SaniPlastica
PIPING SYSTEMS

PP-R PIPES AND FITTINGS

FOR WATER SUPPLY & HEATING SYSTEMS

TECHNICAL CATALOGUE

The Best Quality,
Designed in ITALY

AENOR
Producto Certificado

AENOR
Certified Products

SaniPlastica
PIPING SYSTEMS

SaniPlastica is a system of pipes and fittings in random polypropylene with diameters from 20 to 160mm, for hot water supply, for heating and for cooling, which meets the most demanding requirements in terms of strength and durability.

PP-R is a plastic material that is **resistant to cracking** even under stress, **corrosion and chemical agents**. Its molecular composition also ensures soundproofing and protection from stray currents.

SaniPlastica pipes are produced according to DIN 8077 - 8078 and/or EN ISO 1587-2; the fittings are incompliance with DIN 16962 and/or EN ISO 15874-3.

The SaniPlastica product line is non-toxic and perfectly suitable for transporting drinking water and liquid foodstuffs (DM 174-04).

- SaniPlastica system is manufactured in compliance with the German Standards DIN 8077-8078 and ISO 15874
- The compliance to the most relevant International Standards is guaranteed by the constant monitoring actions carried out by International Certification Bodies.
- SaniPlastica pipes and pipe fittings range is complete: from diameter 16 to diameter 200.
- Our raw material PP-R 100 is produced by Borealis, one of the most leading companies in the world for the production of plastics and chemicals.

ISO 9001 CERTIFIED

REGISTERED ISO 14001

AENOR Producto Certificado

SaniPlastica
PIPING SYSTEMS

Physical characteristics

characteristics	methods	unit	values
specific weight	ISO/R 1183	g/cm^3	0,895
melt index at 190°C - with 5 kg	ISO 1133	g/10 min	0,4
melt index at 230°C - with 2,16 kg	ISO 1133	g/10 min	0,3
melting point	polarization microscope	°C	140-150

Thermal characteristics

characteristics	methods	unit	values
thermal conductivity at 20°C	DIN 52612	W/m·k	0,24
scpecific heat at 20°C	adiabatic calorimeter	KJ/Kg·k	2,0
coefficient of linear thermal expansion	VDE 0304	K^{-1}	1,5x10^{-4}

Mechanical characteristics

characteristics	methods	unit	values
yield strenght	ISO/R527	N/mm^2	21
tensile strenght	DIN 53455	N/mm^2	40
elongation at breaking point	DIN 53455	%	800
elasticity module	ISO 178	N/mm^2	800
hardness test	ISO 2039	N/mm^2	40

resillience with test (Charpy) on uncut sample			
at 0°C	ISO 179	KJ/m^2	resists
to -10°C		KJ/m^2	resists

resillience with test (Charpy) on sample cut			
at 0°C	ISO 179	KJ/m^2	7
to -10°C		KJ/m^2	3
impact resistence at 0°C	DIN 8078		resists

SaniPlastica PP Random is resistant to crack under stress. as it is shown in the following regression bends. For more details, see regression bends in the Chapter called "INSTALLATION"

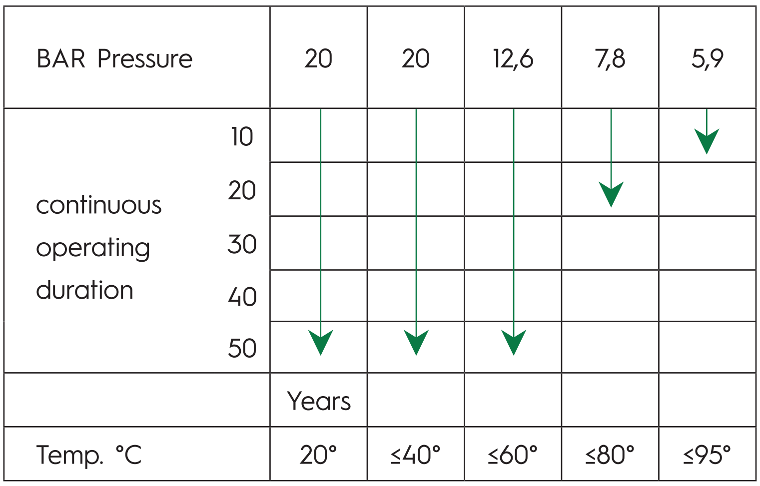


Diagram of pipe life duration for continuous operation under different temperatures and different pressures (PN20)

The SaniPlastica pipes and pipe fittings allow for a multipurpose use: hot and/or cold water, potable water, waste liquids, chemical liquids, compressed air, heating systems, air conditioning systems, etc.

They can be used in civil buildings, (apartments, condominiums, hospitals, schools, etc.), commercial buildings (hotels, restaurants, swimming pools, shopping centers, offices, etc.), industrial buildings (factories, technical installations, air conditioning etc.) and shipbuilding.

They can be used in new buildings as well as in renewals, replacements or connections with pre-existing systems.

- POTABLE WATER
- AGRICULTURE INSTALLATION AND IRRIGATION SYSTEMS
- CHEMICAL LIQUIDS
- HEATING SYSTEM
- FIRE PROTECTION INSTALLATION
- RAINWATER APPLICATION
- CONNECTION HEATING AND COOLING
- SPORTS INSTALLATION HEATING AND COOLING
- SHIP BUILDING INSTALLATION
- CHILLED WATER INSTALLATION AND AIR CONDITIONING
- SWIMMING-POOL
- INDUSTRIAL EQUIPEMENTS AND INSTALLATION

ADVANTAGES

- **Non- Toxic Materials**. The SaniPlastica components are completely non-toxic and the Random Polypropylene, used to produce them, strictly follows international sanitary regulations. SANİPLASTİCA is fit for conveying potable water.
- **Safety Against Corrosion**. The SaniPlastica pipes and pipe fittings are absolutely immune from the corrosion of many chemical substances with a PH between 1 and 14, since Random Polypropylene is characterized by a high resistance to both acid and alkaline substances in a wide range of temperatures and concentrations.
- Easy Installation. The SaniPlastica pipes and pipe fittings are easy to install and assemble, thanks to their excellent properties of lightness, ease of handling, workability, weldability. The last feature allows pipes and pipe fittings to be welded easily by polyfusion, saving time by 40-50%.
- **Safety Against Abrasions and Deposits**. The internal surfaces of SaniPlastica pipes and pipe fittings are uniform and free of roughness, which allows liquids to flow easily without danger of erosion and formation of deposits. Moreover, such peculiarities allow reducing pressure losses to a minimum.
- **Noises and Vibrations**. The vibrations due to water flowing and to its noise are softened and reduced to no impact by the PPR high sound insulation and flexibility. Such features also protect the system from any water hammering.
- **Safety Against Condensation and Heat Loss**. No plastic material is a good heat conductor, therefore also the PPR pipes and pipe fittings are safe thermal insulators. This feature limits condensation and is a guarantee against heat losses.
- **Safety Against Frost**. The PPR elasticity allows pipes and pipe fittings to expand their inner section, so that the volume of frozen liquid is partially absorbed.
- **Safety Against Stray Currents**. Like every plastic material, the PPR is a poor conductor of electricity, endowed with high insulating properties; this ensures safety against corrosion caused by stray currents.

Chemical Resistance

Polypropylene is highly resistant to many chemicals, in particular to acidic and alkaline solutions.
The diagram on the right side indicates the resistance against different classes of substances. For more detailed information, see Table X, ISO TR 10358 standard or the several databases of PP manufacturers.

Polypropylene:

Diluted acidic solutions	O
Alkaline solutions	O
Alcohols, aliphatic composites	O
Concetrated acidic solutions	B
Aldehydes	B
Esters	B
Aliphatic hydrocarbons	B
Oxidizing agents	S
Aromatic hydrocarbons	I
Hydrogenated hydrocarbons	I
Ketones, aromatic composites	I

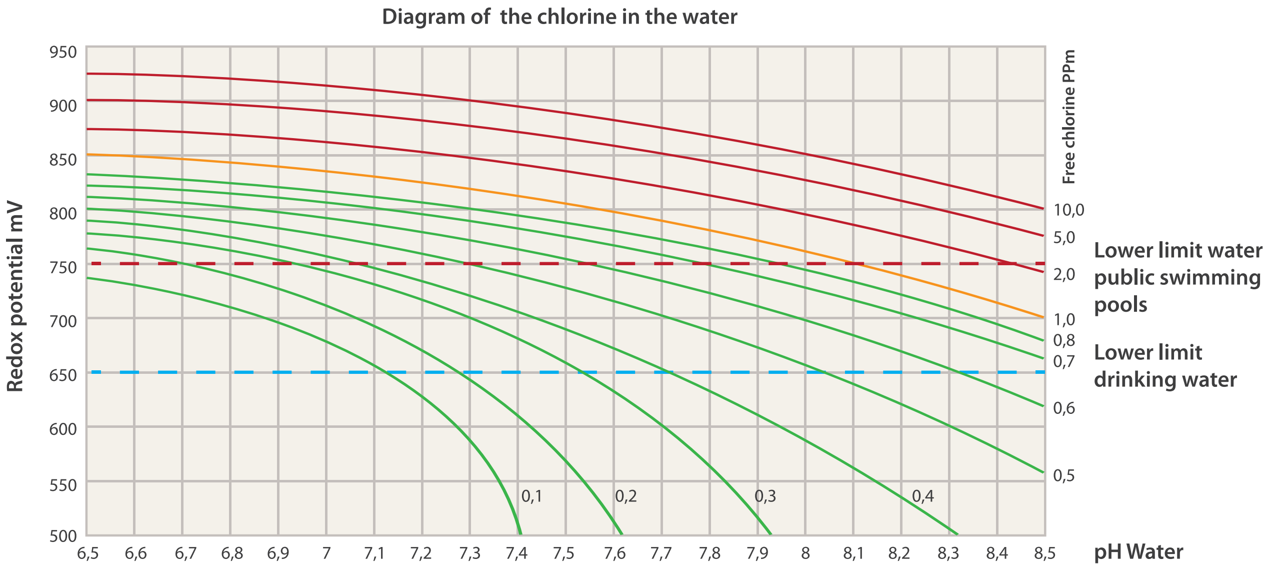
O=very good; B=good; S=sufficient; I=Insufficient

Chemical Resistance

Polypropylene is highly resistant to chlorine used for the disinfection of drinking water.

The disinfecting effect of chlorine is related to the potential of oxidation-reduction (ORP) of the solution made of chlorine water solution. In 1972, the World Health Organization (WHO) established the minimum potential of 650 mV to ensure the immediate destruction of all harmful bacteria. Therefore, ORP potential must be between 650 and 700 mV to ensure optimal disinfection. Chlorine concentrations corresponding to these values are between 0.1 ppm and 1 ppm, depending on the pH of the water.

These concentrations are perfectly compatible with the use of PP pipes at specified operating temperatures up to 70°C.
In 1982, Germany, which has the strictest water quality standards in the world, established a minimum value of 750 mV for the water in public swimming pools. The concentration of chlorine in swimming pools can be well above 1 ppm (up to 10 ppm). In these conditions, the use of polypropylene pipes is not recommended.



