ECOLINE | ECOTECH

Company Profile

Pre-insulated rigid and flexible pipes

ECOTHERM® SYSTEM

BONDED pre-insulated steel pipe pag. 8

Service Pipe Material	**Steel**
Operating Pressure (bar)	**PN 25**
Operating Temperature (°C)	**120**
Peak Temperature (°C)	**140**
Dimensional Range (DN)	**25 - 800**

ECOPEX® SYSTEM

ECOPEX PIPE pag. 14

	HEATING PN6	SANITARY PN10
Service Pipe Material	**PE-Xa**	**PE-Xa**
Operating Pressure (bar)	**PN 6**	**PN 10**
Operating Temperature (°C)	**85**	**85**
Peak Temperature (°C)	**95**	**95**
Dimensional Range (De)	**25 - 125**	**20 - 75**

ECOALUPEX PIPE pag. 18

Service Pipe Material	**PEX/Aluminum/PEX multi-layer pipe**
Operating Pressure (bar)	**PN 10**
Operating Temperature (°C)	**90**
Peak Temperature (°C)	**100**
Dimensional Range (De)	**20 - 32**

ECOPEX FORTE 16 PIPE pag. 21

Service Pipe Material	**Multi-layer (PEX + aluminum oxygen barrier and para-aramid fiber)**
Operating Pressure (bar)	**PN 16**
Operating Temperature (°C)	**95**
Peak Temperature (°C)	**115**
Dimensional Range (De)	**40 - 125**

ECOFLEX PIPE pag. 24

Service Pipe Material	**Stainless steel pipe**
Operating Pressure (bar)	**PN 16**
Operating Temperature (°C)	**100**
Peak Temperature (°C)	**120**
Dimensional Range (De)	**25 - 50**

ECOLINE: HISTORY

ECOLINE'S began producing pre-insulated pipes in 1980 and has since become one of the most experienced manufacturers in Europe.
For over 40 years, every customer has been assisted with the utmost competence, professionalism, and the guarantee of continuity that is embedded in our history.

A team of professionals passes down to new generations the same principles that founded our company: the desire to prove that the trust our Clients place in us is always reciprocated with our utmost effort to exceed expectations. Reliability, short delivery times, flexibility, and innovative solutions are our strengths in providing high-performance systems and swiftly addressing unforeseen challenges on construction sites. With a fully stocked warehouse, highly qualified personnel capable of creating custom-made components, and a technical staff able to offer tailored design solutions for any installation issue, we ensure efficiency and excellence.

ECOLINE = RELIABLE PRODUCTS + QUALITY OF SERVICE

OUR PRODUCTION SITES

At the **Vescovato** site, in the province of Cremona, approximately 100 km from Milan, all types of accessories required for the construction of district heating networks are manufactured on a 60,000 m^2 area (about 10,000 m^2 covered). Each year, the facility produces more than 300,000 meters of rigid piping and 50,000 accessories.

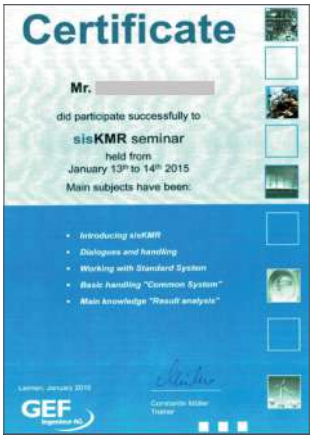
At the new **Casalromano** site, in the province of Mantua, also about 100 km from Milan, flexible pre-insulated pipes in coils are produced on a 50,000 m^2 area (5,000 m^2 covered). These pipes, available in PE, PEX, STAINLESS STEEL, and MULTILAYER, in both UNO and DUO configurations, are manufactured using state-of-the-art systems that ensure optimal performance in minimizing heat loss.

ECOLINE and **ECOTECH** plants and their respective warehouses.

ECOLINE: QUALITY AND CERTIFICATIONS

Over the years, **ECOLINE** has achieved such high-quality standards that ensure a finished product compliant with European regulations EN 253/448/488/489.

In recent years, the following additional standards have been incorporated:
- **EN 13941**, which sets criteria for the design and installation of fixed pre-insulated pipe systems for district heating;
- **EN 14419**, which pertains to monitoring systems for fixed pre-insulated pipe systems for district heating.



ECOLINE is capable of performing stress-analysis verifications of buried pre-insulated pipe networks in compliance with **EN 13491, using the specialized sisKMR® software** (always available in its latest updated version) and relying on a highly experienced technical team.

This ongoing commitment has been recognized through **TUV certification**, ensuring that all material production, system verification studies, and on-site assistance comply with ISO 9001 (quality management systems).

Since January 2012, **ECOLINE's** Vescovato (CR) facility has also been certified by **DET NORSKE VERITAS**, confirming compliance with **EHP/001 guidelines of EUROHEAT & POWER**. Additionally, since June 2012, **ECOLINE** has achieved **UNI EN ISO 14001** environmental management system certification.

CUSTOMER CARE AND SERVICES

Additional Services Offered by Our Team:

- Network Design Verification, including:
  - Installation conditions assessment
  - Stress analysis
- Material Calculation
- Training for Installation Personnel, covering:
- Laying procedures and insulation restoration at joint areas
- Training for Client's personnel responsible for pipe installation oversight
- Ongoing Design Assistance in case of route modifications
- Stress Analysis Verification due to thermal expansion
- Alarm System Design
- Provision of Installation Procedures
- Supply of Detailed Layout Plans

For over 40 years, **ECOLINE** has built customer loyalty by offering comprehensive technical support services, with one of its key strengths being a fully stocked warehouse covering all components from **DN 20 to DN 500** (for larger diameters, raw materials are readily available from our suppliers).

