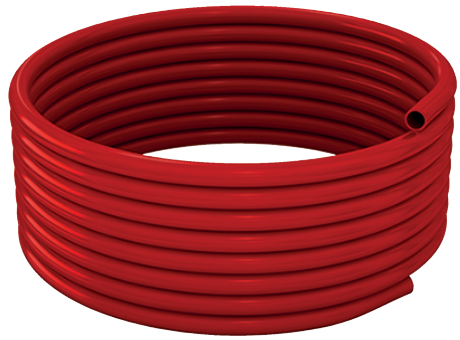
GIACOTHERM PIPES IN PEX-b WITH ANTI-OXYGEN BARRIER R996T



R996T

Description

R996T pipes in PEX-b (polyethylene crosslinked with the silane method - crosslinking degree > 70 %) 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 code

Product code	Size	Packaging
R996Y048	16 x 1,5	240 m
R996Y065		500 m
R996TY227	16 x 2	100 m
R996TY219		240m
R996TY264		600 m
R996TY054	17 x 2	100 m
R996TY033		240 m
R996TY052		600 m
R996TY249	18 x 2	100 m
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: class 4 and class 5 (EN ISO 15875)
- Not for potable water
- Density: 0,939 g/cm^3
- Thermal conductivity: 0,38 W/(m K)
- Coefficient of linear expansion: (1,9 x 10^{-4})/K
- Breaking road: 31 MPa
- Breaking elongation: 520 %
- Elasticity module at 23 °C: 540 MPa

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

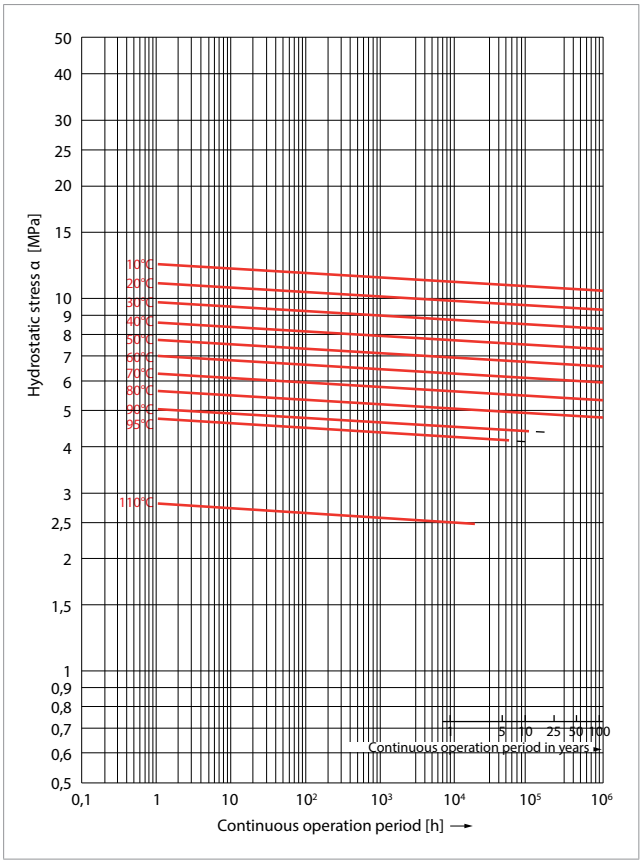
Series (S) of pipes $S = \frac{d - s}{2 \cdot s}$

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

where **σ** is the hydrostatic stress
p is the induced hydrostatic pressure



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.

Elastic module at 23 °C (MPa)	
R996T	540
(media) PEX	623 ÷ 890

Installation

For laying operations of the R996T pipes, it is necessary to follow some easy practical rules concerning the choice of the fittings, the respect of the minimum radius of curvature, the protection from sun rays and from possible accidental damage. The connection to the distribution manifolds and to the system terminals is made by means of Giacomini adaptors for synthetic pipes. To carry out a correct connection, it is essential to cut off the pipes with tools able to make a clean cut, without deburring and perpendicular to its axis.

In the pipe laying operations, it is necessary to make curves with minimum radius equal to 5 times the external diameter of the pipe itself.

After laying the pipe, it is opportune to carry out a pressure test of the system, so as to immediately underline eventual fluid losses.

In case of radiant panel systems, be careful when laying the covering foundation over the pipe, paying attention not to scratch the pipes, or crush them when using other tools or items such as a wheel barrow.

You have to avoid the pipes remaining exposed for long periods to the sun radiation or to fluorescent lamps, keeping the unused coils in their cartons, to prevent the ultraviolet rays from altering the chemical and physical characteristics.

In case of radiant panel systems, it is good practise to lay above the pipes a foundation of at least 3 cm, to avoid cracks due to thermal expansion.

While crossing eventual expansion joints, it is important to protect the pipe with a sleeve, to prevent excessive mechanical stresses.