A simple method for ascertaining whether particular water is compatible with the use of PP pipes is to measure the oxidation-reduction potential using one of the many portable instruments available on the market, such as the one shown in the picture on the top. The potential must be less than 750 mV

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Ethyl aldehyde	TR	CR	–	–
Acetophenone	TR	R	R	–
Acetic acid anhydride	TR	R	–	–
Acetic acid Diluted	TR	R	CR	NR
Acetic acid Diluted	40%	R	R	–
Acetone	TR	R	–	–
Acidic acetic anhydride	40%	R	R	–
Acrylonitrile	TR	R	CR	–
Adipinic acid	TR	R	R	–
Air	TR	R	R	R
Alum Me - Me III	GL	R	R	–
Allyl alcohol, Diluted	96%	R	R	–
Alum	TR	R	R	–
Aluminum chloride	GL	R	R	–
Aluminum sulphate	GL	R	R	–
Succinic acid	GL	R	R	–
Diamino ethanol	TR	R	–	–
Ammonia gas	TR	R	R	–
Ammonia, liquid	TR	R	R	–
Aniline	TR	R	–	–
Ammonia, aqueous	GL	R	R	–
Ammonium Acetate	GL	R	R	–
Ammonium carbonate	GL	R	R	–
Ammonium chloride	GL	R		–
Ammonium fluoride	L	R	R	–
Ammonium nitrate	GL	R	R	R
Ammonium phosphate	GL	R	R	R
Ammonium sulphate	GL	R	R	R
Amyl Amylacetate	TR	R	R	–
Amyl alcohol	TR	R	–	R
Aniline	TR	CR	R	–
Aniline	GL	C	CR	–
Hydrochloride	TR	CR	C	–
Cyclohexanone	TR	CR	CR	NR

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Antifreeze Agent	H	R	NR	R
Antimony (III) chloride	90%	R	R	–
Malic acid	L	R	R	–
Malic acid	GL	R	R	–
Apple wine (ortho)	H	R	R	–
Aqua regia (nitrohydrochloricacid)	H	R	R	R
Arcenical acid	40%	R	R	–
Arcenical acid	80%	R	R	CR
Barium hydroxide	GL	R	R	R
Barium salts	GL	R	R	R
Battery acid (electrolytic acid)	H	R	R	–
Beer	H	R	R	R
Aldehyde	GL	R	R	–
Mixture of gasoline and Benzene	8090/ 2009	CR	NR	NR
Benzene	TR	CR	NR	NR
Benzyl chloride	TR	RR	–	–
Borax (sodium t etraborate)	L	R	R	–
Boric acid	GL	R	R	R
Bromine	TR	NR	NR	NR
Bromine vapors	Any	CR	NR	NR
Butadiene, gas	TR	CR	NR	NR
Butane (2) diol (1,4)	TR	R	R	–
Butandiol	TR	R	R	–
Butanetriol (1,2,4)	TR	R	R	–
Butyne (2) diol (1,4)	TR	R	–	–
Butyl acetate	TR	RR	NR	NR
Butyl alcohol	TR	R	CR	CR
Butyl phenol	GL	R	R	R
Butyl phenol	TR	NR	–	–
Butylene glycol	10%	R	CR	–
Butylene glycol	TR	R	–	–
Butylene, liquid	TR	CR	–	–

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Carbon monoxide	Any	R	R	–
Carbon disulphide	TR	NR	NR	NR
Sodium hydroxide	60%	R	R	R
Trichlorac etaldehyde	TR	R	R	–
Chloramine	L	R	–	–
Chloroethanol	TR	R	R	–
Chloric acid	1%	R	CR	NR
Chloric acid	10%	R	CR	NR
Chloric acid	20%	R	NR	NR
Chlorine	0.5%	CR	–	–
Chlorine	1%	NR	NR	NR
Chlorine	GL	CR	NR	NR
Chlorine, gas	TR	NR	NR	NR
Chlorine, aqueous	TR	NR	NR	NR
Chloroacetic acid	L	R	R	–
Chlorobenzene	TR	CR	–	–
Chloroform	TR	CR	NR	NR
Chlorosulfonic acid	TP	NR	NR	NR
Chromic acid	40%	CR	CR	NR
Chromic acid/ sulfuric acid / water	15/35/ 50%	NR	NR	NR
Crotonic aldehyde	TR	R	–	–
Citric acid	VL	R	R	R
Citric acid	VL	R	R	R
City gas	C	R	–	–
Coconut fatty alcohol	TR	R	CR	–
Coconut oil	TR	R	–	–
Cognac	C	R	R	–
Copper (II) chloride	GL	R	R	–
Copper Cyanide (1)	GL	R	R	–
Copper Nitrate (II)	30%	R	R	R
Copper sulphate	GL	R	R	–
Corn oil	TR	R	CR	–
Cottonseed oil	TR	R	R	–

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Cresol	90%	R	R	–
Cresol	>90%	R	–	–
Cyclohexane	TR	R	–	–
Cyclohexanol	TR	R	CR	–
Cyclohexanone	TR	CR	NR	NR
Dextrin	L	R	R	–
Glucose	20%	R	R	R
1,2 diamine ethane	TR	R	R	–
Dichloroacetic acid	TR	CR	–	–
Dichloroacetic acid	50%	R	R	–
Dichlorobenzene	TR	CR	–	–
Dichlorethylene	TR	CR	–	–
Diesel grease	C	R	CR	–
Diethylamine	TR	R	–	–
Diethyl ether	TR	R	CR	–
Diglycolic acid	GL	R	R	–
Dihexyl phthalate	TR	R	CR	–
Diisooctyl phthalate	TR	R	CR	–
Diisopropyl ether	TR	CR	NR	–
Dimethyl formamide	TR	R	R	
Dimethyl amine	100%	R	–	–
Di-n butyl ether	TR	R	CR	–
Dinonyl phthalate	TR	R	CR	–
Dioctyl phthalate	TR	R	CR	–
Dioxane	TR	CR	CR	–
Potable water	TR	R	R	R
Ethanol	L	R	R	–
Ethanol + 2% of toluene	96%	R	–	–
Ethyl acetate	TR	R	CR	NR
Ethyl alcohol	TR	R	R	R
Ethyl benzene	TR	CR	NR	NR
Ethyl chloride	TR	NR	NR	NR
Ethylene diamine	TR	R	R	–
Ethylene glycol	TR	R	R	R

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Hydrofluosilicic acid	32%	R	R	–
Formaldehyde	40%	R	R	CR
Formic acid	10%	R	R	NR
Formic acid	85%	R	CR	R
Fructose	–	R	R	R
Fruit juices	H	R	R	R
Furfuryl alcohol	TR	R	CR	R
Gelatin	L	R	R	–
Glucose	20%	R	R	NR
Glycerol	TR	CR	CR	NR
Glycolic acid	30%	NR	–	–
Rendered animal fat	H	R	NR	–
HCl/HNO_3	75%/25%	R	CR	–
Heptane	TR	R	CR	NR
Hexane	TR	R	R	–
Hexanetriol (1, 2, 6)	TR	R	–	CR
Hydrazine hydrate	TR	R	CR	–
Hydrofluoric acid	40%	R	R	–
Hydrochloric acid	20%	R	CR	–
Hydrochloric acid	20%-36%	R	R	–
Hydrofluoric acid	40%	R	CR	–
Hydrofluoric acid	70%	R	R	–
Hydrogen	TR	R	R	NR
Hydrogen chloride	TR	R	CR	R
Hydrogen peroxide	30%	R	R	NR
hydrocyanic acid	TR	R	R	–
Sulphate hydroxylammonium	12%	R	CR	–
Iodine solution	C	R	CR	–
Isooctane	TR	R	R	NR
Isopropyl	TR	R	CR	R
Kerosene	C	R	R	NR
a- hydroxy propanoicacid	90%	NR	CR	NR
Lanolin	C	R	R	–

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Lead Acetate	GL	R	R	CR
Flax-seed oil	H	R	R	R
Lubricating oils	TR	R	CR	NR
Magnesium chloride	GL	R	NR	NR
Hydroxycarbonate of Magnesium	GL	R	R	–
Magnesium salts	GL	R	R	R
Magnesium sulfate	GL	R	CR	–
Menthol	TR	H	R	CR
Methanol	TR	H	n	–
Methanol	5%	R	–	NR
Methyl acetate	32%	NR	NR	NR
Methylamine	TR	NR	NR	–
Methyl bromide	TR	R	CR	-
Methyl chloride	TR	R	R	R
Methyl ethyl ketone	TR	R	R	R
Mercury	GL	R	R	R
Mercury salts	H	R	R	R
Milk	H	R	R	R
Mineral water	H	R	CR	–
Molasses	TR	R	CR	NR
Engine oil	TR	R	CR	NR
Natural gas	GL	R	NR	NR
Nickel salts	10%	CR	NR	–
Nitric acid	10%-50%	NR	CR	–
Nitric acid	>50%	R	R	NR
Nitric acid	TR	R	NR	CR
2-nitrotoluene	Any	NR	R	NR
Nitrous gases	TR	R	R	–
Oleum (fuming suluric acid) (H2S04+S03)	TR	R	–	–
Olive oil	GL	R	CR	–
Ethanedioic acid	TR	R	R	NR
Oxygen	0.5 ppm	R	NR	NR
Ozone	C	R	R	–
Paraffin emulsions	TR	R	R	R

SaniPlastica PIPING SYSTEMS

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Oil	TR	R	NR	–
Petroleum	TR	C	NR	–
Petroleum ether	TR	C	NR	–
Phenol	5%	C	C	–
Phenol	90%	C	–	–
Phenylhydrazine	TR	CR	CR	–
Hydrochloride of phenylhydrazine	TR	C	CR	–
Phosgene	TR	CR	CR	–
Phosphates	GL	R	R	–
Phosphoric acid (orthophosphoric)	85%	R	R	R
Oxychloride of phosphorus	TR	CR	–	–
Phthalic acid	GL	R	R	–
Photographic emulsions	H	R	R	–
Baths with photo fixing agent	H	R	R	–
Picric acid	GL	R	–	–
Potassium bichromate	GL	R	R	–
Potassium bromate	10%	R	R	–
Potassium bromide	GL	R	R	–
Potassium carbonate	GL	R	R	–
Potassium chlorate	GL	R	R	–
Potassium chloride	GL	R	R	–
Potassium chromate	GL	R	R	–
Potassium cyanide	L	R	R	–
Potassium fluoride	GL	R	R	–
Potassium bicarbonate	GL	R	R	–
Potassium hydroxide	50%	R	R	R
Potassium iodide	GL	R	R	–

