ZANE Pool Heating

Pool Heating Guide

A buyers guide to selecting the correct solar or conventional pool heating system

Introduction

Dear Pool Owner,

A swimming pool means good fun, healthy exercise, keeping cool in the summer's heat and just plain luxury and enjoyment.

A well designed and constructed pool also means improved property value, due to the increasing number of buyers now seeking homes with pools and the improved aesthetic appeal of a landscaped garden with a pool as the focal point for outdoor living activities.

But these advantages are not without their price - a swimming pool is a major financial investment. To get the most for one's money, a pool should be used as much as possible and this means keeping the pool at a swimmable temperature for the maximum number of hours in each day and the maximum number of days in each year.

In this book, we have explained how you can do this for a very reasonable initial investment and practically zero running costs and because it is solar heating, you are doing your bit for the environment as well.

If you need to have your pool at a swimable temperature year round conventional pool heating in the form of heat pump technology or a gas heater may be required to work in conjunction with your solar pool heating system. Operating this equipment efficiently can be time consuming so investing in a pool automation system may save you time and energy costs.

To ensure you obtain the best possible value for money we also take you through the very important steps involved in making a wise buying decision.

Why heat your pool?

A swimming pool is one of the largest single purchases a home owner can make.

It therefore makes sense that it should be used as much as possible, especially when it has to be maintained and cared for, even when not in use. To examine the benefits of pool heating, it is first necessary to consider why people purchase a pool in the first place.

The main considerations are:

Convenience - Being able to swim at home at any time, day or night.

Luxury - The sheer sensation of owning and using their own private pool.

Aesthetic Value - Enhances the landscaping of the property. Provides a pleasant and relaxing focal point in the garden.

Investment - Increases the value and saleability of the property.

Social - Provides a focal point for social life within family and with friends.

Health and Fitness - The therapeutic value of swimming is well recognised. Some people can only exercise in water, and the value of water based activities for everyone as a simple keep fit measure has been well documented.

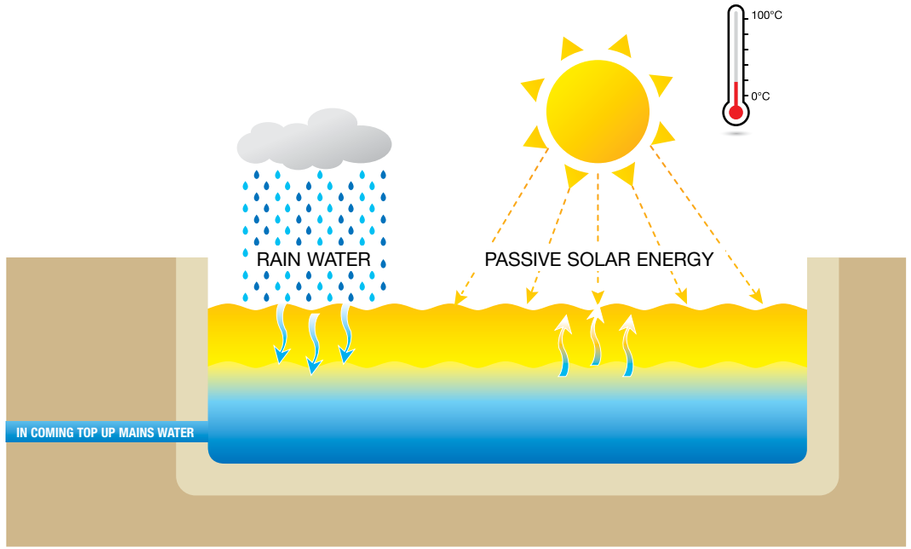
Having accepted these valid reasons for owning a pool, the arguments in favour of heating the pool are straightforward. The pool becomes more convenient to use because you can swim any time, day or night - and certainly that provides a more luxurious lifestyle.

If a pool adds prestige to a property, then a heated pool is the ultimate and the added benefits to the social and health aspects of the family through the increased opportunities to swim are self-evident.

