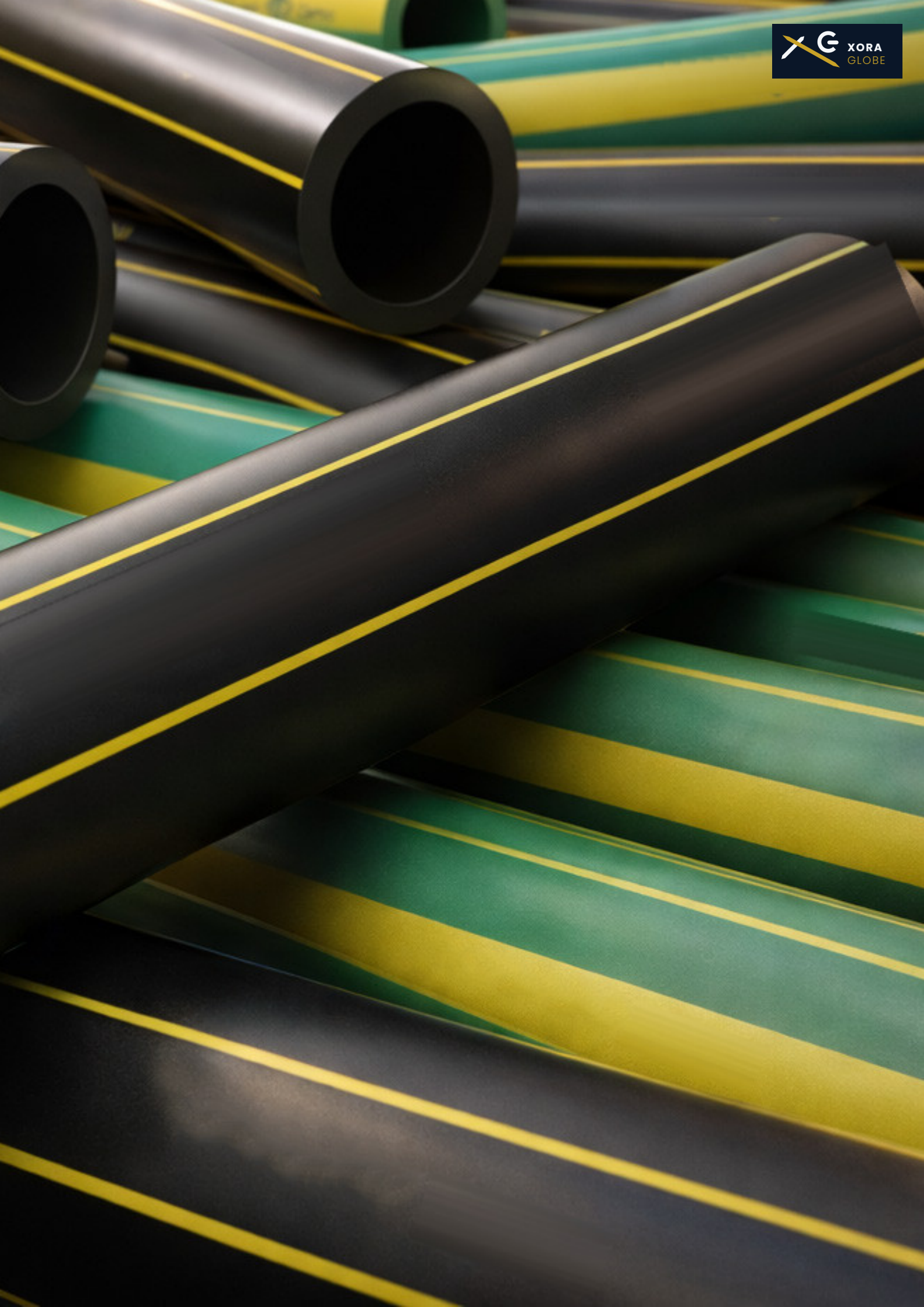
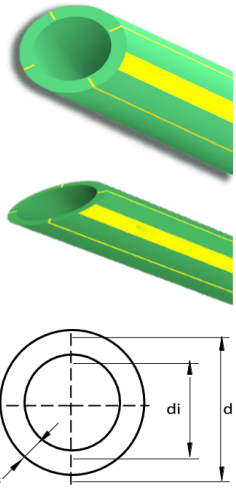


Figure 1- Omega and U part



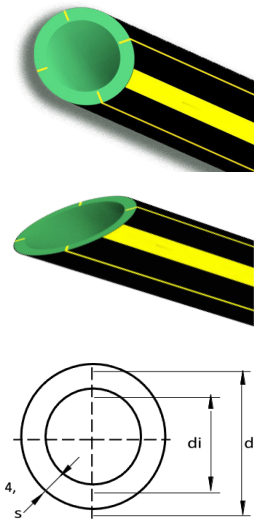

XORA
GLOBE
PIPES





Single layer PPR pipes

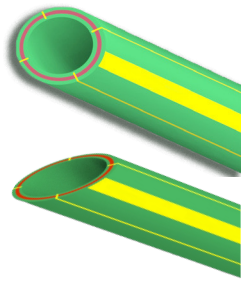
SDR	Dimension d [mm]	Wall thickness s [mm]	internal diameter di [mm]	Water convent [1/m]	Weight [kg]	PU [m]
6	20	3,4	13,2	0,137	0,172	100
	25	4,2	16,6	0,216	0,266	100
	32	5,4	21,2	0,353	0,434	60
	40	6,7	26,6	0,555	0,671	40
	50	8,3	33,4	0,876	1,040	20
	63	10,5	42,0	1,385	1,650	20
1.4	20	2,8	14,4	0,163	0,148	100
	25	3,5	18,0	0,254	0,230	100
	32	4,4	23,2	0,423	0,370	60
	40	5,5	29,0	0,660	0,575	40
	50	6,9	36,2	1,029	0,896	20
	63	8,6	45,8	1,647	1,410	20

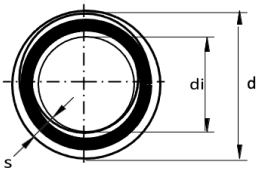


Single layer UV PPR pipes

SDR	Dimension d [mm]	Wall thickness s [mm]	internal diameter di [mm]	Water convent [1/m]	Weight [kg]	PU [m]
6	20	3,4	13,2	0,137	0,172	100
	25	4,2	16,6	0,216	0,266	100
	32	5,4	21,2	0,353	0,434	60
	40	6,7	26,6	0,555	0,671	40
	50	8,3	33,4	0,876	1,040	20
	63	10,5	42,0	1,385	1,650	20
1.4	20	2,8	14,4	0,163	0,148	100
	25	3,5	18,0	0,254	0,230	100
	32	4,4	23,2	0,423	0,370	60
	40	5,5	29,0	0,660	0,575	40
	50	6,9	36,2	1,029	0,896	20
	63	8,6	45,8	1,647	1,410	20

