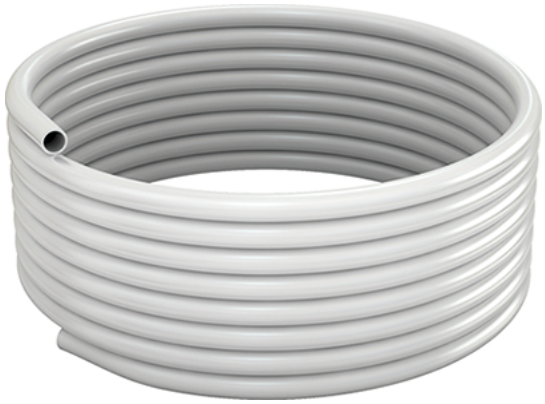
# R996TW

Water Management | Radiant Systems | Energy Management

# PEX-b pipes with anti-oxygen barrier

Datasheet
**1188EN 05/2025**



R996TW pipes in PEX-b (polyethylene crosslinked with the silane method - crosslinking degree > 65%) can be used for the water distribution in heating and/or cooling systems and domestic water systems.
The chemical crosslinking process gives them mechanical, chemical, and thermal characteristics, making them suitable for use with high quality and reliability.
The production ensures the creation of a completely non-toxic product, suitable for the distribution of water for domestic uses (Italian D.M. 174 of 06/04/2004).
All R996TW pipes are extruded with an external anti-oxygen barrier in EVOH, in compliance with EN ISO 15875 and DIN 4726 standards, making the modest amount of oxygen that permeates from the outside to the inside of the pipe completely negligible.

## Versions and codes

### Pipe rolls

| PRODUCT CODE | SIZE [mm] | PACK [m] | PIPE COLOR |
|---|---|---|---|
| R996Y140 | 16 x 1,8 | 100 | Neutral |
| R996Y141 | | 240 | |
| R996Y142 | | 600 | |
| R996Y130 | 16 x 2,2 | 100 | |
| R996Y157 | 20 x 1,9 | 100 | |
| R996Y131 | 20 x 2,8 | 100 | |
| R996Y159 | 25 x 2,3 | 50 | |
| R996Y132 | 25 x 3,5 | 50 | |

### Pipe bars

| PRODUCT CODE | SIZE [mm] | PACK [m] | PIPE COLOR |
|---|---|---|---|
| R996Y155 | 16 x 1,8 | 4 | Neutral |
| R996Y156 | 20 x 1,9 | 4 | |
| R996Y158 | 25 x 2,3 | 4 | |
| R996Y160 | 32 x 2,9 | 4 | |
| R996Y135 | 32 x 4,4 | 4 | |
| R996Y161 | 40 x 3,7 | 4 | |
| R996Y134 | 40 x 5,5 | 4 | |



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# Technical data

- Application classes (EN ISO 15875): 1, 2, 4, 5
- Density a 23 °C: > 0,948 g/cm³
- Crosslinking degre > 65%
- Coefficient of linear expansion: 0,026 mm/m K
- Thermal conductivity: 0,35 W/(m K)
- Breaking load: 31 MPa
- Breaking elongation: 520%

