

# CosyFloor<sup>®</sup>

## MICROFLEX<sup>®</sup> Pre-Insulated Piping System

Microflex's pre-insulated piping system is composed of a thermal insulation around a carrier pipe and covered by a "closed chamber" protective UV-resistant outer casing.

Microflex piping is suitable for use in heating, cooling and sanitary applications and provides significant advantages such as, low-weight, hyper flexibility, robustness, and easy and rapid laying even over obstacles and around corners.

System accessories can be mounted without any special tools.

Our PE-Xa central heating carrier pipe (made from cross-linked polyethylene) is oxygen diffusion proof in accordance with DIN 4726. It can transport a large number of different liquids and is fully corrosion free.

### Properties of the Microflex system

- Versatility
- Oxygen Diffusion Barrier to DIN 4726
- Low Weight
- Completely Corrosion Resistant
- Environmentally Friendly Manufactured
- Maintenance Free
- Long Life Expectancy
- Superior Quality

### Fields of application



#### Heating

- Max Operating Pressure 6 Bar
- Hot Water Distribution
- Supply to Individual Buildings
- Distribution Inside Buildings



#### Local or Remote Heating Networks

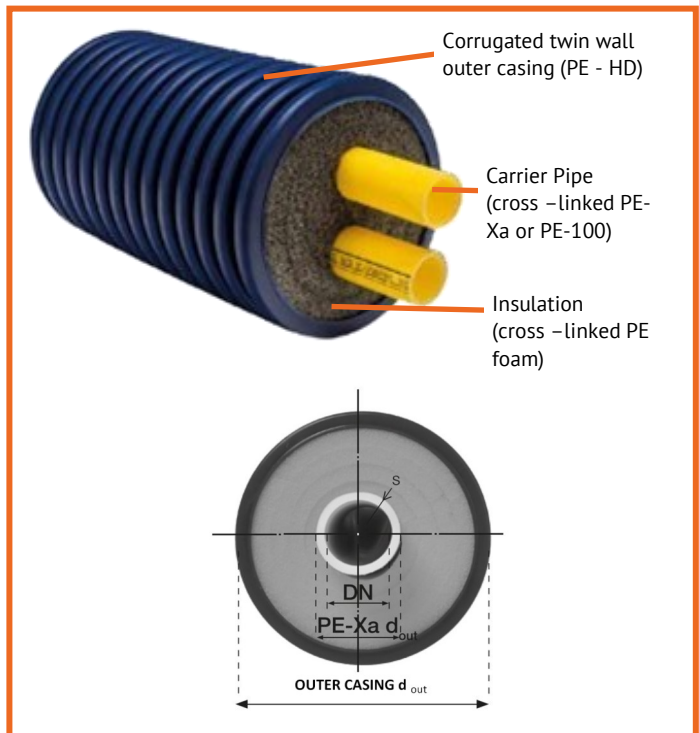
#### Renewable Energy



- Heat Pumps
- Biogas and Biomass Installations
- Combined Heat & Power
- Pellet Fuels
- Geothermal Applications

### Structure of the Microflex system

The Microflex piping system consists of three integrated components and it is manufactured according to the EN 15632: 1-3 norm



### The Hyper Flexibility of the Microflex Piping System

- Placement of the pipe over obstacles and around corners is possible.
- The inside bending radii of the different pipes are specified in the Product Range Table (see bottom of page 3). Measurements are taken from the inside of the pipe. A reserve factor is taken into account.
- For example: two same size PE-Xa pipes of Ø25mm and Ø32mm can form a curve with an inside radius of 0.5m (see picture).



The carrier or media transport pipe, as it is often called, used by Microflex for heating and sanitary applications is a PE-Xa pipe. PE-Xa stands for cross-linked PE, whereby cross-connections between the PE molecules are formed.

The resulting molecule is more resistant to extremes of temperatures and/or pressures and chemical attacks. The pipe is manufactured according to DIN 16892/16893 and ISO 15875 standards.

CosyFloor Microflex Pre-Insulated Pipes are available at UFH Supplies Ltd Trading as CosyFloor

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The PE-Xa pipe offers a few important benefits:

### Chemical resistance

Most chemicals have no influence on the pipe, even at elevated temperatures. Typically, plastics that are exposed to chemical substances are prone to physical changes in their properties, such as, swelling or dissolution of the polymers. Due to the chemical bonding of the polymer chains, PE-Xa pipes (cross-linked PE) are more resilient in that respect than pipes of non- cross-linked PE. In order to assess the resistance to different materials changes in the tensile and elongation characteristics were monitored. In a pressurized piping system, the resistance to unknown chemicals cannot generally be extrapolated from experience of known chemicals. For this, durability tests with the unknown chemicals in test piping are required.

