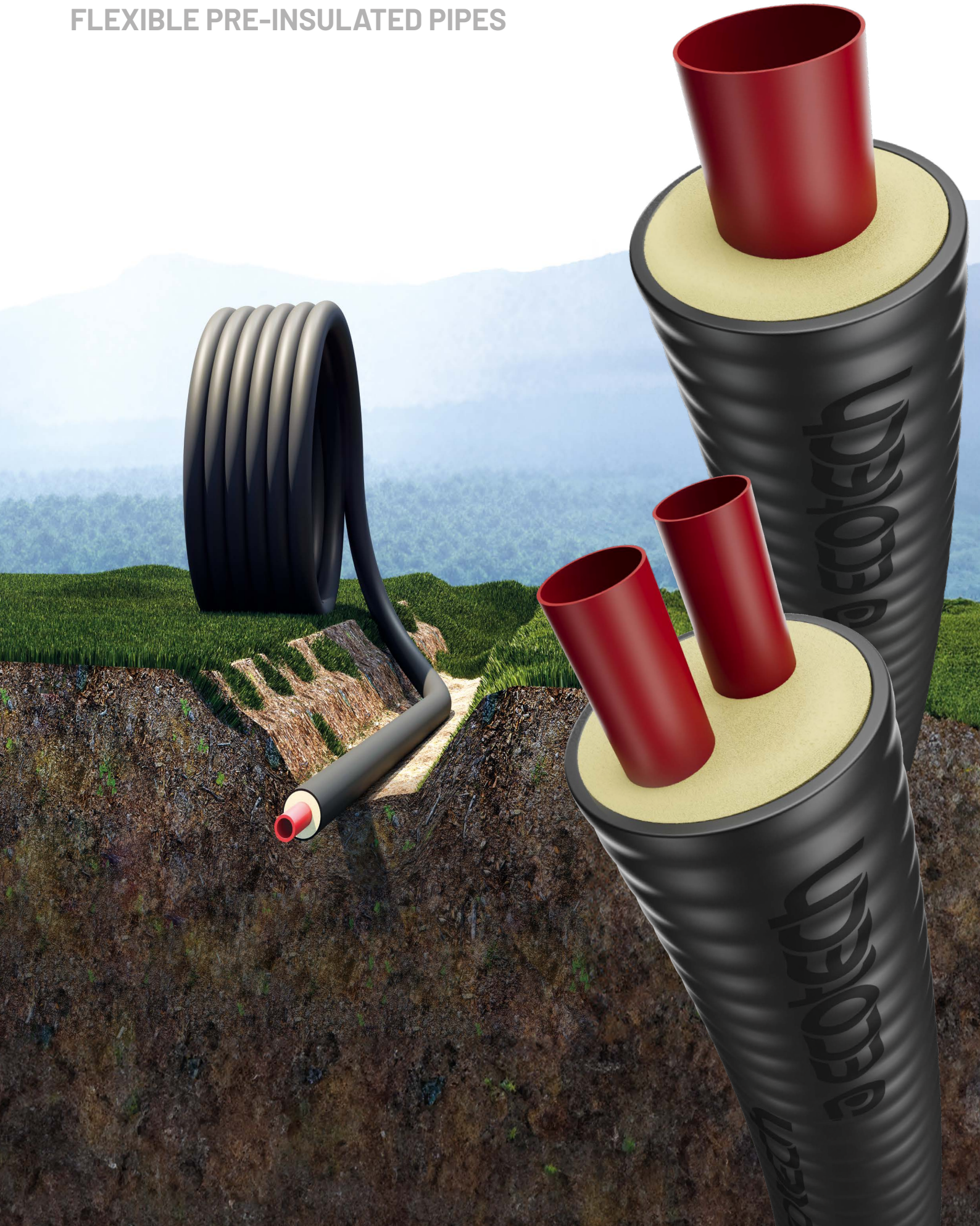
Catalogue
ECOPEX
FORTE 16

ECOTECH

LEADER IN PRODUCING FLEXIBLE PRE-INSULATED PIPES



ECOTECH: HISTORY

ECOTECH was born in 2015, completing the range of ECOLINE products, with flexible pre-insulated pipes of various types.

Expertise and reliability have led the company to improve its business in Italy, in Europe and all over the world. **ECOLINE** is one of the European producers with the most extensive experience in pre-insulated pipeline systems and special fittings, in surveillance systems for municipal and industrial application.