Passive solar heating begins with proper siting

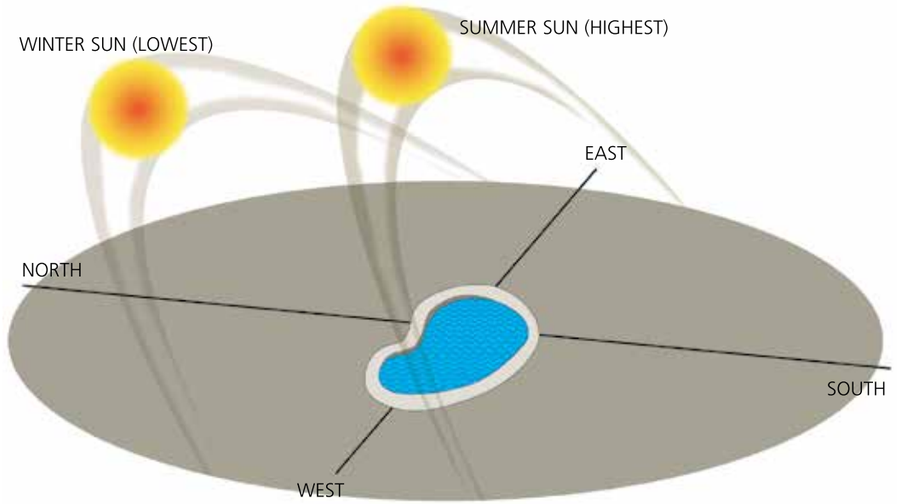
What It Means

Passive solar heating is the term used to describe the energy which is provided naturally by the sun, without any assistance from an artificial or mechanical source.



Path Of The Sun

The diagram below illustrates the importance of correctly siting a pool to take full advantage of passive solar heating at different times of the year.



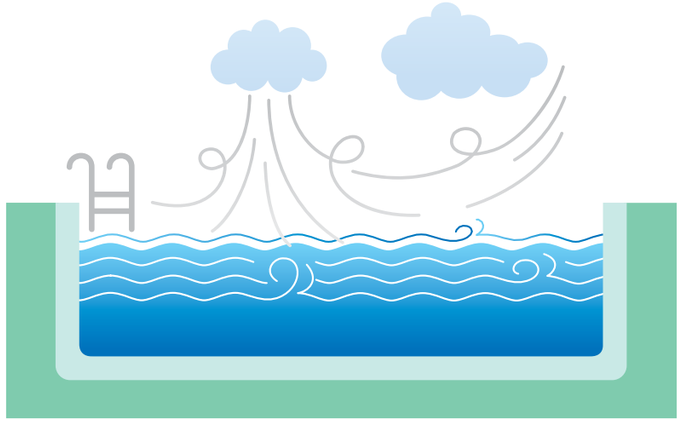
Heat loss reduction

To learn how to heat your swimming pool most effectively, you should understand how and where it gains and looses heat. Water flows into the pool from natural rainwater and from the main town supply at a temperature generally determined by the ground temperature. It acquires a few degrees of additional warmth directly from the sun and from the air if it is warmer than the water. Wind is the main enemy of the heated pool as it accelerates the cooling process quite dramatically - just like blowing on a hot drink.

1. **Evaporation**
   Cooling occurs when the water changes from a liquid to a vapour. This process consumes a great deal of heat, occurs naturally all the time and accounts for the greatest heat loss.
2. **Convection**
   Air currents remove heat from the surface of the pool, at a rate which depends on the wind speed and the difference in air and water temperatures.
3. **Radiation**
   Heat is also radiated to the sky and surrounding objects. In short, the rate of heat loss from a swimming pool is affected by the temperature of the water, the air temperature and the wind speed. The degree to which these losses are counterbalanced by heat supplied to the pool determines its temperature.

   The loss of heat from your swimming pool occurs almost entirely on the water surface, not through the sides and bottom. If you're going to conserve heat, concentrate on the pool surface.

   Before you heat your pool, keep in as much of the natural heat as you can.



POOL COVERS

There are several ways to keep the natural warmth in a swimming pool without using a heating system. The most effective way to prevent heat loss is to install a pool cover. Pool covers virtually eliminate evaporation and reduce convective and radiative heat loss by insulating the surface of the pool.

Pool covers have other benefits besides maintaining the water temperature. A properly used cover keeps the pool water cleaner and reduces the consumption of pool chemicals. Some pool cleaners will operate under a cover; even if your cleaner doesn't, you will find that you need to use it far less frequently.

Some pool covers come with storage rollers which simplify the removal and replacement of the cover.

If the cover is unwieldy and difficult to manage, then it is less likely to be used to best advantage. A pool cover rolled up in the corner of the yard will not keep your pool warm.

