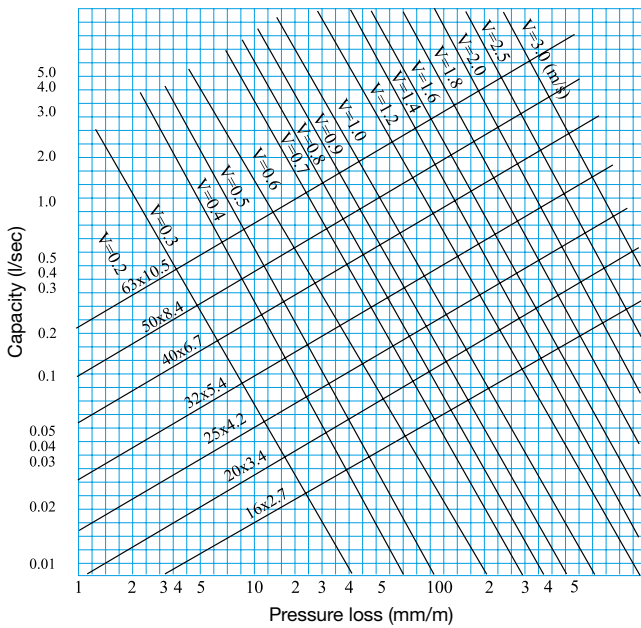


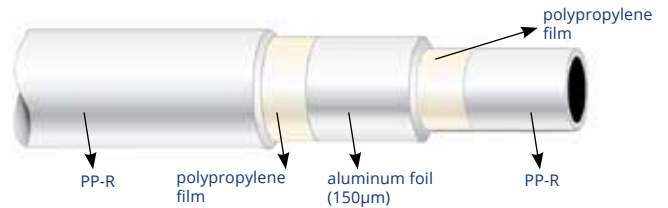
SILVERLINE

Pressure loss in PP-R pipes



PP-R pipes with aluminum foil coverage

- The aluminum foil improves the pipes resistance, even at higher temperatures.
- The linear expansion of the pipes with aluminum foil coverage Pipelife's PP-R system is 3 times lower than the extension of the conventional PP-R pipes.
- The imperforated aluminum foil serves as an oxygen barrier.
- Better resistance. The pipes with aluminum foil Pipelife's PP-R systems withstand pressure of up to 25 bars.



Fittings' hydraulic resistance

$$H = 5 \sum V^2 \sum k$$

H - pressure loss

V - velocity

k - effect loss

Fitting Type		Loss Effect
Socket		0,25
Adapter		0,25 0,25
Elbow 90°		2,0
Elbow 45°		0,6
T-piece / Reducing T-piece		1,8 3,6
T-piece / Reducing T-piece		1,3 2,6
T-piece / Reducing T-piece		4,2 9,0
T-piece / Reducing T-piece		2,2 5,0
Reducing T-piece with brass thread		0,8
Elbow with brass thread		2,2
Adapter with brass thread		0,4

Glass-fiber composite PP-R pipes

The same properties which the polypropylene pipes with aluminum foil have can be achieved with the latest technology for glass-fiber composite pipes where the aluminum foil is replaced by an outer layer of glass-fiber. An important advantage is that glass-fiber composite pipes do not have to be "peeled" with a sharpener before welding.



Note: Product images may differ from the actual products.



GB - PPR pipe PN16



GT - Three way branch



GB - Terminal wall piece MZD



GDG - DG - coupling MZV pin



GB - PPR pipe PN20



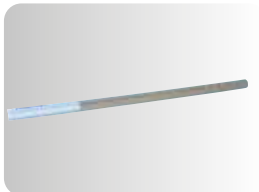
GKD - Elbow 90° pin



GD - BJ Elbow with PM



GN - BJ Coupling with PM



GBF - PPR pipe with aluminum layer PN25



GKD - Elbow 45° pin



GD - BJ Elbow with PM



GR - Direct coupling



GK - Shifter



GB - Wall piece



GR - Reducer



GN - Transition union Female



ΩDilatation loop



GDK - Wall piece pin



GN - DG - coupling MZD



GN - Transition union Male



GD - Elbow 45°



GD - Elbow 90° MZD



GN - DG - coupling MZV



GT - T-piece



GD - Elbow 90°



GD - Elbow 90° MZV



GDG - DG - coupling MZD pin



GT - Reducing T-piece

Note: Product images may differ from the actual products.