INNOVATIVE SOLUTIONS

Transportation of warm and cold fluids used for civil, industrial and oil&gas purposes.
ECOTECH is Italian market leader in producing preinsulated network systems that minimize heat loss in the transportation of warm and cold fluids used for civilian, industrial and oil&gas purposes.
Continuous research and development activity led **ECOTECH** to focus on pre-insulated flexible pipework systems for district heating and district cooling systems.
ECOTECH is EN ISO 9001 certified.

ECOTECH = RELIABLE PRODUCTS + QUALITY OF SERVICE

ECOPEX REIFORCED PREINSULATED FLEXIBLE PIPELINE DESCRIPTION

Preinsulated flexible pipelines with multilayer pipe (PEX+Aluminium barrier and para aramid yarn) are mainly used on small and medium district heating networks and for civil and industrial use characterized increase operating temperatures for highly-efficient solution for heating networks.

1. PIPELINE FOR HEATING USE

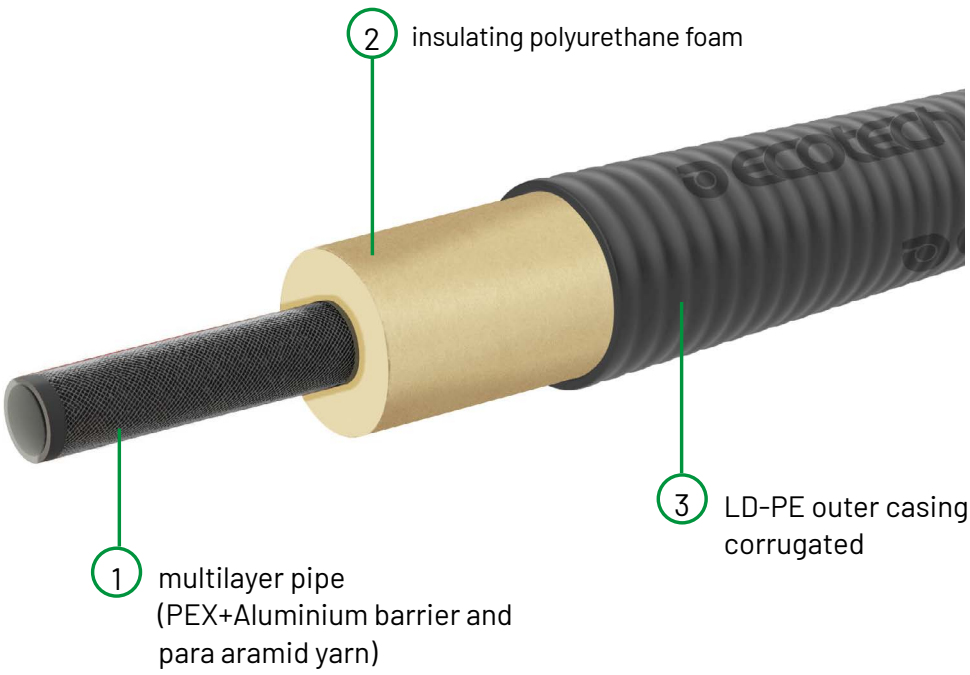
PHYSICAL PARAMETER	SYMBOL	LIMIT VALUE
Permanent operating temperature	T_{es}	95 °C
Maximum peak temperature	T_{max}	115 °C
Maximum operating pressure	P_{max}	PN 12

29 years at 90°C + 1 year at 100°C + 100h at 115°C / Design pressure 12 bar

ECOPEX REIFORCED PREINSULATED FLEXIBLE PIPELINE DESCRIPTION

Ecopex REINFORCED pipelines are bonded type: that means the three elements (service pipe, PUR foam and PE outer casing) are closely bound to each other and create a compact and very efficient system.
Primarily:

- no air and gaps. Expensive and damaging heat losses are avoided;
- PUR insulating foam is of the best type by today's standards;
- all the components are watertight and provide protection against any outer ingresses.