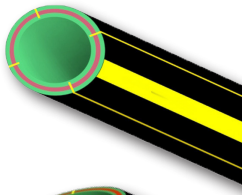
Multilayer GF PPR pipes

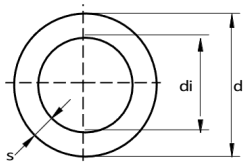




SDR	Dimension d [mm]	Wall thickness s [mm]	internal diameter di [mm]	Water convent [1/m]	Weight [kg]	PU [m]
6	20	3,4	13,2	0,137	0,172	100
	25	4,2	16,6	0,216	0,266	100
	32	5,4	21,2	0,353	0,434	60
	40	6,7	26,6	0,555	0,671	40
	50	8,3	33,4	0,876	1,040	20
	63	10,5	42,0	1,385	1,650	20
1.4	20	2,8	14,4	0,163	0,148	100
	25	3,5	18,0	0,254	0,230	100
	32	4,4	23,2	0,423	0,370	60
	40	5,5	29,0	0,660	0,575	40
	50	6,9	36,2	1,029	0,896	20
	63	8,6	45,8	1,647	1,410	20

Multilayer GF UV PPR pipes



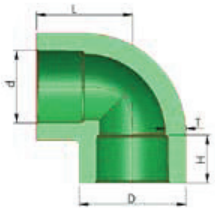


SDR	Dimension d [mm]	Wall thickness s [mm]	internal diameter di [mm]	Water convent [1/m]	Weight [kg]	PU [m]
6	20	3,4	13,2	0,137	0,172	100
	25	4,2	16,6	0,216	0,266	100
	32	5,4	21,2	0,353	0,434	60
	40	6,7	26,6	0,555	0,671	40
	50	8,3	33,4	0,876	1,040	20
	63	10,5	42,0	1,385	1,650	20
1.4	20	2,8	14,4	0,163	0,148	100
	25	3,5	18,0	0,254	0,230	100
	32	4,4	23,2	0,423	0,370	60
	40	5,5	29,0	0,660	0,575	40
	50	6,9	36,2	1,029	0,896	20
	63	8,6	45,8	1,647	1,410	20


XORA
GLOBE
FITTINGS


XORA
GLOBE

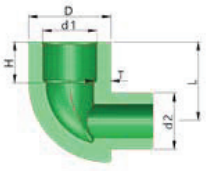




Elbow 90°

Size	d	D	L	H	T
20	19.1	29.5	28	14.5	6
25	24.2	35.6	32	16	6.6
32	31.1	45.3	38	20	8.5
50	48.9	67.1	52	25	10.5
63	61.8	85	65	28	13.5
75	73.7	99	75	31	14.5
110	108.5	153.2	100	38	24.7

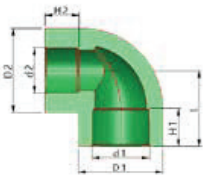




Male Elbow

Size	d1	D	L	H	T	d2
20	19.1	29.5	28	14.5	6	20
25	24.2	35.6	32	16	6.6	25

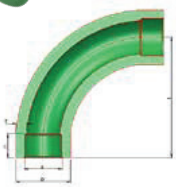




Red Elbow

Size	d1	D1	L	H1	T	d2	D2	H2
25/20	24.2	35.6	32	16	6.6	19.1	35.6	14.5
32/25	31.1	45.3	38	20	8.5	24.3	45.3	16





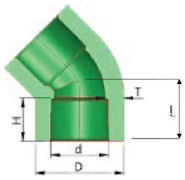
Sanitary Elbow

Size	d	D	L	H	T
25	24.2	35.6	70.2	16	6.6
32	31.1	45.3	100	20	8.5

Elbow 45°



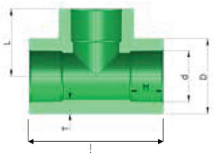
Size	d	D	L	H	T
20	19.1	29.5	20.5	14.5	6
25	24.2	35.6	23.4	16	6.6
32	31.1	45.3	29.6	20	8.5
50	48.9	67.1	39.4	25	10.5
63	61.8	85	46.1	28	13.5



Tee



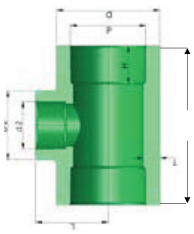
Size	d	D	L	H	C	T
20	19.1	29.5	28	14.5	56	6
25	24.2	35.6	32	16	64	6.6
32	31.1	45.3	38	20	76	8.5
50	48.9	67.1	52	25	104	10.5
63	61.8	85	65	28	130	13.5
75	73.7	99	75	31	150	14.5
110	108.5	153.2	100	38	200	24.7

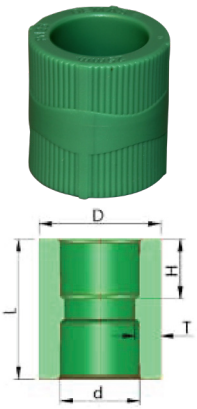


Tee Reducer



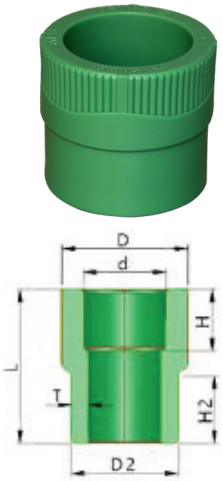
Size	d	D	d2	D2	H	C	L	T
25/20	19.1	29.5	24.2	35.6	16	64	32	6.6
32/25	24.2	35.6	31.1	45.3	20	76	34	8.5
32/20	19.1	29.5	31.1	45.3	20	76	34	8.5
50/25	24.2	35.6	48.9	67.1	25	104	43	10.5
50/32	31.1	45.3	48.9	67.1	25	104	47	10.5
63/25	24.2	35.6	61.8	85	28	130	57	13.5
63/32	31.1	45.3	61.8	85	28	130	57	13.5
63/50	48.9	67.1	61.8	85	28	130	62	13.5
75/32	31.1	45.3	73.7	99	31	150	65	14.5
75/50	48.9	67.1	73.7	99	31	150	69	14.5
75/63	61.8	85	73.7	99	31	150	72	14.5
110/50	48.9	67.1	108.5	153.2	38	200	100	24.7
110/63	61.8	85	108.5	153.2	38	200	100	24.7
110/75	73.7	99	108.5	153.2	38	200	100	24.7





