

## Pin hole leaks in copper piping (Cobb County GA)

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Contrary to popular belief, copper water piping does not last forever. Copper exhibits excellent resistance to corrosion but only lasts about 25 years. Copper is vulnerable to pitting corrosion which can eventually lead to pinhole leaks. A pinhole leak is a puncture due to the progressive pitting corrosion process. The major causes of pinhole leaks in Cobb County are caused by Electrolysis and improper electrical grounding/bonding of your homes electrical system to existing copper in your home. And Yes excessive water pressure speeds up the process.

**Electrical grounding and bonding** (lack there of) is the major problem we see in Cobb County. Stray currents can also have an effect on pinhole corrosion due to improper electrical grounding. The practice of using the water distribution (copper piping) as part of the grounding system for homes and buildings has been common place for more than 80 years. It is well known that direct electrical current discharge from a metallic object causes rapid and extensive corrosion. There are numerous cases of stray current corrosion having been associated with direct electrical currents. For years that panel was simply grounded to the pipes which were usually galvanized or copper and main underground waterlines were of the same materials. Now In today's world many homes of this era upgraded new waterlines underground to plastic materials which have conductive properties. So what happens to those electrons if they can't find ground? There's iron in that water, and iron and copper don't mix. Let's take it one step further. Follow that

energized water in copper pipes to the water heater where the tank is metal, and all water heaters have what is called a sacrificial rod or anode rod. That anode rod is usually magnesium. Let's summarize for a bit, energized water with iron in copper pipes being heated in a steel tank with a magnesium rod. To a layman that almost describes a D battery, so now your entire homes copper piping is like a battery which is corrosion in nature.

**Electrolysis** can also cause pinhole leaks. One is a condition called "electrolysis". This process occurs when you have a mixture of dissimilar metals in your plumbing such as the combination of galvanized iron and copper. Even when a system is comprised of all copper piping, electrolysis can be caused by just one galvanized nipple or connection. An electrical ground wire in contact with a galvanized connection on your hot water heater is also enough to cause electrolysis. The second variable associated with hot water pinhole leaks occurring after the hot water heater concerns the "sacrificial anode" located inside the hot water heater. The "anode" provides what is commonly called cathodic protection. Because the metal anode is more reactive to the corrosive environment than the system as a whole, it dissolves more easily than the internal copper piping and/or water heater. As corrosion is concentrated on the anode first, it provides protection to the metal of the system (copper pipe) it is connected to. If this anode is allowed to corrode or dissolve totally, the corrosive tendencies of the water turn to the next available metal of your copper piping.

**Water Quality**, I hear plumbers and clients both saying its most likely water quality. If you live in Cobb and on the phone with an electrician or plumber telling you this, just hang up the phone. They are CLUELESS! I can tell you 100% certainty in Cobb county you can't blame the water

quality to the cause of pinholes! Cobb prepares an annual water report and does an excellent job educating consumers, read it!

**Acidic water, IN OTHER AREAS** (Outside Cobb) can cause pinhole leaks in your copper pipe. Acidic water slowly eats away the copper at its weakest point until a pinhole develops.

Cobb county treats its raw water supply with calcium hydroxide, commonly referred to as lime. This not only sweetens the taste of our water but also minimizes its corrosive effects. The addition of lime also produces a secondary positive effect. It leaves a calcium carbonate coating on the interior of copper plumbing pipes which protects the pipes by creating a barrier between the pipe and the water which greatly reduces the corrosive process. Cobb county water in my opinion is the best in the state. And yes, I have physically seen the process in person actually watching sewage being converted into potable water as well.

**Green fittings**, green stains you notice near and around your homes copper fittings. Touch them and see if they are slimy? If so, this occurs when the original installer didn't wipe off the excessive flux after soldering. This can be cleaned easily by scrubbing fittings with a rag soaked in warm water and TSP solution available at most home centers.

**Summary**, to those consumers who have experienced pinhole leaks in their homes interior copper water pipes, the best course of action is to contact a licensed master plumber who has knowledge discussed in this article. Would you call a foot doctor to work on your heart? Not all plumbers specialize in all aspects of plumbing. Choosing and hiring the proper contractor not the lowest bidder in town in the end will save you lots of time, avoid unnecessary aggravation and in the end save you money.