CHARACTERISTICS

Pex pipes have been used safely and reliably for over 50 years worldwide. They designed for a **life span of more than 50 years, temperatures up to 200˚F and operating pressures 80 to 100 psi.**

Due to their cross-linking structure, the pipes have a thermal memory that allows them to return to their original form after thermal stress.
Essentially, the internal structure of the material is affected by the form given during production.

Pex pipes exhibit excellent aging resistance combined with high pressure and temperature conditions.
The service life diagram confirms the excellent performance when used in accordance with the manufacturer's specifications and instructions.

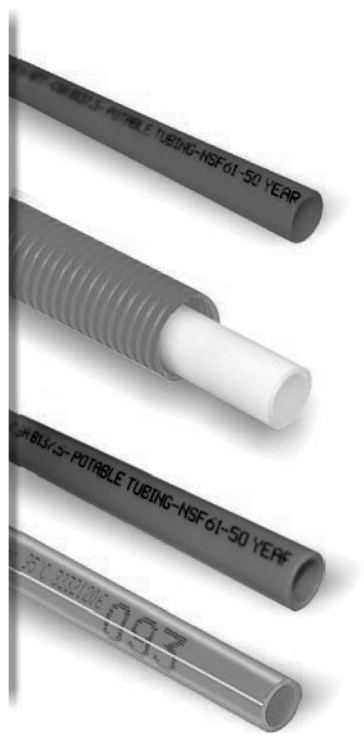
- 200 degrees F (93 degrees C) at 80 psi (551 kPa)
- 180 degrees F (82 degrees C) at 100 psi (689 kPa)
- 73.4 degrees F (23 degrees C) at 160 psi (1102 kPa)

Pex pipes are durable, flexible and completely reliable for plumbing and heating applications.

Pex pipes produced with or without oxygen barrier meet and exceed ASTM F876/877, CSA B137.5, NSF 14, NSF/ANSI 61, European norm EN ISO 15875 and German DIN 16892/16893.

Pipes with oxygen barrier layer meet the require ments of MPA NRW and DIN 4726. The EVOH outer layer does not allow oxygen to enter the pipe and corrode the metal parts of the system.

They are well designed for applications in heating, especially underfloor heating installations, where the length of the circuits of the pipes require their use. In case the pipe does not have oxygen barrier, heat exchanger is required in order to avoid oxygen corrosion.



Property	ASTM Test Method	Typical Values	
		English Unit	SI Units
Density	D 792	-	0.946 g/cc
Melt Index *1 (190°C/2.16 kg)	D 1238	-	0.7g/10min
Flexural modulus*2	D 696	120,000 psi	830 MPa
Tensile Strength @ Yield (2 in/min)	D 638	2,900 psi	20 Mpa
Coefficient of Linear Thermal Expansion @ 68° F	D 696	9.2x10-5/in/°F	1.5x10-4/°C
Hydrostatic Design Basis @ 73°F (23°C)	D 2837	1,250 psi	8.6 MPa
Hydrostatic Design Basis @ 180°F (82°C)	D 2837	800 psi	5.5 MPa
Vicat Softening Point	D 1525	255° F	124° C
Thermal Conductivity	D 177	"2.86 Btu•in/(ft2•hr•°F) "	0.41 W/(m•°K)

*1 Before Cross- linking - *2 73°F

TOP EUROPEAN QUALITY

Research is a sector which company invests. An important part in this is the **Thermal Cycling Tester apparatus, which confirms the high quality of our products**.

Where all systems are certified in the most demanding conditions. In the thermal cycling tester apparatus, pipes and fittings stress at constant pressure 87psi, at temperatures of 68°F & 203°F, which change every 15 minutes.

This is repeated for 5.000 times in 15 minute duration, which means 52 days.

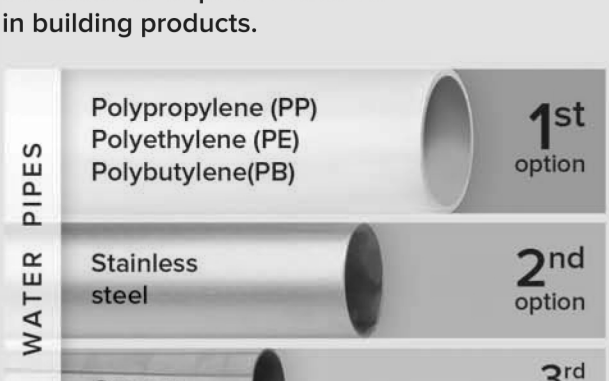
Due to modern laboratory equipment and research and development, uses special additives that give significant properties to Pex pipes as shown in the table below.

