VASEN

Termofusión y
Riego Perú S.A.C.

VASEN PPR
PIPING SYSTEM

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CHAPTER 1: COMPANY PROFILE

QUIENES SOMOS

Todos los productos que abastecemos a nuestros diferentes tipos de clientes, ya sea minera, industria, tratadoras de agua, agrícolas y constructoras se rigen a las diferentes normas y especificaciones técnicas que solicitan las diferentes entidades reguladoras y certificadoras.

Ya sea: ITINTEC, NTP, SGS, ASTM, NSF y con los diferentes tipos de accesorios que fabricamos ya sean Tee UF, Codo UF, Cachimbas, Planchas de PVC, etc. Ofrecemos carta de garantía. Nosotros hacemos clientela para conservarla y no para una sola oportunidad, es por ello que brindamos responsabilidad, garantía y sobre todo lo más importante un buen precio.

Misión

Ofrecer permanentemente a nuestros clientes, las mejores soluciones de ahorro, con calidad, productividad, servicio y tecnología de punta, para sus necesidades de conducción de fluidos en la construcción y la industria.

Visión

Ser una empresa ejemplar de servicio con calidad, con liderazgo a nivel nacional, que permanentemente supere las expectativas de sus clientes, proveedores, empleados y accionistas.

PARTNERS

lyondellbasell · Borouge · سابك sabic · TOTAL · battenfeld-cincinnati · KRAUSSMAFFEI · MSA

MARPAL SAC

CHAPTER 2: FEATURES

PP-R MATERIAL

Historial de Desarrollo del Material PP-R

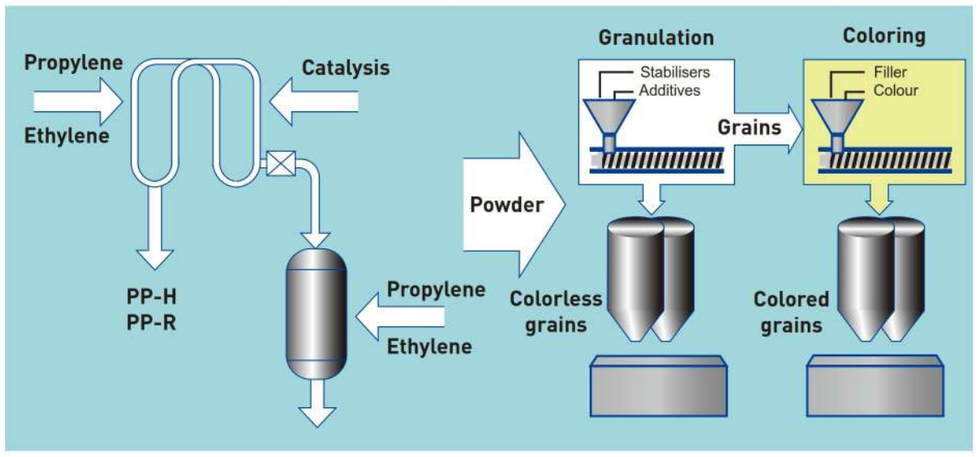
PP-R es la abreviatura de copolímero aleatorio de polipropileno, también denominado polipropileno tipo 3.

¿Qué es el tipo 3?

En 1957, Italia realizó por primera vez la producción industrial de polipropileno. Debido a su excelente rendimiento resistente al calor, resistente a la presión y resistente a la corrosión, los usuarios lo favorecen profundamente. A fines de la década de 1970, el material de polipropile no se consideró la dirección futura de la construcción de tuberías de suministro de agua fría y caliente. Esa es la primera generación de material de polipropileno, que se denomina PP-H, abreviatura de homo-polipropileno. Sin embargo, aunque tiene excelentes resistencia al calor (<110C), resistencia a la presión (MRS = 10MPa) rendimiento, su impacto a baja temperatura pobre La resistencia hace que no sea adecuado para la tubería de suministro de agua fría y caliente del edificio.

Por lo tanto, la gente intentó mejorar su resistencia al impacto a baja temperatura mediante la modificación del material PP-H. Luego tenemos la segunda generación de polipropileno, que se obtiene mediante la adición de una cierta cantidad de monómero de vinilo durante el proceso de polimerización del polipropileno. Se denomina PP-B o PP-H, que es la abreviatura de polipropileno copolimerizado en bloque. Aunque PP-B tiene un gran cambio en la resistencia al impacto a baja temperatura, sacrificó su rendimiento de resistencia al calor. PP-B solo se puede aplicar en la tubería de agua fría o la tubería de agua caliente en condiciones de baja presión.

A finales de la década de 1980, algunas empresas petroquímicas europeas rompen el proceso tradicional de polimerización en fase líquida del polipropileno, adoptando la avanzada tecnología de polimerización en fase gaseosa, que sintetizaba un copolímero aleatorio de propileno y etileno. El copolímero aleatorio se denomina copolímero aleatorio de polipropileno, abreviado PP-R, en el que el contenido de etileno es inferior al 5%, que se distribuye aleatoriamente en la cadena molecular de polipropileno. Este material PP-R, que se crea mediante el nuevo proceso de polimerización, teniendo en cuenta la resistencia al calor del PP-H y las propiedades de impacto a baja temperatura del PP-B, es adecuado para la fabricación de sistemas de tuberías de suministro de agua fría y caliente. dentro del edificio. Por eso a veces lo llamamos polipropileno tipo 3.



Material Characteristics of PP-R

Table 1

Typical Properties	Method	Value	Unit
Physical			
Density	ISO 1183	0.895~0.915	g/cm³
Melt flow rate (MFR)			
(230°C/2.16Kg)	ISO 1133	⩽0.5	g/10 min
Mechanical			
Tensile Modulus (23 °C, v = 1 mm/min, Secant)	ISO 527-1, -2	＞650	MPa
Tensile Stress at Yield (23 °C, v = 50 mm/min)	ISO 527-1, -2	＞20	MPa
Breaking Elongation (23 °C, v = 50 mm/min)	ISO 527-1, -2	＞400	%
Impact			
Charpy notched impact strength	ISO 179		
(-20 °C)		＞1.5	kJ/m²
(23 °C)		＞40	kJ/m²

Resistencia química del material PP-R

Los datos de resistencia química presentados aquí se basan en ASTM D543.

Sistema de valoración

Esta tabla clasifica la resistencia química de la resina de polipropileno Pro-fax de acuerdo con el siguiente código:

Nota: Se recomienda al usuario que realice sus propias pruebas para determinar la idoneidad del polipropileno en el entorno particular.

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.

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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	40	A	–	–
Acetic acid	10			–
Acetone	100	A	A	–
Acetophenone	100	B	B	–
Acriflavine (2% solution in H_20)	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		B	B	–
Antimony chloride		A	A	–
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

Environment	Conc. %	Temp., °C 20	60	100
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	–
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	D	–
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	–

Environment	Conc. %	Temp., °C 20	60	100
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				
Ethanolamine				
Ethyl acetate				
Ethyl alcohol		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	–
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

Environment	Conc. %	Temp., °C 20	60	100
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 (80°C)	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	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	–
Magenta dye (aqueous solution)	2	A	A Some staining	–
Magnesium carbonate	Satd.	A	A	–

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Environment	Conc. %	Temp., °C 20	60	100
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	C
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	–

Environment	Conc. %	Temp., °C 20	60	100
Phenol	100	A	A	–
Phosphoric acid	95	A	A	–
Plating solutions, brass		A	A	–
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	–

Environment	Conc. %	Temp., °C 20	60	100
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	A (80°C)	–
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)		A	A	–
	Satd.			
Sulfates of (potassium and sodium)		A	A	–
Sulfur		A	A	–
Sulfuric acid	98[a]	C	–	D

Environment	Conc. %	Temp., °C 20	60	100
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)	–
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

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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 0.895-0.915g/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°C. And under the temperature of 80°C, 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°C, which is only 1/200 of steel pipe (43-52w/m°C). 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.

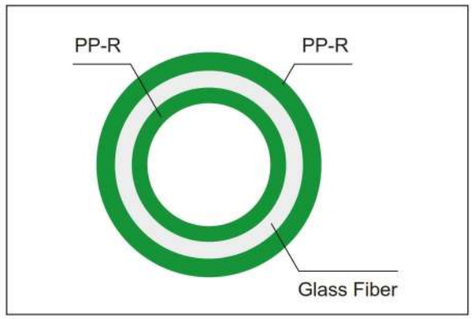
Application Fields

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.**
- **Pipe networks for chilled water.**

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.



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 more pressure load than PP-R under the same service condition.
- Improved resistant to impulse under low temperature.
- Socket fusion connection with PP-R fittings, credible and convenient.
- Smooth and sanitary, being good selection for drinkable water system.

Application Fields

F-PPR is suitable for all application fields of normal 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.

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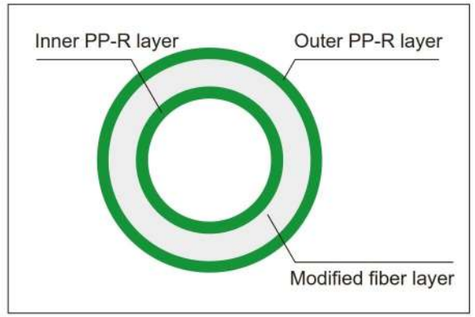
MF-PPR PIPE

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:

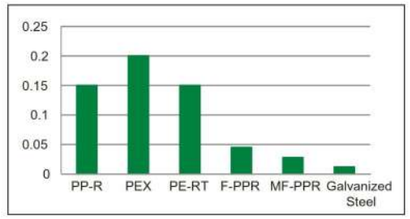
Excellent imported PP-R material, sanitary and healthy, which also can meet the requirement of socket fusion and electrofusion.

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



Liner expansion coefficient contrast between different pipes

Application Fields

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

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UV-RESISTANCE PP-R FASER PIPE

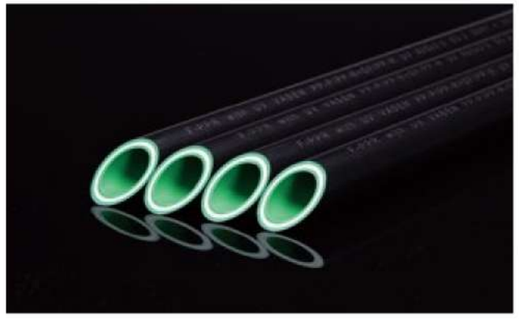
The UV-resistant Faser Composite PP-R pipe is a four-layer composite structure, which is extruded by a special process. Four layers are:

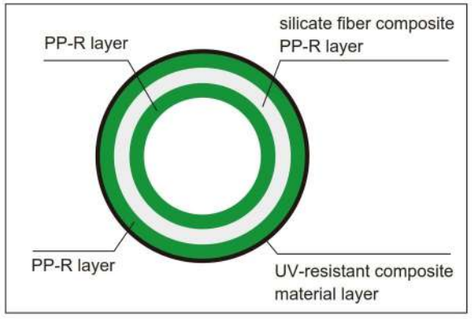
(a) The inner layer is normal PP-R;

(b) The middle layer (second layer) is silicate fiber composite PP-R;

(c) The third layer is normal PP-R;

(d) The outermost layer (fourth layer) is a UV-resistant composite material.