PIPELINE COMPOSITION

ECOPEX REINFORCED DATA	
SINGLE PIPES	Pre-insulated flexible single pipes with Ecopex reinforced carrier pipe, flexible polyurethane insulation and LLDPE jacket.
TWIN PIPES	Pre-insulated flexible twin pipes with 2 Ecopex reinforced carrier pipes, flexible polyurethane insulation and LLDPE jacket.
MULTILAYER PIPE (PEX+ALUMINIUM BARRIER AND PARA ARAMID YARN)	
CROSS-LINKED	PE- Xa/glue/aluminium/glue/kevlar/glue/PP
MAX. CONTINUOUS OPERATING TEMPERATURE	100°C
MAX. OPERATING TEMPERATURE FOR SHORT PERIODS	115°C
MAX. OPERATING PRESSURE	12.0 bar.
Based on current operating parameters, we can perform calculations on maximum temperature and pressure.	
100% diffusion tightness with Aluminium barrier	

POLYURETHANE INSULATING FOAM	
MATERIAL	Polyurethane foam obtained by mixing polyol and isocyanate with Cyclopentane blowing agent (HEATING)
REFERENCE STANDARD	Minimum features according to EN 15632-2
THERMAL CONDUCTIVITY	(50°C) 0,021 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

LD-PE OUTER CASING	
MATERIAL	Continuously extruded low-density polyethylene (LD-PE) minimum quality PE 80 according to ISO 12162 Variation di MFI < = 0,5 g/10 m
REFERENCE STANDARD	Minimum features according to EN 15632-2
SPECIAL TREATMENT	Corona treatment
DENSITY	0,92 g/cm^3
MODULUS OF ELASTICITY	325 N/mm^2
REACTION TO FIRE CLASSIFICATION (DIN 4102)	B2 (normal flammability)

GENERAL
The pipes are delivered in coils length according customer demand

PIPELINE COMPOSITION

1. PE-Xa inner layer
2. High temperature bond layer
3. Aluminium foil as a high temperature oxygen and diffusion barrier
4. High temperature bond layer
5. Para Aramid yarn
6. High temperature bond layer
7. PP

PRESSURE AND TEMPERATURE LIMITS

STANDARD:

- CEN/TS 17889 (E) (2024-01-02) District heating pipes - Factory made flexible pipe systems - Classification, requirements and test methods for bonded or non-bonded system with thermoplastic reinforced service pipes (TRSP)
- DIN EN ISO 9080:2013-02 Kunststoff-Rohrleitungs- und Schutzrohrsysteme - Bestimmung des Zeitstand-Innendruckverhal tens von thermoplastischen Rohrwerkstoffen durch Extrapolation

LONG-TERM PRESSURE STRENGTH (PLPL):

- Determination of long-term hydrostatic pressure
- Test method: DIN EN ISO 1167-1/-2

DESIGN PRESSURE:

Service class according to CEN/TS 17889	Design pressure [bar]
TR 3 (80°C for 29 years)	15
TR 4 (85°C for 29 years)	13

SAFETY FACTORS FOR DESIGN STRESS:

Temperature [°C]	Safety factor according to CEN/TS 17889
TD	1,5
Tmax	1,3
Tmax	1,0

DESIGN PRESSURE:

Operating Temp. (working temperature)	Years	Tmax	Years	Tmal	Hours	Design pressure [bar]
90°	29	100°C	1	115°C	100	12
95° + 85°	15 + 14 (respectively)	100°C	1	115°C	100	12

PRESSURE AND TEMPERATURE LIMITS

DESIGN PRESSURE:

Temperature [°C]	Years	Pressure (Bar) (C=1.25)	Pressure (Bar) (C=1.5)
60	1	30	25
	5	27	22
	10	25	21
	20	24	20
	30	23	19
70	1	27	22
	5	24	20
	10	22	18
	20	20	17
	30	20	16
80	1	24	20
	5	20	17
	10	20	16
	20	18	15
	30	17	13
90	1	20	17
	5	18	15
	10	17	14
	20	16	13
	30	16	13
95	1	20	16
	5	16	14
	10	16	13
	15	15	12
	20	15	12
	25	15	12
	29	14	12
100	1	18	15
	5	16	13
	10	15	12
	15	14	12

PRESSURE AND TEMPERATURE LIMITS

TEST PARAMETERS AND RESULT - THERMAL STABILITY:

Test pressure	Design pressure [bar]	Requirement [h]	Test time [h]
7,5	125	≥ 8760	≥ 8760

OXYGEN TIGHTNESS OF BARRIER LAYER:

