



 **ECOTECH**

———— FLEXIBLE PREINSULATED PIPES —————

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pipes

Our production site

Based in Casalromano, near Mantua, about 100 km from Milan, our plant covering an area of 50,000 square metres [5,000 of which are roofed], we manufacture PE, PEX, stainless steel flexible preinsulated pipes in coils,

both in UNO or DUO and using the latest technology systems thus ensuring the best performances as required by our customers.



ECOPEX manufacturing plant



The ECOPEX® system

The ECOPEX® preinsulated pipe system, complying with standard BS EN 15632-1/2, consists of a PE-Xa carrier pipe complete with an EVOH oxygen diffusion barrier, thermally insulated with CFC free polyurethane flexible foam, protected with a PE-LD polyethylene outer casing. One of our main benefits is that the installation times are reduced when compared with other pipe systems.

The ECOPEX® preinsulated pipe system is used to convey various fluid types and provides full corrosion protection as components are non-corrodible. Pipes are provided in cut-to-measure lengths to suit your requirements and are securely strapped and wrapped in coiled rolls. Being light and flexible, the pipes can be laid easily, quickly and safely avoiding obstacles and when diversions are to be made.



Advantages of the ECOPEX® system



COST SAVINGS: Innovative and streamlined manufacturing process offering best prices



FLEXIBLE & LIGHT: Lightweight construction and reduced bending radii with greater flexibility and easy handling enables faster installations



ENERGY EFFICIENT: Excellent thermal insulation $\leq 0,023$ W/m.K reducing energy losses substantially



RESISTANT: First class materials resistant to corrosion and incrustation



RELIABILITY & DURABILITY: Quality materials and components manufactured to the highest standards providing long service life



FAST: Pipe coils delivered in long lengths reducing the number of underground joints consequently reducing installation times



REDUCED EXCAVATIONS: Smaller outer diameters meaning narrower and shallower trenches speeds up construction works and leads to groundwork cost savings



COMPLETE RANGE: Wide range of first class fittings (press or compression), Underground outer-case jointing methods and accessories guarantee long service life

FIELDS OF APPLICATION OF THE ECOPEX® SYSTEM



HEATING



COOLING



CONDITIONING



BIOGAS



SOLAR ENERGY



BIOMASS



GEOTHERMAL ENERGY



LANDFILL GAS



WASTE INCINERATORS

Flexibility and energy efficiency

Build preinsulated pipe systems with ease of installation and with the best existing technology.



District heating systems will be progressively more competitive if their global efficiency is increased. One of the main actions to implement in order to reach that increased efficiency is decreasing the operating temperature. In the literature, “the 4th generation district heating systems” are traditionally identified as the ones characterized by a limited operating temperature and, as a consequence, by high efficiency

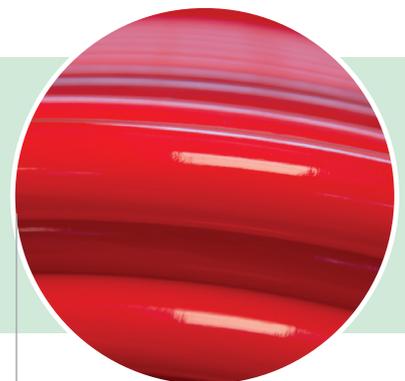
during operation. Bearing in mind the reduction of operating temperatures, the pipelines with plastic service pipes will be used more predominantly in the manufacture of district heating systems. ECOPEX® flexible preinsulated pipes represent the ideal solution to realise small and medium district heating networks characterized by limited operating temperatures, for industrial, commercial and residential applications.



Large material stock



Quality packing for safe delivery and installation



Highest quality original products from leading international brands

Reliability and durability

Maximum quality for long-lasting reliable solutions



Accessories and fittings

We can offer a wide range of mechanical joints including both press type or compression type fittings. Shrink joint insulation and sealing kits are provided using the same quality and methods applied for manufacturing the district heating networks. Alternatively clip shells can be provided which can be used with the need for specialist tools. All joint kits can be pressure tested for quality and reliability purposes and are easy and quick to install guaranteeing a long service life.