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Potassium nitrate	GL	R	R	–
Potassium perchlorate	10%	R	R	–
Permanganate of po-tassium	GL	R	NR	–
Potassium persulphate	GL	R	R	–
Potassium sulfate	GL	R	R	–
Propane gas	TR	R	–	–
Propanol (1)	TR	R	R	–
Propargyl alcohol	7%	R	R	–
Propionic (propanic) acid	>50%	R	–	–
Propylene glycol	TR	R	R	–
Pyridine	TR	NR	NR	–
Sea water	H	C	C	C
Silicic acid	Any	C	C	–
Fluorosilicic acid	32%	C	C	–
Silicone emulsion	H	C	C	–
Silicone oil	TR	C	C	C
Silver nitrate	GL	R	R	CR
Silver salts	GL	R	R	–
Sodium acetate	GL	R	R	R
Sodium benzoate	35%	R	R	–
Hydrocarbonate	GL	R	R	R
Hydrosulphate	GL	R	R	–
Hydrosulfite	L	R	–	–
Sodium carbonate	50%	R	R	CR
Sodium chlorate	GL	R	R	–
Sodium chloride	VL	R	R	R
Sodium chlorite	2-20%	C	CR	NR
Sodium chromate	GL	R	R	R
Sodium hydroxide	60%	R	R	R
Hypochloride of sodi-um	20%	NR	NR	NR
Hypochlorite Of sodi-um	10%	R	–	–
Hypochlorite of sodium	20%	CR	CR	NR
Sodium nitrate	GL	R	R	–
Sodium silicate	L	R	R	–
Sodium sulphate	GL	R	R	–

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Sulphur dioxide	Any	R	R	–
Sulphur dioxide gas	TR	R	R	–
Sulphur dioxide liquid	Any	R	R	–
Sulphuric acid	10%	R	R	R
Sulphuric acid	10%-80%	R	R	–
Sulphuric acid	80%-TR	CR	NR	–
Oleum (fuming sul-furic acid)	Any	R	R	–
Sulfur trioxide	Any	R	R	–
Pine tar oil	H	R	NR	NR
Tetrachloroethane	TR	CR	NR	NR
Tetrachlorethylene	TR	CR	CR	–
Carbon tetrachloride	TR	HR	NR	NR
Tetraethyl lead	TR	R	–	–
Tetrahydrofuran	TR	CR	NR	NR
Tetrahydronaphthalene	TR	NR	NR	NR
Trionyl chloride	TR	CR	NR	NR
Tin (II) chloride	GL	R	R	–

Flowing Substance (corrosive medium)	Concen-tration	Chemical resistance at		
		20°C	60°C	100°C
Tin (IV) chloride	GL	R	R	–
Toluene	TR	CR	NR	NR
Trichloroehylene	TR	NR	NR	NR
Trichloro acetyl acid	50%	R	R	–
Tricresyl phosphate	TR	R	CR	–
Triethanolamine	L	R	–	–
Grape vinegar	H	R	R	R
Xylene	TR	CR	NR	NR
Dimethyl benzene	TR			
Yeast	Any	R	–	–
Zinc	GL	R	R	–
Trioctyl phosphate	TR	R	–	–
Urea	GL	R	R	–
Vaseline oil	TR	R	CR	–
Vinegar	H	R	R	R
Vinyl acetate	TR	R	CR	–
Washing detergent	VL	R	R	–
Pure water	H	R	R	R
Wax	H	R	CR	–
Tartaric acid	10%	R	R	–
Wines	H	R	R	–

FORBIDDEN FLUIDS FOR PP-R PIPES

FLUIDS	CONC.*
butyl acetate	100%
bromine water	soL (*)
aqua regia	HCL/HN03=3/1
benzol	100%
bromine (dry vapour)	
bromine (liquid)	100%
cyclohexanone	100%
chlorine (liquid)	100%
chlorine, gaseous, dry	100%
chloroform	100%
chlorosulphonic acid	100%
ethylchloride	100%
dekalin	100%
heptane	100%
aliphatic hydrocarbons	
ethylacetate	100%

FLUIDS	CONC.*
isooctane	100%
methyl bromide	100%
methylene chloride	100%
nitric acid	> 40%
oleic acid	100%
oleum (sulphuric acid with 60% SO_3)	
camphor-oil	
paraffin-oil	
sulphuric acid	98%
tetrahydrofuran	100%
tetrahydronaphtalene	100%
toluene	100%
turpentine	
trichloroethylene	100%
xilene	100%

The connection welding technique involves four types of welding:

- Polyfusion
- Electric sleeve
- Saddle joints

Polyfusion

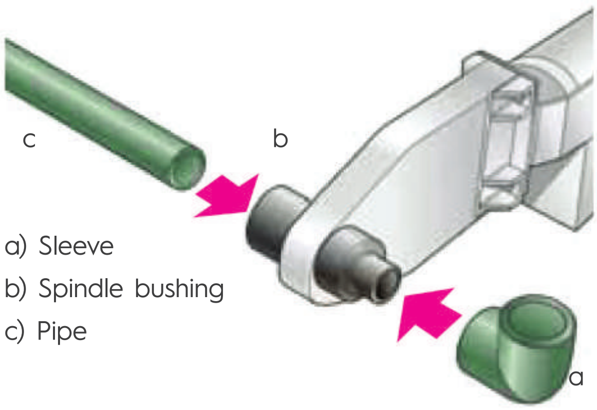
The SaniPlastica system is welded using the "socket" method: the pipes and the fittings are joined together by overlapping.
Heating the pipe ends and the fitting sockets is performed by a bushing and spindle heating element, according to the times reported in the table below.
The optimum SaniPlastica welding temperature is 260°C (± 5).
After heating, the pieces are extracted from the heating element and immediately joined axially without rotating.
Care must be taken regarding the correct depth of insertion: the pipe must be inserted to the previously marked point, i.e. to the bottom of the socket, as shown in the table.
It is recommended that the two parts should be kept fastened for a certain time (approximately the same as the heating time).
The welded connection can only be mechanically stressed once the cooling time has elapsed.
After each welding operation, the bushing and the spindle must be thoroughly cleaned. The figures show the sequence of the welding process

Table of socket depth for fittings in PP-R

Pipe Ø	Depth=t(mm)
20	14,5
25	16
32	18
40	20,5
50	23,5
63	27,5
75	31
90	35,5
110	41,5

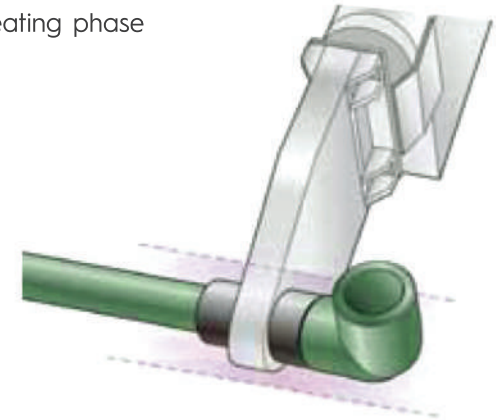
Heating element

Preparation

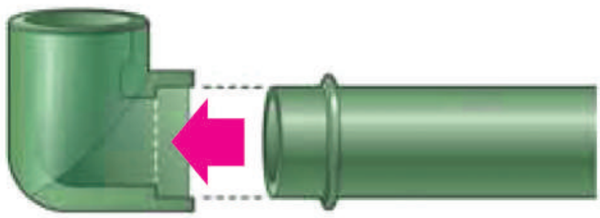


a) Sleeve
b) Spindle bushing
c) Pipe

Heating phase



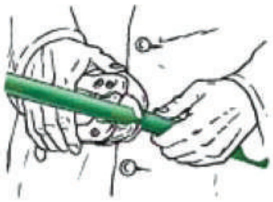
Welded connection



Polyfusion Welding Instruction

1- Cut the SaniPlastica Pipe at a right angle using a pipe cutter or another suitable cutter.

1.



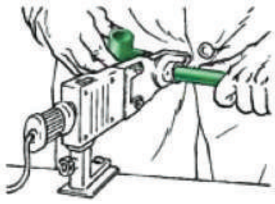
2- Clean the end of the pipe and the fitting socket using the special product and absorbent paper. Mark the depth of insertion of the fitting on the pipe. See the depth table to calculate the depth of the socket in relation to the Ø.

2.

3- Heat the pipe and the fitting simultaneously. The pipe is inserted quickly and axially in the bushing (up to the mark), while the fitting is inserted to abutment on the spindle.

Note: Make sure that the heating element achieves the proper temperature 260°C (± 5).

3.



4- After the heating time has elapsed pull both the pipe and the fitting from the heating element simultaneously.

4.

5- Within the maximum permissible time (see table), join the pipe and the fitting without rotating. **Follow indications on cooling time according with DVS 2207, Part 11.**

5.

Indicative values for socket welding using a heating element at a temperature of 20°C

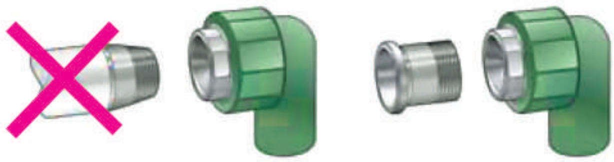
Outer pipe diameter mm	Welding section length	Heating Time, s	Max Time to Welding after Heating	Cooling Time, min
16	13	5-8	4	2
20	14	6-8	4	2
25	15	7-11	4	2
32	16,5	8-12	6	4
40	18	12-18	6	4
50	20	18-27	6	4
63	24	24-36	8	6
90	29	40-60	8	8
110	35	60-80	10	10
125	40	80-100	14	14

Mechanical Connection

The inserts with female threads are subjected to a heat treatment process for detensioning in order to achieve an optimal hardness value of "100 Brinell", a value which gives the insert outstanding mechanical qualities.

Connection Instructions

SaniPlastica Uses EN 228 parallel threads for female threaded fittings and tapered R-threads in accordance with EN 10226 for male threads. This combination ensures maximum compatibility with all interfaces.



Hydraulic Seal

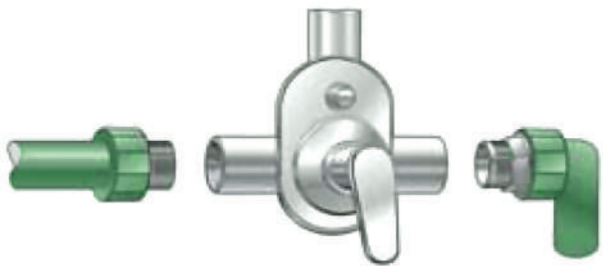
Use Teflon or similar to seal with other metal fittings, without using too much.

Connection between fittings in PP-R and iron pipes

In the case of connection to an existing galvanized iron pipe, we recommend connecting the PP-R pipe using a fitting with male thread and interposing an iron sleeve. It is strongly recommended not to use a “female” thread for connection.

Connection between fittings in PP-R and built-in groups

Connections between a built-in tap fitting body and a PP-R pipe should use "male" fittings and avoid using fittings with a "female" thread and "nipples" with a tapered thread



Selecting the thickness of the pipe based on the conditions of use

To correctly size the pipes, the first thing to do is identify the conditions of use. Please refer to table 1 of standard EN ISO 15874-1, shown on the side, to determine operating temperatures. For example, let's select Class 1.

