VASEN

VASEN PPR
PIPING SYSTEM

http://www.china-pipes.com

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CHAPTER 1: COMPANY PROFILE

ABOUT US

Weixing group was established in 1976, after a steady development, it grew to a state-level conglomerate group. More than 25,000 current employees are recruited by Weixing group and its total property amounts over 3 billion USD with the sales volume over 2 billion USD. Weixing group owns 6 industries and 9 industry parks and 2 listed companies. Zhejiang Weixing New Building Materials Co., Ltd. is one listed.

Zhejiang Weixing New Building Materials Co., Ltd. (hereinafter referred to as Weixing NBM), whose International Brand is VASEN, was established in 1999 and listed in 2010. We have complete product line, massive scale of production, smart management branding. Meanwhile, we have taken the positions of vice-president of China Plastic Process Industry Association and vice-chairman of China Plastic Piping Association for successive years.

Weixing NBM has production bases in Zhejiang, Shanghai, Tianjin and Chongqing. The core products are PP-R piping system, PE piping system, PB and PE-RT piping system and PE double wall corrugated piping system, etc., which are widely applied in the fields of water supply, drainage, gas, heating, the electric power transmission, mine and so on.

Through great efforts, Weixing NBM takes the lead in passing ISO9001 Quality Management System and ISO14001 Environmental Management System, DVGW, TUV, CE, AENOR, WRAS and other international certificates. The test center also obtained the certificate of CNAS (China National Accreditation Service for Conformity Assessment).

The sales network of Weixing NBM covers the China domestic market and 5 continents, 12 regions and 40 countries.

PARTNERS

basell, DSM, Autofina, Drossbach, Ritmo, KRAUSSMAFFEI, battenfeld-cincinnati, MSA, BOREALIS

FACTORIES

Linhai

Linhai (Dayang)

Shanghai

Tianjin

Chongqing

MANUFACTURE CAPABILITY

The production lines are imported from abroad, with high automation level, accurate quality control process, which ensures the performance of offline products can fully meet the standards.

Pipes

Complete set of specialized pipe-extruders introduced from Germany.

- BMC-TOUCH Control System, which monitors production data, and adjusts technical process.
- Gravity Measurement System, which accurately controls pipe meter weight.
- Ultrasonic Thickness Gauge, which precisely controls pipe outer diameter.
- Spiral Die Head, with excellent plasticizing capacity.

Injection Fittings

Full-automatic Injection Molding Machine manufactured by national leading manufacturer.

- Robot Automatic Production, which reduces personal factor influence.
- Computer Control, which ensures accurate dimension, stable performance.
- Moldflow simulation design, which guarantees die head quality at source.
- More than 5000 sets of molds, which fully guarantee the convenience of project application.

Electrofusion Fittings

The key equipment of electrofusion fittings is winding machines, which introduced from U.K. And all the electrofusion fittings are designed and produced according to European standards.

INNOVATION

R&D ORIENTATION

Water Supply System
Drainage System
Industrial Piping System
Plastic Material Research

R&D ACHIVEMENT

30+ new developments
50+ innovation technology
200+ patents
30+ National Standards & Industrial Standards drafter

CHAPTER 2: FEATURES

PP-R MATERIAL

Development History of PP-R Material

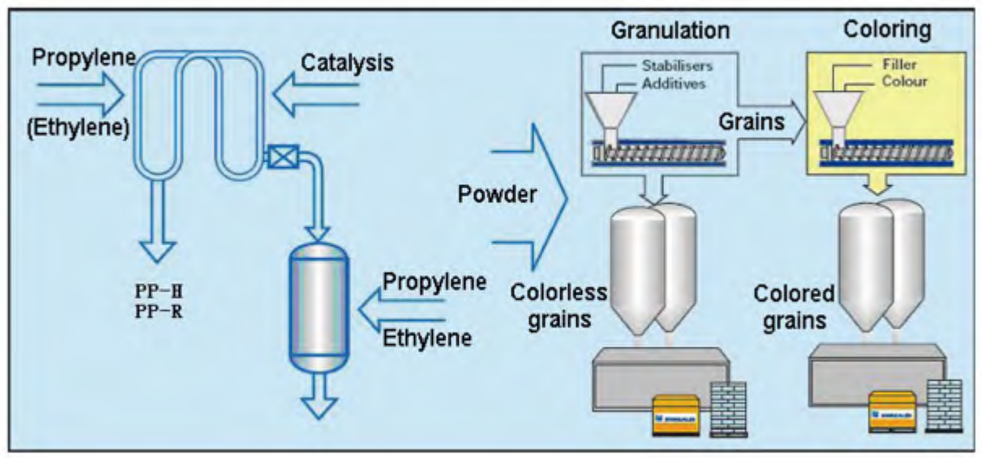
PP-R is short for polypropylene random copolymer, also named as polypropylene type 3.

What is type 3?

In 1957, Italian firstly realized polypropylene industrial production. Due to its excellent heat-resistant, pressure-resistant, corrosion-resistant performance, it is deeply favored by the users. In late 1970s, polypropylene material has deemed to be the future direction of building cold and hot water supply pipeline. That is the first generation of polypropylene material, which named as PP-H, short for homo-polypropylene. However, though it has excellent heat-resistance (<110℃), pressure resistance (MRS=10MPa) performance, its poor low-temperature impact resistance makes it not suitable for the building cold and hot water supply pipeline.

Therefore, people tried to improve its low-temperature impact resistance through the modification of PP-H material. Then we have the second generation of polypropylene, which is obtained through adding a certain amount of vinyl monomer during the polymerization process of polypropylene. It is named as PP-B or PP-H, which is short for block copolymerized polypropylene. Although PP-B has a great change in low-temperature impact resistance, it sacrificed its heat resistance performance. PP-B can only apply in cold water pipeline or the hot water pipeline in low pressure condition.

In late 1980s, some European petrochemical corporations break the traditional polypropylene liquid-phase polymerization process, adopting the advanced gas phase polymerization technology, which synthesized random copolymer of propylene and ethylene. The random copolymer is named as polypropylene random copolymer, PP-R in short, wherein the ethylene content is less than 5%, which is randomly distributed in the polypropylene molecular chain. This PP-R material, which is created by the new polymerization process, taking into account the heat resistance of PP-H and the low-temperature impact properties of PP-B, is suitable for the manufacture of hot and cold water supply pipeline system inside the building. That is why sometimes we call it polypropylene type 3.



Material Characteristics of PP-R

Table 1

Typical Properties	Method	Value	Unit
Physical			
Density	ISO 1183	0.897	g/cm³
Melt flow rate (MFR)	ISO 1133		
(230°C/2.16Kg)		0.3	g/10 min
(190°C/5.0kg)		0.5	g/10 min
(230°C/5.0kg)		1.3	g/10 min
Mechanical			
Tensile Modulus (23 °C, v = 1 mm/min, Secant)	ISO 527 -1, -2	850	MPa
Tensile Stress at Yield (23 °C, v = 50 mm/min)	ISO 527 -1, -2	24	MPa
Tensile Strain at Yield (23 °C, v = 50 mm/min)	ISO 527 -1, -2	13	%
MRS classification	ISO 9080	10	MPa
Impact			
Charpy notched impact strength	ISO 179		
(-20 °C)		2.7	kJ/m²
(23 °C)		89	kJ/m²
(0 °C)		12	kJ/m²
Hardness			
Ball indentation hardness (H 132/30)	ISO 2039 -1	45	MPa
Thermal			
Vicat softening temperature (VST/A/50 K/h (10 N))	ISO 306	132	°C
Melting temperature	DSC	139	°C

Note: ISO 11357 - 3: heating rate: 10K/min, 2nd heating

Chemical Resistance of PP-R

Rating system

This chart rates the chemical resistance of Pro-fax polypropylene resin according to the following code:

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

A = Negligible effect

Should be suitable for all applications where these environmental conditions exist.

B = Limited absorption or attack

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

C = Extensive absorption and/or rapid permeation

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

D = Extensive attack

The specimen dissolves or disintegrates. Polypropylene is not recommended.

Table 2

Environment	Conc. %	Temp., °C 20	60	100
Acetic acid (glacial)	97	A	B (80°C)	–
Acetic acid	50	A	A (80°C)	–
Acetic acid	10	A	A	–
Acetone	100	A	A	–
Acetophenone	100	B	B	–
Acriflavine (2% solution in H_2O)	2	A	A	– (80°C)
Acrylic emulsions		A	A	–
Aluminum chloride		A	A	–
Aluminum fluoride		A	A	–
Aluminum sulfate		A	A	–
Alums (all types)		A	A	–
Ammonia (aqueous)	30	A	–	–
Ammonia gas (dry)		A	A	–
Ammonium carbonate	Satd.	A	A	–
Ammonium chloride	Satd.	A	A	–
Ammonium fluoride	20	A	A	–
Ammonium hydroxide	10	A	A	–
Ammonium metaphosphate	Satd.	A	A	–
Ammonium nitrate	Satd.	A	A	–
Ammonium persulfate	Satd.	A	A	–
Ammonium sulfate	Satd.	A	A	–
Ammonium sulfide	Satd.	A	A	–
Ammonium thiocyanate	Satd.	A	A	–
Amyl acetate	100	B	C	–
Amyl alcohol	100	A	B	–
Amyl chloride	100	C	C	–
Aniline	100	A	A	–
Anisole	100	B	B	–
Antimony chloride		A	A	–

Environment	Conc. %	Temp., °C 20	60	100
Aviation fuel (115/145 octane)	100	B	C	–
Aviation turbine fuel	100	B	C	–
Barium carbonate	Satd.	A	A	–
Barium chloride	Satd.	A	A	–
Barium hydroxide		A	A	–
Barium sulfate	Satd.	A	A	–
Barium sulfide	Satd.	A	A	–
Beer		A	A	–
Benzene	100	B	C	C
Benzoic acid	A	A	–	
Benzyl alcohol		A	A (80°C)	–
Bismuth carbonate	Satd.	A	A	–
Borax		A	A	–
Boric acid		A	A	–
Brine	Satd.	A	A	–
Bromine liquid	100	D	–	–
Bromine water	(a)	C	–	–
Butyl acetate	100	C	C	–
Butyl alcohol	100	A	A	–
Calcium carbonate	Satd.	A	A	–
Calcium chlorate	Satd.	A	A	–
Calcium chloride	50	A	A	–
Calcium hydroxide		A	A	–
Calcium hypochlorite bleach	20[a]	A	B	–
Calcium nitrate		A	A	–
Calcium phosphate	50	A	–	–
Calcium sulfate		A	A	–
Calcium sulfite		A	A	–
Carbon dioxide (dry)		A	A	–
Carbon dioxide (wet)		A	A	–

Environment	Conc. %	Temp., °C 20	60	100
Carbon disulfide	100	B	C	–
Carbon monoxide		A	A	–
Carbon tetrachloride	100	C	C	C
Carbonic acid		A	A	–
Castor oil		A	–	–
Cetyl alcohol	100	A	–	–
Chlorine (gas)	100	D	D	–
Chlorobenzene	100	C	C	–
Chloroform	100	C	D	D
Chlorosulfonic acid	100	D	D	D
Chrome alum		A	A	–
Chromic acid	80[a]	A	–	–
Chromic acid	50[a]	A	A	–
Chromic acid	10[a]	A	A	–
Chromic/sulfuric acid		D	D	–
Cider		A	A	–
Citric acid	10	A	A	–
Copper chloride	Satd.	A	A	–
Copper cyanide	Satd.	A	A	–
Copper fluoride	Satd.	A	A	–
Copper nitrate	Satd.	A	A	–
Copper sulfate	Satd.	A	A	–
Cottonseed oil		A	A	–
Cuprous chloride	Satd.	A	A	–
Cyclohexanol	100	A	B	–
Cyclohexanone	100	B	C	–
Decalin	100	C	C	C
Detergents	2	A	A	A
Developers (photographic)		A	A	–
Dibutyl phthalate	100	A	B	D
Dichloroethylene	100	A	–	–
Diethanolamine	100	A	A	–
Diisooctyl phthalate	100	A	A	–
Emulsifiers		A	A	–
Ethanolamine	100	A	A	–
Ethyl acetate	100	B	B	–
Ethyl alcohol	96	A	A (80°C)	–
Ethyl chloride	100	C	C	–
Ethylene dichloride	100	B	–	–
Ethylene glycol		A	A	–
Ethylene oxide	100	B (10°C)	–	–
Ethyl ether	100	B	–	–
Fatty acids (C_6)	100	A	A	–
Ferric chloride	Satd.	A	A	–
Ferric nitrate	Satd.	A	A	–
Ferric sulfate	Satd.	A	A	–

Environment	Conc. %	Temp., °C 20	60	100
Ferrous chloride	Satd.	A	A	–
Ferrous sulfate	Satd.	A	A	–
Fluorosilicic acid		A	A	–
Formaldehyde	40	A	A	–
Formic acid	100	A	–	–
Formic acid	10	A	A	–
Fructose		A	A	–
Fruit juices		A	A	–
Furfural	100	C	C	–
Gas liquor		C	–	–
Gasoline	100	B	C	C
Gearbox oil	100	A	B	–
Gelatin		A	A	–
Glucose	20	A	A	–
Glycerin	100	A	A	A
Glycol		A	A	–
Hexane	100	A	B	–
Hydrobromic acid	50[a]	A	A	–
Hydrochloric acid	30[a]	A	B	D
Hydrochloric acid	20	A	A (80°C)	–
Hydrochloric acid	10	A	A	B
Hydrochloric acid	2	A	A	A
50-50 HCl-HNO_3	(a)	B	D (80°C)	–
Hydrofluoric acid	40	A	–	–
Hydrofluoric acid	60[a]	A	A (40°C)	–
Hydrogen chloride gas (dry)	100	A	A	–
Hydrogen peroxide	30	A	–	D
Hydrogen peroxide	10	A	B	–
Hydrogen peroxide	3	A	–	–
Hydrogen sulfide		A	A	–
Hydroquinone		A	A	–
Inks		A	A	–
Iodine tincture		A	–	–
Isooctane	100	C	C	–
Isopropyl alcohol	100	A	A	–
Ketones		A	–	–
Lactic acid	20	A	A	–
Lanolin	100	A	A	–
Lead acetate	Satd.	A	A	–
Linseed oil	100	A	A	–
Lubricating oil	100	A	B	–

Environment	Conc. %	Temp., °C 20	60	100
Magenta dye (aqueous solution)	2	A	A Some staining	–
Magnesium carbonate	Satd.	A	A	–
Magnesium chloride	Satd.	A	A	–
Magnesium hydroxide	Satd.	A	A	–
Magnesium nitrate	Satd.	A	A	–
Magnesium sulfate	Satd.	A	A	–
Magnesium sulfite	Satd.	A	A	–
Meat juices		A	A	–
Mercuric chloride	40	A	A	–
Mercuric cyanide	Satd.	A	A	–
Mercurous nitrate	Satd.	A	A	–
Mercury	100	A	A	–
Methyl alcohol	100	A	A	–
Methylene chloride	100	A	–	–
Methyl ethyl ketone	100	A	B	–
Milk and its products		A	A	A
Mineral oil	100	A	B	–
Molasses		A	A	–
Motor oil	100	A	B	–
Naphthalene	100	A	A	A
Nickel chloride	Satd.	A	A	–
Nickel nitrate	Satd.	A	A	–
Nickel sulfate	Satd.	A	A	–
Nitric acid	fuming	D	D	D
Nitric acid	70[a]	C	D	–
Nitric acid	60	A	D (80°C)	–
Nitric acid	10	A	A	A
50-50 HNO_3-HCl	(a)	B	D (80°C)	–
50-50 HNO_3-H_2SO_4	(a)	C	D (80°C)	–
Nitrobenzene	100	A	A	–
Oleic acid		A	B	–
Oleum		–	–	D
Olive oil	100	A	A	–
Oxalic acid (aqueous)	50	A	B	–
Paraffin	100	A	B	–
Paraffin wax	100	A	A	–
Petrol	100	B	C	–
Petroleum ether (boiling point 100°-140°C)	100	C	C	–
Phenol	100	A	A	–
Phosphoric acid	95	A	A	–
Plating solutions, brass		A	A	–

Environment	Conc. %	Temp., °C 20	60	100
Plating solutions, cadmium		A	A	–
Plating solutions, chromium		A	A	–
Plating solutions, copper		A	A	–
Plating solutions, gold		A	A	–
Plating solutions, indium		A	A	–
Plating solutions, lead		A	A	–
Plating solutions, nickel		A	A	–
Plating solutions, rhodium		A	A	–
Plating solutions, silver		A	A	–
Plating solutions, tin		A	A	–
Plating solutions, zinc		A	A	–
Potassium bicarbonate	Satd.	A	A	–
Potassium borate	1	A	A	–
Potassium bromate	10	A	A	–
Potassium bromide	Satd.	A	A	–
Potassium carbonate	Satd.	A	A	–
Potassium chlorate	Satd.	A	A	–
Potassium chloride	Satd.	A	A	–
Potassium chromate	40	A	A	–
Potassium cyanide	Satd.	A	A	–
Potassium dichromate	40	A	A	–
Potassium ferri-/ferrocyanide		A	A	–
Potassium fluoride		A	A	–
Potassium hydroxide	50	A	A	–
Potassium hydroxide	10	A	A	A
Potassium nitrate	Satd.	A	A	–
Potassium perborate	Satd.	A	A	–
Potassium perchlorate	10	A	A	–
Potassium permanganate	20	A	A	–
Potassium sulfate		A	A	–
Potassium sulfide		A	A	–
Potassium sulfite		A	A	–
Propyl alcohol	100	A	A	–
Pyridine	100	A	–	–
Silicone oil	100	A	A	–
Soap solution (concentrated)		A	A	–
Sodium acetate		A	A	–
Sodium bicarbonate	Satd.	A	A	–
Sodium bisulfate	Satd.	A	A	–
Sodium bisulfite	Satd.	A	A	–
Sodium borate		A	A	–
Sodium bromide oil solution		A	A	–
Sodium carbonate	Satd.	A	A	–
Sodium chlorate	Satd.	A	A	–
Sodium chloride	Satd.	A	A	A
Sodium chlorite	2	A	A (80°C)	–
Sodium chlorite	5	A (80°C)	A	–

Environment	Conc. %	Temp., °C 20	60	100
Sodium chlorite	10	A (80°C)	A	–
Sodium chlorite	20	A (80°C)	A	–
Sodium cyanide	Satd.	A	A	–
Sodium dichromate	Satd.	A	A	–
Sodium ferricyanide	Satd.	A	A	–
Sodium ferrocyanicle	Satd.	A	A	–
Sodium fluoride	Satd.	A	A	–
Sodium hydroxide	50	A	A	–
Sodium hydroxide	10	A	A	A
Sodium hypochlorite	20	A	B	B
Sodium nitrate		A	A	–
Sodium nitrite		A	A	–
Sodium silicate		A	A	–
Sodium sulfate	Satd.	A	A	–
Sodium sulfide	25	A	A	–
Sodium sulfite	Satd.	A	A	–
Stannic chloride	Satd.	A	A	–
Stannous chloride	Satd.	A	A	–
Starch		A	A	–
Sugars and syrups		A	A	–
Sulfamic acid		A	A (80°C)	–
Sulfates of Calcium and magnesium	Satd.	A	A	–
Sulfates of potassium and sodium		A	A	–
Sulfur		A	A	–
Sulfuric acid	98[a]	C	–	D
Sulfuric acid	60	A	B (80°C)	–
Sulfuric acid	50	A	B	–
Sulfuric acid	10	A	A	A
50-50 H_2SO_4/HNO_3	(a)	C	D (80°C)	–
Tallow		A	A	–
Tannic acid	10	A	A	–
Tartaric acid		A	A	–
Tetrahydrofuran	100	C	C	C
Tetralin	100	C	C	C
Toluene	100	C	C	–
Transformer oil	100	A	C	–
Trichloroacetic acid	10	A	A	–
Trichloroethylene	100	A	A (80°C)	–

Environment	Conc. %	Temp., °C 20	60	100
Turpentine	100	C	C	C
Urea		A	A	–
Urine		A	A	–
Water (distilled, soft, hard and vapor)		A	A	A
Wet chlorine gas		–	D (70°C)	–
Whiskey		A	A	A
White Paraffin	100	A	B (80°C)	–
White spirit	100	B	C	–
Wines		A	A	–
Xylene	100	C	C	C
Yeast		A	A	–
Zinc chloride	Satd.	A	A	–
Zinc oxide		A	A	–
Zinc sulfate	Satd.	A	A	–

(a) May produce cracking in material under stress

PP-R PIPE

PP-R pipes, made from polypropylene random copolymer since 1990s, applying in cold and hot water supply in buildings, with variety of advantages as following:

Light weight:

The density of the pipe is only 0.89-0.91g/cm^3, which is only 1/9 of steel pipe and 1/10 of copper pipe. It makes handling and installation more convenient.