Safety over time

ECOPEX® is a "bonded" system. The three main elements (carrier pipe, PUR foam and outer casing) are bonded

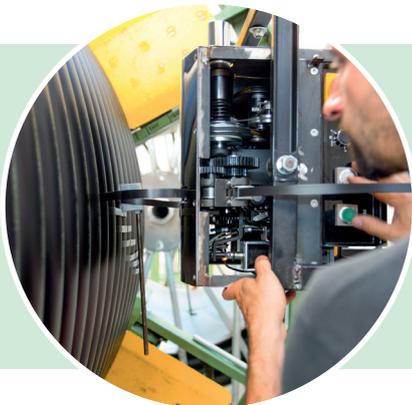
to each other in order to create a mono-block system. This prevents water tracking down the pipe into the buildings, should the casing be unintentionally breached or the assembly joint fittings fail, for example during re-opening of the excavations for laying new networks.

Reduced excavations

Due to the reduced outer diameter of the ECOPEX® preinsulated flexible pipe, the system can be laid in narrower and shallower trench excavations when compared with other types of pipe systems. Reduced trench excavations result in reduced groundwork costs which in turn speed up the progress of construction work thus leading to further cost savings.

Knowledge in the sector.....

Experienced and innovative we can meet all of your requirements



● **THE SAFETY OF A TRADEMARK**

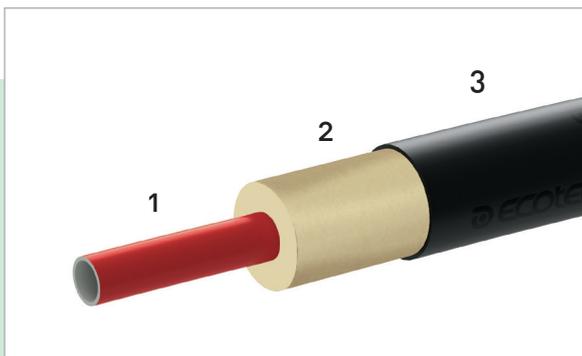
ECOPEX® is a product guaranteed by over 40 years worth of experience and expertise in the manufacturing of preinsulated pipes. Our wide range of accessories guarantees a suitable solution for any given application or possible situation arising on site. Our internal system of Quality Control and Assurance and the compliance to all the International Standards ensure our materials reach the maximum performance requirements. One of our key strengths is our ability to process material orders and deliver within a short space of time.

● **OTHER ADVANTAGES FOR OUR CUSTOMERS**

- We manufacture in compliance with BSEN 15632-1/-2
- PE-Xa crosslinked polyethylene carrier pipes
- PE-LD outer casing for a tough, durable, water tight seal and mechanical protection
- Wide range of press, compression and welding joints
- No requirement for compensation of the pipe system due to thermal expansion
- Long coils supplied sealed for a simple, quick and safe laying
- Upon request we can supply special insulation specifications to meet your requirements
- Special components, according to the customer's technical specification and requirements, can be supplied in a short space of time.

ECOPEX

Features



ECOPEX PIPE

The main components in the ECOPEX® pipes are:

- Carrier pipe (1)
- Insulation (2)
- Outer casing (3)



CARRIER PIPE

The carrier pipe is manufactured using high pressure cross-linked polyethylene (PE-Xa), complying with the Standards DIN 16892 and DIN 16893.

PE-Xa pipes are available in varying thicknesses in order to guarantee resistances in two classes of operating pressure (6 BAR and 10 BAR). The carrier pipes are cross-linked adding peroxide which undergoes high pressures and temperatures. This process produces macromolecules which join together forming a crosslinked structure.

6 BAR ECOPEX CARRIER PIPE

6 BAR ECOPEX® pipes are mainly used for district heating and cooling applications. For this reason, they are equipped with an EVOH oxygen barrier in compliance with the standard DIN 4726.



10 BAR ECOPEX CARRIER PIPE

10 BAR ECOPEX® pipes are used for conveying potable water and therefore may undergo higher operating pressures. For this purpose, they are manufactured with thicker walls which have undergone special thermal treatment in order to guarantee the quality of the potable water.

PE-XA CARRIER PIPE FEATURES

- Excellent chemical resistance
- Low friction coefficient (e = 0,007 mm at 60°C)
- No incrustation, therefore, lower maintenance costs
- Very low pressure loss
- Carrier pipes with EVOH barrier against oxygen diffusion
- High corrosion resistance
- Excellent break strength for heat stress over long term
- Memory Effect: PE-Xa memory effect guarantees perfect sealing of the connections over time
- High temperature resistance
- Sound absorption
- Huge high pressure resistance
- Toxicologically and physiologically harmless
- Excellent impact strength

IN PE-XA CARRIER PIPE CHARACTERISTIC VALUES

DENSITY	0,94 g/cm ³
Average thermal longitudinal expansion coefficient in temperature range from 0°C to 70°C	0,15 [mm/m·K]
Thermal conductivity	0,38 W/mK
Modulus of elasticity	600 N/mm ²
Surface resistance	10 ¹² Ω
Construction material class (DIN 4102)	B2 (normal entflammbar)
Surface friction coefficient	0,007 mm

Properties of PE-Xa service pipe

CHEMICAL RESISTANCE

PE-Xa service pipe demonstrates excellent resistance to chemicals.