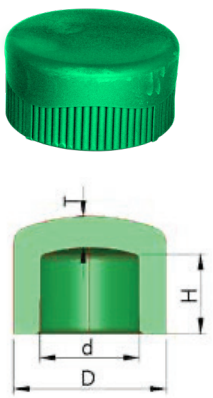
Coupling

Size	d	D	L	H	T
20	19.1	29.5	34	14.5	6
25	24.2	35.6	37	16	6.6
32	31.1	45.3	44	20	8.5
50	48.9	67.1	48	25	10.5
63	61.8	85	54	28	13.5
75	73.7	99	68	31	14.5
110	108.5	153.2	89	38	24.7



Reducer

Size	d	D	H	D2	H2	L	T
25/20	19.1	29.5	14.5	25	16	36	3.95
32/25	24.2	35.6	16	32	20	38	5
32/20	19.1	29.5	14.5	32	20	38	5
50/25	24.2	35.6	16	50	25	48.5	8.3
50/32	31.1	45.3	20	50	25	50.5	8.3
63/32	31.1	45.3	20	63	28	57.5	10.5
63/50	48.9	67.1	25	63	28	60	10.5
75/32	31.1	45.3	20	75	31	56	12.5
75/50	48.9	67.1	25	75	31	60	12.5
75/63	61.8	85	28	75	31	70	12.5
110/50	48.9	67.1	25	110	38	80	18.3
110/63	61.8	85	28	110	38	73	18.3
110/75	73.7	99	31	110	38	73	18.3

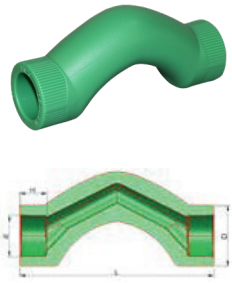


End Cap

Size	d	D	H	T
20	19.1	29.5	14.5	6
25	24.2	35.6	16	6.6
32	31.1	45.3	20	8.5
50	48.9	67.1	25	10.5
63	61.8	85	28	13.5

Crossover

Size	d	D	H	L
25	24.2	35.6	16	115.3
32	31.1	45.3	20	150



Long Crossover

Size	d	D	L
20	13	20	285
25	16	25	285



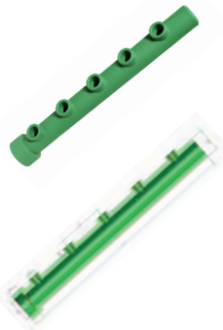
Spacer Clamp

Size	d	D	L
25	25	31	9.5
32	32	39	10.9
50	50	58	13.5
63	63	72	14



Manifold

Size	d1	D2	d2	H1	H2	S	L
50/25	48.9	50	24.2	25	16	85	400
63/25	61.8	63	24.2	28	16	123.4	645
63/32	61.8	63	31.1	28	20	123.4	645
50/32	48.9	50	24.2	28	20	85	400

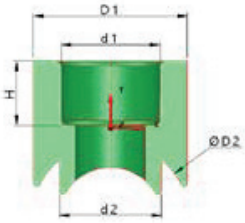




Test Plug

Size	d	G	H	L
1/2	30	1/2	13	87

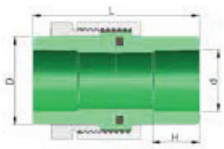




Saddle

Size	d1	D1	H	d2	Ø D2
25/50	24.2	35.6	16	25	50
25/63	24.2	35.6	16	25	63
25/75	24.2	35.6	16	25	75
25/110	24.2	35.6	16	25	110
32/50	31.1	45.3	20	32	50
32/63	31.1	45.3	20	32	63
32/75	31.1	45.3	20	32	75
32/110	31.1	45.3	20	32	110





Plastic Union

Size	d	D	L	H
25	24.2	35.6	70	16
32	31.1	45.3	85	20



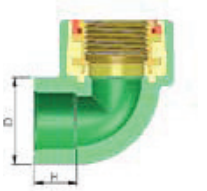
Tee Cross

Size	d	D	H	T
25	24.2	35.6	16	6.6
32	31.1	45.3	20	8.5


XORA
GLOBE
FITTINGS


XORA
GLOBE



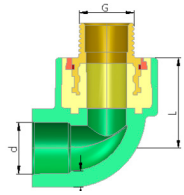


Elbow With Insert

Female Insert

Size	d	D	L	H	T	G
20-1/2	19.1	29.5	31	14.5	6	1/2
25-1/2	24.2	35.6	35	16	6.6	1/2
25-3/4	24.2	35.6	35	16	6.6	3/4
32-3/4	31.1	45.3	41	20	8.5	3/4
32-1	31.1	45.3	41	20	8.5	1



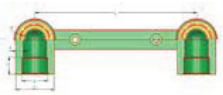


Elbow With Insert

Male Insert

Size	d	D	L	H	T	G
20-1/2	19.1	29.5	31	14.5	6	1/2
25-1/2	24.2	35.6	35	16	6.6	1/2
25-3/4	24.2	35.6	35	16	6.6	3/4
32-3/4	31.1	45.3	41	20	8.5	3/4
32-1	31.1	45.3	41	20	8.5	1





Ruler Elbow

Size	d	D	L	H	T	G
25 -1/2	24.2	35.6	150	16	6.6	1/2





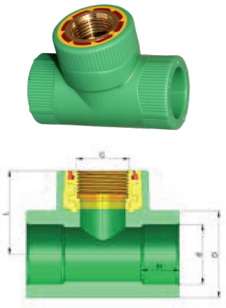
Movable Ruler Elbow

Size	d	D	L	H	T	G
25-1/2	24.2	35.6	100-135-150	16	6.6	1/2

Tee with Insert

Female Insert

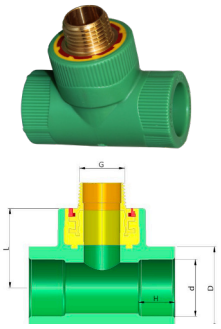
Size	d	D	L	H	T	G
20-1/2	19.1	29.5	34	14.5	6	1/2
25-1/2	24.2	35.6	37.5	16	6.6	1/2
25-3/4	24.2	35.6	36	16	6.6	3/4
32-3/4	31.1	45.3	43.5	20	8.5	3/4
32-1	31.1	45.3	43.5	20	8.5	1