The PP-R raw material of the inner layer guarantees the hygienic performance for water supply. The middle layer reduces the linear expansion coefficient and improves the rigidity. The outermost UV-resistant composite material improves the anti-ultraviolet and anti-aging properties.

The pipe can be connected directly with PPR fitting by socket fusion, which is simple and convenient. The composite structure is realized by the four-layer co-extrusion process, and each layer are merged with each other. This structure can avoid delamination after the long-term application.

This new type of pipe makes up the limitations of normal PP-R pipe in outdoor installation. It is an ideal improvement and beneficial supplement for normal PP-R pipes.

Advantages

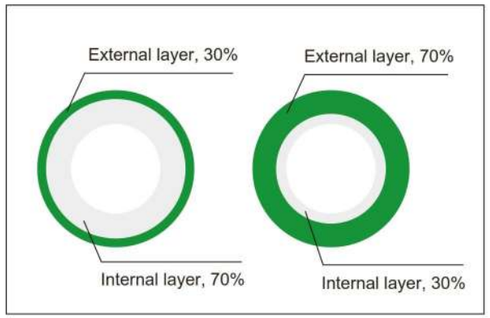
- With anti-UV layer, the pipe can be installed exposed, which solves the aging problem may happen when normal PP-R used in outdoor installation.
- Low linear expansion coefficient, 1/3 of normal PP-R, which is close to stable composite pipes.
- Excellent rigidity and dimensional stability, good for installation.
- Convenient and reliable connection with complete accessories, which can be connected with PP-R fittings directly (with welding temperature 260°C).
- Smooth and sanitary, safe to be used in water supply system.

Application Field

- Distribution for portable water.
- Low temperature heating system (straight pipe).
- Connecting pipe for central air conditioning system.
- Heat recovery system.

PP-R DOUBLE COLOR PIPE

Double color pipe adopts double-layer co-extrusion process, with a variety of colors to give customers more choices, and provide healthy water environment for consumers who pursue high quality.



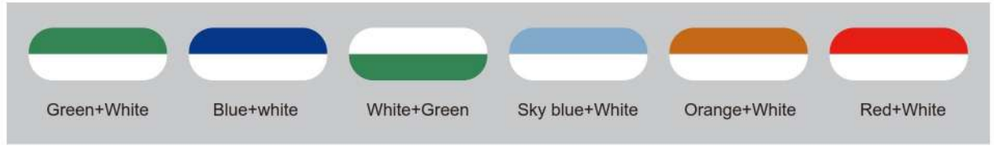
Advantages

- Distinguish from the common colors in the market, the personalized color matching can meet the differentiated needs of the market, with outstanding recognition ability.
- Double layer co-extrusion technology makes the inner and outer layers of the pipe different in two colors, and it is a perfect performance combination of same material.
- Convenient connection, same as normal PP-R.
- Smooth and sanitary, being good selection for drinkable water system.

Application Fields

Double color pipe is suitable for all application fields of pure PP-R pipe, such as transportation of hot & cold water and drinking water in family residence, office, hotel, catering, etc.

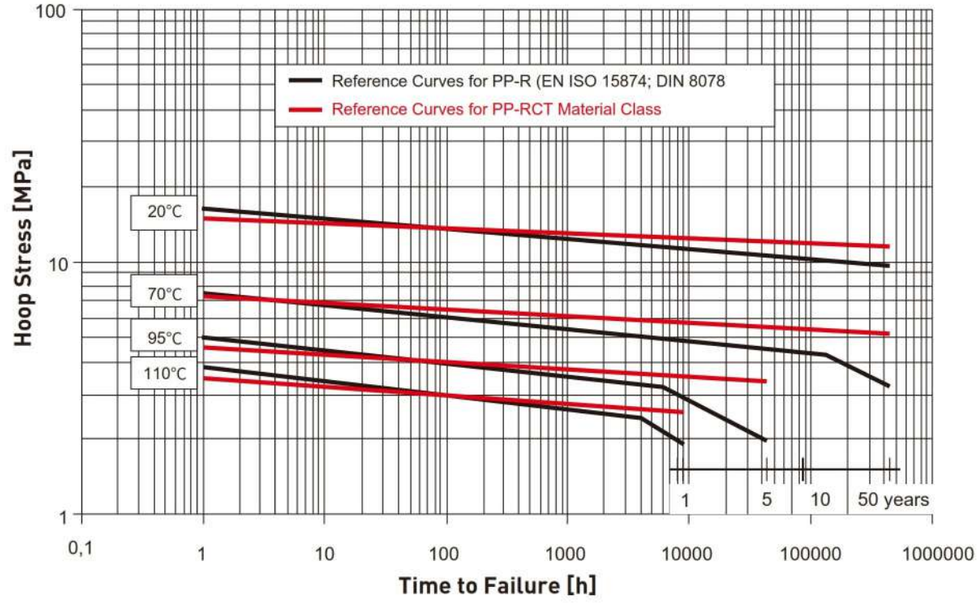
Customizable Color



Two random colors can be customized.

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.



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Material Characteristics of PP-RCT

Physical Properties

Table 3

Physical Properties		Typical Value*	Unit	TestMethod
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.

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CHAPTER 3: QUALITY ASSURANCE

PRODUCT STANDARDS

Table 4

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

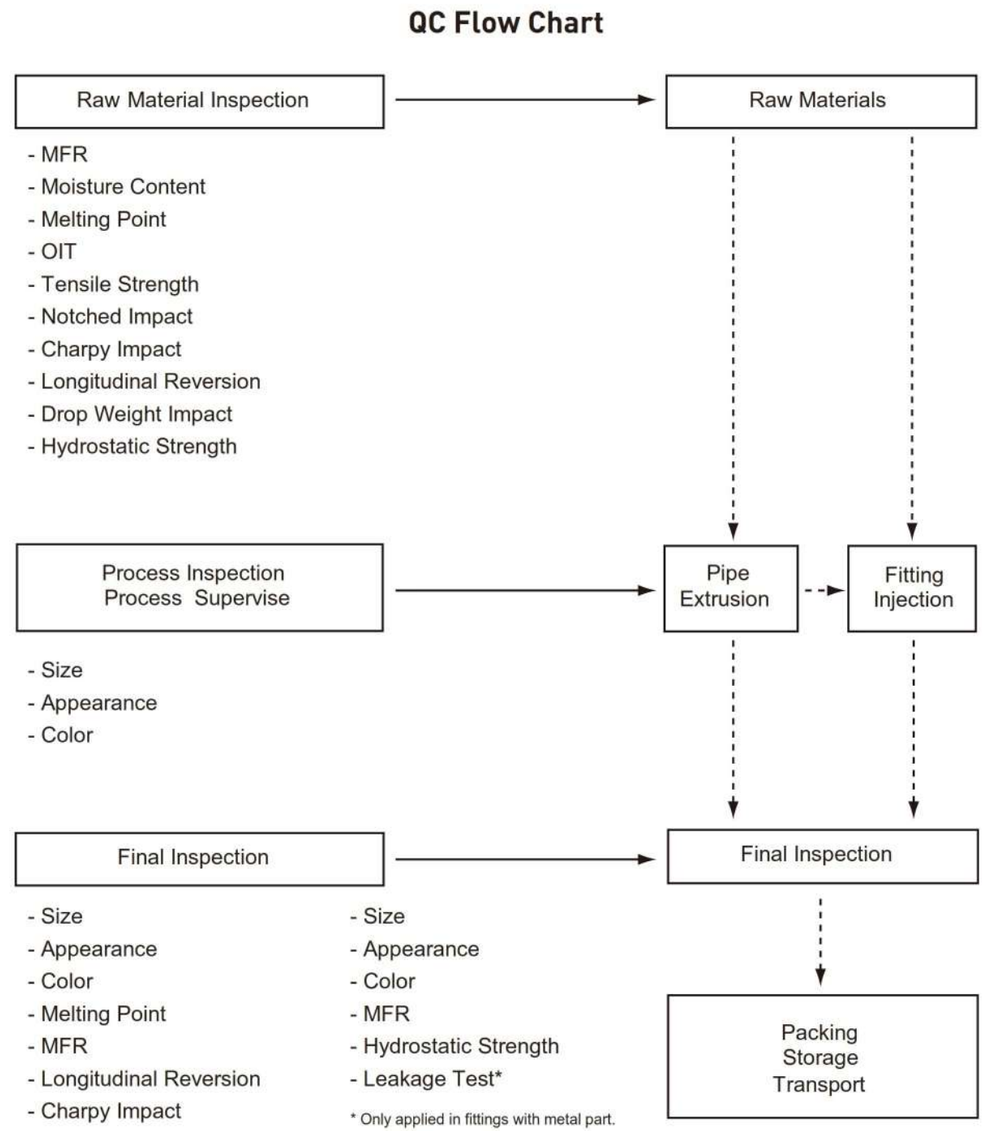
ilac-MRA & CNAS Accredited Laboratory

Raw Material Analysis

MFR Test

Elongation Test

QUALITY MANAGEMENT SYSTEM



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CERTIFICATES

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CHAPTER 4: SYSTEM DESIGN

DIMENSION STANDARD

Standard Dimension Ratio (SDR)

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

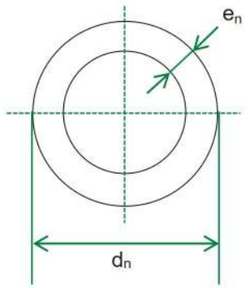
$$SDR=2\times S+1 \qquad SDR=\frac{d_n}{e_n}$$

S: Pipe series

d_n: Nominal outer diameter, mm.

e_n: Nominal 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 as a mean for selecting pipe sizes for practical purposes.