Even today, as 40 years ago, the exact list of required materials can only be precisely defined once excavation begins. This is where **ECOLINE** excels:
the ability to promptly respond to unexpected needs with **certified EUROHEAT & POWER** components, ensuring immediate availability.

The use of makeshift products manufactured on-site, which do not comply with applicable technical standards, should be strictly avoided.

ECOTHERM SYSTEM ®

The Ecotherm® System consists of pipes, special fittings, and accessories designed for the construction of district heating and district cooling networks.
ECOLINE manufactures pre-insulated pipes capable of transporting fluids at temperatures ranging from -200°C to +300°C. Pre-insulated piping systems for district heating and district cooling are typically used for temperatures between 0°C and 140°C. The transported fluid is usually cold water, hot water, superheated water, or low-pressure steam.

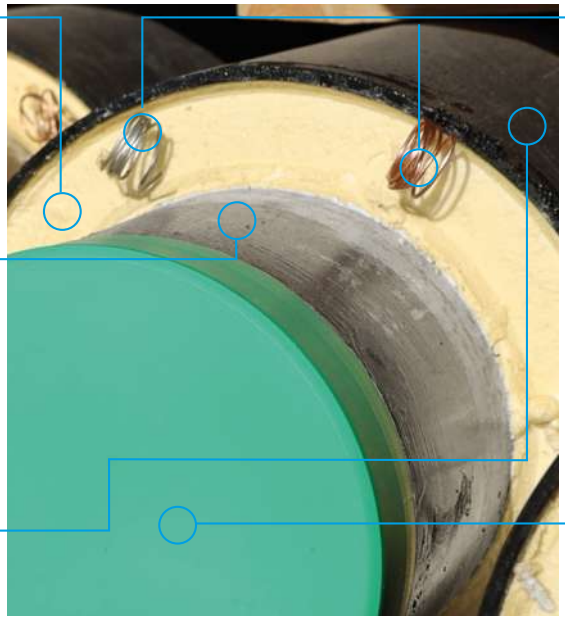
The pipes are also suitable for transporting other types of fluids. The insulation consists of high-performance polyurethane foam, while the most commonly used material for the service pipe is carbon steel.

The specifications and operational limits are detailed in the tables below. Upon request, other types of service pipes can be supplied, including: seamless steel pipes, high-grade steels, stainless steels, galvanized steels, PE (polyethylene), copper and more.

INSULATION
Rigid polyurethane foam compliant with EN 253 standard. The thermal conductivity coefficient is ≤ 0.027 W/m·K at an average temperature of 50°C.
Density: ≥ 60 kg/m^3
PUR Compression Strength: ≥ 0.3 MPa

SERVICE PIPE
Welded steel compliant with the UNI EN 10217 standard, with a minimum yield strength of 235 N/mm^2.
All steel pipes undergo hydraulic testing (or alternative methods) during manufacturing to ensure their integrity and leak resistance.
Other types of steel pipes can be supplied upon request.on request.

OUTER CASING PIPE
High-density polyethylene compliant with the EN 253 standard (SINGLE BLOCK).



SURVEILLANCE SYSTEM
The insulation includes two copper wires with a 1.5 mm^2 cross-section (one bare copper, the other tinned copper) designed for the leak detection system.
Upon request, the pipes can alternatively be equipped with a Brandes-type detection system.

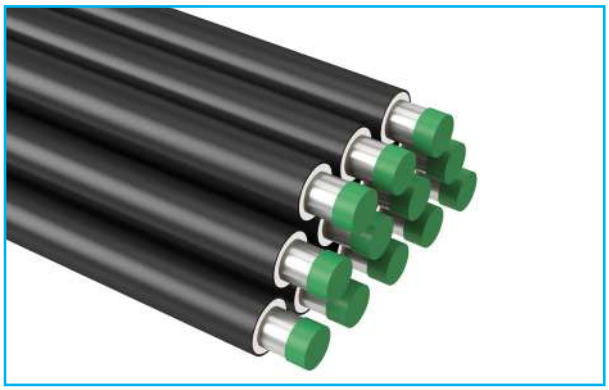
ASSEMBLED PIPE
Supplied in 6-meter bars for DN 20 to DN 150 (inclusive) and in 12-meter bars starting from DN 25 (inclusive).
The pipe ends are free from insulation for 150-200 mm. The maximum operating temperature is 155°C. For higher temperatures, we can provide alternative systems capable of withstanding up to 300°C.

FIELDS OF APPLICATION OF THE ECOTHERM® SYSTEM

- HEATING
- COOLING
- GEOTHERMAL ENERGY
- SANITARY WATER
- FIREPROOF NETWORK
- CONDITIONING
- GREENERY PLANTS
- THERMAL PLANTS
- PROCESS PLANTS
- STEAM TRANSPORT

RANGE OF PRODUCTS

STRAIGHT PRE-INSULATED PIPES



Bonded pre-insulated pipes compliant with EN 253, manufactured using advanced technology. The standard production includes a service pipe in welded steel, in accordance with EN 10217. Other types of service pipes are available upon request.

The pipes are produced with different insulation thicknesses (classified as Series 0, 1, 2, 3). The optimal thickness is selected based on the required thermal dispersion. **ECOLINE's** technical team is fully available to provide support in determining the most suitable solution.

The pipe ends are free from insulation for 150-200 mm. Upon request, they can be equipped with alarm wires, based on the customer's specifications.