Tee with Insert

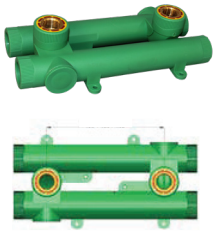
Male Insert

Size	d	D	L	H	T	G
20-1/2	19.1	29.5	34	14.5	6	1/2
25-1/2	24.2	35.6	37.5	16	6.6	1/2
25-3/4	24.2	35.6	36	16	6.6	3/4
32-3/4	31.1	45.3	43.5	20	8.5	3/4
32-1	31.1	45.3	43.5	20	8.5	1



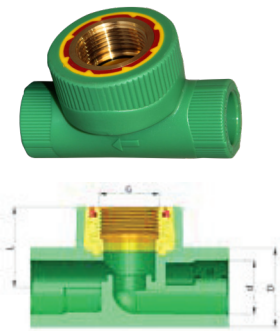
Ruler Tee

Size (L)	100-135-150



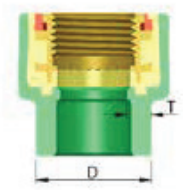
Valve Tee

Size	d	D	L	H	T	G
20-3/4	19.1	29.5	36	14.5	6	1/2
25-3/4	24.2	35.6	36	16	6.6	3/4
32-3/4	31.1	45.3	40	20	8.5	3/4



Adaptor

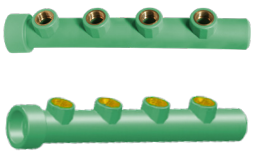




Size	d	D	L	H	T	G
20-1/2	19.1	29.5	36.5	14.5	6	1/2
25-1/2	24.2	35.6	38.5	16	6.6	1/2
25-3/4	24.2	35.6	41	16	6.6	3/4
32-3/4	31.1	45.3	48	20	8.5	3/4
32-1	31.1	45.3	48	20	8.5	1
50-$1^{1/2}$	48.9	67.1	55	25	10.5	$1^{1/2}$
63-2	61.8	85	75.5	28	13.5	2
75-$2^{1/2}$	73.7	99	76.5	31	14.5	$2^{1/2}$
110-4	108.5	153.2	83.5	38	24.7	4

Manifold with Insert

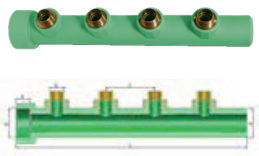
Female Insert



Size	d	D	G	H	S	L
50-3/4	50	48.9	3/4	25	85	400

Manifold with Insert

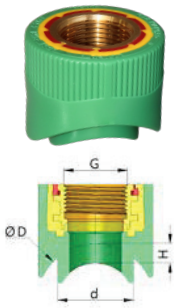
Male Insert



Size	d	D	G	H	S	L
50-3/4	50	48.9	3/4	25	85	400

Saddle with Insert

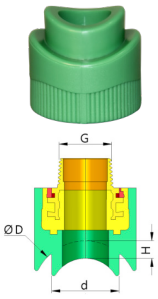
Female Insert



Size	d	D	H	G
50-3/4	32	50	10.5	3/4"
50-1"	32	50	10.5	1"

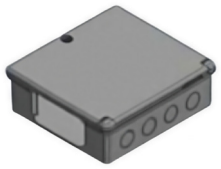
Saddle with Insert

Male Insert



Size	d	D	H	G
50-3/4	32	50	10.5	3/4"
50-1"	32	50	10.5	1"

