

WELCOFLEX

Datasheet WELCOFLEX

Multi-layer pipes for water-based heating systems

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Multi-layer pipes for water-based heating systems



WELCOFLEX

DESCRIPTION

WELCOFLEX is a white PEX-c/Al/PEX-b multi-layer pipe, available in rolls. It is characterised by a high-thickness aluminium layer and is also supplied with medium-density PE insulation with closed cells of different thicknesses.






WELCOFLEX can be used in water-based heating systems, Type A, class 5.

The presence of aluminium makes it possible to shape the pipe very easily in order to greatly speed up installation and prevent the passage of oxygen inside the pipe.

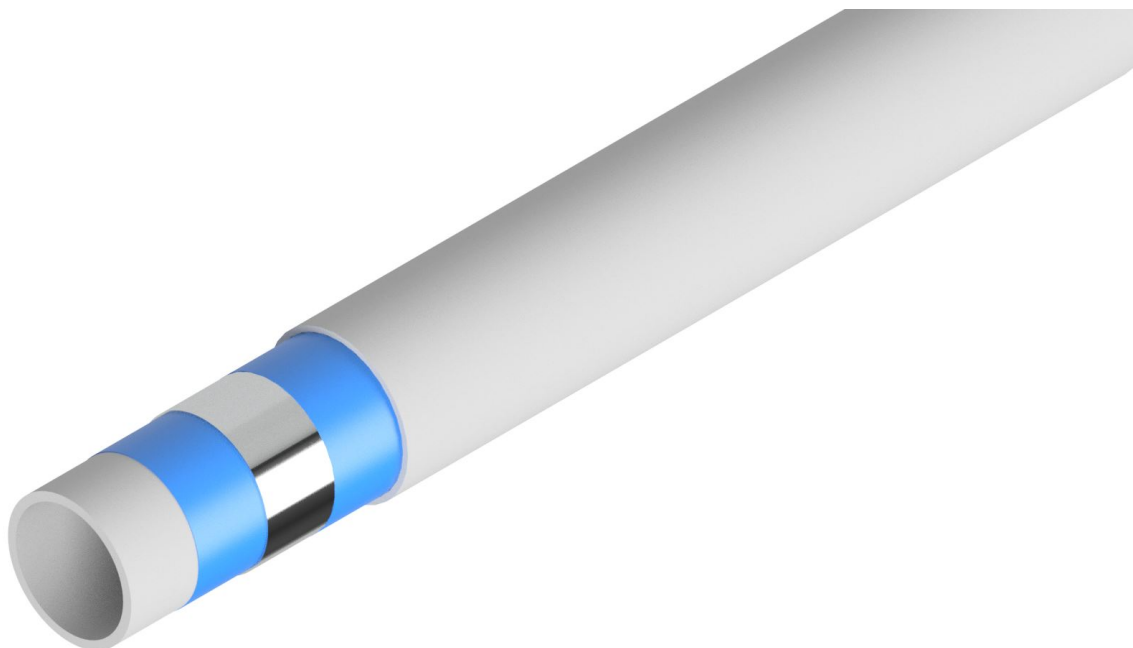
ADVANTAGES

- **STRENGTH:** the thickness of the intermediate aluminium layer varies from 0.4 mm (DN16) to 0.5 mm (DN20). The elevated thickness of the aluminium allows the pipe to withstand the stresses and vibrations of seismic activity.
- **FLEXIBILITY:** the union of cross-linked polyethylene and aluminium guarantees excellent flexibility when bending. WELCOFLEX can also be bent by hand with very small bending radii (1.5xDe).
- **LIGHTNESS:** the specific weights of the materials that make up the pipe are very low. Assuming the same diameter, WELCOFLEX is seven times lighter than iron pipe and three times lighter than copper pipe.
- **LOW TEMPERATURES:** WELCOFLEX can be used in very harsh climatic conditions (-45°C) as low temperatures do not weaken the mechanical and physical characteristics of the pipe. (However, all necessary precautions must be taken to avoid the formation of ice)
- **SMOOTHNESS:** the inner surface of the pipe is practically smooth and free of limescale and/or rust. Pressure drops are low and above all remain unchanged over time, as no encrustations can form on the walls.
- **DURABILITY:** laboratory tests guarantee that WELCOFLEX pipe will last for at least 50 years. During this period, it can be used at pressures of 10 bar and temperatures up to 95°C with maximum peaks at 110°C.
- **EXPANSION:** the linear expansion coefficient of WELCOFLEX pipe remains 0.024 mm/m°K, regardless of its diameter. No special devices are required when the pipe is covered in concrete.