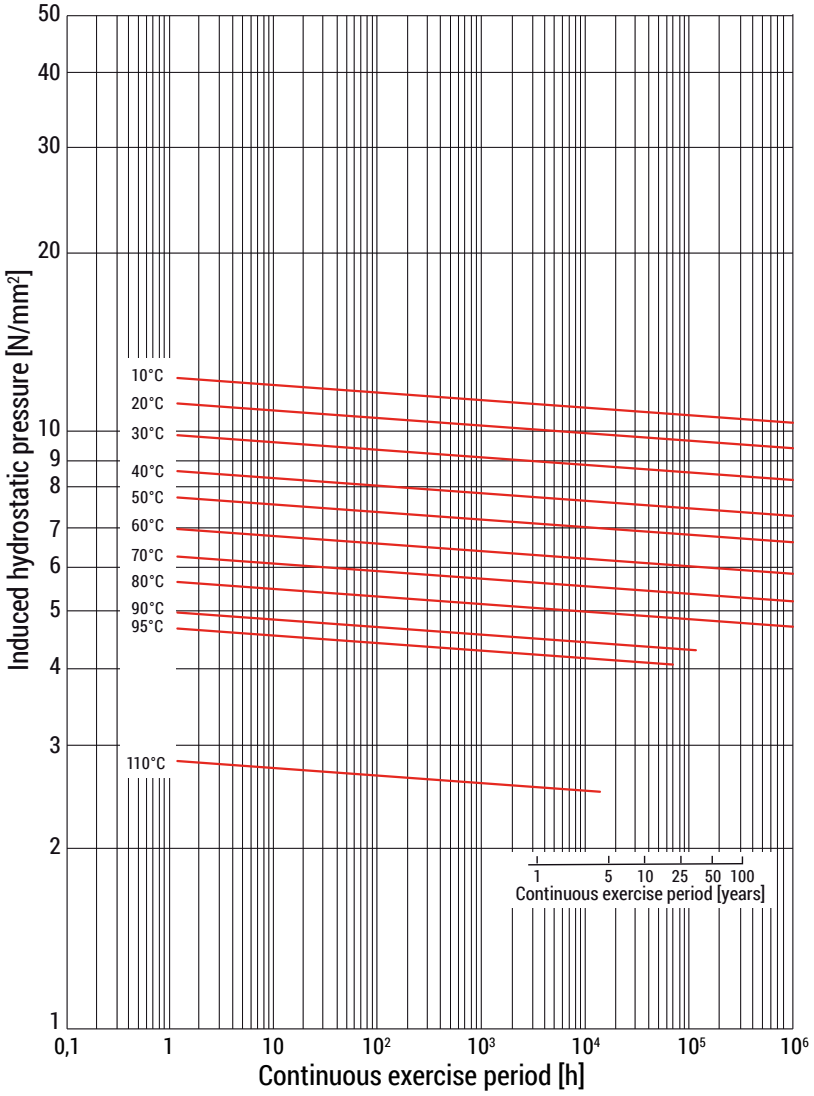
**NOTE.** All pipes are suitable for the transport of water for a period of 50 years at a temperature of 20 °C and an operating pressure of 10 bar.
**NOTE.** All heating systems must use only water or treated water as the transfer fluid.

**NOTE.** R996TW 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.

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

| SIZE | CLASS 1 | CLASS 2 | CLASS 4 | CLASS 5 |
|---|---|---|---|---|
| 16 x 1,8 | 8 bar | 8 bar | 10 bar | 10 bar |
| 16 x 2,2 | 10 bar | 10 bar | 10 bar | 10 bar |
| 20 x 1,9 | 6 bar | 6 bar | 8 bar | 6 bar |
| 20 x 2,8 | 10 bar | 10 bar | 10 bar | 10 bar |
| 25 x 2,3 | 6 bar | 6 bar | 8 bar | 6 bar |
| 25 x 3,5 | 10 bar | 10 bar | 10 bar | 10 bar |
| 32 x 2,9 | 6 bar | 6 bar | 8 bar | 6 bar |
| 32 x 4,4 | 10 bar | 10 bar | 10 bar | 10 bar |
| 40 x 3,7 | 6 bar | 6 bar | 8 bar | 6 bar |
| 40 x 5,5 | 10 bar | 10 bar | 10 bar | 10 bar |

**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)

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

s: pipe nominal thickness
d: pipe nominal diameter

### Regression curve

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

σ: hydrostatic stress
p: induced hydrostatic pressure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# Losses of pressure

