



Solar Pool Heating Frequently Asked Questions & Answers

Introduction

Solar pool heating is one of the most economically attractive solar technologies. If you are interested in heating your pool, or can no longer afford heating it with fossil fuel alone, consider installing a solar pool heater.

The following information helps answer the most frequently asked questions concerning solar pool heating. Keep in mind that much of this information is "rule of thumb"; your individual situation, if analyzed in detail, may differ somewhat from the general application.

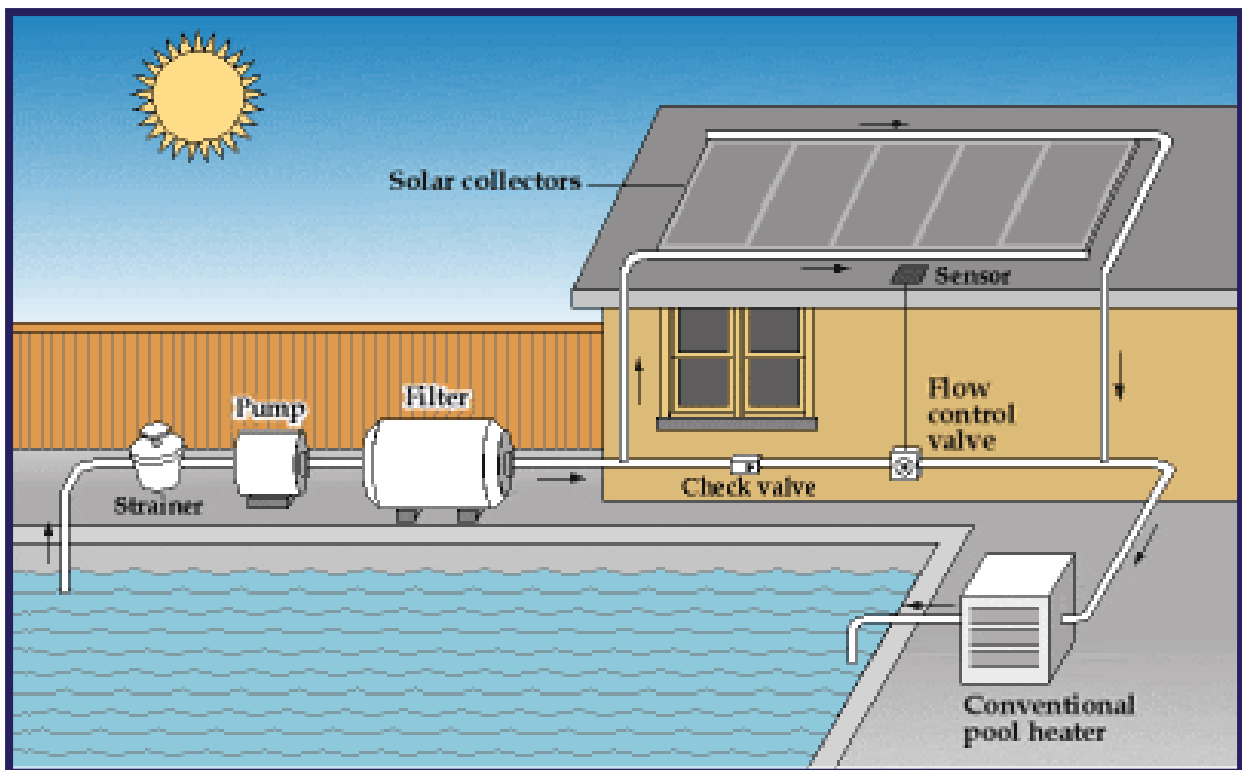


Figure 1: Solar pool heating system schematic



Q: Will it heat my pool?

Of course! Depending on your weather and climatic conditions, you can expect your solar pool heater to:

- Raise your pool temperature 2 to 5 degrees Fahrenheit each time the water passes through the system, and
- Raise your pool's temperature 5 to 15 degrees Fahrenheit over a period of several days of good weather.

A solar blanket will help hold in this heat at night or when it's windy, and can help the system be even more effective.

Q: Can it also cool my pool?

During the hottest part of the summer, running the solar system at night can cool a pool to a more refreshing swimming temperature - down several degrees in one night if the conditions are right.

Q: How much would a solar pool heater cost for my pool?

Solar pool heating system prices for a residential pool can range anywhere from \$4500 to \$8000. The location and size of the pool, location of the solar panels, desired temperature and season, and type of pool equipment determine system size and costs. Because of all the variables, it is impossible to give an accurate estimate without careful inspection of the site.