Wind barriers such as hedges and fences will also reduce convective heat loss.

Maximise your passive solar heating: track the path of the sun (see diagram) over your pool. If there are trees shading the water, they are cutting back on your solar heat. You should consider trimming them.

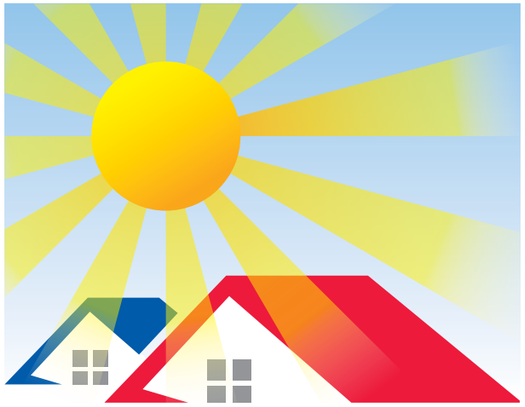
If you are building a new pool, locate it in a sunny yard. Increase the absorption of solar radiant heat with a dark colour on the bottom and sides of the pool.

An active system

WHAT IT MEANS

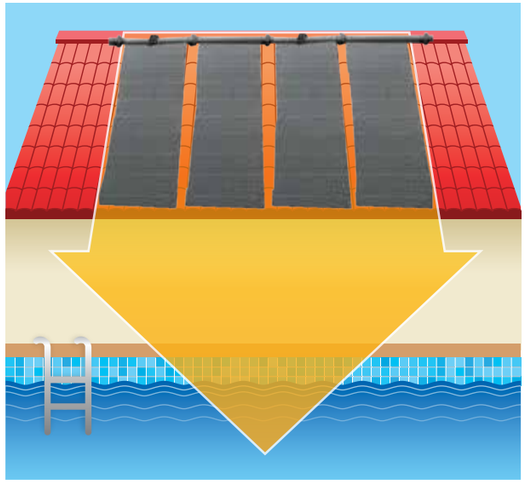
An active solar system is one that gives the sun a helping hand. Unlike fossil fuelled heaters, we cannot turn the sun up and make it hotter.

What we can do is collect solar energy from other sources and transfer it to the pool water. We do this without polluting our environment with the harmful products of combustion.



The energy source

The solar pool heating principle is as old as time itself. Each day the sun warms the earth, bringing light and life to the planet and this we take for granted. Through conscious observation, we can discover an abundance of solar energy stored in our own backyard. Medium to dark coloured surfaces, such as the roof, provide the best source of solar energy. This large expanse of warm material provides an ideal place to mount solar absorbers, as a typical daily temperature of 20-25°C can achieve a roof material temperature of around 50°C.



How it works

THE MECHANICS OF SOLAR HEATING

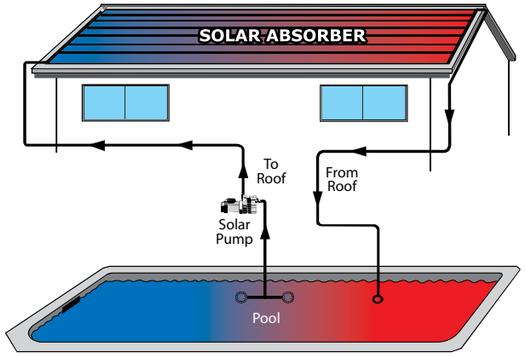
The principles involved in solar pool heating are very simple. Imagine a garden hose that has been lying in the sun for several hours. When you turn on the tap, out comes hot water. That's solar heating: the sun's energy has been absorbed by the hose and transmitted as heat to the water inside it. The hose acts as a solar collector.

The Collector is the first functional element of a solar pool heating system. Sunlight falling on the collector heats it, just as it heats the water inside. It is usually installed on a north facing surface apart from the pool, on the roof of the house or garage, on a patio cover or specially built structure.

The other components of a solar heating system are:

The Storage, where the heated water is stored. In a pool system, the pool itself stores the heat. The Distribution System, which delivers the warmed water from the collector to storage. When the filter and pump are running, a pool system simply circulates the water from the collectors to the pool and back to the collectors for more heating.

The Controls, the devices which regulate the flow of heated water to the pool and back, according to the prevailing solar conditions.