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

PRESSURE DESIGN

Reference Curves for Expected Strength

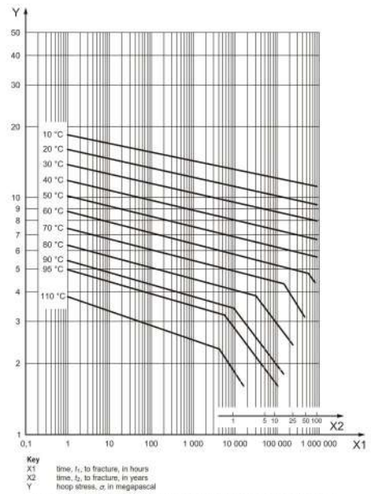


Figure 1: Reference curves for expected strength of PP-R

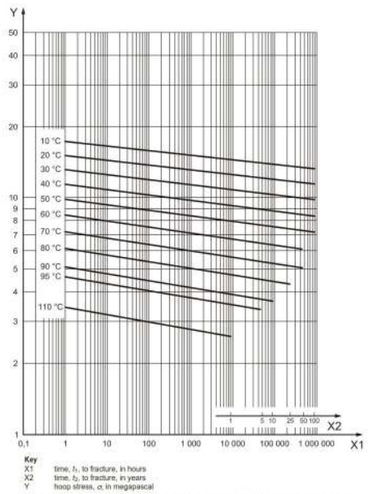


Figure 2: Reference curves for expected strength of PP-RCT

Reference Curves Formula

The reference curves in Figures 1 and 2 in the temperature range of 10°C to 95°C are derived from the following equations:

First branch (i.e. the left hand portion of the lines as shown in Figures 1 and 2)

For PP-R: $\log t = -55.725 - \frac{9484.1 \log \sigma}{T} + \frac{25502.2}{T} + 6.39 \log \sigma$

For PP-RCT: $\log t = -119.546 + \frac{52176.696}{T} - \frac{23738.797 \log \sigma}{T} + 31.279 \log \sigma$

Second branch (i. e. the right hand portion of the lines as shown in Figures 1)

For PP-R: $\log t = -19.98 + \frac{9507}{T} - 4.11 \log \sigma$

Where:

T is the temperature, in Kelvin (K)

t is the time to fracture, in hours (h)

σ is the hoop stress, in *Mpa*

Safety Factor

Safety factors shall be specified in the application standards. According to ISO12161, minimum safety factors SF are given in below table and take account of the material characteristics

Table 5

Material designation	Minimum Safety factors
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, and taking account of a safety factor.

$$P=\frac{\sigma}{S\times SF}$$

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

SF is safety factor, PPR SF_{min}=1.25

PIPE SERIES SELECTION METHOD

Classification of Service Conditions

The performance requirements for piping systems conforming to ISO 15874 are specified for four different application classes and are shown in Table 6.

Classification of Service Conditions

Table 6

Class of Application	Design Temperature T_D °C	Duration of Operation at T_D Years	T_{max} °C	Duration of Operation at T_{max} Years	T_{mal} °C	Duration of Operation at T_{mal} Hours	Typical Fields of Application
Class 1	60	49	80	1	95	100	Hot water supply (60°C)
Class 2	70	49	80	1	95	100	Hot water supply (70°C)
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: For values of T_D, T_{max}, T_{mal} in excess of those in this table, this International Standard does not apply.

PP-R Pipe Series Selection

PP-R pipe series selection should according to the application classes and design pressure, which is given in Table 7, 8 and 9. If the pipe application condition conform to Table 6, pipe series should be selected according to Table 7. In other conditions, pipe series should be selected according to Table 8 or 9.

PP-R Pipe Series Selection Ⅰ

Table 7

Design Pressure MPa	Class 1 σ_D=3.02MPa	Class 2 σ_D=2.12MPa	Class 4 σ_D=3.29MPa	Class 5 σ_D=1.89MPa
0.4	S5	S5	S5	S4
0.6	S5	S3.2	S5	S3.2
0.8	S3.2	S2.5	S4	-----
1.0	S2.5	-----	S3.2	-----

PP-R Pipe Series Selection Ⅱ (SF=1.25)

Table 8

Temperature °C	Operation Time Year	Pipe Series S			
		S5	S4	S3.2	S2.5
		Allowable Working Pressure, MPa			
10	10	1.93	2.44	3.07	3.86
	25	1.87	2.36	2.97	3.74
	50	1.82	2.30	2.89	3.64
20	10	1.64	2.07	2.61	3.28
	25	1.59	2.00	2.52	3.17
	50	1.54	1.95	2.45	3.09
30	10	1.39	1.75	2.21	2.78
	25	1.34	1.69	2.13	2.68
	50	1.30	1.64	2.07	2.61
40	10	1.18	1.48	1.87	2.35
	25	1.13	1.43	1.80	2.26
	50	1.10	1.39	1.74	2.20
50	10	0.99	1.25	1.57	1.98
	25	0.95	1.20	1.51	1.90
	50	0.92	1.16	1.47	1.85
60	10	0.83	1.05	1.32	1.66
	25	0.80	1.01	1.27	1.60
	50	0.77	0.97	1.23	1.55
70	10	0.70	0.88	1.11	1.39
	25	0.60	0.76	0.96	1.21
	50	0.51	0.64	0.81	1.02
80	10	0.48	0.61	0.77	0.97
	25	0.39	0.49	0.62	0.78

Note: This table is calculated according to ***Figure 1: Reference curves for expected strength of PP-R,*** the safety factor SF=1.25.

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PP-R Pipe Series Selection II (SF=1.5)

Table 9

Temperature °C	Operation Time Year	Pipe Series S			
		S5	S4	S3.2	S2.5
		Allowable Working Pressure, MPa			
10	10	1.61	2.03	2.56	3.22
	25	1.56	1.96	2.47	3.11
	50	1.52	1.91	2.41	3.03
20	10	1.37	1.72	2.17	2.74
	25	1.32	1.66	2.10	2.64
	50	1.29	1.62	2.04	2.57
30	10	1.16	1.46	1.84	2.32
	25	1.12	1.41	1.77	2.23
	50	1.09	1.37	1.72	2.17
40	10	0.98	1.23	1.55	1.96
	25	0.94	1.19	1.50	1.88
	50	0.92	1.15	1.45	1.83
50	10	0.82	1.04	1.31	1.65
	25	0.79	1.00	1.26	1.59
	50	0.77	0.97	1.22	1.54
60	10	0.69	0.87	1.10	1.39
	25	0.66	0.84	1.05	1.33
	50	0.64	0.81	1.02	1.29
70	10	0.58	0.73	0.92	1.16
	25	0.50	0.63	0.80	1.00
	50	0.42	0.53	0.67	0.85
80	10	0.40	0.51	0.64	0.81
	25	0.32	0.41	0.51	0.65

Note: This table is calculated according to ***Figure 1: Reference curves for expected strength of PP-R,*** the safety factor SF=1.5

PP-RCT Pipe Series Selection

PP-RCT pipe series should be selected according to the application classes and design pressure, which is given in Table 10, 11 and 12. If application condition of pipe conform to Table 6, pipe series should be selected according to Table 10. In other conditions, pipe series should be selected according to Table 11 or 12.

PP-RCT Pipe Series Selection I

Table 10

Design Pressure MPa	Class 1 σ_D=3.64MPa	Class 2 σ_D=3.40MPa	Class 4 σ_D=3.67MPa	Class 5 σ_D=2.92MPa
0.4	S6.3	S6.3	S6.3	S5
0.6	S5	S5	S5	S4
0.8	S4	S4	S4	S3.2
1.0	S3.2	S3.2	S3.2	S2.5

PP-RCT Pipe Series Selection II (SF=1.25)

Table 11

Temperature °C	Operation Time Year	Pipe Series S			
		S5	S4	S3.2	S2.5
		Allowable Working Pressure, MPa			
10	10	2.19	2.75	3.47	4.37
	25	2.15	2.71	3.41	4.29
	50	2.12	2.67	3.36	4.23
20	10	1.90	2.39	3.01	3.79
	25	1.86	2.35	2.96	3.72
	50	1.84	2.31	2.92	3.67
30	10	1.64	2.06	2.60	3.27
	25	1.61	2.02	2.55	3.21
	50	1.58	1.99	2.51	3.16
40	10	1.41	1.77	2.23	2.81
	25	1.38	1.73	2.18	2.75
	50	1.36	1.71	2.15	2.71
50	10	1.20	1.51	1.90	2.39
	25	1.17	1.47	1.86	2.34
	50	1.15	1.45	1.83	2.30
60	10	1.01	1.27	1.60	2.02
	25	0.99	1.24	1.57	1.98
	50	0.97	1.22	1.54	1.94
70	10	0.85	1.07	1.35	1.69
	25	0.83	1.04	1.31	1.65
	50	0.81	1.02	1.29	1.62
80	10	0.70	0.89	1.12	1.41
	25	0.69	0.86	1.09	1.37

Note: This table is calculated according to ***Figure 2: Reference curves for expected strength of PP-RCT,*** the safety factor SF=1.25

PP-RCT Pipe Series Selection II (SF=1.5)

Table 12

Temperature ℃	Operation Time Year	Pipe Series S			
		S5	S4	S3.2	S2.5
		Allowable Working Pressure, MPa			
10	10	1.82	2.29	2.89	3.64
	25	1.79	2.25	2.84	3.57
	50	1.77	2.22	2.80	3.53
20	10	1.58	1.99	2.51	3.16
	25	1.55	1.96	2.46	3.10
	50	1.53	1.93	2.43	3.06
30	10	1.36	1.72	2.17	2.73
	25	1.34	1.69	2.12	2.68
	50	1.32	1.66	2.09	2.64
40	10	1.17	1.47	1.86	2.34
	25	1.15	1.44	1.82	2.29
	50	1.13	1.42	1.79	2.26
50	10	1.00	1.26	1.58	1.99
	25	0.97	1.23	1.55	1.95
	50	0.96	1.21	1.52	1.92
60	10	0.84	1.06	1.34	1.68
	25	0.82	1.04	1.31	1.65
	50	0.81	1.02	1.28	1.62
70	10	0.70	0.89	1.12	1.41
	25	0.69	0.87	1.09	1.38
	50	0.68	0.85	1.07	1.35
80	10	0.59	0.74	0.93	1.17
	25	0.57	0.72	0.91	1.14

Note: This table is calculated according to ***Figure 2: Reference curves for expected strength of PP-RCT,*** the safety factor SF=1.5

PP-R/PP-RCT Composite Pipe Series Selection

- PP-R composite pipe series selection is the same as PP-R pipe series selection.
- PP-RCT composite pipe series selection is the same as PP-RCT pipe series selection.

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HYDRAULIC CALCULATION

Head Loss Calculation

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

$$i = 105 \times K \times C_h^{-1.85} \times d_j^{-4.87} \times q_g^{1.85}$$

i –The head loss per unit length of pipe (kPa/m)

q_g – Design flow rate (m^3/s)

d_j – Calculated inner diameter of pipe (m)

K –Water temperature modified coefficients, in table 13

C_h –Hazen-Williams coefficient, PP-R C_h=140

Water Temperature Modified Coefficients

Table 13

Water temperature(℃)	10	20	30	40	50	55	60	65	70	75
Water temperature modified coefficients	1.00	0.943	0.895	0.856	0.822	0.808	0.793	0.781	0.769	0.761

Comparison Table of Nominal Outside diameter and Calculated Inner Diameter (mm)

Table 14

Nominal Outside Diameter (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S5	15.4	20.4	26.2	32.6	40.8	51.4	61.4	73.6	90.0	102.2	114.6	130.8
S4	15.4	19.4	24.8	31.0	38.8	48.8	58.2	69.8	85.4	97.0	114.6	130.8
S3.2	14.4	18.0	23.2	29.0	36.2	45.8	54.4	65.4	79.8	90.8	101.6	116.2
S2.5	13.2	16.6	21.2	26.6	33.4	42.0	50.0	60.0	73.4	83.4	93.4	106.8

Local Head Loss

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.

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CHAPTER 5: INSTALLATION INTRODUCTION

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.


1


2


3


4


5

6


7


8


9

- **Heat pipe and fitting**

  When the temperature of welding tool reaches 260°C (the green lamp flashing), insert the pipe and the fitting into the welding tool at the same time. The heating time refers to Table 15 below.