Steel Service Pipe			INSULATION CLASS SERIES 1		INSULATION CLASS SERIES 2		INSULATION CLASS SERIES 3		Water content (l/m)
DN	Ø [mm]	Thickness [mm]	HDPE casing [mm]	Pipe weight [Kg/m]	HDPE casing [mm]	Pipe weight [Kg/m]	HDPE casing [mm]	Pipe weight [Kg/m]	
20	26,9	2,0	90	2,5	110	2,9	125	3,2	0,4
25	33,7	2,3	90	3,0	110	3,4	125	3,7	0,7
32	42,4	2,6	110	4,1	125	4,4	140	4,8	1,1
40	48,3	2,6	110	4,5	125	4,8	140	5,2	1,5
50	60,3	2,9	125	6,0	140	6,5	160	7,0	2,4
65	76,1	2,9	140	8,0	160	8,0	180	8,4	3,9
80	88,9	3,2	160	10,0	180	10,0	200	10,5	5,5
100	114,3	3,6	200	13,0	225	14,5	250	15,5	9,0
125	139,7	3,6	225	17,0	250	17,5	280	18,8	14,0
150	168,3	4,0	250	21,0	280	22,5	315	24,2	20,0
200	219,1	4,5	315	31,0	355	33,0	400	36,0	34,7
250	273,0	5,0	400	44,0	450	47,5	500	51,7	54,4
300	323,9	5,6	450	57,0	500	61,0	560	66,5	77,0
350	355,6	5,6	500	64,0	560	69,2	630	77,0	93,2
400	406,4	6,3	560	81,0	630	88,0	710	97,5	122,0
450	457,0	6,3	630	94,0	710	103,0	800	114,5	155,3
500	508,0	6,3	710	108,0	800	120,0	900	134,0	193,0
600	610,0	7,1	800	140,0	900	155,0	1000	171,0	278,5
700	711,0	8,0	900	180,0	1000	196,0	1100	214,0	380,0
800	813,0	8,8	1000	222,0	1100	240,0	1200	260,0	497,0

Nominal values

MAIN FITTING

ELBOWS

In compliance with EN 448, we supply pre-insulated bends with angles ranging from 0° to 90°. The construction method (forged or bent) and thickness are calculated for each project.

TEES

We also provide pre-insulated branches, manufactured according to EN 448. These can be 45° branch, parallel, or straight types. The construction method (forged, extruded, or reinforced) and thickness are determined based on project requirements.

REDUCTIONS

Additionally, we supply pre-insulated reducers in accordance with EN 448, with dimensions and thicknesses calculated for each specific project.

JOINT SYSTEMS

DOUBLE SEALING JOINTS

For sealing, we offer heat-shrinkable PEHD sleeves, featuring mastic at the ends, which are further sealed with an additional cross-linked heat-shrink ring at each end. These sleeves fully comply with the EN 489 standard.

VALVES

In compliance with EN 488, we supply pre-insulated valves. These can be stainless steel ball valves, either floating or trunnion-mounted, with full or reduced bore, and available with or without a manual, electric, or pneumatic actuator. Butterfly valves are also available.
Additionally, air release and drain valves can be supplied upstream and downstream of the main valve.

FIXED POINTS OR ANCHORS

In compliance with EN 448, we supply pre-insulated anchors. The construction method and thickness are calculated for each specific project.

BENDED PIPES

Pre-insulated pipes can also be supplied in curved shapes, according to customer-provided designs.

CROSSLINKED JOINTS

The cross-linked PEHD sleeve consists of a central body made of cross-linked polyethylene. It can be either: a "formwork" type, where foaming occurs before applying the coupling, or a traditional system, where foaming takes place after the coupling is applied, which must then be sealed with closure caps.
The sleeve meets the EN 489 requirements for 1,000 cycles.

THE ECOPEX® SYSTEM

The **Ecopex®** pre-insulated piping system, compliant with EN 15632-1/2, consists of a PE-Xa main pipe with an EVOH oxygen diffusion barrier, thermally insulated with flexible, CFC-free polyurethane (PUR) foam, and covered with a polyethylene (LD-PE) outer casing. This system significantly reduces installation time compared to other solutions.

The **Ecopex®** pre-insulated piping system is suitable for transporting various types of fluids, offering complete protection against corrosion. It is custom-supplied in coils, and thanks to its lightweight and high flexibility, installation is quick and easy, even in the presence of obstacles.