Good heat and pressure resistance:

Its short-term operating temperature can up to 95℃. And under the temperature of 80℃, it still can bear some pressure for a long term. That's the best choice for cold and hot water supply pipeline in buildings.

Long service life:

Under proper temperature and pressure, its service life can reach over 50 years.

Good corrosion resistance:

VASEN PP-R pipes have excellent corrosion resistance to most inorganic ion and common chemical substances in buildings. It is anti-corrosion and does not rust in long term use.)

Reliable and convenient connection:

PP-R material has excellent melting welding performance. The pipes and fittings are made from the same material, joined together by melting welding. Compared to single pipe, the tensile, bending and impact strength in joint are much higher, which prevents the danger of leakage, and this kind of connection method also makes the site installation reliable and convenient.

Nonpoisonous and harmless:

PP-R belongs to polyolefin, which is a kind of thermoplastics, whose molecule is only composed of carbon and hydrogen. And the sanitary property of the materials for VASEN PP-R pipes and fittings has been certificated by national authority organization.

Good thermal and sound insulation property:

The thermal conductivity coefficient of PP-R is 0.23w/m℃, which is only 1/200 of steel pipe (43-52w/m℃). No need to use insulating materials when used in hot water systems, which saves insulation materials and energy. And it has lower noise when water delivery in pipeline system.

Better water passing capacity:

The smooth inner surface of PP-R pipes and fittings have lower friction, which ensure fast running of the water.

Environment-friendly building material:

During production, installation and application, no pollution will be caused to the environment. Meanwhile, the materials are recyclable, which can minimize resource wasting.

Application Fields

Due to its special characteristics and outstanding advantages, PP-R piping system is a piping system with many applications.

Portable water pipe network for cold and hot water supply in civil buildings, such as residence, hospitals, hotels, offices, schools and buildings on ship, etc.

Industrial pipe networks for foodstuff, chemical and electric industry. e.g. for the transportation of some corrosive fluids (acid or alkaline water and ionized water, etc.)

Pipe networks for purified water and mineral water.

Pipe networks for air conditioning equipment.

Pipe networks for floor heating system.

Pipe networks for rainwater utilization system.

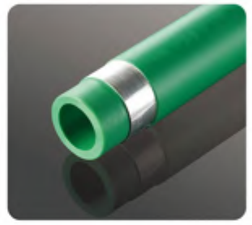
Pipe networks for swimming pool facilities.

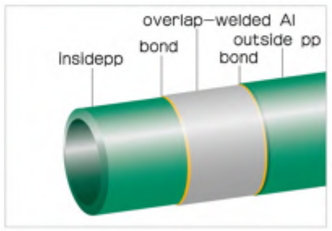
Pipe networks for agriculture and horticulture.

Pipe networks for solar energy facilities.

PP-R STABLE ALUMINUM COMPOSITE PIPE

As a kind of high-quality and high-performance pipe, the pipe has five layers. The inside and outside layers are made of PP-R, tightly bonded with PP-based adhesive to the mid-layer of aluminum core, which is well welded in an overlapping way. It is a perfect performance combination of metal pipe and plastic pipe.





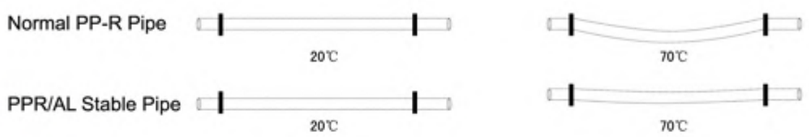
- Working under higher temperature and higher pressure for cold and hot water system.
- Easily detected by detector when embedded, owing to the metal layer.
- Good performance of heat preservation and low heat conduction coefficient of 0.45W/m.k.
- Smooth and sanitary, being good selection for drinkable water system.

Application Fields

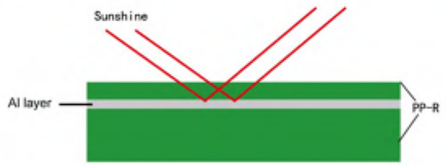
- Distribution for portable water.
- Transportation for edible liquid.
- Industrial transportation for chemical liquids.
- Heating pipeline, floor and wall heating equipment, and building snow melting device.
- Heating and cooling settings in solar energy system.
- Connecting pipe for air conditioners.
- Pressure pipe for agricultural irrigation system.

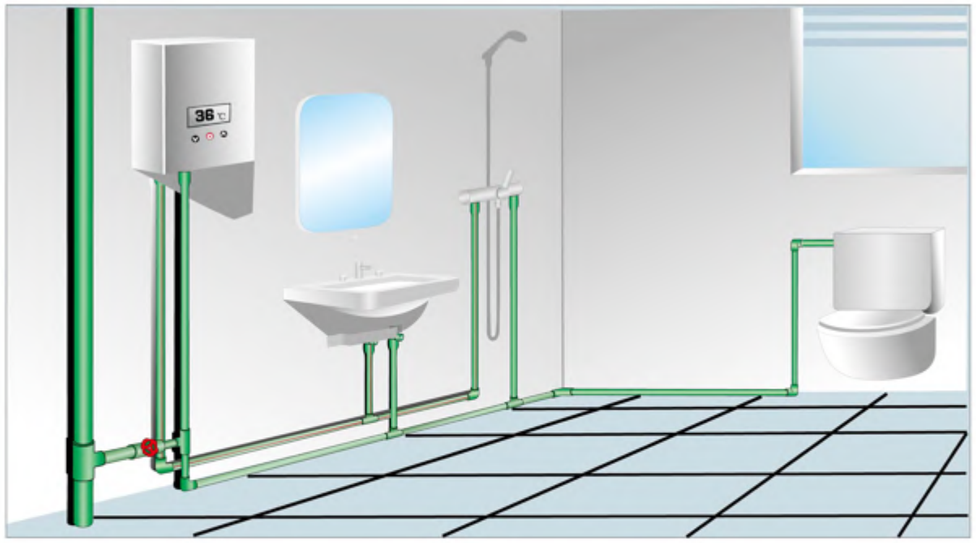
Advantages

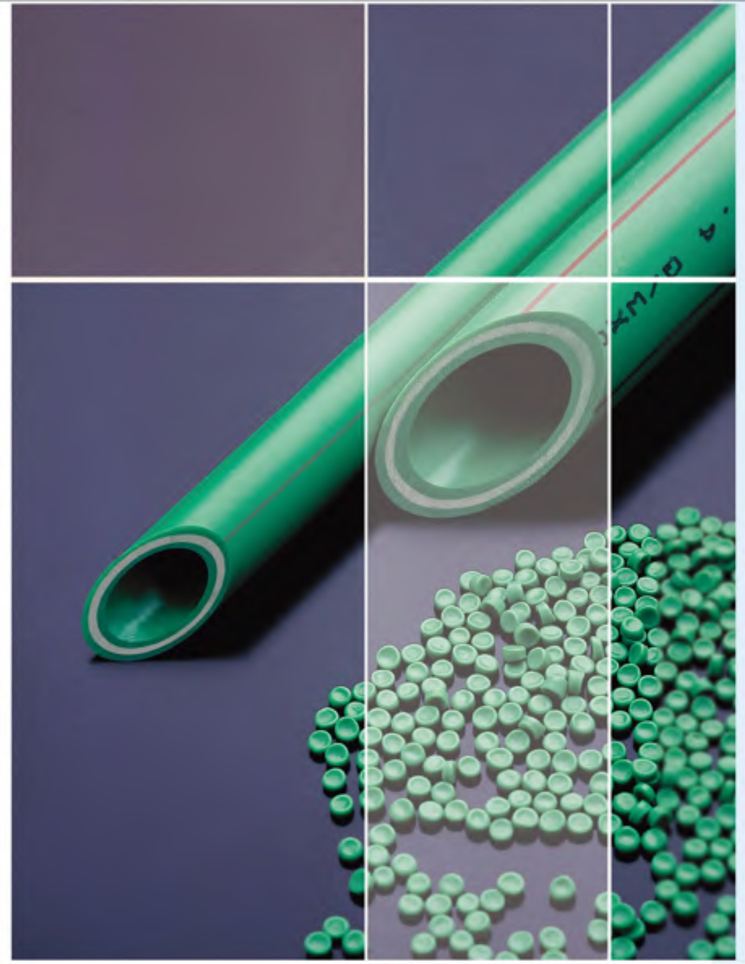
- Greatly reduced linear expansion coefficient, only 1/4 of that of PP-R, which means the composite pipes have stable dimensions.

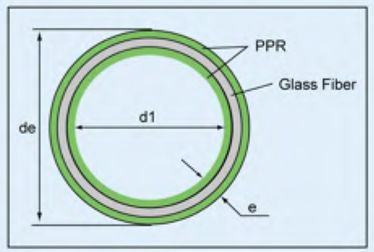


- 100% oxygen tightness, suitable for heating system.
- Improved resistant to impact under low temperature, resistant to UV-rays.



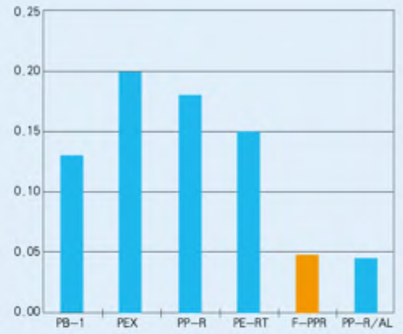






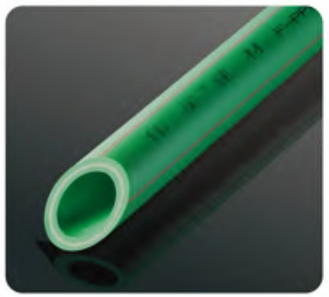
Advantages

- Greatly reduced linear expansion coefficient, 30% of that of PP-R, which is close to that of the stable composite pipes.
- Higher strength and stability of dimension.
- Greatly improved resistant to pressure. It can bear 25% more pressure load than PP-R under the same service condition.
- Improved resistant to impulse under low temperature.
- Excellent resistance to high temperature. It can be used in 90℃ for long term.
- Socket fusion connection with PP-R fittings, credible and convenient.
- Smooth and sanitary, being good selection for drinkable water system.



PP-R FIBER COMPOSITE PIPE (F-PPR)

As a kind of three-layer composite pipe, PP-R fiber composite pipe is a really improver of normal PP-R pipe. Inside and outside layer of the pipe are made of pure polypropylene random copolymer resin, which ensures the pipe sanitary and healthy when used for water supplying. The high-performance PP-R fiber composite material of mid-layer greatly improves the characters of such pipes as used in hot water system. This newly-typed pipe has higher strength, higher tenacity, higher rigidity and lower linear expansion coefficient.



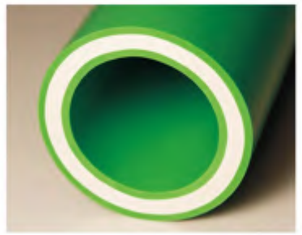
Application Fields

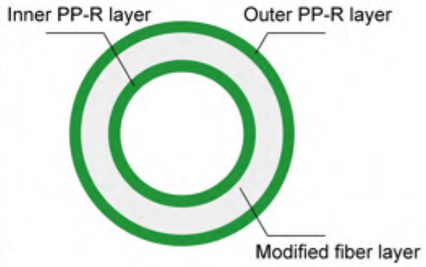
F-PPR is suitable for all application fields of pure PP-R piping system. At the meanwhile, based on the differential advantages of F-PPR, it is more suitable for below application.

- Distribution for hot water inside building;
- Central heating system
- Transportation of thermal spring water;
- Central air conditioning system
- Solar-powered building integration system

MF-PPR PIPE

MF-PPR Pipes apply three-layer co-extrusion technology, once injection the pipe in melting state, which can effectively avoid interface delamination that easily happens on composite pipes.





External & Internal PP-R layer:

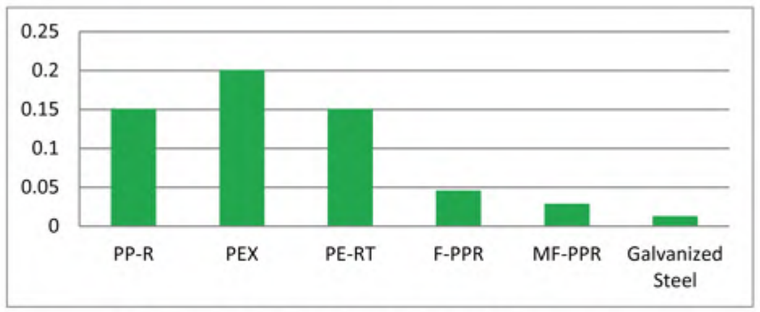
Excellent imported PP-R material, sanitary and healthy, which also can meet the requirement of socket fusion and electrofusion.

Modified fiber layer (functional layer):

High performance silica fiber composite with PP-R resin, possess 50% of wall thickness, enhance pipe rigidity, improve strength, and significantly lower liner expansion coefficient.

Advantages:

- Lower liner expansion coefficient than normal plastic pipes, ＜0.03mm/m. ℃, only 1/6 of normal PP-R pipes.



Liner expansion coefficient contrast between different pipes

- Excellent rigidity and dimensional stability, good for installation. Could be used as indoor exposed pipe, as well as vertical pipe.

Table 3

Temperature (℃)	Service life	Pipe Series (S)		
		4	3.2	2.5
		Permissible working pressure, MPa		
20	10	2.10	2.63	3.36
	25	2.00	2.50	3.20
	50	1.94	2.43	3.10
30	10	1.74	2.18	2.78
	25	1.68	2.10	2.69
	50	1.64	2.05	2.62
40	10	1.48	1.85	2.37
	25	1.44	1.80	2.30
	50	1.38	1.73	2.21
50	10	1.26	1.58	2.02
	25	1.20	1.50	1.92
	50	1.16	1.45	1.83
60	10	1.06	1.33	1.70
	25	1.01	1.27	1.62
	50	0.98	1.23	1.57
70	10	0.88	1.10	1.41
	25	0.76	0.95	1.22
	50	0.65	0.81	1.04
80	10	0.62	0.78	0.99
	25	0.48	0.60	0.77
	50	0.43	0.54	0.69

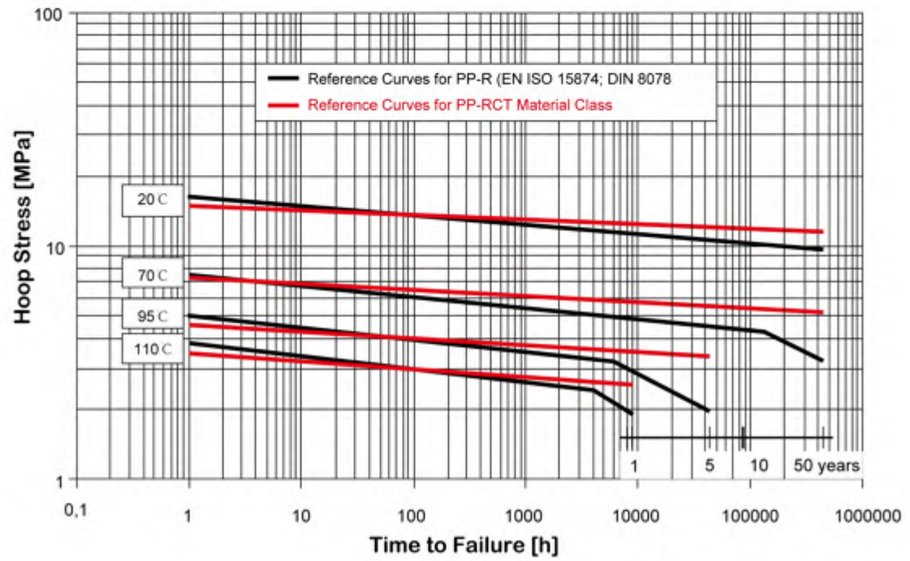
- More than 25% pressure capacity improvement than normal PPR pipes, could be used in cold and hot water supply.
- Convenient connection methods, both socket fusion and electrofusion are available.
- Seamless connection with indoor PP-R pipes, which could avoid the transformation connection between different materials.
- Smooth and sanitary, inherit from PP-R pipes, could rest assure use in water system.

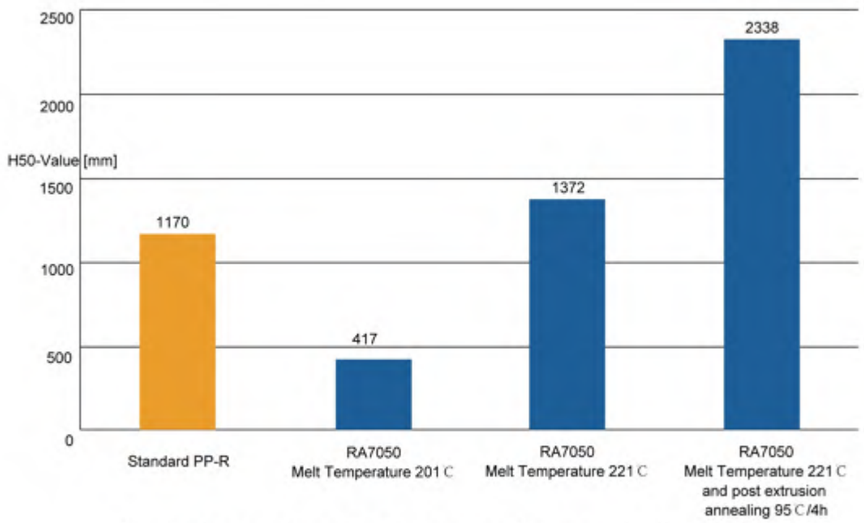
Application Fields

Main riser and horizontal main pipe for various buildings, such as hotel, resident, airport, station, hospital, stadium, etc.

PP-RCT PIPE

PP-RCT, a Polypropylene-Random-Copolymer with an enhanced Crystalline structure brought about by a special nucleation and with an improved temperature resistance.





Impact performance of pipes 25 x 3.5 mm measured at 0 C according to the EN1411

Material Characteristics of PP-RCT

Physical Properties

Table 4

Physical Properties		Typical Value*	Unit	Test Method
Density		905	kg/m^3	ISO 1183
Melt Flow Rate	(230°C/2.16 kg)	0.25	g/10 min	ISO 1133
Tensile Stress at Yield	(50 mm/min)	25	MPa	ISO 527-2
Tensile Strain at Yield	(50 mm/min)	10	%	ISO 527-2
Modulus of Elasticity in Tension	(1 mm/min)	900	MPa	ISO527
Charpy Impact Strength, notched	(+23°C)	40	kJ/m^2	ISO 179/1eA
Charpy Impact Strength, notched	(0°C)	4	kJ/m^2	ISO 179/1eA
Charpy Impact Strength, notched	(-20°C)	2	kJ/m^2	ISO 179/1eA
Mean Linear Thermal Coefficient of Expansion from 0°C to 70°C		1.5	$*10^{-4}K^{-1}$	DIN 53752
Thermal Conductivity		0.24	$WK^{-1}m^{-1}$	DIN 52612 Part 1

Advantages

- More than a 50% improvement in long-term strength, which enables designers to select thinner walled pipes and in some situations also smaller diameter pipes can be used.
- Enhanced long-term durability, due to better resistance to oxidation and to slow crack growth.
- Long-term temperature resistance improvement. Under 90 C , 1.0MPa, can be used for 50 years, 20 C higher than existing PP-R materials.
- Excellent impact resistance.
- Convenient connection, same way as standard PP-R.
- Smooth and sanitary, being good selection for drinkable water system.

