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Technical data sheet for multilayer pipes for sanitary, heating and cooling installations

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## Multilayer pipes for water installations



### DESCRIPTION

The multilayer pipe is characterized by a 5-layer structure in which a butt-welded aluminum layer is enclosed between two layers of cross-linked polyethylene (PEX) and fixed to the latter by two layers of adhesive. Thanks to this feature, TB00.20 pipe represents a perfect combination of the properties of plastic (cross-linked polyethylene with high mechanical resistance) and ductile metal (highly flexible aluminum), in which the qualities of PEX are added to those of aluminum, giving life to a product with extraordinary and multiple qualities.

PEX confers chemical resistance, corrosion resistance, lightness, hygiene and guarantees a very smooth and polished surface in contact with the transported fluid such as to reduce pressure drops and avoid encrustations.

The presence of aluminum allows the pipe to be modeled very easily in order to significantly speed up installation and prevent the passage of oxygen inside the pipeline. The pipe is suitable for sanitary, heating, cooling and compressed air systems.

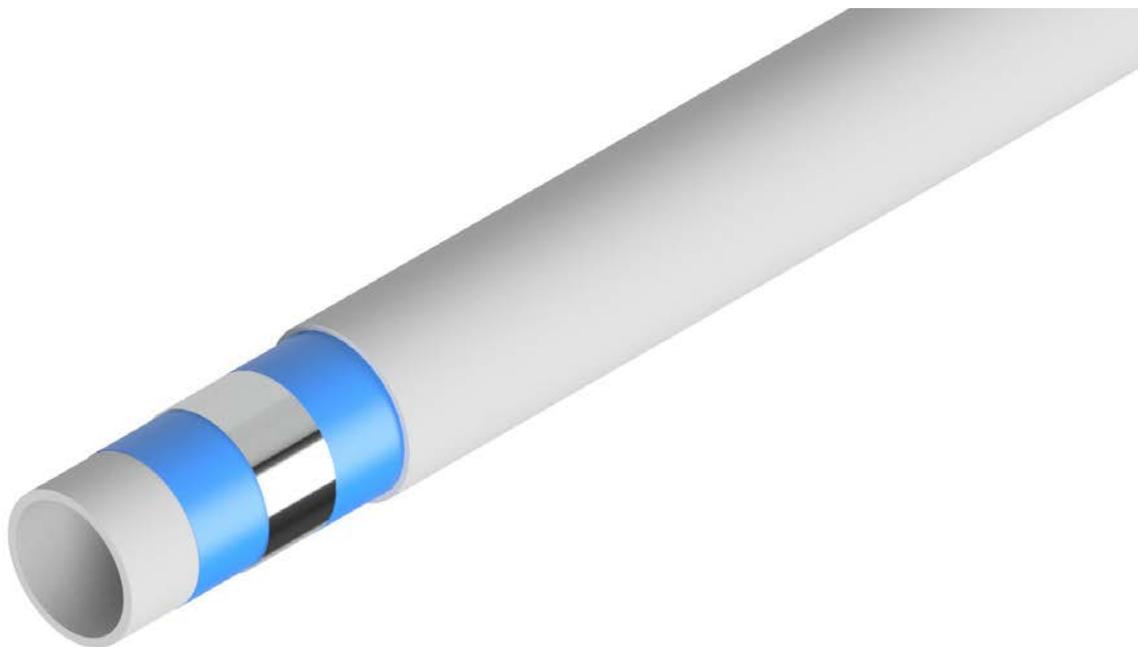
## ADVANTAGES

- Excellent sound insulation: the elasticity of the cross-linked polyethylene allows for excellent absorption of vibrations
- Corrosion resistance
- Lightness: pipes are much lighter than metal pipes
- Hygiene: the materials used are non-toxic and certified for the transport of drinking water
- Hygiene, absence of encrustations and fungi (the extreme smoothness of the internal surface reduces the possibility of obstructions caused by the growth of encrustations and fungi)
- Reduced pressure drops: the smooth and polished internal surface reduces pressure drops and avoids the formation of encrustations
- Flexibility: the presence of aluminum with a high degree of yield allows the tube to be modeled very easily
- Reduced thermal expansion: thermal expansion is limited to 0.026mm / m °C
- Chemical and electrochemical resistance (PEX being a bad electrical conductor it is not subject to destructive phenomena of stray currents)
- Barrier to light and oxygen: the butt-welded aluminum layer forms an oxygen barrier that promotes the formation of algae, fungi and corrosion
- Ideal for seismic areas thanks to its flexibility and ability to attenuate vibrations

