



GIACOQEST SYSTEM



GIACOMINI
WATER E-MOTION

Technical documentation

0519EN

SUMMARY

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Giacquest system

Distribution system for domestic water and heating/cooling systems, both traditional and radiant, consisting of PEX-b pipes and brass fittings. The system water-tightness and reliability over its entire lifetime are guaranteed by a crimped copper ring that compresses pipes on fittings. No needs of any other sealing elements.

Advantages and features

Pipes, made of plastic material (PEX-b), are designed to avoid any corrosion.

The wide range of **fittings** is made with brass.

Both Giacomini's brass and PEX-b comply with the highest international functional and **hygienic standards**. This guarantee the Giacquest system to be able to withstand long-term effects of **high temperature** and **pressure** of a plumbing system also for **domestic water distribution**.

The special profile of the fittings, once the copper ring is crimped, allows to obtain the seal not requiring any other components or materials.

Only brass fittings and PEX-b pipes are in contact with the water and this avoid any leakage over time due to material ageing.





The system features support an **easy** and **quick installation**, also in limited space. This, together with the need of a lower number of components need, contributes to the **reduction of overall system costs and in the meanwhile, increases the reliability**.

Main features:

- Threaded fittings comply with the international standard ISO 228.
- Enhanced water hammer resistance.
- Freeze damage resistance.
- Prevention of lime and mineral build-up.
- No electrolysis corrosion on pipe (that caused pin holes on metallic pipes).
- Enhanced resistance to low PH level water.

Giacquest system has been designed respecting:

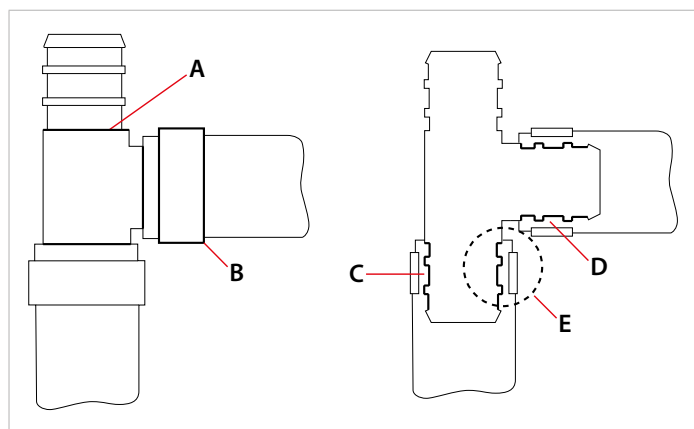
- European norms EN12164 (CW614N) and EN 12165 (CW617N) for brass selection.
- Dimensional requirements contained in ASTM F876 standard for the pipe.
- Dimensional requirements contained in ASTM F1807 standard for the fittings.
- Test requirements contained in EN ISO 15875 standard for the pipe.

Pipes	Fittings
	
Rings	Equipment
	

Technical features - Connection

In order to create system connections, the Giacquest system relies on the mechanical compression generated by a crimped ring that permanently seals pipe and fittings together.

Crimping rings are made of annealed and ductile copper with a black finish.



Once ring has been inserted on the tube, fitting has to be pushed in the pipe up to the shoulder **(A)**.

Then the ring must be positioned at a distance of 3÷6 mm from the fitting's shoulder **(B)**.

Once crimped the ring presses the tube on the fitting special profile, generating the seal on the profile ribs **(C; D)**.

The radial compression does not generate any kind of dimples, ears or leak path gaps **(E)**.

With a special gauge is also possible to check if the connection has been properly realized, avoiding leakage during the system test.

Technical features - Pipes

Description

The Giacquest system high-density, cross-linked polyethylene pipes (PEX-b) enable the distribution of hot and cold domestic water and/or heating/cooling water.

Water distribution via PEX-b pipes is a modern technique that offers notable advantages compared to traditional distribution systems based on iron or copper pipes. This include quick and easy installation with significant time savings.

Plastic pipes means also the possibility of avoiding welding or mechanical joints and chased mechanical joints that can result in leaks with the passing of time, as well as the long lifespan of the material that is not subjected to encrustations and various electrochemical phenomena.


Other factors that cannot be ignored include the low thermal conductivity (about 100 times lower than iron and 700 times lower than copper), and the low distribution noise level thanks to the excellent acoustic insulation properties of cross-linked polyethylene.

The PEX-b pipe is particularly advantageous in water distribution systems with low pressure levels, because its limited roughness ensures low Loss of pressure and therefore minimum flow rates in devices.

Advantages and features

- Pipes suitable for domestic water plumbing systems and for heating/cooling systems.
- Degree of cross-linking > 65 % because silane cross-linking (PEX-b) is "three-dimensional" and, therefore, the molecular bond is stronger compared to PEX-a, that needs higher cross-linking (> 70 %) to obtain same performances.
- Greater resistance to chlorine solutions compared to PEX-a thanks to greater density.
- Lower internal pipe roughness compared to PEX-a pipes (**lower loss of pressure**).

Versions and product codes

Series	Use	Product code	Dimensions [mm]	Package [m]	Anti-oxygen barrier	Pipe colour
 <p>GZ996</p>	Domestic water plumbing systems Heating and/or cooling systems	GZ996Y253	1/2"	4 (in bar)	Yes	Neutral
		GZ996Y003	1/2"	100	No	Neutral
		GZ996Y103	1/2"	100	Yes	Neutral
		GZ996Y205	3/4	4 (in bar)	No	Neutral
		GZ996Y255	3/4	4 (in bar)	Yes	Neutral
		GZ996Y005	3/4	100	No	Neutral
		GZ996Y105	3/4	100	Yes	Neutral
		GZ996Y206	1"	4 (in bar)	No	Neutral
		GZ996Y256	1"	4 (in bar)	Yes	Neutral
		GZ996Y006	1"	50	No	Neutral
		GZ996Y106	1"	50	Yes	Neutral

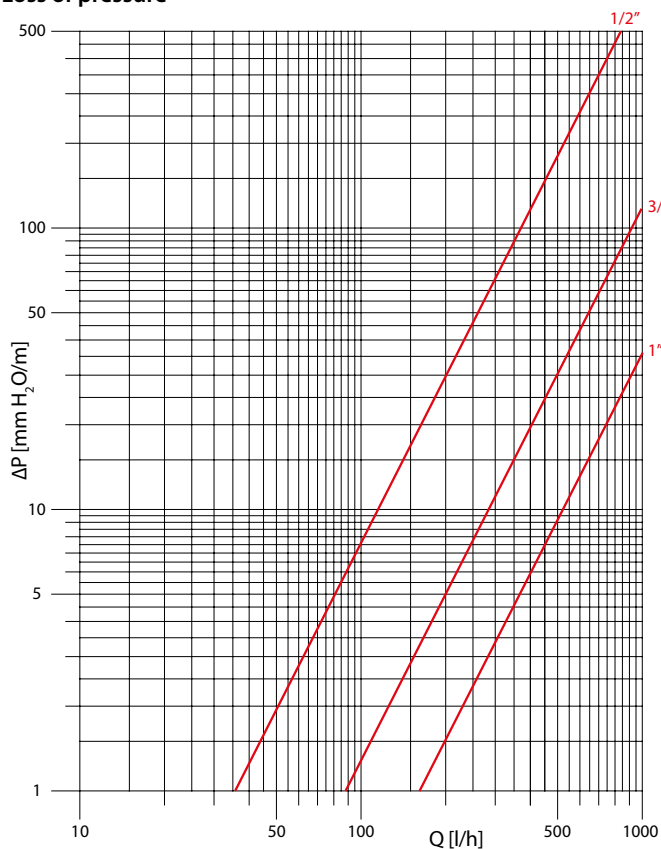
Technical data

Giacquest system pipes are cross-linked with the silane method (PEX-b) and compliant with the EN ISO 15875 Standard.