Application Fields

PP-RCT is suitable for all application fields of pure PP-R piping system. At the meanwhile, based on the differential advantages of PP-RCT, it is more suitable for high temperature radiator heating system.

CHAPTER 3: QUALITY ASSURANCE

PRODUCT STANDARDS

Table 5

DIN8077	Polypropylene (PP) Pipes -Dimension
DIN8078	Polypropylene (PP) Pipes -General Quality Requirements and Testing
DIN4725/4726/4728	Polypropylene (PP) Pipes Floor Heating System
ISO15874	Plastics Piping Systems for Hot and Cold Water Installations -- Polypropylene (PP)
DIN16962	Pipe Joint Assemblies and Fittings for Polypropylene (PP) Pressure Pipes
DIN12202	Plastics Piping Systems for Hot and Cold Water - Polypropylene (PP)
DVS2203	Fabricated Rules for Thermoplastic Materials
DVS2207	Fabricated Property Test for Thermoplastic Materials
DVS2208	Fabrication of Thermoplastic Materials, Polypropylene (PP) Piping System
GB/T 18742	Polypropylene Piping Systems for Hot and Cold Water Installation.

TEST CENTER

Test Center

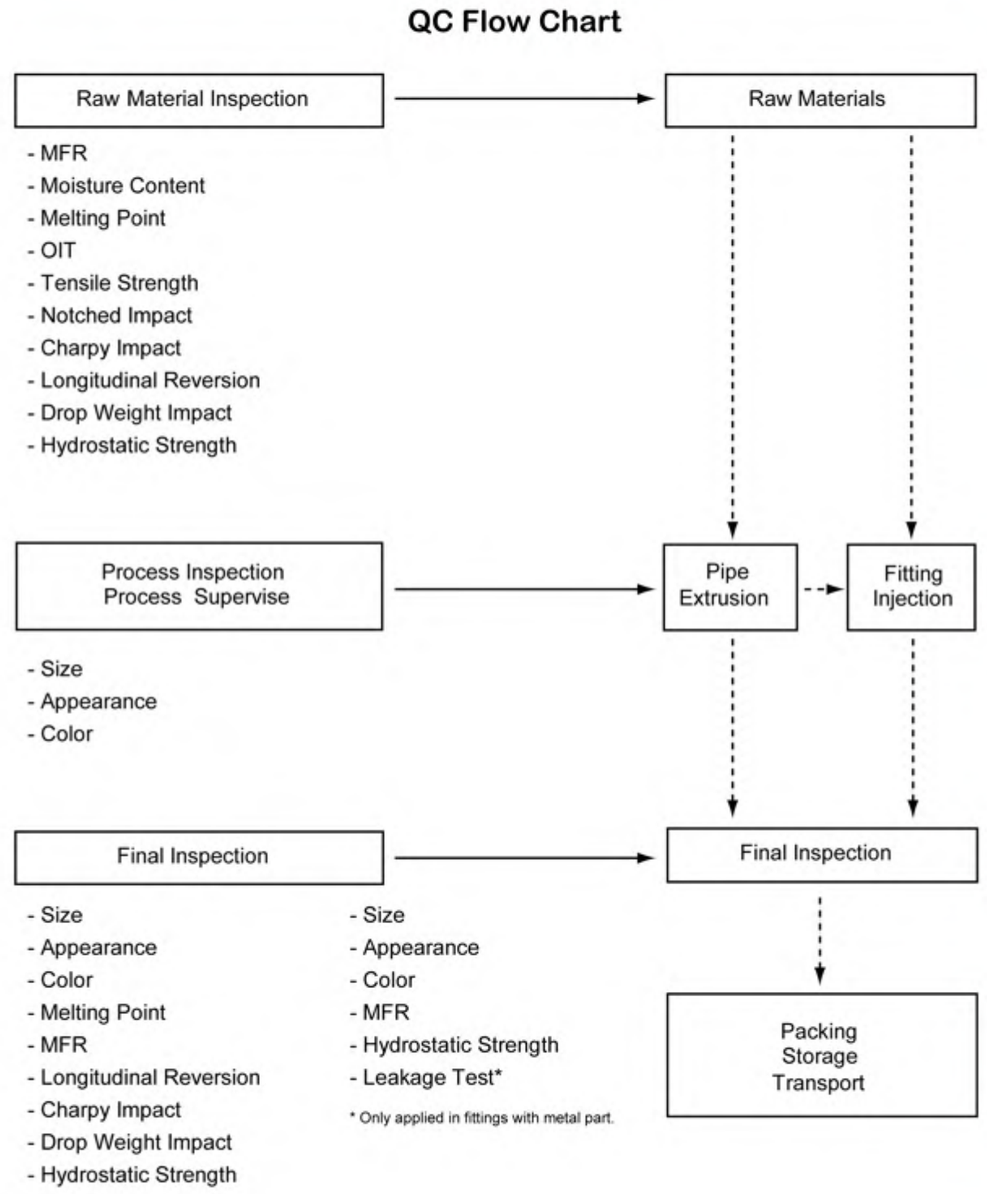
ilac-MRA & CNAS Accredited Laboratory

Raw Material Analysis

MFR Test

Elongation Test

QUALITY MANAGEMENT SYSTEM



CERTIFICATES

DVGW

CERT

DVGW type examination certificate

DVGW-Baumusterprüfzertifikat

DW-6317CM0070

Field of Application	products of water supply
Owner of Certificate	Zhejiang Weixing New Building Materials Co., Ltd. Middle Baiye Road,Econ.Dev.Zone, Chi- Linhai, Zhejiang
Distributor	Zhejiang Weixing New Building Materials Co., Ltd. Middle Baiye Road,Econ.Dev.elop.Zone, Chi- Linhai, Zhejiang
Product Category	plastic pipes for drinking water installations: PP-R, SDR 6 (S3/1)
Product Description	plastic pipe (PP-R) for the drinking water installation, colour: green
Model	WEIXING
Test Reports	laboratory control test: S20115/1-1/115363 from 28.05.2015 (SAZ) type testing: 6110/08-I from 24.02.2011 (SAZ) KTW testing: KR 348/15 from 20.05.2015 (TZW) hygienic testing: MO 019/11 from 15.02.2011 (TZW)
Test Basis	DVGW W 544 (01.06.2007) UBA KTW (07.10.2008) DVGW W 270 (01.11.2007)

Date of Expiry / File No. 24.02.2021 / 16-0001-WNV

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(Registration No. CNAS L4362)

Test Center of Zhejiang Weixing New Building Materials Co., Ltd.

Baiye Middle Road, Economic Development Zone, Linhai, Zhejiang, China

is accredited in accordance with ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence to undertake testing service as described in the schedule attached to this certificate.

The scope of accreditation is detailed in the attached schedule bearing the same registration number as above. The schedule form an integral part of this certificate.

Date of Issue: 2016-03-17

Date of Expiry: 2022-03-16

Date of Initial Accreditation: 2010-01-08

Signed on behalf of China National Accreditation Service for Conformity Assessment

AENOR

CERTIFICADO AENOR DE PRODUCTO Nº 001 / 006401

ACCESORIOS PARA TUBOS DE POLIPROPILENO (PP-R) PARA INSTALACIONES DE AGUA CALIENTE Y FRÍA

FITTINGS FOR POLYPROPYLENE (PP-R) PIPES FOR HOT AND COLD WATER INSTALLATIONS

detallado en la(s) página(s) siguiente(s),

detailed in the following page(s),

suministrado por

supplied by

ZHEJIANG WEIXING NEW BUILDING MATERIALS CO., LTD.

MIDDLE BAITE ROAD

LINHAI CITY (Zhejiang Province - China)

y elaborado en

and manufactured in

MIDDLE BAITE ROAD

LINHAI CITY (Zhejiang Province - China)

en conformidad con

complies with

UNE-EN ISO 15874-1:2013 (EN ISO 15874-1:2013)

UNE-EN ISO 15874-3:2013 (EN ISO 15874-3:2013)

Fecha de concesión: 2015-07-16

Fecha de anulación: 2020-07-16

Director General de AENOR

Entidad de certificación de productos acreditada por ENAC con el Nº 014/C-PR082

Product certification body accredited by ENAC, number 014/C-PR082

WRAS APPROVED MATERIAL

Water Regulations Advisory Scheme Ltd.

Unit 13,

Willow Road,

Parc y Tan Industrial Estate,

Cwmbrân,

Gwent,

NP11 4EQ

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)

APPROVAL NUMBER: 1503020

APPROVAL HOLDER: ZHEJIANG WEIXING NEW BUILDING MATERIALS CO. LTD.

Jason Fynmat

Approvals & Enquiries Manager

Water Regulations Advisory Scheme

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NP11 4EQ

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)

APPROVAL NUMBER: 1503024

APPROVAL HOLDER: ZHEJIANG WEIXING NEW BUILDING MATERIALS CO. LTD.

Jason Fynmat

Approvals & Enquiries Manager

Water Regulations Advisory Scheme

CERTIFICATE OF COMPLIANCE

CERTIFICATE Nr. 110330/ZWN188

MANUFACTURER:	
NAME	ZHEJIANG WEIXING NEW BUILDING MATERIALS CO. LTD.
ADDRESS	MIDDLE BAIYE ROAD, LINHAI CITY, ZHEJIANG PROVINCE, P.R.CHINA.

WE CERTIFY THE FOLLOWING PRODUCT(S):

PRODUCT	PP-R PIPES AND FITTINGS HDPE PIPES AND FITTINGS
MODEL	PP-R PIPES D16mm-D160mm, PP-R COMPOSITE PIPES D16mm-D160mm, PP-R FITTINGS D16mm-D160mm,PP-R ELECTROFUSION FITTINGS D16mm-D160mm, ALUMINUM/PLASTIC COMPOSITE PIPES D12mm-D63mm, FITTINGS FOR ALUMINUM/PLASTIC COMPOSITE PIPES D12mm-D63mm, HDPE PIPES D20mm-D800mm, HDPE FITTINGS D20mm-D800mm, HDPE ELECTROFUSION FITTINGS D20mm-D400mm
YEAR	2011

REMARK: THIS DOCUMENT HAS BEEN ISSUED UPON A REVIEW OF THE DATASHEETS AND OF THE TECHNICAL CONSTRUCTION FILE. THE APPARATUS IS CONSIDERED TO MEET THE REQUIREMENTS OF THE BELOW LISTED DIRECTIVES.

89/106/EEC	CONSTRUCTION PRODUCT DIRECTIVE

SAFETY STANDARDS EN NORMS :

EN ISO 15874-1:2003, EN ISO 15874-2:2003, EN ISO 15874-3:2003, EN ISO 15874-5:2003, EN 12201-1:2003, EN 12201-2 2003, EN 12201-3:2003, EN 1555-1:2010, EN 1555-2:2010, EN 1555-3:2010

THIS DOCUMENT IS ONLY VALID FOR THE EQUIPMENT AND CONFIGURATION DESCRIBED AND IN CONJUNCTION WITH THE TEST DATA DETAILED ABOVE. NEVERTHELESS THE MANUFACTURER IS NOT EXEMPTED TO PERFORM ALL THE NECESSARY ACTIVITIES BEFORE ISSUING THE DECLARATION OF CONFORMITY. IN CASE THE APPLIANCE IS MODIFIED OR THE APPLIANCE WILL BE EQUIPPED WITH ACCESSORIES NOT SPECIFIED IN THE MANUFACTURER OPERATOR MANUAL, IT IS RECOMMENDED TO GET IN TOUCH WITH EMTE CERTIFICAZIONE MACCHINE THAT IDO VALIDITY EXTENDED.

DATE OF ISSUE: MARCH 2011

EMTE CERTIFICAZIONI MACCHINE

AENOR

CERTIFICADO AENOR DE PRODUCTO Nº 001 / 006400

ACCESORIOS PARA TUBOS DE POLIPROPILENO (PP-R) PARA INSTALACIONES DE AGUA CALIENTE Y FRÍA

FITTINGS FOR POLYPROPYLENE (PP-R) PIPES FOR HOT AND COLD WATER INSTALLATIONS

detallado en la(s) página(s) siguiente(s),

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UNE-EN ISO 15874-3:2013 (EN ISO 15874-3:2013)

Fecha de concesión: 2015-11-03

Fecha de anulación: 2020-11-03

Director General de AENOR

Entidad de certificación de productos acreditada por ENAC con el Nº 014/C-PR082

Product certification body accredited by ENAC, number 014/C-PR082

Certificado AENOR de Producto

Plásticos

001/006634

ZHEJIANG WEIXING NEW BUILDING MATERIALS CO., LTD.

con domicilio social en	MIDDLE BAIYE ROAD - LINHAI CITY (Zhejiang Province - China)
suministra	tubos de polipropileno (PP-R) para instalaciones de agua caliente y fría
conforme con	UNE-EN ISO 15874-1:2013 (EN ISO 15874-1:2013) UNE-EN ISO 15874-3:2013 (EN ISO 15874-3:2013)
MARCA (OPCIONAL)	WEIXING
SERIE	2,5
DIAMETROS (mm)	16 - 20 - 25 - 32 - 40 - 50 - 63 - 75 - 90 - 110 - 125 - 160
CLASE DE APLICACIÓN / PRESIÓN DE DISEÑO (bar)	1(60) ; 2(8) ; 4(20) ; 5(6)
SDR (PROCESO)	11
Lugar de producción	MIDDLE BAIYE ROAD - LINHA CITY (Zhejiang Province - China)
Fecha de primera emisión	2016-09-20
Fecha de expiración	2023-09-20

AENOR

Asociación Española de Normalización y Certificación

Certificate of conformity

Plastics

001/006639

ZHEJIANG WEIXING NEW BUILDING MATERIALS CO., LTD.

registered office	BAIYE MIDDLE ROAD - ECONOMIC DEVELOPMENT ZONE LINHAI CITY (Zhejiang Province - China)
supplies	Polypropylene pipes (PP-R) / polypropylene + glass fiber (PP-R + FV) / polypropylene (PP-R) for installations of hot and cold water inside the building structure
in compliance with	ESPECIFICACIÓN TÉCNICA AENOR 53
DESCRIPTION	TRADENAME: WEIXIN MATERIAL/COLOR/SIZE: etc. MATERIAL(S) CONTENT OF THE MODEL/ LAYER: 3rd. See annex for more information.
Production site	NO. 4421 BAIYE ROAD, FENGHUAN ZONE (HAIMEN/IN - China)
Certification scheme	In order to grant this Certificate, AENOR has tested the product and has verified the quality system implemented for its manufacture. AENOR performs these tests periodically while the Certificate has not been cancelled, in accordance with Specific Rules RP 053.10.
First issued on	2016-09-20
Validity date	2023-09-20

AENOR

Asociación Española de Normalización y Certificación

GAINSHINE ASSESSMENT

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATE

GAC(Signature):

GAINSHINE ASSESSMENT

ENVIRONMENT MANAGEMENT SYSTEM CERTIFICATE

GAC(Signature):

GAINSHINE ASSESSMENT

QUALITY MANAGEMENT SYSTEM CERTIFICATE

GAC(Signature):

CHAPTER 4: CONNECTION METHODS

SOCKET FUSION

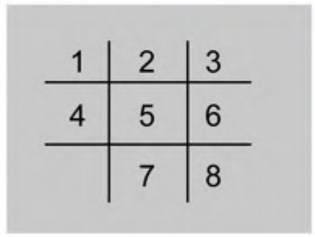
Socket Fusion with a Hand-held Welding Device (From dn20)

- **Cut the pipe**

  Cut the pipe at right angles to the pipe axis. After cutting, make the surface free from burr and cutting debris. The pipe end connect with fittings should be clean, dry, oil-free.

- **Mark welding depth**

  Use special gauge and pencil to measure the pipe end, and mark the welding depth.



- **Heat pipe and fitting**

  When the temperature of welding tool reach 260℃ (the green lamp flashing), insert the pipe and the fitting into the welding tool at the same time. The heating time refer to below table.

- **Align and weld-in**

  After the required heating time quickly remove pipe and fitting from the welding tools. Joint them immediately, and without turning, until the marked welding depth is covered by the PP-bead from the fitting. Hold the pipe and the fitting tightly until reach the required cooling time. Do not push the pipe too far or too close, as this would reduce the bore, even close the pipe, or make the connection unstable.

- **Pressure Test**

  When the whole system installation accomplished, carry out water pressure test, to ensure the connection is reliable.

PP-R pipe & fitting heat socket fusion technical requirement

Table 6

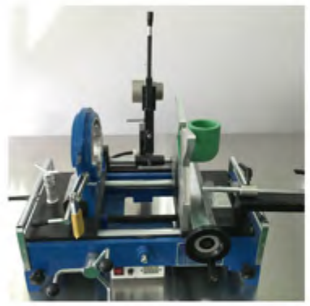
Diameter (mm)	Min. Weld-in Depth (mm)	Heating time (sec.)	Welding time (sec.)	Cooling time (min.)
20	11.0	5	4	3
25	12.5	7	4	3
32	14.6	8	4	4
40	17.0	12	6	4
50	20.0	18	6	5
63	23.9	24	6	6
75	27.5	30	10	8
90	32.0	40	10	8
110	38.0	50	15	10

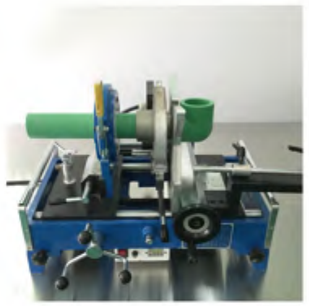
Note:

This table is only applied in the situation that environment temperature is 20℃. When the environment temperature is lower than 20℃, the heating time should increase properly. If the environment temperature is less than 5℃, the heating time should increase 50%.

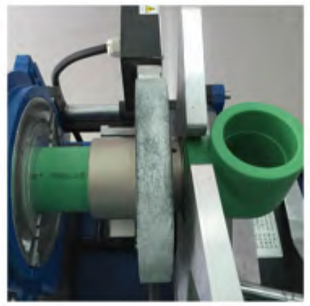
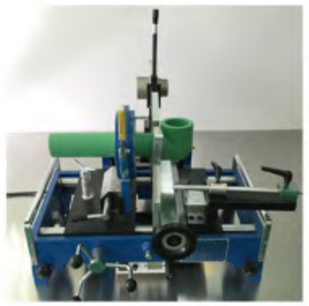
Socket Fusion with a Stationary Welding Machine (From dn50)

- **Cut the pipe.**
  Cut the pipe at right angles to the pipe axis. After cutting, make the surface free from burr and cutting debris. The pipe end connect with fittings should be clean, dry, oil-free.
- **Mark welding depth**
  Use special gauge and pencil to measure the pipe end, and mark the welding depth.
- **Fix the fitting**
  Fix the fitting with the clamp, taking care not to wind it too tightly, as this can lead to ovality, with a negative impact on the resulting weld. Make sure the fitting is correctly positioned
- **Place the pipe**
  Place the pipe loosely into the jaw chuck. Adjust the dimension using the rotary button, which sets the precise welding insertion depth.
- **Align**
  Push pipe and fitting together until they reach the stop, and make sure the pipes and fitting are accurately aligned.
- **Heat up**
  Check the welding tool, and make sure the welding temperature is reached. Use the crack, gradually push the fitting and pipe into the tool until the stop is reached. Pay attention to the welding time. Allow them to heat up without exerting any further pressure.
- **Fit together**
  Once the heating time has elapsed, move them apart, remove the welding tool, and fit together the fitting and the pipe. Wait till the required cooling time has reached.
- **Pressure Test.**
  When the whole system installation accomplished, carry out water pressure test, to ensure the connection is reliable.