The safety factors and temperature resistances are strictly dependent on the fluids involved. The resistances mentioned in DIN 8075, Supplement 1, generally also apply to PE-Xa which, because of its crosslinking, is even more resistant than non-crosslinked PE.

PRESSURE AND TEMPERATURE LIMITS

The following temperature and pressure limits apply in accordance with DIN 16892/93 at continuous operating temperatures for ECOPEX® pipes (application: water; safety factor: 1,25).

ECOPEX 6 BAR

Temperature limits	Pressure limits	Expected service life
40°C	11,9 bar	50 years
50°C	10,6 bar	50 years
60°C	9,5 bar	50 years
70°C	8,5 bar	50 years
80°C	7,6 bar	25 years
90°C	6,9 bar	15 years
95°C	6,6 bar	10 years

Pressure and temperature limits 6 BAR

ECOPEX 10 BAR

Temperature limits	Pressure limits	Expected service life
40°C	18,9 bar	50 years
50°C	16,8 bar	50 years
60°C	15,0 bar	50 years
70°C	13,4 bar	50 years
80°C	12,1 bar	25 years
90°C	11,0 bar	15 years
95°C	10,5 bar	10 years

Pressure and temperature limits 10 BAR

For varying pressures and temperatures, the expected service life can be determined through the "Miner's rule" according to DIN 13760. Although the pipes are designed for maximum operating temperatures of 95°C, the pipes can tolerate excess temperatures of up to 110°C for short periods. Approvals for carrier pipes and fittings – all relevant approvals and standards for fittings and carrier pipes will be supplied on request.

PIPE INSULATION

Insulation of 6 BAR and 10 BAR ECOPEX pipes is made of polyurethane foam, with CO₂ or Cyclopentane as a blowing agent. The foam is completely free from chlorofluorocarbons (CFC).

FEATURES

- Closed cells $\geq 95\%$
- High water vapour transfer coefficient, which means no moisture penetration during operation.

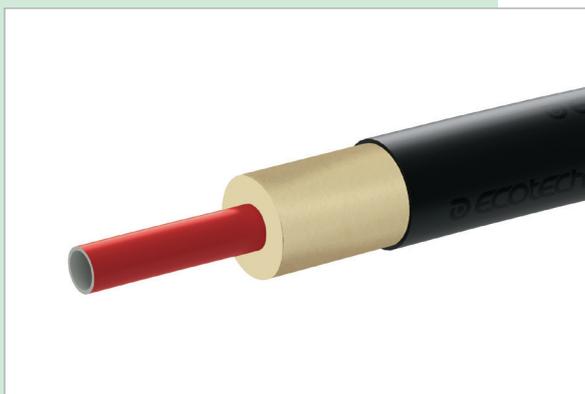
PROPERTIES OF PU INSULATION FOR 6 BAR HEATING - PENTANE-DRIVEN

Thermal conductivity at 50°	$\leq 0,023$ W/mk according to the standard EN 253
Density	≥ 50 kg/m ³
Compression strength	0,3 MPa
Long-term temperature resistance	100°C
Axial shear strength (EN 253)	$\geq 0,12$ MPa

PROPERTIES OF PU INSULATION FOR CONVEYING POTABLE WATER 10 BAR DRIVEN

Thermal conductivity at 50 °C	$\leq 0,032$ W/mk according to the standard EN 253
Density	≥ 50 kg/m ³
Compression strength	0,3 MPa
Long-term temperature resistance	100°C
Axial shear strength (EN 253)	$\geq 0,12$ MPa





ECOPEX OUTER CASING

ECOPEX® pipes are provided with water-resistant PE-LD protected outer casing.