The chemical cross-linking process provides mechanical, chemical and thermal characteristics that make them suitable for use, with an optimum level of quality and reliability. This method creates a product that is entirely non-toxic, making it ideal for domestic water distribution as required by Ministerial Decree 174 of 06/04/2004 for Italy.

- Application range, depending on the series: class 1, 2, 4, 5 (EN ISO 15875)
- Density: 0,94 g/cm³
- Cross-linking degree > 65% (EN ISO 15875)
- Thermal conductivity of the pipe: 0,35 W/(m K)

Loss of pressure



Resistance to combined pressure and temperature stress referring to regression curves

Series (S) of pipes

$$S = \frac{d-s}{2 \cdot s}$$

Standard Dimension Ratio (SDR)

$$SDR = 2 \cdot S + 1 \approx \frac{d}{s}$$

where s is the nominal pipe thickness

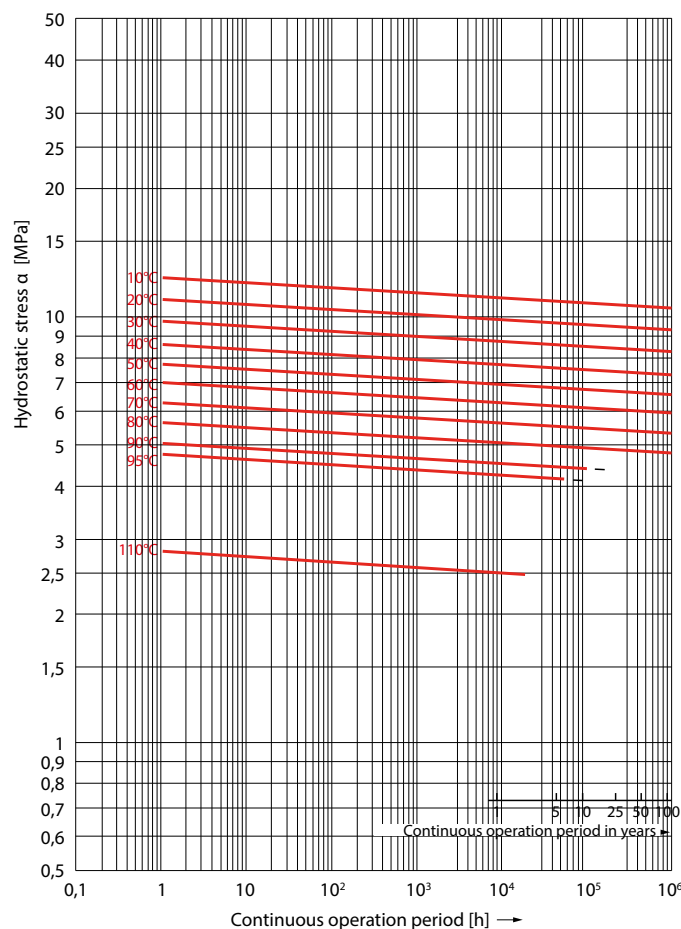
d is the nominal pipe diameter

Regression curves

$$\alpha = p \cdot \frac{d-s}{2 \cdot s}$$

where α is the hydrostatic stress

p is the induced hydrostatic pressure



ANNEX: EN ISO 15875

Classification of operating conditions

Performance requirements for pipe systems complying with EN ISO 15875 are specified for an operating lifespan of 50 years.

Application range	T _{oper} [°C]	Time at T _{oper} [years]	T _{max} [°C]	Time at T _{max} [years]	T _{mal} [°C]	Time at T _{mal} [h]
CLASS 1 Domestic hot water (60 °C)	60	49	80	1	95	100
CLASS 2 Domestic hot water (70 °C)	70	49	80	1	95	100
CLASS 4 Underfloor heating and low-temperature radiators	20	2,5	70	2,5	100	100
	40	plus 20				
	60	plus 25				
CLASS 5 Radiator heating at a high temperature	20	14	90	1	100	100
	60	plus 25				
	80	plus 10				

- Operating temperature (T_{oper}): operating temperature expected for the application range, expressed in °C.
- Max. working temperature (T_{max}): the highest value of the operating temperature, only allowed for a short period of time.
- Malfunctioning temperature (T_{mal}): the highest temperature value that can occur when the control systems is not working (the time frame allowed for this value is of 100 h over 50 years of continuous operation).

For each application class, maximum operating pressure can be evinced from the table below:

PIPE WITHOUT ANTI-OXYGEN BARRIER	CLASS 1	CLASS 2	CLASS 4	CLASS 5
1/2"	8 bar	8 bar	10 bar	8 bar
3/4"				
1"				
PIPE WITH ANTI-OXYGEN BARRIER	CLASS 1	CLASS 2	CLASS 4	CLASS 5
1/2"	Not applicable	Not applicable	10 bar	8 bar
3/4"				
1"				



NB:
For the system pressure test, please refer to the relevant paragraph on system installation.

Technical features - Fittings

Description

Fittings are made of brass and are subjected to a special wash process to obtain a lead free surface.

These new products are designed to protect drinking water from lead exposure, and are constructed to comply with several standards.

Giacomini ensures continuous improvement in processes that impact on the environment, including those not currently subjected to regulation.
















This policy is consistent with our environmental ISO 14001 registration.






Fittings are manufactured according to the ASTM American standards. This testifies the reliability of the system granted by clear and precise norms.

Threaded ends of the in-range fittings comply with the international standard ISO 228.