- **POTABILITY:** there are no special precautions in relation to the use of WELCOFLEX piping for any type of installation where the fluid is drinking water.
- **WATERPROOF:** the head-to-head welded metal coating is a perfect barrier to the passage of oxygen and light. The pipe is absolutely opaque, so there is no possibility of algae formation.
- **CLEANLINESS:** in order for algae to grow, the presence of ultraviolet rays is required. The aluminium layer protects the inner layer from UV radiation and thus prevents the formation of algae.
- **CORROSION RESISTANCE:** the surface does not become corroded and no rusty particles detach. The PEX outer layer protects against the corrosion that can be caused by some cement mortars and against possible mechanical deterioration.
- **RESISTANT TO INTERNAL ABRASION** due to the abrasive action of impurities suspended in the carrier fluid (especially in bends), even when the flow rate is very high.
- **FIRE RESISTANCE:** the metal layer makes the pipe difficult to ignite, but combustion can still take place, developing a thin smoke (class 1).
- **SOUNDPROOFING:** good sound-absorbing properties for noises caused by the operation of electric pumps and fluid flow. The inner and outer PE-X coating attenuates sounds not absorbed by the metal layer.
- **RECYCLABILITY:** WELCOFLEX multi-layer pipe is completely recyclable; any unusable residual fragments can be recycled and used for other purposes.
- Can be used in MIXED INSTALLATIONS.

FIELDS OF APPLICATION

APPLICATIONS		T. of the system	Max. pressure
	drinking water	-45°C/+90°C	10 bar
	sanitary hot water	-45°C/+90°C	10 bar
	radiators	-45°C/+90°C	10 bar
	floor heating	-45°C/+90°C	10 bar
	irrigation	-45°C/+90°C	10 bar

COMPOSITION OF BARE PIPE



LAYER COMPOSITION

Inner layer in HD (high density) polyethylene cross-linked with the PE-Xc electronic system

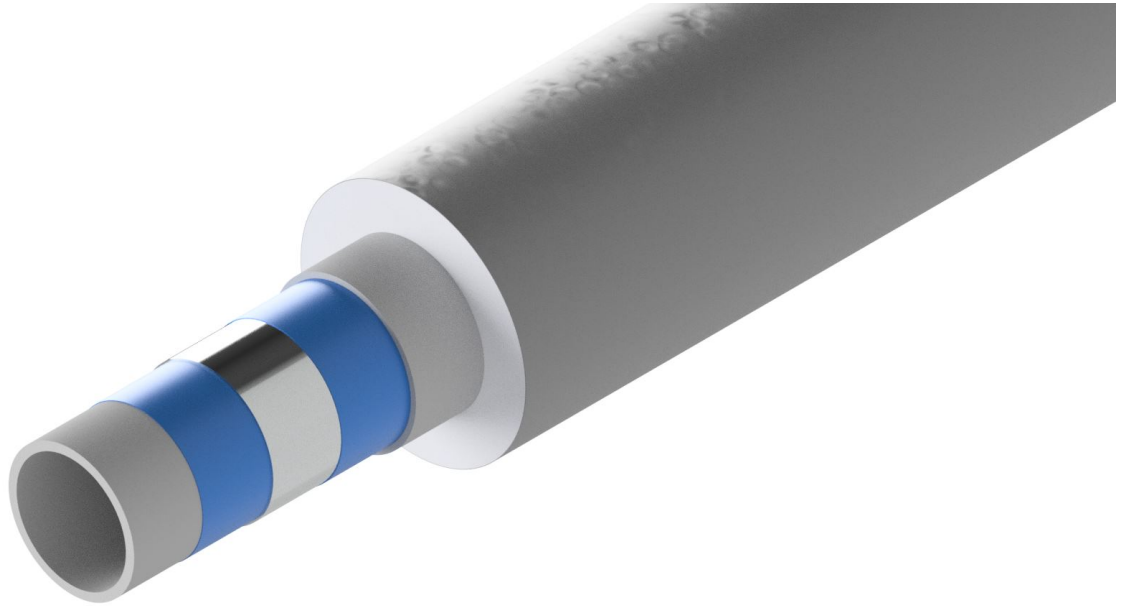
A high-quality adhesive layer to ensure the homogeneous connection between the aluminium pipe and the PEX-c inner pipe

Longitudinal head-head welded aluminium layer, from 0.4 mm (16x2.25 pipe) to 0.5 mm (20x2.5 pipe) in thickness.

