

# PEX-a Tubing — Why It's Better

Currently, three methods for producing crosslinked polyethylene (PEX) tubing exist.

- Engel or peroxide method (PEX-a)
- Silane method (PEX-b)
- E-beam (electron beam) or radiation method (PEX-c)

All three processes generate tubing that is crosslinked to varying degrees, and are acceptable for potable water distribution applications according to ASTM F876 and F877 standards.

## Engel Method (PEX-a)

Uponor manufactures Engel-method PEX-a tubing. The PEX tubing industry considers this tubing superior because the crosslinking is done during the manufacturing process when polyethylene is in its amorphous state (above the crystalline melting point). Because of this, the degree of crosslinking reaches around 85%, resulting in a more uniform product with no weak links in the molecular chain.

## Silane Method (PEX-b)

PEX-b tubing is crosslinked after the extrusion process by placing the tubing in a hot water bath or steam sauna. The degree of crosslinking for PEX-b is typically around 65 to 70%. This method is not as evenly crosslinked as the PEX-a method, nor does it have the same degree of

thermal memory, which allows kinked tubing to be reshaped with the use of a heat gun.

## E-beam Method (PEX-c)

PEX-c uses an electron beam to change the molecular structure of the tubing (i.e., crosslink) after the extrusion process. The PEX-c method requires multiple passes under the beam to reach a 70 to 75% degree of crosslinking. Side effects of this process are discoloration due to oxidation (from natural white to yellow, unless other pigment is added), and a slightly stiffer product.

## PEX-a Distinctions

The properties in PEX-a tubing make it the most flexible PEX on the market. This allows the tubing the tightest bend radius available — as little as 3½" for ½" tubing. Its flexibility also greatly reduces the instance of kinked tubing.

However, if there is the rare occurrence of kinked tubing, that's okay, because PEX-a tubing has thermal memory. This allows the repair of kinked tubing with a simple shot of heat from a heat gun. The shape memory of PEX-a tubing offers the unique opportunity for fitting connections. Shape memory allows PEX-a tubing to expand and then shrink back to normal size, creating strong, durable and reliable fitting connections.

- Most flexible
- Smallest bend radius
- Least likely to kink
- Thermal memory
- Shape memory
- Highest degree of crosslinking
- Greater resistance to crack propagation

And finally, PEX-a tubing offers the greatest resistance to crack propagation (how a crack grows) over PEX-b and PEX-c tubing. This means if a crack occurs in PEX-a tubing, it is least likely to grow over time and cause leaks or damage.

## Uponor Tubing

With over 30 years of service — longer than any other PEX manufacturer in North America — Uponor is the leader in PEX tubing for radiant heating, plumbing and fire protection systems. More than 2 billion feet of Uponor PEX tubing is in service in North America alone, and over 12 billion feet of tubing is installed worldwide. With that kind of history, you can count on Uponor PEX to offer the highest-quality tubing for all your application needs.