### High abrasion resistance

PE-Xa pipes provide an enhanced abrasion resistance and durability. Pipes conveying aggressive sludge at fairly high velocities do not suffer internal erosion.

### Pipe roughness

The smooth bore offers less resistance to flow than conventional pipes resulting in excellent flow characteristics with minimal flow loss without formation of any sedimentary deposits.

### Environmentally friendly

PE-Xa pipes are certified to comply with international potable water quality requirements such as DVGW, WRAS and ACS (copies of the certificates are available on request). The pipe imparts neither taste nor odour and is non-toxic. Consequently, it is ideally suited for different branches of the food

### Oxygen diffusion barrier

The PE-Xa carrier pipe for central heating applications also features an oxygen diffusion barrier (EVOH) that prevents oxygen permeating into the piping system (according DIN 4726).

The oxygen barrier layer enhances the life of any ferrous components of the system (pumps, valves, etc.)

Mechanical properties	Standard	Value	Unit
Density	-	938	Kg/m <sup>3</sup>
Cross linking degree	-	80	%
Elasticity modulus (20° C)	DIN 53457	600 - 900	N/mm <sup>2</sup>
Tensile Strength	DIN 53455	19	N/mm <sup>2</sup>
Elongation at break (20° C)	DIN 53455	>400	%
Moisture absorption	-	<0,01	
Oxygen permeability (80° C)	DIN 4726	0,02	mg/l/day
Thermal properties	Standard	Value	Unit
Linear expansion coefficient 20° C	-	1,4 x 10 <sup>-4</sup>	1/K
		2,0 x 10 <sup>-4</sup>	1/K
Thermal conductivity coefficient (20° C)	-	0,35	W/mK
Softening Temperature	-	133	°C

The PE-Xa carrier pipe has a life expectancy of 50 years. The following table serves as a general guideline for temperatures and pressures. The permitted operating pressures are based on the medium water and are marked with a Safety factor of 1.25.

Average Temperature (°C)	Life Expectancy (years)	Operating Pressure (bar)	
		Heating pipes SDR 11	Sanitary pipes SDR 7,4
40	50	11,9	18,9
50	50	10,6	16,8
60	50	9,5	15,0
70	50	8,5	13,4
80	25	7,5	12,0
90	15	6,8	10,9

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The life expectancy of the pipe, however, is highly dependent on a combination of pressures and temperatures according to EN ISO 15875. This standard covers a range of service conditions (or application classes), design pressures and pipe dimensions. There are four application classes, based on different service conditions. Each class is related to a typical field of application and for a design period of 50 years. Each application class is combined with a design pressure. The design pressure is the highest pressure related to the circumstances for which the system has been designed.

### Class 1: hot water supply (60°C)\* | Design pressure 6 bar

Type	Temperature	Lifetime
Design temperature	60°C	49 years
Maximum temperature	80°C	1 year
Accidental temperature	90°C	100h

### Class 2: hot water supply (70°C) | Design pressure 6 bar

Type	Temperature	Lifetime
Design temperature	70°C	49 years
Maximum temperature	80°C	1 year
Accidental temperature	95°C	100h

### Class 4: Underfloor heating and low temperature radiators | Design pressure 8 bar

Type	Temperature	Lifetime
Design temperature	20°C Followed by 40°C Followed by 60°C	2,5 years  20 years
Maximum temperature	70°C	2,5 years
Accidental temperature	100°C	100h

### Class 5: High temperature radiators | Design pressure 8 bar

Type	Temperature	Lifetime
Design temperature	20°C Followed by 60°C Followed by 80°C	14 years  25 years
Maximum temperature	90°C	1 year
Accidental temperature	100°C	100h

\* A country may select either class 1 or class 2 to conform to its national regulations.

Product Range Table		Microflex DUO PN 6/95 <sup>°</sup> - SDR 11 Range & Inner Bending Radii				
Stock Number	PE-Xa d <sub>out</sub> xs (mm)	DN	Outer Casing d <sub>out</sub> (mm)	Weight (kg/m)	Inner Bending Radius (1*) (m)	Average Thickness of Insulation (mm)
PREDUO25	2x25x2,3	20	125	2.21	0.5	40
PREDUO32	2x32x2,9	25	125	2.41	0.5	37

1\* Applicable practical values without risk of pipe distortion or damage.

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