Q: Will a solar pool heater save me money?

If a pool owner heats their pool with natural gas through the normal swimming season, an investment in solar can pay for itself in 2 to 3 years. If the pool owner does not have a gas heater or wish to use one, solar will not really "save" money, but the pool will be much warmer and more inviting. A swimming pool, with decking and landscaping, represent a sizable investment for the homeowner. Maintenance costs exist whether the pool is used or not. The investment in solar pool heating will assure that the pool is used and enjoyed much more.

Q: How much does a solar pool heater cost to operate?

The majority of residential solar pool heaters use an automatically controlled valve to divert the existing filtration flow to the solar panels, so there is no additional cost to operate the solar pool heater. Some pools might require an additional solar boost pump that would cost a few dollars per month to operate during the swimming season.

Usually no special maintenance is required during the season. Modern electronic controls allow you to "set and forget" the solar heater. It is recommended that the panels be shut off and drained in the winter. This process takes just a few minutes.



Q: How does a solar pool heater work?

Imagine a garden hose that has been lying in the sun. When you turn on the faucet, out comes hot water. That's solar heating. The sun's energy has been absorbed by the hose and transmitted as heat to the water inside it. The hose acts as a solar collector.

Comfortable swimming water temperature is relatively low compared to other uses of hot water. This allows the use of simple, efficient solar collectors. These systems require no separate storage tank, since the pool itself serves as the storage tank. In most cases, the pool's filtration pump is used to force the pool water through the solar panels. In some retrofit applications, a larger pump may be required to handle the needs of the solar system, or a small pump may be added to boost the pool water up to the solar collectors.

When adequate sunshine is available, the filtered pool water is circulated through the solar collectors, where it is heated by solar radiation and then returned to the pool. In this operation, the water goes from pool to pump, from pump to filter, from filter to collectors, from collectors to fossil-fueled backup heater (if there is one), from fossil-fueled heater to automatic chlorinator (if there is one), then back to the pool (see Figure 1, above).

Automatic controls may be used to direct the flow of filtered water to the collectors when solar heat is available. This may be accomplished manually by the use of a manual "bypass valve". Normally solar systems are designed to drain down into the pool when the pump is turned off. This provides the collectors with freeze protection.

Q: What are the general types of swimming pool collectors used?

At the present time, the Texas solar industry is almost exclusively using black polypropylene plastic collectors. These panels may be either rigid or have individual pipes running lengthwise (see Figure 2). Individual collectors are normally 4'x10' or 4'x12'.

Other types of pool collectors are flexible rubber mat, arrays of black plastic pipe or tube-on-sheet panels made of copper or aluminum. Glass covered or glazed collectors, commonly used for domestic water heating, are not as cost effective for pool heating as unglazed collectors and are not used for pool heating in Texas.

Q: Can I use one solar system to heat both my pool and domestic water supply?

No. Swimming pool heaters used in Texas do not have covers (glazing) and are designed to heat a large volume of water (thousands of gallons) to relatively low temperatures (around 80°F), while hot water systems raise less than a hundred gallons to about 130°F. The energy used to heat 100 gallons of water to 130°F daily is a "drop in the bucket" compared to that needed to heat a pool. To do so, a similar collector area of glazed hot water-type collectors would be needed; but the additional cost of the higher temperature collectors would be unnecessary. In fact, pool heating collectors are generally more efficient at low temperature than the hot water type.