- **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 welding 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 15

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°C. When the environment temperature is lower than 20°C, the heating time should increase properly. If the environment temperature is lower than 5°C, the heating time should increase 50%.

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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

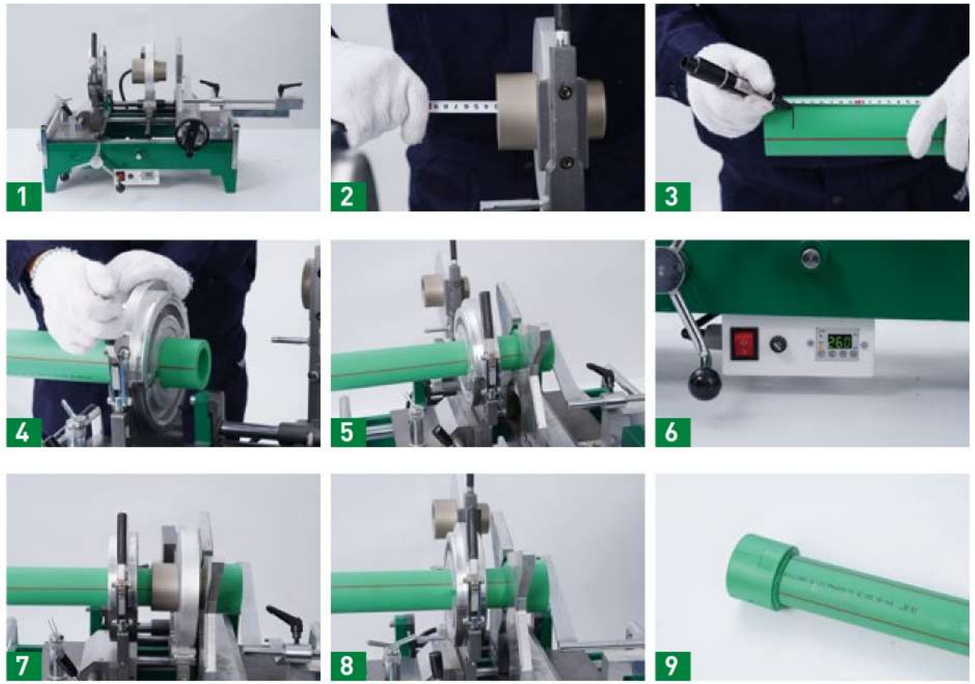
Check the welding tool, and make sure the welding temperature is reached. Use the crack, gradually push the fitting and pipe into the tool until the stop is reached. Pay attention to the welding time. Allow them to heat up without exerting any further pressure.

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.



PP-R pipe & fitting heat socket fusion technical requirement Table 16

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°C. When the environment temperature is lower than 20°C, the heating time should increase properly. If the environment temperature is less than 5°C, the heating time should increase 50%.

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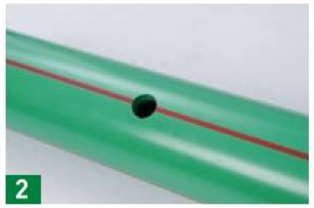
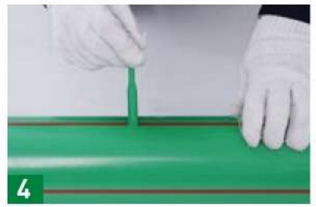
Welding Saddle

- **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.



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.



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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**

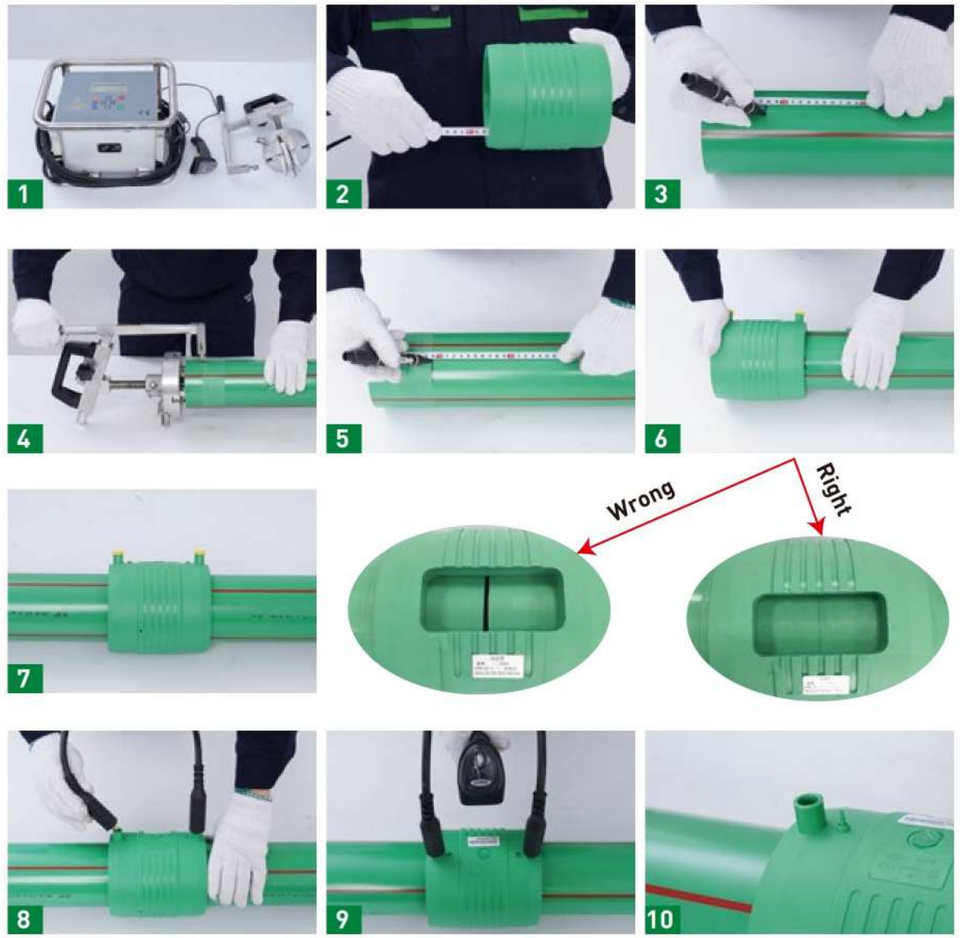
  Attach the electrode plugs of the welding machine to the electrodes of the fittings, to ensure fully contact.

- **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 varies with fit clearance between the pipes and fittings).



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.

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BUTT FUSION

- **Clamp pipes**

  Plastic pipes are aligned and fixed by means of the clamping elements.

- **Check welding parameter**

  Set welding temperature to 210±5°C, 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**

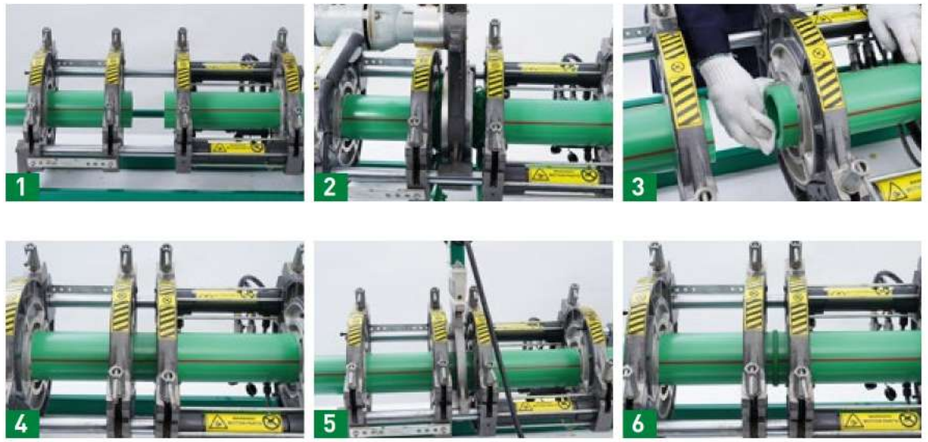
  After the heating element has been positioned, the pipes are pushed onto the heating plate with a defined adjusting pressure. After reaching the specified bead height (see tablet) the pressure is reduced. This process marks the beginning of the heating time. This time is for heating up the pipe ends 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.



Welding process diagram:

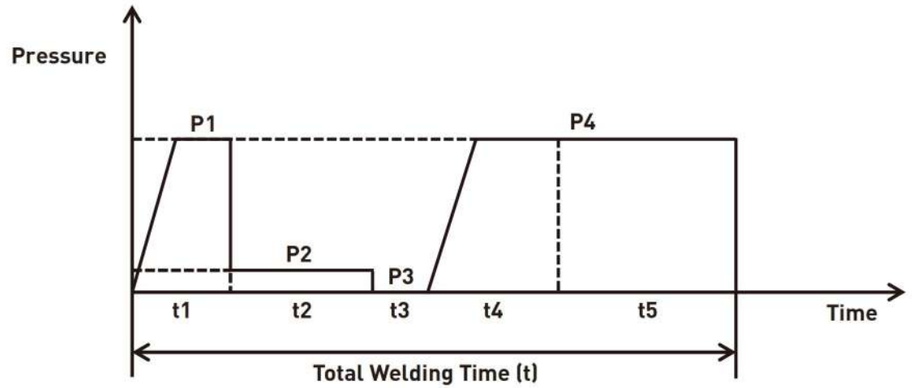


Figure: Butt Fusion Pressure Chart of Each Phase

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

PP-R Working Pressure under Different Conditions

Table 17

SDR	Welding temperature (°C)	dn (mm)	Thickness (mm)	Heating		Absorption		Transfer time t_3 max (s)	Pressure rising time t_4 (s)	Absorption	
				Pressure P_1 (bar)	Bead height (mm)	Pressure P_2 (bar)	Time t_2 (s)			Pressure P_4 (bar)	Time t_5 (min)
11	210±5	90	8.2	4	1.0	0	178	6	8	4	15
		110	10.0	6	1.0	0	217	7	9	6	17
		125	11.4	7	1.0	1	237	7	11	7	19
		160	14.6	11	1.0	1	277	8	13	11	24
		200	18.2	17	1.0	1	320	9	16	17	29
		250	22.7	27	1.5	2	367	10	20	27	35
		315	28.6	43	2.0	3	419	12	24	43	43
7.4	210±5	90	12.3	5	1.0	0	257	7	13	5	21
		110	15.1	8	1.0	1	283	8	14	8	24
		125	17.1	10	1.0	1	307	9	15	10	27
		160	21.9	16	1.5	1	359	10	19	16	34
6	210±5	90	15.0	6	1.0	0	285	8	15	6	25
		110	18.3	9	1.0	1	321	9	16	9	29
		125	20.8	11	1.5	1	348	10	18	11	33

MECHANICAL CONNECTION

Flange Connection

To transition to other piping systems and mechanical equipment, VASEN provides a full range of flange adaptors. Flange adaptors can join the pipe to itself or another material. VASEN flange connections consist of two parts: the flange adaptor 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 adaptor to the pipe**
  As above mentioned butt fusion method (See page 41).
- **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 adaptor**
  The gasket for flange adaptor should be rubber gasket which is of 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.