GT - T-piece MZD



GKB - Plug/End cap



GKV - Ball valve



GGV - Under plaster ball valve with chrom cover



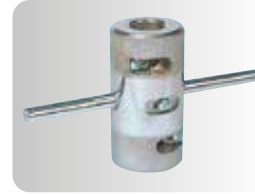
GT - T-piece MZV



GK - Plug with thread



GKV - Ball valve with outlet Left



GKT - Sharpener



GT - T-piece with PM



GK - Plug for template with seal



GKV - Ball valve with outlet Right



GC - Welding machine Set



GT - T-piece BJ with PM



GK - Plug for Wall set



GKVP - Ball valve with bow tie - dismantlable



GI - Cross



GKB - Wall set



GV - Direct valve



GM - Pipe coupling/Socket



GK - Clip/Bracket



GV - Under plaster valve with chromium cover



GM-G - Pipe coupling with reducer



GKD - Double clip/Bracket



GVR /GVL- Direct valve with outlet Left/Right

Note: Product images may differ from the actual products.

Introduction

Nowadays polypropylene is one of the most spread and used materials throughout the world. Pipelife's PP-R installation systems for hot and cold household water are designed for in-

house assembly and are manufactured from Random PP-R. Typical features of these systems are the resistance to temperature, corrosion and roving electricity, low heat conductivity and

very quiet work mode of the installation. Due to the used technology and the raw materials of highest grade, the system is hygienic and guarantees safety during exploitation.

Technical properties

Material	- PP-R Polypropylene
Colour	- Light grey
Manufactured diameters	- DN/OD 20, 25, 32, 40, 50, 63, 75, 90, 110
Pressure	- 16 PN (SDR 7.4) internal water-conduit for cold water - 20 PN (SDR 6) internal water-conduit for hot water
Pipe's length	- 3 m for Ø20, Ø25, Ø32 and Ø40 - 4 m for Ø50, Ø63, Ø75, Ø90 и Ø110 - 4 m for pipes with aluminum foil or glass-fiber layer
Connection method	- Polyfusion welding
According to standard	- EN 15874
Types of fittings	- Fittings manufactured entirely from polypropylene - Fittings manufactured from polypropylene with built in metal CrNi bush – threaded connections

Temperature expansion

The temperature expansion of the polypropylene pipes can be calculated according to the following formula or reported on the following diagram:

$\Delta L = c * L * \Delta T$ where:

ΔL – calculated expansion in mm;

c – coefficient of linear expansion:

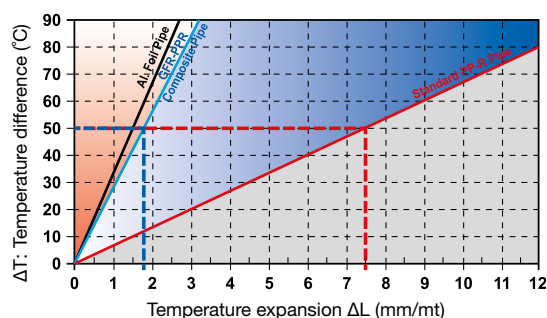
$c = 0,15$ for standard polypropylene pipes

$c = 0,035$ for glass-fiber composite polypropylene pipes

$c = 0,03$ for polypropylene pipes with aluminum foil

L – pipe's length in meters;

ΔT – temperature difference during installation and exploitation in °C



How to weld the pipes by polyfusion welding?

Reliability of the installed pipes depends on connections of the pipes and the fittings as well as on the material used for their manufacturing. For the water-conduit and heating systems the PP-R pipes and fittings are manufactured from the same material and the result is homogeneous connections.

The basic feature of the PP-R products is the opportunity to be made molecular connection by polyfusion welding. This process is achieved by the usage of heating elements and it turns out to be one of the most practical and efficient methods which is widely spread and applied in Europe.

By using the polyfusion method of welding, the welding is as strong as the pipe. During extension tests of the connections, the pipe can break before the welded connections.