## Losses of pressure with water at 50 °C

| Flow rate [l/h] | 16 x 1,8 (Øint 12,4 mm) [kPa/m] | 16 x 2,2 (Øint 11,6 mm) [kPa/m] | 20 x 1,9 (Øint 16,2 mm) [kPa/m] | 20 x 2,8 (Øint 14,4 mm) [kPa/m] | 25 x 2,3 (Øint 20,4 mm) [kPa/m] | 25 x 3,5 (Øint 18,0 mm) [kPa/m] | 32 x 2,9 (Øint 26,2 mm) [kPa/m] | 32 x 4,4 (Øint 23,2 mm) [kPa/m] | 40 x 3,7 (Øint 32,6 mm) [kPa/m] | 40 x 5,5 (Øint 29,0 mm) [kPa/m] |
|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 0,013 | 0,024 | 0,003 | 0,008 | - | - | - | - | - | - |
| 72 | 0,044 | 0,064 | 0,012 | 0,024 | - | - | - | - | - | - |
| 108 | 0,090 | 0,128 | 0,023 | 0,049 | - | - | - | - | - | - |
| 144 | 0,151 | 0,209 | 0,040 | 0,072 | - | - | - | - | - | - |
| 180 | 0,225 | 0,313 | 0,059 | 0,113 | 0,019 | 0,035 | - | - | - | - |
| 216 | 0,313 | 0,425 | 0,082 | 0,152 | 0,027 | 0,049 | - | - | - | - |
| 252 | 0,413 | 0,554 | 0,109 | 0,201 | 0,036 | 0,063 | - | - | - | - |
| 288 | 0,526 | 0,698 | 0,139 | 0,248 | 0,046 | 0,081 | - | - | - | - |
| 324 | 0,656 | 0,858 | 0,171 | 0,305 | 0,056 | 0,100 | - | - | - | - |
| 360 | 0,787 | 1,027 | 0,207 | 0,369 | 0,069 | 0,120 | 0,019 | 0,036 | - | - |
| 720 | 2,736 | 3,490 | 0,723 | 1,236 | 0,237 | 0,416 | 0,067 | 0,123 | 0,023 | 0,042 |
| 1080 | 5,678 | 7,213 | 1,502 | 2,536 | 0,492 | 0,863 | 0,139 | 0,255 | 0,048 | 0,086 |
| 1440 | 9,531 | 12,139 | 2,523 | 4,245 | 0,825 | 1,449 | 0,232 | 0,429 | 0,080 | 0,146 |
| 1800 | 14,243 | 18,228 | 3,774 | 6,347 | 1,232 | 2,166 | 0,347 | 0,640 | 0,118 | 0,217 |
| 2160 | 19,777 | - | 5,243 | 8,834 | 1,712 | 3,010 | 0,481 | 0,889 | 0,164 | 0,302 |
| 2520 | 26,104 | - | 6,925 | 11,698 | 2,260 | 3,975 | 0,635 | 1,174 | 0,216 | 0,398 |
| 2880 | 33,196 | - | 8,811 | 14,931 | 2,877 | 5,059 | 0,081 | 1,494 | 0,275 | 0,506 |
| 3240 | 41,037 | - | 10,897 | - | 3,558 | 6,258 | 1,000 | 1,848 | 0,340 | 0,626 |
| 3600 | - | - | 13,178 | - | 4,305 | 7,572 | 1,210 | 2,235 | 0,412 | 0,757 |
| 3960 | - | - | 15,651 | - | 5,114 | 8,997 | 1,437 | 2,655 | 0,489 | 0,899 |
| 4320 | - | - | 18,311 | - | 5,986 | 10,531 | 1,681 | 3,107 | 0,572 | 1,051 |
| 5040 | - | - | 24,183 | - | 7,911 | - | 2,221 | 4,106 | 0,756 | 1,390 |
| 5760 | - | - | 30,771 | - | 10,076 | - | 2,829 | 5,228 | 0,962 | 1,769 |
| 6480 | - | - | 38,057 | - | 12,473 | - | 3,501 | 6,472 | 1,190 | 2,189 |
| 7200 | - | - | 46,025 | - | 15,099 | - | 4,236 | 7,833 | 1,440 | 2,649 |
| 7920 | - | - | - | - | 17,949 | - | 5,034 | 9,310 | 1,711 | 3,148 |
| 8640 | - | - | - | - | 21,020 | - | 5,895 | 10,902 | 2,003 | 3,685 |
| 9360 | - | - | - | - | 24,308 | - | 6,815 | - | 2,315 | 4,260 |
| 10080 | - | - | - | - | 27,811 | - | 7,796 | - | 2,648 | 4,873 |
| 10800 | - | - | - | - | 31,525 | - | 8,836 | - | 3,001 | 5,523 |
| 12600 | - | - | - | - | 41,725 | - | 11,689 | - | 3,969 | 7,306 |
| 14400 | - | - | - | - | 53,202 | - | 14,899 | - | 5,058 | 9,311 |
| 16200 | - | - | - | - | - | - | 18,458 | - | 6,264 | 11,533 |
| 18000 | - | - | - | - | - | - | 22,359 | - | 7,586 | - |
| 19800 | - | - | - | - | - | - | 26,595 | - | 9,022 | - |
| 21600 | - | - | - | - | - | - | 31,163 | - | 10,569 | - |
| 23400 | - | - | - | - | - | - | 36,057 | - | 12,226 | - |
| 25200 | - | - | - | - | - | - | - | - | 13,992 | - |
| 27000 | - | - | - | - | - | - | - | - | 15,866 | - |
| 28800 | - | - | - | - | - | - | - | - | 17,846 | - |
| 30600 | - | - | - | - | - | - | - | - | 19,932 | - |
| 32400 | - | - | - | - | - | - | - | - | 22,122 | - |
| 34200 | - | - | - | - | - | - | - | - | 24,415 | - |
| 36000 | - | - | - | - | - | - | - | - | 26,810 | - |