- Test requirements: prCEN/TS 17889, Table 3
- Test method: ISO 17455

TEST PARAMETERS AND RESULT - OXYGEN TIGHTNESS:

Test temperature [°C]	Required max diffusion rate [mgO2/ (m2 * d)]	Diffusion rate [mgO2/(m2 * d)]
80	≥ 1,80	< 0,01

TEST PARAMETER - RESISTANCE TO PRESSURE CYCLING:

Specimens	Test temperature [°C]	Pressure values max/min [bar]	Frequency of cycles [min-1]	No. of cycles
3	23 ± 2	25 / 0,5	30 ± 5	≥ 10000

RESULTS - RESISTANCE TO PRESSURE CYCLING:

Test pressure [bar]	No. of cycles	Result	Remark
25 / 0,5	> 10000	Pipes, fittings and joints were tight	The requirements for pD 1,6 MPa are fulfilled

PRESSURE AND TEMPERATURE LIMITS

RESISTANCE TO THERMAL CYCLING OF THE SYSTEM:

- Test requirements: prCEN/TS 17889, table 4
- Test methods: DIN EN ISO 19893:2018-12
- Test equipment: Temperature cycling device with higher parameters TWPA

PARAMETER - RESISTANCE TO THERMAL CYCLING:

Specimens	Test temperature [°C]	Test time cold / warm [min]	Test temperature [°C]	Pressure value [bar]	No. of cycles
1 per dn	Rigid Pipes	15 + 1 / 15 + 1	20 ± 2 / 115 ± 21)	$16 + {}^{00,1} / - {}^{0,2}$	≥ 1000

RESULTS - RESISTANCE TO THERMAL CYCLING:

- The requirement of 1.000 cycles has been reached.
  The higher requirements of TR 4 according to prCEN/TS 17889 with a test pressure of 16 bar are fulfilled.

SANITARY APPROVALS (DRINKING WATER):

- Inner layer made of PE-Xa is produced of a formulation that is complying with the following starndard requirements:
  1. KTW-BWGL (Germany)
  2. BS 6920 (UK)
  3. NSF 61 (USA)

PIPE DIMENSION

Pipe	Outer diameter [mm]	Inner Diameter [mm]	Weight per meter [Kg]
40	40.0	32.6	0.45
50	49.8	40.8	0.65
63	61.8	51.4	0.95
75	72.8	61.4	1.25
90	86.5	73.6	1.70
110	104.9	90.0	2.25
125	117.0	102.2	2.70
140	130.4	114.6	3.20
160	148.0	130.8	4.00

IMPORTANT NOTE:

- **MULTILAYER PIPE (PEX+ALUMINIUM BARRIER AND PARA ARAMID YARN)**
  shall only be used/installed as part of an insulated system (insulation and casing) to prevent damage to the outer layer of the pipe.

ECOPEX REINFORCED UNO PN 16 - SERIE 1

ECOPEX REINFORCED UNO PN 16 - SERIE 1

Type [mm]	Alupex reinforced		PE Casing		Bending radius [m]	Water volume [l/m]	Max. length(*) [m]
	Outer diam [mm]	Inner diam [mm]	Outer diam [mm]	thickness [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.

HEAT LOSS - ECOPEX REINFORCED UNO PN 16 - SERIE 1

DN	U [W/(mK)]	AVERAGE OPERATING TEMPERATURE [°C]				
		40	50	60	70	80
40/90	0,163	4,88	6,51	8,13	9,76	11,39
50/110	0,184	5,51	7,34	9,18	11,01	12,85
63/125	0,192	5,74	7,64	9,50	11,47	13,48
75/140	0,199	5,96	7,95	9,93	11,92	13,91
90/160	0,213	6,38	8,51	10,63	12,76	14,89
110/160	0,302	9,06	12,07	15,09	18,11	21,13
125/180	0,308	9,24	12,32	15,40	18,48	21,56
140/200	0,315	9,45	12,60	15,75	18,90	22,05

ECOPEX REINFORCED UNO PN 16 - SERIE 2

ECOPEX REINFORCED UNO PN 16 - SERIE 2

Type [mm]	Alupex reinforced		PE Casing		Bending radius [m]	Water volume [l/m]	Max. length(*) [m]
	Outer diam [mm]	Inner diam [mm]	Outer diam [mm]	thickness [mm]			
40/110	40	32,6	110	3,0	0,90	0,83	300
50/125	50	40,8	125	3,0	1,00	1,31	300
63/140	63	51,4	140	3,0	1,10	2,07	250
75/160	75	61,4	160	3,0	1,20	2,96	150
90/180	90	73,6	180	3,0	1,40	4,25	90
110/180	110	90,0	180	3,0	1,60	6,36	90
125/200	125	102,2	200	3,2	1,60	8,20	70

