

OVERVIEW: Frozen pipes: Tracing, thawing, preventing.

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As weather patterns change we are getting longer colder periods than traditionally in many areas of the country -- and with that, more and more complaints of water pipes freezing. Finding the frozen point can be difficult, thawing it can be problematic but if you have done those two, go one step further and prevent it from re-occurring.

If you have had to deal with hidden frozen pipes, you realize why I hate finished drywall ceilings in a basement. Removable ceiling tiles give you access to plumbing and electrical runs above, as well as access to otherwise hidden forced air heating balancing dampers. If you are going to finish a basement ceiling with taped drywall, make sure you have air sealed and insulated the header board all around first.

Ice that forms in a water pipe can burst the pipe and when the pipe thaws out you have a plumbing flood, but more often ice will simply form a plug and stop the water flowing until it thaws out. In fact an ice plug is the first sign of danger which can lead you to solving a problem before it becomes a cracked pipe. By the way, copper piping is more prone to bursting than plastic pipe -- it is stronger but has no flexibility.

A myth to dispel is that wrapping a water pipe in insulation of any kind will help to keep it from freezing: not true! Half of that wrap insulation will keep the cold away from the pipe but the other half will keep the household heat away from the pipe - leaving you with a net no change. Water pipes near outside walls need to have as much insulation as possible between them and the source of the cold with as little insulation as possible between them and the heat of the house. But let me back up and work through this problem from the moment you go to turn on the water and nothing comes out.

TRACING TO THE PROBLEM

To locate the plug it can help to understand what creates freezing conditions around a plumbing pipe. Of course pipes running through totally unheated spaces like some crawl spaces or attics are quickly prone to freezing - check the solutions section of this entry lower down to see how to deal with these areas.

Of course any area that has little or no insulation between the water pipe and the outside wall can get cold enough to freeze in extreme weather. Similarly, pipes that are buried in insulation in outside walls are more prone to freezing than pipes that have no insulation on the warm side. But the most common source of frozen pipes is an electrical wire, or a TV cable wire or telephone wire that goes through a hole in the wall from the outdoors to the basement and more often than not the passageway through the wall sheathing is not sealed.

What happens is that workman making the hole through the siding (brick, aluminium, vinyl or anything else) will caulk where the wire goes through the siding to keep the rain out, but he is not aware that our walls are designed to have wind moving around behind the siding to keep everything dry; a healthy house design technique called a Rain Screen. When you drill a hole right through the wall, that moving air behind the siding can now blow into the basement alongside that wire. If you are unfortunate enough to have a plumbing pipe right in the very small but continual blast of arctic air that is flowing alongside the wire, under extreme cold conditions it will freeze the standing water in the pipe.

Let me recommend three non-destructive techniques for finding the point of freezing.

1- The simplest is to run your hand behind the blocked pipe anywhere you can reach and if you feel one spot that is significantly colder than another, you may have identified the problem area. This is best done on a very cold and windy day.

2- The second is to put an electrical heater in different areas where the pipes are exposed (under the

sink, along the ceiling in the basement) and if the plug thaws, that area is worth a closer look.

3- The third, a bit more high tech, is to use an Infrared Thermometer to read the temperature of the water pipe all along its exposed length. Where it gets colder, is probably your problem area. They used to be only available on the web but some are now showing up in renovation centres.

If none of these identify the problem area, go to the outside of the house and see if you can spot any hole in the wall (wires, exhaust ducts, hose bibs, heat pump pipes...) that possibly line up with where the water pipes are inside the house. At this point I would start opening up finished walls or ceilings where I am pretty sure there is both a hole in the wall and a plumbing pipe. Once the wall is open, you can check for that cold spot.

Another cold air route that I have seen reaching plumbing pipes is when soffit vents in a lower area of a house actually connect to passageways that have air flow access to upper story bathrooms. This usually shows up after renovations when someone moves a baffle or some insulation that up to that point served to protect the pipes from the air flow. Some simple soffit work that seems to have no real relation to the rest of the house can actually create plumbing disasters. Every frozen pipe problem has a path of some kind to the cold side of the wall.

