

SPASA FACT SHEET No 3

SOLAR POOL HEATING.....

Installing solar pool heating can increase the use of your pool by up to four months. By using the heating energy from the sun, the cost to heat a pool in this way is very economical. The type of solar system may vary, however, the basic principal remains the same. Pool water is circulated through a series of tubes (the collector) usually mounted on the roof, where heat is absorbed and the heated water returned to the pool. The collector can be of either EPDM Rubber or PVC/TPR material and is usually supplied in multiple tube "strips". The amount of heat absorbed and the ultimate increase in pool water temperature depends on several factors which should be considered when deciding on a solar heating system for your pool. They are;

- Size or area of collector and number of tubes per sq.m

Naturally the major influence on the effectiveness of any solar system is its exposure to the sun, therefore,

- Location or positioning of collector
- Control system

SIZE OR AREA

The amount of collector used in your solar system will have a major influence on the effectiveness of the system. The size of the collector is usually expressed in square metres, and as a general rule, directly relates to the surface area of the pool.

Australian Standard 3634 suggests a **minimum** collector area equal to 60% of the surface area of the pool, **only in ideal* conditions**, for systems in the Sydney, Newcastle and Wollongong areas. * The area of collector generally needs to be increased depending on variables such as; local climate, shading of roof or pool, slope and orientation of roof, wind protection, type and colour of roof and collector type.

Larger systems will be needed where higher than average water temperature, or extended swimming season is desired.

In accordance with the above, SPASA recommend a minimum area of 80% for the majority of installations.

The "area" referred to in relation to collector size is the area of actual collector strip NOT the roof onto which it is to be placed.

Australian Standard 3634 details the way in which the effective width of collector strip is to be determined for calculating collector area.
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The formula is $N \times (W + D)$ where N = number of tubes, D = tube diameter and W = web width between tubes. (The maximum web width which can be used is no more than one tube diameter per tube).

LOCATION AND ORIENTATION

Collectors (other than those on flat roofs) should ideally be placed on north facing roofs. Deviation is allowable as long as collector area is increased accordingly. Collector should be located so as to avoid shade from objects ie; trees, neighbouring houses etc for at least six hours every day.

Remember, the following will all effect the size and location of your solar system;

- Pool surface area
- Roof orientation
- Shade on collector or roof
- Colour of roof and pool

PUMPING REQUIREMENTS

To circulate water through the solar system you can choose to use either the existing pump or provide a dedicated pump.

If the existing pump is to be used it must meet the following conditions;

- (a) the required rate of turnover of the pool water for filtration purposes shall be maintained,
- (b) the operating pressure of the filter shall not be increased above the manufacturer's maximum pressure by the addition of the solar circuit and
- (c) the pump shall have sufficient capacity to handle the static head and friction losses introduced by the addition of the collector circuit.

The average domestic solar installation requires a minimum flow rate of around 100 to 200 litres per minute to operate effectively. In most circumstances this would mean a dedicated solar pump would be required.

Always check that the minimum design flow rate of the collector is met when selecting your pump. This flow rate will vary with the diameter of the tubing used.

The circulated water needs to be strained to avoid blocking up the collector with dirt and debris, so when using a dedicated pump, some form of strainer must be provided.

Important points;

- make sure pool filtration requirements are met
- ensure correct flow rates are obtained
- circulated water should be strained

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SOLAR CONTROLLERS

As nobody can guarantee at what time of the day the sun will actually shine, time clocks are of little use in controlling solar heating systems. What is needed is a temperature sensing control device. These units will operate the solar pump system only when heat can be gained. This ensures that maximum heat gain is acquired. Circulating water through a cold collector will cool the pool at a faster rate than it can be heated.

MAJOR POINTS TO REMEMBER:

- Either EPDM or PVC/TPR material is suitable
- The size/area of the collector is critical to performance
- Be sure all pumping and filtration requirements are met
- **A temperature sensing controller should be used**

HANDOVER AND DOCUMENTATION

At the time of handover, the pool owner should be provided with an appropriate document certifying that the system has been installed and commissioned satisfactorily.

The owner should receive documentation covering;

- (a) A list of all major components, including the size and make of solar collector, make and model of the control system, components and pump.
- (b) Copies of all warranties as issued by the manufacturers of the components and any warranties issued by the installer should also be provided.
- (c) Operating, preventative maintenance and service instructions describing start up, normal running and shut down procedures in an easily understood form.
- (d) A record of the date of the installation and the name and address of the contracting installer.

Using a pool blanket can increase the benefits of solar pool heating. For more information see Fact Sheet No 6. POOL BLANKETS

For further information on building, renovating or maintaining a pool, contact;

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