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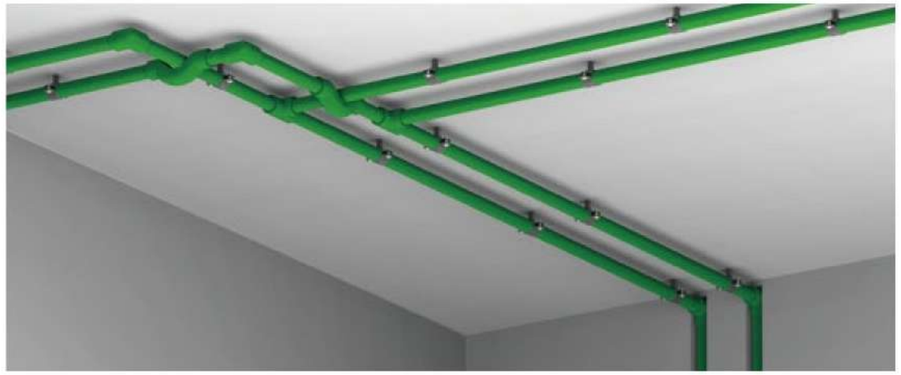
PIPE LAYING

Pipe Laying Methods

There are two laying methods for building water supply PP-R pipes, open installation and concealed installation. Concealed installation have two types, direct buried installation and non-direct buried installation. When the pipeline is under open installation and non-direct buried installation, the compensation measures for pipeline deformation due to temperature should be considered.

The direct burial form is divided into embedded wall laying and floor surface laying

Non-direct buried type can be laid in pipeline shafts, decorative boards and suspended ceilings



Sealant Material

When the pipes pass through the floor or wall, the plastic or metal sleeve should be set. When the pipes pass through the roof, anti-leakage measures should also be taken. And the gap between the protective sleeve and the pipe wall should be sealed. The sealant must not cause harmful reactions with PP-R pipes.

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PIPE EXPANSION AND CONTROLS

Calculation of the Linear Expansion

The linear expansion is calculated according to the following formula:

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

ΔL: Linear expansion (mm)

L: Pipe length (m)

α: Coefficient of linear expansion

Δt: Temperature differential(℃)

$$\Delta t = 0.65\Delta t_s+0.10\Delta t_g$$

Δt_s: Maximum temperature difference of water medium in the pipes

Δt_g: Maximum temperature difference of the air environment outside the pipes

Coefficient of linear expansion α of VASEN polypropylene pipes

PP-R PIPES	$\alpha=15.00\times10^{-5}$ m/m·K
PP-RCT PIPE	$\alpha=15.00\times10^{-5}$ m/m·K
PP-R FIBER COMPOSITE PIPE	$\alpha=5.00\times10^{-5}$ m/m·K
MF PP-R PIPE	$\alpha=3.00\times10^{-5}$ m/m·K

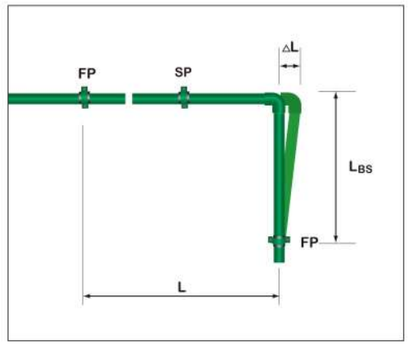
Expansion Controls

Sliding Elbow

Expansion is directed to where the pipe changes. The force of the expansion is absorbed by the flexibility of the bending side.

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

Symbol	Explanation	Unit
L_{BS}	Minimum 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, ≤3m	m
FP	Fixed point	
SP	Sliding point	

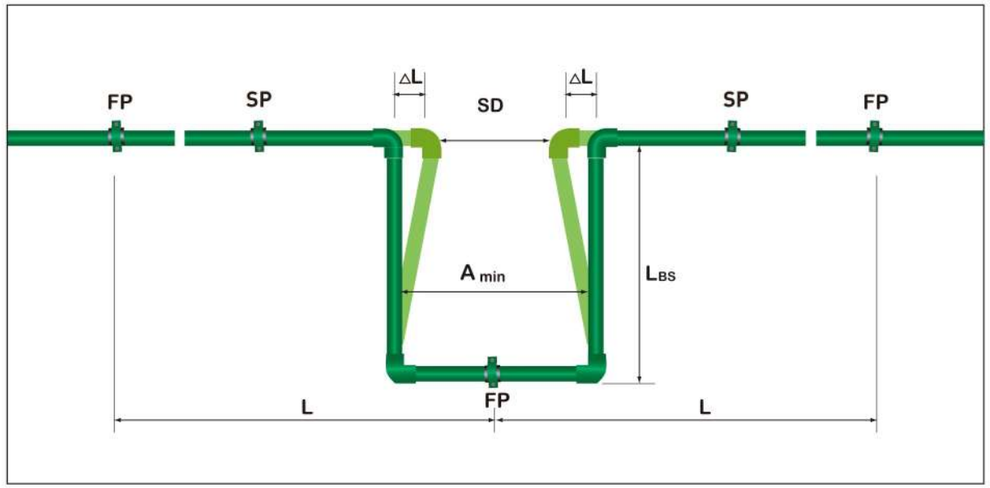


Expansion loop

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

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

Symbol	Explanation	Unit
A_{min}	Width of the expansion loop	mm
ΔL	Linear expansion	mm
SD	Safety distance =150	mm
L	Pipe length,≤3m	m
FP	Fixed point	
SP	Sliding point	



Support and Hanger Installation

When the expansion of the pipes cannot be compensated naturally, a fixed hanger or support can be used to limit the deformation of the pipes. The maximum spacing of the hanging bracket should be selected according to the following Table 18 and 19.

Maximum spacing of PP-R cold water pipe support and hanger (unit:mm) Table 18

Nominal Outside Diameter (mm)	Horizontal Pipe	Stand Pipe
20	450	700
25	500	800
32	600	900
40	700	1000
50	800	1100
63	900	1200
75	1100	1350
90	1250	1500
110	1350	1800
125	1450	2300
160	1600	2600
180	1750	2900
200	1900	3200
225	2100	3500
250	2300	4000
315	2500	4500

Maximum spacing of PP-R hot water pipe support and hanger (unit:mm) Table 19

Nominal Outside Diameter (mm)	Horizontal Pipe	Stand Pipe
20	300	400
25	350	450
32	400	500
40	450	600
50	500	750
63	600	900
75	700	1050
90	800	1200
110	900	1400
125	1000	1600
160	1100	1800
180	1200	2000
200	1400	2300
225	1600	2600
250	1800	2900
315	2000	3200

PRESSURE TESTING

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/T18742.2-2017
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	20.1	24.6	29.0
200	18.2	22.4	27.4	33.2
225	20.5	--	--	--
250	22.7	--	--	--
280	25.4	--	--	--
315	28.6	--	--	--

Note: SF=1.5

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PP-R Fiber Composite Pipe

Raw Material: PP-R, F-PPR
Standards: DIN8077/78, ISO15874, GB/T18742.2-2017, 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

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MF-PPR Pipe

Raw Material: PP-R, MF-PPR

Standards: DIN8077/78, ISO15874, GB/T18742.2-2017, CJ/T258-2014

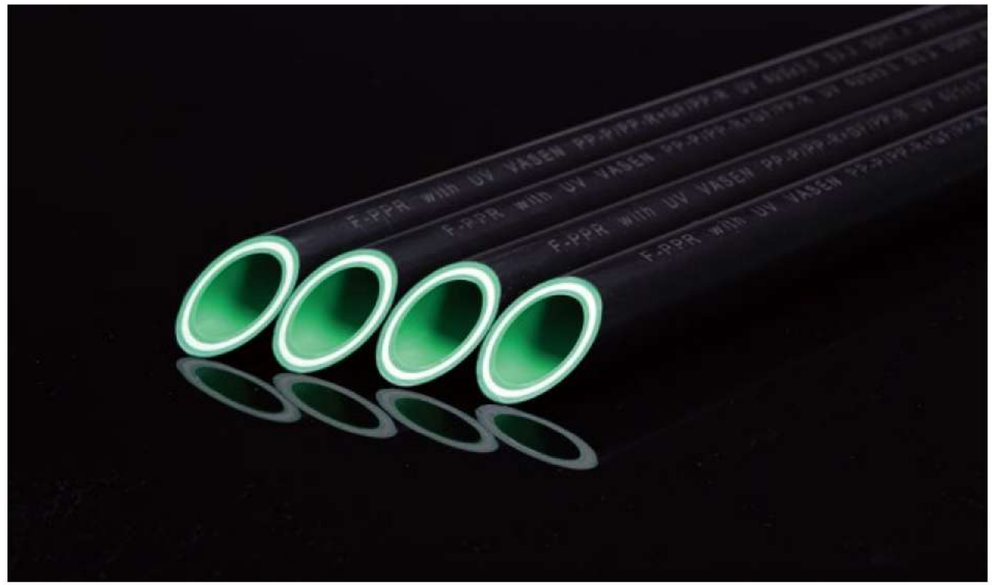
Length of Pipes: 4m, or customized

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

UV-Resistance PP-R Faser Pipe



Raw Material: PP-R, F-PPR

Standards: DIN8077/78, ISO15874, GB/T18742.2-2017

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

Note: SF=1.5

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PP-R Double Color Pipe

Raw Material: PP-R
Standards: DIN8077/78, ISO15874, GB/T18742.2-2017
Length of Pipes: 4m, or customized
Color: Two random colors can be customized.