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

HEAT LOSS - ECOPEX REINFORCED UNO PN 16 - SERIE 2

DN	U [W/(mK)]	AVERAGE OPERATING TEMPERATURE [°C]				
		40	50	60	70	80
50/125	0,160	4,80	6,40	8,00	9,60	11,20
63/140	0,164	4,92	6,56	8,20	9,84	11,48
75/160	0,168	5,04	6,72	8,40	10,08	11,76
90/180	0,181	5,43	7,24	9,05	10,86	12,67
110/180	0,242	7,26	9,68	12,10	14,52	16,94
125/200	0,249	7,32	9,94	12,40	14,90	17,45

ECOPEX REINFORCED DUO PN 16 SERIE 1

ECOPEX REINFORCED DUO - PN 16 - SERIE 1

Type [mm]	Alupex reinforced		PE Casing		Bending radius [m]	Water volume [l/m]	Max. length(*) [m]
	Outer diam [mm]	Inner diam [mm]	Outer diam [mm]	thickness [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.

HEAT LOSS - ECOPEX REINFORCED DUO - PN 16 - SERIE 1

DN	U [W/(mK)]	AVERAGE OPERATING TEMPERATURE [°C]				
		40	50	60	70	80
40+40/125	0,224	6,72	8,95	11,19	13,43	15,67
50+50/160	0,209	6,28	8,37	10,46	12,56	14,65
63+63/180	0,251	7,54	10,06	12,57	15,09	17,60
75+75/200	0,290	8,69	11,59	14,49	17,39	20,28

ECOPEX REINFORCED DUO PN 16 SERIE 2

ECOPEX REINFORCED DUO - PN 16 - SERIE 2

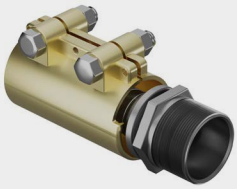
Type [mm]	Alupex reinforced		PE Casing		Bending radius [m]	Water volume [l/m]	Max. length(*) [m]
	Outer diam [mm]	Inner diam [mm]	Outer diam [mm]	thickness [mm]			
40+40/140	40.0	32,6	140	3,0	1,20	1,67	150
50+50/180	49.8	40,8	180	3,0	1,30	2,61	90
63+63/200	61.8	51,4	200	3,0	1,40	4,15	70

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

HEAT LOSS - ECOPEX REINFORCED DUO - PN 16 - SERIE 2

DN	U [W/(mK)]	AVERAGE OPERATING TEMPERATURE [°C]				
		40	50	60	70	80
40+40/140	0,187	5,60	7,47	9,33	11,20	13,07
50+50/180	0,176	5,29	7,05	8,81	10,57	12,34
63+63/200	0,220	6,60	8,80	11,00	13,20	15,40

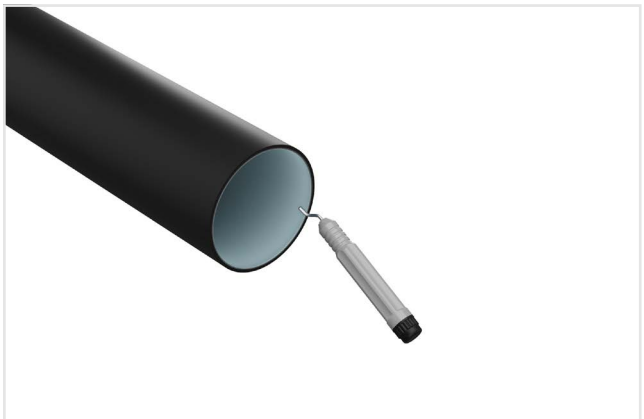
ACCESSORIES

Type	Image	Material
Bending		Brass - Steel
Compression nipples		Brass - Steel
Straight coupling		Brass - Steel
T-piece		Brass - Steel

