

Beware: Anti-scald shower faucets may prevent proper drainage of hot water pipes.

Have you noticed that the most likely pipe to freeze in your cabin is the hot water pipe? How strange! You have drained your cabin by closing the main water valve (the one underground) and opened all the faucets (in a middle position for a mixing valve) to let air into both hot and cold pipes. Later, when you re-open your cabin, no hot water runs through the showers and other faucets. But the cold water is fine. You have to wait several hours for the flow to resume. Or worse you discover that you have a leak in the wall. Why is it more likely for the hot pipe to freeze rather than the cold pipe?

I am not a professional plumber; like most of us, I have raised my skills in the profession by necessity.

The problem above can be caused by a "less" than horizontal pipe in a wall. Most plumbers do not pay much attention to the importance of making all horizontal pipes "more" than horizontal. I had that problem in my cabin, and had to install a special drain pipe to empty such a bottleneck. But despite this fix, I still experienced the hot pipe freeze!

After much frustration, I finally figured out what was going on. The problem was with the "anti-scald" feature of my shower faucet. Here is a good article on "How an anti-scald shower faucet works" (http://www.ehow.com/how-does_5782844_anti_scald-shower-faucet-work_.html):

Anti-scald shower faucets use a combination of controls to reduce the possibility of hot water burns. Valves within the faucet react to changes in water pressure, water temperature and sometimes both, to regulate hot water temperature and limit the risk of scalding. Some set a limit on the general temperature of hot water coming from the faucet independent of the temperature set on the hot water heater.

The design of my anti-scald shower faucet is based on a "pressure balancing" diaphragm. When the hot water pressure exceeds the cold water one, the hot water flow is diminished. Should the cold water pressure drop to zero, the hot water gets fully shut. This is exactly what happens when I turn the shower faucet handle from the closed position to its middle position while the whole house is being drained through its main underground valve. No air enters into the hot water pipe, and a column of water stays in the pipe, ready to freeze.

There are many different designs for anti-scald shower faucets, and it is quite possible that other designs do not have this problem. I fixed my problem by modifying the shower valve. Another solution which might work for all designs is to position the shower faucet in its middle position (and let water flow) before starting the draining through the main water valve. The anti-scald device should not affect the draining, as the pressure on both the hot and cold pipe drops evenly.

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