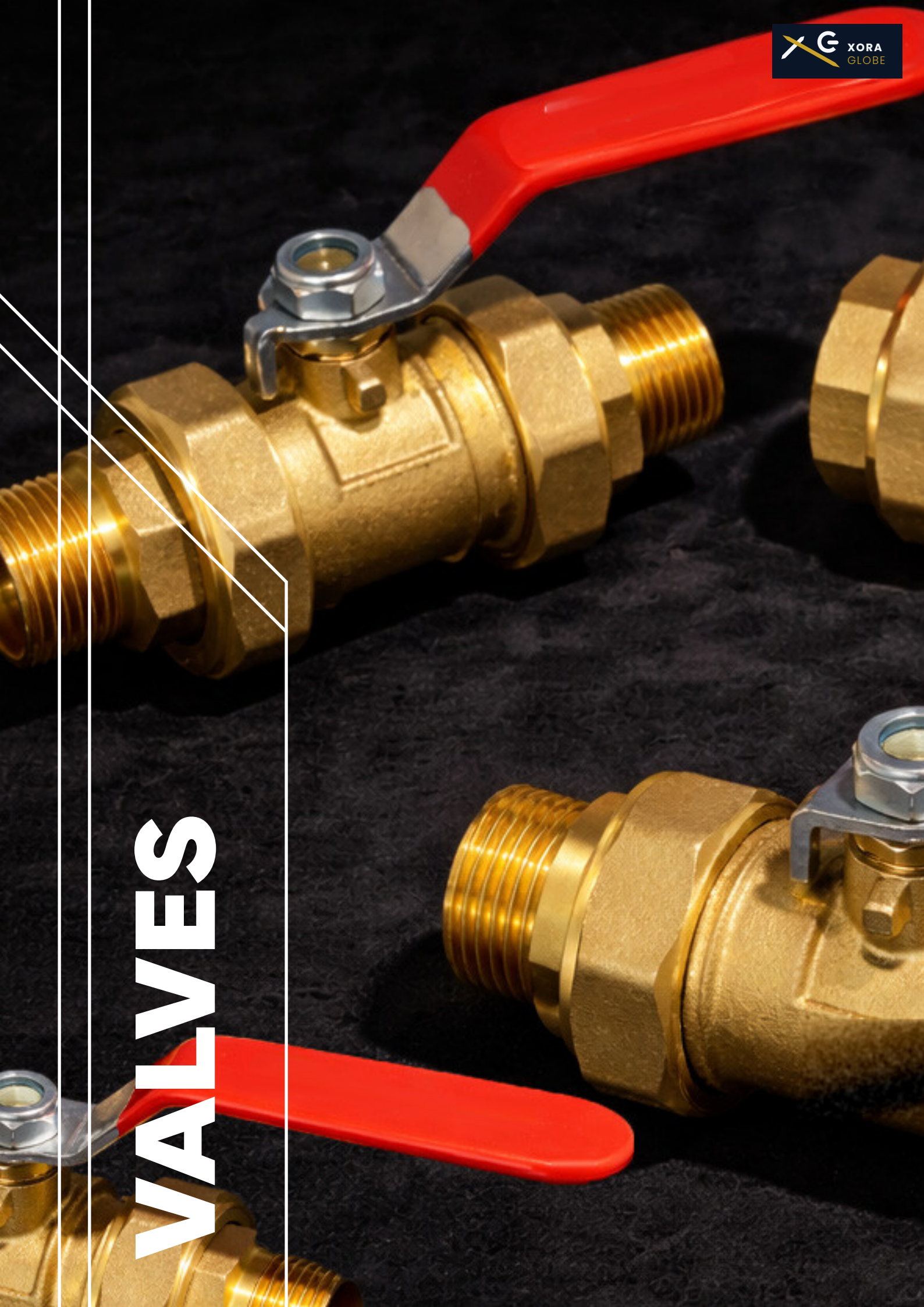
Battery Box

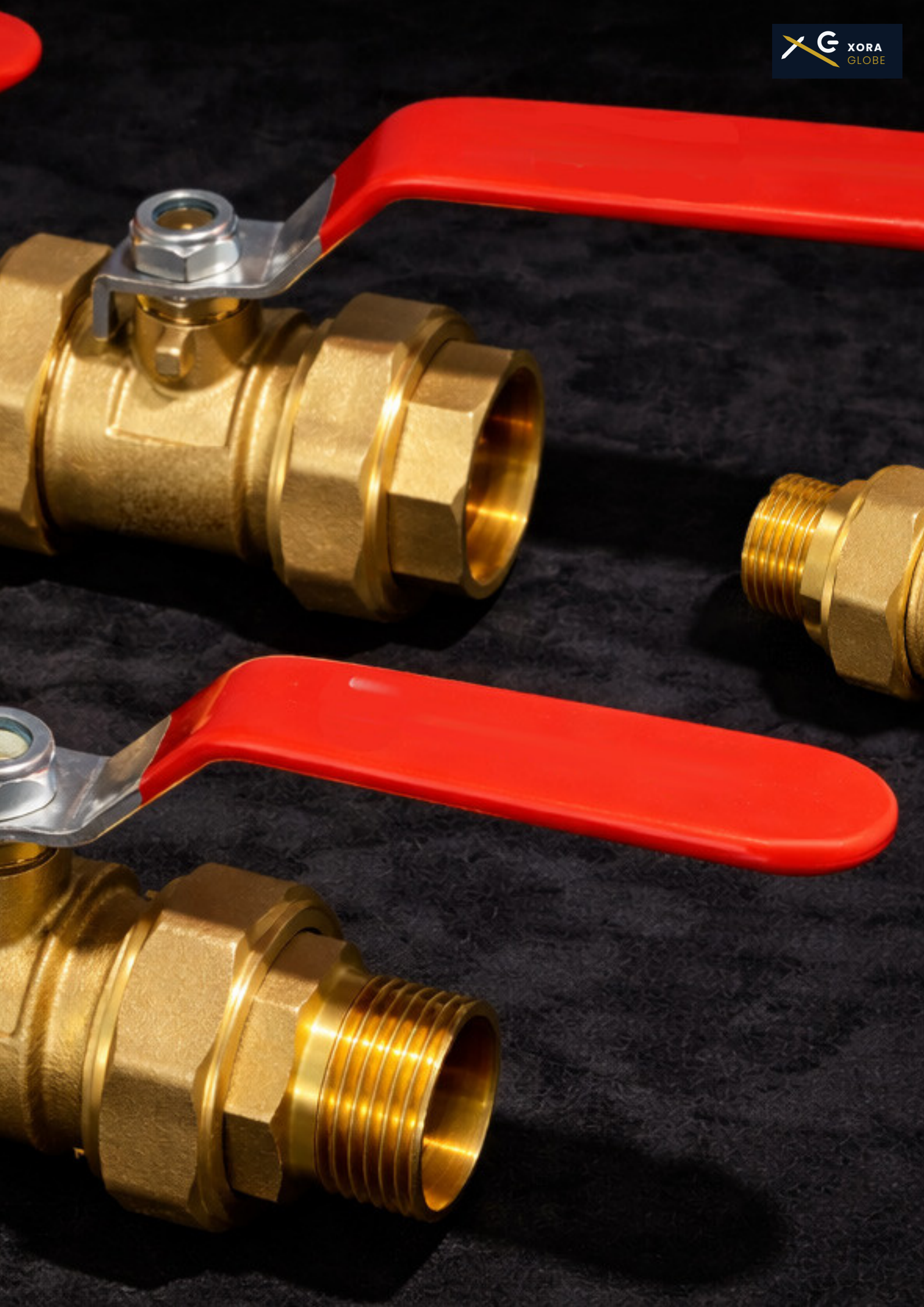


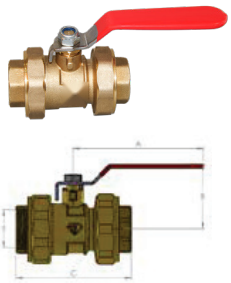
Size L	L	L1	25
25	400	450	140

XORA GLOBE

VALVES

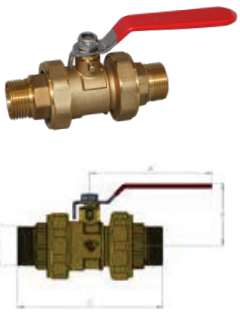



XORA
GLOBE



Ball Valve

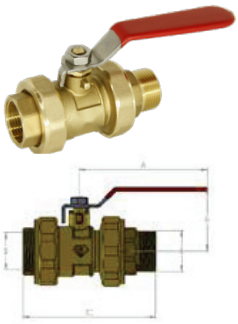
Size	A	B	C
G3/4"	99	50	84
G1"	104	51	92
G1.5"	136	75	119
G2	159	75	129



Ball Valve

M/M Double Thread

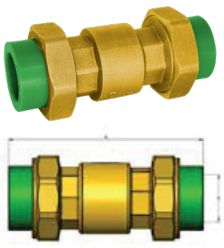
Size	A	B	C
G3/4"	99	50	111
G1"	104	51	123
G1.5"	136	75	155
G2	159	75	163



Ball Valve

M/F Double Thread

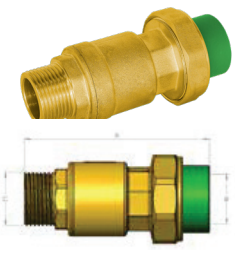
Size	A	B	C
G3/4"	99	50	98
G1"	104	51	108
G1.5"	136	75	137
G2	159	75	146