1	2	3
	4	5

PP-R pipe & fitting heat socket fusion technical requirement

Diameter (mm)	Min. Weld-in Depth (mm)	Heating time (sec.)	Welding time (sec.)	Cooling time (min.)
50	20.0	18	6	5
63	23.9	24	6	6
75	27.5	30	10	8
90	32.0	40	10	8
110	38.0	50	15	10
125	41.0	55	15	12
160	46.0	60	15	15

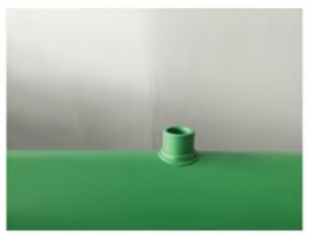
Note:
This table is only applied in the situation that environment temperature is 20℃. When the environment temperature is lower than 20℃, the heating time should increase properly. If the environment temperature is less than 5℃, the heating time should increase 50%.

Welding Saddle

- **Prepare materials and tools**
  Ensure that the welding saddle, the drill and the welding tool are in same diameters.
- **Mark the welding area**
  Position the exact location, and make a mark.
- **Drill and remove debris**
  Drill through the marked pipe wall, clear any debris from the drill hole. The parts and the areas to be welded must be clean and dry.
- **Heat up**
  Check the welding tool to make sure it is in required operation temperature. Insert the concave side of heating tool into the hole drilled in the pipe wall, until the tool is completely in contact with the outer wall of the pipe. Next the weld-in saddle must be pushed in the convex side of the heating tool, until the saddle surface reaches the camber of the tool.
- **Fit together**
  Once the heating time has elapsed, remove the welding tool. The weld-in saddle should be immediately inserted into the heated, drilled hole, and hold the pipe and saddle in position for required time in the necessary pressure. After being allowed to cool for required time, the connection can be exposed to its full loading.



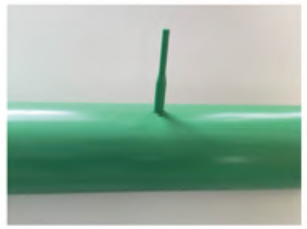
1	2	3
	4	5

Repair Stick

- **Drill pipe**
  Drill damaged area of pipe out to the diameter of repair stick at right angle to the pipe.
- **Heat up**
  Heat up drill hole and repair stick with welding tool for required time.
- **Fit together**
  Remove the welding tool, and insert repair stick immediately.
- **Cut off**
  After cooling down, cut off protruding end of repair stick.


1	2
3	4




ELECTROFUSION

- **Cut the pipe**

  Cut the ends of the pipes rectangularly and deburr them thoroughly.

- **Measure welding depth**

  Measure the vertical length between the fitting end and the limit circle (measure half length of the fittings if without limit circle).

- **Mark welding depth**

  Mark the depth of electrofusion fitting on the ends of the pipes.

- **Peel pipe end surface**

  Peel the surface of the pipes up to the marks thoroughly with a peeling tool (0.1-0.2mm thickness), and deburr. (It is a necessary procedure)

- **Clean up welding area**

  Clean the welding area of the pipes and fittings with Acetone, completely dry the fusion area with clean cloth. Do not touch the clean and dry fusion area of pipes or fittings with hands.

- **Mark welding depth**

  Mark the depth of electrofusion fitting again on the ends of the pipes.

- **Insert into the fitting**

  Push the electrofusion sockets on the clean and dry end of the pipe (up to the marked depth), and check the fitness.

  Clamp the pipes and fittings at the same axis, ensure not move during fusion.

- **Plug in the electrodes**

  Attach the electrode plugs of the welding machine to the electrodes of the fittings, to ensure fully contact.

- **Electric weld**

  Read the bar code on the fittings by scanning pen or input the welding parameter manually. Check the welding parameter showed on the machine, such as product type, voltage, heating and cooling time. Press “start” button to carry on welding. Do not move or stress pipe and fitting during the whole fusion process and cooling time.

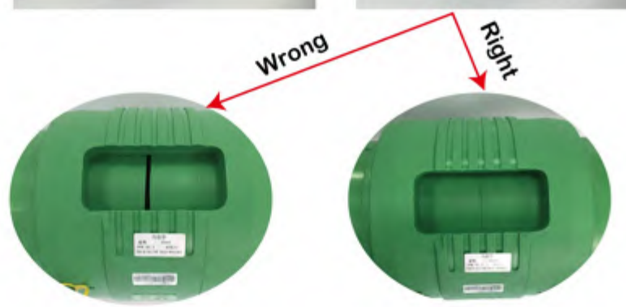
- **Welding check**

  After fusion process, check and see if the welding indicators are protruded (the welding indicators height vary with fit clearance between the pipes and fittings)






1	2	3
4	5	6
7	8	




Attention:

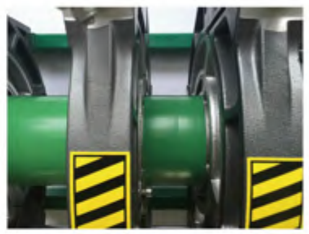
1.Input voltage deviation should be not more than ±15%, output voltage allowed deviation is within ±5%.

2.The electrofusion machine without temperature compensation function should set compensation time.

BUTT FUSION

- **Clamp pipes**
  Plastic pipes are aligned and fixed by means of the clamping elements
- **Check welding parameter**
  Set welding temperature to 240±5℃, and test the pipe moving pressure.
- **Mill pipe ends**
  Use the milling machine for milling the pipe end to be plane-parallel. Check if the pipe match, if not, makes adjustment, to ensure the alignment tolerance less than 10%.
- **Heat up**
  After the heating element has been positioned, the pipes are pushed onto the heating plate with a defined adjusting pressure.
  After reaching the specified bead height (see tablet) the pressure is reduced. This process marks the beginning of the heating time. This time is for heating up the pipe ends up to the right welding temperature.
- **Butt weld**
  When heating time has expired, divide the machine slide, remove heating element quickly and join the pipes (by putting both parts of the slide together).
- **Hold pressure and cool down**
  The pipes are fused with the required welding pressure and cooled down under pressure.





1	2	3
	4	5


Welding parameter reference:

When welding pipes and fittings in large size, we could calculate welding pressure according to following formula.

$$P_w = \frac{K \times \pi \times e_n \times (d_n - e_n)}{nS}$$

nS: Total effective area of the cylinder piston (mm^2)

P_w: Total welding pressure (MPa)

P2: Drag pressure (MPa)

K: Pressure coefficient (MPa)

Note: dn90-160mm, K=0.3N/mm^2, dn≥160mm, K=0.2N/mm^2.

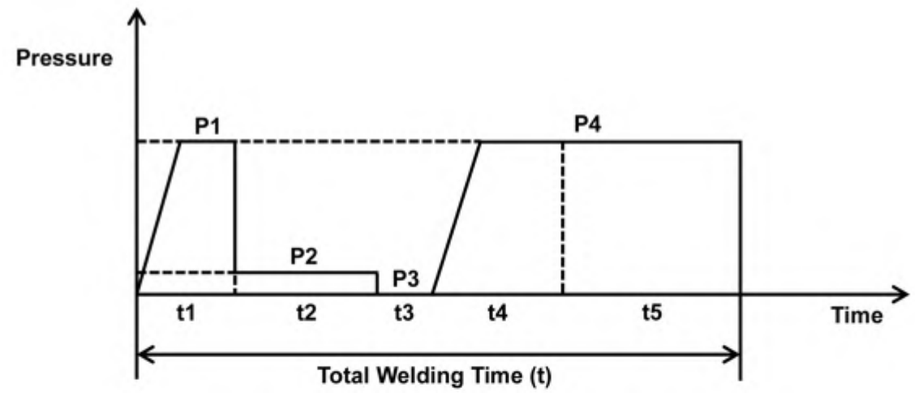


Figure: Butt Fusion Pressure Chart of Each Phase

t1 - Pre heating, edge curling
t2 - Heat absorption
t3 - Transition phase, heating plate removing
t4 - Welding phase
t5 - Cooling phase

$$P1=P4=P2+P_w$$

Table 8

S	Size	①		②	③	④	⑤	
S2.5	(mm)	P1-P2	e	t2	t3	t4	P1-P2	t5
		(MPa)	(mm)	(s)	(s)	(s)	(MPa)	(min)
	dn90x15.0	1060/S_2	1.0	10e	6	6	1060/S_2	8
	dn110x18.3	1580/S_2	1.5	10e	6	6	1580/S_2	8
	dn160x26.7	2235/S_2	1.5	10e	7	7	2235/S_2	9
	dn200x33.3	3486/S_2	1.5	10e	8	8	3486/S_2	10

Note: In this table, S_2=nS, which means total effective area of the cylinder piston.

S	Size	①		②	③	④	⑤	
S3.2	(mm)	P1-P2	e	t2	t3	t4	P1-P2	t5
		(MPa)	(mm)	(s)	(s)	(s)	(MPa)	(min)
	dn90x12.2	894/S_2	1.0	10e	6	6	894/S_2	7
	dn110x14.9	1334/S_2	1.5	10e	6	6	1334/S_2	8
	dn160x21.6	1877/S_2	1.5	10e	7	7	1877/S_2	9
	dn200x27.0	2933/S_2	1.5	10e	8	8	2933/S_2	9

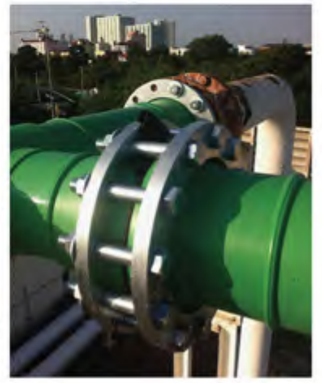
S	Size	①		②	③	④	⑤	
S4	(mm)	P1-P2	e	t2	t3	t4	P1-P2	t5
		(MPa)	(mm)	(s)	(s)	(s)	(MPa)	(min)
	dn90x10.0	753/S_2	1.0	10e	6	6	753/S_2	7
	dn110x12.2	1124/S_2	1.5	10e	6	6	1124/S_2	7
	dn160x17.8	1590/S_2	1.5	10e	7	7	1590/S_2	8
	dn200x22.2	2479/S_2	1.5	10e	8	8	2479/S_2	9

S	Size	①		②	③	④	⑤	
S5	(mm)	P1-P2	e	t2	t3	t4	P1-P2	t5
		(MPa)	(mm)	(s)	(s)	(s)	(MPa)	(min)
	dn90x8.2	631/S_2	1.0	10e	6	6	631/S_2	6
	dn110x10.0	942/S_2	1.5	10e	6	6	942/S_2	7
	dn160x14.5	1325/S_2	1.5	10e	7	7	1325/S_2	7
	dn200x18.2	2077/S_2	1.5	10e	8	8	2077/S_2	8

MECHANICAL CONNECTION

Flange Connection

To transition to other piping systems and mechanical equipment, VASEN provides a full range of flange adapters. Flange adapters can join the pipe to itself or another material. VASEN flange connections consist of two parts: the flange adapter and the flange plate. It is a common connection method in areas where traditional fusion is difficult or impossible.



- **Set flange plate**

  Put pipe through the flange plate.

- **Weld flange adapter to the pipe**

  As above mentioned butt fusion method (See page34).

- **Align flange**

  Aligning two connection parts, make the flange vertical to the central line of pipes, and make sure their surfaces parallel to each other.

- **Put gasket onto flange adapter**

  The gasket for flange adapter should use rubber gasket which is with good heat-resistance and nonpoisonous (black EPDM is recommended).

- **Fasten the bolt**

  Use same size bolts, make sure they are in same installation direction. And fasten the bolts in symmetrical way. Fully tighten the bolts, make sure the bolts exposed outside the nuts, and keep them flush with each other. Galvanized bolts and nuts are recommended.

Note:

1. The pipe connection length should be accurate, and ensure no pipe axial stress generated when fastening the bolts.
2. The flange connection position should set supports and hangers.

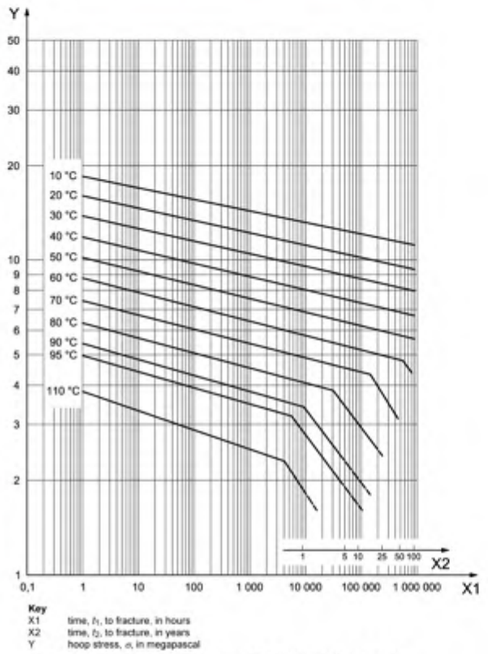
Thread Connection

When the PP-R pipe connected to steel pipes, other pipes of different materials, sanitary wares or hardware fittings, we should use the PP-R fittings with thread insert as a transition connection. When use the female or male thread union fittings, we should connect the union fittings to the PP-R pipes through socket fusion first, then use thread connection.

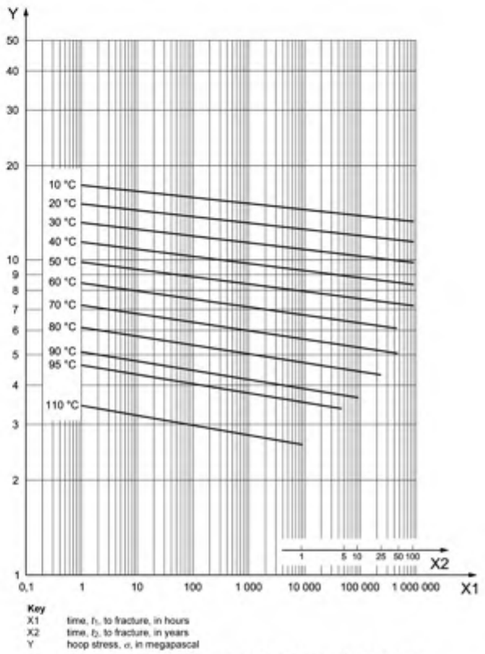
CHAPTER 5: INSTALLATION INTRODUCTION

PIPE SERIES SELECTION

Pressure Design Reference



Reference curves for expected strength of PP-R



Reference curves for expected strength of PP-RCT

Standard Dimension Ratio (SDR)

SDR is an index in use for the classification of plastic pipes, which describes the ratio between a pipe's outer diameter and its wall thickness.

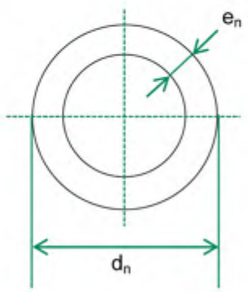
$$SDR=2\times S+1 \qquad SDR\approx\frac{d_n}{e_n}$$

S: Pipe series

d_n: Outer diameter, mm.

e_n: Wall thickness, mm

Standard dimension ratio (SDR) is a method of rating a pipe's durability against pressure. Pipes with a lower SDR can withstand higher pressures.



Pipe Series Number (S)

The nominal pipe series number is a dimensionless index, which is used for the calculation of the wall thickness of pipes.

$$S=\frac{(SDR-1)}{2}$$

e.g.: PP-R pipe, SDR6, the pipe series is S2.5.

$$S=\frac{(SDR-1)}{2}=\frac{6-1}{2}=2.5$$

Safety Factors

Safety factors shall be specified in the application standards. Minimum safety factors SF are given in Table 9 and take account of the material characteristics. Since the impact strength of PP-H decreases as the temperature increases, the safety factors have been classified as a function of the temperature.

Safety factor SF as a function of the temperature

Table 9

Material designation	Temperature		
	10 to less than 40℃	40 to less than 60℃	from 60℃ upwards
PP-H	1.6	1.4	1.25
PP-B	1.25		
PP-R	1.25		
PP-RCT	1.25		

Allowable Operating Pressures

The allowable operating pressures have been calculated according to below formula on the basis of the long-term hydrostatic strengths shown in the reference curves (**Pressure Design Reference**), and taking account of a safety factor SF.

$$\mathbf{p}=\frac{\sigma}{S\times SF}$$

Where:

p is the allowable operating pressure, in MPa

σ is the relevant long-term hydrostatic strength from the reference characteristic curve in **Pressure Design Reference,** in MPa

S is the pipe series number

Classification of Operational Conditions

Class of application according to DIN EN ISO 15874

Table 10

Class of Application	Design Temperature T_D ℃	Duration of Operation at T_D Years	T_{max} ℃	Duration of Operation at T_{max} Years	T_{mal} ℃	Duration of Operation at T_{mal} Years	Typical Fields of Application
Class 1	60	49	80	1	95	100	Hot water supply (60 ℃)
Class 2	70	49	80	1	95	100	Hot water supply (70 ℃)
Class 4	20 40 60	2.5 20 25	70	2.5	100	100	Underfloor heating and low-temperature radiator connection
Class 5	20 60 80	14 25 10	90	1	100	100	High-temperature radiator connection

Note: The table is not available if the values (T_D, T_{max}, T_{mal}) are higher than those stated in the table.

The piping system which indicated in the table meet a duration of 50 years at 20 ℃, 1.0MPa for cold water delivery at the meantime

Pipe Series Selection

PP-R Pipe Series Selection (Cold & Hot Water Pipe inside Building)

Table 11

Type	Design Pressure P_D (MPa)		
	$P_D \leqslant 0.6$	$0.6 < P_D \leqslant 0.8$	$0.8 < P_D \leqslant 1.0$
Cold Water Pipe	S5	S5	S4
Hot Water Pipe	S3.2	S2.5	S2

If the design operating temperature of cold water pipe is less than or equal to 40 ℃, and the long-term operating temperature of hot water pipe is less than or equal to 70 ℃, the pipe series selection of PP-R cold & hot water pipe could refer to Table 11. When PP-R piping system applies in other condition, the pipe series selection could as per Table12 and Table 13.

PP-R Pipe Series Selection

Table 12

Design Pressure MPa	Class 1 σ_D=3. 09MPa	Class 2 σ_D=2.13MPa	Class 4 σ_D=3.30MPa	Class 5 σ_D=1.90MPa
0.4	S5	S5	S5	S4
0.6	S5	S3.2	S5	S3.2
0.8	S3.2	S2.5	S4	S2
1.0	S2.5	S2	S3.2	-----

Note: σ_D means Design Hoop Stress.