Versions and product codes

Series	Product code	Size	Type of fitting
 GZ102	GZ102Y003	1/2" x 1/2"	Straight
	GZ102Y004	3/4" x 3/4"	
	GZ102Y005	1" x 1"	
 GZ103	GZ103Y004	3/4" x 1/2"	Straight reducer
	GZ103Y005	1" x 1/2"	
	GZ103Y006	1" x 3/4"	
 GZ107	GZ107Y033	1/2" x 1/2" M	Straight, male thread
	GZ107Y043	1/2" x 3/4" M	
	GZ107Y034	3/4" x 1/2" M	
	GZ107Y044	3/4" x 3/4" M	
	GZ107Y054	3/4" x 1" M	
	GZ107Y035	1" x 1/2" M	
	GZ107Y045	1" x 3/4" M	
GZ107Y055	1" x 1" M		
 GZ109	GZ109Y033	1/2" x 1/2" F	Straight, female thread
	GZ109Y034	3/4" x 1/2" F	
	GZ109Y044	3/4" x 3/4" F	
	GZ109Y045	1" x 3/4" F	
	GZ109Y055	1" x 1" F	
 GZ122	GZ122Y003	1/2" x 1/2"	90° elbow
	GZ122Y004	3/4" x 3/4"	
	GZ122Y005	1" x 1"	
 GZ127	GZ127Y003	1/2" x 1/2" M	90° elbow, male thread
	GZ127Y043	1/2" x 3/4" M	
	GZ127Y044	3/4" x 3/4" M	
	GZ127Y045	1" x 3/4" M	
	GZ127Y055	1" x 1" M	
 GZ128	GZ128X003	1/2" x Ø15 - L = 300 mm	90° elbow, chrome plated, with copper pipe Ø15 mm
	GZ128X023	1/2" x Ø15 - L = 150 mm	
	GZ128X073	1/2" x Ø15 - L = 750 mm	
 GZ129	GZ129Y033	1/2" x 1/2" F	90° elbow, female thread
	GZ129Y034	3/4" x 1/2" F	
	GZ129Y044	3/4" x 3/4" F	
	GZ129Y045	1" x 3/4" F	
	GZ129Y055	1" x 1" F	

Series	Product code	Size	Type of fitting
 <p>GZ139</p>	GZ139Y003	1/2" x 1/2"F	90° elbow, female thread, with wall support
	GZ139Y004	3/4" x 1/2"F	
	GZ139Y044	3/4" x 3/4"F	
	GZ139Y045	1" x 3/4"F	
 <p>GZ150</p>	GZ150Y003	1/2" x 1/2" x 1/2"	Tee 
	GZ150Y004	3/4" x 3/4" x 3/4"	
	GZ150Y005	1" x 1" x 1"	
 <p>GZ151</p>	GZ151Y009	1/2" x 3/4" x 1/2"	Tee reducer 
	GZ151Y014	3/4" x 1/2" x 1/2"	
	GZ151Y015	3/4" x 1/2" x 3/4"	
	GZ151Y016	3/4" x 3/4" x 1/2"	
	GZ151Y023	1" x 1/2" x 1"	
	GZ151Y025	1" x 3/4" x 3/4"	
	GZ151Y017	3/4" x 1" x 3/4"	
	GZ151Y026	1" x 3/4" x 1"	
	GZ151Y027	1" x 1" x 3/4"	
 <p>GZ152-1</p>	GZ152Y041	3/4" x 1/2" x 1/2" x 1/2"	Manifold with 1 inlet and 3 outlets
 <p>GZ152-2</p>	GZ152Y042	3/4" x 1/2" x 1/2" x 1/2" x 1/2"	Manifold with 1 inlet and 4 outlets
 <p>GZ152-3</p>	GZ152Y043	3/4" x 1/2" x 1/2" x 1/2" x 3/4"	Manifold with 2 inlets and 3 outlets
 <p>GZ152-4</p>	GZ152Y044	3/4" x 1/2" x 1/2" x 1/2" x 1/2" x 3/4"	Manifold with 2 inlets and 4 outlets
 <p>GZ153</p>	GZ153Y033	1/2" x 1/2"M x 1/2"	Tee, male thread 
	GZ153Y034	3/4" x 1/2"M x 3/4"	
 <p>GZ154</p>	GZ154Y033	1/2" x 1/2"F x 1/2"	Tee, female thread 
	GZ154Y034	3/4" x 1/2"F x 3/4"	
	GZ154Y035	1" x 1/2"F x 1"	
	GZ154Y045	1" x 3/4"F x 1"	
 <p>GZ158</p>	GZ158X003	1/2" x Ø15 x 1/2" - L = 300 mm	45° Tee, chrome plated, with copper pipe Ø15 mm 
	GZ158X073	1/2" x Ø15 x 1/2" - L = 750 mm	
	GZ158X004	3/4" x Ø15 x 3/4" - L = 300 mm	
	GZ158X074	3/4" x Ø15 x 3/4" - L = 750 mm	

Series	Product code	Size	Type of fitting
GZ165 	GZ165Y003	1/2"	Plug
	GZ165Y004	3/4"	
	GZ165Y005	1"	
GZ179 	GZ179Y032	16 x 1/2"	Plastic pipe adaptor
	GZ179Y042	18 x 1/2"	
	GZ179Y045	18 x 3/4"	
	GZ179Y056	28 x 1"	
	GZ179Y062	1/2"E x 1/2"	
GZ573 	GZ573Y033	1/2" x 1/2"F	90° elbow domestic water system connection
GZ606 	GZ606Y003	1/2"	Ball valve, white handwheel
GZ651 	GZ651Y003	1/2"	Ball valve, red T-handle
	GZ651Y004	3/4"	
	GZ651Y005	1"	


Technical features - Rings

Description

Rings are made of annealed copper with a black finish.

After being crimped in the right position, they permanently seal the pipe and the fitting together.

Versions and product codes

Series	Product code	Size	Type of fitting
GZ61 	GZ61Y003	1/2"	Copper crimp ring
	GZ61Y005	3/4"	
	GZ61Y006	1"	





Technical features - Equipment

Description



Tools for system installation are extremely easy to be used, following the basic rules of Giaccoquest: easy, quick and safer.

Versions and product codes

Crimping tools

Series	Product code	Size	Type of tool
 <p>GZ200</p>	GZ200Y003	1/2"	Manual crimping tool, provided with GZ211 checking gauge
	GZ200Y004	3/4"	
	GZ200Y005	1"	
 <p>GZ200A</p>	GZ200Y203	1/2"	Short angled manual crimping tool
	GZ200Y205	3/4"	
 <p>GZ200C</p>	GZ200Y103	1/2"	Short straight manual crimping tool
	GZ200Y105	3/4"	
 <p>GZ211</p>	GZ211Y001	1/2" - 3/4"	Checking gauge
	GZ211Y003	1"	

Cutting tool

Series	Product code	Size	Type of tool
 <p>R990</p>	R990Y001	1/2" - 3/4" - 1"	Cutter for 1/2", 3/4" and 1" plastic pipes
 <p>GZ201</p>	GZ201Y001	1/2" - 3/4" - 1"	Shears for removal the rings

Regulation instructions for crimping tool

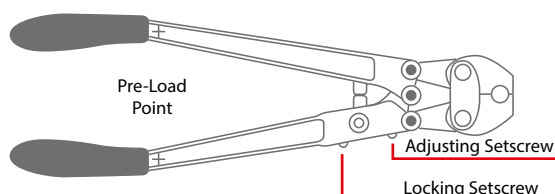
Giaccoquest crimp tools are factory set to provide proper crimps. This should be checked before the first use by making a crimp connection test and checking it with the crimp gauge. As long as the finished crimp connection fits in the gauges properly, there is no need to adjust the tool.