Application class	Use	TD Temp. (°C)	TDproject Temp. (°C)	T Max. (°C)	T Max. Time (°C)	T mal. (°C)	T mal. Time (°C)
1	Sanitary water at 60°C	60	49	80	1	95	100
2	Sanitary water at 70°C	70	49	80	1	95	100
4	Low temperature radiators and underfloor heating	20 40 60	2.5 20 25	70	2,5	100	100
5	Heating with high temperature radiators	20 40 80	14 25 10	90	1	100	100

Once the class of application has been established, it is necessary to define the operating pressure. Standard UNI EN ISO 15874-2 has four levels of pressure. Let's select the pressure up to 6 bars.

Operating pressure (bar)	4	6	8	10

For each type of polypropylene, standard EN ISO 15874-2 provides a table to determine the Smax stress parameter. Using the PPR table it is possible to obtain the parameter:

SDRMax PPR = 5,2

P_D	class 1	class 2	class 4	class 5
4	6,9	5,3	6,9	4,8
6	5,2	3,6	5,5	3,2
8	3,9	2,7	4,1	2,4
10	3,1	2,1	3,3	1,9
bar				

Smax for PPR(Mpa)

We are now able to determine the SDR values of pipes in PPR and that can be used in the example. The SDR is calculated using the formula shown on the side:

SDRMax = 2 SMax +1

For PPR pipes we obtain **SDRmax = 2x5,2+1=11,4**

Therefore, we select a pipe with SDR<SDRmax. In this case SDR 11 pipes are suitable.

If we apply the formula that links the SDR to the S parameter in the tables relating to the various materials, we obtain the values shown on the side:

P_D	class 1	class 2	class 4	class 5
4	13	11	13	9
6	11	7,4	11	6
8	7,4	6	9	
10	6		7,4	
bar				

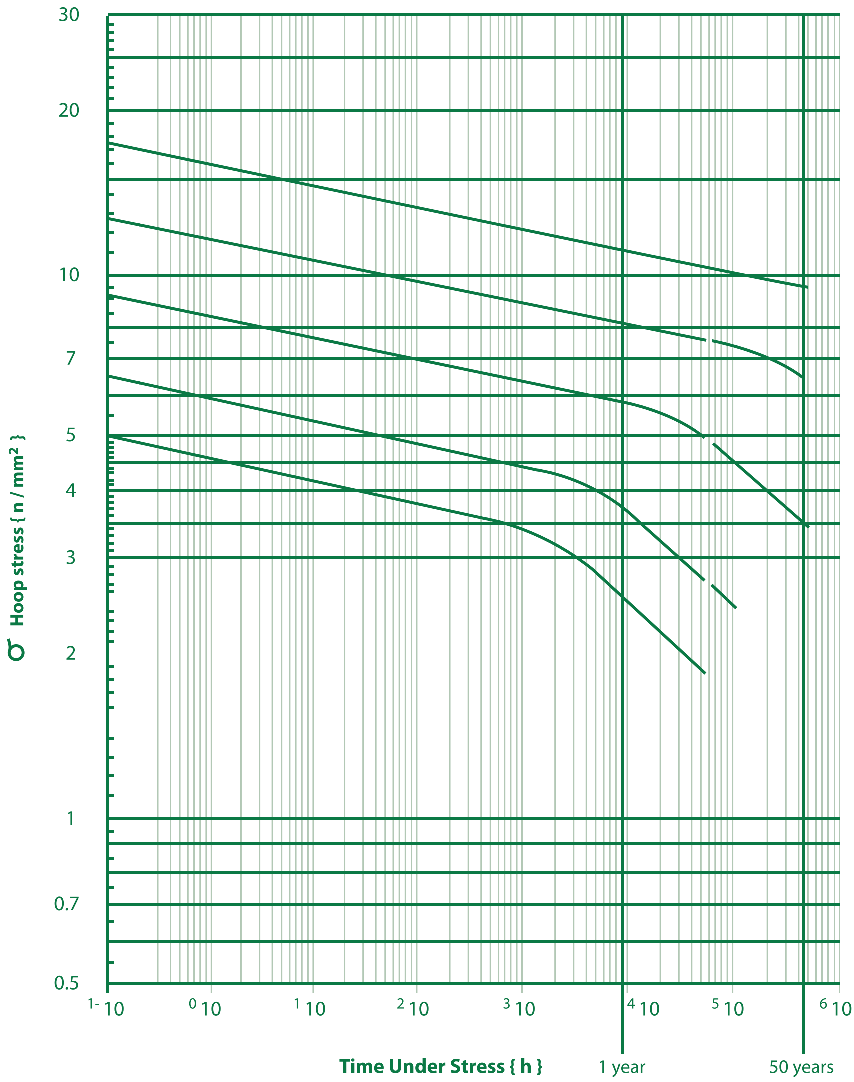
SDRMax for PPR(Mpa)

Selecting the thickness of the pipe based on the conditions of use

For conditions of use that do not fall within the classes provided by the standard EN ISO 15874-1, use the regression curves available in the German standard DIN 8078. The PPR regression curves are on the side.
For example, if we want to check the possibility of using pipes in PPR with a temperature and an operating pressure of:

T_D = 80°C

P_D = 10 bar



Multiply the pressure by a minimum safety factor of 1.4:

P_{Max} = 1,4 x 10 = 14bar

Apply the following formula:

$S_{max} = \frac{1}{2} P_{max}(SDR_{max} - 1)$

The following Smax values for the available pipes are obtained:

SDR	Pmax	Smax
6,0	14,0	3,5
7,4	14,0	4,5
11,0	14,0	7,0
	bar	Mpa

Projected Service Life

The following table provides more detailed information with regards to the permissible pressure of various pipe pressure rating at various temperatures. These values are derived from the hoop stress chart and formula.
Under normal working pressures and conditions, the average service life of SaniPlastica pipes is projected to be 50 years or more.

Examples:

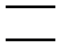
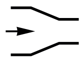
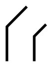
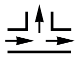
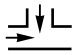
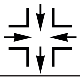
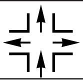
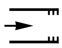
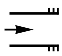
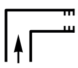
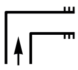
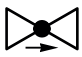
A PN 10 cold water pipe, transporting water at a temperature of 30°C can last for more than 50 years under normal conditions with an operating pressure of 10.9 bars or 158 psi.
A PN 20 hot water pipe, transporting water at a temperature of 70°C can last for more than 50 years under normal conditions with an operating pressure of 8.5 bars or 123 psi.

Temperature	Service Life, Yrs	For Water Installations, According to DIN 8077 Safety-Factor of 1.5			
		SaniPlastica Pipe SDR7,4	SaniPlastica Pipe SDR7,4	SaniPlastica Pipe SDR7,4	SaniPlastica Pipe SDR7,4
		Nominal Pressure in bars			
		PN 10 ColdWater	PN 16, Hot & ColdWater	PN 16, Hot & ColdWater	PN 16, Hot & ColdWater
		Permissible Working Pressure at Various Temperatures (bars)			
20°C	1	15,0	23.8	30.0	37.8
	5	22.3	22.3	28.1	35.4
	10	21.7	21.7	27.3	34.4
	25	21.1	21.1	26.5	33.4
	50	20.4	20.4	25.7	32.4
30°C	1	12.8	20.2	25.5	32.1
	5	12.0	19.0	23.9	30.1
	10	11.6	18.3	23.1	29.1
	25	11.2	17.7	22.3	28.1
	50	10.9	17.3	21.8	27.4
40°C	1	10.8	17.1	21.5	27.1
	5	10.1	16.0	20.2	25.5
	10	9.8	15.6	19.6	24.7
	25	9.4	15.0	18.8	23.7
	50	9.2	14.5	18.3	23.1
50°C	1	9.2	14.5	18.3	23.1
	5	8.5	13.5	17.0	21.4
	10	8.2	13.1	16.5	20.7
	25	8.0	12.6	15.9	20.0
	50	7.7	12.2	15.4	19.4
60°C	1	7.7	12.2	15.4	19.4
	5	7.2	11.4	14.3	18.0
	10	6.9	11.0	13.8	17.4
	25	6.7	10.5	13.3	16.7
	50	6.4	10.1	12.7	16.0
70°C	1	6.5	10.3	13.0	16.4
	5	6.0	9.5	11.9	15.0
	10	5.9	9.3	11.7	14.7
	25	5.1	8.0	10.1	12.7
	50	4.3	6.7	8.5	10.7
80°C	1	5.5	8.6	10.9	13.7
	5	4.8	7.6	9.6	12.0
	10	4.0	6.3	8.0	10.0
	25	3.2	5.1	6.4	8.0
95°C	1	3.9	6.1	7.7	9.7
	5	2.5	4.0	5.0	6.3

SDR= Standard Dimension Ratio (Diameter/Wall Thickness Ratio) SDR=d/s(s=Pipes series index form ISO 4065)

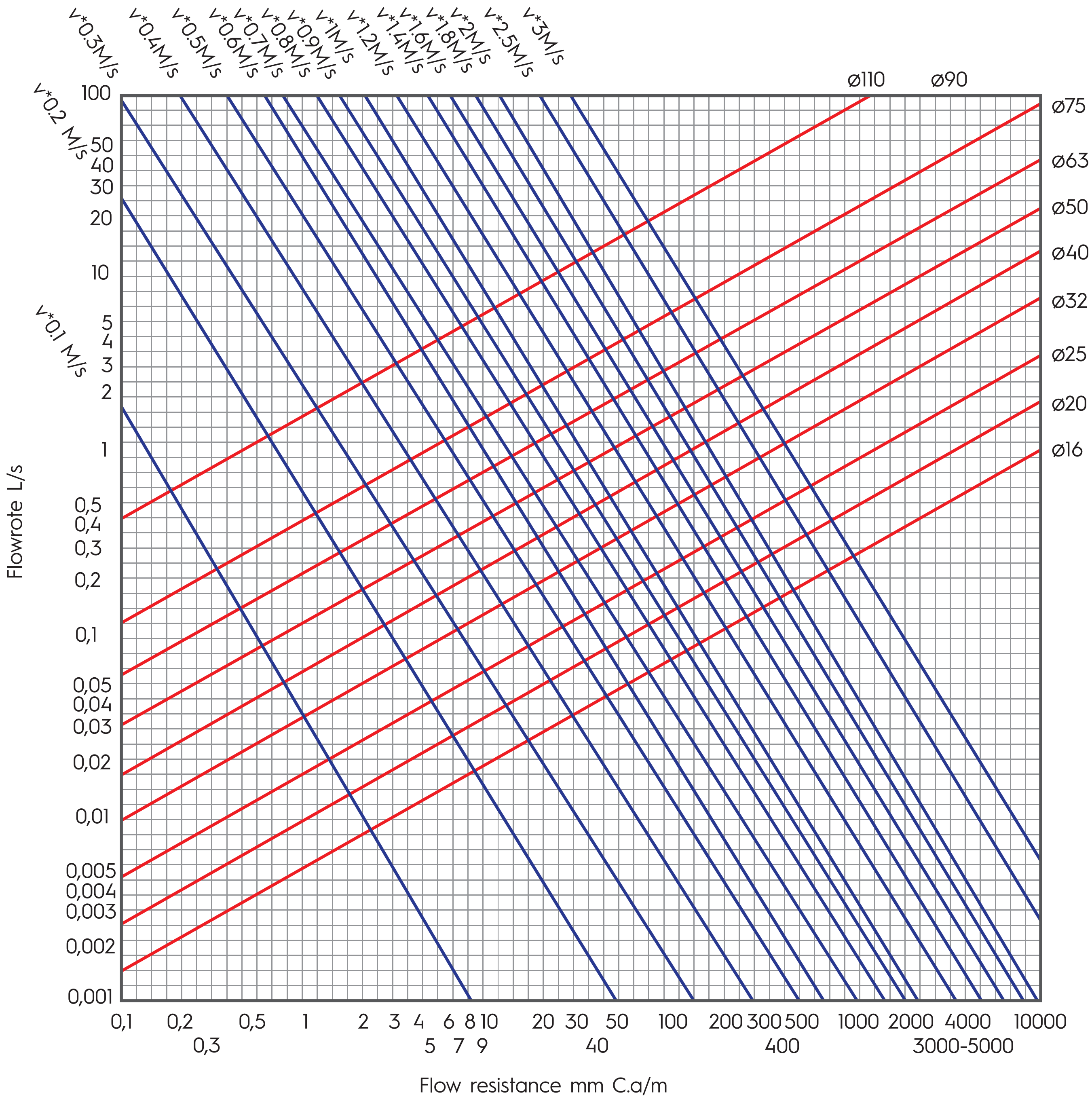
SaniPlastica Fittings Pressure Drop Diagram

