

Pool Care

Conducting Annual Preventive Maintenance On Heating Systems Will Assure Peak Efficiency

by Alvaro G. Mendoza

Maintaining a pool and spa at an acceptable temperature may be one of the association's most important tasks. Doing it within a budget may be one of the most challenging. This article will address the different variables of pool or spa heating and will investigate alternatives available to lower costs or improve performance of these systems.

Heating Alternatives

While there are many ways to heat a pool or spa, the two most popular types are heat pumps and gas (propane or natural gas). Heat pumps are high efficiency units that take the heat out of the air (air to water) or from ground water (water to water) to heat and cool the pool. They run on electricity, and produce \$4-\$6 of heat for every dollar of electricity spent. They have a relatively high installation cost. They also require more attention to chemistry control. Since these heaters work by exchanging heat from a hot (Freon) gas to colder pool water, if water were corrosive enough to break through the thin heat exchanger wall, it could violate the compressor and cause major repair or replacement. Similar destruction of a gas heating system might only require replacement of the heat exchanger system.

Gas heaters are, in comparison, lower technology heaters. They use fossil fuel, burning in a burner tray (similar to a barbecue grill) to heat the pool

or spa water passing in pipes above the trays. These heaters are less expensive to install, but only produce 60-89 cents of heat for each dollar of gas purchased. This is merely a fraction of the efficiency afforded by the heat pumps. Gas prices can fluctuate during heating season, posing a major threat to a fixed heating budget. Gas heaters come in two different types, atmospheric or sealed combustion systems. The name of the game for gas heaters is efficiency. That means an 89 percent efficient heater will consume almost 30 percent less gas (money) than a 60 percent efficient system, to produce the same pool temperature. Gas heaters have a considerable advantage over heat pumps because they are very quick. A typical heat pump will produce 120,000 BTU's per hour (enough to raise an 50,000 gallon

pool one degree in three hours), and a small gas heater may produce 400,000+ BTU's per hour, doing the same heating job in a little over one hour. Gas is quick and expensive. A heat pump is slower and more efficient.

Heat Retention

Have you ever seen steam rising from the pool water? That harmless steam represents big heating dollars. When pool water evaporates from the wind influence, from a big variation between water and air temperatures, or from passing over a waterfall or water feature, huge amounts of energy (heat) are used (lost) to transfer the water from a liquid to a gas form. That heat comes from the surrounding water, making it colder. That is why you can save over 60 percent of the annual heating costs by seasonal covering of the

Water source heat pumps draw heat from ground water or lake water and transfer that heat to the pool. They heat and cool at the highest efficiency possible.



pool with a thin insulated floating pool cover. This has been proven in field applications over the past 30 years. While some pools cannot be covered due their irregular shape, high surface winds, or round the clock use, thousands of pools are enjoying this guaranteed mechanical cost avoidance technique. The Florida Department of Health (DOH) codes require that pools using covers be closed to the public during times that a cover is in use.

Maintaining Proper Flow

Under certain conditions, the seasonal activation of the heating system will cause the recirculation rate to drop below the DOH minimum level. Heating systems use elaborate heat exchangers that cause greater restriction of flow and higher total dynamic head (TDH). Pool pumps flow lower gallons per minute (GPM) at a higher TDH. If the recirculation rate becomes lower than required, the DOH has the authority to close the pool until the problem is corrected. DOH codes clearly state, "Heater shall not prevent the attainment of the required turnover rate." An installing contractor should correct the problem if they replaced a system that originally had complied. If the installation is new, the DOH codes require, "A sketch of any proposed heater installation including valves, thermometer, pipe sizes, and material specifications shall be submitted to the department and permitted prior to installation." This will allow the DOH to verify that their existing pump can handle the added restrictions and still attain required flow. If the pool flow is low, don't fret. A contractor can install a small booster pump that activates when the heater turns on, and boosts the water flow through the heating system.

What To Do?

If the association doesn't want to spend lots of money on pool heating, there are several things that can be done:

1. Take close control of temperature. An inexpensive thermostat may be

maintaining the pool many degrees hotter than necessary. Install a digital thermostat, or connect the heating system to a suitable automated chemical controller digital temperature control feature.

2. Have the gas heater or heat pump checked for proper operation. Use monitoring thermometers on the inlet and outlet piping to verify that the heater is receiving the correct amount of water. This will protect the design heating efficiency. Conduct annual preventive maintenance on heating systems to assure peak efficiency.

3. Maintain a moderate temperature. Every degree above 80 degrees Fahrenheit costs 10 percent more to maintain. Is an 89 degree pool really necessary? It could be lowered to a comfortable 82 degrees and save lots of money.

4. Replace aging systems with more efficient models. Heaters can often be replaced with a more efficient model and recover the costs within one to two seasons.

5. Learn more about heating costs. An important first step is to conduct a heat cost analysis. Two popular sources are the United States Department of Energy (RESPEC) program, and the Florida Solar Energy Center (FSEC 1981) Heating Study. These computerized analyses pinpoint heating costs using various heat sources and savings methods. They will analyze cost of heating with propane gas, natural gas, heat pumps, pool covers, windbreaks, and enclosures.

Providing comfortable pool and spa temperatures for residents is very important. With a little bit of homework, and some relatively simple conversions, you could potentially save thousand of dollars a year without compromising the health and safety of swimmers.

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