When the tool wears and the crimps no longer gauge properly, the tool needs adjusting.

Follow this simple steps:

- Loosen the bottom Locking Setscrew (two turns) using the hex wrench supplied with the tool.
- Close tool until the jaws just touch and increased resistance is felt. This is the pre-load point.
- Turn the top Adjusting Setscrew until the distance between the raised "+" marks on the handles is between 178 and 216 mm.
- Tighten the bottom Locking Setscrew.
- Make a crimp connection test and check it with both the "Go" and "No Go" opening of the gauge. If necessary, make additional adjustment. If the "No Go" opening goes over the crimped ring, the tool is too tight. The distance between the "+" marks should be decreased. If the "Go" opening does not go over the crimped ring, the tool is too loose and the distance between the "+" marks should be increased.

Apply a light oil to the tool pivot points each time the tool is regulated. If not lubricated the tool life will be shortened.



Warning.

Increasing the pre-load distance beyond 216 mm (aluminium handled) or 330 mm (steel handled) will make the tool hard to use and shorten tool life because of excessive stress.

System installation

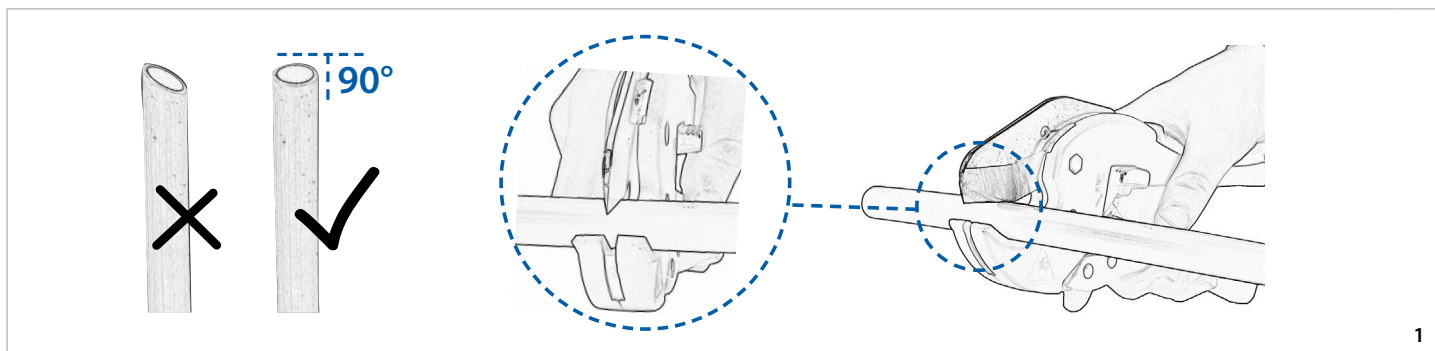


WARNING - READ CAREFULLY

- Giacoquest pipe maintains good flexibility and resistance to temperature nearby 0 °C. The minimum laying temperature is -10 °C.
- Giacoquest tubing is approved for water distribution only and should not be used for distribution of petroleum based products such as liquid petroleum (LP) or natural gas.
- Giacoquest tubing should not be exposed to or stored under direct ultraviolet light.
- Do not use supports that have sharp edges which could damage the tubing.
- The installation must be carried out by skilled, qualified personnel.

1) Pipe cut

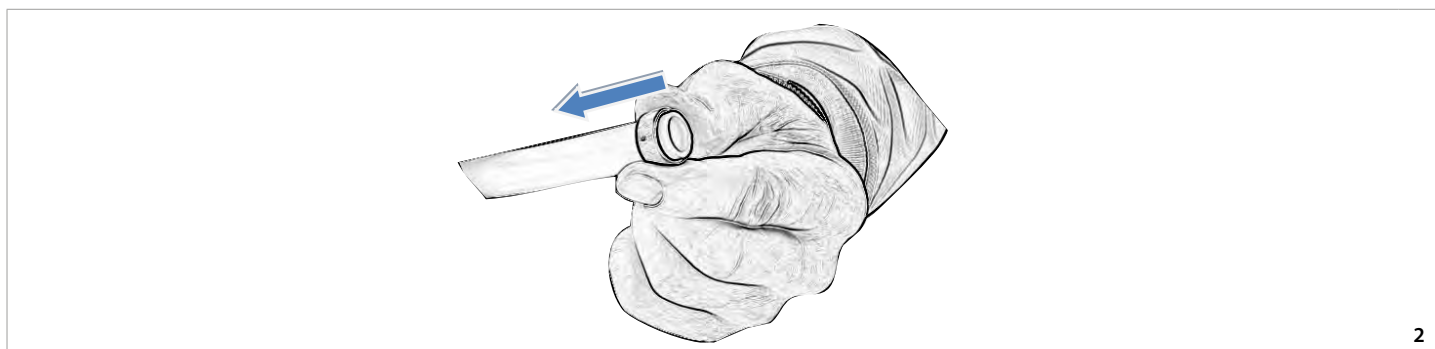
Square-cut the pipe perpendicularly to its axis, using the R990 cutter and taking care not to deform it (1).



1

2) Ring insertion

Insert the special copper crimp ring onto the pipe (2).

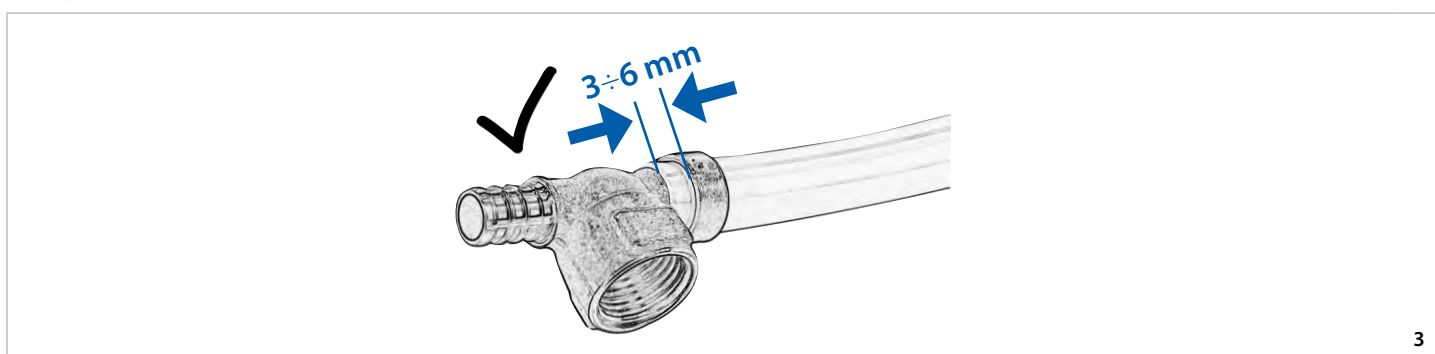


2

3) Fitting positioning

Insert the fitting into the pipe up to the fitting shoulder. Position the crimp ring 3-6 mm from the end of the pipe (3).

