



# HIGH PERFORMANCE PIPES ECOPECS

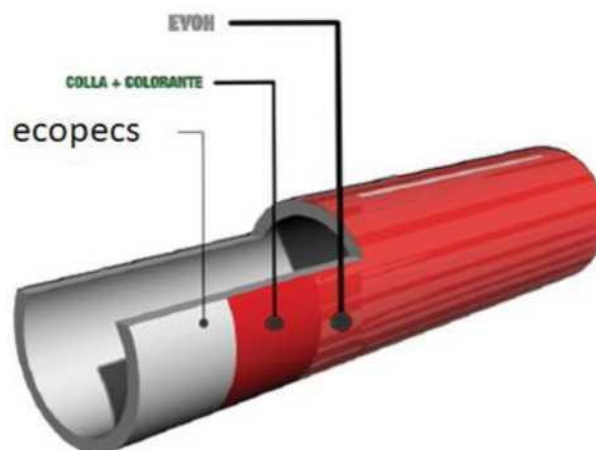
|                |
|----------------|
| Scheda tecnica |
| 01/10/18       |
| REV 2.1        |

## 01 GENERAL DESCRIPTION :

The ECOPECS EUROTHER pipe is a three-layer product:

1. The innermost layer is made of polyethylene with increased thermal resistance, has an extremely smooth surface and allows a drastic reduction in load losses compared to the traditional pipe for installations using solar energy.
2. The intermediate layer consists of a chemically modified resin designed to maintain its adhesive properties over time and is used to provide a perfect seal of the last layer of the pipe.
3. The last layer is composed of EVOH (ethylene-vinyl-alcohol) and represents a barrier of 80 pm (the legally established limit is 50 pm), which makes the pipe practically impermeable to oxygen and allows a drastic reduction of corrosion problems in heating systems where plastic pipes are combined with materials sensitive to these phenomena.

Combined with a co-extrusion method, an innovative method in which the 3 materials of which the pipe is composed are extruded simultaneously to reduce the risk of possible impurities between the layers due to the several treatments to zero.



### EVOH – Glue and colorant - ECOPECS

The Hi-Performance Ecopecs Eurothex pipe is manufactured in accordance with standard EN ISO 22391-2, with oxygen barrier (EVOH according to DIN 4726) and in accordance with standard UNI-EN 1264-4 (Surface embedded heating: systems and components, Installations)

|                |
|----------------|
| Scheda tecnica |
| 01/10/18       |
| REV 2.1        |

## Advantages of the Ecopecs Eurothex pipe

- **Flexibility:** The Ecopecs pipe has more flexibility than cross-linked PE-x pipes, which makes installation faster, especially in cold weather.
- **High temperature resistance:** its maximum operating temperature is 95 ° C and its maximum peak temperature is 110 ° C.
- **High resistance to pressure**
- **Minimal loss when loaded**
- **Excellent thermal conductivity**
- **Fully recyclable**
- **Non-toxic**, therefore can be used for food liquids and drinking water in accordance with DM 174/2004

## 02 TECHNICAL SPECIFICATIONS:

The entire production process of Ecopecs Eurothex Hi-Performance pipes is subject to constant quality control related to:

- Size: of the production line and of the finished pipe, according to EN ISO 3126
- Reactivity to heat, according to ISO 2505
- Internal pressure resistance according to EN ISO 1167
- Oxygen permeability
- Elongation at break according to ISO 6259

The pipe marking includes

- Eurothex - our trade mark
- Pipe description
- Outer diameter and thickness
- EN ISO 22391 - reference standard for production and certification
- Application class and pressure
- EVOH indication according to DIN 4726
- Made in Italy - country of manufacture
- Date and time of production
- Batch
- Sizes

|                |
|----------------|
| Scheda tecnica |
| 01/10/18       |
| REV 2.1        |

| $d_n$ (mm)   | $e_n$ (mm) | Weight (g/m) | Water content (l/m) |
|--|------------|--------------|---------------------|
| 17   | 2          | 97           | 0,13                |
| $d_n$ = nominal outer diameter, $e_n$ = wall thickness |            |              |                     |

