

R996T



Radiant Systems Energy Management

Giacotherm PEX-b pipes with anti-oxygen barrier

Datasheet
0129EN 10/2022



R996T

R996T pipes in PEX-b (polyethylene crosslinked with the silane method - crosslinking degree > 65 %) can be used for the water distribution into heating and/or cooling systems. Due to a compound expressly developed for this product, the R996T series combines the advantages represented by the use of pipes in synthetic material, the feature of high flexibility, a rapid and easy installation and a consistent stress reduction, after the completion of the laying operations. All R996T pipes are extruded with an external anti-oxygen barrier in EVOH, in compliance with EN ISO 15875 and DIN 4726 Standards, therefore the modest oxygen quantity that permeates from outside towards the inside of the pipe, becomes quite negligible.

Versions and product codes

Pipe rolls

PRODUCT CODE	SIZE [mm]	PACK [m]	PIPE COLOR
R996Y048	16 x 1,5	240 m	Red
R996Y065		500 m	
R996TY227		100 m	
R996TY219	16 x 2	240m	
R996TY264		600 m	
R996TY054		100 m	
R996TY033	17 x 2	240 m	
R996TY052		600 m	

PRODUCT CODE	SIZE [mm]	PACK [m]	PIPE COLOR
R996TY249	18 x 2	100 m	Red
R996TY220		240 m	
R996TY250		500 m	
R996TY221	20 x 2	100 m	
R996TY222		240 m	
R996TY253		400 m	
R996TY068	25 x 2,3	320 m	

Technical data

- Application classes (EN ISO 15875): 4, 5
- Not suitable for the transport of domestic water
- Density at 23 °C: > 0,939 g/cm³
- Thermal expansion coefficient: (1,9 x 10⁻⁴)/K
- Thermal conductivity: 0,38 W/(m K)
- Breaking load: 31 MPa
- Breaking elongation: 520 %
- Elasticity module at 23 °C: 540 MPa

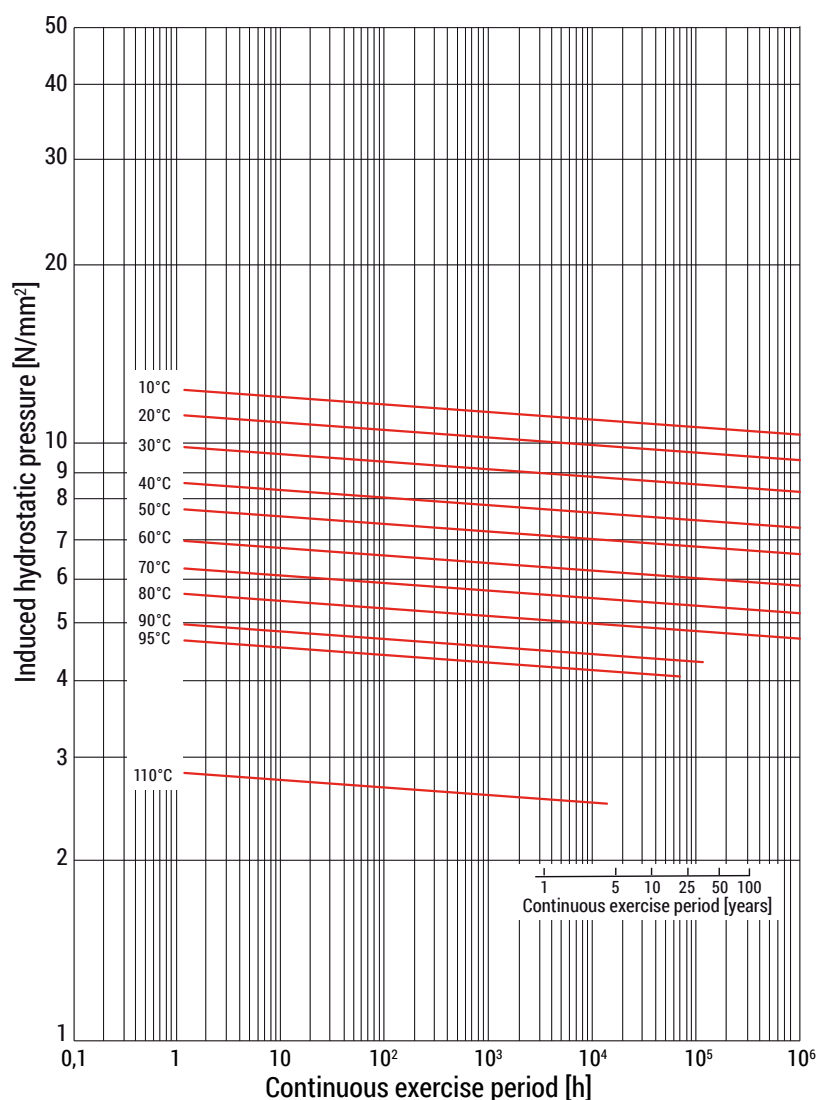
For each application classes, maximum usage pressure can be evinced from the table below:

SIZE	CLASS 4	CLASS 5
16 x 1,5	8 bar	6 bar
16 x 2,0	10 bar	8 bar
17 x 2,0	10 bar	8 bar
18 x 2,0	10 bar	8 bar
20 x 2,0	8 bar	6 bar
25 x 2,3	8 bar	6 bar

- All pipes are suitable for carrying water for a period of 50 years at a temperature of 20 °C and an operating pressure of 10 bar.
- All heating systems shall use as transfer fluid only water or treated water.