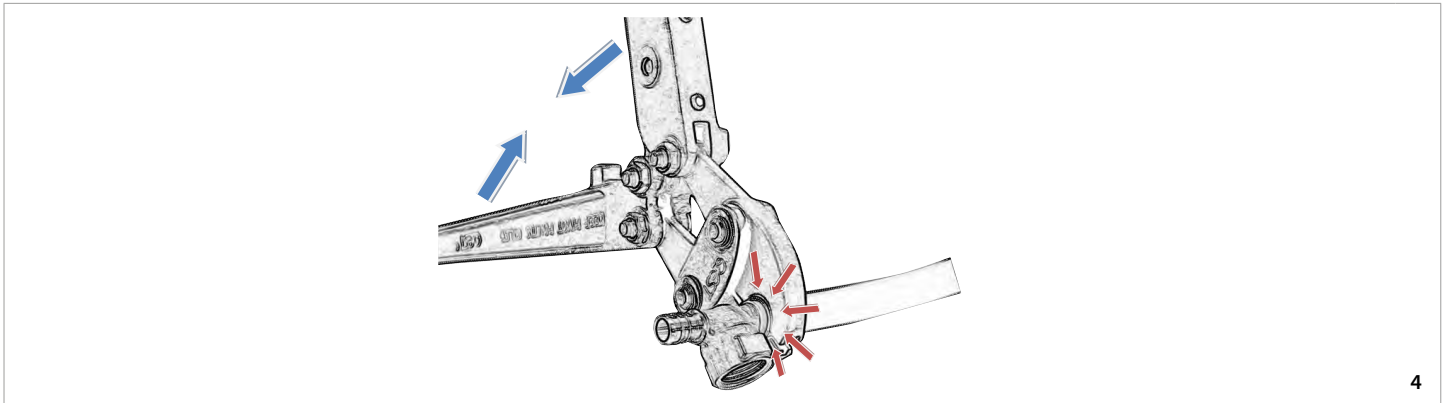
Slightly tighten the ring with a pincers in order to avoid its displacements.



3

4) Crimp

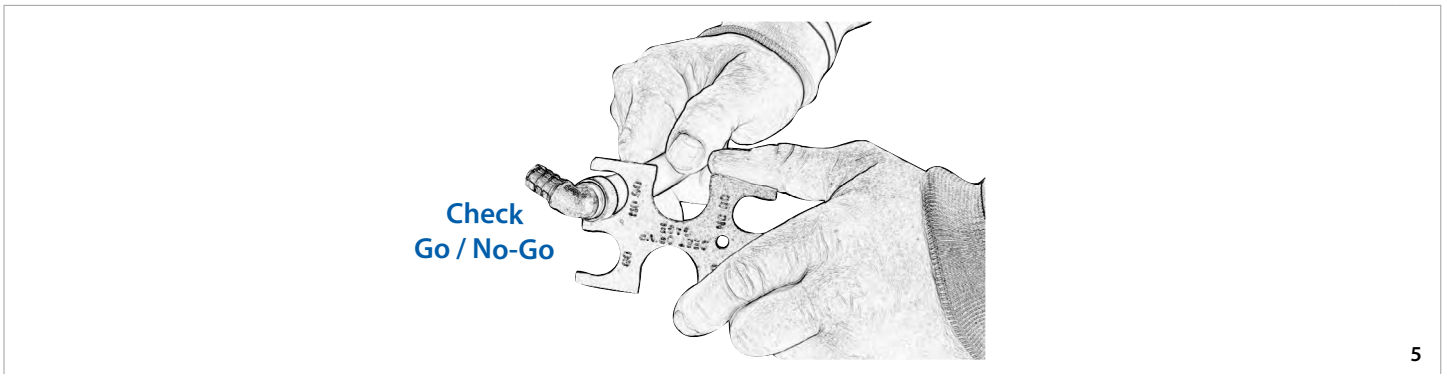
Position the crimping tool so that the ring will be completely covered from its jaws (4).
Be sure to keep the tool perpendicular to the pipe axis and close it completely.



4

5) Check

Check if the crimping has been done properly using the Giacquest checking gauge GZ211 (5).



5

How to check a connection: Giacquest gauge

After making a connection, use the corresponding opening on the gauge and insert it into the fitting perpendicularly to the pipe axis.

The "Go" opening shall freely pass through the ring everywhere on its diameter, with the possible exception of the deformed area on the ring, caused by the jaws closing on the fitting. Do not force the gauge on the ring.

The "No-Go" shall not pass through a crushed ring under no circumstance.

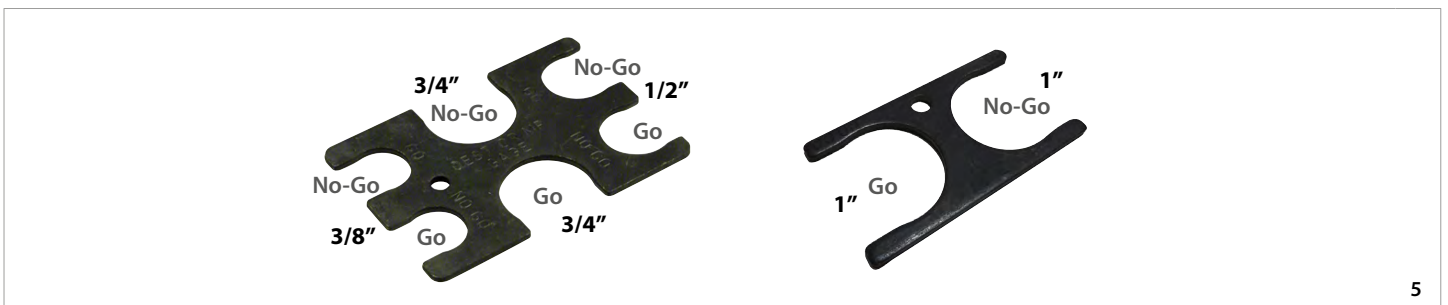
If the connection does not pass one of the two tests, it has to be replaced with a new one.

DO'S

- Always check every finished crimp with this gauge.
- Always place the gauge opening on the crimp ring at a 90° angle for an accurate check.
- Be certain to use the proper opening size.

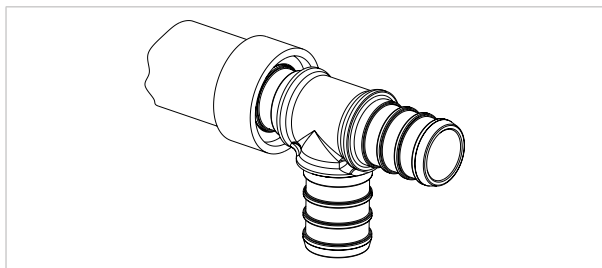
DON'Ts

- Don't slide the gauge onto the connection along the pipe. Push it directly onto the crimped ring.
- If not properly crimped a ring can not be crimped again. The pipe must be cut and the connection re-done.
- Do not modify the gauge opening areas for any reason. They have been carefully manufactured within a 0,05 mm tolerance.



