

PPR HOT & COLD WATER PIPING SYSTEM



FUSION WELDING PROCESS

VODA PPR pipes and fittings are jointed using heating process called fusion welding. The process is very simple and results in inseparable water tight joints. It is carried out using a electric fusion welding machines that simultaneously heat the internal surface of the fitting and the external surface of the pipe which are then joined together to form inseparable water tight joints. The following sections demonstrate the basic procedure for fusion welding process for plain and composite PPR pipes.

Pipe Dia (mm)	Welding Depth (mm)	Heating time (secs)	Processing time (secs)	Cooling time (mins)
20	14	5	4	2
25	15	7	4	2
32	16.5	8	6	4
40	18	12	6	4
50	20	18	6	4
63	24	24	8	6
75	26	30	10	8
90	29	40	10	8
110	32.5	50	10	8

PPR PIPE FITTING INSTALLATION MANUAL

- Mark the pipe for depth of penetration into the heater bush and fitting (see table). The mark must remain visible under heating and joining.
- Push the pipe and the fitting into the heating tools. Once pipe and fitting are hot (after the correct time), pull out pipe and fitting very slowly.
- Joint the pipe & the fitting and push the pipe until it reaches the mark (that has to stay out side). During the jointing time the welded part of pipe and fitting must remain fix, without any rotation.
- Fusion inspection. The outer fusion seam must be inspected. The seam must be present all around the pipe.
- Required operation temperature of the welding machine is 250-C to 270-C

VODA (PN20) CLAMP SPACES

Ø pipe mm	maximum distances in cm of supports of VODA PPR (PN20) pipe (horizontal pipeline) at temperature of					
	20C	30C	40C	50C	60C	80C
20	95	90	85	85	80	70
25	100	100	100	95	90	85
32	120	115	115	110	100	90
40	130	130	125	120	115	100
50	150	150	140	130	125	110
63	170	160	155	150	145	125
75	185	180	175	160	155	140
90	200	200	185	180	175	150
110	220	215	210	195	190	165



1. The VODA PPR Piping system is made of plastic and needs to be treated carefully to prevent shocks and impact on the pipe during transportation, storage and installation.



2. Protect the pipes, fittings and components from lengthy exposure to direct UV radiation from the sun. The usual time required for storage and installation will have no effect on the material as it is stabilised against UV rays but the material is not resistant to long term UV exposure.



3. The following precautions can be made to ensure that the maximum operating temperature is not exceeded:
 • Monitor and regulate solar energy storage.
 • Check the electric connections to the hot water storage before the system is operated.
 • We recommend installing in the hot water piping a mixer valve which is regulated by the boiler.



Drinking water

- ó PPR hot & cold water piping system
- ó Pressure ratings: PN20
- ó Resistant to corrosion



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PPR HOT & COLD WATER PIPING SYSTEM



PPR PIPE SYSTEM

VODA PPR Piping System, with its numerous advantages, is ideal for hot and cold water installation. The excellent quality of the piping system, based on a polypropylene copolymer (PP-R), guarantees corrosion resistance against all ions in the water as well as building materials- inside and outside.

High impact resistance even at temperatures below freezing, the secure connection technology without added material ensures that after connection, the pipe and fitting form a permanently sealed unit made of one single continuous material. PPR pipes are designed as the most hygienic system for the transportation of portable water.

VODA Pipes is exclusive licensee of a well known European company "Ke Keli[®]" which is rewarded as a leader in innovation and quality.

VODA PPR MATERIAL

VODA PPR Piping System is manufactured from Polypropylene Random (PPR). PPR is a 100% certified food-grade material. Its resistance to high temperature has made PPR a popular piping system recommended for domestic and industrial usage. The physical and chemical properties of PPR make it a superior and safe piping system for supply of potable water and other fluids. VODA Pipes and fittings are supplied in grey in colour.

AVAILABLE RANGE

VODA Pipes and fittings are available in the following outside diameters.