Rules for polyfusion welding

1. Cut the pipeperpendicularlyand smooth the sharp edges of the profile if any.
2. Wipe the pipe and the socket of the fittings with a dry cloth in order to clean any dirt.
3. Switch on the welding machine and check if the tips for welding have achieved the necessary temperature of 260°C (±5). When this temperature has been reached, the indicator light of the thermorelay goes out.
4. Put the end of the pipe and the fitting if the welding tips, until the fittings are slid to the end. During this operation, it is necessary to hold tight the pipe and the fittings and not to allow them to move.
5. The surface of the elements which will be welded must be heated in accordance with the time intervals, given in the table below.
8. The welded connection must not be put under any mechanical pressure before the time for cooling has finished.
9. It is necessary, after every welding, to clean the welding tips thoroughly.

MANIPULATION TIME AND DATA				
Ø	Pipe Placement	Heating Time	Assem- bly Time	Cooling Time
mm		sec.	sec.	min.
20	14,0	5	4	2
25	15,0	7	4	2
32	16,5	8	6	4
40	18,0	12	6	4
50	20,0	18	6	4
63	24,0	24	8	6
75	26,0	30	8	6

Installation work parameters are in accordance with BSS EN 15874-1

Installation Type	Pipe TypePN (bars)	Work Pressure (bars)	Class Of Application	Design Temperature (°C)	Acceptable Failure Temperature	Acceptable Time Of Work During Failure (h)
Cold household water	10, 16, 20	10	-	Up to 20	-	-
Hot household water	16, 20	10	1	Up to 60	95	95
Floor heating and low-temperature radiators	16, 20	64		60	100	100
High-temperature radiators	20	65		80	100	100

Recommendations for PP-R pipes use

- Though the material of the PP-R pipes is resistant to high temperatures and to UV rays, do not expose the pipes and the fittings to direct sunlight for a long period of time
- The pipes and the fittings must be protected from hard and sharp objects, and must be transported carefully and to be stored clean.
- Do not use damaged and cracked pipes.
- Use special cutters (provided by Pipelife) to cut the pipes.
- First clean the dirty pipes and fittings with a clean cloth and then start welding the pipes.
- Do not use fittings with cone thread, but fittings and valves with a cylindrical thread.
- Do not tighten the fittings and valves too much.
- The pipes and fittings which are stored at low temperatures must be heated before welding.
- Use Teflon tape instead of hemp fibers for the thread connection. Do not use too much tape for making the connections tight.

Advantages

- Ecological
- Easy and reliable assembly
- Full range of products
- An opportunity for inspection of the connections
- No sediments and corrosion
- High resistance to chemicals
- Electrical isolation
- High protection against cracking when under pressure
- Extremely smooth internal surface
- Guaranteed high velocity of the water stream
- Easy connecting with already existing heterogeneous installations
- Soundproofing
- Nontoxic
- Guaranteed long period of exploitation

Recommendation for disinfection of PP-R systems

Thermal disinfection of the system

In the case of thermal disinfection to prevent legionella bacteria, we recommend disinfecting with a duration of min. 3 minutes and water at 70°C throughout the system.

Chemical disinfection of the system

Disinfection of the system must be applied only in case of proven

contamination. In the case of impact disinfection, it is permitted to load plastic pipes twice a year with a free chlorine content of 50 mg/l for a period not exceeding 12 hours. Alternatively, 150 mg/l hydrogen peroxide (H₂O₂) can be used for 24 hours. The temperature must not exceed 30°C during the disinfection process.

The use of a disinfection process, especially for chlorinated water, can have a direct impact on the life of the drinking water system.

Exceeding the specified temperature, concentration and exposure time values can lead to serious damage to pipes and connecting parts.

Diameters

		Outer Diameter (mm)									
		20	25	32	40	50	63	75	90	110	125
Wall Thickness (mm)	PN16	2,8	3,5	4,4	5,5	6,9	8,6	10,3	12,3	15,1	17,1
	PN20	3,4	4,2	5,4	6,7	8,3	10,5	12,5	15,0	18,3	20,8

Note: Product images may differ from the actual products.