The Zane Way

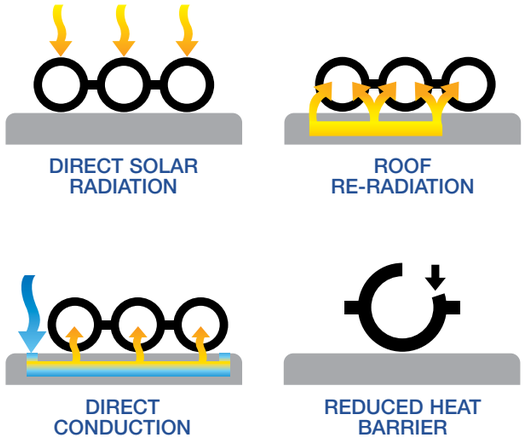
In 1974, Zane invented and later patented the concept of a solar strip absorber system. It has now become the accepted method of solar heating for pools world wide. Zane's award winning products and designs are undisputed market leaders in their field.

The Zane system was one of the first to harness this stored energy. Our unique strip absorbers not only collect heat direct from the sun in the usual way, they also extract heat from the warm roofing material with which they are in close contact.

The bonus heat energy contributed by the roof is added to the energy falling directly onto the strips and the total energy is transferred to the swimming pool by diverting the cool pool water through the enclosed flexible channels contained within each strip.

Before Zane's innovation, other systems comprised large panels or mats which were installed over the roofing material. Consequently, this inhibited the energy collecting ability of the roofing material and resulted in a great deal of wasted energy.

If there is insufficient roof area available, Zane absorber strips still provide top performance as the material used is an excellent solar collector in its own right.



Especially the Zane Way

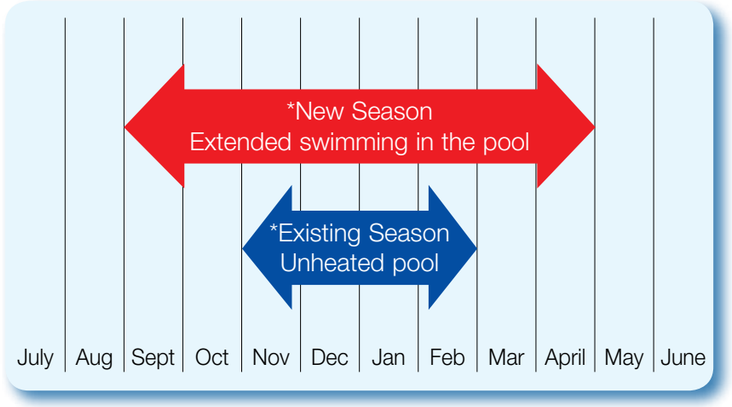
DOES SOLAR POOL HEATING REALLY WORK?

The answer is an unqualified “yes.” The heating of swimming pools is one of the best possible applications of solar heating. The temperatures required enable the solar system to perform at peak efficiency.

In a survey of existing owners of solar pool heating systems, the Victorian Solar Energy Council found 94% of existing owners would make the same decision again.

They cited the fact solar energy is free plus the increase in pool usage and comfort as their main reasons for buying.

It Really Does Work



*The actual results obtained will depend entirely on the size and type of system installed. A typical Zane Solar system will add around four months to your existing swimming season.

WHAT CAN I EXPECT FROM SOLAR POOL HEATING?

Our research indicates that without heating, pools are mostly used during daylight hours in very warm or hot weather. In other words, there is a “Swimming Season” which varies from city to city according to location and seasonal conditions.

SYDNEY	3-4 months	BRISBANE	4.5-5.5 months
MELBOURNE	2-3 months	ADELAIDE	2.5-3.5 months
PERTH	3-4 months	ALICE SPRINGS	4.5-5.5 months
HOBART	2-3 months	DARWIN	9-10 months
AUCKLAND	2-3 months		

Typical usage for unheated pools is:

There are two ways this “Swimming Season” can be altered. The first is by making it possible to use the pool more during the existing season. That is for more hours in every day (including early morning and evening) and more days in each of the months shown.

The second is to increase the number of months during which the pool is comfortable to use.