Nominal outside diameter in mm

20mm
25mm
32mm
40mm
50mm
63mm
75mm
90mm
110mm

STANDARD AND SPECIFICATIONS

VODA PPR Piping System conforms to the following international standards:

Pipes DIN 8077-8078 PN 20

Fittings* TS EN-ISO 15874-3 PN 25

*VODA fittings carry on mark " KELEN - KE KELIT" (on Fittings).

SERVICE LIFE AND TEMPERATURE

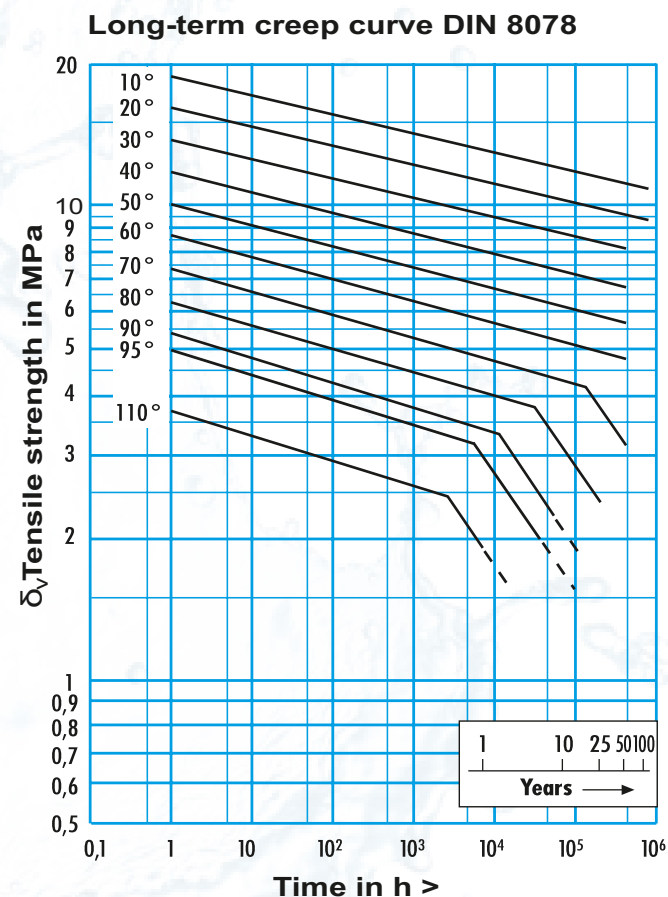
Operating pressure in relation to service life and temperature

Operating conditions as specified:

Cold water 20° – 20 bar

Hot water 70° – 8 bar

Temperature (° C)	Pressure (bar)	Service life (years)
20	20	50
40	15	50
60	10	50
70	8	50
80	6	25



PPR HOT & COLD WATER PIPING SYSTEM



PIPE SYSTEM FOR ALL APPLICATIONS

- Hot and cold potable water piping network in residential and commercial buildings. i.e hospital, hotels, offices, school apartments building etc.
- Chilled water networks in air conditioning systems, as an effective light weight and corrosion free substitute for steel pipes.
- Irrigation systems for gardens.
- Piping networks for rainwater utilization systems.
- Compressed air installations.
- Piping networks for swimming pools, fountains system.

FEATURES AND BENEFITS OF PPR PIPES

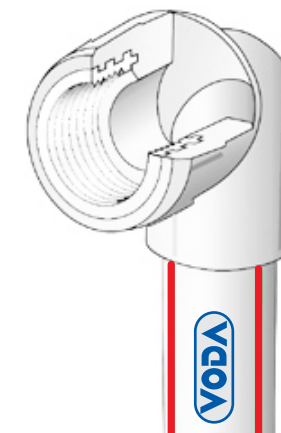
- Long Life, Leak proof, Safe and reliable.
- Resistance to abrasion and corrosion and frost.
- Low electrical and heat conductivity.
- Noise free, reduced head losses.
- Ease of installation significantly.
- Food grade.
- Light weight, minimum load on building.
- Less in friction, smooth surface.
- Preserving the purity of water.
- Resistance against chemicals.
- Non-toxic and physiologically harmless material.
- High impact strength.
- Cost affective pipe line network.
- Fitness for use in seismic areas.

JOINTING TECHNOLOGY

- Polyfusion welding (socket welding) using material-identical PP-R fittings with moulded welding sleeves d20-110 mm.