The values contained in the table on the side can be used to estimate the resistance of fittings. The resistance of fittings can be determined with the "rule of thumb" as a whole. As an approximate value you can add 3-5% to the total pressure drop.

Type	Designation	Remarks	Coefficient
Socket			0,25
Reducing Socket		Reduction by 1 size	0,40
		Reduction by 2 size	0,50
		Reduction by 3 size	0,60
		Reduction by 4 size	0,70
Elbow 90°			1,20
Elbow 45°			0,50
T-Part		Flow Separation	1,20
		Flow Connection	0,80
Four-way union		Flow Connection	2,10
		Flow Separation	3,70
Combined socket female			0,50
Combined socket Male			0,70
Combined Elbow Female			1,40
Combined Elbow Male			1,60
Combined T Pipe Female			1.40 - 1.80
Valve		20 mm	9,50
		25 mm	8,50
		32 mm	7,60
		40 mm	5,70

SaniPlastica Fittings Pressure Drop Diagram

The values contained in the table on the side can be used to estimate the resistance of fittings. The resistance of fittings can be determined with the "rule of thumb" as a whole. As an approximate value you can add 3-5% to the total pressure drop.



SaniPlastica PIPING SYSTEMS

Insulation

Thanks to the excellent thermal properties of the material, SaniPlastica pipes offer low energy losses in the construction of hot water, heating and cooling systems, even without insulation.

Typical conditions of use	
Thermal conductivity (W/mk)	0,24
Water Temperature (°C)	60
Outdoor Temperature (°C)	20
Water speed (m/min)	60

Under typical conditions of use, energy losses are reported in the following table.

External diameter (mm)	20	25	32	40	50	63	75	90	110	125
Internal diameter (mm)	13,2	16,6	21,2	26,6	33,2	42,0	50,0	60,0	73,2	83,2
Section Area mm²	137	215	345	554	867	1385	1963	2826	4210	5438
Hot water flow rate l/min	8	13	21	33	52	83	118	170	253	326
Pipe thermal resistance k/w	0,274	0,273	0,272	0,272	0,271	0,269	0,269	0,269	0,270	0,270
Energy loss W/m	146	147	147	147	148	149	149	149	148	148

Nevertheless, it is necessary to refer to national codes and regulations to determine the minimum value of the insulation layer.

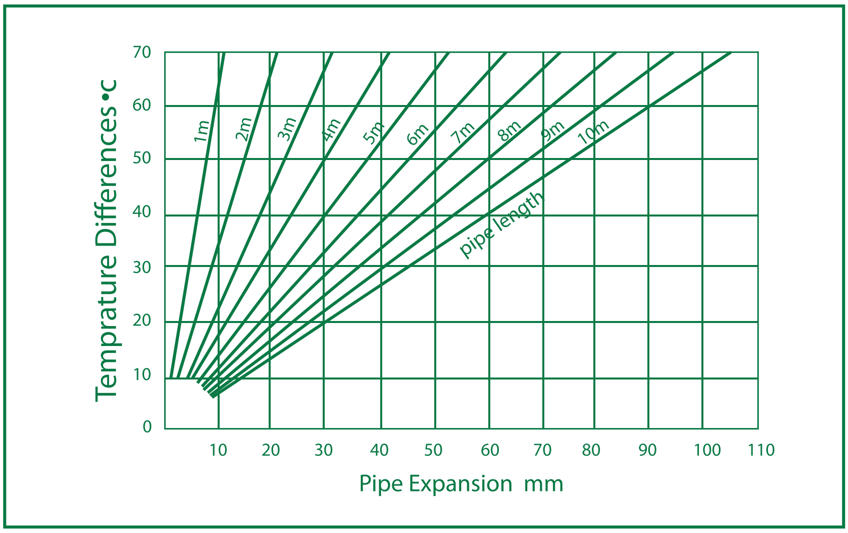
Thermal Dilatation

When subjected to temperature variations, PP-R pipes undergo a relatively high level of thermal expansion. The longitudinal thermal expansion of these pipes is about 11 times greater than steel pipes. This phenomenon must be taken into account not only during the installation phase. All the alternatives regarding the layout of the pipes has to be examined during design in order to compensate the thermal expansion phenomena that may occur.

The linear thermal expansion coefficient for the SaniPlastica monolayer pipes is

$$\alpha = 1,5 \cdot 10^{-4}\ (K^{-1})$$

Diagram of changes in the SaniPlastica pipes



Changes in the length of a pipe regardless of its diameter and thickness is calculatedby the following formula:

$$\Delta L = L * \Delta t \cdot \varepsilon\tau (mm)$$

ΔL = linear thermal expansion (mm)
$\varepsilon\tau$ = longitudinal expansion coefficient mm/m°C
L = pipe length (m)
Δt = temperature difference (°C)
The change in length (ΔL) depends on the design temperature.

Example for a pipe that is 8 m in length with a design temperature of + 16°C

1. minimum pipe wall temperature = + 9°C
(e.g. cold water pipe)
difference Δt = 9°C – 16°C = - 7°C

2. maximum pipe wall temperature = + 60°C
(e.g. hot water pipe)
difference Δt = 60°C – 16°C = 44°C

In case 1: contraction of the pipe = 8 x -7 x 0,15 =- 8,4 mm

In case 2: expansion of the pipe = 8 x 44 x 0,15 = 52,8 mm

In most cases, the change in length can be compensated by a change of direction of the pipes.

SaniPlastica Fiberglass Pipes

SaniPlastica Pipe is the latest addition to the PP-R pipe range.

It is a composite pipe consisting of 3 layers, with 20% glass fiber / PP-R, sandwiched between PP-R material in the inner layer and on the surface layer i.e. PP-R / GF / PP-R.

Fiberglass pipes are used for chilled and hot water reticulation systems.

Linear Expansion

Compared to normal PP-R pipes, Faser pipes have a much lower extension when transporting hot water. As such, Fiberglass pipes remain relatively straight at high temperatures.

The linear thermal expansion coefficient for the SaniPlastica monolayer pipes is:

$$\alpha = 0{,}40 \cdot 10^{-4} (K^{-1})$$

Thermal expansion comparison PP-R Pipe / Fiberlass Pipe:

PPR Pipe 10mt. Δt 50 = ΔL 75mm

Fiberglass Pipe 10mt. Δt 50 =ΔL 17,5mm

Expansion compensation by a change of direction

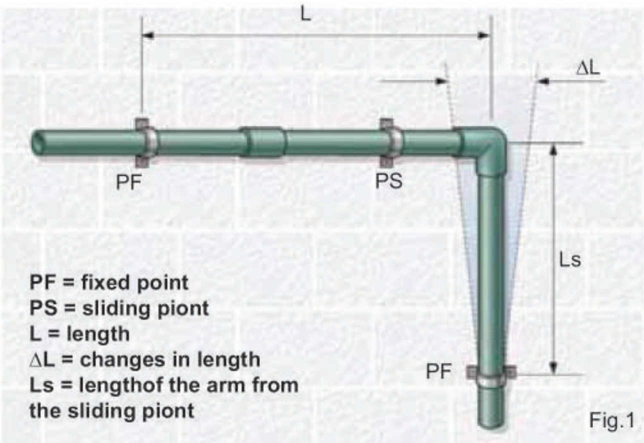
Be careful to make sure that pipes can move freely in the axial direction and, in this case, if compensation by change of direction is not possible, it will be necessary to install expansion bends. Where it is not possible to work on the layout, you will have to use axial compensators, even though they are more expensive.

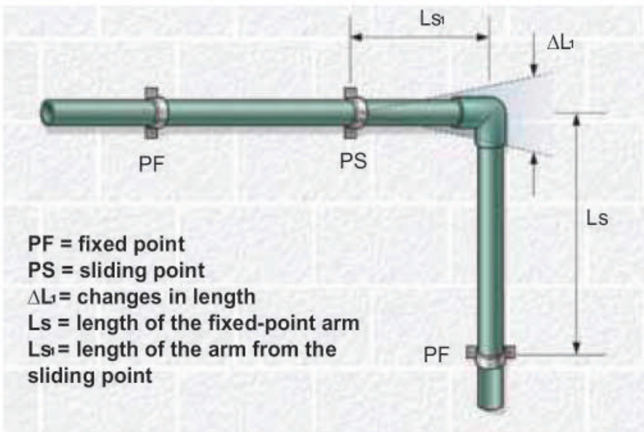
In order to achieve compensation, you need to calculate the length of the flexible arm of the pipe, using the formula to the side:

$$Ls = K \cdot \sqrt{d \cdot \Delta L} \, (mm)$$

where:
Ls = arm length (mm)
d=external pipe diameter (mm)
ΔL = change in length (mm)
K = constant depending on the material used (for PP = 20)

The diagrams in Figs. 1,2 and 3 show the compensation systems based on linear expansion.





Once the length of the section is known L, the elongation AL is determined using the formula:

$$\Delta L = L \cdot \Delta t \cdot \alpha$$

Then it is possible to calculate the Ls inflection length that compensates the elongation of the L section. It is also necessary to check whether the elongation of the Ls section is adequately absorbed by the inflection of Ls_1.