Check Valve

Double Union

Size	A	B
25	115	24.2
32	128	31.1



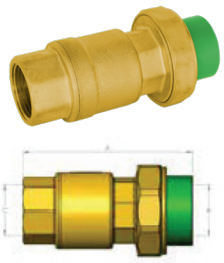
Check Valve

Male Nut

Size	A	B	C
25	98	24.2	G 3/4"
32	108	31.1	G 1"

Check Valve

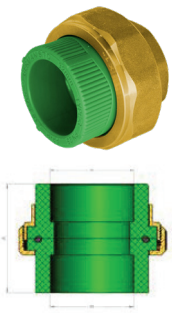
Female Nut



Size	A	B	C
25	92	24.2	G 3/4"
32	102	31.1	G 1"

Union

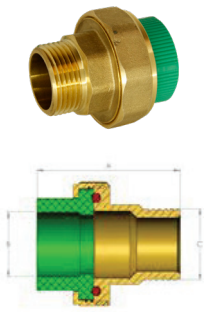
Two Flange



Size	A	B
25	42	24.2
32	50	31.1
50	63	48.9
63	79	61.8

Union

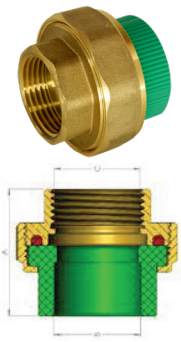
Male nut



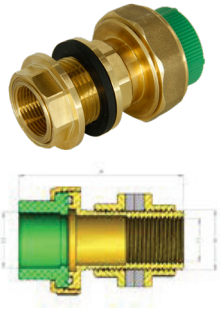
Size	A	B	C
25	53	24.2	G 3/4"
25	53	24.2	G 1"
32	62	31.1	G 1"
50	76	48.9	G 1.5"
63	84	61.8	G 2"

Union

Female Nut

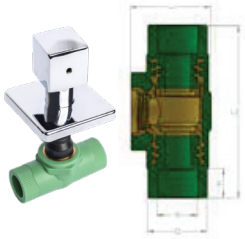


Size	A	B	C
25	53	24.2	G 3/4"
25	53	24.2	G 1"
32	62	31.1	G 1"
50	76	48.9	G 1.5"
63	84	61.8	G 2"



Tank Valve

Size	A	B	C	D
25	71	G 3/4"	G 1/2"	24.2
32	88	G 1"	G 3/4"	31.1
50	94	G 1.5"	G 1.25"	48.9



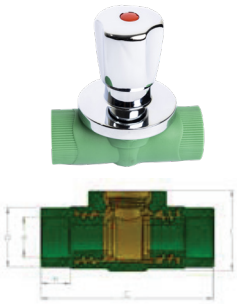
Alluwlua Valve

Size	D	d	H	L	C
25	35.6	24.2	16	45	99
32	45.3	31.1	20	56	115.5



Alluwlua Valve

Size	D	d	H	L	C
25	35.6	24.2	16	45	99
32	45.3	31.1	20	56	115.5



Aljawhara Valve

Size	D	d	H	L	C
20	29.5	19.1	14.5	45	91
25	35.6	24.2	16	45	99

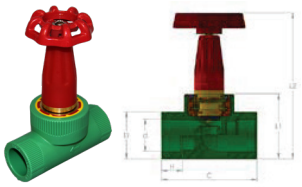


Almasa Valve

Size	D	d	H	L_1	L_2	C
20 (mm)-3/4	29.5	19.1	14.5	51	134	80
25 (mm)-3/4	35.6	24.2	16	54	137	90
32 (mm)-3/4	45.3	31.1	20	63	146	92

Wheel Valve

Size	D	d	H	L_1	L_2	C
20 (mm)-3/4	29.5	19.1	14.5	51	130	80
25 (mm)-3/4	35.6	24.2	16	54	134	90
32 (mm)-3/4	45.3	31.1	20	63	143	92



Male Insert

Size	1/2"	3/4"	1"	1.5"	2"



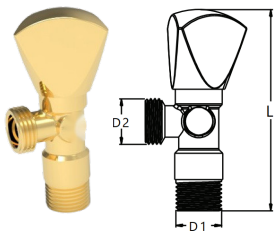
Female Insert

Size	1/2"	3/4"	1"	1.5"	2"



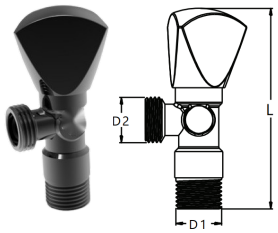

XORA
GLOBE
VALVES


XORA
GLOBE



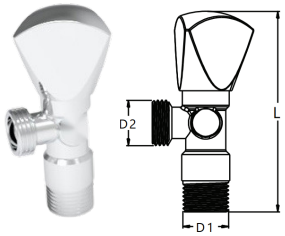
Rio Corner Valve Gold

Size	D1	D2	L
1/2"	1/2"	1/2"	90



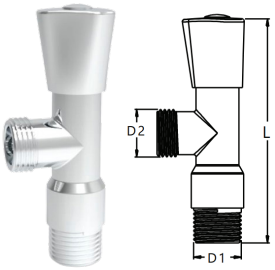
Rio Corner Valve Black

Size	D1	D2	L
1/2"	1/2"	1/2"	90



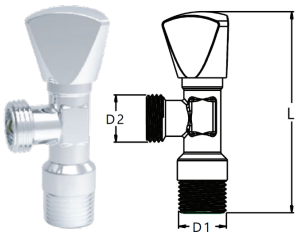
Rio Corner Valve Silver

Size	D1	D2	L
1/2"	1/2"	1/2"	90



Crystal Corner Valve

Size	D1	D2	L
1/2"	1/2"	1/2"	90

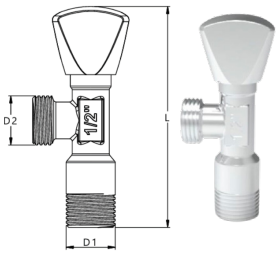


CR7 Angle Valve

Size	D1	D2	L
1/2"	1/2"	1/2"	90

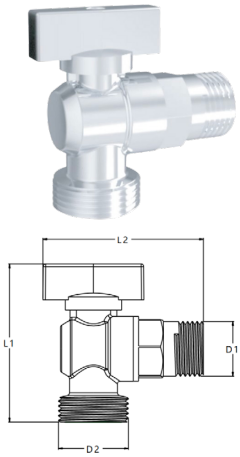
Elite Corner Valve

Size	D1	D2	L
1/2"	1/2"	1/2"	90



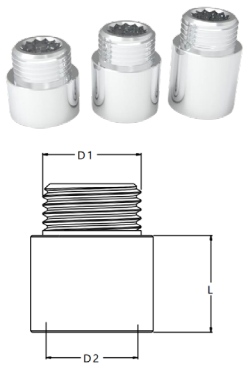
Washer Tap

Size	D1	D2	L1	L2
1/2"	1/2"	3/4"	60	60



Extension Joint

Size	D1	D2	L
10	1/2"	1/2"	10
15	1/2"	1/2"	15
20	1/2"	1/2"	20
25	1/2"	1/2"	25
30	1/2"	1/2"	30
35	1/2"	1/2"	35
40	1/2"	1/2"	40




LAB TESTING



PP-R pipe Lab Test

Testing and sample measurements

1- Test conditions

2- Surface condition

The internal and external surfaces of the pipe shall be examined against the light without optical aids.

