Maintaining Your Spa or Hot Tub

How to protect your investment

A Spa or Hot Tub You Can Enjoy

Enjoying your spa or hot tub depends on knowing that it is well maintained and that the water is fresh and clean.

The National Spa & Pool Institute (NSPI) has developed this booklet to help you get the most out of your investment in a spa or hot tub.

It includes information on necessary support equipment, optional accessories and ways to chemically care for the water. Understanding how to keep the water free from harmful bacteria and algae and the basic steps of other operations will aid you in maintaining your own spa or hot tub.

The Support System

The support system circulates, filters and heats the hot tub water in your spa. It consists of the pump, filter, heater and usually an air blower.

For most spas and tubs with a capacity of up to 600 gallons, you can purchase a skid pack (a preassembled package) of electrically and hydraulically matched components. Whether your spa has a skid pack or individual components, it is useful to understand the basic equipment in your system.

Owners' manuals or instructions from the manufacturer included with your support equipment will assist you in maintenance procedures.

The Pump

The pump circulates the water through the filter and heater in order to keep it clean and hot. The pump also powers the hydrojets in your spa or tub.

When choosing a pump, important factors to consider are its capacity relative to the volume of water in your spa or hot tub, the number of hydrojets, the operating costs and maintenance steps. Generally, a 1 hp pump motor is sufficient for a 500-700 gallon spa or tub with four hydrojets.

Many new energy saving models, such as two-speed pumps are on the market, and your NSPI professional will be glad to assist you in your product choice.

Air Blowers and Hydrojets

Air blowers use small electric motors to produce thousands of tiny air bubbles. These motors must run at 15,000 rpm to 22,000 rpm. Proper sizing and correct installations are the key factors for years of trouble-free performance.

Little direct maintenance is required for the air blowers. Powered by the pump, hydrojets produce aerated streams of water, creating a massage effect.

Generally, no maintenance is required except a thorough cleaning when you drain your spa or hot tub.

The Filter

The filter's job is to keep the water clean by removing solids algae and dirt. There are generally three types of filters. Cartridge filters, composed of non-woven polyester, Dacron or treated paper, trap dirt and residue as the water flows through them.

A large majority of spas and tubs use cartridge filters. Properly maintained cartridges last 1-2 years before replacement is necessary. However, they do require regular cleaning with a recommended cleaner.

For larger spas and hot tubs, DE (diatomaceous earth) filters are more efficient since they can carry a heavier dirt load than cartridge filters. Cleaning DE filters is more complicated than cartridges. When the DE filter needs to be cleaned, it must be backwashed (reverse-flow) or manually cleaned. A new coating of DE is applied and then the filter is ready for its new cleaning cycle.

Sand Filters operate similarly to the DE filter and must be cleaned in a similar process, during which a portion of the water is lost. They offer a slightly less efficient filtration than DE filters. There are different filter sizes, and the filter flow rate should be compatible with the pump.

Your NSPI dealer or retailer can give you advice on the right model and instructions on how long to run your filter.

The Heater

Most heaters are either fossil-fueled (natural gas, propane or heating oil) or electric. Your climate and type of vessel will help determine the most efficient energy source in your area. In natural gas, propane and oil heaters, air and fuel are pulled in to produce an open flame that heats copper tubes or another heat transfer system.

These heaters are designed to raise the water temperature quickly and may be more desirable in colder climates. Electric heaters take longer to heat water but may be adequate for small installations, portable spas or highly insulated spas. Electric heaters usually run continuously if the spa or tub is used often.

Electric heaters make good backup systems for solar heaters. To date, the effectiveness of solar heaters for spas and tubs has yet to be proven.

However, with the rapid advances in technology, solar heating may soon become a feasible alternative. Other alternatives include wood and coal burning heaters, as well as heat exchangers.

An NSPI professional can help you choose the best energy source for your spa or tub.

The Chemicals

The chemistry of spa and hot tub water changes very quickly. Factors that cause this are high water temperatures, the aeration of the water, the body chemistry of the people using the spa or hot tub, and the high body to water ratio in the spa or hot tub.

For example, five people in a 500-700 gallon spa or tub equals about 250 people in an average size (25,000 gallon) pool; the high water temperature also provides a good environment for algae and bacteria to grow. And because these factors change the water chemistry rapidly, water should be checked daily. To keep your spa or hot tub's water fresh and clean, you need a water quality test kit.

They are easy to use and will give you the necessary information to keep the water clean and properly balanced.

The kit should test the following:

- The chlorine/bromine disinfectant level;
- pH level;
- Total alkalinity; and
- Calcium hardness.

Spa and hot tub water must have the correct balance of these elements. Unbalanced water can irritate eyes, corrode the equipment and leave mineral deposits.

Disinfectants

The most widely used chemicals for disinfecting the spa or tub are chlorine and bromine. Chlorine comes in liquid, tablet or granulated forms while bromine is available in sticks and tablets or a two-step dry chemical mixture.