5

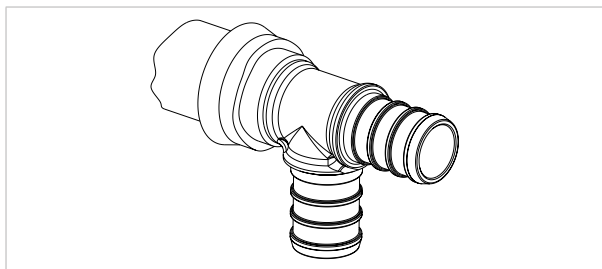
How to check a connection: visual inspection



Defect: there's no pipe between fitting shoulder and the copper ring.

Cause: ring crimped over the end of the pipe.

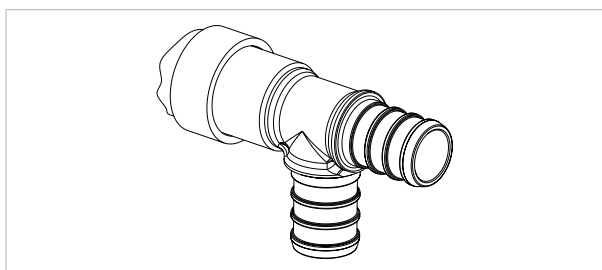
Effect: ring does not cover enough of the fitting's ribs.



Defect: uneven ring deformation along pipe axis.

Cause: tool misplacement during crimping operation.

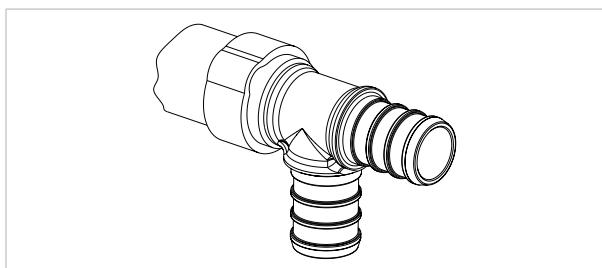
Effect: uneven crimping force distribution.



Defect: more than 6 mm between fitting shoulder and the copper ring.

Cause: ring crimped away from fitting shoulder.

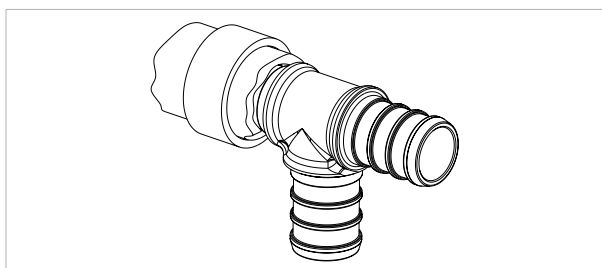
Effect: ring does not cover enough of the fitting's ribs.



Defect: uneven ring deformation, radially. Ring dented.

Cause: misplacement of the tool, tool not fully closed during crimping or wrong fitting/ ring dimension.

Effect: uneven crimping force distribution.



Defect: uneven or not squared pipe's edge.

Cause: wrong pipe cutting.

Effect: covering of fitting ribs could not be granted.

Fitting recovery

- Cut the pipe.
- Cut the ring with the GZ201 shears.
- Remove the ring with a pincers.
- Remove the fitting from the pipe.
- Visually check the integrity of the fitting before using it again.

6) Pipe laying

Giacoquest system pipes enable the creation of plumbing systems with extreme ease and speed.

During the laying process, some simple precautions must be observed for pipe connection to fittings, pipe bending, protection against UV rays and against any possible pipe damaging.

- The connection of pipes to distribution manifolds or elbows for tap coupling must be executed using fittings and adaptors of the right size for that specific pipe.
- Pipe laying, fixing and connections have to be realized thus to avoid permanent mechanical stress on components.
- All materials used to manufacture pipes expand when heated and shrink when cooled: for this reason longitudinal change (ΔL) generated by temperature changes should always be considered during installation.

Longitudinal change can be calculated with the following formula: $\Delta L = L \times \alpha \times \Delta T$ where:

ΔL = pipe longitudinal change in mm

L = pipe length in mm

α = linear expansion coefficient (the linear expansion coefficient is $1,4 \times 10^{-4} \text{ m}/(\text{m} \cdot \text{K})$, independently from pipe diameter)

ΔT = maximum temperature difference in the system in °C

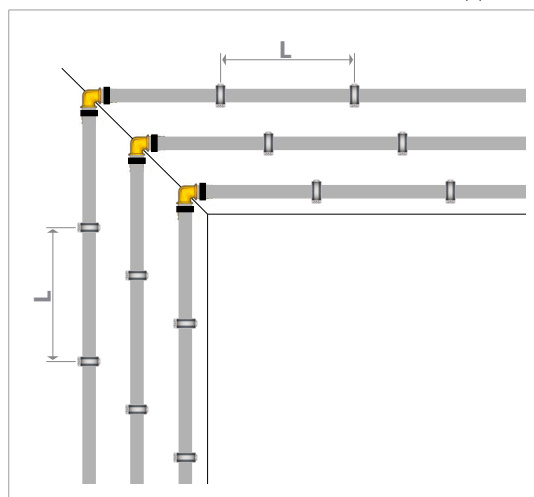
Example: L = 5 m

$$\alpha = 1,4 \times 10^{-4} \text{ m}/(\text{m} \cdot \text{K})$$

$$\Delta T = 63 \text{ }^\circ\text{C} \text{ (where } T_{\text{min}} = 7 \text{ }^\circ\text{C} \text{ and } T_{\text{max}} = 70 \text{ }^\circ\text{C)}$$

$$\Delta L = 5000 \times 0,00014 \times 63 = 44 \text{ mm}$$

- For surface installation, pipe length must be calculated on the basis of system requirements and distances between pipe supports must be carefully evaluated. Maximum distance between each support (L) depends on the diameter of the pipe used.



Pipe external Ø	Max. distance between supports (L)
16 mm	80 cm
20 mm	120 cm
25 mm	150 cm
32 mm	160 cm
40 mm	170 cm

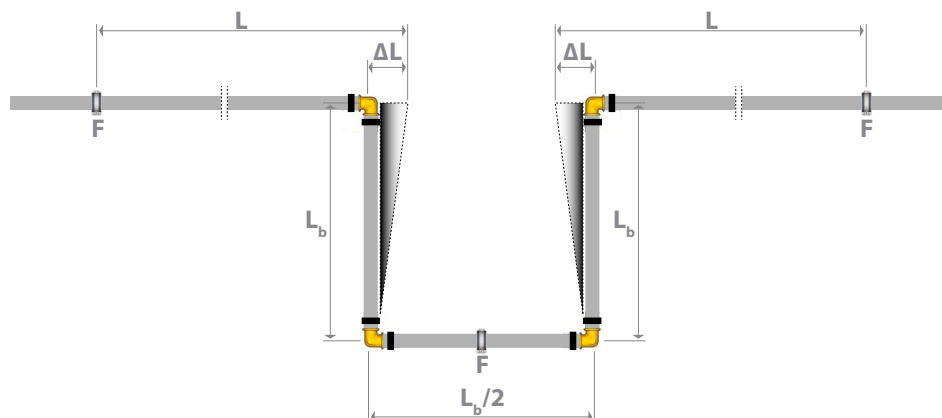
- Supports used in surface installations have the two key functions of supporting the pipe and allowing its thermal expansion. Supports can be **fixed**, clamping the pipe; or **sliding**, permitting the pipe to slide as a result of thermal expansion.