## TECHNICAL SPECIFICATIONS

| Specification                              | Value   | U.m.               | Regulation                                    |
|--|---------|--------------------|---|
| Reference standard                         |         |                    | DIN EN ISO 15875 -DIN 4726<br>EN ISO 22391-2* |
| Density (bulk density) at 23°C.            | 941     | Kg/m <sup>3</sup>  | ISO 1183                                      |
| Weight per meter of pipe                   | 0.096   | Kg/m               |   |
| Field of application                       | +5/+100 | °C                 |   |
| Thermal conductivity (at 60 ° C)           | 0.40    | W/mk               |   |
| Coefficient of thermal expansion           | 0.18    | mm/m°C             |   |
| Oxygen permeability at 40 ° C.             | <0.1    | g/m <sup>3</sup> d |   |
| Pipe roughness (Ra)                        | 1.0     | µm                 | DIN EN ISO 4287                               |
| Elasticity module                          | 645     | MPa                |   |
| Internal tension lengthwise                | <2      | %                  | EN ISO 22391-2                                |
| Tensile strength when dragging             | ~20.3   | MPa                |   |
| Minimum permitted bending radius           | 5d      | Mm                 | DIN 4726                                      |
| Elongation at break                        | 780     | %                  |   |
| Internal pressure resistance               |         |                    |   |
| At 20 ° C with bending $\sigma = 10.8$ MPa | >1      | hour               | EN ISO 22391-2                                |
| At 95 ° C with bending $\sigma = 3.9$ MPa  | >22     | hours              | EN ISO 22391-2                                |
| At 95 ° C with bending $\sigma = 3.7$ MPa  | >165    | hours              | EN ISO 22391-2                                |
| At 95 ° C with bending $\sigma = 3.6$ MPa  | >1000   | hours              | EN ISO 22391-2                                |

\* EN ISO 22391-2 "Plastic piping systems for hot and cold water installations. Polyethylene with increased heat resistance (PE-RT)

## Recommendations for storage and packaging

The pipe is supplied in packages that protect it during the storage period. Prolonged exposure to ultraviolet rays causes irreparable damage to the pipes. It is recommended that IT IS NOT TO BE EXPOSED TO DIRECT SUNLIGHT

|                |
|----------------|
| Scheda tecnica |
| 01/10/18       |
| REV 2.1        |

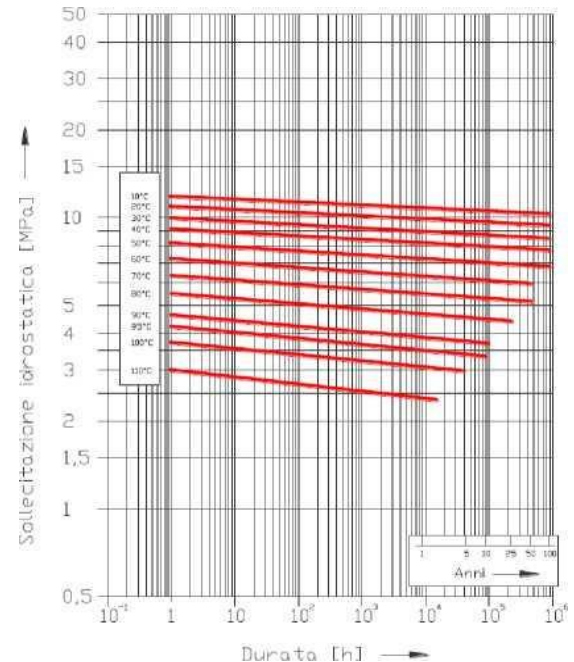
## REGRESSION GRAPH

The following graph illustrates the classical regression curves related to peripheral stresses (Hopp Stress) and notes that the regression curves do not represent the typical “knee” of the regression curves of the Pe-x, PP pipes.

Until recently, this graph was used by applying simple mathematical formulas, the maximum working pressure under certain conditions of use

However, the new regulation requires various checks, introducing application classes corresponding to operating pressures for certain combinations of temperature cycles.

Therefore, regression curves are used only to give a qualitative comparison, while the following table is used to obtain quantitative information.



Graph 1 - Diagram, prepared in accordance with EN ISO 22391-2

### \*Graph 1 – legend

Hydrostatic load [MPa]

Duration [h] Years ->

### Field of application by class of application

|   |         |   |                           |                |
|---|---------|---|---------------------------|----------------|
| Operating condition according to regulation: DIN EN ISO 22391-2 | CLASS 1 | Filling with hot water (60°C)                     | T <sub>ma</sub><br>x 80°C | Pressure 9 bar |
|   | CLASS 2 | Filling with hot water (70°C)                     | T <sub>ma</sub><br>x 80°C | Pressure 9 bar |
|   | CLASS 4 | Underfloor heating and low temperature radiators  | T <sub>ma</sub><br>x 80°C | Pressure 9 bar |
|   | CLASS 5 | Underfloor heating and high temperature radiators | T <sub>ma</sub><br>x 90°C | Pressure 7 bar |