Diameter dn, mm	Wall Thickness (mm) S (20℃, Pressure, bar)			
	S5 (SDR11, PN10)	S4 (SDR9, PN12.5)	S3.2 (SDR7.4, PN16)	S2.5 (SDR6, PN20)
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

Note: SF=1.5

PP-RCT Pipe

Raw Material: PP-RCT
Standards: DIN8077/78, ISO15874,GB/T18742.2-2017
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	20.1	24.6	29.0
200	18.2	22.4	27.4	33.2
225	20.5	--	--	--
250	22.7	--	--	--
280	25.4	--	--	--
315	28.6	--	--	--

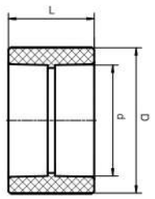
Note: SF=1.5

FITTING SERIES

Socket Fusion Fittings

Socket (WXR100)

Unit:mm



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

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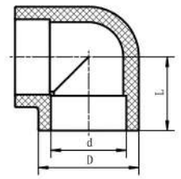
Elbow 90° (WXR200)

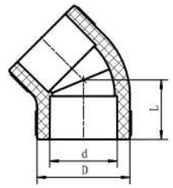
Unit:mm



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)

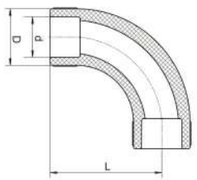
Unit:mm



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

Large Elbow 90° (WXR200-7)

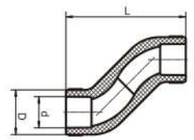
Unit:mm



Description	d	D	L
dn20	20	28	56.5
dn25	25	34	67
dn32	32	43	82.5

S Fitting (WXR240)

Unit:mm



Description	d	D	L
dn20	20	28	75
dn25	25	34	85.5

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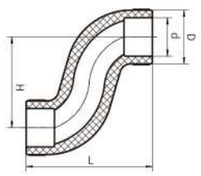
S Elbow (WXR241)

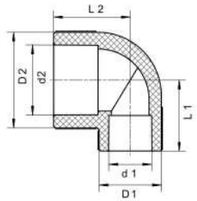
Unit:mm



Description	d	D	L	H
dn25	25	34	80	57.5

Reducing Elbow (WXR210)

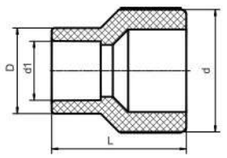
Unit:mm



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

Reducer (WXR110)

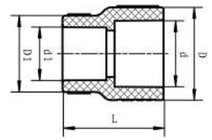
Unit:mm



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
dn63x20	63	20	28	56
dn63x25	63	25	34	56
dn63x32	63	32	43	57
dn63x40	63	40	53	59
dn63x50	63	50	67	63
dn75X50	75	50	67	68
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

Bushing (WXR120)

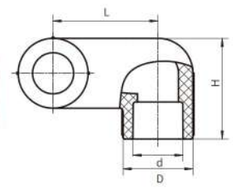
Unit:mm



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
dn75x40	75	40	100	53	68
dn75x50	75	50	100	67	74
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

Large Elbow for Corner (Left) (WXR250-A)

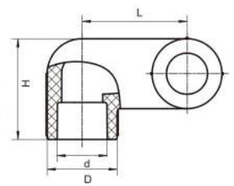
Unit:mm



Description	d	D	L	H
dn20	20	29	51	49
dn25	25	34	51	49

Large Elbow for Corner (Right) (WXR250-B)

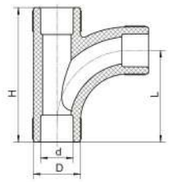
Unit:mm



Description	d	D	L	H
dn20	20	29	51	49
dn25	25	34	51	49

Branch Fitting (WXR320)

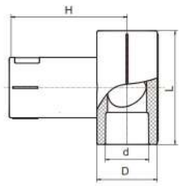
Unit:mm



Description	d	D	L	H
dn20	20	28	54.5	80
dn25	25	34	67	100
dn25×20×25	25	34	56.5	85

Tee for Corner (WXR401)

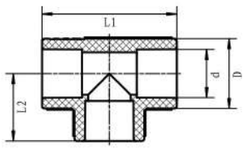
Unit:mm



Description	d	D	L	H
dn25	25	34	64	66

Tee (WXR300)

Unit:mm



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

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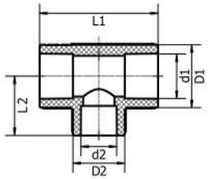
Reducing Tee (WXR310)

Unit:mm



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
dn32x20x25	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

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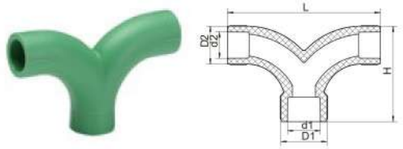
Y Type Tee (WXR330)

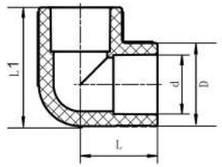
Unit:mm



Description	d1	D1	d2	D2	H	L
dn20	20	28	20	28	113	70.5
dn25	25	34	25	34	134	84
dn20x25x20	20	28	25	34	113	70.5

Tee with Side Inlet (WXR320)

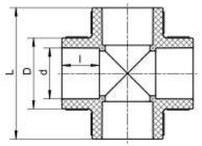
Unit:mm



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

Cross (WXR400)

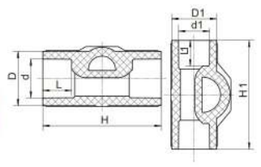
Unit:mm



Description	d	D	L	l
dn20	20	28	54	16
dn25	25	34	63	18
dn32	32	43	74	20
dn40	40	54	90	22
dn50	50	67	102	25
dn63	63	84	123	29

Cross Fitting (WXR430)

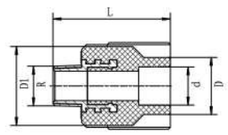
Unit:mm



Description	d	D	L	H	d1	D1	L1	H1
dn20	20	28	18	64				
dn25	25	34	18	74				
dn20x25	25	34	18	74	20	28	16	68

Male Thread Connector (WXR101)

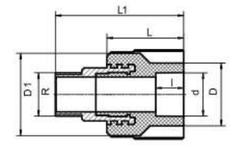
Unit:mm



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
dn25x1"	25	1	36	59	55
dn32x1/2"	32	1/2"	43	40	59.5
dn32x3/4"	32	3/4"	43	45	61
dn32x1"	32	1"	45	59	85
dn40x1"	40	1	57	59	57
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

Long Male Thread Connector (WXR101-7)

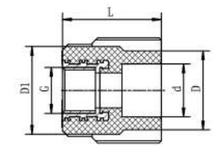
Unit:mm

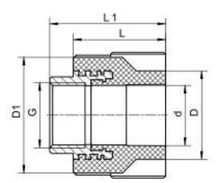


Description	d	R	D	D1	L	L1
dn32x1"	32	1"	45	59	55	92
dn40x1-1/4"	40	1-1/4"	57	71	58	98

Female Thread Connector (WXR102)

Unit:mm

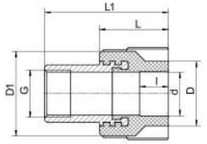




Description	d	G	D	D1	L	L1
dn20x1/2"	20	1/2"	29	40	45	\
dn20x3/4"	20	3/4"	29	45	45	\
dn25x1/2"	25	1/2"	36	40	45	\
dn25x3/4"	25	3/4"	36	45	45	\
dn25x1"	25	1"	36	59	55	\
dn32x1/2"	32	1/2"	43	40	47	\
dn32x3/4"	32	3/4"	43	45	47	\
dn32x1"	32	1"	45	59	48	61
dn40x1-1/4"	40	1-1/4"	57	71	57	70
dn50x1-1/2"	50	1-1/2"	70	84	64	80
dn63x2"	63	2"	86	101	75	92
dn75x2-1/2"	75	2-1/2"	100	116	75	94
dn90x3"	90	3"	120	140	57	85

Long Female Thread Connector (WXR102-7)

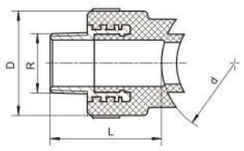
Unit:mm



Description	d	G	D	D1	L	L1	l
dn32x1"	32	1"	45	59	48	86	20
dn40x1-1/4"	40	1-1/4"	57	71	58	96	22

Male Thread Saddle (WXR151)

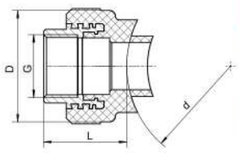
Unit:mm



Description	d	D	R	L
dn63×25×1/2"	31.5	40	1/2"	46.5
dn63×25×3/4"	31.5	45	3/4"	48

Female Thread Saddle (WXR152)

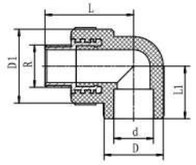
Unit:mm



Description	d	D	G	L
dn75x32x1"	75	61	1"	44
dn90x32x1"	90	61	1"	44
dn110x32x1"	110	61	1"	44
dn160x32x1"	160	61	1"	44

Male Thread Elbow (WXR201)

Unit:mm



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

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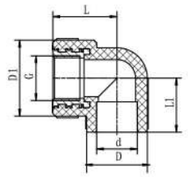
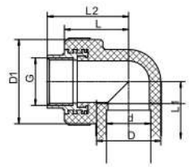
Female Thread Elbow (WXR202)

Unit:mm

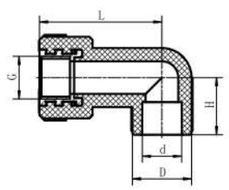




Description	d	G	D	D1	L	L1	L2
dn20x1/2"	20	1/2"	29	40	36	28	\
dn20x3/4"	20	3/4"	29	45	36	28	\
dn25x1/2"	25	1/2"	36	40	38	32	\
dn25x3/4"	25	3/4"	36	45	38	32	\
dn25x1"	25	1"	36	59	42	32	54
dn32x1/2"	32	1/2"	43	40	41	35	\
dn32x3/4"	32	3/4"	43	45	41	37	\
dn32x1"	32	1"	45	59	45	40	58

Long Female Thread Elbow (WXR202-7)

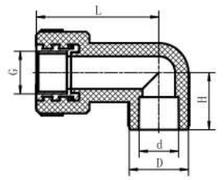
Unit:mm



Description	d	D	G	L	H
dn20x1/2"	20	29	1/2"	60	28
dn25x1/2"	25	36	1/2"	75	32

Long Female Thread Elbow (B) (WXR207)

Unit:mm



Description	d	D	G	L	H
dn25×1/2"（52mm）	25	36	1/2"	52	40

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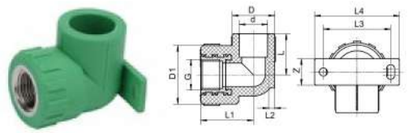
Female Thread Elbow with Ear (WXR204)

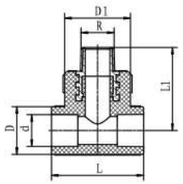
Unit:mm



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)

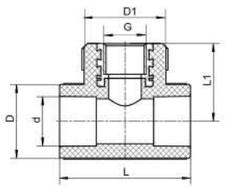
Unit:mm

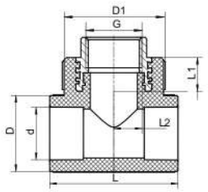


Description	d	R	D	D1	L	L1
dn20x1/2"x20	20	1/2"	29	40	56	50.5
dn20x3/4"x20	20	3/4"	29	45	66	52
dn25x1/2"x25	25	1/2"	36	40	64	50.5
dn25x3/4"x25	25	3/4"	36	45	64	57
dn32x1/2"x32	32	1/2"	43	40	74	52.5
dn32x3/4"x32	32	3/4"	43	45	74	56
dn32x7/16"x32	32	7/16"	43	25	56	49.5
dn32x1"x32	32	1"	45	59	76	72
dn40x1"x40	40	1"	57	59	86	78

Female Thread Tee (WXR302)

Unit:mm

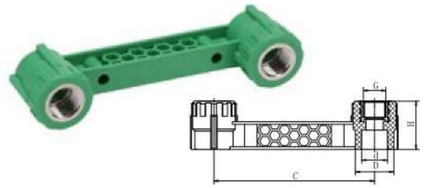




Description	d	G	D	D1	L	L1	L2
dn20x1/2"x20	20	1/2"	29	40	56	36	\
dn20x3/4"x20	20	3/4"	29	45	66	36	\
dn20x3/8"x20	20	3/8"	28	33	50	30	\
dn25x1/2"x25	25	1/2"	36	40	64	38	\
dn25x3/4"x25	25	3/4"	36	45	70	41	\
dn25x3/8"x25	25	3/8"	36	40	64	36	\
1/2"xdn32x32	32	1/2"	43	40	77	37	\
dn32x1/2"x32	32	1/2"	43	40	68	40	\
dn32x3/4"x32	32	3/4"	43	45	74	42	\
dn32x1"x32	32	1"	45	59	82	45	58
dn40x1/2x40	40	1/2"	57	40	86	49	\
dn40x3/4x40	40	3/4"	57	45	86	49	\
dn40x1"x40	40	1"	57	59	86	65	78