PERFORMANCE OF POLYTHELYNE MATERIAL IN DRINKING WATER

PE is a material that **does not react with water or its components** (completely inert), does not extract any chemical that can harm the quality of the water, does not develop on its surface any microbiological or bacterial substances, **does not corrode from any chemical agents, cement, lime or acid waters** and has very low roughness (mean surface anomalies in mm), resulting in that the pipes and fittings are protected against damages caused by the friction of water with the inner walls of the pipes, while the pressure drop coefficients remain very low.

For all the aforementioned reasons, Greenpeace, as shown in the following table, and other relevant environmental non-governmental organizations, propose specific types of plastic pipe for water systems in buildings because they have low energy charges, provide clean drinking water without harmful substances, while not having the problems of metal corrosion. They ideally propose as first alternatives for plumbing, the use of plastic polypropylene pipes (PP), of polyethylene pipes (PE) and of polybutylene pipes (PB).

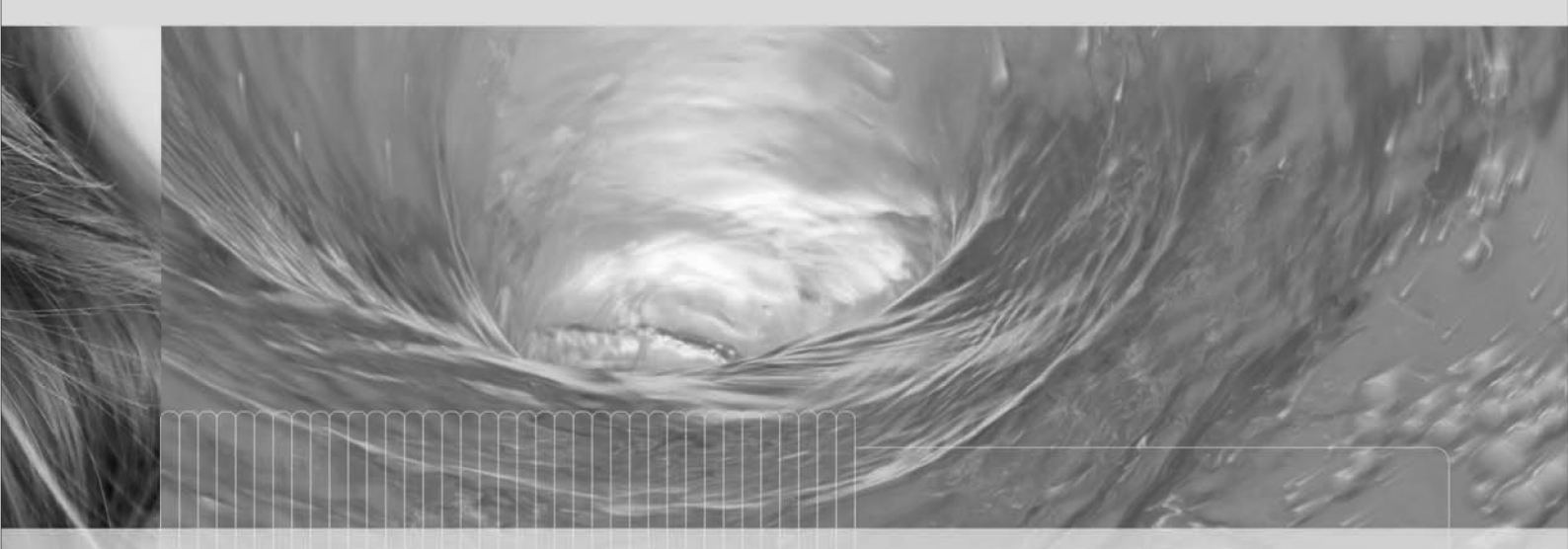
Indicative examples of choices in building products.