Warning.

Secure the pipe with the aid of plastic ties. Avoid using metal ties without protection, as they could damage the pipe.

- In long straight pipe stretches, to absorb any length changes, it is advisable to insert at least one expansion bend **every 10 m**. For pipes with a diameter equal to or greater than 32 mm, expansion bends are mandatory.



Legend

L	Distance between fixed support and expansion bend	F	Fixed support
ΔL	Pipe longitudinal change	L _b	Length of the expansion bend

Minimum length of expansion bend (L_b) can be calculated with the following formula: $L_b = C \times \sqrt{(\varnothing_e \times \Delta L)}$ where:

L_b = minimum length of the expansion bend in mm

C = constant of material (for PEX pipe the value is 33)

\varnothing_e = pipe external diameter in mm

ΔL = pipe longitudinal change in mm

Example: L = 5 m

$$\varnothing_e = 25 \text{ mm}$$

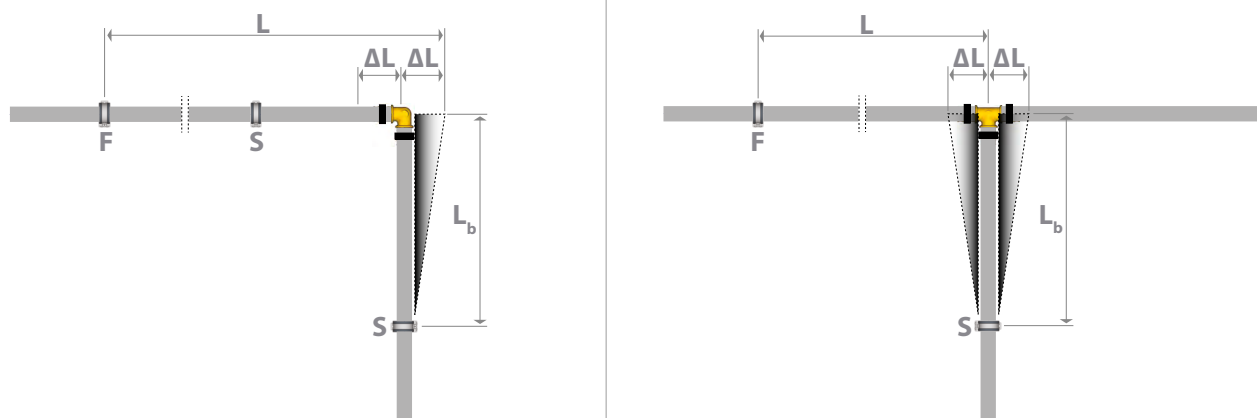
$$\alpha = 1,4 \times 10^{-4} \text{ m}/(\text{m} \cdot \text{K})$$

$$\Delta T = 63 \text{ }^\circ\text{C} \text{ (dove } T_{\text{min}} = 7 \text{ }^\circ\text{C e } T_{\text{max}} = 70 \text{ }^\circ\text{C)}$$

$$\Delta L = 5000 \times 0,00014 \times 63 = 44 \text{ mm}$$

$$L_b = 33 \times \sqrt{25 \times 44} = 1094,5 \text{ mm}$$

- When bends are required, it is fundamental to use fittings and fix/sliding supports correctly, as per the following drawing. It is advisable to fit an expansion bend each time the pipe changes direction also considering to have clearance around.



Legend

L	Distance between fixed support and expansion bend	F	Fixed support
ΔL	Pipe longitudinal change	S	Sliding support
L _b	Length of the expansion bend		

- The bend radius during the installation of pipes with \varnothing 1/2", 3/4" and 1" must be greater than 8 times the pipe's outer diameter; such value can drop to 5 times the pipe's outer diameter only if the dedicated **R549P** bend support is used.
- Pipe bending can be done either with the cold or the hot method with the aid of hot air (max 100 °C).
- Pipes must not be heated with a naked flame or heat sources with temperatures so high to cause the pipe melting.

- Pipes where fittings have already been assembled must not be bent.
If bending cannot be avoided for technical reasons, the area of the pipe near the fitting must not be subjected to permanent stresses.
- In installations pipe must always be protected from UV rays and fluorescent lights that could alter its chemical-physical properties.
- If the pipe is chased without a protective sleeve, it has to be covered with at least 15 mm thick screed to prevent cracking of the plaster due to thermal expansion.
- Avoid encasing fittings as much as possible. If this is not possible, make sure the fitting can be inspected or protect it from contact with building material and make a note of its position in the project documentation.
- After installing the pipes and before covering them, it is advisable to test the system under pressure, so as to immediately identify any possible leaks (see paragraph "Pressure test").
- Following the pressure test, sleeves must be protected by encasing them with cement so that the pipes cannot be crushed or moved.
- Do not allow ice to form, as the expansion caused by the change of status could damage the pipe.

Storage precautions

- Store the pipe in a dry, protected area to avoid dampness-related damage to the packaging.
- Keep the pipe in its packaging, avoiding any exposure to direct sunlight.
- Pay special attention during the transport and installation stages.
- Make sure the pipe does not come into contact with sharp objects that could scratch it.
- Do not allow ice to form, as the expansion caused by the change of status could damage the pipe.
- Make sure the pipe does not come into contact with a naked flame or heat source with a temperature over 100 °C.
- Make sure the pipe does not come into contact with any chemical solvents or paints.

7) Pressure test

The pressure test must be performed for all Giacomest system installations before commissioning.

Maximum test pressure, which cannot be exceeded, is 15 bar (1,5 MPa; 200 psi).

The pressure test procedure is:

- 1) Remove the air from the system and put it under water pressure at 0,5 bar.
- 2) If there are no leaks after 15 minutes, increase the pressure of 1,5 times the operating pressure and keep it at this level for 30 minutes, visually inspecting the joints.
- 3) Reduce the pressure to 0,5 times the operating pressure and keep it at this level for 90 minutes:
 - if the pressure remains constant or increases slightly, it means that the systems does not leak;
 - if the pressure decreases, it means there is a leak in the system.