PP-R Working Pressure under Different Conditions

Table 13

Temperature ℃	Operation Time Year	Pipe Series S			
		S5	S4	S3.2	S2.5
		Allowable Working Pressure, MPa			
20	10	1.68	2.10	2.63	3.36
	25	1.60	2.00	2.50	3.20
	50	1.55	1.94	2.43	3.10
30	10	1.40	1.74	2.18	2.78
	25	1.34	1.68	2.10	2.69
	50	1.31	1.64	2.05	2.62
40	10	1.18	1.48	1.85	2.37
	25	1.15	1.44	1.80	2.30
	50	1.11	1.38	1.73	2.21
50	10	1.01	1.26	1.58	2.02
	25	0.96	1.20	1.50	1.92
	50	0.93	1.16	1.45	1.86
60	10	0.85	1.06	1.33	1.70
	25	0.81	1.01	1.27	1.62
	50	0.78	0.98	1.23	1.57
70	10	0.70	0.88	1.10	1.41
	25	0.61	0.76	0.95	1.22
	50	0.51	0.64	0.81	1.04
80	10	0.50	0.62	0.78	0.99
	25	0.38	0.48	0.60	0.77
	50	0.34	0.43	0.54	0.69
90	10	-----	-----	0.43	0.54
	25	-----	-----	0.40	0.51
	50	-----	-----	0.34	0.44

Note: This table is calculated according to the Reference curves for expected strength of polypropylene random copolymer, the safety factor SF=1.25.

PP-R Stable Aluminum Composite Pipe Series Selection I

Table 14

Design Pressure (MPa)	Pipe Series S			
	Class 1	Class 2	Class 4	Class 5
0.4	S5	S5	S5	S4
0.6	S5	S4	S5	S3.2
0.8	S4	S2.5	S4	S2.5
1.0	S3.2	S2.5	S3.2	-----

When the application condition is beyond Table 14, we could choose according to Table 15.

PP-R Stable Aluminum Composite Pipe Series Selection II

Table 15

Temperature ℃	Operation Time Year	Pipe Series S			
		S5	S4	S3.2	S2.5
		Allowable Working Pressure, MPa			
20	10	1.68	2.10	2.63	3.36
	25	1.60	2.00	2.50	3.20
	50	1.55	1.94	2.43	3.10
30	10	1.39	1.74	2.18	2.78
	25	1.34	1.68	2.10	2.69
	50	1.31	1.64	2.05	2.62
40	10	1.18	1.48	1.85	2.37
	25	1.15	1.44	1.80	2.30
	50	1.10	1.38	1.73	2.21
50	10	1.01	1.26	1.58	2.02
	25	0.96	1.20	1.50	1.92
	50	0.93	1.16	1.45	1.86
60	10	0.85	1.06	1.33	1.70
	25	0.81	1.01	1.27	1.62
	50	0.78	0.98	1.23	1.57
70	10	0.70	0.88	1.10	1.41
	25	0.61	0.76	0.95	1.22
	50	0.52	0.65	0.81	1.04
80	10	0.50	0.62	0.78	0.99
	25	0.38	0.48	0.60	0.77
	50	0.34	0.43	0.54	0.69
90	10	0.27	0.34	0.43	0.54
	25	0.26	0.32	0.40	0.51
	50	0.22	0.27	0.34	0.44

PP-R Fiber Composite Pipe Series Selection

Table 16

Application	Design Pressure P_D (MPa)		
	$P_D \leqslant 0.6$	$0.6 < P_D \leqslant 0.8$	$0.8 < P_D \leqslant 1.0$
Convey hot water below 60 ℃	S3.2	S3.2	S2.5
Convey hot water below 70 ℃	S3.2	S2.5	S2.5
Connect heatsink (80 ℃)	S3.2	S2.5	-----

MF-PPR Pipe Series Selection

Table 17

Application	Design Pressure P_D (MPa)			
	$P_D \leqslant 0.6$	$0.6 < P_D \leqslant 0.8$	$0.8 < P_D \leqslant 1.0$	$1.0 < P_D \leqslant 1.6$
Cold water pipe	S5	S5	S4	S4
Hot water pipe	S3.2	S2.5	-----	-----

PP-RCT Pipe Series Selection

Under same pressure condition, we can choose 1 or 2 series lower than pure PP-R pipe when we select PP-RCT pipe.

Table 18

Design Pressure (MPa)	Class 1		Class 2		Class 4		Class 5	
	PP-R	PP-RCT	PP-R	PP-RCT	PP-R	PP-RCT	PP-R	PP-RCT
0.4	S5	S6.3	S5	S6.3	S5	S6.3	S4	S5
0.6	S5	S5	S3.2	S5	S5	S5	S3.2	S4
0.8	S3.2	S4	S2.5	S4	S4	S4	S2	S3.2
1.0	S2.5	S3.2	S2	S3.2	S3.2	S3.2	-----	S2.5

HYDRAULIC CALCULATION

The purpose of hydraulic calculation for water supply pipe network inside building, is to determine the pipe diameter of each pipe section, calculate the head loss which is caused by design flow rate, recheck whether the outdoor water supply network could satisfy the pressure requirement of the worst water distribution point or the fire hydrant, find out the required lift of pressure devices and setting height of high level cistern.

Head Loss Calculation

Head loss per unit length

To PP-R piping system, the head loss per unit length should according to below formula.

Cold water pipe: $i_c = 0.011 \cdot dj^{4.87} \cdot q_g^{1.85}$

Hot water pipe: $i_H = 0.008 \cdot dj^{4.87} \cdot q_g^{1.85}$

i_C – The head loss per unit length of cold water pipe (kPa/m)
i_H – The head loss per unit length of hot water pipe (kPa/m)
q_g – Design flow rate (m^3/s)
dj – Calculated inside diameter of pipe (m)

Note: In the formulas, the water temperature of cold water pipe is calculated based on 20℃, the water temperature of hot water pipe is calculated based on 70℃.

PP-R Piping System: Comparison Table of Nominal Outside Diameter and Calculated Inside Diameter (mm)

Table 19

Nominal Outside Diameter (mm)	20	25	32	40	50	63	75	90	110
S5	15.4	20.4	26.2	32.6	40.8	51.4	61.4	73.6	90.0
S4	15.4	19.4	24.8	31.0	38.8	48.8	58.2	69.8	85.4
S3.2	14.4	18.0	23.2	29.0	36.2	45.8	54.4	65.4	79.8
S2.5	13.2	16.6	21.2	26.6	33.4	42.0	50.0	60.0	73.4

Local Head Loss

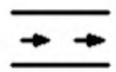
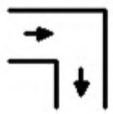
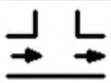
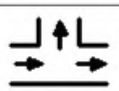
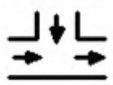
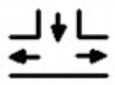
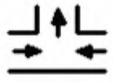
Local head loss of water supply piping system mainly from the installation of various fittings, the sum of the local head loss can be calculated as follows:

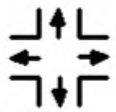
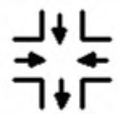
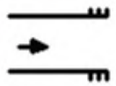
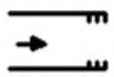
$$h_1 = 0.01 \sum \xi \frac{v^2}{2g} \text{ (MPa)}$$

h1: The sum of the local head loss (MPa)
$\sum \xi$: The sum of the coefficients of local resistances, the coefficient of local resistance of different fittings is as Table 20.
v: The average flow rate, generally refers to the flow rate after local resistance (according to the flow direction) (m/s)
g: Gravitational acceleration (m/s^2)
To simplify the calculations, the local head loss of the water supply network inside building can be calculated according to 25% -30% of the head loss.

Coefficient of local resistance of fittings

Table 20

Fitting	Picture	Graphic symbol	Resistance Coefficient
Socket			0.25
Elbow 90°			1.20
Elbow 45°			0.50
Tee			0.25
			1.20
			0.80
			1.80
			3.00

Fitting	Picture	Graphic symbol	Resistance Coefficient
Cross			2.10
			3.70
Male thread connector			0.70
Female thread connector			0.50
Male thread elbow			1.60
Female thread elbow			1.40
Male thread tee			1.80
Female thread tee			1.60

Flow Direction

INSTALLATION PRINCIPLES

Liner Expansion

The liner expansion of pipes depends on the heat subjected to the pipe material. Generally speaking, cold water pipes have practically no linear expansion and consequently expansion need not considering.
Because of the heat dependent expansion of the material, the linear expansion must be specially considered in hot water and heat supply. There will be three types of installations.

Concealed installation

Concealed installations generally do not need to consider the expansion of PP-R pipes.
The insulation according to DIN1988 or the Decree for the installation of Heating Systems gives enough expansion space for the pipe. In case that the expansion is greater in the insulation, the material absorbs every stress arising from a residual expansion. The same applies to pipes, which do not have to be insulated acc. to current regulations. A temperature dependent linear expansion is prevented through the embedding in the floor, concrete or plaster. The compressive strain and tensile stress arising from this are not critical as they are absorbed through the material.

Installation in Ducts

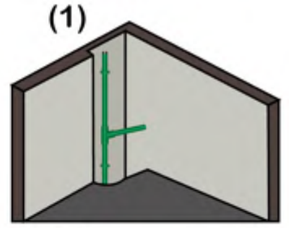
The installation of risers of PP-R pipes requires a branch pipe, which is elastic enough to take the linear expansion of the riser.

They can be ensured by a favorable fixing of the riser in the duct. (1)

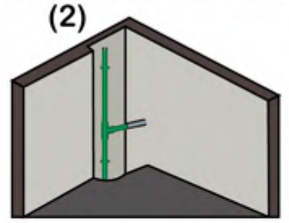
An adequate pipe liner also gives sufficient elasticity to the branch pipe. (2)

Furthermore, the installation of a spring leg gives the appropriate elasticity. (3)

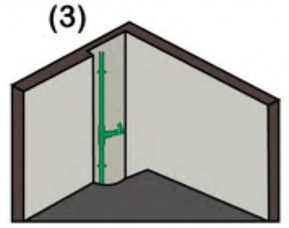
(1)



(2)



(3)



Open Installation

The coefficient of linear expansion α of VASEN polypropylene pipes is as following:

PP-R PIPE	**$\alpha=15.00\times10^{-5}\,[k^{-1}]$**
PP-RCT PIPE	**$\alpha=15.00\times10^{-5}\,[k^{-1}]$**
PP-R FIBER COMPOSITE PIPE	**$\alpha=5.00\times10^{-5}\,[k^{-1}]$**
PP-R STABLE ALUMINUM COMPOSITE PIPE	**$\alpha=4.00\times10^{-5}\,[k^{-1}]$**
MF-PPR PIPE	**$\alpha=3.00\times10^{-5}\,[k^{-1}]$**

Therefore, it is suggested to plan and install visible PP-R pipes, where linear expansion has to be considered.

Calculation of the Linear Expansion

The linear expansion is calculated according to the following formula:

$$\Delta L = a \times L \times \Delta t$$

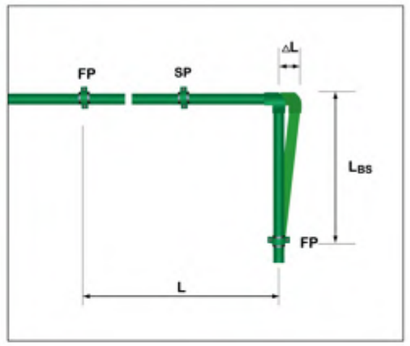
The linear expansion is fully described in following tables. This facilitates a simple and quick reference of linear expansion and the expansion bellow.

Linear expansion due to temperature difference between operating temperature and installation temperature can be compensated by different installation techniques.

Bending side

In most cases direction changes can be used to compensate for linear expansion in pipes.

Symbol	Explanation	Unit
L_{BS}	Length of the bending side	mm
K	Material specific constant (15.0 for PP)	
d	Outside diameter	mm
ΔL	Linear expansion	mm
L	Pipe length	m
FP	Fixed point	
SP	Sliding point	



Calculational determination of the bending side length

$$L_{BS}=K\times\sqrt{(d\times\Delta L)}$$

Expansion loop

If the linear expansion cannot be compensated by a change in direction, it will be necessary to install an expansion loop with long and straight pipelines.

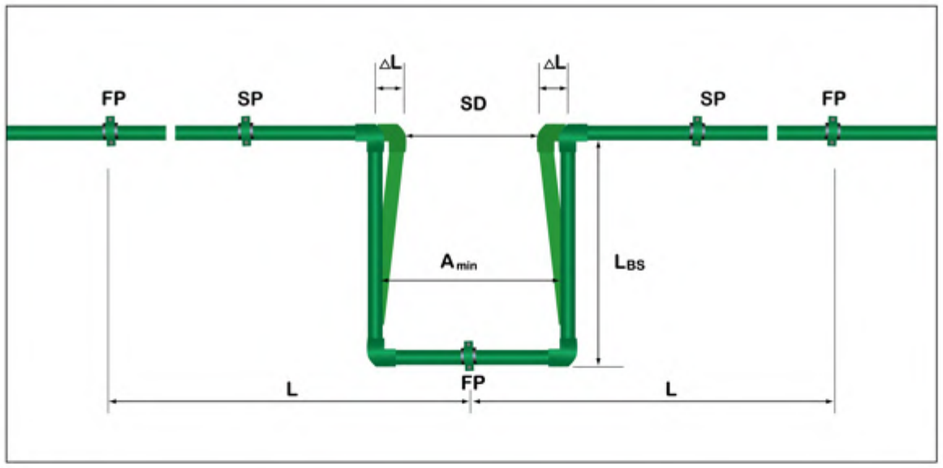
In addition to the length of the bending side L_{BS} the width of the pipe bend A_{min} must be considered.

Symbol	Explanation	Unit
A_{min}	Width of the expansion loop	mm
ΔL	Linear expansion	mm
SD	Safety distance =150	mm

The pipe bend Amin is calculated according to the following formula:

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

The width of the expansion loop A_{min} should be at least 210 mm.



Pre-stress

Where space is limited, it is possible to shorten the total width A_{min} as well as the length of the bending side L_{BSV} by pre-stressing.

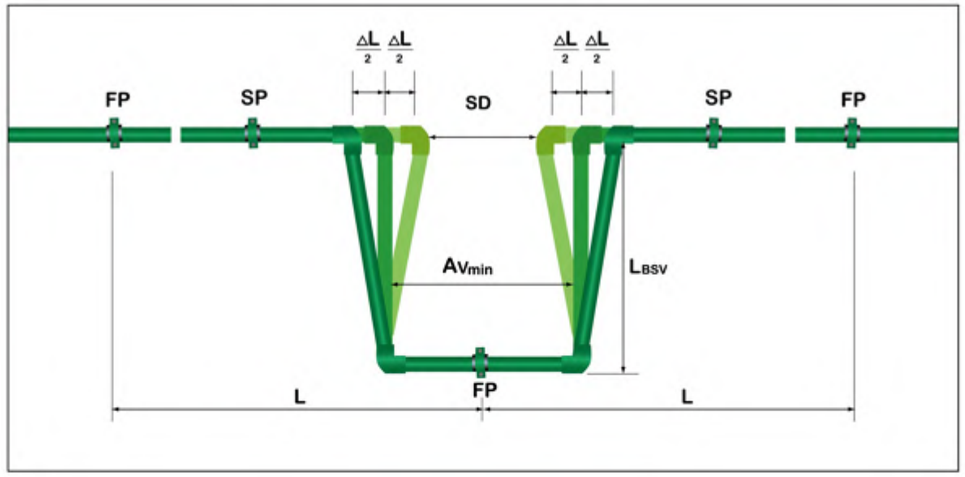
Pre-stress installation, if planned and carried out carefully, offer an optically perfect installation, as the linear expansion is hardly visible.

The side length L_{SV} is calculated according to the following calculation example:

Symbol	Explanation	Unit
L_{BSV}	Length of pre-stress	mm
ΔL	Linear expansion	mm
L_{SV}	Side length	mm

The side length of expansion loops with pre-stress is calculated according to following example

$$L_{BSV}=K\times\sqrt{(d\times\frac{\Delta L}{2})}$$



Bellow expansion joint

All bellow expansion joints for corrugated pipes designed for metal materials are not suitable for polypropylene pipes.

When using axial expansion joints observe the manufacturer's instructions.

Pressure Test/ Test Control

According to the Technical Rules for Portable Water Installations DIN1988, the test pressure has to be 1.5 times of the working pressure for piping systems.
When carrying out the pressure test, the material properties of PP-R pipes lead to an expansion of the pipe, which influences the test result. A further influence to the test result can be caused by the coefficient of thermal expansion of PP-R pipes. Different temperatures for pipe and test medium lead to difference of 0.5 to 1 bar. Therefore, the highest probable constant temperature of the test medium has to be ascertained at the hydraulic pressure test of installations with PP-R pipes.
The hydraulic pressure test requires a preliminary, principal and final test. For the preliminary test, a test pressure of 1.5 times of the highest probable working pressure has to be produced. This test pressure has to be re-established twice within 30 minutes within an interval of 10 minutes. After a test time of further 30 minutes, the test pressure must not drop more than 0.6 bar and no leakage will appear.
The preliminary test is to be followed directly by the principal test. The test time is 2 hours. On doing so, the test pressure may not fall more than 0.2 bar. When the preliminary and principal tests are completed, the final test follows, which has to be effected with a test pressure of alternate 10 bar and 1 bar in a rhythm of at least 5 minutes. Between each test, the pressure has to be released. No leakage may appear at any point.

