

## 2.1 Plumbing system

### COMBINATION OF POLYPROPYLENE AND CROSS-LINKED POLYETHYLENE PIPES

With this method of installation the polypropylene is used for the central supply up to the manifold after which the water is distributed via regulating manifolds to different discharge points through cross-linked polyethylene pipes.

#### Advantages of the system

- Distribution through separate lines reduces pressure differences and improves flow.
- Increased protection against damage. The outer conduit gives early warning in the event of damage to the pipe.
- Easy replacement of damaged pipes. The old pipe is removed and a new pipe is inserted with the aid of a special pipe extractor.  
(The only system offering this possibility)
- Isolation of circuits in the event of damage in the mixers/taps.
- Low friction, constant inner diameter over lifetime of product.

Certifications: SKZ Germany, WRAS Great Britain, AENOR Spain

Tests: ELOT, General Chemical State Laboratory

Guarantee: 30 years for the pipes and 10 years for the metal fittings as regards watertightness of connections, covered by the insurance company ALLIANZ, to a sum of up to € 3,000,000.

#### Characteristics of Como-pex pipes

Como-pex pipes are clean and toxic-free, they present an exceptional resistance to corrosion, they have a low friction factor and a high mechanical strength. These are some of the reasons why cross-linked polyethylene pipes are the number one choice in plumbing installations all over the world. Como-pex pipes are manufactured in dimensions ranging from 12 mm to 32 mm, in white and black. For the technician's convenience, Interplast produces Como-pex pipe already passed through the corrugated sheath (pipe in pipe).

Table of Service life for Como-pex pipes with safety coefficient 1.5

Temperature (° C)	Lifespan (Years)	Pressure (bar)	Safety coefficient
20	50	19,5	1,5
60	50	10	1,5
80	50	9.6	1,5
95	50	8,2	1,5

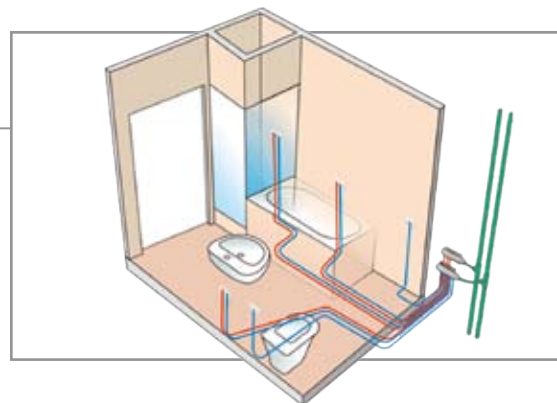
#### Connection Fittings

Interplast is one of the few companies in Europe with vertically integrated production and the only company in Greece that manufactures all the components of the system while offering a guarantee on the entire heating-plumbing installation.

The company's subsidiary ELVIOM S.A. manufactures brass fittings for the Como-pex system. ELVIOM, which has 33 years experience in brass fittings manufacture, produces brass fittings from materials compliant with European standards 12164, 12165, 12167 and 12168.

#### Bass bar manifolds

Manufactured in 3/4", 1" and 1 1/4" with 1/2" water connections. This is a product with low hardness, in order to prevent cracking.





### Regulating Manifolds

Manufactured in 3/4" and 1" dimensions, with 2, 3 and 4 outlets. Available with male threading 24 x 19.

#### Advantages

- Isolation of circuits in the event of damage.
- Prevents pressure surge upon closing the water connection, when this is required.
- Red and blue markings and circuit identification markings (wash-basin, cistern, bathroom etc.) to assist the homeowner.



### Plastic pipe adaptor

This connects the pipes with the male threading of the manifold and comprises three components:

- Conic tail, which fits into the inner surface of the pipe.
- It is made watertight by an elastic EPDM ring and metal at the base of the valve.
- Taper ring, which has two cones for providing a watertight connection between the brass insert and the plastic pipe.
- Nut.



### 105° wall plate elbow

A 105° wall plate elbow, which facilitates intervention by the installer in the event of leakage. By use of the reducing sleeve, which fits to the water connections of the wall plate elbow, the corrugated pipe enwraps a section of the angle, so that in the event of leakage the water will flow to the distribution panel.



### Segmented wall plate elbow

A segmented wall plate elbow with secure and watertight closing. By use of the multi-position metal bracket it can be used in both plumbing and heating systems.

Characterized by its ideal curve, which aids the plumber in fitting the plastic pipe to the brass inserts of the wall plate elbow, more easily.



### Brass connections for PEX pipes

Our company manufactures a full range of connection fittings for cross-linked polyethylene pipes.

The following products are available:

- Male, female and connecting coupling
- Male, female and connecting tee
- Male, female and connecting elbow
- Support elbow
- Mini-ball valves for plastic pipe.