ADVANTAGES OF THE ECOPEX® SYSTEM

SAVING
Excellent thermal insulation properties ≤ 0,02 W/m.K

RESISTANCE
No corrosion and incrustation

STRUCTURE
Minimizes excavation and filling costs

SPEED
Up to hundreds of meters without joints

FLEXIBILITY
Possibility of achieving narrow bending radii

COMPLETE RANGE
Including fittings and accessories

FIELDS OF APPLICATION OF THE ECOPEX® SYSTEM

HEATING

COOLING

CONDITIONING

BIOGAS

SOLAR ENERGY

BIOMASS

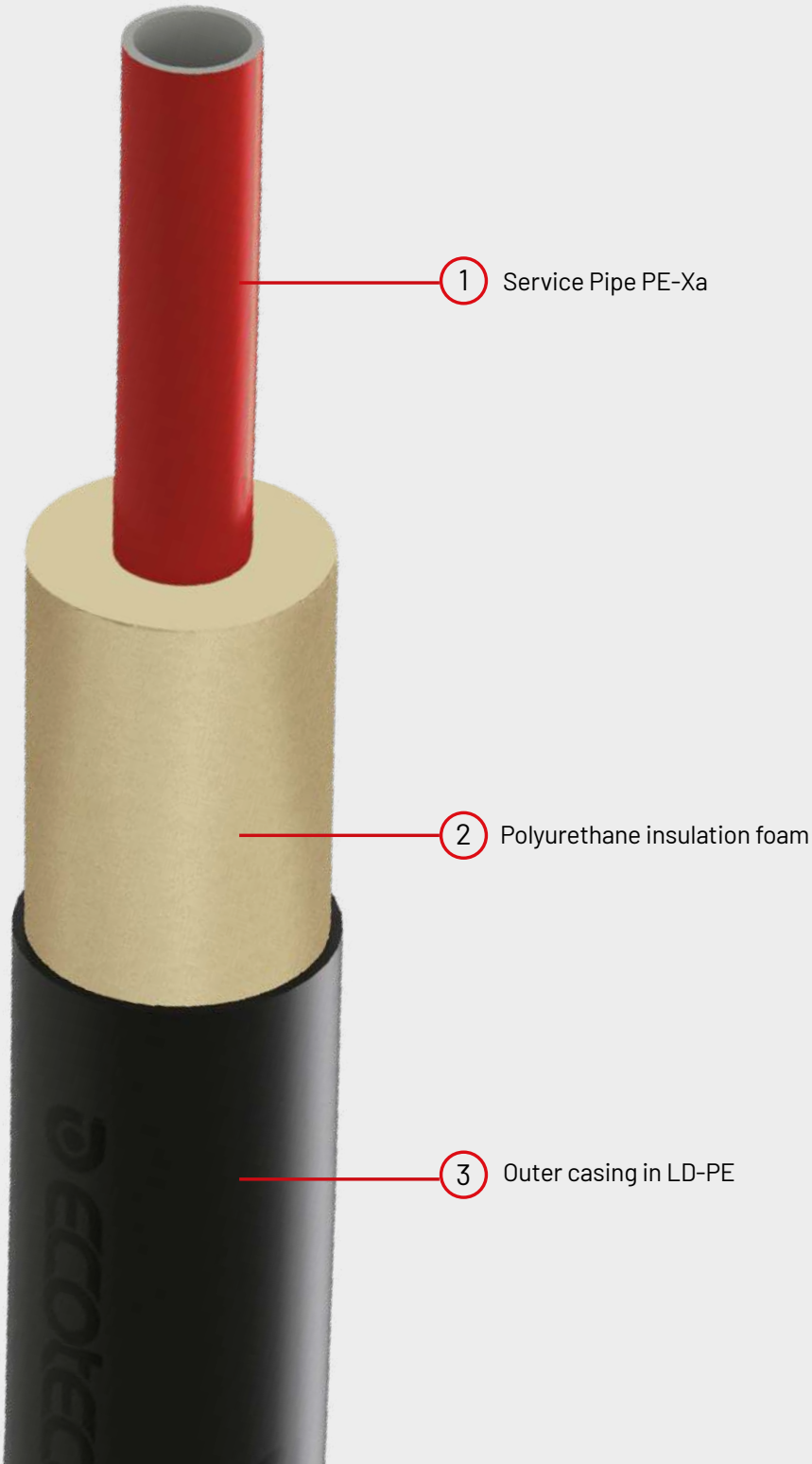
GEOTHERMAL ENERGY

LANDFILL GAS

WASTE INCINERATORS

DISTRIBUTION DIAGRAM

ECOPEX


1 Service Pipe PE-Xa
2 Polyurethane insulation foam
3 Outer casing in LD-PE

ECOPEX	
COMPOSITION	
MATERIAL	High-density polyethylene (PE-HD), peroxide cross-linked PE-Xa, natural color
OXYGEN DIFFUSION BARRIER	Ethylene-vinyl alcohol (EVOH), thermally stabilized, natural color
ADHESIVE LAYER	Modified PE, heat-stabilized, red (for heating) and silver (for sanitary applications)
STANDARDS COMPLIANCE	DIN 16892 / DIN 16893 - DIN EN 12318-2 Series 3.2 according to DVGW W 544 technical specification
OXYGEN IMPERMEABILITY	DIN 4729 at 40°C Oxygen permeability relative to the pipe's internal volume according to DIN 4726: ≤ 0.10 g / (m^3 × day)
PIPE SERIES (DIN 16893)	Series 5: SDR 11 (for heating, with oxygen diffusion barrier) Series 3.2: SDR 7.4 (for sanitary installations)
POLYURETHANE INSULATION FOAM	
MATERIAL	Polyurethane foam obtained by mixing polyol and isocyanate with a cyclopentane-based blowing agent.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
THERMAL CONDUCTIVITY	(50°C) ≤ 0,02 W/mK
DENSITY	≥ 50 kg/m^3
COMPRESSION STRENGTH	≥ 0,2 MPa
LONG-TERM TEMPERATURE RESISTANCE	100°C
AXIAL SHEAR STRENGTH (EN 253)	≥ 0,12 MPa
CASING LD-PE	
MATERIAL	Low-density polyethylene (LD-PE) PE 80, compliant with ISO 12162. MFI variation ≤ 0.5 g/10 min.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
SPECIAL TREATMENT	Corona treatment.
DENSITY	0,92 g/cm^3
ELASTIC MODULUS	325 N/mm^2
FIRE REACTION CLASSIFICATION (DIN 4102)	B2 (normal flammability).
GENERAL	

The pipes are provided in coils cut to the lengths specified by the customer.

ECOPEX® HEATING

ECOPEX® Flexible Pre-insulated Pipes cross-linked Polyethylene PE-Xa with oxygen diffusion barrier PN6, Maximum operating temperature: 95°C – Compliant with EN 15632-1/2

ECOPEX UNO - HEATING PN 6 - STANDARD INSULATION

Type [mm]	PE-Xa				External PE casing		Min. bending radius [m]	Pipe weight [kg/m]	Fluid content [l/m]	Maximum roll length * [m]
	DN/ inch	d_{int} [mm]	wt [mm]	d_{ext} [mm]	D_e [mm]	wt_p [mm]				
25/75	20 - 3/4"	20,4	2,3	25	75	3,0	0,50	0,90	0,33	830
32/75	25 - 1"	26,2	2,9	32	75	3,0	0,50	1,00	0,54	830
40/90	32 - 1" 1/4	32,6	3,7	40	90	3,0	0,60	1,50	0,83	580
50/110	40 - 1" 1/2	40,8	4,6	50	110	3,0	0,70	1,80	1,31	380
63/125	50 - 2"	51,4	5,8	63	125	3,0	0,70	2,60	2,07	250
75/140	65 - 2" 1/2	61,4	6,8	75	140	3,0	0,80	3,30	2,96	170
90/160	80 - 3"	73,6	8,2	90	160	3,0	1,00	4,56	4,25	144
110/160	100 - 4"	90	10	110	160	3,0	1,20	6,40	6,36	144
125/180	125 - 5"	102,2	11,4	125	180	3,0	1,35	7,50	8,20	82

* Production tolerance +/- 5%.
The maximum length corresponds to a roll with a width of 1.2 meters and an external diameter of 2.8 meters. Nominal values.