EXTRA-LONG FITTINGS ASSEMBLY INSTRUCTIONS

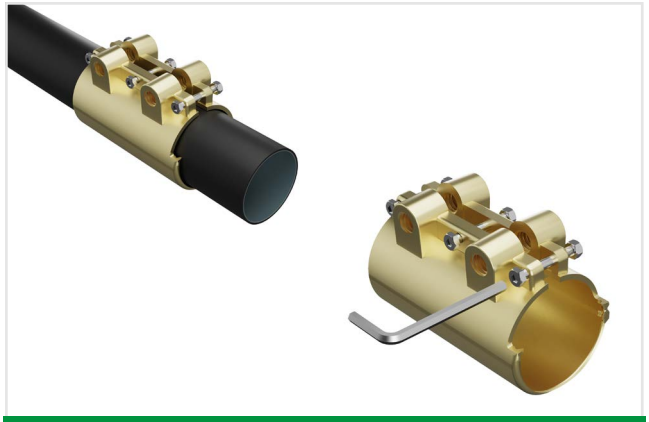
1.

Cut the pipe straight, carefully pill the isolation layer. During all the installation process, Make sure not to make any damage to extremal layer and/or the yarns of the internal pipe.



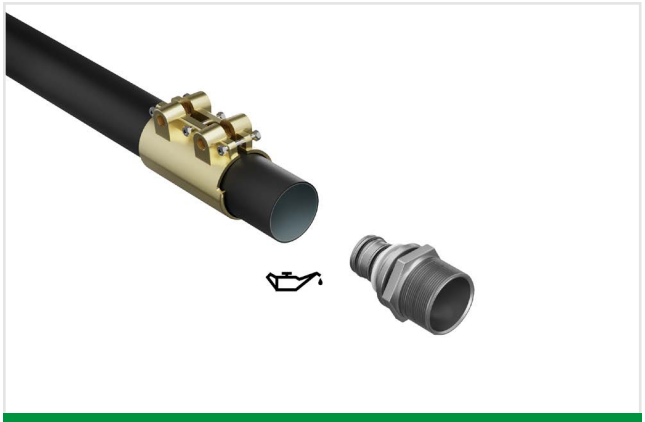
2.

Bevel the pipe inner edge.



3.

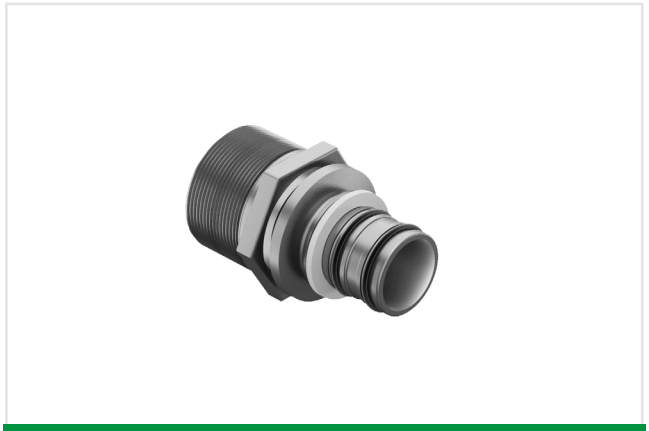
Remove the tightening bolt, spread the clamping sleeve with an Allen wrench using all the opening bolts and place it into the pipe as shown.



4.

Generously lubricate the connector insert and the pipe internal diameter with a non mineral-based lubricant.

EXTRA-LONG FITTINGS ASSEMBLY INSTRUCTIONS



5.

Make sure that two O-rings and one Teflon ring are assembled on the insert.

6.

Push the pipe to the bottom of the connector, if needed, you can carefully use plastic hummer.

7.

Place the clamping sleeve so that the tabs align with the groove on the body.

8.

Remove the opening bolts.

EXTRA-LONG FITTINGS ASSEMBLY INSTRUCTIONS

9.

Insert the tightening bolts and brush them with Anti-Seize Lubricant.

10.

Start tightening. Tighten periodically and slowly and allow the pipe to modify.

11.

Ensure that the pipe stays in the bottom at all times.

12.

Tighten the bolt until the clamping sleeve halves are flush with each other. It is advisable to take breaks and allow the pipe to modify. Depending on the circumstances, large connectors may require breaks of 30 minutes or longer. The tightening bolt is lubricated at the factory but especially for larger (over 63mm) connectors, additional lubrication may be necessary. Work slowly and prevent heat in order to avoid cold welding or galling.

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