Examples of pressure tests

Example for Class 1, 2, 5 system

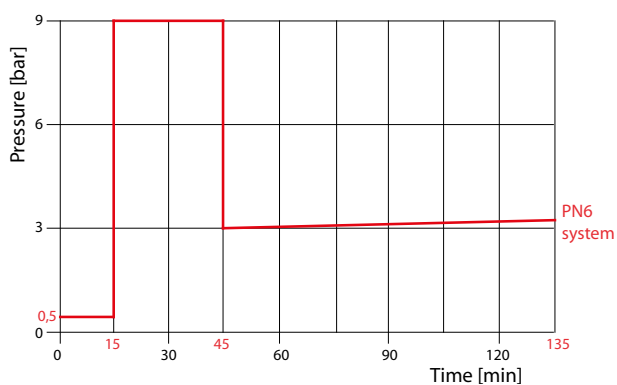
Operating pressure = 6 bar

Initial test pressure: 0,5 bar [for 15 min.]

Test pressure after 15 min.: $6 \cdot 1,5 = 9$ bar [for 30 min.]

Test pressure after 45 min.: $6 \cdot 0,5 = 3$ bar [for 90 min.]

Pressure ≥ 3 bar ($6 \cdot 0,5$) = the system does not leak



Example for Class 1, 2, 4, 5 system

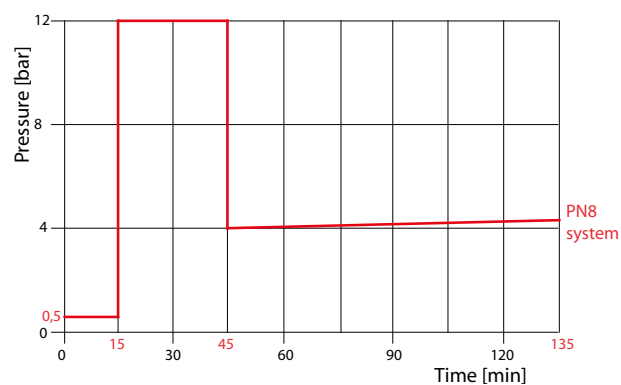
Operating pressure = 8 bar

Initial test pressure: 0,5 bar [for 15 min.]

Test pressure after 15 min.: $8 \cdot 1,5 = 12$ bar [for 30 min.]

Test pressure after 45 min.: $8 \cdot 0,5 = 4$ bar [for 90 min.]

Pressure ≥ 4 bar ($8 \cdot 0,5$) = the system does not leak



Example for Class 1, 2, 4, 5 system

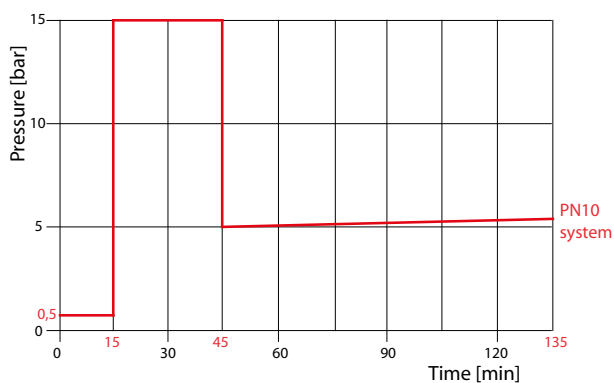
Operating pressure = 10 bar

Initial test pressure: 0,5 bar [for 15 min.]

Test pressure after 15 min.: $10 \cdot 1,5 = 15$ bar [for 30 min.]

Test pressure after 45 min.: $10 \cdot 0,5 = 5$ bar [for 90 min.]

Pressure ≥ 5 bar ($10 \cdot 0,5$) = the system does not leak



NB:

For system classes, refer to Annex EN ISO 15875, paragraph "Technical features - Pipes".

System warranty

All products and components supplied by Giacomini are subjected to numerous tests in order to guarantee the high quality in compliance with UNI EN ISO 9001 certification of the Company's Quality Management System.

All products and components supplied by Giacomini are covered by the warranty and liabilities provided for in Directives 1994/44/EC, 2001/95/EC and 85/374/EEC.

The warranty does not apply to the following cases:

- 1) if the Giacquest system is used to distribute fluids that are not compatible with its materials;
- 2) if there are visible faults at the time of installation or during the system's pressure test;
- 3) if installation instructions are not carefully followed;
- 4) if pipes connected to fittings are made of non-compatible materials or have non-compatible dimensions;
- 5) if the Giacquest system is installed using components or equipment not compatible or not manufactured by Giacomini.

Reference Standards

- EN ISO 15875 Plastic piping systems for hot and cold water installations.
- DIN 16892 Plastic piping systems - Technical requirements.
- DIN 4726 Plastic piping systems - Technical requirements.

Product specifications

Distribution system for domestic water and/or heating/cooling systems, both traditional and radiant, consisting in PEX-b **pipes** and brass **fittings** with a seal guaranteed by a **copper ring**.

Giacquest system pipes are cross-linked with the silane method (PEX-b) and compliant with the EN ISO 15875 Standard; the pipes indicated as suitable for the distribution of domestic water are in compliance with Ministerial Decree 174 of 06/04/2004 for Italy; application range: class 1, 2, 4 and 5 (EN ISO 15875) depending on the series.

Fittings are made of CW617N (CuZn40Pb2) brass in compliance with EN12164, EN12165 and DIN50930-6 Standards and the UBA list provided by the 4MS Initiative, so that they can also be used in domestic water systems. Cooling systems must be totally insulated. The range of threaded fittings complies with the international standard ISO 228. Copper rings are suitable for all Giacquest system pipes, both for domestic water distribution systems and heating/cooling systems.

The system is completed by a wide range of dedicated equipment (crimping and cutting tools, dedicated gauges).



NB:

The product codes mentioned in this technical document may be changed without any notice. Check available product codes in the most up-to-date product catalogue.

Additional information

For additional information please check the website: www.giacomini.com or contact the technical service: ☎ +39 0322 923372 📠 +39 0322 923255 ✉ consulenza.prodotti@giacomini.com
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 Giacomini S.p.A. Via per Alzo, 39 - 28017 San Maurizio d'Opaglio (NO) Italy



⚠ Safety Warning. Installation, commissioning and periodical maintenance of the product must be carried out by qualified operators in compliance with national regulations and/or local standards. A qualified installer must take all required measures, including use of Individual Protection Devices, for his and others' safety. An improper installation may damage people, animals or objects towards which Giacomini S.p.A. may not be held liable.

♻ Package Disposal. Carton boxes: paper recycling. Plastic bags and bubble wrap: plastic recycling.

ℹ Additional information. For more information, go to giacomini.com or contact our technical assistance service. This document provides only general indications. Giacomini S.p.A. may change at any time, without notice and for technical or commercial reasons, the items included herewith. The information included in this technical sheet do not exempt the user from strictly complying with the rules and good practice standards in force.

♻ Product Disposal. Do not dispose of product as municipal waste at the end of its life cycle. Dispose of product at a special recycling platform managed by local authorities or at retailers providing this type of service.