Integrated Female Connector (WXR106)

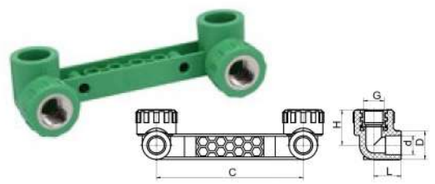
Unit:mm



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)

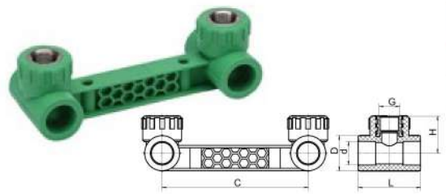
Unit:mm



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)

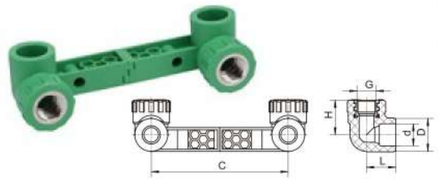
Unit:mm



Description	d	D	G	L	H	C
dn20x1/2"x20	20	29	1/2"	56	36	150
dn25x1/2"x25	25	36	1/2"	64	38	150

Compositional Integrated Female Thread Elbow (WXR216)

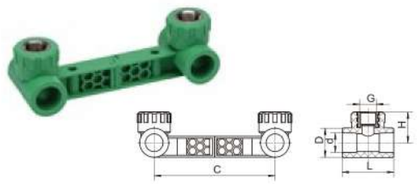
Unit:mm



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

Compositional Integrated Female Thread Tee (WXR307)

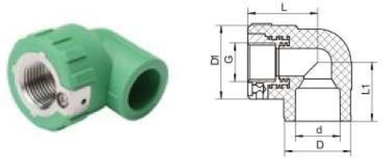
Unit:mm



Description	d	D	G	L	H	C
dn20x1/2"x20	20	29	1/2"	56	36	150
dn25x1/2"x25	25	36	1/2"	64	38	150

Equipotential Female Thread Elbow (WXR220)

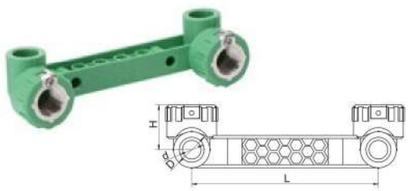
Unit:mm



Description	d	G	D	D1	L	L1
dn20x1/2"	20	1/2"	29	40	36	28
dn25x1/2"	25	1/2"	36	40	38	32

Equipotential Integrated Female Thread Elbow (WXR226)

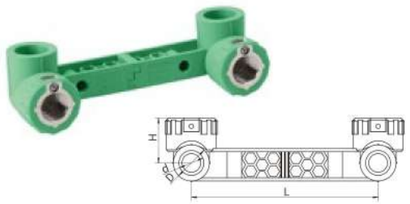
Unit:mm



Description	d	D	H	L
dn20x1/2"	20	29	36	150

Compositional Equipotential Integrated Female Thread Elbow (WXR236)

Unit:mm

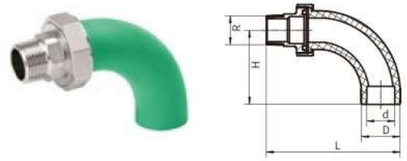


Description	d	D	H	L
dn25*1/2	25	36	38	150

Termofusión y Riego Perú S.A.C.

Male Thread Union & Large Elbow (WXR161)

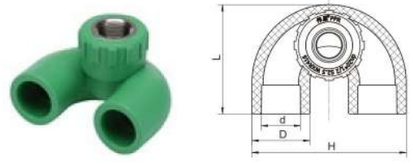
Unit:mm



Description	d	D	G	L	H
dn32X1"	32	43	1"	148.5	82.5

Female Thread Backwater Ring (WXR304)

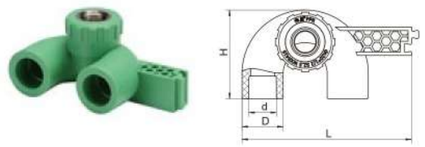
Unit:mm



Description	d	D	L	H
dn20×1/2"	20	29	62.5	89
dn25×1/2"	25	36	68	96

Compositional Integrated Female Thread Backwater Ring （underground） (WXR304-A)

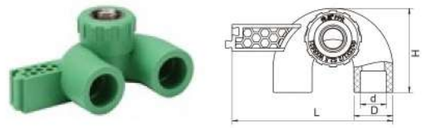
Unit:mm



Description	d	D	H	L
dn20x1/2"	20	29	64.5	119.5
dn25x1/2"	25	36	68	123

Compositional Integrated Female Thread Backwater Ring （ceiling） (WXR304-B)

Unit:mm

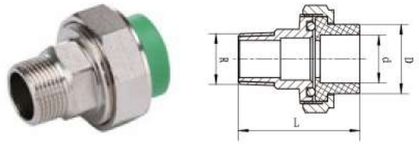


Description	d	D	H	L
dn20x1/2"	20	29	64.5	119.5
dn25x1/2"	25	36	68	123

Termofusión y Riego Perú S.A.C.

Male Thread Union (Metal/Plastic) (WXR103)

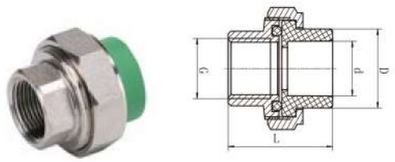
Unit:mm



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
dn32x3/4"	32	3/4"	43	61
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)

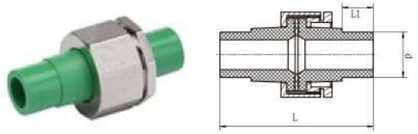
Unit:mm



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
dn25×3/4"	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)

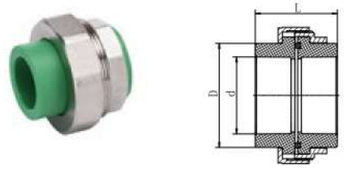
Unit:mm



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

Union (Female/Female) (WXR109)

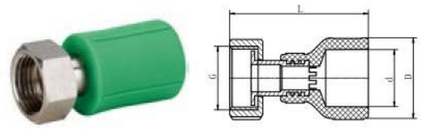
Unit:mm



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

Fast Union Socket (WXR108)

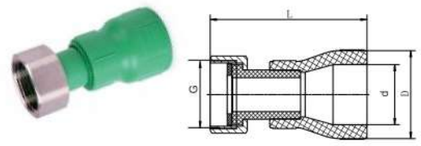
Unit:mm



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

Nut Union (WXR107)

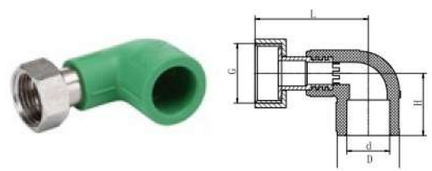
Unit:mm



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

Fast Union Elbow (WXR208)

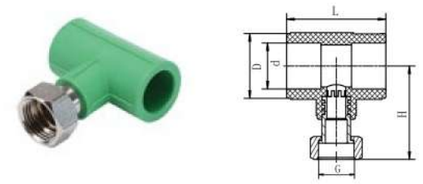
Unit:mm



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

Fast Union Tee (WXR308)

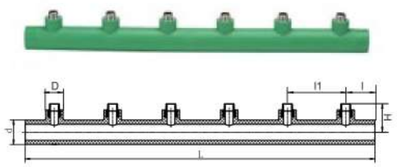
Unit:mm



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

Male Thread Manifolds (WXR161)

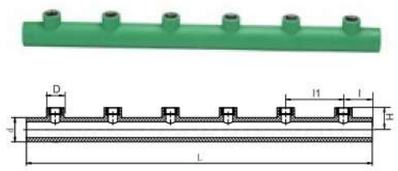
Unit:mm



Description	d	D	L	H	I	I1
dn63x6x3/4"	63	45	900	73.5	75	150
dn63x4x1/2"	63	40	930	72	75	260
dn63x2x3/4"	63	45	270	73.5	75	120
dn63x3x3/4"	63	45	390	73.5	75	120
dn63x6x1/2"	63	40	1100	72	100	180

Female Thread Manifolds (WXR162)

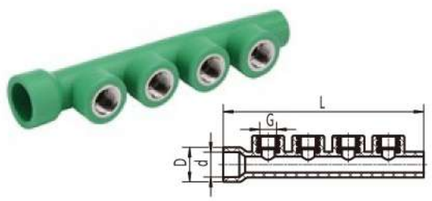
Unit:mm



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

Indoor Female Thread Manifolds (WXR734)

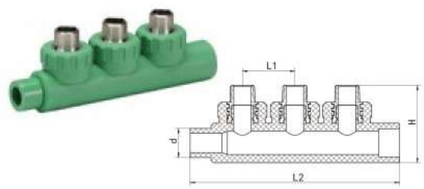
Unit:mm



Description	d	D	G	L
dn32×4×1/2" (branch spacing 50mm)	32	43	1/2"	250

Manifolds (WXR731)

Unit:mm



Description	d	H	L1	L2
Dn25/2X1/2S2.5	25	66.5	45	135
Dn25/3X1/2S2.5	25	66.5	45	180

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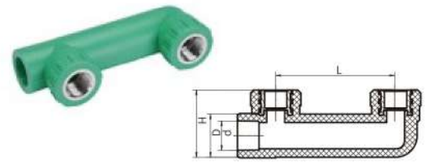
Female Thread Tee (F Type) (WXR309)

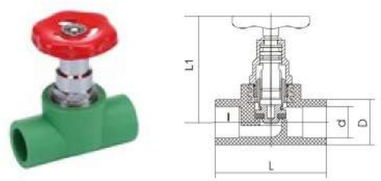
Unit:mm



Description	d	D	L	H
dn20	20	29	100	36
dn25	25	34	100	56

Stop Valve-Socket End (WXR830)

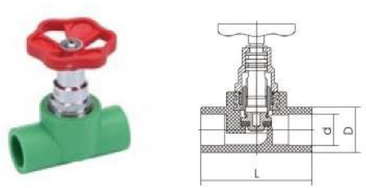
Unit:mm



Description	d	D	L	L1	I
dn20	20	28	75	73	16
dn25	25	34.5	85	85	18
dn32	32	43	105	93	20
dn40	40	54	130	110.5	22
dn50	50	70	165	138	25
dn63	63	86	190	161	29

Plastic Handwheel Valve(A) (WXR832)