Source: Greenpeace, www.greenpeace.org

CROSS- LINKING METHODS – ADVANTAGES OF PEX-B PIPES

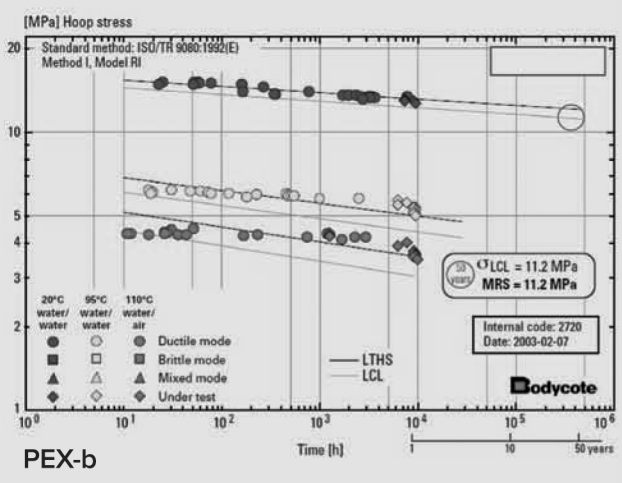
The most common cross-linking methods used in industrial production are **Pex-a** method (peroxides), **Pex-b** (silanes) and **Pex-c** (radiation).
All the aforementioned methods achieve the same results in PE-X pipes and meet the **DIN 16892/16893** and the recent European **EN ISO 15875-1/2** standards.
The Pex pipes of are produced usings the –b method. It is a method that has managed to improve the charachteristics of Pex pipes. The production method of Pex-b pipes was discovered in tha laboratories of Sioplast in 1970. It had an initial cross-linking degree of 65%, which increased over time and reached about 80%, in contrast to the degrees of the other two methods (Pex-c & Pex-a) that stop at 60% and 70% respectively.
It is considered to be the best cross-linking method for many reasons, but mainly due to its fully three-dimensional dense networking structure and its high chemical resistance to chlorinated water because of its sufficient amounts of antioxidant additives in its material.
For these reasons, it is used by most manufacturers of PEX pipes worldwide.



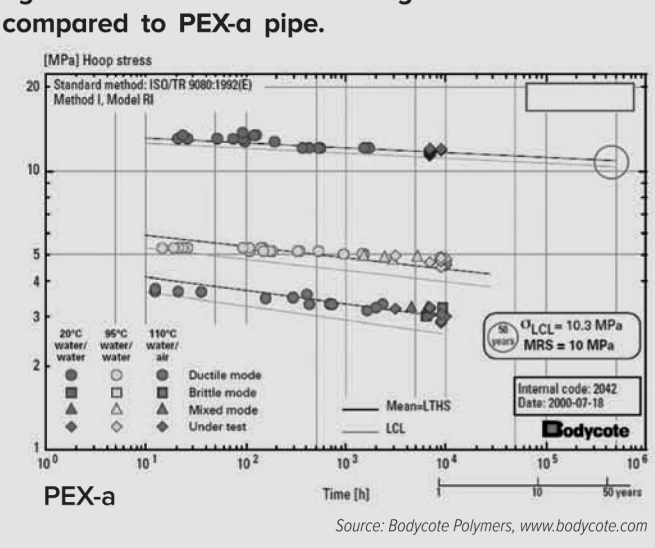
PEX TUBES RESISTANCE

The following charts show the resistance to pressure of a **PEX-b** pipe and a **PEX-a** pipe in long term hydrostatic pressure tests conducted at the renowned Swedish Institute Bodycote Polymer. The prediction for the strength of the PEX-b pipe at 68˚F for 50 years is 11.20MPa, while for PEX-a pipe is 10.30 MPa.

At 203˚F, the strengths are 4.20 MPa and 3.81 MP respectively, whereas at 230˚F 3.06 MPa and 2.60 MPa respectively.
The results show the clear superiority of the Pex-b pipe in pressure strength by 9% at 68˚F, by 10.3% at 203˚F and by 17.7% in 230˚F compared to PEX-a pipe.



PEX-b



PEX-a

Source: Bodycote Polymers, www.bodycote.com