Metal adaptor fittings

Special care has been taken over the choice and quality control of the metal threads.



Special quality criteria

- Brass (MS 58, CW 617N) for all parts transporting water ensures high resistance against aggressive water.
- A pore-free, chemically applied metal plating prevents stress corrosion cracking.
- Metal parts which are not in contact with the media are generally made of metal-plated MS 58 brass.
- Exceptional resistance to torsion force and suitable for on-site conditions
- Depth of the thread conforms to EN 10226-1 for normal faucets



PPR METAL FITTING SPECIAL QUALITY CRITERIA

uPVC SUPPORT DISTANCES & EXPANSION

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SUPPORT DISTANCES		
	Maximum Support Distance	
	Vertical	Horizontal
Pipe size - soil, waste & vent		
50-56 mm	2 m	1 m
75-82 mm	2 m	1 m
110 mm	2 m	1 m
160 mm	2 m	1.2 m

$$\Delta L = \alpha \times L \times \Delta T$$

Where:

ΔL = expansion (mm)

α = co-efficient of linear expansion (mm/m/°C) = 0.08

L = length of the pipe (m)

ΔT = temperature difference (°C)

VODA INFRASTRUCTURE



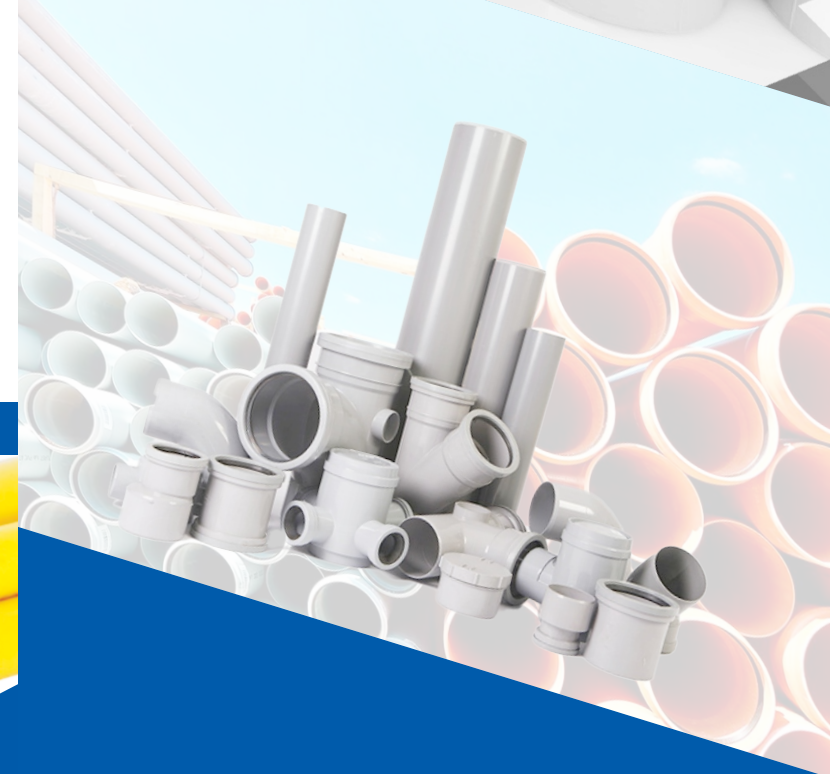
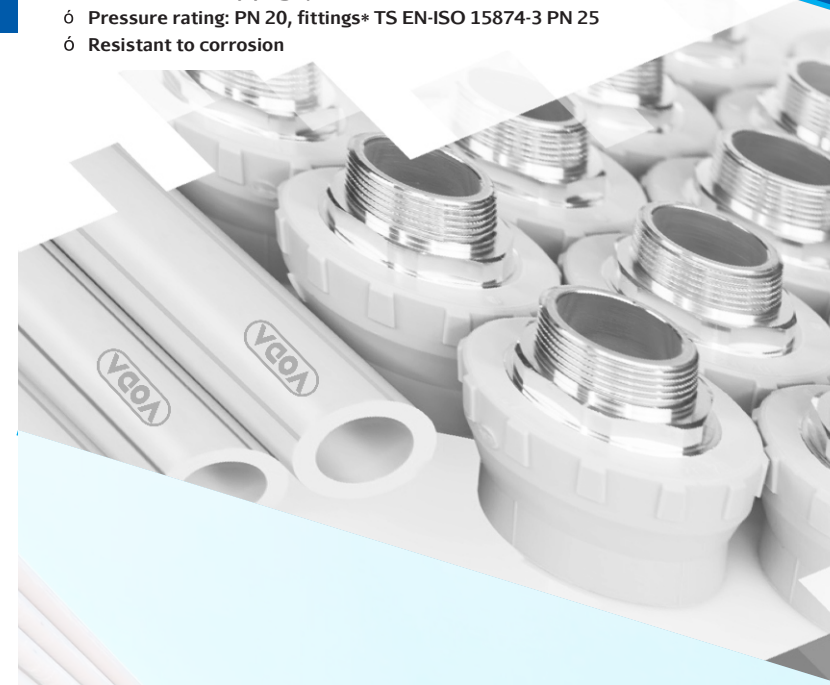
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VODA PPR hot & cold water piping system