3- Dimensions

The mean outside diameter of the pipe shall be determined to the nearest 0,1 mm at both ends of the pipe by measuring the circumference. The wall thicknesses of the pipe shall be determined to the nearest 0,1 mm at 4 points at each pipe end with the measurement points being distributed as uniformly as possible around the circumference of the pipe. The measurements shall be carried out at (23 ± 2) °C.

4- Out-of-roundness (ovality)

Out-of-roundness (the difference between the measured maximum outside diameter and the measured minimum outside diameter in the same cross-section of the pipe) shall be measured to the nearest 0,1 mm immediately after production.

Long-Term Hydrostatic Pressure Test



1- Test Conditions

Test must carry out at specified test temperature, Environment (air or water) and Hoop stress value (∂0) within Stressing period (failure time/ hr.) as

Pipe Material	Environment	Test Temperature	Hoop Stress	Stressing Period (Failure Time)
PP-R	Air or water	20	16	1
	Air or water	95	3.8	165
	Air or water	95	3.5	1000
	Air	110	19	8760a

1- Sample Preparations

Sample dimension Pipe sample length must be specified the basis of pipe size as:

for $d \leq$ 250 mm: $l_1 \approx 3\,d + 2\,l_5 + 250$ mm

for $d >$ 250 mm: $l_1 \approx 1\,000$ mm $+ 2\,l_5$

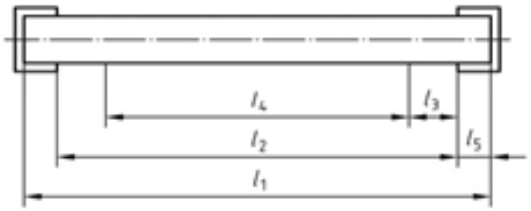


Figure 5 — Test pieces for long-term hydrostatic test

3- Test Steps

1- Measure the wall thickness e to the nearest 0,1 mm at eight points distributed along l 4, and the outside diameter d to the nearest 0,1 mm by measuring the pipe circumference at three points, and then determine the minimum wall thickness e min and mean outside diameter dm.
2- Fit the pipe with caps at both ends.
3- Fill the pipe with water at the test temperature specified.
4- Steadily increase the pressure in the pipe in the bath so that the specified test pressure is reached within 1 minute.
5- Calculate the test pressure from (p=2*emin ∂0/d-emin).

sult: the must exceed the specified pressure at specified temperature within test period.

Impact Test:





1- Test Conditions

• The impact strength test shall be carried out according to DIN EN ISO 179-1 on 10 test pieces using a 15 J pendulum impact testing machine with the blow being applied to the external pipe surface or the machined side. • The test shall be carried out at (0 ± 2) °C
2- Sample preparation
• Prepare ten samples with its dimension according to pipe size.
• Sample dimension
Pipe sample dimension be specified the basis of pipe size as:

Table 3 — Impact strength test pieces

Type of test piece	Pipe		Test piece			Distance between supports
	outside diameter d mm	wall thickness e mm	length mm	width mm	height mm	$^{+0,5}_{0}$ mm
1	< 25	e	Pipe section (100 ± 2) mm long			70
2	≥ 25	≤ 4,2	50 ± 1	6 ± 0,2	e	40
3	> 25	> 4,2	120 ± 2	15 ± 0,5	max. 10,5	70

1- Test Steps

1- Put the sample between two supports according to specified dimension 2- Lift the arm until reach its limit switch
3- Hit the ten samples one by one with 15 joule kinetic energy
Result: the test is passed when there no break of test samples and it shall be established whether the test pieces fail. If more than one test piece fails, the impact test is rejected.

Heat reversion Test

1- Test Conditions

Test must carry out at specified test temperature and stressing period as :

Pipe material	Test temperature©	Stressing period(min)
PP-R	135+2	1202

2- Sample Preparation

A sample of 20 cm length is prepared from the pipe and a 10 cm long mark is placed leaving a gap between the end of the pipe and the beginning of the mark.

3- Test Steps

1- Wait until the heater reach test temperature
2- Put the sample in the oven
3- Wait until the test time is complete
4- Take the sample out of the oven then wait until the sample completely cool 5- Measure the distance between two marks
Result: the distance difference between two marks before test and after the sample loss its latent heat (shrinkage) must not exceed 2% to initial distance.

Tensile Test

This part of ISO6259 specifies a method of determining the tensile properties of polyolefin
(polyethylene, cross-linked polyethylene, polypropylene, and polybutene) pipes, and the following properties:
— the stress at yield; — the elongation at break.

1- Test Condition

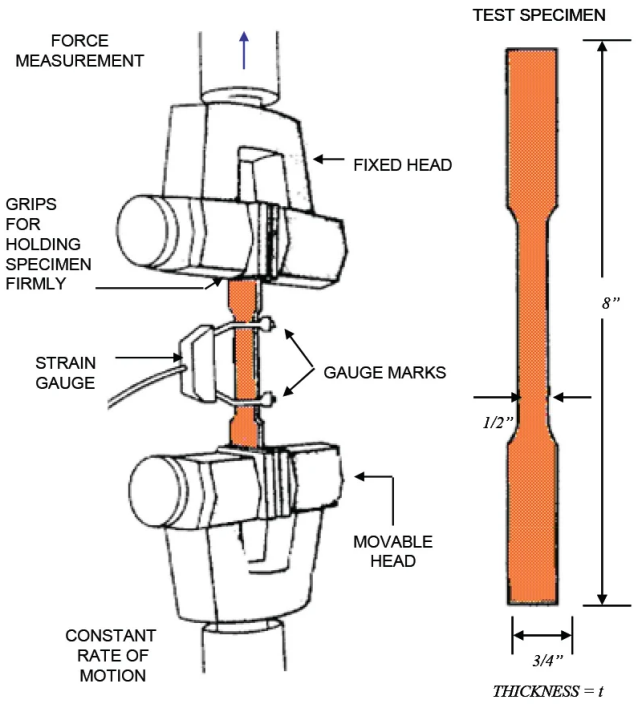
1-The test pieces shall be obtained by die cutting or machining. Note 1 when the thickness of the pipe is less than or equal to 12 mm the test pieces are to be machined preferably.
2-NOTE 2 care ought to be taken when using die cutting to avoid damaging the test specimen or producing non parallel sides.
3-The test pieces shall not be tested within a period of 15 h after the production of the pipes, except for manufacturing checks.
4-Prior to testing, condition the test pieces in air at a temperature of (23+-2)°C.
5- Test speed depends on the constituent material and wall thickness of the pipe and shall be as specified in the applicable product standard as