\

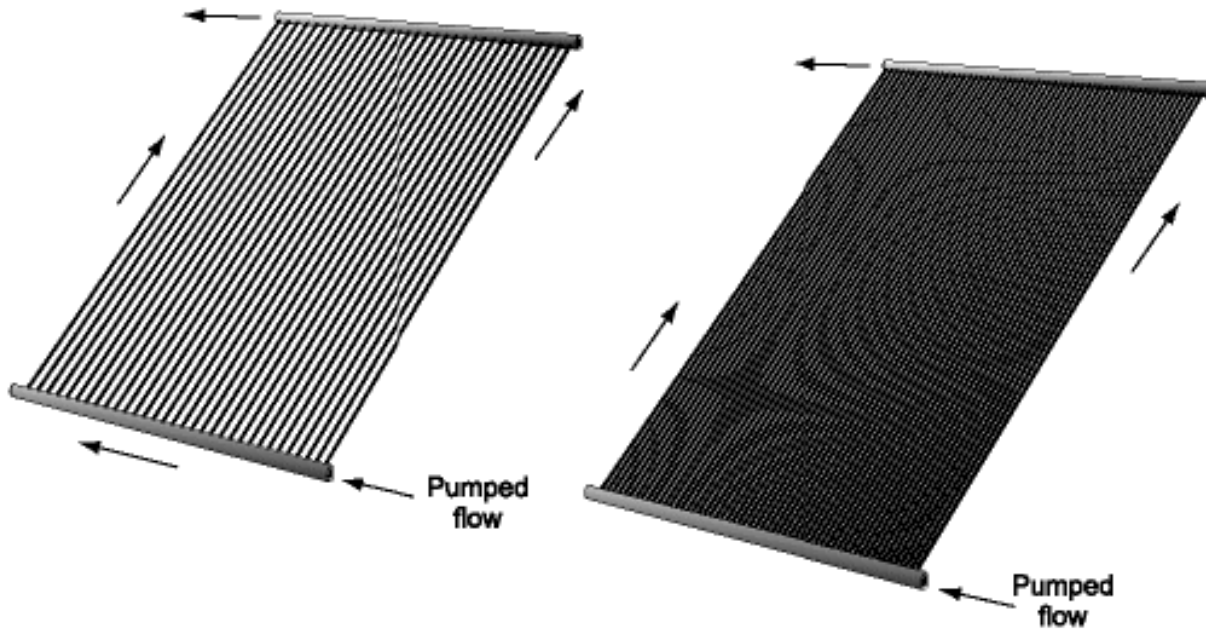


Figure 2. Black polypropylene plastic collectors

Q: How do the different types of collectors vary in performance?

The performance of pool heating collectors does not vary significantly when comparing their energy delivered per day per square-foot of equivalent collector area (i.e., Btu/day-sq ft).

Q: How long will solar pool heaters last?

Solar collectors made of patented stabilized polypropylene can be expected to last between 20 to 25 years. Thousands of solar pool heating systems that were installed over 20 years ago are still going strong, even in harsh climates such as Arizona and Florida.

Q: What is the proper orientation and tilt of the collector panels?

Ideally, solar collectors should face south. However, an orientation up to 45° east or west of due south will not significantly decrease performance as long as shading is avoided.

For optimum pool heating in winter, solar collectors should be tilted at latitude plus 15°. However, in Texas they are almost always mounted directly to the sloping roof. "Standoff" mounting to optimum tilt from a sloped roof usually will increase performance only 2 to 8 percent and is hardly worth the effort.



Q: Can I install a solar pool heater myself?

Generally speaking, yes. But only a person who is very handy at plumbing and electrical wiring should consider installing a solar pool heating system. The first time around, you and a friend can expect to spend two days putting in a system that would take an experienced crew six hours. This is hard work on a hot roof; but you can usually save at least one-third of what you would otherwise pay a solar contractor for the installed system.

If you plan to install your own system, thoroughly read the manufacturer's installation manual. Read it carefully. Also, you may wish to purchase a copy of the Florida Solar Energy Center's "Solar Water and Pool Heating: Design and Installation Manual," and carefully study Section 7 (Swimming Pool Heating).

Q: How big a collector do I need?

Heating a swimming pool requires a large amount of energy. As a result, a large collector area (typically 350-500 square feet) is necessary to collect the solar energy needed, regardless of the type of collector used. Thus, from 7 to 12 black plastic panels will be required for typical residential pools.

Q: What about pool covers?

The greatest loss of heat from a pool occurs from its surface because of evaporation. By reducing this evaporation loss, pool covers are very effective in lengthening the swimming season. They also keep the pool clean, thereby lowering the cost of chemicals and filter maintenance. Depending on materials and the number of hours of use, temperature increases of 5°F to 10°F may be expected from a pool cover. A 5°F increase is reasonable when the cover is used 12 hours a day; 10°F when it is used 20 hours a day.

Transparent or lightly translucent covers work best because they allow solar energy to pass through and be absorbed by the pool water, and they also prevent heat loss at night. Opaque covers are best used at night to prevent heat loss. A roller is a good investment to help you move the cover on and off the pool. Motorized rollers are also available.

Pool covers will last from three to five years, depending on care in handling and storage. Nevertheless, they are your best buy for an extended swimming season. From the standpoint of energy conservation, a pool cover should be used.