

## Repairing Frozen or Broken Pipes

Skill Level: Intermediate

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Pipes which are exposed to the cold can freeze and stop your water supply. Even worse, is the fact that frozen pipes often break, making repairs absolutely necessary. These problems usually occur at the most inopportune times and may leave you struggling to find a plumber — unless, of course, you know how to make at least temporary repairs yourself. Lowe's is happy to provide this information as a service to you..

### Prevention

Pipes may freeze even if they are not exposed to outside air. In extremely cold weather, even pipes that run along exterior walls or through crawl spaces may freeze. Residents of mobile or modular homes are particularly susceptible to this problem.

There are steps you can take in advance to minimize the possibility of frozen pipes.

Pipes may be insulated with foam rubber sleeves or

fiberglass insulation. Pipes which run through unheated areas may also be wrapped with special heating strips before being insulated.

Rather than providing passive protection, these strips use electricity to provide heat to potential problem areas. Do not fall into the trap of believing that your hot water lines can't freeze, they can. Insulate both cold and hot water pipes.

If you are caught in a cold streak and think that your pipes may be vulnerable, leave one of the faucets farthest from your water source open slightly. The running water will provide freeze protection. This is obviously a last resort, since even a small constant trickle can represent a waste of water, but it is much better than ruptured pipes.

If you have a faucet outside your home, it is best to have a turnoff valve in the line leading to the faucet. If you have such a valve (or if you install one), you can turn off the water at the inside valve during the winter. Then you can open the outside valve and drain the water. This provides a margin of safety, eliminating the possibility that water in the pipe will freeze in the area where it exits your house.

### Thawing Frozen Pipes

Unless your water pipes freeze at night while your family is asleep (and this is often the case), you may recognize that your pipes are beginning to freeze by a reduction in water pressure. At this point, action should be taken immediately. If the pipes are allowed to freeze completely, blocking the flow of water, the pipes are likely to burst. Water expands as it turns into ice, and there is only so much room in the pipe. When the water expands beyond what the pipe can handle, the pipe may burst.

If you can catch the situation before the pipes freeze completely, you are in luck. Turn the water on and leave it on. The flowing water will help thaw the frozen obstruction in the pipe. If you were not so lucky, more extreme measures must be taken. Water Conservation Tips.

1. Before thawing frozen pipes, check to see if they have burst or are leaking. You will need to make repairs before thawing the ice in the pipes.
2. Shut off the water supply to the pipe. If there is no valve in the line to allow you do this locally, shut off the flow of water to your whole house at the main water cut-off valve.
3. Open a couple of faucets to provide an outlet for melting ice or steam.
4. Work back toward the water supply from the faucet side of the frozen area. Several methods can be used to do the actual thawing. They all require caution, however. The pipes must not be heated too quickly, and the water in the pipes must not be allowed to boil. The resulting steam pressure in the pipes could cause them to burst. Do not allow the pipe to become too hot to touch. Plastic pipe should be warmed with particular care. The following are some options.



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### Thawing Frozen Pipes (cont'd)

- You can wrap rags around the pipe in the frozen area and pour hot water on the rags. Keep the wet rags hot by pouring more hot water on them as they cool.
- Wrap a grounded, heat strip around the frozen pipe.
- Use a hairdryer focused on the frozen area of the pipe.
- Use a space heater directed to the frozen area of pipe.

**NEVER** use electrical tools or appliances if you are wet or standing in water.

### Making Emergency Repairs

It may be necessary to make a temporary emergency repair. Maybe a pipe has frozen and burst, you are at home without water and the roads are expected to be impassable for days. These situations call for a bit of ingenuity. While the fix may not be pretty or complete, sometimes anything is better than nothing.

A piece of inner tube and some hose clamps would suffice to slow a leak until a permanent repair could be made. Simply wrap the pipe with the piece of rubber and clamp it in place. A piece of garden hose or radiator hose and some hose clamps may work as well. If the repair leaks a little, at least there is less chance that the pipes will freeze again before you can get them permanently repaired.

### Making Permanent Repairs

#### Pipe Clamps

Pipe clamps are available which can be used to permanently repair burst pipes. These clamps are simple hinged units sized to fit the pipe. Simply wrap the pipe with a rubber or neoprene (synthetic rubber) pad, wrap the clamp around the pad and tighten the screws to secure the clamp. Such clamps are simple to install and work well for emergencies. If your pipes are leaking at a fitting, an elbow or T joint, for example, you will have to use one of the methods presented below.

#### Steel Pipes

Some homes have steel pipes. Unlike copper or plastic pipes which are fused at joints, steel pipes are threaded just like nuts and bolts. Pipe clamps are particularly useful for repairing steel pipes which sometimes burst along the seam. Simply peen the ruptured area down level with the rest of the pipe using a ball peen hammer and install the clamp.