NOTE. R996T pipes in PEX-b comply with EN ISO 15875 standard, which defines the physical and dimensional features, and are verified following EN ISO 15875 and DIN 16892 standards, that allow evaluation of the resistance to the combined pressure and temperature stress, with reference to the relevant regression curves.

Resistance to combined pressure and temperature stress with respect to regression curves



Series of pipes (S)

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

Standard Dimension Ratio (SDR)

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

s: pipe nominal thickness
d: pipe nominal diameter

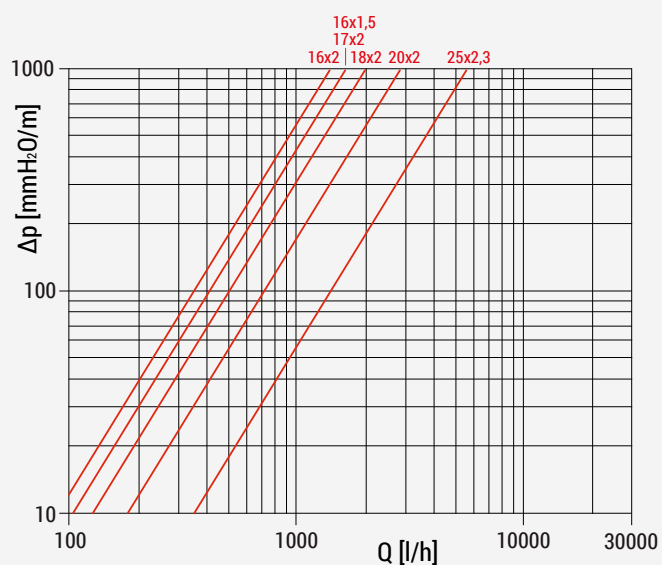
Regression curve

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

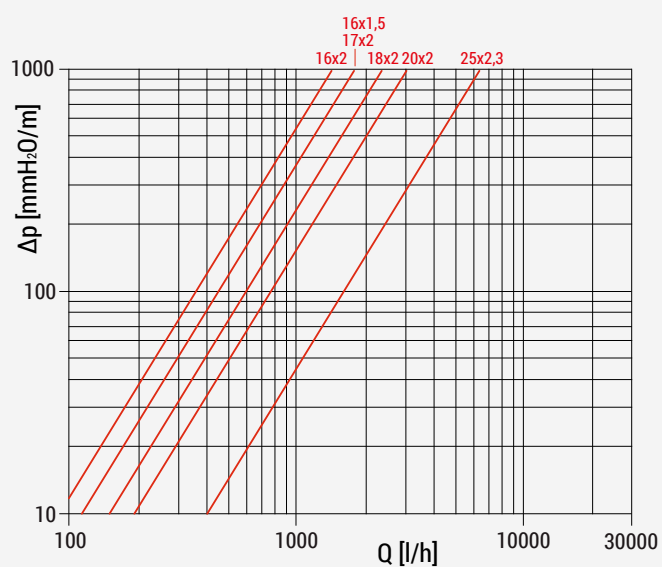
α : hydrostatic stress
 p : induced hydrostatic pressure

➤ Losses of pressure

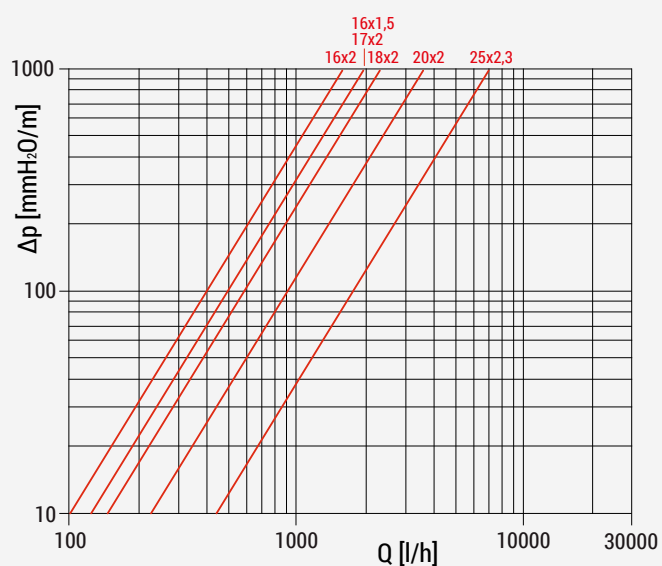
TEMPERATURE = 10 °C



TEMPERATURE = 50 °C



TEMPERATURE = 80 °C



► Pipe laying

For the laying operations of PEX-b pipes, it is necessary to follow some simple practical rules concerning the choice of the fittings, the respect of the minimum radius of curvature and the protection from the sun rays and from possible fortuitous damages.