## FIELDS OF APPLICATION

APPLICATIONS		T. of the system	Press. Max
	drinking water	-20°C/+95°C	10 bar
	hot sanitary water	-20°C/+95°C	10 bar
	cooling	-20°C/+95°C	10 bar
	conditioning	-20°C/+95°C	10 bar
	heating	-20°C/+95°C	10 bar
	floor heating	-20°C/+95°C	10 bar
	irrigation	-20°C/+95°C	10 bar

## COMPOSITION OF BARE PIPE



### LAYER COMPOSITION

A cross-linked polyethylene (PEX) inner pipe

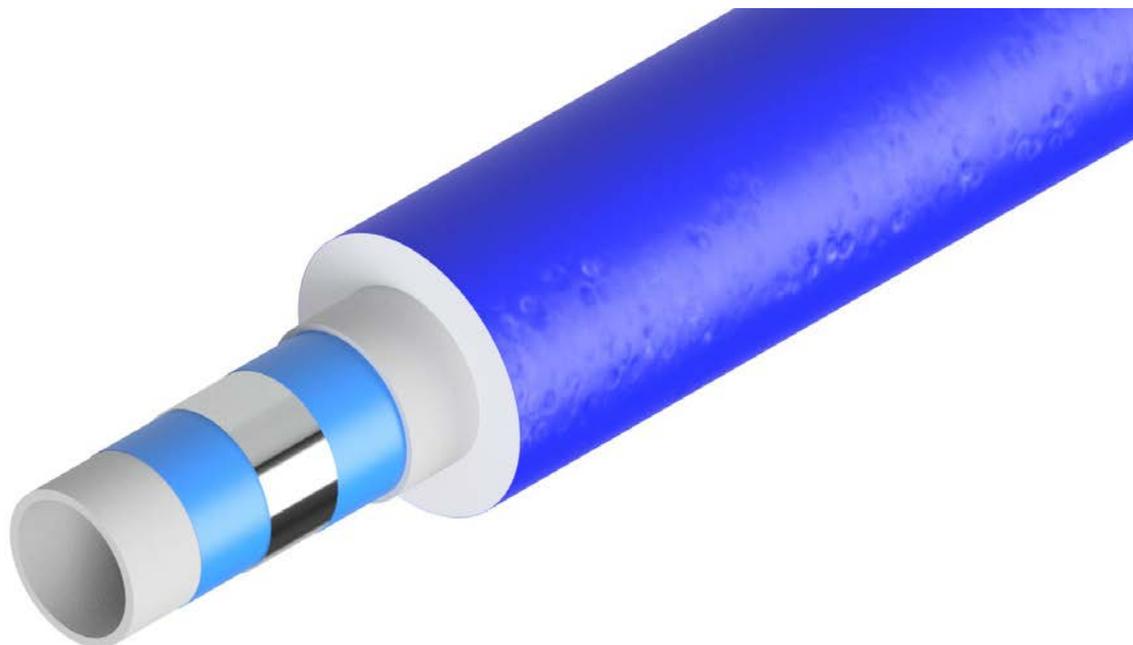
A layer of high quality glue to ensure a homogeneous connection between the aluminum pipe and the internal PE-X pipe

An aluminum tube, longitudinally welded and electronically controlled

A layer of high quality glue to ensure a homogeneous connection between the aluminum pipe and the external PEX pipe

An outer pipe in catalyst cross-linked polyethylene (PEX-b), extruded with cross-linkable high-density polyethylene