### Application classes\*\*

| Application class | Operating conditions for a period of 50 years and 100 hours, of which   | Field of application                             |
|-------------------|---|--|
| CLASS 1           | 49 years at an operating temperature (TD) of 60 ° C, 1 year at a maximum temperature (Tmax) of 80 ° C and 100 hours at a fault temperature (Tmal) of 95 ° C.  | Filling with hot water (60°C)                    |
| CLASS 2           | 49 years at operating temperature (TD) of 70 ° C, 1 year at maximum temperature (Tmax) of 80 ° C and 100 hours at fault temperature (Tmal) of 95 ° C.   | Filling with hot water (70°C)                    |
| CLASS 4           | 2.5 years at an operating temperature (TD) of 20 ° C, 20 years at an operating temperature (Td) of 40 ° C, 25 years at an operating temperature (TD) of 60 ° C, 2.5 years at a maximum temperature (Tmax) of 70 ° C and 100 hours at a fault temperature (Tmal) of 100 ° C. | Underfloor heating and low temperature radiators |
| CLASS 5           | 14 years at operating temperature (TD) of 20 ° C, 25 years at operating temperature (Td) of 60 ° C, 10 years at operating temperature (TD) of 80 ° C, 1 year at maximum temperature (Tmax) of 90 ° C and 100 hours at a fault temperature (Tmal) of 100 ° C.                | Underfloor heating and low temperature radiators |

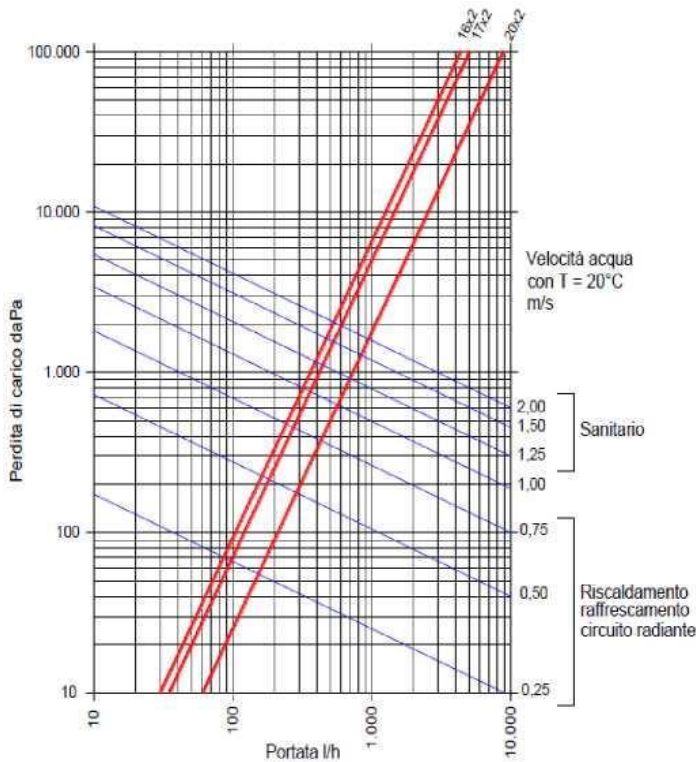
\*\*All systems that meet one of the above application classes can be used to transport cold water at 20 ° C for a period of 50 years at an operating pressure of 10 bar

|                |
|----------------|
| Scheda tecnica |
| 01/10/18       |
| REV 2.1        |

**DYNAMIC CHARACTERISTICS OF FLUID**

obtained at 20 ° C room temperature and pressure 1 atm

| D(mm) | Di | Kv (m <sup>3</sup> /h) |
|-------|----|------------------------|
| 16x2  | 12 | 4.4                    |
| 17x2  | 13 | 5.1                    |
| 20x2  | 16 | 8,9                    |



**\*Graph legend**

Load loss daPa

Capacity l/h

Water speed at T = 20°C

Sanitary values

Warming up  
cooling  
radiation circuit

eurothex

HI-performance

“B2B LTD” [B2B S.r.L.]

Registered office: “IV novembre“ Sq., 7 - 20124 MILAN  
(MILAN province) Tel.: 0292852504

Offices and warehouses: “Della Cantina” str. no number, township of Groppoli- 54026  
Mulazzo ( province of Massa-Carrara)

Telephone 0187851008 Fax 0187850542 e-mail: [tecnico@eurothex.it](mailto:tecnico@eurothex.it) - [www.eurothex.com](http://www.eurothex.com)

VAT Id/ Tax number 01283940458 - Registered capital 400.000,00 Euro