ECOPEX DUO - HEATING PN 6 - STANDARD INSULATION

Type [mm]	PE-Xa				External PE casing		Min. bending radius [m]	Pipe weight [kg/m]	Fluid content [l/m]	Maximum roll length * [m]
	DN/ inch	d_{int} [mm]	wt [mm]	d_{ext} [mm]	D_e [mm]	wt_p [mm]				
25+25/90	20 + 20 2 x 3/4"	20,4	2,3	25	90	3,0	0,60	1,40	0,65	580
32+32/110	25 + 25 2 x 1"	26,2	2,9	32	110	3,0	0,65	1,90	1,08	380
40+40/125	32 + 32 2 x 1" 1/4	32,6	3,7	40	125	3,0	1,00	2,40	1,67	250
50+50/160	40+40 2 x 1" 1/2	40,8	4,6	50	160	3,0	1,10	3,80	2,61	144
63+63/180	50+50 - 2x2"	51,4	5,8	63	180	3,0	1,20	4,80	4,15	120
75+75/200	65 + 65 2 x 2" 1/2	61,4	6,8	75	200	3,0	1,40	6,25	5,92	75

* Production tolerance +/- 5%.
The maximum length corresponds to a roll with a width of 1.2 meters and an external diameter of 2.8 meters. Nominal values.

ECOPEX® SANITARY

ECOPEX® Pre-insulated Flexible Pipes – PE-Xa Cross-linked Polyethylene with Oxygen Diffusion Barrier, PN10, Maximum Operating Temperature: 95°C, Compliant with EN 15632-1/2.

ECOPEX UNO - SANITARY PN 10 - STANDARD INSULATION

Type [mm]	PE-Xa				External PE casing		Min. bending radius [m]	Pipe weight [kg/m]	Fluid content [l/m]	Maximum roll length * [m]
	DN/ inch	d_{int} [mm]	wt [mm]	d_{ext} [mm]	D_e [mm]	wt_p [mm]				
20/75	15 - 5/8"	14,4	2,8	20	75	3,0	0,50	0,96	0,16	830
25/75	20 - 3/4"	18	3,5	25	75	3,0	0,50	1,00	0,25	830
32/75	25 - 1"	23,2	4,4	32	75	3,0	0,50	1,10	0,42	830
40/90	32 - 1" 1/4	29	5,5	40	90	3,0	0.60	1,80	0,66	580
50/110	40 - 1" 1/2	36,2	6,9	50	110	3,0	0.70	2,20	1,03	380
63/125	50 - 2"	45,6	8,7	63	125	3,0	0,70	3,00	1,63	250
75/140	65 - 2" 1/2	54,4	10,3	7,5	140	3,0	0,80	4,30	2,32	170

* Production tolerance +/- 5%.
The maximum length corresponds to a roll with a width of 1.2 meters and an external diameter of 2.8 meters. Nominal values.

ECOPEX DUO - SANITARY PN 10 - STANDARD INSULATION

Type [mm]	PE-Xa				External PE casing		Min. bending radius [m]	Pipe weight [kg/m]	Fluid content [l/m]	Maximum roll length * [m]
	DN/ inch	d_{int} [mm]	wt [mm]	d_{ext} [mm]	D_e [mm]	wt_p [mm]				
25+20/90	20 + 15 3/4" + 5/8"	18 - 14,4	3,5-2,8	25 - 20	90	3,0	0,60	1,40	0,42	580
32+20/110	25 + 15 1" + 5/8"	23,2 -14,4	4,4-2,8	32 - 20	110	3,0	0,65	2,00	0,59	380
40+25/125	32 + 20 1"1/4 + 3/4"	29 -18	5,5-3,5	40 - 25	125	3,0	0,70	2,60	0,91	250
50+32/140	40 + 25 1"1/2 + 1"	36,2 - 23,2	6,9-4,4	50 - 32	140	3,0	0,75	3,50	1,45	170

* Production tolerance +/- 5%.
The maximum length corresponds to a roll with a width of 1.2 meters and an external diameter of 2.8 meters. Nominal values.

ECOALUPEX


1 Multilayer pipe PEX/ALU/PEX
2 Polyurethane insulation foam
3 Outer casing in LD-PE

ECOALUPEX

COMPOSITION	
PIPE	Pre-insulated flexible pipes with a multilayer service pipe, flexible polyurethane insulation, and an LD-PE outer casing.
MULTILAYER PIPE (PEX + ALUMINUM OXYGEN BARRIER + PEX)	
CROSS-LINKED STRUCTURE	Adesive
MAXIMUM CONTINUOUS OPERATING TEMPERATURE	90 C°
MAXIMUM SHORT-TERM OPERATING TEMPERATURE	100 C°
MAXIMUM OPERATING PRESSURE	PN 10
Based on the operating parameters of each system, specific calculations can be performed to determine the service life concerning maximum temperature and pressure.	
POLYURETHANE INSULATING FOAM	
MATERIAL	Polyurethane foam obtained by mixing polyol and isocyanate with a cyclopentane-based blowing agent.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
THERMAL CONDUCTIVITY	(50°C) ≤ 0,02 W/mK
DENSITY	≥ 50 kg/m^3
COMPRESSIVE STRENGTH	≥ 0,2 MPa
LONG-TERM TEMPERATURE RESISTANCE	100°C
AXIAL SHEAR STRENGTH (EN 253)	≥ 0,12 MPa
EXTERNAL SHEATH IN LD-PE	
MATERIAL	Low-density polyethylene (LD-PE) PE 80, compliant with ISO 12162. MFI variation ≤ 0.5 g/10 min.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
SPECIAL TREATMENT	Corona treatment.
DENSITY	0,92 g/cm^3
ELASTIC MODULUS	325 N/mm^2
FIRE REACTION CLASSIFICATION (DIN 4102)	B2 (normal flammability).
GENERAL	

The pipes are provided in coils cut to the lengths specified by the customer.