A high-quality adhesive layer to ensure the homogeneous connection between the aluminium pipe and the PE-Xb outer pipe

Outer layer in PE-Xb cross-linked polyethylene

COATED PIPE COMPOSITION



LAYER COMPOSITION

Inner layer in HD (high density) polyethylene cross-linked with the PE-Xc electronic system

A high-quality adhesive layer to ensure the homogeneous connection between the aluminium pipe and the PEX-c inner pipe

Longitudinal head-head welded aluminium layer, from 0.4 mm (16x2.25 pipe) to 0.5 mm (20x2.5 pipe) in thickness.

A high-quality adhesive layer to ensure the homogeneous connection between the aluminium pipe and the PEX-b pipe

Outer layer in PE-Xb cross-linked polyethylene

Coating: layer of insulation made of closed-cell medium-density polyethylene, which increases the energy efficiency of the system, and further reduces noise.

CROSS-LINKED POLYETHYLENE (PEX)

Polyethylene is a thermoplastic polymeric material composed of numerous long molecules that, even at moderately high temperatures (still below the melting point), begins to have a significant degree of fluidity. With the cross-linking process, the polyethylene molecules are bonded together to form a more complex three-dimensional structure: the chemical cross-linking reaction transforms the product from thermoplastic to thermosetting.

The material undergoes a structural modification that improves its characteristics such as abrasion, chemical resistance, mechanical resistance over time, resistance to ageing and high temperatures. The mechanical performance of the material is significantly increased.

Cross-linked polyethylene can be produced by different technologies recognised by international standards and identified by methods A (peroxides), B (silanes), and C (radiation). The method used is indicated after the abbreviation of the material: PE-Xa, PE-Xb, PE-Xc.

All the above methods are valid: it is not the cross-linking process that defines the quality of the product, but its ability to pass the physical and mechanical tests defined by the standards.

In the case of PE-Xc, the PE layer is electronically cross-linked uniformly over the entire thickness; gamma rays trigger the cross-linking process without any toxic and/or harmful residues. The uniformity of the degree of cross-linking increases the strength of the PE-X layer and thus of the pipe.

The PEX-b outer layer ensures high resistance to breakage and offers advanced and permanent protection to the underlying aluminium layer. In addition, the pipe (often subjected to high stresses both during transport and installation) is protected from abrasion and wear by the outer layer.

WATERPROOFING

The metal coating of the pipe is a perfect barrier to the passage of gaseous molecules: that means no risk of corrosion due to oxygen infiltration.

The aluminium layer is welded at the head with the WIG system: the metal layer therefore not only serves to make the pipe waterproof, but also to adequately withstand thermal and pressure stresses, especially in sanitary installations.

PRE-INSULATED PIPE IN ROLLS

Some diameters of WELCOFLEX pipe in rolls also come complete with insulation.

This insulation is made of closed cell medium density polyethylene with thermal conductivity (CSI certified) of 0.040 W/m²K with a density of 21.4 kg/m³.

The insulation impermeability index (CSI certificate) detected has an average value of $\mu = 11450$ (based on three samples) while the standard deviation is $\mu = 614$.

The insulation is protected by a tear-resistant, low-density polyethylene film. The fire resistance class is 1.

The sole function of the insulation is not only thermal insulation, but also the attenuation of noise; in addition, it absorbs elongations due to expansion without damaging the pipe, and is therefore advisable in cases where

the pipe is placed inside the wall or under the floor.

REGULATIONS

WELCOFLEX pipes comply with the following regulations and provisions:

- UNI 10954-1
- DVGW (U448)
- Italian Ministerial Decree of 21 March 1973
- Italian Ministerial Decree No. 220 of 26 April 1993
- Ministerial Memorandum no. 102, enclosure . II, part A, part B, in Italy's Official Gazette 1978
- Italian Law 46/90: rules for the safety of systems
- Italian Presidential Decree 447 of 6/12/91
- Italian Law 10/91
- Italian Legislative Decree No. 174 of 6 April 2004

CERTIFICATIONS

WELCOFLEX pipes are tested according to the new DVGW EW542 provisions and registered under the number U448, which guarantees the perfect hygienic quality of the pipe.

FITTINGS

WELCOFLEX pipes can be used with WOFLEX compression fittings and EWOPREX press fittings. Please refer to the sales catalogue or www.generalfittings.it.



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