

Special Considerations When Using PEX Plumbing Lines

Mark's Thoughts...

Let's talk a little about all of those red, white, and blue pipes we see in a lot of new homes.

The PEX (cross-linked polyethylene) plumbing system is widely accepted as an excellent cost saving plumbing solution when properly installed. But, like everything, it has its caveats. If you do a Google search you will find that the vast majority of PEX system failures (and legal actions) can be traced back to one cause... *UV Exposure*.

That's right! Exposure of PEX plumbing lines to UV light for extended periods of time can lead to several forms of damage. You see PEX is sensitive to ultraviolet (UV) radiation, which can cause degradation of the material over time. The specific damage can vary, depending on the PEX model type and the intensity and duration of UV exposure.

Here are some potential damages that can occur:

1. **Brittleness:** Prolonged UV exposure can make PEX pipes brittle and more susceptible to cracking or breaking. This can lead to faulty connections as well as cracking and splitting of the pipes in the late stages of construction.
2. **Reduced Longevity:** UV radiation can accelerate the aging process of PEX pipes, causing them to become weaker and more prone to failure over time. While the lifetime of PEX is advertised as forty plus years, the useful lifetime is exponentially reduced by UV exposure. This can result in premature replacement or repair of the plumbing system and major water damage to your home. Typically occurring after your home warranty expires.
3. **Color Fading:** PEX pipes may experience color fading when exposed to UV light. This is primarily an aesthetic issue and does not affect the performance or functionality of the pipes. However, faded pipes are a good indicator that the pipes' durability has been degraded and / or compromised.

To mitigate these damages, it is recommended to limit the exposure of PEX pipes to all forms of UV light. Especially direct exposure to sun light.

1. Personally, I require the plumbing contractor to only use rolls of PEX pipe that is still in its original factory wrapping. That's the only way to know if the PEX is new and has not been sitting out in the sun in the back of a truck or at another job site for weeks or even months.
2. When PEX is run through the slab it often sits exposed to the sun for months before the home is dried-in. Personally, I always insist that the full length of all PEX supply lines be protected from UV Exposure 'from day one' by simply requiring the full length of all PEX pipes be covered with Flexible Foam Insulation.

Here are a few of Mark's tips to help mitigate expensive potential damage...

- A) Make it clear from the start, that all PEX plumbing lines (Hot & Cold) must be wrapped with Flexible Foam Insulation (Equal To Armaflex II) as it is installed

and that all joints in the insulation must be taped. This is typically an extra cost, but in my opinion, a justifiable expense.

The insulation helps to...

- Protect the pipes during construction - and -
- greatly reduces the damaging effects of UV exposure both during and after the build.

B) Try and minimize the number of ***in-slab water supply lines***. Plumbers like to run their PEX lines in the concrete because it's easier for them. They use less material and they don't have to drill feed holes through the studs or fish the lines through the walls.

But this is not about making the plumbers job easier. It's about sustainability and saving you money in the long run. Repairing in-slab water leaks can be extremely expensive! Whenever possible, minimize the number of lines in the concrete and minimize the length of the required lines.

C) Typically, water lines have to run through the concrete slab to feed remote areas, like a Kitchen Island or a freestanding bathtub pedestal faucet. Whenever I need to run PEX in the concrete I require it to be wrapped with Flexible Foam Insulation (Equal To Armaflex II) when the lines are dropped.

Not only does Flexible Foam Insulation save money and energy loss by mitigating thermal exchange loss between the pipe and the concrete, Flexible Foam Insulation also...

- helps to protect the plumbing lines from damage during construction
- It helps to protect the plumbing lines from damage when the concrete compresses, shifts and cracks over time
- Be sure to cover the full length of all PEX supply lines extending out of the concrete slab. These PEX lines must be protected from the extended UV Exposure during months of construction. This is just another reason to wrap the full lengths of all PEX lines, both in the slab and extending out of the concrete. Check the lines throughout the build to ensure that they are covered with Flexible Foam Insulation securely taped in place. I usually cover the Insulated lines in a black plastic bag as well for extra protection during construction.

D) Reminder... If you plan to have a continuous flow instant hot water system, all in-slab water supply lines will require 3 lines. A cold water supply line and TWO hot water supply lines. One for the hot water supply and another line for the continuous flow return loop.

The maximum recommended exposure times can vary based on the PEX model types. Here are some general guidelines:

The UV resistance of each PEX tubing is indicated in the tubing ID print line, which is repeated at least every five feet along the line. Typically, there is a four-digit material designation code printed on the line. The second digit is used to indicate the certified UV resistance based on testing according to ASTM F2657 and evaluation, according to ASTM F876.

For example:

PEX 1106 has a second digit '1' which means at least 30 days of UV resistance

PEX 3206 has a second digit '2' which means at least 90 days of UV resistance

PEX 5306 has a second digit '3' which means at least six months of UV resistance.

It is important to note that these recommended exposure times can vary depending on the manufacturer's specifications and the specific environmental conditions. Therefore, it is always best to consult the manufacturer's guidelines or seek professional advice when installing or maintaining PEX plumbing systems to ensure proper UV protection and longevity.

Quality PEX manufacturers integrate sunlight resistance into their packaging to protect their tubing before installation. You should not allow installers to use open unprotected PEX tubing on your job. There is no way to tell how long it has been sitting in the back of a truck or laying around on a job site before installation. The PEX pipes may be cheaper for the plumber because they have already exceeded the allowable UV exposure limits and been rejected by another builder. I always insist on the original manufacturer's packaging to minimize problems down the road.

Well, that's it for now. Stay tuned for the next helpful construction blog from Meyer3D!

Remember... Build strong and stay safe!

Mark