CHAPTER 6: PRODUCT RANGE

PIPE SERIES

PP-R Pipe

Raw Material: PP-R
Standards: DIN8077/78, ISO15874, GB/T18742.2-2002
Length of Pipes: 4m, or customized
Color: Green / White / Grey, or customized

Diameter dn, mm	Wall Thickness S (20℃, Pressure, bar)			
	S5 (SDR11, PN10)	S4 (SDR9, PN12.5)	S3.2 (SDR7.4, PN16)	S2.5 (SDR6, PN20)
16	--	2.0	2.2	2.7
20	2.0	2.3	2.8	3.4
25	2.3	2.8	3.5	4.2
32	2.9	3.6	4.4	5.4
40	3.7	4.5	5.5	6.7
50	4.6	5.6	6.9	8.3
63	5.8	7.1	8.6	10.5
75	6.8	8.4	10.3	12.5
90	8.2	10.1	12.3	15.0
110	10.0	12.3	15.1	18.3
125	11.4	14.0	17.1	20.8
140	12.7	15.7	19.2	23.3
160	14.6	17.9	21.9	26.6
180	16.4	--	--	--
200	18.2	--	--	--
225	20.5	--	--	--
250	22.7	--	--	--
280	25.4	--	--	--
315	28.6	--	--	--

Note: SF=1.5

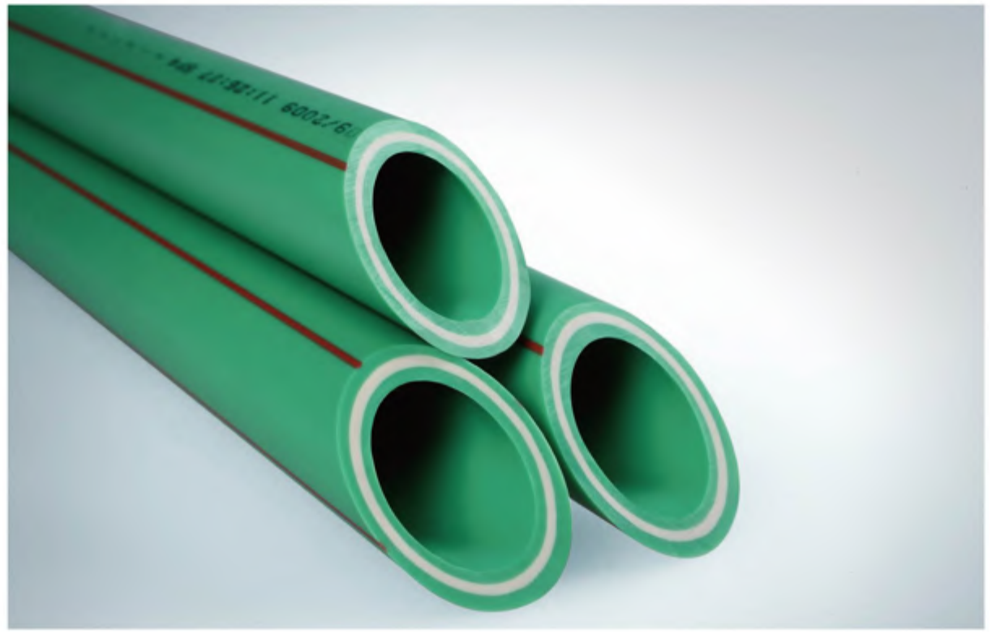
PP-R Aluminum Composite Pipe

Raw Material: PP-R & Aluminum
Standards: DIN8077/78, ISO15874, GB/T18742.2-2002, CJ/T210-2005
Length of Pipes: 4m, or customized
Color: Green / White / Grey, or customized

Diameter dn, mm	Wall Thickness S (20℃, Pressure, bar)		
	S5 (SDR11, PN10)	S4 (SDR9, PN12.5)	S3.2 (SDR7.4, PN16)
20	2.0	2.3	2.8
25	2.3	2.8	3.5
32	2.9	3.6	4.4
40	3.7	4.5	5.5
50	4.6	5.6	6.9
63	5.8	7.1	8.6
75	6.8	8.4	10.3
90	8.2	10.1	12.3
110	10.0	12.3	15.1

Note: SF=1.5

PP-R Fiber Composite Pipe



Raw Material: PP-R, F-PPR

Standards: DIN8077/78, ISO15874, GB/T18742.2-2002, CJ/T258-2014

Length of Pipes: 4m, or customized

Color: Green / White / Grey, or customized

Diameter dn, mm	Wall Thickness	
	S (20℃, Pressure, bar)	
	S3.2 (SDR7.4, PN16)	S2.5 (SDR6, PN20)
20	2.8	3.4
25	3.5	4.2
32	4.4	5.4
40	5.5	6.7
50	6.9	8.3
63	8.6	10.5
75	10.3	12.5
90	12.3	15.0
110	15.1	18.3
125	17.1	20.8
160	21.9	26.6

Note: SF=1.5

MF-PPR Pipe

Raw Material: PP-R, MF-PPR

Standards: DIN8077/78, ISO15874, GB/T18742.2-2002, CJ/T258-2014

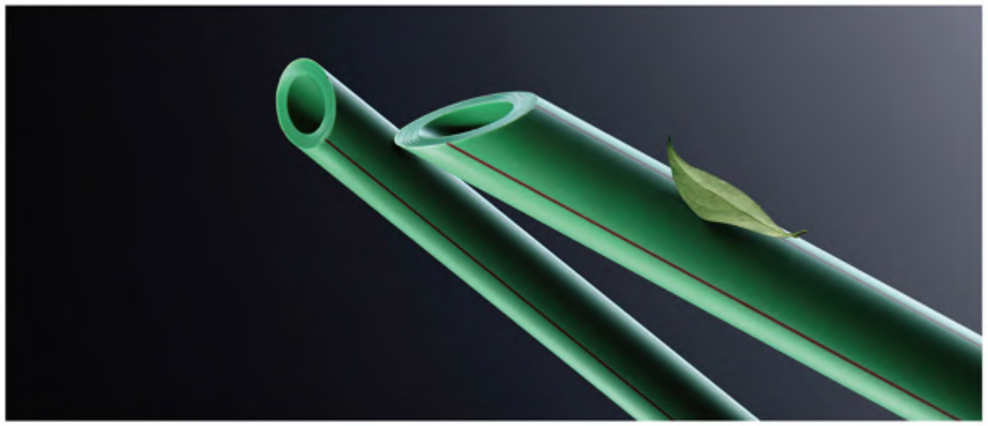
Length of Pipes: 4m, or customized

Color: Green / White / Grey, or customized

Diameter dn, mm	Wall Thickness		
	S (20℃, Pressure, bar)		
	S4 (SDR9, PN12.5)	S3.2 (SDR7.4, PN16)	S2.5 (SDR6, PN20)
50	5.6	6.9	8.3
63	7.1	8.6	10.5
75	8.4	10.3	12.5
90	10.1	12.3	15.0
110	12.3	15.1	18.3
125	14.0	17.1	20.8
140	15.7	19.2	23.3
160	17.9	21.9	26.6

Note: SF=1.5

PP-RCT Pipe



Raw Material: PP-RCT

Standards: DIN8077/78, ISO15874

Length of Pipes: 4m, or customized

Color: Green / Grey

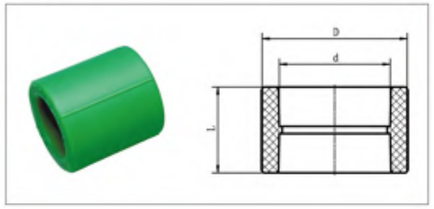
Diameter dn, mm	Wall Thickness S (20℃, Pressure, bar)			
	S5 (SDR11, PN12.5)	S4 (SDR9, PN16)	S3.2 (SDR7.4, PN20)	S2.5 (SDR6, PN25)
16	--	2.0	2.2	2.7
20	2.0	2.3	2.8	3.4
25	2.3	2.8	3.5	4.2
32	2.9	3.6	4.4	5.4
40	3.7	4.5	5.5	6.7
50	4.6	5.6	6.9	8.3
63	5.8	7.1	8.6	10.5
75	6.8	8.4	10.3	12.5
90	8.2	10.1	12.3	15.0
110	10.0	12.3	15.1	18.3
125	11.4	14.0	17.1	20.8
140	12.7	15.7	19.2	23.3
160	14.6	17.9	21.9	26.6
180	16.4	--	--	--
200	18.2	--	--	--
225	20.5	--	--	--
250	22.7	--	--	--
280	25.4	--	--	--
315	28.6	--	--	--

Note: SF=1.5

FITTING SERIES

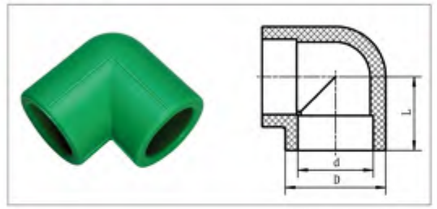
Socket Fusion PP-R Fittings

Socket
WXR100



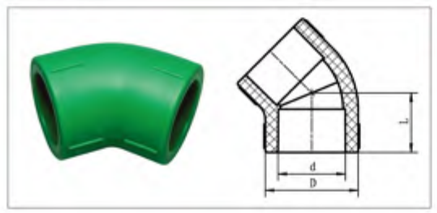
Description	d	D	L
dn20	20	28	34
dn25	25	34	39
dn32	32	43	43
dn40	40	53	47
dn50	50	67	53
dn63	63	84	61
dn75	75	100	68
dn90	90	122	77
dn110	110	148	89
dn125	125	159	94
dn160	160	204	102

Elbow 90°
WXR200



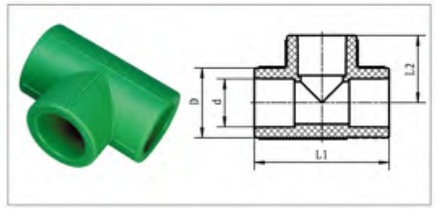
Description	d	D	L
dn20	20	28	27
dn25	25	34	31.5
dn32	32	43	37
dn40	40	53	43
dn50	50	67	51
dn63	63	84	61.5
dn75	75	100	70.5
dn90	90	122	82
dn110	110	148	98
dn125	125	159	111
dn160	160	204	135

Elbow 45°
WXR220



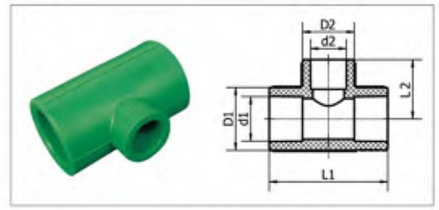
Description	d	D	L
dn20	20	28	21
dn25	25	34	24
dn32	32	43	27.5
dn40	40	53	31.5
dn50	50	67	36.5
dn63	63	84	43
dn75	75	100	48.5
dn90	90	122	55.5
dn110	110	148	65.5
dn160	160	204	88

Tee
WXR300



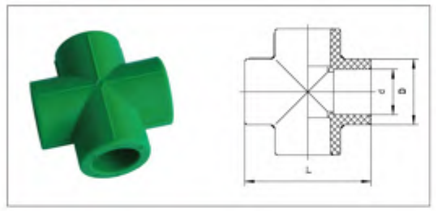
Description	d	D	L1	L2
dn20	20	28	54	27
dn25	25	34	64	32
dn32	32	43	74	37
dn40	40	53	86	43
dn50	50	67	102	51
dn63	63	84	123	61.5
dn75	75	100	141	70.5
dn90	90	122	164	82
dn110	110	148	196	98
dn125	125	159	233	116.5
dn160	160	204	290	145

Reducing Tee
WXR310



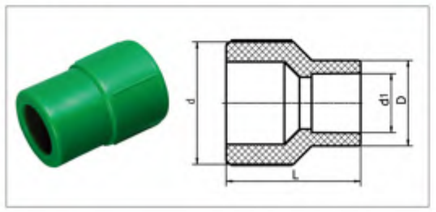
Description	d1	d2	D1	D2	L1	L2
dn20x25x20	20	25	28	34	60	32
dn25x20x20	25	20	34	28	60	31
dn25x20x25	25	20	34	28	64	32
dn25x25x20	25	25	34	34	63	31.5
dn32x20x20	32	20	43	28	62	33
dn32x25x20	32	25	43	34	67	35
dn32x25x25	32	25	43	34	67	35
dn32x20x32	32	20	43	28	62	33
dn32x25x32	32	25	43	34	67	35
dn40x20x40	40	20	53	28	66	37
dn40x25x40	40	25	53	34	71	39
dn40x32x40	40	32	53	43	78	41
dn50x20x50	50	20	67	28	72	42
dn50x25x50	50	25	67	34	77	44
dn50x32x50	50	32	67	43	84	46
dn50x40x50	50	40	67	53	92	48
dn63x20x63	63	20	84	28	83	50.5
dn63x25x63	63	25	84	34	85	50.5
dn63x32x63	63	32	84	43	92	52.5
dn63x40x63	63	40	84	53	100	54.5
dn63x50x63	63	50	84	67	110	57.5
dn75x20x75	75	20	100	28	88	58
dn75x25x75	75	25	100	34	93	58
dn75x32x75	75	32	100	43	100	58
dn75x40x75	75	40	100	53	110	60
dn75x50x75	75	50	100	67	116	62
dn75x63x75	75	63	100	84	129	67.5
dn90x25x90	90	25	120	34	102	69
dn90x32x90	90	32	120	43	109	69
dn90x40x90	90	40	120	53	124	71
dn90x50x90	90	50	120	67	124	71
dn90x63x90	90	63	120	84	137	75
dn90x75x90	90	75	120	100	149	78
dn110x25x110	110	25	148	34	114	82
dn110x32x110	110	32	148	43	121	82
dn110x40x110	110	40	148	53	126	83.5
dn110x50x110	110	50	148	67	136	83.5
dn110x63x110	110	63	148	84	149	85
dn110x75x110	110	75	148	100	161	88
dn110x90x110	110	90	148	120	176	92
dn125x110x125	125	110	159	141	233	115.5
dn160x110x160	160	110	204	141	290	142
dn160x125x160	160	125	204	161	290	143

Cross
WXR400



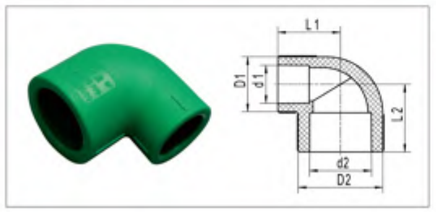
Description	d	D	L
dn20	20	28	54
dn25	25	34	64
dn32	32	43	74
dn40	40	53	86
dn50	50	67	102
dn63	63	84	123

Reducer
WXR110



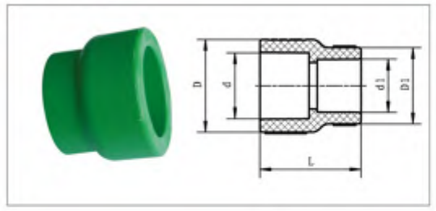
Description	d	d1	D	L
dn25x20	25	20	28	39
dn32x20	32	20	28	37
dn32x25	32	25	34	43
dn40x20	40	20	28	44
dn40x25	40	25	34	41
dn40x32	40	32	43	47.5
dn50x20	50	20	28	45
dn50x25	50	25	34	47
dn50x32	50	32	43	49
dn50x40	50	40	53	53
dn63x25	63	25	34	56
dn63x32	63	32	43	57
dn63x40	63	40	53	59
dn63x50	63	50	67	63
dn75x63	75	63	84	73
dn90x63	90	63	84	67
dn90x75	90	75	100	82
dn110x63	110	63	84	82
dn110x75	110	75	100	83
dn110x90	110	90	122	90
dn160x110	160	110	141	100
dn160x125	160	125	160	100

Reducing Elbow
WXR210



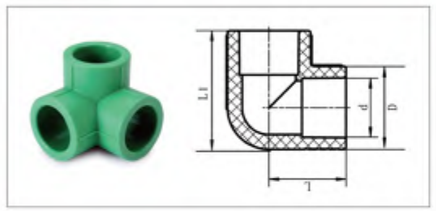
Description	d1	d2	D1	D2	L1	L2
dn25x20	20	25	28	34	29.5	31.5
dn32x20	20	32	28	43	33	37
dn32x25	25	32	34	43	35	37
dn40x32	32	40	43	53	39.5	42.5

Bushing
WXR120



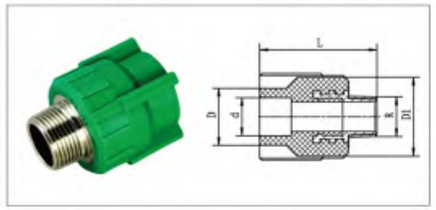
Description	d	d1	D	D1	L
dn25x20	25	20	34	28	37
dn32x20	32	20	43	28	41
dn32x25	32	25	43	34	53
dn40x20	40	20	53	28	48
dn40x25	40	25	53	34	48
dn40x32	40	32	53	43	63
dn50x20	50	20	67	28	56
dn50x25	50	25	67	34	54
dn50x32	50	32	67	43	54
dn50x40	50	40	67	53	54
dn63x25	63	25	84	34	68
dn63x32	63	32	84	43	66
dn63x40	63	40	84	53	66
dn63x50	63	50	84	67	66
dn75x63	75	63	100	84	76
dn90x63	90	63	120	84	82
dn90x75	90	75	120	100	83
dn110x63	110	63	148	84	98
dn110x75	110	75	148	100	98
dn110x90	110	90	148	120	95
dn125x110	125	110	159	141	105
dn160x125	160	125	204	159	115

Tee with Side Inlet
WXR320



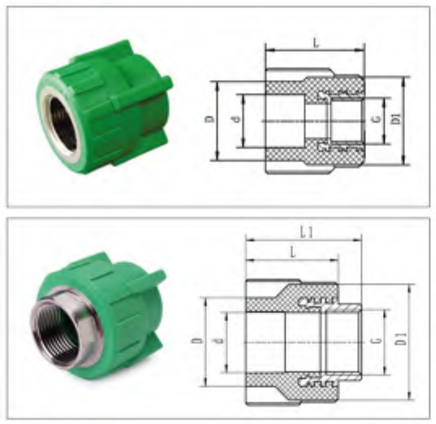
Description	d	D	L	L1
dn20	20	28	27	41
dn25	25	34	31.5	48.5

Male Thread Connector
WXR101



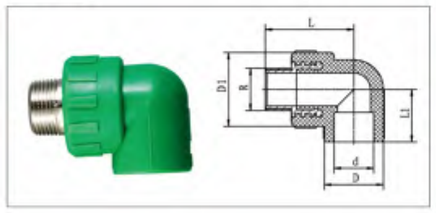
Description	d	R	D	D1	L
dn20x1/2"	20	1/2"	29	40	59.5
dn20x3/4"	20	3/4"	29	45	61
dn25x1/2"	25	1/2"	36	40	59.5
dn25x3/4"	25	3/4"	36	45	61
dn32x1/2"	32	1/2"	43	40	59.5
dn32x3/4"	32	3/4"	43	45	61
dn32x1"	32	1"	45	59	85
dn40x1 1/4"	40	1 1/4"	57	71	93
dn50x1 1/2"	50	1 1/2"	70	84	102
dn63x2"	63	2"	86	101	118.5
dn75x2 1/2"	75	2 1/2"	100	116	118.5
dn90x3"	90	3"	120	140	135.5

Female Thread Connector
WXR102



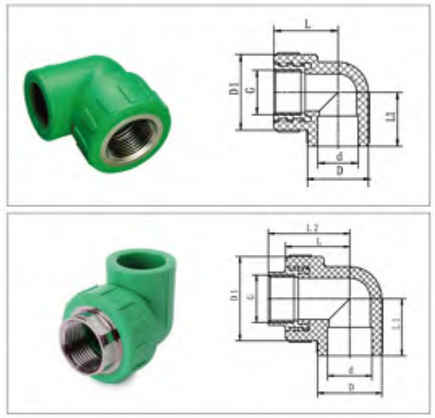
Description	d	G	D	D1	L	L1
dn20x1/2"	20	1/2"	29	40	45	\
dn20x3/4"	20	3/4"	29	45	45	\
dn25x1/2"	25	1/2"	36	40	45	\
dn25x3/4"	25	3/4"	36	45	45	\
dn32x1/2"	32	1/2"	43	40	47	\
dn32x3/4"	32	3/4"	43	45	47	\
dn32x1"	32	1"	45	59	48	61
dn40x1 1/4"	40	1 1/4"	57	71	57	70
dn50x1 1/2"	50	1 1/2"	70	84	64	80
dn63x2"	63	2"	86	101	75	92
dn75x2 1/2"	75	2 1/2"	100	116	75	94

Male Thread Elbow
WXR201



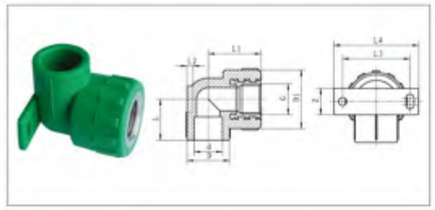
Description	d	R	D	D1	L	L1
dn20x1/2"	20	1/2"	29	40	50.5	28
dn20x3/4"	20	3/4"	29	45	52	28
dn25x1/2"	25	1/2"	36	40	52.5	32
dn25x3/4"	25	3/4"	36	45	54	32
dn32x1/2"	32	1/2"	43	40	55.5	35
dn32x3/4"	32	3/4"	43	45	57	37
dn32x1"	32	1"	45	59	75	40

Female Thread Elbow
WXR202



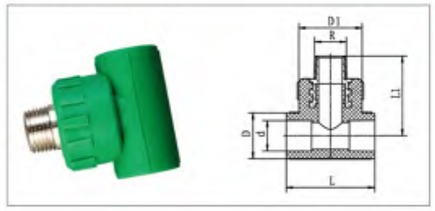
Description	d	G	D	D1	L	L1	L2
dn20x1/2"	20	1/2"	29	40	36	28	\
dn20x3/4"	20	3/4"	29	45	36	28	\
dn25x1/2"	25	1/2"	36	40	38	32	\
dn25x3/4"	25	3/4"	36	45	38	32	\
dn32x1/2"	32	1/2"	43	40	41	35	\
dn32x3/4"	32	3/4"	43	45	41	37	\
dn25x1"	25	1"	36	59	42	32	54
dn32x1"	32	1"	45	59	45	40	58