- Hot & cold water piping system
- Pressure rating: PN 20, fittings* TS EN-ISO 15874-3 PN 25
- Resistant to corrosion



PPR hot & Cold water piping system

TetraFlow®
Quality is Our Profession

Soil waste and vent system



INTRODUCTION

PPR PIPE SYSTEM

The VODA Pipes (KELEN) Austria system, with its numerous advantages, is ideal for hot and cold water installation. The excellent quality of the piping system, based on a polypropylene copolymer (PP-R), guarantees corrosion resistance against all ions in the water as well as building materials inside and outside

High impact resistance even at temperatures below freezing, the secure connection technology without added material ensures that after connection, the pipe and fitting form a permanently sealed unit made of one single continuous material, PPR pipes are designed as the most hygienic system for the transportation of portable water.

Optionally, the system is also available pre-insulated - this enables fast, standard-compliant and cost saving concealed installation,

Field of application: Pn20 = 20 C/20 bar, 70°C/8 bar Pn 16 = 20 C/16 bar, 60 C/8 bar Pn10 -20 C/10 bar
Dimension range: KE00 PN20: d20, 25 32, 40, 50, 63, 75, 90, 110, And 160

Colour: Grey with 3 coloured longitudinal stripes which accord to the pressure level

Special parts: KE06 KELIT ALU composite pipe PN20

SYSTEM DESCRIPTION

Drinking water, sanitary and utility water piping for hot and cold water Pipe system for hot and cold water and drinking water, made of PP random copolymer (PP-R type 3) The pipes are tested and approved both internally and by external institutes. Approved for drinking water Smooth internal surface. Low heat conductivity. Long service life and high resistance to impact down to a temperature of -5 C

STANDARD AND SPECIFICATIONS

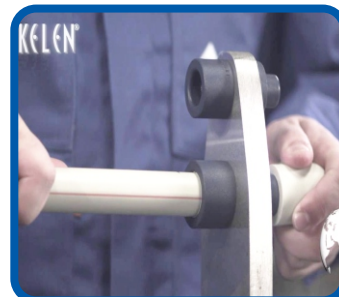
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Pipes DIN 8077-8078 PN 20
Fittings* TS EN-ISO 15874-3 PN 25

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SERVICE LIFE AND TEMPERATURE

Operating pressure in relation to service life and temperature
Operating conditions as specified:
Cold water 20 20 bar
Hot water 70 8 bar



CONNECTION TECHNOLOGY

Polyfusion welding (socket welding) using material-identical PP-R fittings with moulded welding sleeves d20-110 mm
Material-identical LX-insulated PP-R fittings with 4, 9 and 13 mm insulation 020-32 mm
Butt welding using material-identical POB fittings in d160 mm
Metal transitions with internal or external thread made of stress free annealed, dezincification-resistant brass, pore-free and metallised d20-75 mm
Electric welding process by means of push-on electric welding socket d20-160 mm

PIPE SYSTEMS FOR ALL APPLICATIONS

Whether its drinking water, heating water or wastewater that is to be transported, and whether active surfaces, district heating or something completely different is desired - offers the optimum pipe system for all areas of application. For over 70 years, innovative, flexible and durable systems have been developed, produced and distributed here that represent the highest quality worldwide. Whether for sanitary or heating systems, for industry or for pressurized and cooling water, with manifold pipe systems you always make the right choice.