Table 5 — Test speeds

Nominal wall thickness of pipe e_n mm	Type of test piece	Test speed mm/min
$e_n \leq 5$	Type 2	100
$5 < e_n \leq 12$	Type 1	50
$12 < e_n \leq 25$	Type 1 Type 3	25 10
$e_n > 25$	Type 3	10

6-The surfaces and edges should be free of scratches or pits, checked by visual observation before testing.



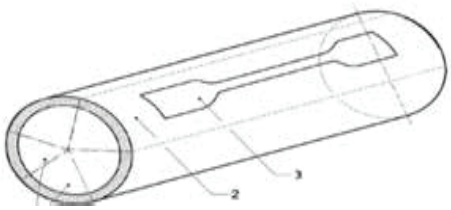


2- Sample Preparation

1- take sections of pipe of the appropriate length according to the type of test piece to be used
2- Cut strips from the pipe section as supplied which has not been heated or flattened, so that their axes are parallel to the axis of the pipe.
3- Cut strips from the pipe section in such a way that they are equally distributed around the circumference of the pipe
4- The minimum number of test pieces is given in Table 1. When it is not possible to obtain the required number of strips from around the circumference of one pipe section, additional strips shall be taken from another section of the pipe.

Nominal outside diameter, dn mm	15 < dn ≤ 32	32 < dn ≤ 63	>63
Number of strips	2	3	

5- Select the test pieces from the center of the strips taken from the length of pipe either by die cutting or machining as Cutting method Use the cutting die (5.6) with clean cutting edges, free from notches, with the profile, Cut the test piece from the strip (see 6.2.1). Care should be taken when using die cutting to avoid damaging the test piece or producing non-parallel sides. As using machining reduce the specimen by milling, where necessary, using a milling jig. The shape of the milling cutter and the machining conditions (speed of rotation and advance) are at the discretion of the operator. They shall, however, be chosen so as to avoid excessive heating of the test piece and deterioration of its surface such as cracks, scratches, or other visible flaws



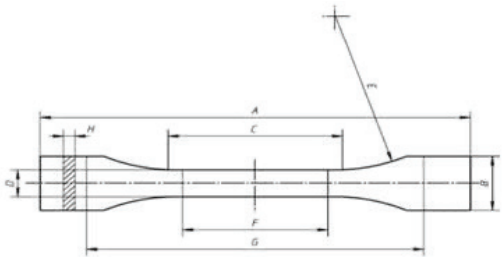


Figure 1 — Type 1 test piece

Table 1 — Dimensions of Type 1 test pieces

Symbol	Description	Dimensions mm
A	Overall length (min.)	150
B	Width of ends[a]	20 ± 1
C	Length of narrow, parallel-sided portion	60 ± 1
D	Width of narrow, parallel-sided portion	10 ± 0,2
E	Radius	60 ± 1
F	Gauge length	50 ± 1
G	Initial distance between grips	115 ± 5
H	Thickness	that of the pipe

[a] This dimension can be larger in accordance with Note 2 of 6.1.2.

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3- Test Steps

1- Carry out the following procedure at a temperature of (23 ± 2) °C.
2- Measure, to within 0,01 mm, the width and minimum thickness of the central part of the test piece between the gauge marks. Calculate the minimum cross-sectional area.
3- Place the test piece in the tensile-testing machine in such a way that the axis of the test piece coincides more or less with the direction of the tensile force. Clamp the grips) uniformly and tightly to avoid any slippage of the test piece
4- When using an extensometer monitor the gauge length (the part between the gauge marks) of the test piece.
5- Apply a pre-stress when necessary. Start the test at the specified test speed
6- Record the stress/strain curve up to the rupture of the test piece and record on this curve the force at the yield point and the gauge length at rupture, or note directly the value of the force at yield and the gauge length after rupture
7- Discard any test pieces which slip in the grips, those which break at one of the shoulders and those which deform, thus changing the width of the shoulders, and retest an identical number of test pieces.

Melt Flow Testing





The Test System Consists Of:

- A heated barrel with a removable die at one end
- Temperature control of the barrel
- A piston to fit in the barrel.

Optional items Include:

- Masses to apply various weights
- An encoder to measure the deflection of the piston (required for melt volume rate measurement)
- A die plugs to keep thinner materials in the barrel until test start
- A weight Lifter to apply weight sets automatically at test start
- Hastelloy (non corrosive) barrel for chemically aggressive materials

1- Sample Preparation

A small sample of about 5 grams is heated above its melting or softening point and forced to flow through a capillary using a piston actuated by a specified weight, usually 2.16 kg or 5 kg

2- Test method

The weight of melt in grams flowing through the capillary in 10 minutes is the melt flow index at 230 c

QUALITY & COMPLIANCE

Certifications & approvals

The manufacturer behind this range holds the certifications and approvals below.

ISO 9001

QUALITY MANAGEMENT SYSTEM

Certified by ABS Global (EGAC-accredited, IAF member). Scope: manufacture of plastic and copper pipes, valves and fittings for water, pressure and sewage connections, and of moulds and machine parts.

EOS

EGYPTIAN ORGANIZATION FOR STANDARDIZATION & QUALITY

The ISO 9001 certificate is registered with the EOS international certificates registration unit.

NOPWASD

NATIONAL ORGANIZATION FOR POTABLE WATER & SANITARY DRAINAGE

Production-facility approval for polypropylene (PPR) pipes and PPR fittings, 20–63 mm, in various pressure classes, to Egyptian and international standards.

Standards. Product standards stated by the manufacturer: DIN 8077 / 8078 and EN ISO 15874.

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