ECOALUPEX

ECOALUPEX is our pre-insulated flexible piping system designed for district heating systems

ECOALUPEX SINGLE - HEATING PN 10 – STANDARD INSULATION

Type [mm]	Multilayer Pipe			PE casing		Min. bending radius [m]	Pipe weight [kg/m]	Fluid content [l/m]	Maximum roll length * [m]
	d_{int} [mm]	wt [mm]	d_{ext} [mm]	D_e [mm]	wt_p [mm]				
20/90	16	2,0	20	90	3,0	0,80	0,9	0,20	-
25/90	20	2,5	25	90	3,0	0,80	1,0	0,31	-
32/90	26	3,0	32	90	3,0	0,80	1,2	0,53	-

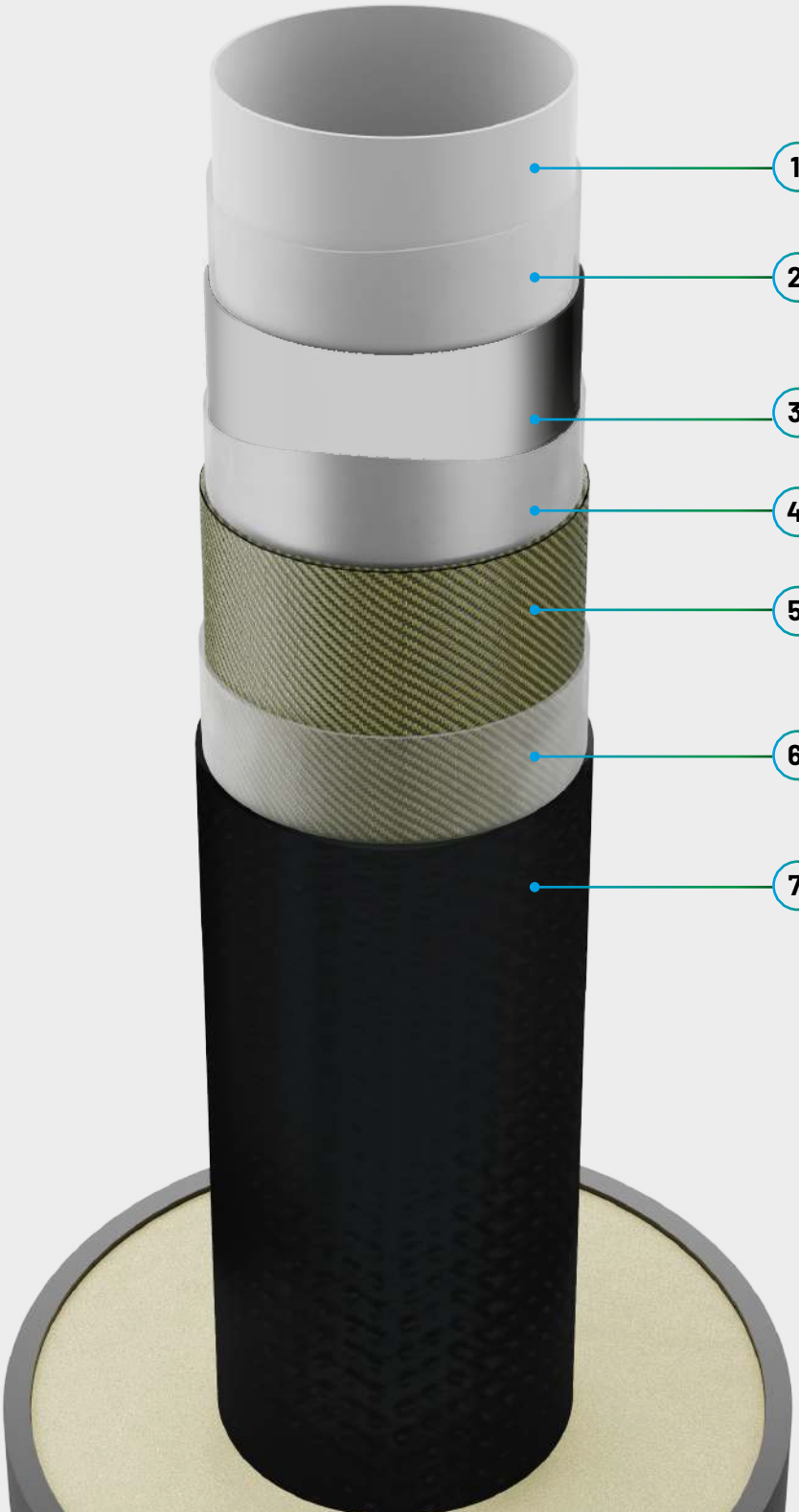
* On request.

ECOALUPEX TWIN - HEATING PN 10 – STANDARD INSULATION

Type [mm]	Multilayer Pipe			PE casing		Min. bending radius [m]	Pipe weight [kg/m]	Fluid content [l/m]	Maximum roll length * [m]
	d_{int} [mm]	wt [mm]	d_{ext} [mm]	D_e [mm]	wt_p [mm]				
20+20/110	16	2,0	20	110	3,0	0,85	1,4	0,40	-
25+25/110	20	2,5	25	110	3,0	0,85	1,6	0,63	-
32+32/110	26	3,0	32	110	3,0	0,85	2,0	1,06	-

* On request.