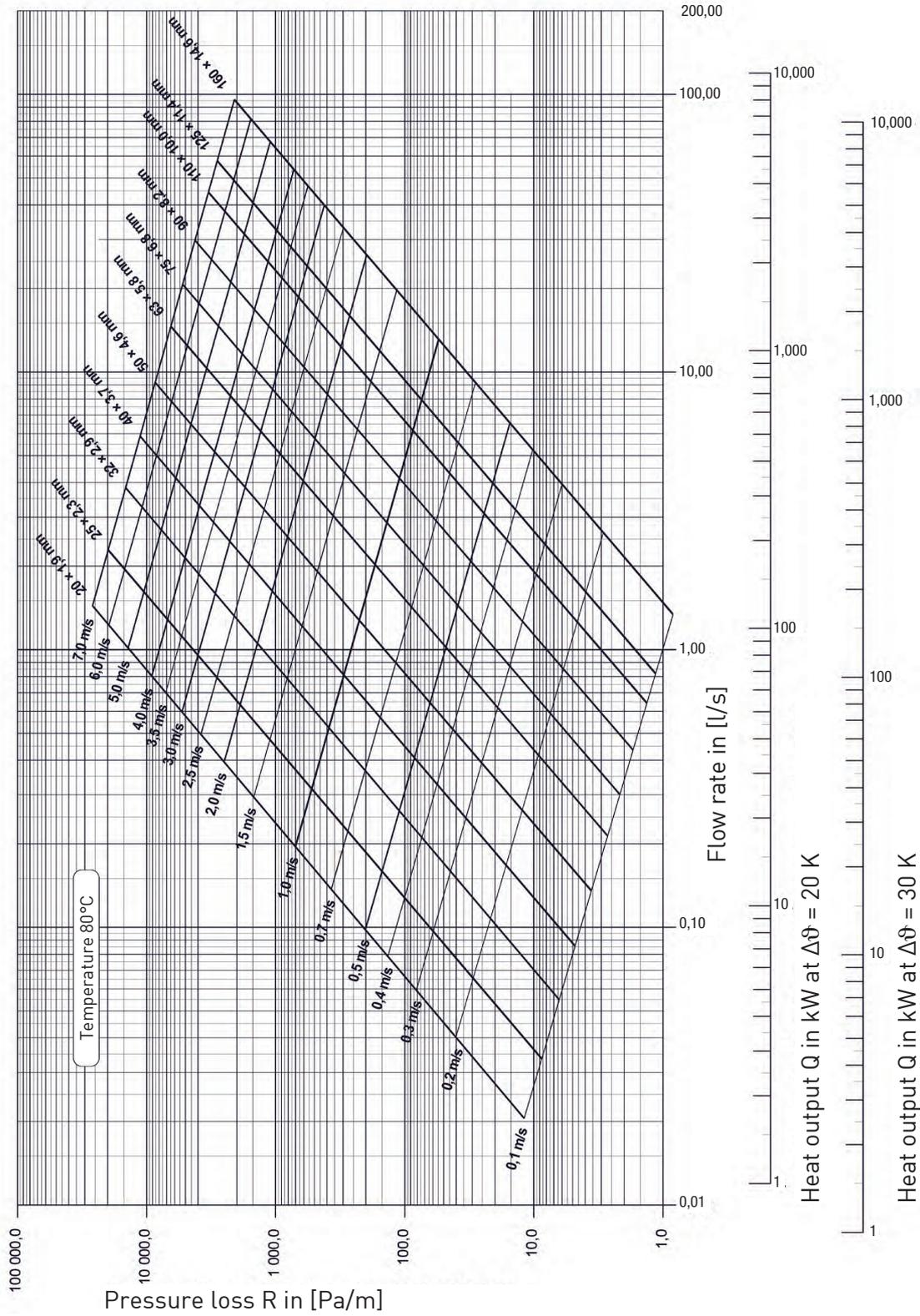
PROPERTIES OF THE OUTER CASING

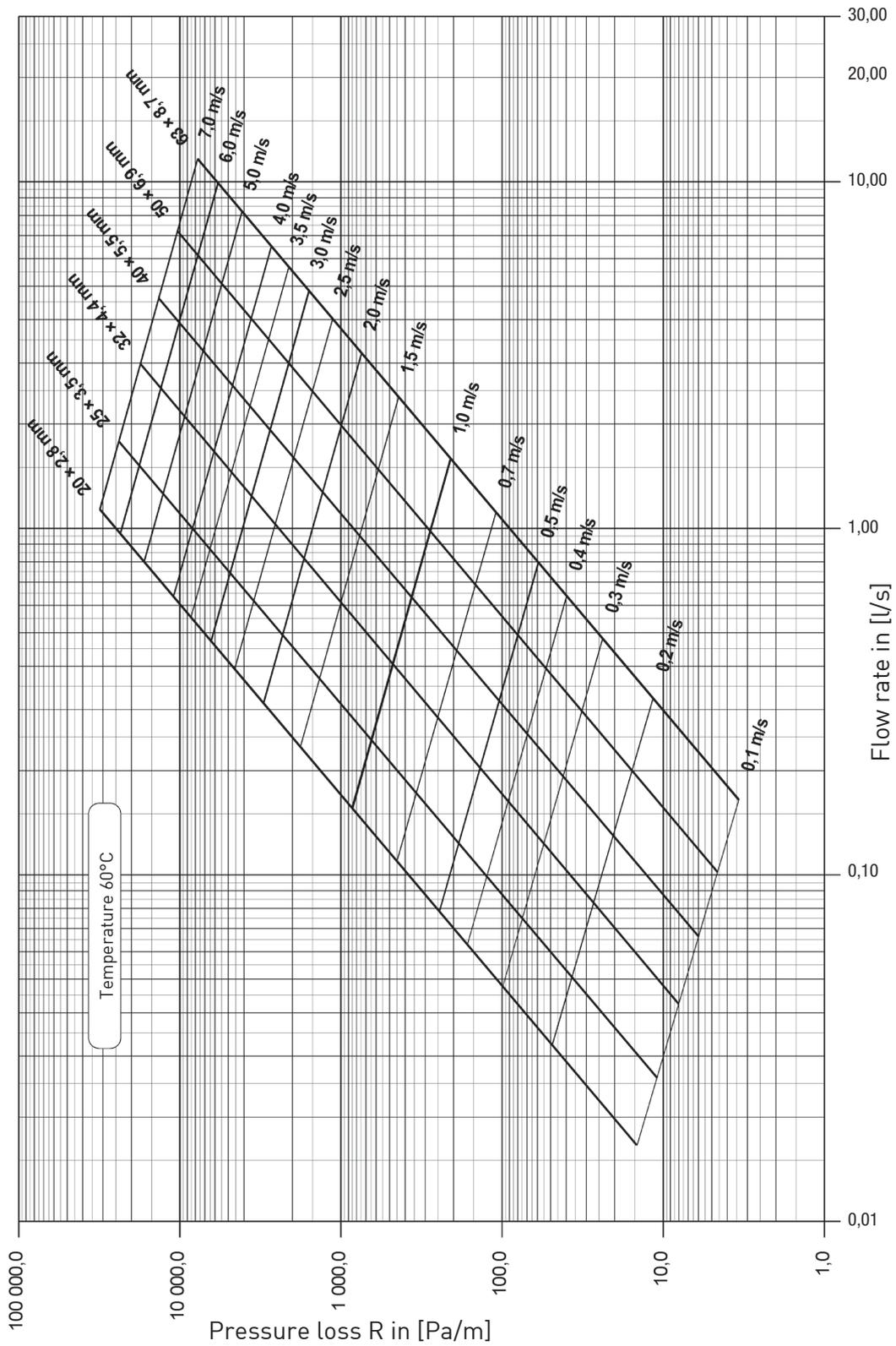
Low density polyethylene (PE-LD):

Thermal conductivity	0,33 W/mK
Cristallite melting range	122° C
Density	0,92 g/cm ³
Modulus of elasticity	325 N/mm ²
Construction material class (DIN 4102)	B2 (normal entflammbar)

FEATURES

- High quality compound due to the polyurethane foam
- Extrusion of the PE-LD outer casing around the polyurethane foam with continuous annular system
- Ideal for joint system in buried excavations with sealed heat-shrinkable products.



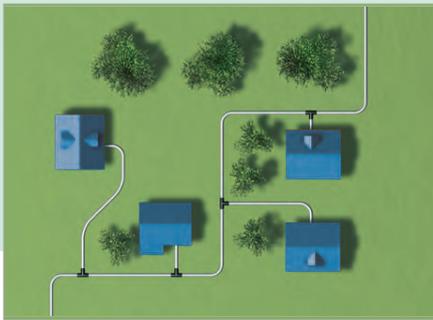


ECOPEX

Designing

GENERAL CONSIDERATIONS

With ECOPEX® pipes both complicated district heating networks and connecting lines between buildings can be achieved cost effectively. There are three different laying alternatives. Combinations are also possible.