Precautions

The use of R996T pipes requires the observance of certain requirements, needed to guarantee the lifetime and the operation.

1) Store the pipes in the appropriate packaging, avoiding their direct exposure to sun rays, and store in covered and dry places, preventing the humidity damageing the boxes.

2) Avoid the pipes coming into contact with sharp edges or articles able to scratch them and trigger a cogging phenomenon, paying particular care in the installation and transport phases.

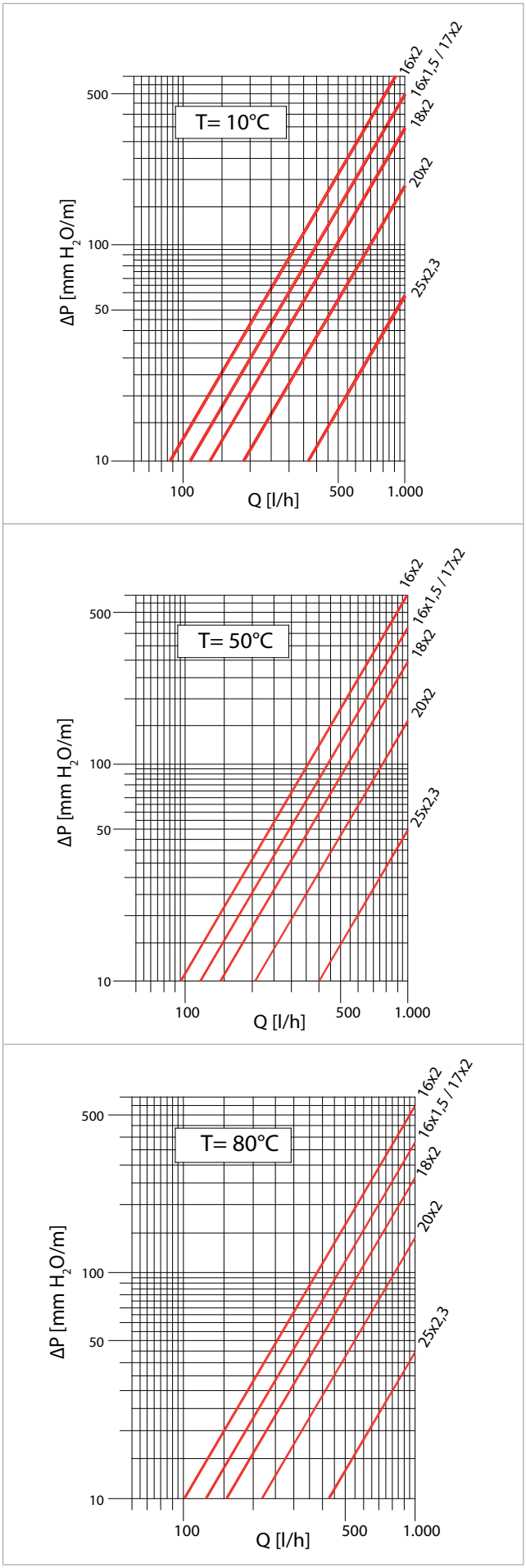
3) Avoid the ice formation inside the pipes and the packaging, because the expansion due to the status passage could cause a crack.

4) Prevent the pipes coming into contact with free flames or with other heat sources, able to provoke fusions, even partial.

5) During the eventual fixing to electrowelded network, use plastic material clamps, instead of metallic, to avoid the pipe damage.

6) Avoid the contact with chemical solvents or paints that could damage the pipes.

Pressure losses



Guarantee

All products and components supplied by Giacomini S.p.A. are subjected to the European norms in force as regards to guarantee and responsibility (1994/44/CE Directive, 2001/95/CE Directive and CEE 85/374).

The guarantee is not valid in the following cases:

1. If the working conditions are different from the prescribed ones;
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 the pipe shows defects already present at the installation time due to accidental factors, visually perceivable in the laying phase, or at the system pressure test;
5. If the pipe is installed using components not produced by Giacomini S.p.A. or anyway different from the allowed ones.

Reference standards

• DIN 16892

Cross-linked high-density polyethylene (PEX) pipes. General qual-ity requirements and testing.

• EN ISO 15875

Plastic piping for hot and cold water installation – Cross-linked polyethylene (PEX).

ADD ON

EN ISO 15875

Classification of the working 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 Sanitary hot water (60 °C)	60	49	80	1	95	100
CLASS 2 Sanitary hot water (70 °C)	70	49	80	1	95	100
CLASS 4 Underfloor heating and low-temperature radiators	20 plus 40 plus 60	2,5 20 25	70	2,5	100	100
CLASS 5 Radiator heating at a high temperature	20 plus 60 plus 80	14 25 10	90	1	100	100

- Operating temperature (T_{oper}): operating temperature envisaged 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 are not working (the time period possible and allowed for this value is 100 h over 50 years of continuous operation).

For each application class, 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.