Axial and transverse thrusts on the collars

The inflection of the Ls section produces an axial thrust Sa on the fixed point FP that can be calculated for the PP using the following formula:

$$S_a = \frac{3 \cdot D^3}{10 \cdot L_s} \, (N)$$

This thrust generates a transverse reaction on the fixed point PR that is equal and opposite:

$$S_{t1} = -\frac{3 \cdot D^3}{10 \cdot L_s} \, (N)$$

It then becomes necessary to apply the following two formulas:

$$Ls = K\sqrt{D \cdot L \cdot \Delta t \cdot \alpha} \, (mm)$$

$$Ls_1 = K\sqrt{D \cdot Ls \cdot \Delta t \cdot \alpha} \, (mm)$$

Similarly, the inflection of the Ls, section produces an axial thrust on the fixed point PF_1 and a transverse thrust on the sliding point PS.
It is necessary to take into account said thrusts when dimensioning the locking collar

$$S_{a1} = \frac{3 \cdot D^3}{10 \cdot L_{s1}} \, (N)$$

$$S_{ts} = -\frac{3 \cdot D^3}{10 \cdot L_{s1}} \, (N)$$

Expansion compensation using expansion bends (Ω)

PF= fiwed point
L= length
ΔL= change in length
D= external pipe diameter
L1, L2= size of the Ω

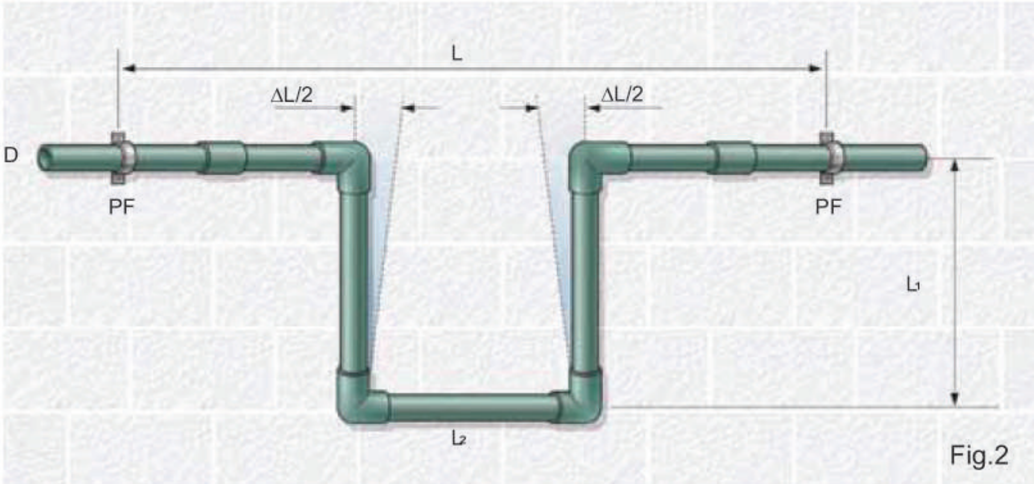


Fig.2

In cases in where a straight section of pipe does not allow a change of direction, as in Fig.1, it is necessary to insert one or more **Ω** bends as shown in Fig. 2. In this case, the length of inflection **Ls** is equal to the progres- sion of the **Ω** bend:

$$L_s = 2L_1 + L_1$$

In general, $L_2 = \frac{1}{2} L_1$, then $L_s = 2{,}5\, L_1$.
The formula for calculating the **Ls** is always the same:

$$L_s = K\sqrt{D \cdot L \cdot \Delta t \cdot \alpha}\ (mm)$$

Axial thrusts on the fixed points are still given by:

$$S_a = \frac{3 \cdot D^3}{10 \cdot L_s}\ (N)$$

This configuration does not generate transverse thrusts.

PF = fixed point
PS = sliding point
L = length
ΔL = change in length
D = external pipe diameter
L1, L2 = size of the Ω

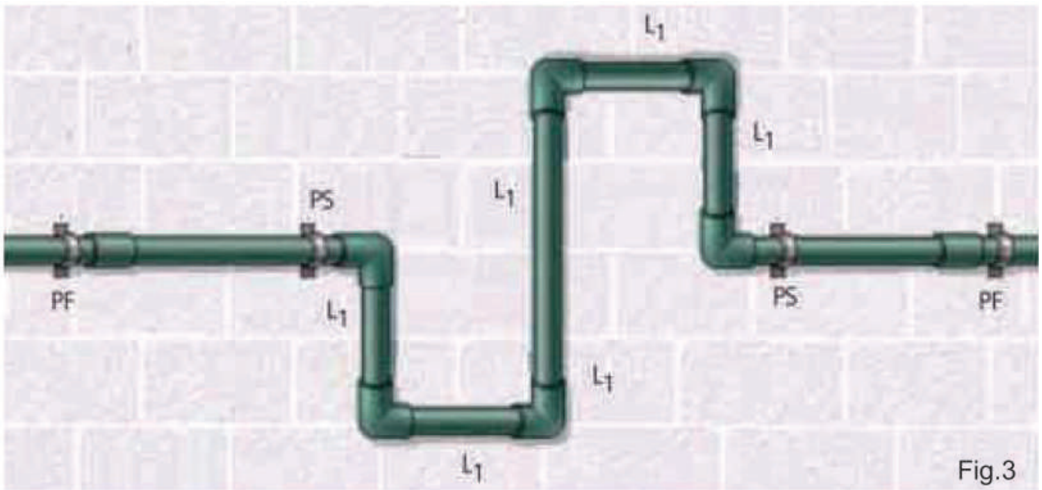


Fig.3

The diagram in Fig. 3 allows a reduction of the dimensions of the **Ω** braches out of the pipe axis and a decrease in the number of the **Ω** bends required to compensate for the expansion of an **L** pipe section.

In this case, the inflection length **Ls** is equal:
Ls=6L1
Note the position of the 2 sliding points supporting the Ω or double Ω bend.

SaniPlastica PIPING SYSTEMS

Fixed point and sliding point

The type and frequency of pipe fastenings are determined by the system layout and possible expansions. Fixed points must divide the pipe into sections that may be subjected to contractions or expansions, without affecting inserts or fittings. The guide for these sections is obtained by means of sliding point bracelets. The distance between bracelets, i.e. the distance between supporting points, depends mainly on the operating conditions and the weight of the pipe (passing fluid included).
In current prectice, the distances between supports shown in the table on the right side have proven valid.

N.B. The fastening of a pipe must take into account expansions and related axial thrusts.

Distance between supports in cm at temperature:

Ø mm	20°C	30°C	40°C	50°C	60°C	70°C	80°C
16	75	70	70	65	65	60	55
20	80	75	70	70	65	60	60
25	85	85	85	80	75	75	70
32	100	95	90	85	80	75	70
40	110	110	105	100	95	90	85
50	125	120	115	110	105	100	90
63	140	135	130	125	120	115	105
75	150	150	140	140	125	115	105
90	165	160	150	150	140	125	115
110	190	180	170	170	160	140	130

Bending

It is possible to create bends by using hot air blowers (industrial dryers); the radius of the bends must be > 8 times the diameter of the pipe. The use of flames is absolutely not recommend.

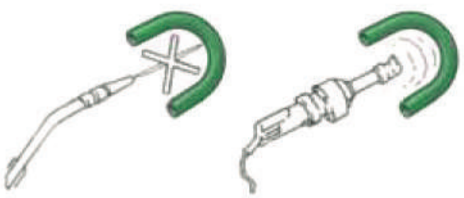
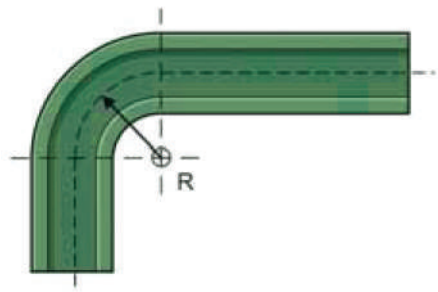


Diagram of bend radii:

Ø mm	pipeswith cold bending (R = 8xd)
20	160
25	200
32	256
40	320
50	400
63	500



Chased pipe installations

Chased pipe installations subjected to thermal stress must take into account the possible mechanical stresses transmitted by pipes to the structure.

Pipes installed together with metal pipes

Sometimes, during renovations, parts of new systems need to be connected to existing metal pipes.
PP-R pipes are perfectly compatible if connected downstream of steel pipes, but cannot be connected downstream of copper pipes or pipe systems with copper water heaters or accumulators.
The presence of a high concentration of copper ions causes a rapid deterioration of the inner surface of PP-R pipes.
No problem exists when copper pipes are connected downstream of installations in PP-R.

UV exposure

Pipes in PP-R must never be exposed to direct sunlight. For outdoor installations, pipes must have adequate protection from the sun's rays and low winter temperatures.
For the same reason, pipes must not be installed near UV ray water sterilisation devices.

Pipes for the supply of heavily chlorinated water

Pipes in PP-R cannot be used for the supply of heavily chlorinated water such as water for swimming pools, see page 4. However, they are suitable for use in swimming pools which use seawater, with low concentrations of chlorine or alternative disinfectants.

TRANSPORT

In event of pipes being removed from their factory packaging avoid disorderly transportation, (Fig. 1).

Fig. 1

Avoid dragging pipes on the ground or against the sides and tailgate of the vehicle (Fig.2).

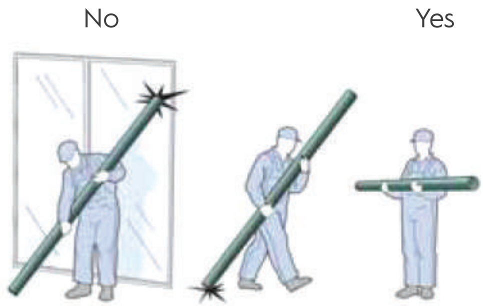


Fig. 2

STORAGE

To prevent warping over the course of time, the maximum stacking height must not exceed 1.5 m, irrespective of the diameter (Fig. 3).

Low temperatures

SaniPlastica® monolayer pipes tend to become brittle in temperatures near 0°C; therefore, it is good practice to always empty the pipes if it may freeze to prevent breakages.

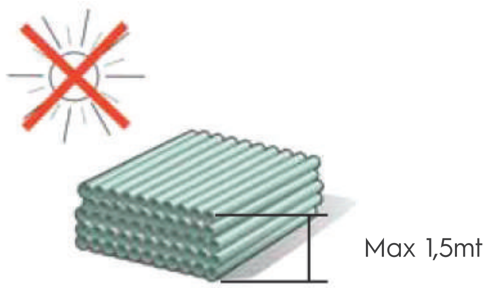


Fig. 3

Exposure to UV rays

Although it's appropriately stabilised, SaniPlastica® is affected by UV rays. Therefore, it is recommended not to remove the pipes from their packaging, if they will be stored outdoors.

PN10 (SDR11) PP-R Cold Water Pipe

Code	de, mm	di, mm	s, mm	L, mm	SDR	m/Pack
V1A0120L4	20	16,2	1,9	4000	11	100
V1A0125L4	25	20,4	2,3	4000	11	80
V1A0132L4	32	26	3	4000	11	40
V1A0140L4	40	32,6	3,7	4000	11	20
V1A0150L4	50	40,8	4,6	4000	11	20
V1A0163L4	63	51,4	5,8	4000	11	12
V1A0175L4	75	61,2	6,9	4000	11	8
V1A0190L4	90	73,6	8,2	4000	11	8
V1A0111L4	110	90	10	4000	11	4
V1A0112L4	125	102,2	11,4	4000	11	4
V1A0116L4	160	130,8	14,6	4000	11	4

SaniPlastica PN 10 (SDR 11) Pipes are suitable for cold water installations and low pressure systems.