Female Thread Elbow with Ear
WXR204



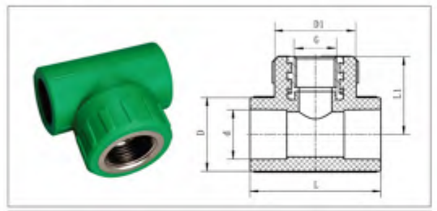
Description	d	G	D	D1	L	L1	L2	L3	L4	Z
dn20x1/2"	20	1/2"	29	40	28	36	4	46	58	18
dn25x1/2"	25	1/2"	36	40	32	38	4	48	60	20
dn25x3/4"	25	3/4"	36	40	32	38	4	48	60	20

Male Thread Tee
WXR301



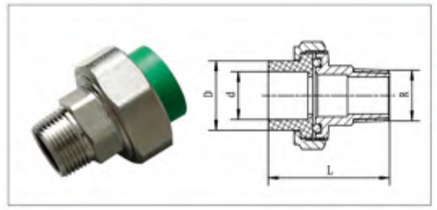
Description	d	R	D	D1	L	L1
dn20x1/2"x20	20	1/2"	29	40	56	50.5
dn20x3/4"x20	20	3/4"	29	45	66	52
dn25x1/2"x25	25	1/2"	36	40	64	50.5
dn25x3/4"x25	25	3/4"	36	45	64	57
dn32x1/2"x32	32	1/2"	43	40	74	52.5
dn32x3/4"x32	32	3/4"	43	45	74	56
dn32x1"x32	32	1"	45	59	76	72
dn40x1"x40	40	1"	57	59	86	78

Female Thread Tee
WXR302



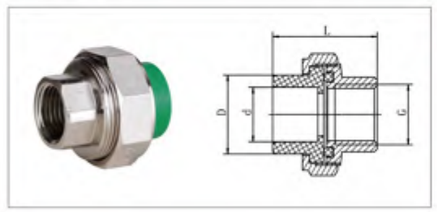
Description	d	G	D	D1	L	L1	L2
dn20x1/2"x20	20	1/2"	29	40	56	36	\
dn20x3/4"x20	20	3/4"	29	45	66	36	\
dn20x3/8"x20	20	3/8"	28	33	50	30	\
dn25x1/2"x25	25	1/2"	36	40	64	38	\
dn25x3/4"x25	25	3/4"	36	45	70	41	\
dn32x1/2"x32	32	1/2"	43	40	68	40	\
dn32x3/4"x32	32	3/4"	43	45	74	42	\
dn32x1"x32	32	1"	45	59	82	45	58
dn40x1"x40	40	1"	57	59	86	65	78

Male Thread Union (Metal/Plastic)
WXR103



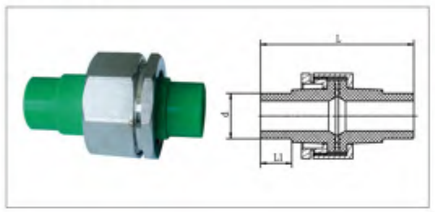
Description	d	R	D	L
dn20x1/2"	20	1/2"	28	49
dn20x3/4"	20	3/4"	28	54.5
dn25x1/2"	25	1/2"	34	56
dn25x3/4"	25	3/4"	34	53
dn25x1"	25	1"	34	57
dn32x1"	32	1"	43	57
dn40x1 1/4"	40	1 1/4"	53	76
dn50x1 1/2"	50	1 1/2"	67	80
dn63x2"	63	2"	84	88
dn75x2 1/2"	75	2 1/2"	100	93
dn90x3"	90	3"	120	109.5

Female Thread Union (Metal/Plastic)
WXR104



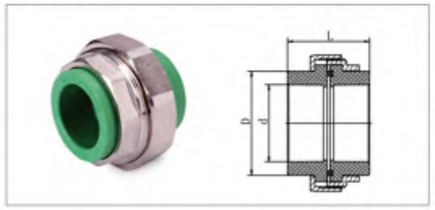
Description	d	G	D	L
dn20x1/2"	20	1/2"	28	37
dn20x3/4"	20	3/4"	28	38
dn25x1/2"	25	1/2"	34	40
dn25x3/4"	25	3/4"	34	41
dn32x1"	32	1"	43	45
dn40x1 1/4"	40	1 1/4"	55	52
dn50x1 1/2"	50	1 1/2"	66	59
dn63x2"	63	2"	84	65
dn75x2 1/2"	75	2 1/2"	100	70

Union (Male/Male)
WXR105



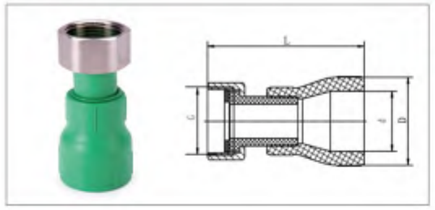
Description	d	L	L1
dn20	20	92	20
dn25	25	96	20
dn32	32	108	22
dn40	40	118	22

Union (Female/Female)
WXR109



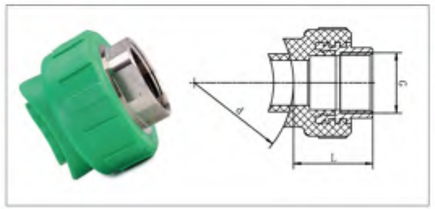
Description	d	D	L
dn20	20	28	37
dn25	25	34.5	43
dn32	32	44	48
dn40	40	53	53
dn50	50	67	60
dn63	63	84	66

Nut Union
WXR107



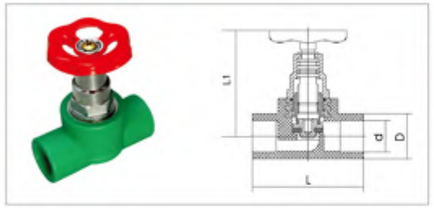
Description	d	D	L	G
dn32x1"	32	43	88	1"
dn40x1 1/4"	40	53	101.5	1 1/4"

Female Thread Saddle
WXR152



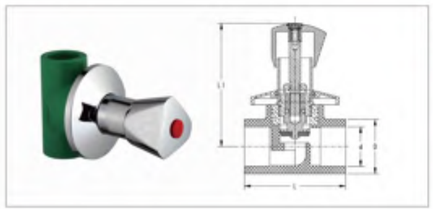
Description	d	L	G
dn75x32x1"	75	44	1"
dn90x32x1"	90	44	1"
dn110x32x1"	110	44	1"
dn160x32x1"	160	44	1"

Stop Valve-Socket End
WXR830



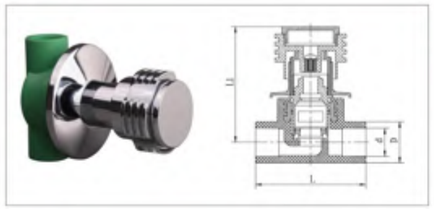
Description	d	D	L	L1
dn20	20	28	75	73
dn25	25	34.5	85	85
dn32	32	43	105	93
dn40	40	54	130	110.5
dn50	50	70	165	138
dn63	63	86	180	161

Stop Valve-Chrome Handle
WXR860



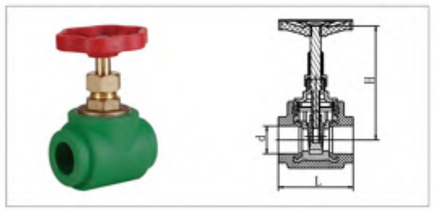
Description	d	D	L	L1
dn20	20	28	65	96
dn25	25	34	75	98
dn32	32	43	80	101

Concealed Valve
WXR870



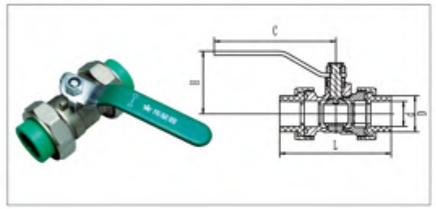
Description	d	D	L	L1
dn20	20	28	75	78.5
dn25	25	34	79	78.5

Gate Valve
WXR850



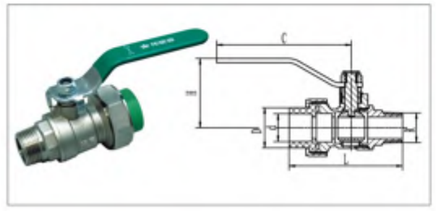
Description	d	L	H
dn20	20	58	77
dn25	25	65	99

Double Union Ball Valve
WXR800



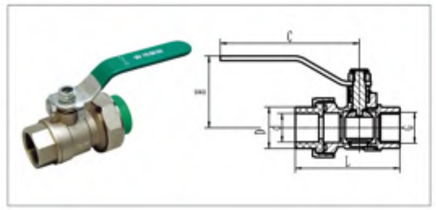
Description	D	d	L	H	C
dn20	20	15	87	55	90
dn25	25	21	98	58	105
dn32	32	27	105	68	125
dn40	40	36	122	80	132
dn50	50	45	133	83	145
dn63	63	59	156	95	165

Single Union & Male Thread Ball Valve
WXR810



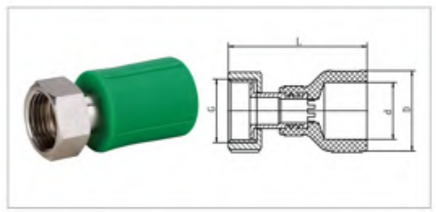
Description	D	d	L	H	R	C
dn20x1/2"	28	20	80	55	1/2"	90
dn25x3/4"	34	25	88	58	3/4"	105
dn32x1"	43	32	102	68	1"	125

Single Union & Female Thread Ball Valve
WXR820



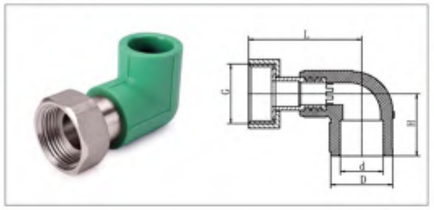
Description	D	d	L	H	G	C
dn20x1/2"	15	20	71	55	1/2"	90
dn25x3/4"	21	25	79	58	3/4"	105
dn32x1"	27	32	90	68	1"	125

Fast Union Socket
WXR108



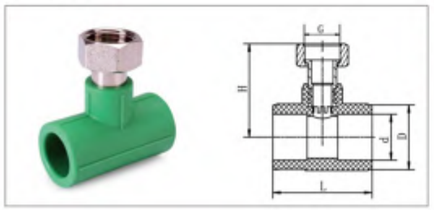
Description	d	D	L	G
dn20x1/2"	20	28	56	1/2"
dn25x1"	25	34	71	1"

Fast Union Elbow
WXR208



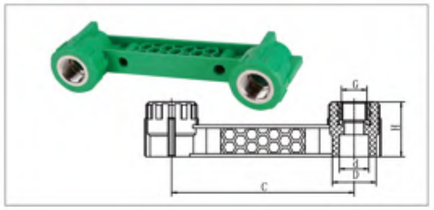
Description	d	D	L	G	H
dn20x1/2"	20	28	49	1/2"	28
dn25x1"	25	34	64	1"	33

Fast Union Tee
WXR308



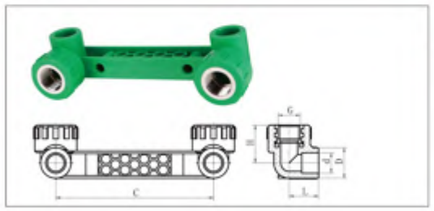
Description	d	D	L	G	H
dn20x1/2"	20	28	54	1/2"	48

Integrated Female Connector
WXR106



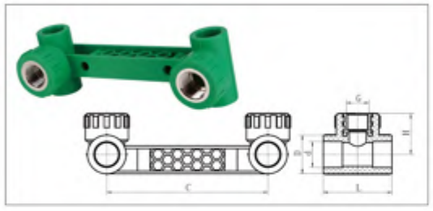
Description	d	D	G	H	C
dn20x1/2"	20	28.5	1/2"	45	150
dn25x1/2"	25	36	1/2"	45	150

Integrated Female Thread Elbow
WXR206



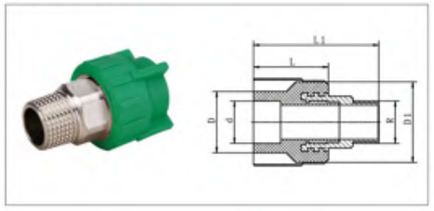
Description	d	D	G	L	H	C
dn20x1/2"	20	29	1/2"	28	36	150
dn25x1/2"	25	36	1/2"	32	38	150
dn25x20x1/2"	25/20	29/36	1/2"	32/28	38/36	150

Integrated Female Thread Tee
WXR306



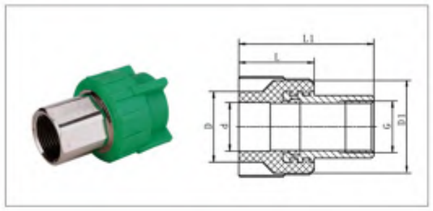
Description	d	D	G	L	H	C
dn20x1/2"x20	20	29	36	56	36	150
dn25x1/2"x25	25	36	38	64	38	150

Long Male Thread Connector
WXR101-7



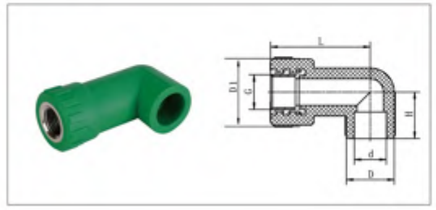
Description	d	D	D1	L	L1	R
dn32x1"	32	45	59	55	92	1"
dn40x1 1/4"	40	57	71	58	98	1 1/4"

Long Female Thread Connector
WXR102-7



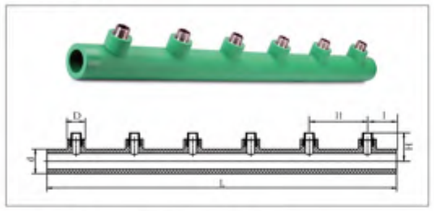
Description	d	D	D1	L	L1	G
dn32x1"	32	45	59	48	86	1"
dn40x1 1/4"	40	57	71	58	96	1 1/4"

Long Female Thread Elbow
WXR202-7



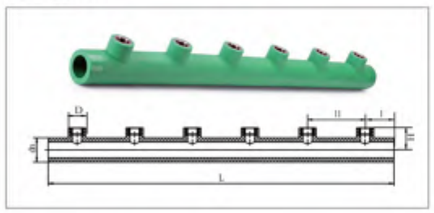
Description	d	D	D1	L	H	G
dn25x1/2"	20	29	40	74.5	28	1/2"
dn20x1/2"	25	36	40	93	32	1/2"

Male Thread Mainfold
WXR161



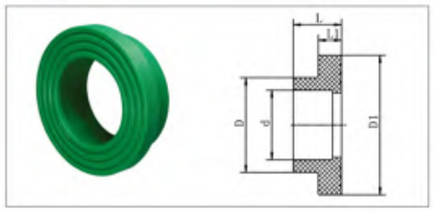
Description	d	D	L	H	I	I1
dn63x6x3/4"	63	45	900	73.5	75	150

Female Thread Mainfold
WXR162



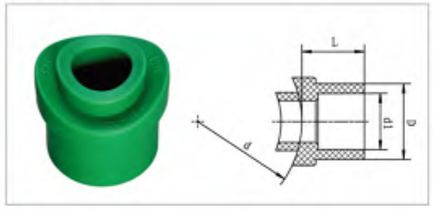
Description	d	D	L	H	I	I1
dn63x6x3/4"	63	45	900	57.5	75	150

Flange Adaptor
WXR140



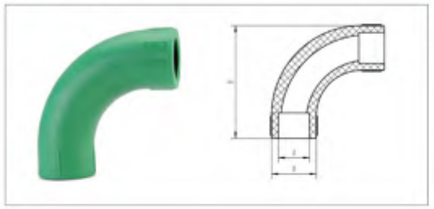
Description	d	D	D1	L	L1
dn40	40	53	78	27	13
dn50	50	67	87	30	10
dn63	63	84	100	34	12
dn75	75	99	123	38	14
dn90	90	118	140	44	15
dn110	110	141	161	50	18.5
dn160	160	196	218	52	21

Saddle
WXR150



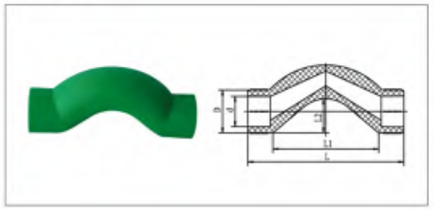
Description	d	d1	D	L
dn50x25	50	25	34	27
dn63x25	63	25	34	27
dn63x32	63	32	43	29
dn75x25	75	25	34	27
dn75x32	75	32	43	29
dn90x25	90	25	34	27
dn90x32	90	32	43	29
dn90x40	90	40	53	33
dn110x25	110	25	34	27
dn110x32	110	32	43	29
dn110x40	110	40	53	33
dn125x25	125	25	34	27
dn125x32	125	32	43	29
dn125x40	125	40	53	33
dn160x25	160	25	34	27
dn160x32	160	32	43	29
dn160x40	160	40	53	33

Large Elbow 90°
WXR200-7



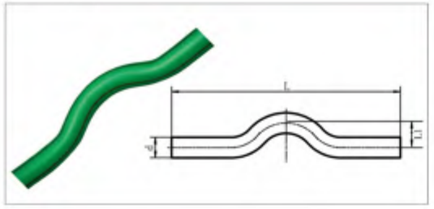
Description	d	D	H
dn20	20	28	56.5
dn25	25	34	67

Cross Fitting
WXR130



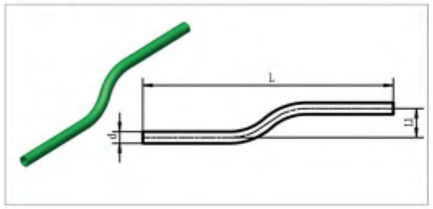
Description	d	D	L	L1	L2
dn20	20	28	96	61	22
dn25	25	34	124	84	27
dn32	32	43	156	116	34

Cross Pipe
WXR131



Description	d	L	L1
dn20	20	280	25
dn25	25	280	30
dn32	32	280	40

Z Pipe
WXR132



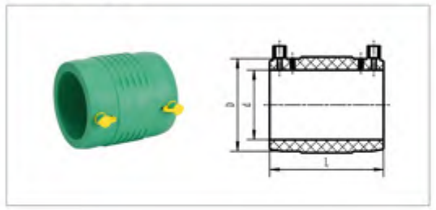
Description	d	L	L1
dn20	20	432	50
dn25	25	432	50
dn32	32	432	50

Ω Pipe
WXR133

Description	d
dn20	20
dn25	25
dn32	32

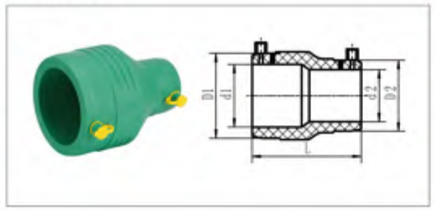
Electrofusion Fittings

E.F. Socket
WXRD100



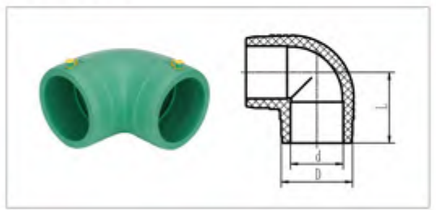
Description	d	D	L
dn25	25	40	73
dn32	32	47	81
dn40	40	56	85
dn50	50	70	101
dn63	63	84	118
dn75	75	100	130
dn90	90	120	145
dn110	110	146	160
dn125	125	159	182
dn160	160	204	190
dn200	200	242	210
dn250	250	304	244
dn315	315	380	285