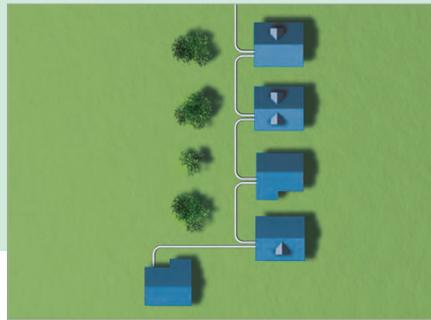


BRANCH LAYOUT

With this method, buildings are connected via branches from a main line.

FEATURES

- Maximum flexibility in designing
- Very easy installation
- Branches can be connected to the main pipe at a later stage.

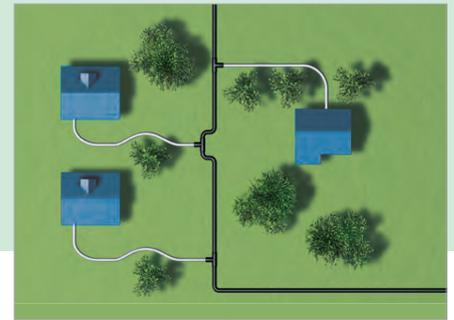


BUILDING TO BUILDING ("DAISY CHAIN") LAYOUT

In many cases, the availability of long delivery lengths of ECOPEX® pipes allows for the complete elimination of below ground joints. ECOPEX® pipe is laid from one building to the next and back.

FEATURES

No connections below ground and therefore lower installation costs.



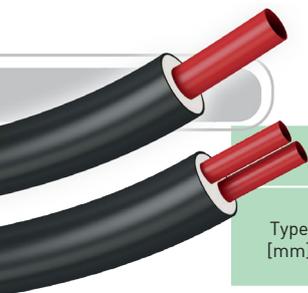
BRANCHING OFF A PLASTIC JACKETED STEEL MAIN LINE

It is possible to join preinsulated steel pipe to an ECOPEX® pipe in order to run the arterial main in steel with branches in pex.

FEATURES

- If operating temperatures of the main line are too high, it is possible to create a secondary network through a proper connection using ECOPEX® system.
- If the thermal power, ie. the volume flow of the main line is too high, branches can be added without the need for any special precautions using ECOPEX® pipes.

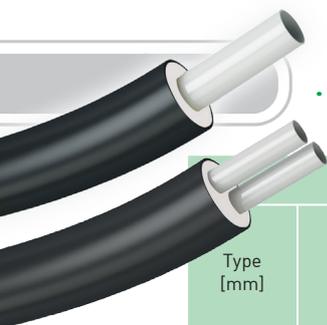
Wide range of products



ECOPEX® UNO 6 BAR HEATING				
Type [mm]	DN	Inches [-]	Bending radius [m]	Roll length up to: [m]
25/75	20	3/4	0.80	830
32/75	25	1	0.80	830
40/90	32	1 1/4	0.80	580
50/110	40	1 1/2	0.85	380
63/125	50	2	0.90	250
75/140	65	2 1/2	1.00	170
90/160	80	3	1.00	144
110/160	100	4	1.20	144
125/180	125	5	1.40	*

ECOPEX® DUO 6 BAR HEATING				
Type [mm]	DN	Inches [-]	Bending radius [m]	Roll length up to: [m]
25+25/90	20	3/4	0.80	580
32+32/110	25	1	0.85	380
40+40/125	32	1 1/4	0.90	250
50+50/160	40	1 1/2	1.00	144
63+63/180	50	2	1.20	120

* supplied upon request



ECOPEX® UNO 10 BAR SANITARY				
Type [mm]	DN	Inches [-]	Bending radius [m]	Roll length up to: [m]
25/75	20	3/4	0.80	830
32/75	25	1	0.80	830
40/90	32	1 1/4	0.80	580
50/110	40	1 1/2	0.85	380
63/125	50	2	0.90	250

ECOPEX® DUO 10 BAR SANITARY				
Type [mm]	DN	Inches [-]	Bending radius [m]	Roll length up to: [m]
25+20/90	20+16	3/4 + 5/8	0.80	580
32+20/110	25+16	1 + 5/8	0.85	380
40+25/125	32+20	1 1/4 + 3/4	0.90	250
50+32/125	40+25	1 1/2 + 1	0.90	250

Operating parameters

Operating temp.: max. 95 °C
 Continuous operating temp.: max. 80 °C
 Operating pressure: 6/10 bar

Product structure

PE-Xa service pipes
 PUR insulation with cyclopentane
 PE-LD protective coat

Fields of application

Heating, cooling, conditioning,
 biogas, solar energy,
 biomass, geothermal energy,
 landfill gas, waste incinerators

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