ECOPEX FORTE 16



1. Inner layer in PE-Xa
2. High-temperature adhesive layer
3. Aluminum foil as a high-temperature oxygen diffusion barrier
4. High-temperature adhesive layer
5. Para-aramid fiber
6. High-temperature adhesive layer
7. Polypropylene

ECOPEX FORTE 16

COMPOSITION	
PIPE	Pre-insulated flexible pipes with a multilayer service pipe, flexible polyurethane insulation, and an LD-PE outer sheath.
MULTILAYER PIPE (PEX + ALUMINUM OXYGEN BARRIER AND PARA-ARAMID FIBER).	
CROSS-LINKED STRUCTURE	PE-Xa/adhesive/aluminum/adhesive/para-aramid fiber/adhesive/PP.
MAXIMUM CONTINUOUS OPERATING TEMPERATURE	100°C
MAXIMUM SHORT-TERM OPERATING TEMPERATURE	115°C
MAXIMUM OPERATING PRESSURE:	See table on page 9 (Ecotech catalog)
Based on the operating parameters of each system, specific calculations can be performed to determine service life with respect to maximum temperature and pressure.	
POLYURETHANE INSULATING FOAM	
MATERIAL	Polyurethane foam obtained by mixing polyol and isocyanate with a cyclopentane-based blowing agent.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
THERMAL CONDUCTIVITY	(50°C) ≤ 0,02 W/mK
DENSITY	≥ 50 kg/m^3
COMPRESSIVE STRENGTH	≥ 0,2 MPa
LONG-TERM TEMPERATURE RESISTANCE	100°C
AXIAL SHEAR STRENGTH (EN 253)	≥ 0,12 MPa
EXTERNAL SHEATH IN LD-PE	
MATERIAL	Low-density polyethylene (LD-PE) PE 80, compliant with ISO 12162. MFI variation ≤ 0.5 g/10 min.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
SPECIAL TREATMENT	Corona treatment.
DENSITY	0,92 g/cm^3
ELASTIC MODULUS	325 N/mm^2
FIRE REACTION CLASSIFICATION (DIN 4102)	B2 (normal flammability).
GENERAL	

The pipes are provided in coils cut to the lengths specified by the customer.

ECOPEX FORTE 16

ECOPEX FORTE 16 is our pre-insulated flexible piping system designed for small to medium-sized district heating networks.

ECOPEX FORTE 16 UNO - SERIES 1

Type [mm]	ECOPEX FORTE 16		PE casing		Min. bending radius [m]	Fluid content [l/m]	Maximum roll length * [m]
	External diam. [mm]	Internal diam. [mm]	External diam. [mm]	Internal diam. [mm]			
40/90	40.0	32.6	90	3,0	0,80	0,83	400
50/110	49.8	40.8	110	3,0	0,85	1,31	300
63/125	61.8	51.4	125	3,0	0,90	2,07	300
75/140	72.8	61.4	140	3,0	1,00	2,96	250
90/160	86.5	73.6	160	3,0	1,10	4,25	150
110/160	104.9	90.0	160	3,0	1,10	6,36	150
125/180	117.0	102.2	180	3,0	1,40	8,20	90
140/200	130.4	114.6	200	3,2	1,40	10,31	70

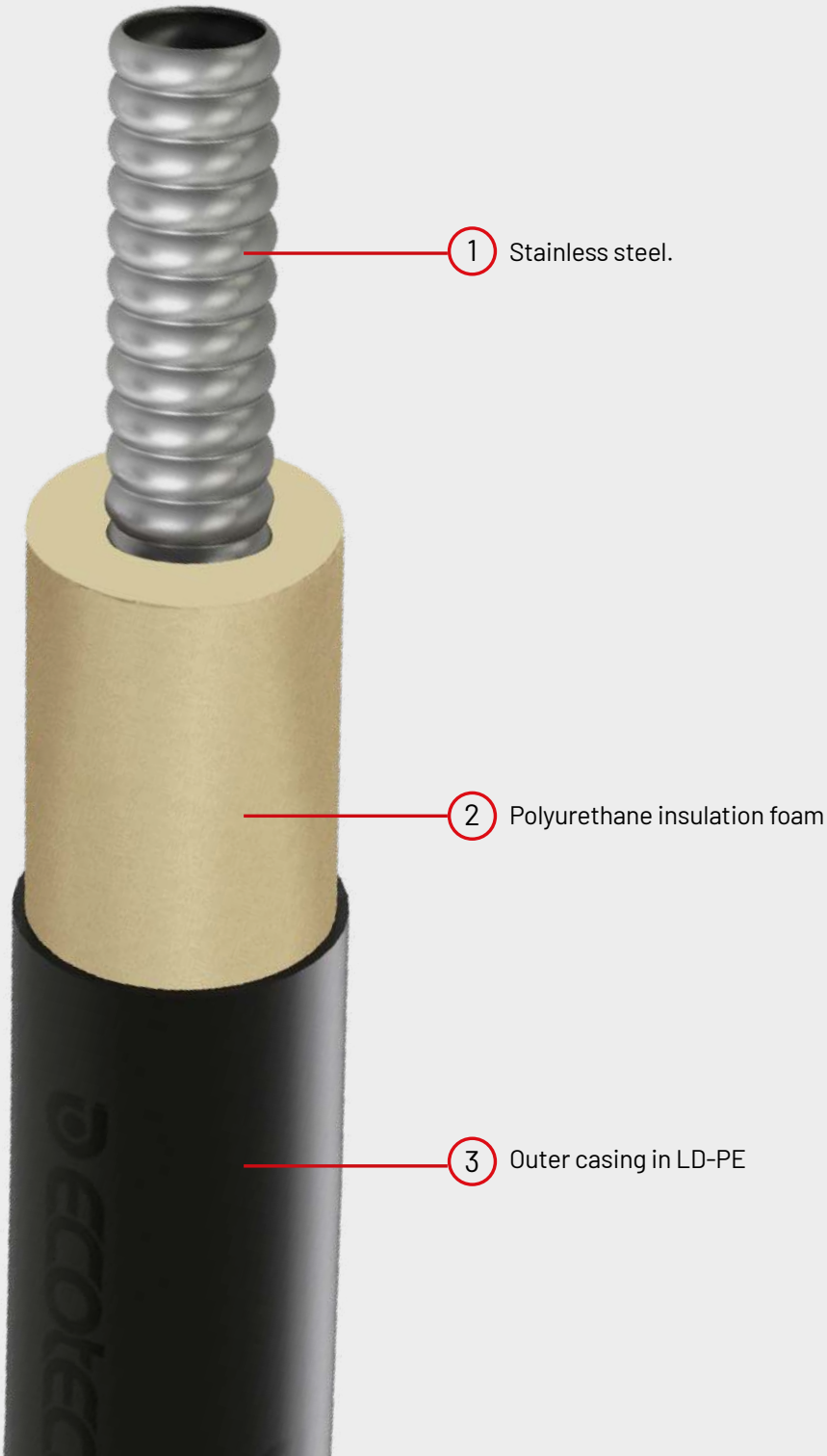
* The maximum length is based on a coil with a diameter of 2.80 m and a width of 1.20 m.