## COATED PIPE COMPOSITION



### LAYER COMPOSITION

A cross-linked polyethylene (PEX) inner pipe

A layer of high quality glue to ensure a homogeneous connection between the aluminum pipe and the internal PE-X pipe

An aluminum tube, longitudinally welded and electronically controlled

A layer of high quality glue to ensure a homogeneous connection between the aluminum pipe and the external PEX pipe

An outer pipe in catalyst cross-linked polyethylene (PEX-b), extruded with cross-linkable high-density polyethylene

Coating: layer of insulating material, made of closed cell expanded polyethylene, which increases the energy efficiency of the installation, and further improves the already reduced noise level. The coating structure consists of two layers. The coating has ZQ038 insulating properties and the outer film is in self-extinguishing PVC.

## CERTIFICATIONS

COUNTRY	CERTIFICATION	COUNTRY	CERTIFICATION	COUNTRY	CERTIFICATION
					
					KTW-BWGL
					

## CERTIFICATIONS

KIWA-DVGW in accordance with UNI EN ISO 21003.

The new regulation requires the marking to report only the classes of applications and temperatures of the pipe project. Any other indication of temperature and pressure is confusing

General Fittings pipe, certified by prestigious bodies, finds its application in continuous hot water supplies at 70 °C.

General Fittings pipe is therefore guaranteed for continuous operation of hot water supply at 70 °C for 49 years and, for one year at 80 °C, for 100h at 95 °C, the latter considered as a malfunction temperature.

## REGULATIONS

- ISO 21003-2

It is the European standard for multilayer pipes for hot and cold water in installations inside homes. This legislation specifies the general characteristics of pipes and multilayer systems for conveying hot and cold water inside homes in heating and drinking water systems

## 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.

## PERMEABILITY TO OXYGEN

General Fittings pipe is impermeable to any diffusion phenomenon, as the intermediate aluminum structure guarantees a zero passage of gases inside the tube itself.

This feature makes it the perfect solution in any heating system that includes aluminum exchangers or metal tube bundles sensitive to oxygen diffusion.

General Fittings multilayer pipes can also be used in underfloor heating systems in compliance with the provisions of the UNI EN1264 standard which prescribes an oxygen diffusion barrier on the pipes for radiant floor heat systems, limiting it to 0.32 mg / m<sup>2</sup> per day in order to avoid the reduction of the useful life of the pipe itself.

## ADHESIVE PRIMER

The aluminum tape is attached to the inner and outer PEX layers by two layers of glue.

The latter was specifically developed to maximize the adhesion between PEX and aluminum and to ensure that the bond strength does not decline with time and with high temperatures.

Thanks to the adhesive, the two layers of PEX and the aluminum layer form a whole with superior properties compared to the single component.

## COVERING (in case of coated pipe)

The layer of insulating material, made of closed cell polyethylene foam, in addition to increasing the energy efficiency of the installation, further improves the already reduced noise level of systems made of synthetic materials.

The insulating section is made up of a layer of closed cell expanded polyethylene (CFC-free) protected by a characteristic red, blue, gray and white external covering film.

N.B. It is strongly recommended to always consult a technician to define the insulation thicknesses.

## APPLICATION CLASSES

Class	Design Temperature	TIME <sub>b</sub> at TD	T max	Time at T max	T mal	Time at T mal	Typical Field of application
1a	60	49	80	1	95	100	Hot water supply (60 °C)
2a	70	49	80	1	95	100	Hot water supply (70 °C)
4b	20 plus cumulative	2.5	70	2.5	100		Underfloor heating and low temperatures radiators
4b	40 plus cumulative	20	70	2.5	100		Underfloor heating and low temperatures radiators
4b	60	25	70	2.5	100		Underfloor heating and low temperatures radiators
5b	20 plus cumulative	14	90	1	100		Underfloor heating and low temperatures radiators
5b	60 plus cumulative	25	90	1	100		Underfloor heating and low temperatures radiators
5b	80	10	90	1	100		Underfloor heating and low temperatures radiators



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