

PEX, The Greatest Thing Since Sex or a potential HEX?

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Well, PEX does not really compete with sex, but from all the advertising hype in some circles and the growing use, it is becoming quite popular for new home construction. It even comes in red and blue colors.

What is PEX?

The “latest innovation in plumbing supply lines” could be one description. The skeptics may describe it as the “latest form of Trojan Horse”.

PEX is a flexible tubing made of high density polyethylene, used for water supply lines. Terminations are typically made with crimp connections, using special tools and fittings.

What are the benefits?

It can be run from one end of the water service to the other in one piece. That means no fittings, nor labor for assembling fittings. It is rated for use with hot water so it can be used through the whole house. With no intermediate joints, there are no workmanship dependent leak points in the walls. When hot and cold lines have different colored material, there can be no mistake about which is which.

PEX manufacturers are also touting the use of a manifold system which routes all the service lines to a connection box with a separate valve in the box for each line. That way when it is time to service a faucet, the water supply could be shut off at the manifold panel for that line only. This is a wonderful way for PEX suppliers to add the sale of distribution valves as another profit center. This idea is really independent of PEX and could be done with other kinds of pipe as well.

One of the biggest driving forces is cost. Reducing the number of fittings, reduces the installation cost – both labor and materials – allowing the builder to save money, even though the cost of the PEX itself is said to be similar to that of copper.

All PEX is not the same.

While PEX manufacturers are united in their assurance of the reliability of PEX, they freely recognize there are two different methods for making the material. Of course, according to each one, their method is the best. Other manufacturers acknowledge some of the potential PEX problems and use a multilayer manufacturing process to, hopefully, avoid most of them.

Sorting out the difference between manufacturers can be frustrating and confusing with a sea of claims and counter claims. Reliability is difficult to assess with no definitive service life comparisons or actual long term service data to help sort it out.

Too good to be true?

PEX is relatively new. The only long term reliability results apparently come from two interesting sources. PEX has been used in Europe for many years with few apparent problems. More recently, PEX has survived several years of successful service in radiant heating systems in the North East.

While that may sound impressive, two important factors are left out. There is little addition of fluorides or chlorine to the water in Europe. In a closed system, like radiant heating systems, any chlorine or fluorine in the system eventually reacts with system components and is not replenished.

The rubber begins to hit the road when you understand that the basic chemical building block in PEX is a polyolefin molecule. These molecules like to react with oxidizing agents. Chlorine and Fluorine are the two most powerful oxidizing

agents in the world. Is it possible that the high levels of these two oxidizing agents in our tap water could degrade the performance of PEX? You can bet your bippie on it.

In fact, the manufacturers include stabilizer additives in the basic polymer formulation to sacrificially react with those oxidation agents, thus prolonging the life of the product. This information is not on the label. The down side is that once the stabilizer is consumed, the polymer begins to decompose. That can translate eventually into leaks or even bursting water lines.

The operative question is not if, but when? There is, apparently no long term data available for PEX used in highly oxidizing environments. Claimed expectations run typically from 20 - 50 years, at best. Twenty years ago was only 1985. Imagine the impact of lots of houses built before that date routinely requiring replacement of their entire plumbing systems.

Polyolefins are also highly reactive to sunlight, abrasion and surface damage. Bare PEX tubing exposed to the sunlight for only a few days during the building process can be seriously degraded. Scrapes, cuts and nicks can produce hidden weakness.

Special tools and fittings for installation also means special tools and procedures will be required for eventual repairs, translating into higher repair costs. PEX installation and repair is typically not a do-it-yourself option either.

If the PEX ever had to be replaced with straight pipe [CPVC or copper] supply systems, entirely new routes for the pipes would have to be made in the walls. Look around your house and estimate how many walls would have to be opened to run new pipes – not a trivial operation.

Remember polybutylene?

It wasn't that long ago when similar wonderful claims were made for polybutylene pipe. That's the gray stuff that has since been recalled. Problems surfaced from crimp connections and decay of the pipe itself, primarily from oxidation due to chlorine and fluorine in the water. It took several years for it to happen. How long is your new home warranty?

Remember the Romans?

They invented plumbing. In fact, the name plumbing came from “plumbum” the latin word, for lead. Can millions of people be wrong? The Romans used lead pipe everywhere, even for their drinking water. Then they died early from lead poisoning. Perhaps their plumbing was a significant factor in the decline and fall of the empire.

Do your own research and make your choices from real information, not just someone's sales pitch. If I were building a home, without more substantive information, I'd prefer copper or CPVC for my water lines.

Even new houses need inspection.

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