ECOPEX FORTE 16 DUO - SERIES 1

Type [mm]	ECOPEX FORTE 16		PE casing		Min. bending radius [m]	Fluid content [l/m]	Maximum roll length * [m]
	External diam. [mm]	Internal diam. [mm]	External diam. [mm]	Internal diam. [mm]			
40+40/125	40.0	32,6	125	3,0	0,90	1,67	300
50+50/160	49.8	40,8	160	3,0	1,00	2,61	150
63+63/180	61.8	51,4	180	3,0	1,20	4,15	90
75+75/200	72.8	61,4	200	3,0	1,30	5,92	70

* The maximum length is based on a coil with a diameter of 2.80 m and a width of 1.20 m.

ECOFLEX


1 Stainless steel.
2 Polyurethane insulation foam
3 Outer casing in LD-PE

ECOFLEX	
COMPOSITION	
PIPE	Pre-insulated flexible pipes with a stainless steel service pipe, flexible polyurethane insulation, and an LD-PE outer sheath.
STAINLESS STEEL PIPE	
MATERIAL	AISI 304/316
MAXIMUM CONTINUOUS OPERATING TEMPERATURE	100 C°
MAXIMUM SHORT-TERM OPERATING TEMPERATURE	120 C°
MAXIMUM OPERATING PRESSURE	PN 16
Based on the operating parameters of each system, specific calculations can be performed to determine the service life in relation to maximum temperature and pressure.	
POLYURETHANE INSULATING FOAM	
MATERIAL	Polyurethane foam obtained by mixing polyol and isocyanate with a cyclopentane-based blowing agent.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
THERMAL CONDUCTIVITY	(50°C) ≤ 0,02 W/mK
DENSITY	≥ 50 kg/m^3
COMPRESSIVE STRENGTH	≥ 0,2 MPa
LONG-TERM TEMPERATURE RESISTANCE	100°C
AXIAL SHEAR STRENGTH (EN 253)	≥ 0,12 MPa
EXTERNAL SHEATH IN LD-PE	
MATERIAL	Low-density polyethylene (LD-PE) PE 80, compliant with ISO 12162. MFI variation ≤ 0.5 g/10 min.
REFERENCE STANDARD	Minimum characteristics according to EN 15632-2.
SPECIAL TREATMENT	Corona treatment.
DENSITY	0,92 g/cm^3
ELASTIC MODULUS	325 N/mm^2
FIRE REACTION CLASSIFICATION (DIN 4102)	B2 (normal flammability).
GENERAL	
The pipes are provided in coils cut to the lengths specified by the customer.	

ECOFLEX

ECOFLEX® type flexible pre-insulated pipes in rolls, in stainless steel for substation disconnection, building connection, solar panels – EN15632-1/4

ECOFLEX® UNO

ECOFLEX® UNO	
Type	
DN - inches	PE
25 - 1"	110
32 - 1" 1/4	125
40 - 1" 1/2	125
50 - 2"	140

ECOFLEX® DUO

ECOFLEX® DUO	
Type	
DN - inches	PE
25+25 - 1"	125
32+32 - 1"1/4	140
40+40 - 1"1/2	160

OTHER PRODUCTS

In addition to the materials mentioned on the previous pages, ECOLINE also manufactures pre-insulated pipes by combining the following components:

SERVICE PIPE

- Welded black steel grade P235/355
- Seamless black steel grade P235
- Welded galvanized steel grade S195T
- Seamless galvanized steel grade S195T
- Rigid raw copper in bars
- Stainless steel AISI 304 or 316
- High-density polyethylene (PEHD)
- Reinforced polypropylene (PP-R)

INSULATION

Rigid polyurethane foam obtained by mixing polyol and isocyanate. The foam is homogeneous, with closed cells > 90%, minimum density of 60 kg/m^3, and complies with the requirements of the European standard EN 253.

EXTERNAL CASING

For buried pipelines, it consists of a high-density polyethylene (HDPE) pipe, compliant with the European standard EN 253. For exposed outdoor pipelines, it can be made of helically crimped galvanized sheet metal, aluminum, or stainless steel.

All our products can be supplied with:
• A leak detection system to signal any leaks and/or infiltrations
• A heating cable to prevent the transported fluids from freezing

Furthermore, to transport fluids at high temperatures, ECOLINE has developed the HIGH TEMP system, which allows fluids to be transported at temperatures up to 300°C.

Galvanized

Sheet metal

PE with PE

Eco Cool

Copper

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