PN16 (SDR7.4) PP-R Hot & Cold Water Pipe

Code	de, mm	di, mm	s, mm	L, mm	SDR	m/Pack
V1A0320L4	20	14,4	2,8	4000	7,4	100
V1A0325L4	25	18	3,5	4000	7,4	80
V1A0332L4	32	19,2	4,4	4000	7,4	40
V1A0340L4	40	29	5,5	4000	7,4	20
V1A0350L4	50	36,2	6,9	4000	7,4	20
V1A0363L4	63	45,8	8,6	4000	7,4	12
V1A0375L4	75	54,5	10,3	4000	7,4	8
V1A0390L4	90	65,4	12,3	4000	7,4	8
V1A0311L4	110	79,8	15,1	4000	7,4	4
V1A0312L4	125	90,8	17,1	4000	7,4	4
V1A0316L4	160	116,2	21,9	4000	7,4	4

SaniPlastica PN 16 (SDR 7,4) Pipes are used for both hot & cold water installations and higher pressure systems.

PN20 (SDR6) PP-R Hot & Cold Water Pipe

Code	de, mm	di, mm	s, mm	L, mm	SDR	m/Pack
V1A0420L4	20	13,2	3,4	4000	6	100
V1A0425L4	25	16,6	4,2	4000	6	80
V1A0432L4	32	21,2	5,4	4000	6	40
V1A0440L4	40	26,6	6,7	4000	6	20
V1A0450L4	50	33,2	8,4	4000	6	20
V1A0463L4	63	42	10,5	4000	6	12
V1A0475L4	75	50	12,5	4000	6	8
V1A0490L4	90	60	15	4000	6	8
V1A0411L4	110	73,5	18,3	4000	6	4
V1A0412L4	125	20,8	83,4	4000	6	4
V1A0416L4	160	26,6	106,8	4000	6	4

SaniPlastica PN 20 (SDR 6) Pipes are used for both hot & cold water installations and higher pressure systems.

PN20 (SDR 7.4) Fiberglass Pipe for Hot & Cold Water

Code	de, mm	di, mm	s, mm	L, mm	SDR	m/Pack
V1A0520L4	20	14,4	2,8	4000	7,4	100
V1A0525L4	25	18	3,5	4000	7,4	80
V1A0532L4	32	19,2	4,4	4000	7,4	40
V1A0540L4	40	29	5,5	4000	7,4	20
V1A0550L4	50	36,2	6,9	4000	7,4	20
V1A0563L4	63	45,8	8,6	4000	7,4	12
V1A0575L4	75	54,5	10,3	4000	7,4	8
V1A0590L4	90	65,4	12,3	4000	7,4	8
V1A0511L4	110	79,8	15,1	4000	7,4	4
V1A0512L4	125	90,8	17,1	4000	7,4	4

SaniPlastica Fiberglass PN 20 (SDR 7,4) Pipes are used for both hot & cold water installations and higher pressure systems.

PN25 (SDR 6) Fiberglass Pipe for Hot & Cold Water

Code	de, mm	di, mm	s, mm	L, mm	SDR	m/Pack
V1A0620L4	20	13,2	3,4	4000	6	100
V1A0625L4	25	16,6	4,2	4000	6	80
V1A0632L4	32	21,2	5,4	4000	6	40
V1A0640L4	40	26,6	6,7	4000	6	20
V1A0650L4	50	33,2	8,4	4000	6	20
V1A0663L4	63	42	10,5	4000	6	12
V1A0675L4	75	50	12,5	4000	6	8
V1A0690L4	90	60	15	4000	6	8
V1A0611L4	110	73,5	18,3	4000	6	4
V1A0612L4	125	20,8	83,4	4000	6	4

SaniPlastica Fiberglass PN 25 (SDR 6) Pipes are used for both hot & cold water installations and higher pressure systems.

Socket

Code	Size, mm	SDR	pcs/Pack
V1B012000	20	6	280
V1B012500	25	6	180
V1B013200	32	6	90
V1B014000	40	6	75
V1B015000	50	6	36
V1B016300	63	6	16
V1B017500	75	6	16
V1B019000	90	6	7
V1B011100	110	6	4
V1B011200	125	6	2
V1B011600	160	6	1

SaniPlastica Sockets are used to join two pipes.

Reducer

Code	Size, mm	di, mm	SDR	pcs/Pack
V1B022520	25/20	25	6	250
V1B023220	32/20	32	6	180
V1B023225	32/25	32	6	120
V1B024020	40/20	40	6	100
V1B024025	40/25	40	6	100
V1B024032	40/32	40	6	105
V1B025020	50/20	50	6	60
V1B025025	50/25	50	6	60
V1B025032	50/32	50	6	60
V1B025040	50/40	50	6	60
V1B026320	63/20	63	6	48
V1B026325	63/25	63	6	40
V1B026332	63/32	63	6	40
V1B026340	63/40	63	6	30
V1B026350	63/50	63	6	36
V1B027540	75/40	75	6	16
V1B027550	75/50	75	6	16
V1B027563	75/63	75	6	16
V1B029050	90/50	90	6	12
V1B029063	90/63	90	6	12
V1B029075	90/75	90	6	12
V1B021175	110/75	110	6	6
V1B021190	110/90	110	6	6
V1B021611	160/110	160	6	2

SaniPlastica Reducers are used for joining bigger size pipelines to smaller size pipelines.

90° Elbow

Code	Size, mm	SDR	pcs/Pack
V1B032000	20	6	200
V1B032500	25	6	125
V1B033200	32	6	75
V1B034000	40	6	40
V1B035000	50	6	24
V1B036300	63	6	10
V1B037500	75	6	5
V1B039000	90	6	2
V1B031100	110	6	2
V1B031200	125	6	1
V1B031600	160	6	1

SaniPlastica Elbows are used where the pipeline makes a curve of 90°.

45° Elbow

Code	Size, mm	SDR	pcs/Pack
V1B042000	20	6	200
V1B042500	25	6	120
V1B043200	32	6	75
V1B044000	40	6	48
V1B045000	50	6	25
V1B046300	63	6	12
V1B047500	75	6	5
V1B049000	90	6	3
V1B041100	110	6	2
V1B041200	125	6	1
V1B041600	160	6	1

SaniPlastica Elbows are used where the pipeline makes a curve of 45°.

T Part

Code	Size, mm	SDR	pcs/Pack
V1B052000	20	6	125
V1B052500	25	6	75
V1B053200	32	6	40
V1B054000	40	6	30
V1B055000	50	6	12
V1B056300	63	6	8
V1B057500	75	6	4
V1B059000	90	6	2
V1B051100	110	6	1
V1B051200	125	6	1
V1B051600	160	6	1

SaniPlastica T Parts are used to join branches on the main pipeline.

SaniPlastica PIPING SYSTEMS

Reducing T

Code	Size, mm	SDR	pcs/Pack
V1B062252	20x25x20	6	75
V1B062522	25x20x20	6	75
V1B065202	25x20x25	6	75
V1B065520	25x25x20	6	75
V1B063222	32x20x20	6	45
V1B063225	32x20x25	6	45
V1B063223	32x20x32	6	50
V1B063252	32x25x20	6	60
V1B063253	32x25x32	6	48
V1B064020	40x20x40	6	36
V1B064025	40x25x40	6	36
V1B064032	40x32x40	6	36
V1B065020	50x20x50	6	15
V1B065025	50x25x50	6	15
V1B065032	50x32x50	6	15
V1B065040	50x40x50	6	12
V1B066320	63x20x63	6	8
V1B066325	63x25x63	6	8
V1B066332	63x32x63	6	8
V1B066340	63x40x63	6	8
V1B066350	63x50x63	6	8
V1B067532	75x32x75	6	5
V1B067540	75x40x75	6	5
V1B067550	75x50x75	6	5
V1B067563	75x63x75	6	5
V1B069040	90x40x90	6	4
V1B069050	90x50x90	6	4
V1B069063	90x63x90	6	3
V1B069075	90x75x90	6	3
V1B061150	110x50x110	6	2
V1B061163	110x63x110	6	2
V1B061175	110x75x110	6	2
V1B061190	110x90x110	6	2

SaniPlastica Reducing T parts are used for both joining branches on pipelines and fortransitions to different dimeters like reducer parts.

Cap

Code	Size, mm	SDR	pcs/Pack
V1B082000	20	6	350
V1B082500	25	6	270
V1B083200	32	6	150
V1B084000	40	6	90
V1B085000	50	6	50
V1B086300	63	6	24
V1B087500	75	6	10
V1B089000	90	6	4
V1B081100	110	6	4

SaniPlastica Caps are used as a stopper at the pipeline ends.

Threaded Cap

Code	Size, mm	SDR	pcs/Pack
V1B092000	20	6	300
V1B092500	25	6	300
V1B093200	32	6	200

SaniPlastica Threaded Caps are for sealing the pipe ends during the pressure tests.

Clamp

Code	Size, mm	SDR	pcs/Pack
V1B102000	20	6	400
V1B102500	25	6	300
V1B103200	32	6	200
V1B104000	40	6	100
V1B105000	50	6	50
V1B106300	63	6	25

SaniPlastica Caps are used as a stopper at the pipeline ends.

Pipe Bridge

Code	Size, mm	SDR	pcs/Pack
V1B142000	20	6	50
V1B142500	25	6	40
V1B143200	32	6	25

SaniPlastica Pipe Bridges are used where a pipeline has to pass over the other pipeline.

Pipe Bridge with Socket

Code	Size, mm	SDR	pcs/Pack
V1B132000	20	6	50
V1B132500	25	6	40
V1B133200	32	6	15

SaniPlastica Pipe Bridges are used where a pipeline has to pass over the other pipeline.

PP Union

Code	Size, mm	SDR	pcs/Pack
V1B152000	20	6	50
V1B152500	25	6	40
V1B153200	32	6	20
V1B154000	40	6	15
V1B155000	50	6	10
V1B156300	63	6	5
V1B157500	75	6	2
V1B159000	90	6	1
V1B151100	110	6	1

SaniPlastica PP-R Unions, which are preferred for cold water systems, are composed of 3 parts and there is no need to twist the pipes for joining.

Adaptor Female

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C012020	20	1/2"	6	150
V1C012025	20	3/4"	6	120
V1C012520	25	1/2"	6	120
V1C012525	25	3/4"	6	105
V1C013220	32	1/2"	6	48
V1C013225	32	3/4"	6	48
V1C013232	32	1"	6	48

SaniPlastica Female Adaptors are used as transition parts between SaniPlastica and metal pipelines. These fittings are preferred mostly for permanent joints.