FEATURES AND BENEFITS OF PPR PIPES

Long Life, Leak proof. Safe and reliable
Resistance to abrasion and corrosion and frost.
Low electrical and heat conductivity.
Noise free, reduced head losses
Ease of installation significantly
Food grade
Light weight, minimum load on building
Less in friction, smooth surface
Leak proof
Preserving the purity of water
Resistance against chemicals

PPR PIPE FITTING INSTALLATION MANUAL

Mark the pipe for depth of penetration into the heater bush and fitting (see table). The mark must remain visible under heating and joining.

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Required operation temperature of the welding machine is 250-C to 270-C

INTRODUCTION

UPVC PIPE SOIL WASTE AND VENT SYSTEM

VODA Pipes manufactures and markets integrated piping systems to the civil, building, DIY and construction sectors
TetraFlow is the Voda Pipes brand of unplasticised Polyvinyl Chloride (U. PVC), Perfect soil, waste and vent system geared to offer complete solutions to a cross section of customers. Building pipe system is designed to carry the solids present in both foul and surface water effluents with minimum risk of blockage

VODA Pipes soil, waste and underground systems provide an efficient means for drainage of waste water and foul discharge in both single and multi-story residential and commercial buildings.

These products are engineered for use in a variety of applications from waste to sewer and drainage systems.

STANDARD AND SPECIFICATION

UPVC Soil, WASTE Vent Above Ground Discharge System

TetraFlow is the VODA PIPES brand of unplasticised Polyvinyl Chloride (U-PVC)

Fittings having mark with Tetra Flow" AND pipes having mark with VODA SWV Pipe BS EN 1329.BS 4514

Voda Pipes conform to BS EN 1329, 4514

Solvent Welding and Rubber Ring (Push Fit) Type: with sizes from 56mm up to 200mm

Normal Size (mm)	W.T. (mm)	O.D. (mm)		Wall Thickness (mm)	
		min	max	min	max
50mm -56 mm	3.00	55.80	56.05	3.00	3.50
75mm -82mm	3.00	82.00	82.30	3.00	3.50
110 mm	3.20	110.00	110.30	3.20	3.80
160 mm	3.20	160.00	160.40	3.20	3.80
200 mm	4.90	200.00	200.50	4.90	5.60

U-PVC PHYSICAL PROPERTIES

Specific Gravity: 142
Inflammability, does not support combustion
Specific heat: 1.00kJ/kg/OC
Thermal conductivity: 0.180 m2/s/OCm
Impact Strength complies with relevant standard
Tensile Strength in excess of 45MN m2 at 20 C
Characteristics of uPVC Material used: Modulus of Elasticity = E (Min) 2400NM
Average Density=1.4g/cm
Average Coefficient of Linear Thermal Expansion=0.08 mm C



PROPERTIES OF VODA PIPES PIPE

Corrosion Resistance and Chemical Resistance
Light in weight Easy and Quick to Install
Excellent Hydraulic Characteristics
Long Service Life
Flexible and resistance to breakage
Resistance to biological growth
Effect of Frost
Thermal Expansion
Abrasion/Wear Resistance
Coefficient of Friction
Flame Resistance

JOINTING TECHNIQUES

Cut the Pipes at Right angle using appropriate cutter or saw.
Chamfer the pipe and remove the burrs.
Clean the pipe and fittings with dry cloth and apply the cleaning fluid to the outside surface of the pipe and inside surface of the fittings
Apply thin layer of solvent cement to the mating surfaces using suitable brush While the solvent cement is still wet, insert the pipe inside the fitting until it reaches the socket end. It is recommended to twist the pipe a turn while inserting it inside the fittings for better distribution of the cement, wipe the excess and leave the joint to dry.