If a stretch of steel pipe must be replaced, do-it-yourself homeowners have a couple of choices. The damaged area can be removed and a new piece of pipe installed using threaded couplings and a pipe wrench. It will be necessary to thread the ends of any pipes which are cut so they will mate with the threaded couplings. For many homeowners, this will not be possible since it requires special tools. Another alternative (if allowed by code in your area) is to replace the damaged steel pipe with rigid plastic (CPVC). Transition fittings are available which allow this to be done, and some homeowners may choose to do so because plastic pipe is much easier to work with. In this case, threaded plastic couplings attach to existing threaded steel pipes or fittings. Once the couplings are attached, plastic pipes are run between the couplings. These plastic pipes are joined as necessary using the "solvent welding" method.

### Solvent Welding Rigid Plastic Pipe

Rigid plastic pipe (PVC, CPVC and ABS) is easy to repair. These types of pipe are joined by a process called "solvent welding." A special cement is applied in the areas to be joined and, after the pieces are brought together, the surfaces of the plastic elements melt and fuse together. Although this process is not difficult, it must be done correctly to prevent leaks particularly in supply lines which remain under pressure.



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### Solvent Welding Rigid Plastic Pipe (cont'd)

Here is how it is done:

1. Cut the pipe to length with a hacksaw or tubing cutter. Make your cut straight, otherwise the pipe will not fully seat in the fitting.
2. Smooth and bevel the edges slightly with a knife or fine file.
3. Insert the pipe into the fitting and adjust to the correct position. Mark the pipe and fitting with a reference line to make it easy to find the position again after you have added the cement.
4. Clean the surfaces to be mated with solvent primer.
5. Brush the outside of the pipe and the inside of the fitting with cement.
6. Working quickly, push the pipe into the fitting with the marks 1/4 turn apart. Twist the pipe to align the marks. This spreads the cement and makes a bead along the edge of the fitting. The bead should extend all the way around the pipe. The glue sets in about 30 seconds, so if you make a mistake, pull them apart quickly. Once the joint is set, it is stuck for good.

### Soldering Copper Pipes

If you have to repair or replace copper plumbing, your job is a bit more difficult than for plastic, and requires more skill. Still, if you are careful, there is no reason why you can't do it yourself.

One of the primary rules in soldering copper pipes is that the pipe and fitting surfaces to be joined must be clean. Do not try to fudge to save time. Do it right the first time or you may have to do it again. Another very important rule is that the water should be turned off and the lines drained before attempting to repair plumbing with a torch. Otherwise, dangerous steam pressure may build in the pipes and you could be injured.

If you are trying to reconnect a joint that has come loose or sprung a leak, you must take the joint completely apart. Trying to melt solder around the joint to stop the leak simply will not work. Heat the joint with a propane torch until the pipe can be completely pulled from the fitting. Use pliers the pipe will get hot! Once the joint is disassembled, use a knife, file or sandpaper to remove the old solder and any residue from the pipe and the inside of the fitting. The end of the pipe and inside of the fitting should look like new before you attempt to solder them back together.

If you are working with new pipe or fittings, sand the ends of the pipe and the insides of the fittings with very fine sandpaper, emery cloth or steel. All areas to be soldered must be clean and grease-free.

Once you have cut and fit the pipe and cleaned all of the elements to be joined, you are ready to solder. Here's how:

1. Apply a thin layer of lead-free flux to the outside of the pipe end and the inside of the fitting to which it will be joined.
2. Insert the pipe completely into the fitting. Twist it slightly to spread the flux.
3. Pull out about 8" of lead-free solder from the roll. Never use solder with lead for plumbing. Bend the end of the solder wire as necessary to make it easy to reach the joint.



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### Soldering Copper Pipes (cont'd)

- Light your propane torch and adjust the flame until it is a couple of inches long. You do not need a roaring flame to do the job, and a smaller flame is easier to control. You would not want to start a fire while concentrating on your solder joint!
- Hold the flame against the fitting for a few seconds, then move the flame around to the opposite side of the fitting to distribute the heat. The pipe is hot enough and the flame can be removed when touching the solder against the pipe beside the fitting causes it to melt and run around the joint.
- Touch the solder to several places around the pipe near each end of the fitting, allowing the heat from the pipe to melt the solder. It will flow into the joint. Do not attempt to melt the solder with the torch flame and drip it onto the joint. This is a common mistake.
- Carefully wipe the soldered joint with a rag. Remember, it is hot! A properly soldered joint should have a thin bead of solder all the way around the pipe at the joint.
- When the joints have cooled, test them by turning on the water and allowing the pipe system to build pressure. If you have a leak, the only thing you can do is completely disassemble the bad joint and start again.

If you are repairing or adding new plumbing and want to use pipe of a material different than that already in place, you may purchase special adapters for joining unlike piping materials. These adapters normally have one type of material at one end and another type at the other end. The adapters allow you to join the materials together without the hassle of joining dissimilar materials.