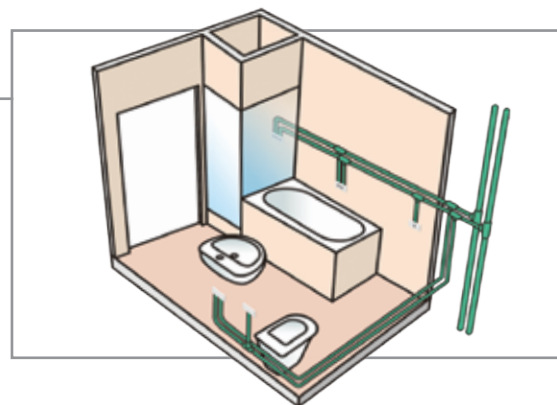
## 2.2 Plumbing system

### POLYPROPYLENE RANDOM (PP-R) PIPES & FITTINGS

By this method of installation different discharge points can supply water from the same piping branch. It shares the same philosophy as the traditional method of installation for metal pipes. The pipes and fittings are connected together by thermal fusion welding using special machines.

#### Advantages of the System

- Pipes and fittings display high resistance to hydraulic shock (at pressures greater than 130 bar at ambient temperature).
- Lifespan of more than 50 years for temperatures of 20-80° C and operating pressure 6-26 bar. Temperature peaks of 110° C at operating pressure of 4 bar do not affect the Aqua-plus system.
- Exceptional resistance to corrosion, even in areas with very hard water.
- Low thermal conductivity makes it possible to reduce heat loss in the hot water networks.



Certifications: SKZ Germany, DVGW Germany, WRAS Great Britain, AENOR Spain

Tests: ELOT, General Chemical State Laboratory.

Guarantee: 10 years covered by ALLIANZ insurance company, to a sum of up to € 3,000,000.



#### Characteristics of Aqua-plus pipes

The structure of the material and the smooth texture of the surface ensure low friction losses resulting in low resistance and low pressure drop in the piping. The material used presents a greatly reduced noise factor and restricted transmission of noise through the pipes. Thus plastic pipes of smaller diameter can be used for the same quantity of water. Aqua-plus pipes are manufactured in dimensions ranging from 20 mm to 110 mm, in green color, in straight 4 metre sections.



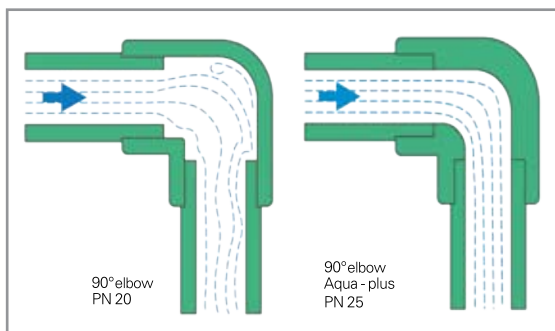
Table of Service life for Aqua-plus pipes with safety coefficient 1.5

Temperature (° C)	Lifespan (Years)	Pressure (bar)	Safety coefficient
20	50	25,9	1,5
40	50	18,4	1,5
60	50	12,9	1,5
80	50	6,4	1,5

#### Characteristics of Aqua-plus fittings

- Manufactured in accordance with DIN 16962 from Polypropylene Random (Type 3) and are available in dimensions of 20 mm to 110 mm. For the manufacture of the fittings the company uses raw material with a low melt flow index, identical to that of its pipes so that the mechanical strength of the pipe does not differ from that of the fittings.
- Produced with a wall thickness equivalent to 25 bar since the resistances created in the fittings are much greater in relation to those of the pipes.





- The considerable thickness of the walls of the PN 25 fittings allows us to improve the design of the internal geometry of the fittings, thus considerably reducing the value of hydraulic losses and improving flow through the system. For example, the local resistance coefficient ( $\xi$ ) of the 90° elbow for the usual PN 20 fittings is 1.2 whereas for the PN 25 fittings is 0.9, i.e. 25% less.



- The brass parts are reinforced, heavy-duty and of low hardness (105 Brinell) thus the possibility of cracking, particularly common in fittings with female threading, is eliminated.

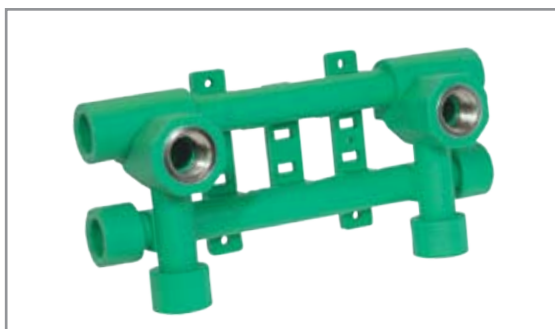
They have cross-shaped grooves at the base of the brass insert so as to prevent torsion and consequent detachment of the metal from the plastic part.



- Perimetric fitting retaining grooves, in which one side of the groove has negative declination, from the outside in, so as to retain the PP-R material and prevent detachment of the metal part from the plastic part in the presence of tensile forces.



- The PP-R overlaps the male brass inserts on the inside. In this way the metal parts are isolated from the installation, and solid deposits and consequently reduced flow are prevented. Moreover, the system is protected against electrochemical corrosion.



- For the technician's convenience Interplast produces an intake with predefined connection distances for the bath mixers allowing connection of the hot or cold water lines either from the floor or from the wall.