THAWING THE PLUG

Once you think you have identified the problem, often with a bit of frost right on the pipe, you need to thaw it out, but before thawing it out make sure you are ready for water to flow. If you have taken apart the faucet looking for the problem, put it back together so that the water will not squirt up to the ceiling when it starts to flow -- and be sure that the tub or sink is not plugged, again to avoid creating a flood yourself. Also be ready to turn off the main water valve as you thaw out the pipe in case you discover that the pipe is in fact cracked and going to make a mess right where you are working. But generally we leave the water pressure on and the faucet open during the thawing process as it will help to remove the problem as soon as water can barely begin to flow.

Often the ice plug is hidden behind a finished wall or ceiling. With the same line of thinking, imagine what you think is the path from the non-operating faucet to the hot water tank. Usually both the hot and cold pipes run close together (although many DIY plumbers are quite creative and you don't know the real path until you rip out the ceiling). Over heat the room where the pipes run. This can take several hours as you wait for the heat to go through the drywall to get to the pipes. As soon as you get the smallest trickle of water, let the water flow to clean out the ice -- even cold running water will melt ice. If the hot water opens first, leave it running as a slow trickle. This will not empty the hot water tank, but will keep the pipe in the wall hot and that can rather quickly thaw the cold water pipe in the same floor or wall passageway.

If you are going to apply heat to the pipe, your first consideration is safety -- don't burn the house down while it is freezing cold outdoors! Even just using a hair dryer can be dangerous because it is not fast, you tend to lose your concentration and you can seriously overheat nearby wood. A hair dryer can work for many small ice plugs. You could simply put a small electrical space heater in the area and wait, or use both the space heater and the hair dryer (in different electrical outlets to not blow the circuit breaker). If you have the area up above room temperature for an hour and nothing happens, you probably do not have an ice plug in this area. The best is to keep an area warm as you move on to try other areas in case there are multiple ice plugs.

Another method of applying heat to a pipe is to wrap it in rags and then pour boiling water on it. The rags simply hold the heat on the pipe longer than just pouring water on the pipe. You can also purchase pipe heating cables, designed to keep pipes from freezing more than to thaw them out, but they can do the job slowly. You need to get one that does not have a thermostat on it - designed to only go on when the temperature falls near freezing. The warm thermostat will keep the wire from warming up.

Many people use propane blow torches -- but -- but -- but -- you can very easily start a fire with these things as you are always working around combustible materials when working with plumbing pipe runs. If you do choose to do this, have a second person standing by with a fire extinguisher and have them concentrate only on your collateral damage, not the frozen pipe. Do I need to add? -- do not use a blow torch on a plastic pipe!

None of this works? Now you do need either a plumber, who may be able to use special electrical equipment to thaw out long runs of metal pipe (doesn't work on plastic pipe), or a demolition expert who can open walls to expose the entire run of the pipe.

PREVENTING FREEZING

The water is flowing so you probably have a good idea of where the problem was located. You could get past a cold spell with simply leaving the water flowing slowly -- a terrible solution from an ecological point of view, but an effective way to prevent the water standing in a pipe from getting colder and colder until it freezes. This is often a necessary tactic while waiting for someone to solve the real problem.

If you have access to the problem area, remove all the insulation in the area and see if there is in fact a blast of cold air. Plug all leaks with caulking, foam in a can or even bubble gum -- anything that sticks. We are not out in the weather, we are not trying to be water resistant -- we are simply creating an Air Barrier.

Then put back as much insulation as possible between the cold and the plumbing pipe. The most effective technique is using the foam in a can or other spray on foam insulation -- this both air seals and insulates at the same time. Just be careful to keep the pipe free and open to the heat of the house.

If you need to close a wall, you can put drywall over this area, but no insulation between the drywall and the pipe. You can make frost protected chambers or raceways for pipes going through an unheated cottage crawl space - check out: unheated crawl spaces. Similarly, water pipes, like fire sprinkler systems cannot go through the attic in cold country -- but you can hide them inside the warm part of the house with false beams or lowered ceilings - check out: false ceilings.

Keywords:

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