E.F. Reducer
WXRD110



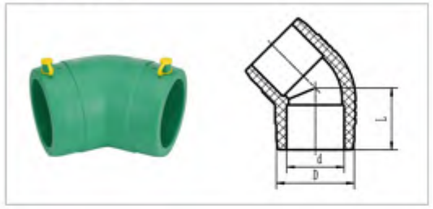
Description	d1	d2	D1	D2	L
dn63x50	63	50	84	70	120
dn90x63	90	63	120	84	155
dn110x63	110	63	146	84	191
dn110x90	110	90	146	120	179
dn125x110	125	110	159	144	186
dn160x90	160	90	204	120	220
dn160x110	160	110	204	144	220
dn160x125	160	125	204	159	215
dn200x160	200	160	256	204	220
dn250x200	250	200	314	254	245
dn315x250	315	250	396	318	340

E.F. Elbow 90°
WXRD200



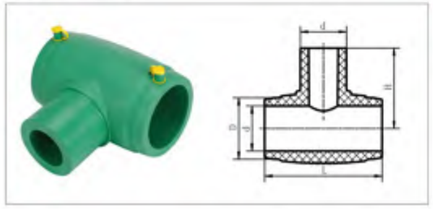
Description	d	D	L
dn50	50	70	90
dn63	63	84	95
dn75	75	100	109
dn90	90	120	119
dn110	110	146	144
dn125	125	159	152
dn160	160	204	195
dn200	200	257	215
dn250	250	316	261
dn315	317	387	299

E.F. Elbow 45°
WXRD220



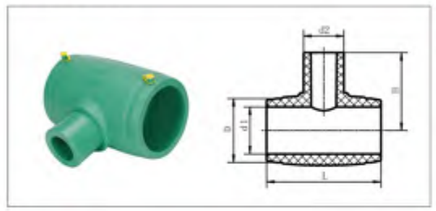
Description	d	D	L
dn63	63	84	78
dn75	75	400	88
dn90	90	120	95
dn110	110	146	112
dn125	125	159	116
dn160	160	204	148
dn200	200	254	165
dn250	250	316	191
dn315	317	387	210

E.F. Tee
WXRD300



Description	d	D	L	H
dn50	50	70	165	102
dn63	63	84	178	120
dn75	75	100	191	131
dn90	90	120	226	144
dn110	110	146	245	167
dn125	125	159	310	184.5
dn160	160	204	364	217
dn200	200	254	400	255
dn250	250	318.5	450	310
dn315	315	396	640	390

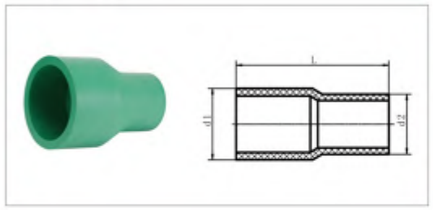
E.F. Reducing Tee
WXRD310



Description	d1	d2	D	L	H
dn63x25x63	63	25	84	144	92
dn63x32x63	63	32	84	144	96
dn63x50x63	63	50	84	162	111
dn75x25x75	75	25	100	156	99
dn75x32x75	75	32	100	156	103
dn75x63x75	75	63	100	179	122
dn90x25x90	90	25	120	174	111
dn90x32x90	90	32	120	174	115
dn90x63x90	90	63	120	200	132
dn90x75x90	90	75	120	212	145
dn110x25x110	110	25	146	200	125
dn110x32x110	110	32	146	200	129
dn110x63x110	110	63	146	245	155
dn160x63x160	160	63	204	267	188
dn160x110x160	160	110	204	318	202
dn200x160x200	200	160	254	360	240
dn250x200x250	250	200	305	392	287
dn315x250x315	315	250	385	533	365

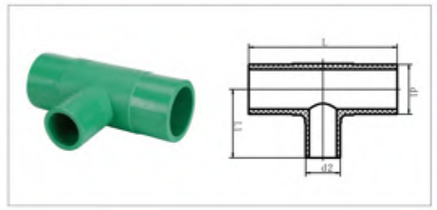
Butt Fusion Fittings

B.F. Reducer
WXRB110



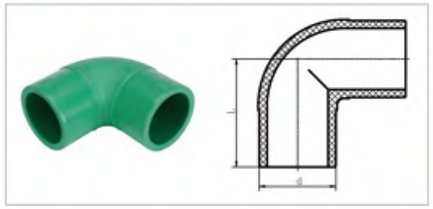
Description	d1	d2	L
dn110x63	110	63	182
dn110x75	110	75	182
dn110x90	110	90	177
dn125x63	125	63	182
dn125x90	125	90	180
dn125x110	125	110	182
dn160x63	160	63	217
dn160x90	160	90	222
dn160x110	160	110	229
dn160x125	160	125	211
dn200x90	200	90	255
dn200x110	200	110	244
dn200x160	200	160	231
dn225x160	225	160	258
dn225x200	225	200	248
dn250x110	250	110	294
dn250x125	250	125	299
dn250x160	250	160	289
dn250x180	250	180	289
dn250x200	250	200	274
dn250x225	250	225	266
dn315x200	315	200	336
dn315x250	315	250	345

B.F. Reducing Tee
WXRB310



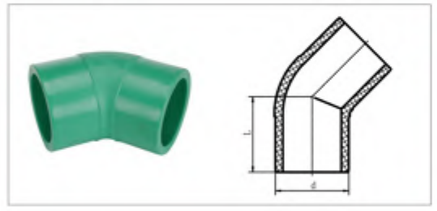
Description	d1	d2	L	L1
dn110x63x110	110	63	310	137
dn110x75x110	110	75	258	135
dn110x90x110	110	90	310	153
dn125x63x125	125	63	340	150
dn125x90x125	125	90	340	166
dn160x63x160	160	63	295	157
dn160x90x160	160	90	370	193
dn160x110x160	160	110	340	177
dn180x63x180	180	63	300	168
dn180x90x180	180	90	330	184
dn180x125x180	180	125	365	192
dn200x90x200	200	90	350	195
dn200x110x200	200	110	370	199
dn200x160x200	200	160	420	215
dn250x110x250	250	110	405	223
dn250x160x250	250	160	460	241
dn250x200x250	250	200	500	255
dn315x250x315	315	250	605	313

B.F. Elbow 90°
WXRB200



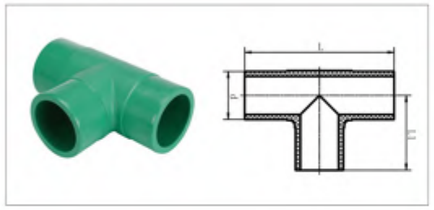
Description	d	L
dn110	110	155
dn125	125	165
dn160	160	185
dn200	200	230
dn250	250	276
dn315	315	330

B.F. Elbow 45°
WXRB220



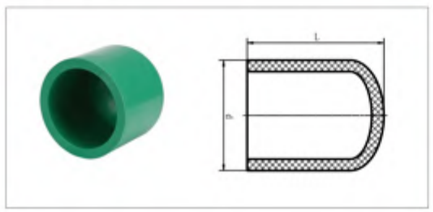
Description	d	L
dn110	110	113
dn125	125	121
dn160	160	132
dn200	200	165
dn250	250	193
dn315	315	230

B.F. Tee
WXRB300



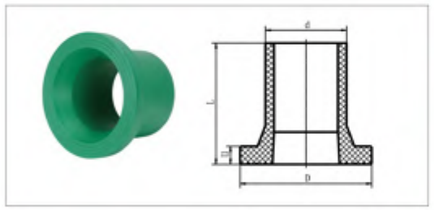
Description	d	L	L1
dn110	110	310	155
dn125	125	340	170
dn160	160	380	190
dn180	180	420	210
dn200	200	460	230
dn250	250	550	275
dn315	315	670	335

B.F. End Cap
WXRB700



Description	d	L
dn110	110	123
dn125	125	124
dn160	160	132
dn180	180	183
dn200	200	190
dn250	250	192
dn315	315	216

B.F. Flange Adapter
WXRB140



Description	d	D	L	L1
dn110	110	158	128	18
dn125	125	140	160	28
dn160	160	196	187	40
dn180	180	212	180	28
dn200	200	268	182	32
dn225	225	269	180	32
dn250	250	320	205	35
dn315	315	374	210	35

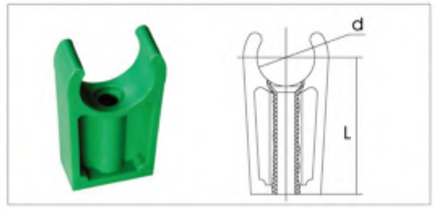
TOOLS & ACCESSARIES

Accessories

Small Plastic Clip
WXR710

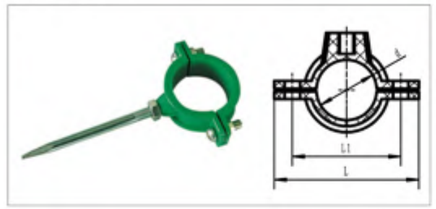
Description	d	H
dn20	19	17.5
dn25	24	20
dn32	31	23

Large Plastic Clip
WXR711



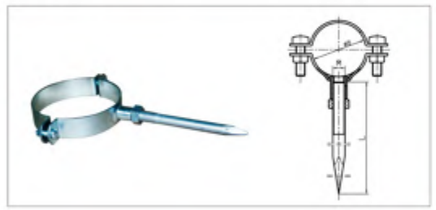
Description	d	L
dn20	19	45
dn25	24	45
dn32	31	45

Clip with Thread
WXR712



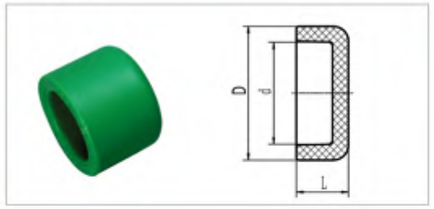
Description	d	L	L1
dn20	20	48	36
dn25	25	52	40
dn32	32	60	48

Metal Clip
WXR713



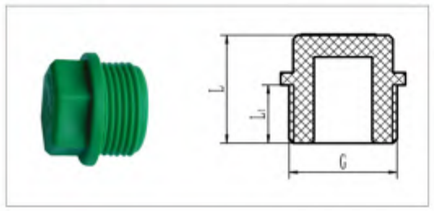
Description	D	L	M
dn20	20	110	M8
dn25	25	110	M8
dn32	32	110	M8
dn40	40	120	M10
dn50	50	120	M10
dn63	63	120	M10
dn75	75	170	M14
dn90	90	170	M14
dn110	110	170	M14

End Cap
WXR700



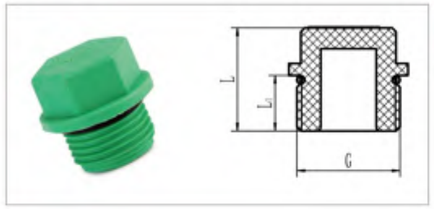
Description	d	D	L
dn20	20	28	24
dn25	25	34	27
dn32	32	43	30
dn40	40	53	33
dn50	50	67	36
dn63	63	84	42
dn75	75	100	46
dn90	90	120	78
dn110	110	148	97
dn125	125	159	96
dn160	160	204	105

End Cap with Thread
WXR701



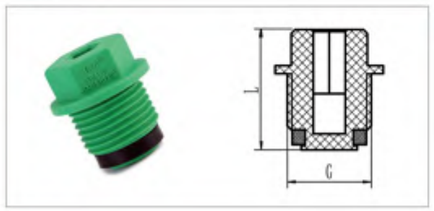
Description	G	L	L1
R1/2	1/2"	22.5	21
R3/4	3/4"	25	24

End Cap with Thread (with seals)
WXR702



Description	G	L	L1
R1/2	1/2"	22.5	21
R3/4	3/4"	25	24

End Cap with Thread (with gasket)
WXR703



Description	L	G
R1/2	29	12

Flange Plate (for Socket Fusion)
WXR900

Description	
dn40	dn90
dn50	dn110
dn63	dn160
dn75	

Flange Plate (for Butt Fusion)
WXRB900

Description	
dn110	dn200
dn125	dn250
dn160	dn315

Welding Machine
WXR920

Description
dn20-32
dn20-63
dn75-110

Welding Machine Mould
WXR931

Description	
dn20	dn63
dn25	dn75
dn32	dn90
dn40	dn110
dn50	dn160

Welding Machine Saddle Mould
WXR932

Description	
dn50/25	dn90/32
dn63/25	dn110/25
dn75/25	dn110/32
dn90/25	

Repairing Stick Mould
WXR933

Description
dn7
dn11

Aiguille
WXR934

Description
dn25
dn32

Repairing Stick
WXR720

Description
dn7-11

Roller Cutter
WXR930-1

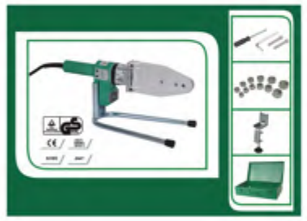
Description
dn50-140

Cutter
WXR930

Description
dn20-40
dn20-75

Socket Fusion Tools

RJQ-63
PPR SOCKETS WELDER 63MM



MAIN TECHINICAL DATA:

FUSING PIPE SCOPE:	D20, D25, D32, D40, D50, D63
RATE VOLTAGE:	A.C 220/230V 50/60HZ
RATED POWER:	800W/870W
WORKING TEMPERATURE:	260℃±3%
ENVIRONMENT TEMPERATURE:	-5℃~45℃
APPLICABLE MATERIAL:	POLYPROPYLENE
ACCESSORIES:	1PC FUSION TOOL
	1PC METAL CASE (BIG METAL CASE OPTIONAL)
	1PC UNDERPIN RACK
	1PC TABLE-BOARD CLAMP (OPTIONAL)
	1BAG OF BOLTS & HEX KEY WRENCH
	SOCKETS D20, D25, D32, D40, D50, D63 (OPTIONAL)

ZRJQ-63T
PPR SOCKETS WELDER WITH DIGITAL SCREEN 63MM

MAIN TECHINICAL DATA:

FUSING PIPE SCOPE:	D20, D25, D32, D40, D50, D63
RATE VOLTAGE:	A.C 220/230V 50/60HZ
RATED POWER:	800W/870W
WORKING TEMPERATURE:	200~279℃±1%
ENVIRONMENT TEMPERATURE:	-5℃~45℃
APPLICABLE MATERIAL:	POLYPROPYLENE
ACCESSORIES:	1PC FUSION TOOL
	1PC METAL CASE (BIG METAL CASE OPTIONAL)
	1PC UNDERPIN RACK
	1PC TABLE-BOARD CLAMP (OPTIONAL)
	1BAG OF BOLTS & HEX KEY WRENCH
	SOCKETS D20, D25, D32, D40, D50, D63 (OPTIONAL)

ZRJQ-110
PPR SOCKETS WELDER WITH DIGITAL SCREEN 110MM

MAIN TECHINICAL DATA:

FUSING PIPE SCOPE:	D75, D90, D110
RATE VOLTAGE:	A.C 220/230V 50/60HZ
RATED POWER:	1200W/1310W
WORKING TEMPERATURE:	200~279℃±1%
ENVIRONMENT TEMPERATURE:	-5℃~45℃
APPLICABLE MATERIAL:	POLYPROPYLENE
ACCESSORIES:	1PC FUSION TOOL
	1PC METAL CASE (BIG METAL CASE OPTIONAL)
	1PC UNDERPIN RACK
	1PC TABLE-BOARD CLAMP (OPTIONAL)
	1BAG OF BOLTS & HEX KEY WRENCH
	SOCKETS D75, D90, D110 (OPTIONAL)

CHHJ-160SC
MECHANIC PLASTIC SOCKET WELDING MACHINE 160MM-C

MAIN TECHINICAL DATA:

FUSING PIPE SCOPE:	D50, D63, D75, D90, D110, D125, D140, D160
RATE VOLTAGE:	A.C 220/230V 50/60HZ
RATED POWER:	1800W
WORKING TEMPERATURE:	200~279℃±1%
ENVIRONMENT TEMPERATURE:	-5℃~45℃
APPLICABLE MATERIAL:	POLYPROPYLENE
ACCESSORIES:	1PC WORKBENCH WITH ELECTRIC CONTROL SYSTEM
	1PC TRIPOD STAND MAIN FRAME
	3PCS PIPE SUPPORTING STAND
	1SET OF REDUCERS D50, D63, D75, D90, D110, D125, D140
	1SET OF EXACT SELF-CENTERING SPIGOTS D50, D63, D75, D90, D110, D125, D140, D160
	1SET OF SOCKETS D50, D63, D75, D90, D110, D125, D140, D160
	1PC METAL CASE

Electrofusion Tools

DRJ-III Electrofusion Welding Machine

SUITABLE FOR: POLYPROPYLENE ELECTROFUSION FITTINGS UNDER D315

A

B

MAIN TECHINICAL DATA:

INPUT VOLTAGE:	175V~250V AC
OUTPUT VOLTAGE:	39.5V AC
FREQUENCY:	50HZ
OUTPUT POWER:	3.5KW
OPERATING TEMPERATURE:	-15℃~50℃
RELATIVE HUMIDITY:	≤80%
TIME ADJUSTMENT RANGE:	1~2999 sec
TIME RESOLUTION:	1 sec
TIME ERROR:	≤1%
OUTPUT VOLTAGE ERROR:	≤2.5%
PROTECTION AGAINST:	IP54

DRJ-IIIA Electrofusion Welding Machine

SUITABLE FOR: POLYPROPYLENE ELECTROFUSION FITTINGS UNDER D110

MAIN TECHINICAL DATA:

INPUT VOLTAGE:	175V~250V AC
OUTPUT VOLTAGE:	39.5V AC
FREQUENCY:	50HZ
OUTPUT POWER:	1.5KW
OPERATING TEMPERATURE:	-15℃~50℃
RELATIVE HUMIDITY:	≤80%
TIME ADJUSTMENT RANGE:	1~2999 sec
TIME RESOLUTION:	1 sec
TIME ERROR:	≤1%
OUTPUT VOLTAGE ERROR:	≤2.5%
PROTECTION AGAINST:	IP54

Butt Fusion Tools

CHDHJ-250

ELECTRONIC-HYDRAULIC PLASTIC BUTT WELDING MACHINE 250MM-A

MAIN TECHINICAL DATA:

FUSING PIPE SCOPE:	D90, D110, D125, D140, D160, D180, D200, D225, D250
RATE VOLTAGE:	A.C 220/230V 50/60HZ
POWER:	4600W
MILLING POWER:	1100W
HEATING POWER:	2000W
PUMP POWER:	1500W
WORKING TEMPERATURE:	0~300℃
ENVIRONMENT TEMPERATURE:	-5℃~45℃
APPLICABLE MATERIAL:	POLYPROPYLENE
ACCESSORIES:	1PC MACHINE 1PC HYDRAULIC POWER UNIT 1PC FLANGE HOLDER* 1PC HEATING PLATE 1PC MILLING TOOL 1PC HOLDER STAND 1SET OF REDUCERS D90*, D110, D125*, D140*, D160, D180*, D200, D225*

CHDHJ-315

ELECTRONIC-HYDRAULIC PLASTIC BUTT WELDING MACHINE 315MM

MAIN TECHINICAL DATA:

FUSING PIPE SCOPE:	D110, D125, D140, D160, D180, D200, D225, D250, D280, D315
RATE VOLTAGE:	A.C 220/230V 50/60HZ
POWER:	5100W
MILLING POWER:	1100W
HEATING POWER:	2500W
PUMP POWER:	1500W
WORKING TEMPERATURE:	0~300℃
ENVIRONMENT TEMPERATURE:	-5℃~45℃
APPLICABLE MATERIAL:	POLYPROPYLENE
ACCESSORIES:	1PC MACHINE 1PC HYDRAULIC POWER UNIT 1PC FLANGE HOLDER* 1PC HEATING PLATE 1PC MILLING TOOL 1PC HOLDER STAND 1SET OF REDUCERS D110*, D125*, D140*, D160, D180*, D200, D225*, D3150, D280*

CHAPTER 7: PROJECT REFERENCES

Company Profile
Features
Quality Assurance
Connection Methods
Installation Introduction
Product Range
Project References

Notes