Hex. Adaptor Female

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C024040	40	1 ¼ "	6	25
V1C025050	50	1 ½"	6	16
V1C026363	63	2"	6	12
V1C027575	75	2 ½"	6	6

SaniPlastica Hexagonal Female Adaptors are used as transition parts between SaniPlastica and metal pipelines. These fittings are preferred mostly for permanent joints.

Adaptor Male

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C032020	20	1/2"	6	140
V1C032025	20	3/4"	6	90
V1C032520	25	1/2"	6	120
V1C032525	25	3/4"	6	90
V1C033220	32	1/2"	6	55
V1C033225	32	3/4"	6	55
V1C033232	32	1"	6	55

SaniPlastica Male Adaptors are used as transition parts between SaniPlastica and metal pipelines. These fittings are preferred mostly for permanent joints.

Hex. Adaptor Male

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C044040	40	1 ¼ "	6	20
V1C045050	50	1 ½"	6	16
V1C046363	63	2"	6	12
V1C047575	75	2 ½"	6	8

SaniPlastica Hexagonal Male Adaptors are used as transition parts between SaniPlastica and metal pipelines. These fittings are preferred mostly for permanent joints.

Union Female

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C112000	20	1/2"	6	160
V1C112500	25	3/4"	6	90
V1C113200	32	1"	6	60
V1C114000	40	1 ¼ "	6	30
V1C115000	50	1 ½"	6	16
V1C116300	63	2"	6	10

SaniPlastica Female Unions are used in transition between fixed SaniPlastica and metal pipelines. These fittings are preferred mainly for the installations in which temporarily renovation of the intermediate parts (valves, batteries, etc.) is required.

Union Male

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C122000	20	1/2"	6	120
V1C122500	25	3/4"	6	80
V1C123200	32	1"	6	48
V1C124000	40	1 ¼ "	6	24
V1C125000	50	1 ½"	6	12
V1C126300	63	2"	6	10

SaniPlastica Male Unions are used in transition between fixed SaniPlastica and metal pipelines. These fittings are preferred mainly for the installations in which temporarily renovation of the intermediate parts (valves, batteries, etc.) is required.

T Part Female

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C092020	20	1/2"	6	90
V1C092025	20	3/4"	6	60
V1C092520	25	1/2"	6	60
V1C092525	25	3/4"	6	50
V1C093220	32	1/2"	6	32
V1C093225	32	3/4"	6	32
V1C093232	32	1"	6	24

SaniPlastica Female T parts are used in joints between SaniPlastica pipelines and metal threaded parts.

T Part Male

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C102020	20	1/2"	6	75
V1C102025	20	3/4"	6	60
V1C102520	25	1/2"	6	60
V1C102525	25	3/4"	6	48
V1C103220	32	1/2"	6	32
V1C103225	32	3/4"	6	24
V1C103232	32	1"	6	24

SaniPlastica Male T parts are used in joints between SaniPlastica pipelines and metal threaded parts.

Elbow Female

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C052020	20	1/2"	6	120
V1C052025	20	3/4"	6	90
V1C052520	25	1/2"	6	60
V1C052525	25	3/4"	6	40
V1C053220	32	1/2"	6	30
V1C053225	32	3/4"	6	30
V1C053232	32	1"	6	24

SaniPlastica Female Elbows are used in transition between SaniPlastica pipeline and metal threaded parts (battery, tap, etc.)

Elbow Male

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C062020	20	1/2"	6	105
V1C062025	20	3/4"	6	80
V1C062520	25	1/2"	6	80
V1C062525	25	3/4"	6	60
V1C063220	32	1/2"	6	24
V1C063225	32	3/4"	6	24
V1C063232	32	1"	6	24

SaniPlastica Male Elbows are used in transition between SaniPlastica pipeline and metal threaded parts (battery, tap, etc.)

Wall Conn. Elbow Female

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C062020	20	1/2"	6	105
V1C062025	20	3/4"	6	80

Wall Connection Elbows with their additional back parts are used to fasten the pipelines to the wall.

Ball Valve

Code	Size, mm	SDR	pcs/Pack
V1D022000	20	6	40
V1D022500	25	6	32
V1D023200	32	6	18
V1D024000	40	6	6
V1D025000	50	6	4
V1D026300	63	6	2

SaniPlastica Ball Valves are preferred for a more practical usage with their handles to regulate the water flow.

Globe Valve

Code	Size, mm	SDR	pcs/Pack
V1D012000	20	6	24
V1D012500	25	6	25
V1D013200	32	6	16

Valves are used as turn on/off and flow regulating units in pipelines.

Chromium Valve

Code	Size, mm	SDR	pcs/Pack
V1D042000	20	6	30
V1D042500	25	6	30
V1D043200	32	6	20

Chromium Valves are stop valves that are preferred mostly for installations where aesthetic is important.

Chromium Valve Long

Code	Size, mm	SDR	pcs/Pack
V1D052000	20	6	20
V1D052500	25	6	20
V1D053200	32	6	16

Chromium Valves are stop valves that are preferred mostly for installations where aesthetic is important.

SaniPlastica
PIPING SYSTEMS

Adjustable Under Plaster Elbow

Code	d1, mm	d2, inch	SDR	pcs/Pack
V1C132020	20	1/2"	6	10
V1C132525	25	1/2"	6	10

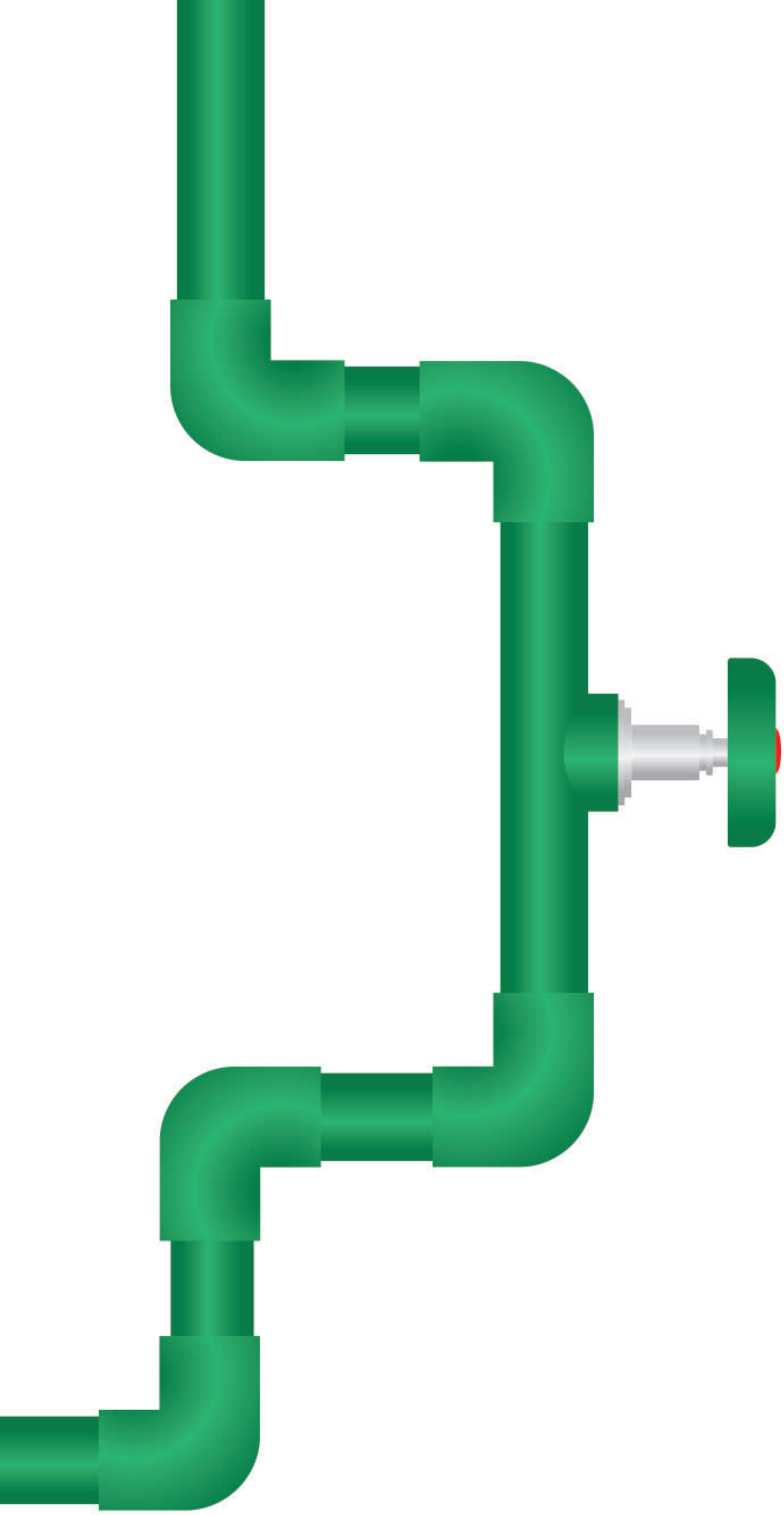
Code	Size, mm	pcs/Pack
01E022000	20	1
01E022500	25	1
01E023200	32	1
01E024000	40	1
01E025000	50	1
01E026300	63	1
01E027500	75	1
01E029000	90	1
01E021100	110	1
01E021200	125	1
01E021600	160	1

WELDING MACHINE SET 1500W (20 - 40 mm)

Installed Capacity	750+750=1500 Watt (Double Resistance)
Supply Voltage	220-240V ~
Frequency	50-60 Hz.
Operating Temperature	270 ° C
Cable	3X1 mm²,210cm Black Cable
Thermostat Regulation Indicator	50-320 ° C
Resistor Material	Stainless Steal
Main Supply Cross Section	3 x 2,5 mm² Feeding Cable
Protection Class	IP 44
Main Fuse Value	16 A (on electrical installation)
Other Remarks	a- Three wedling sockets can be simultaneously installed on a unit
	b-The ON-OFF switch is without a light indicator and has been manufactured with aluminium foot.
	c- The welding machine set includes heads of 20,25,32,40 mm, plastic pipe shears of 16-42 mm and other apparatuses you might need for PPRC welding.
Weight	5,8 Kg (Net) -6,0 Kg (Gross)

WELDING MACHINE SET 2400W (up to 200 mm)

Installed Capacity	1200+1200=2400 Watt (Double resistance)
Supply Voltage	220-240V ~
Frequency	50-60 Hz.
Operating Temperature	270 ° C
Cable	3X1 mm²,210cm Black Cable
Thermostat Regulation Indicator	50-320 ° C
Resistor Material	Stainless Steal
Main Supply Cross Section	3 x 2.5 mm² Supply Cable
Protection Class	IP 44
Main Fuse Value	16 A (on the power connection line)
Other Remarks	a- One pcs large-size head can be installed on the iron
	b-The ON-OFF switch has been equipped with a light indicator for easier operation.
	c- A special aluminum floor foot with a clamp has been installed providing the ability to operate everywhere.
Weight	3,05 Kg (Net) -3,35 Kg (Gross)
Weight	5,8 Kg (Net) -6,0 Kg (Gross)



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