Both chemicals keep water free of harmful bacteria and prevent the growth of some algae when maintained at proper levels.

pH Level

Potential hydrogen (pH) is the measure of acidity or alkalinity (basicity) in the water. The scale runs from 0-14.

The recommended pH range is 7.2-7.8. Below this, the water can corrode a spa or tub finish and support equipment; above this, the pH level can produce scaling, cloudy water or a clogged filter and reduce the efficiency of the chlorine or to a lesser degree, bromine.

Soda ash or sodium bicarbonate is used to raise pH level; muriatic acid or sodium bisulfate to lower it. As with any chemicals, carefully read and follow the directions for proper use of these substances.

Total Alkalinity

Total alkalinity testing measures the amount of all alkaline salts in the water. Keeping total alkalinity in the recommended ranges of 90-150 parts per million will help keep your pH level stable and is one good defense against forming excessive calcium carbonate, a type of alkalinity that causes scaling, cloudiness and residue to form in your spa or tub.

Water should be tested for total alkalinity every month. The same chemicals used to raise and lower pH are also used to control total alkalinity.

Calcium Hardness

Testing for water hardness is also important. Calcium is a mineral that affects the water's overall balance and is no more than 150-300 parts per million.

If the calcium level is very high, it may be time to replace old water with new. If it is too low, add calcium chloride. Water chemistry is an important part of protecting and enjoying your spa or hot tub.

For specific questions on chemical maintenance, consult a local NSPI member. Many members have computerized testing labs for your convenience.

Special Care for Your Hot Tub

During the first few months, water will soak some chemicals from certain types of wooden hot tubs. This calls for draining the tub frequently or using a cleaning agent regularly during the break-in period.

In addition, periodic draining and light scrubbing of the wood will maintain its appearance. However, once it is in use, it is best not to leave a wooden hot tub empty for more than two days. The wood can shrink, and when you fill it again, it may leak until the wood swells.

Special Care for Your Spa

Both acrylic and gelcoat spas should be periodically drained and wiped with a sponge. Deposits can be removed with a common nonabrasive cleaner. In addition to general cleaning, proper chemical maintenance will prolong the spa's shine and finish. A concrete or plaster spa also requires consistent maintenance and can be cleaned with a diluted muriatic acid solution.

If a gelcoat spa loses its shiny gloss, there are a number of coatings or sealant to freshen the surface. Acrylic spas maintain their luster indefinitely, and using a special kit available from the manufacturer or dealer can repair surface scratches. If you have any questions, consult your NSPI dealer or builder for proper care procedures.

Optional Accessories

A skimmer is perhaps the most necessary piece of optional equipment. Outdoors, it skims leaves and other contaminants off the surface of the water. Indoor, it skims perspiration and body oils from the water. The device prevents clogged drains and plumbing.

Some owners also supplement their filter with a water purification system. Such systems keep the water free of microorganisms by using purifying agents, like ozone or ultraviolet energy. Both these products, along with other purifying agents, are recognized as useful supplements to chlorine or bromine treatment.

Water purifying systems leave no residue in the water, remove most odors and may even reduce the amounts of disinfectant required for proper water treatment. However, most experts caution owners to use water purification systems only in addition to regular chemical purification.

Chemical treatment of the water helps to kill micro organisms in still water or before they are pumped through the purifier. Spa or hot tub covers can be made out of fiberglass, canvas, plastic or wood and are useful because:

- they keep the water free of leaves and other objects when not in use;
- they can act as a safety device to keep children out;
- they keep heat in, thereby reducing energy costs;
- they reduce the evaporation of water and chemicals; and
- they can be used as a winterizing cover.

If you own an indoor spa or tub, you can enjoy year-round hot soaks. Owners of outdoor models can soak year-round as well with some additional steps. A freeze-protection kit for your spa or tub includes:

- insulation for the unit, pipes and support equipment;
- insulated cover to retain heat; and a device to protect your spa or tub from freezing that is monitored by a thermostat or time clock. If you close your spa or tub, carefully read the directions that come with your model and consult your NSPI professional on the proper steps.

With additional accessories such as inflatable pillows, trays, juice bars, toys, games and back scrubbers, you can make your spa or hot tub an indoor or outdoor recreational center.

Some Basic Maintenance Ideas

Your spa or hot tub will benefit from a regular schedule of maintenance. Here is what the experts recommend.

- Test your water daily for its pH level and chlorine or bromine. Test for total alkalinity and calcium levels once a month.
- Use your cover consistently to prevent heat loss.
- Clean your filter on the average once a month.
- Check the leaf strainer basket at least every other week to remove debris.
- Drain and refill the tub or spa with fresh water about every 3 months; clean the unit thoroughly at this time. Heavy usage may require cleaning more often; the tests made will help determine the time.
- Periodically check pipe joints and seals in the support equipment for leaks.
- Inspect the heater annually for scale, mineral deposits or corrosion.
- Apply exterior oil to hot tubs 2-4 times a year to preserve the finish.
- Check the metal bands or hoops of your hot tub for signs of rust or corrosion.
- If you have a fiberglass spa, add a coat of special wax about twice a year to restore luster.