Sump Pump Questions

For many homeowners the first line of defense against water in the basement is a sump with a pump in it. The sump may be connected to drain tile that drains the footings of the house, under the entire basement, or just the area where the sump is located. Many houses have tiling installed only around a portion of the house. The water that drains into the sump must be removed, and this is accomplished with a sump pump.

The two basic sump pump models are the up-right (commonly called a pedestal) and the submersible. Either will work well with proper maintenance.

The pedestal pump has the motor on top of the pedestal and the pump at the base, which sits on the bottom of the sump. The motor is not meant to get wet. The pump is turned on and off by a ball float. One advantage of this type of pump is that the on/off switch is visible so the action of the ball float can be easily seen. Submersible pumps are designed to be submerged in water and sit on the bottom of the sump. The on/off switch is attached to the pump and can be either a ball float connected to an internal pressure switch or a sealed, adjustable, mercury-activated float switch. The sealed mercury switch is generally more reliable than the pressure switch.

Either type of pump should have a check valve on the water outlet pipe so water doesn't flow back in the sump when the pump shuts off. Water flowing back and forth can cause the pump to turn on and off more frequently than necessary and decrease the life of the pump.

- **Some frequently asked questions about sump pumps:**

Q. How do you check or test a sump pump?

A. First, make sure the outlet pipe is not frozen shut or plugged and that it directs water away from the house. Next make sure the pump is plugged in. Remove the lid (if the sump has one) and use a flashlight to check if the sump is clean and that the pump inlet is not plugged. Then slowly pour about 5 gallons of water into the sump. Try to simulate the speed that water would normally flow into the sump. Watch the action of the on/off switch and listen to the pump. Make the pump turn on and off at least twice. If something doesn't work right, fix it as soon as possible.

Q. Can you burn the pump out if the outdoor pipe is frozen shut, or will it automatically shut off?

A. Most pumps will not burn up, but they can overheat if left in this condition. Almost all sump pump motors have thermal protection built in. If they do overheat you just have to shut them off and let them cool down. The thermal relay will reset.

Q. What size pump should I have for my house?

A. There is no "correct" size. The horsepower requirement for a house is determined by the area of drainage connected to the sump, the depth to groundwater, the depth of the basement, and many other factors. A 1/3 hp pump is satisfactory for most houses.

Q. Are there any problems with replacing a 1/3 hp pump with a 1/2 hp pump?

A. When used in similar conditions, a 1/2 hp pump will pump more water and lift it higher than a 1/3 hp pump. Most new sump pumps will have a chart or graph in the instructions or on the box that shows the flow versus height of lift for both sizes. The flow is usually given in either gallons per minute or gallons per hour (multiply gpm by 60 to convert to gph). The height of lift is given in feet of vertical lift. There shouldn't be any problem, but where the flow into the sump is relatively slow there would be no advantage to using the larger pump. However, in situations where water flow can become rapid, a 1/2 hp pump may be able to keep up with the flow where a 1/3 hp pump may not.

Q. Do sump pumps have filters which need to be cleaned or replaced?

A. Sump pumps do not have filters, but they do have screens or small openings where the water enters the pump. These can sometimes be plugged.

Q. Can or should you pump into a sewer drain or basement floor drain?

A. No, you should not. If you have a septic system, under no circumstances should the sump be pumped into the basement floor drain. During wet conditions the drainfield of the septic system is usually saturated and struggling to handle the normal flow of water from the house. Adding to it with a sump pump can damage the septic system. Even if you are connected to a public system the sump should not be pumped into a floor drain. Putting additional water into the sewer system can overload the public system, and there may be a regulation against pumping into it.

Q. Where should the sump pump drain hose be run?

A. Preferably, sump water should be discharged at least 20 feet away from the house in such a way that it drains away from the house. It should not be directed onto a neighbor's lot, into window wells, or onto a septic system drainfield.

Q. Can the average person replace a defective sump pump or does it require specialized tools or the expertise of a plumber?

A. Almost all sump pumps come with a list of required tools and directions for installation. It should not be difficult for the "average" person to replace a sump pump.

Q. How big should the sump hole be? What kind of hole liner should you use? How much gravel do you put under and around it?

A. Sump holes should be about 2 feet in diameter. This allows space for the pump and associated piping and to store water between pumping events (about 15 to 25 gallons). Metal or plastic liners can be used, but plastic is easier to work with and it the material of choice. When the sump liner is installed, about 3 to 4 inches of coarse gravel should be placed in the bottom of the hole. The gravel forms a solid base for the pump as well as helping to prevent mud and other debris from clogging the pump.

Q. Should the sump pump be on an isolated electrical circuit?

A. A standard 15-amp, three-prong grounded outlet is sufficient to handle a sump pump. A sump pump is always in or near water, so it is best to have an outlet with a ground fault interrupter (GFI).

Q. I don't have a sump in my basement but am concerned about water leaking in. What can I do?

A. You can push the water to the floor drain, but if water backs up in the floor drain or drains very slowly a pump is needed. Small pumps sometimes referred to as "skimmer" pumps are designed to sit on a flat surface and pump when water on the floor is only 1/4 to 1/2 inch deep. They can often be used with a common garden hose. A 50-foot garden hose run out through a basement window will usually carry the water far enough away from the house. You can remove more water by taking the cover off the floor drain and placing the pump in the drain bowl -- these pumps are usually small enough to fit in the bowl. In emergencies where electric service is off, these pumps can be powered by a small gasoline generator.

Source: *NDSU Extension Service – Tom Scherer, Agricultural Engineer -*
http://www.ag.ndsu.edu/disaster/flood/sumppumpquest.html