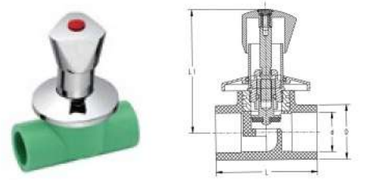
Unit:mm



Description	d	D	L
dn20	20	28	75
dn25	25	34.5	85
dn32	32	43	105

Stop Valve-Chrome Handle (WXR860)

Unit:mm



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

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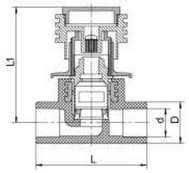
Concealed Valve (WXR870)

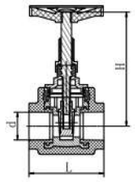
Unit:mm



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

Gate Valve (WXR850)

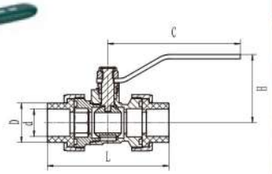
Unit:mm



Description	d	L	H
dn20	20	58	71.5
dn25	25	65	82.5
dn32	32	80	82.5

Double Union Ball Valve (WXR800)

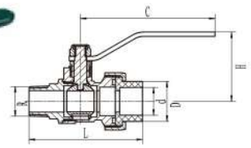
Unit:mm



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)

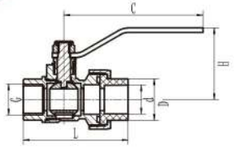
Unit:mm



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)

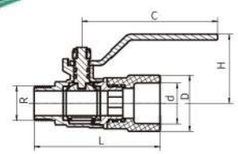
Unit:mm



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

Integrated Male Single Ball Valve (WXR920)

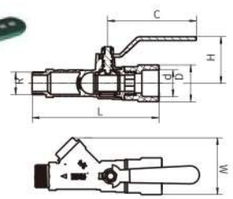
Unit:mm



Description	d	D	R	L	H	C
dn32X3/4"	32	43	3/4"	96.5	54.5	104

Integrated Male Single Filter Ball Valve (Left) (WXR910-A)

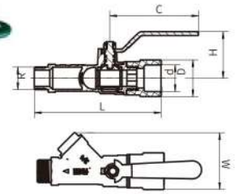
Unit:mm



Description	d	D	R	L	H	W	C
dn32X3/4"	32	43	3/4"	148.5	54.5	66.5	104

Integrated Male Single Filter Ball Valve (Right) (WXR910-B)

Unit:mm



Description	d	D	R	L	H	W	C
dn32X3/4"	32	43	3/4"	148.5	54.5	66.5	104

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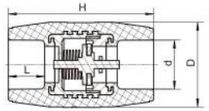
Check Valve (WXR870)

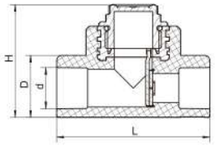
Unit:mm



Description	d	D	L	H
dn20	20	30	16	68
dn25	25	42	18	72

Swing Check Valve (WXR871)

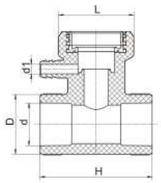
Unit:mm



Description	d	D	H	L
dn25	25	34	65.5	89

Safety Valve (WXR880)

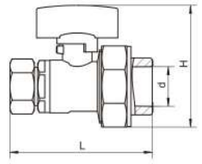
Unit:mm



Description	d	d1	D	L	H
dn25	25	5.5	34	43	64

Mini Ball Valve (WXR890)

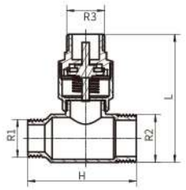
Unit:mm



Description	H	L	d
dn20x1/2"	60	70	20

Copper Check Valve (WXR750)

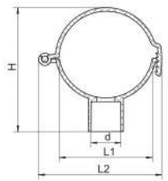
Unit:mm



Description	R1	R2	R3	L	H
1/2"X3/4"	1/2"	3/4"	1/2"	70.5	60

Adjustable Clamp Used In Thermal Insulation Pipe (WXR715)

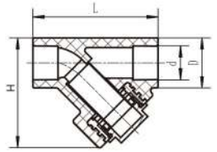
Unit:mm



Description	d	L1	L2	H
dn20	20	31	50	55.5
dn25	20	45	63	62
dn32	20	62	82.5	83

Y type Strainer Valve (WXR860)

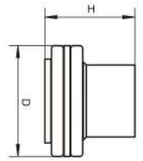
Unit:mm



Description	d	D	L	H
dn25	25	36	61	90
dn32	32	43	65	95

Female Thread Sealing Ring (WXR721)

Unit:mm



Description	H	D
1/2"	15	15

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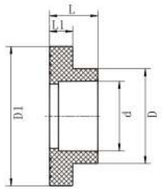
Flange Adaptor (WXR140)

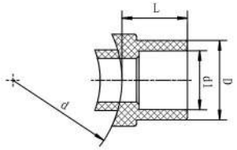
Unit:mm



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)

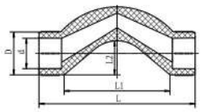
Unit:mm



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

Bridge Fitting (WXR130)

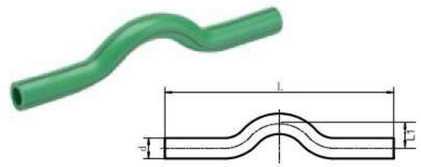
Unit:mm



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)

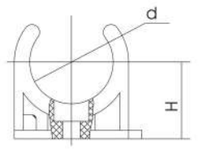
Unit:mm



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

Small Plastic Clip (WXR710)

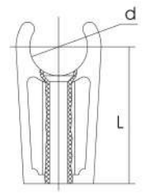
Unit:mm



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

Large Plastic Clip (WXR711)

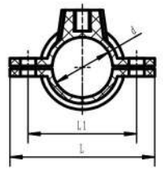
Unit:mm



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

Clip with Thread (WXR712)

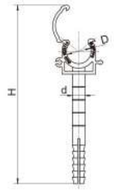
Unit:mm



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

Long Foot Clamp (WXR714)

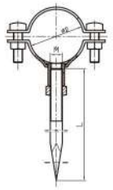
Unit:mm



Description	d	D	H
dn20	9.5	19	138.5
dn25	9.5	24	197

Metal Clip (WXR713)

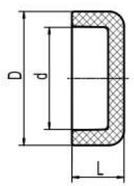
Unit:mm



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)

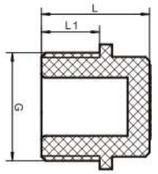
Unit:mm



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)

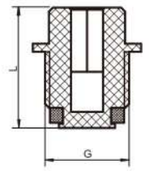
Unit:mm



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

End Cap with Thread (with gasket) (WXR703)

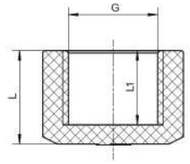
Unit:mm



Description	L	G
R1/2"	29	12

Female Thread Pipe Plug (WXR704)

Unit:mm



Description	G	L	L1
G1/2"	19	19.5	15.5

Cover (WXR706)

Description
R1/2"

Plastic Wrench End Cap (WXR707)

Description
G1/2"

Lengthen Brass Female Thread Connector (WXRJ751)

Description
G1/2"
G1/2" (double gaskets)

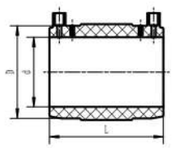
Brass Double Male Thread Connector (WXRJ750)

Description
G1/2"

Electrofusion Fittings

E.F. Coupler (WXRD100)

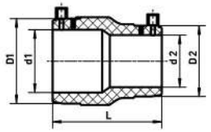
Unit:mm



Description	d	D	L
dn20	20	32	76
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)

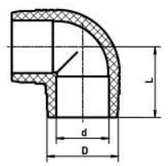
Unit:mm



Description	d1	d2	D1	D2	L
dn63x32	63	32	84	47	130
dn63x40	63	40	84	56	125
dn63x50	63	50	84	70	120
dn75x63	75	63	104	84	135
dn90x63	90	63	120	84	155
dn110x63	110	63	146	84	191
dn110x75	110	75	146	104	178
dn110x90	110	90	146	120	179
dn125x90	125	90	159	120	193
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)

Unit:mm



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	315	387	299

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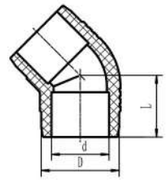
E.F. Elbow 45° (WXRD220)

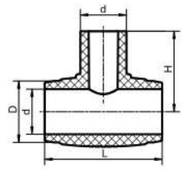
Unit:mm



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	315	387	210

E.F. Tee (WXRD300)

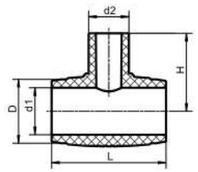
Unit:mm



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)

Unit:mm



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
dn90x50x90	90	50	120	200	132
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
dn110x90x110	110	90	146	245	196
dn125x110x125	125	110	159	270	175.5
dn160x63x160	160	63	204	267	188
dn160x110x160	160	110	204	318	202
dn160x125x160	160	125	204	310	212
dn200x160x200	200	160	254	360	240
dn250x200x250	250	200	305	392	287
dn315x250x315	315	250	385	533	365

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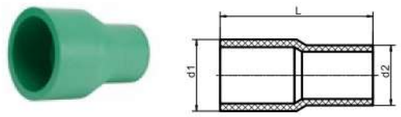
Butt Fusion Fittings

B.F. Reducer (WXRB110)

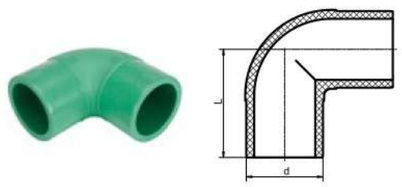
Unit:mm



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. Elbow 90° (WXRB200)

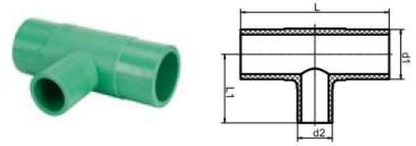
Unit:mm



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

B.F. Reducing Tee (WXRB310)

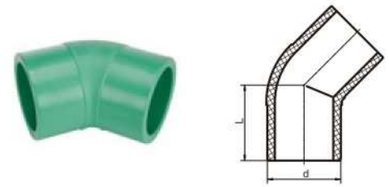
Unit:mm



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 45° (WXRB220)

Unit:mm



Description	d	L
dn110	110	113
dn125	125	121
dn160	160	147
dn200	200	165
dn250	250	193
dn315	315	230

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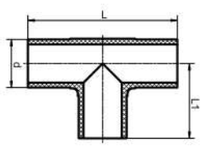
B.F. Tee (WXRB300)

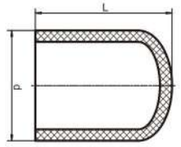
Unit:mm



Description	d	L	L1
dn110	110	310	155
dn125	125	340	170
dn160	160	410	205
dn180	180	420	210
dn200	200	460	230
dn250	250	550	275
dn315	315	670	335

B.F. End Cap (WXRB700)

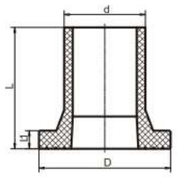
Unit:mm



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)

Unit:mm



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

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	dn160/32

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)

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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

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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*

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CHAPTER 7: PROJECT REFERENCES