- The connection to distribution manifolds and to the system terminals shall be made by means of Giacomini's adaptors for synthetic pipes.
- In order to make a correct connection, it is essential to cut off the pipes with tools that can make a clean cut without deburring and perpendicular to its axis.
- During the pipe laying operations, it is necessary making curvatures with a minimum radius equal to five times the external diameter of the pipe itself. After the pipe laying, it is opportune making a pressure test of the system, in order to underline immediately possible fluid losses.
- In case of radiant panel systems, the laying of the pipe covering shall occur with care, by paying attention not to scratch the pipes with spatulas or crush them in the passages with wheel barrow.
- The pipes must not remain exposed for long time to the sun radiations or to fluorescent lamps. Keep the coils that are not used in the suitable boxes, to avoid that the ultraviolet rays will alter the chemical and physical features.
- In case of radiant panel systems, it is good to lay over the pipes a foundation of 3 cm at least, to avoid cracks due to thermal expansion.
- While crossing possible expansion joints, it is important to protect the pipe with a protecting covering in order to avoid excessive mechanical stress.

Ease of laying

By comparing the traction elastic module of R996T pipes, calculated at 23 °C in room, with an average of the values reported in literature for the different types of PEX and considering that " lower is the elastic module, higher is the pipe flexibility", it shows the advantage in terms of obtainable flexibility by using this kind of product.

ELASTICITY MODULE at 23 °C (MPa)	
R996T	540
(media) PEX	623÷890

► Precautions

The use of R996T pipes requires the observance of some prescriptions, needed to guarantee the life time and the functional character.

- Store the pipes in the appropriate packaging, by avoiding their direct exposition to sun rays, and in covered and dry places to prevent damages to the boxes caused by the humidity.
- Prevent the pipes from coming into contact with sharp bodies able to scratch and trigger carving phenomenon – pay particular care during the installation and transport phases.
- Prevent icing inside the pipes and in the packaging, because the expansions due to the state change could cause cracking.
- Prevent the pipe from coming into contact with open flames or other heat sources, that could provoke melting, even partial.
- If a fixing to electrically welded networks is needed, use plastic material instead of metallic bands, to avoid damages to the pipes.
- Prevent the contact with chemical solvents or paints that can damage the pipes.

► Warranty

The guarantee is not valid in the following cases:

- 1) if the working conditions are different from those prescribed;
- 2) if the pipes are used to distribute fluids, that are not compatible with the material;
- 3) if the installation instructions are not scrupulously followed
- 4) if at the installation time, during the laying phase or at the pressure testing of the system, the pipe shows visually perceivable defects caused by accidental factors;
- 5) if the pipe is installed by using components not produced by Giacomini S.p.A., or in any case different from the permitted ones.

► Classification of working conditions (EN ISO 15875)

The performance specifications for pipe-based systems complying with EN ISO 15875 are specified for a project with a 50-year operational life.

RANGE OF APPLICATION	WORKING TEMPERATURE T_D [°C]	DURATION OF T_D [years]	MAX WORKING TEMPERATURE T_{MAX} [°C]	DURATION OF T_{MAX} [years]	FAILURE TEMPERATURE T_{MAL} [°C]	DURATION OF T_{MAL} [h]
CLASS 4 Floor heating and low-temperature systems	20	2,5	70	2,5	100	100
	+	+				
	40	20				
	+	+				
CLASS 5 Radiator heating and high-temperature systems	60	25	90	1	100	100
	+	+				
	60	25				
	+	+				
	80	10				

- Working temperature (T_D): working temperature provided for the range of application, expressed in °C.
- Max. working temperature (T_{MAX}): the working temperature highest value, allowed only for a short period of time.
- Failure temperature (T_{MAL}): the highest temperature possible when control systems fail (the time allowed for this value is 100 h over 50 years of uninterrupted operation).

► Product specifications

R996T

PEX-b pipes with EVOH external anti-oxygen barrier. Application classes (En 15875): 4, 5 (radiant floor heating and low temperature systems and radiator heating and high-temperature systems). Not suitable for the transport of domestic water. High flexibility for a quick and easy installation and a consistent reduction of tensions, even after the completion of the laying operations. Red pipe colour. Density at 23 °C: > 0.939 g/cm³. Thermal conductivity: 0,38 W/m K. Thermal expansion coefficient: (1,9 x 10⁻⁴)/K. Breaking load: 31 MPa. Breaking elongation: 520 %. Elastic modulus: 540 MPa.

⚠ 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.