## Correction factor for temperatures different from 50 °C

| °C | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Factor | 1,208 | 1,174 | 1,144 | 1,115 | 1,087 | 1,060 | 1,039 | 1,019 | 1,000 | 0,982 | 0,965 | 0,954 | 0,943 | 0,928 | 0,923 | 0,907 | 0,896 | 0,878 |

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## Pipe laying

**NOTE.** Given the wide range of fittings, it is recommended to refer to the latest update of the commercial catalog to identify the available sizes and codes, along with their respective fields of application.

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.

## Precautions

The main rules to follow are:

- Store the pipes in the appropriate packaging, by avoiding their direct exposition to sun rays.
- Store the pipes 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.
- Cut the pipe with appropriate shears capable of making a clean, burr-free cut perpendicular to the pipe's axis.
- 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.
- Fixing the pipes using 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.



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## 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 1<br>Hot domestic water (60 °C) | 60 | 49 | 80 | 1 | 95 | 100 |
| CLASS 2<br>Hot domestic water (70 °C) | 70 | 49 | 80 | 1 | 95 | 100 |
| CLASS 4<br>Floor heating and low-temperature systems | 20<br>+<br>40<br>+<br>60 | 2,5<br>+<br>20<br>+<br>25 | 70 | 2,5 | 100 | 100 |
| CLASS 5<br>Radiator heating and high-temperature systems | 20<br>+<br>60<br>+<br>80 | 14<br>+<br>25<br>+<br>10 | 90 | 1 | 100 | 100 |

- 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 specification

**R996TW**

PEX-b pipe in crosslinked polyethylene, with EVOH external anti-oxygen barrier. Application classes (EN 15875): 1, 2, 4, 5 (suitable for the distribution of domestic water). Neutral pipe color. Density at 23 °C: > 0,948 g/cm$^3$. Thermal conductivity: 0,35 W/m K. Coefficient of linear expansion: 0,026 mm/m K . Breaking load: 31 MPa. Breaking elongation: 520%.

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.

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.

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