In other words, a correctly sized solar pool heating system should allow you to swim in far greater comfort, virtually 24 hours a day during your existing season, plus it should also extend the number of months in which it is possible to swim in comfort at some time during each day. This “Extended Swimming Season” would look something like the chart on the opposite page

SYDNEY	7-9 months	BRISBANE	8-10 months
MELBOURNE	4-6 months	ADELAIDE	5-7 months
PERTH	7-9 months	ALICE SPRINGS	8-10 months
HOBART	4-6 months	DARWIN	11-12 months
AUCKLAND	6-8 months		

Note: Use of a pool cover on cold days and evenings can extend the above seasons even further.

Most people find a swimming pool comfortable when it is at 24°C or better, therefore the “Swimming Season” shown is based on months where it is possible to achieve this temperature or better on fine days.

A comparison of these tables clearly indicates the benefit to be derived from solar heating a swimming pool. So in summary, we can say that: “YES, IT REALLY DOES WORK” and at Zane, we guarantee it!

If anyone tells us about a solar pool heating system that’s not delivering the goods, we know it will come down to one of the following points:

- They have purchased an inferior product
- The system has been poorly designed
- The system is not being correctly operated
- The seller of the system has made exaggerated claims and the system is not capable of delivering the promised performance. This booklet will tell you all you need to know about solar pool heating systems that really do work.

Sizing the collector area

RULE OF THUMB METHOD

Many solar pool heating contractors use a “Rule of Thumb” to size the solar collectors to the individual pool. This method is quick and easy. They simply measure the pool, calculate the surface area and take a percentage of the answer - usually between 60% - 100%.

Unfortunately, there is no way this method will work out in most cases as it assumes that most people have an “average” situation.

An “average” is frequently the result of widely different situations, e.g. if we take 21 pool owners, 10 with a “windy” location, 10 with a “sheltered” location and one with a “moderate” location, the average will be “moderate.”

A system designed to suit this “moderate” location will not be correct for the 20 hypothetical pool owners with “windy” and “sheltered” locations.

There are many other factors which, like the wind, need to be accurately assessed for each location to ensure the system is correctly designed.

If this is not done, you may be lucky enough to obtain a good result by chance, but then again, you may never know - WHY GAMBLE?

If the collector area is much larger than you need to obtain the desired performance, you will have wasted some money. If it is less than you need you will be disappointed with the result and will have wasted your money.

Using correct design calculations, it is possible to both accurately determine what you need and the result it will produce.

Make sure your supplier has the ability to do this.

A CALCULATED METHOD

This type of method takes into account various factors such as those shown in the table opposite, which can all have a marked effect on the performance of a system.

Ensure the Solar Consultant fully understands these and can justify the reasons for recommending the system they have designed for you.

GEOGRAPHICAL LOCATION	Colder locations require more collector to produce any given result.
COLLECTOR ORIENTATION	North facing is best. More collector is needed if the roof is not north facing.
COLLECTOR SLOPE	A flat roof receives less sun in winter than a pitched northerly-facing roof.
ROOF COLOUR	When forming part of the collector a dark roof will contribute more energy than a light coloured one.
ROOF TYPE	Metal roofs are better heat conductors than most other types. Insulated roofs are also better.
SHADE ON THE ROOF	Some allowance should be made for trees, neighbouring properties etc. that may shade the collector for the part of the day.
WIND OVER THE ROOF	A roof area exposed to the wind will require more collector to be fitted to compensate for heat loss.
SHADE ON THE POOL	A shaded pool will normally be colder than one constantly bathed in sunlight. Therefore it will need more collector.
WIND OVER THE POOL	Wind over the water accelerates heat loss from the pool. Pools open to the wind need more collector than sheltered pools.
POOL COLOUR	Provided it receives sunlight, a dark coloured pool will normally be warmer than a light coloured one.

They should be prepared to discuss in detail:

a) Their system design calculations, taking into account all of these valuable factors.

b) The results of efficiency tests for their system, as conducted by a reputable independent testing authority.

Exercise caution if exaggerated claims are being made, e.g.:“Our product has superior performance and will only cost you half as much.”

If in doubt, ask the consultant to put you in touch with the actual manufacturer or supplier who should have the facilities to check the calculations.

Ask the consultant to be specific about what you can expect for your money.

They will not be able to guarantee you that your pool will be a specific temperature at a particular time (e.g: 28°C on the next Easter weekend), because solar systems are subject to prevailing weather conditions and, in any case, every pool owner’s situation is different.

But the consultant must be able to calculate the size and cost of a system to heat your pool to a comfortable temperature, day and night, during your usual season, plus give you a pre-determined extension of that season as explained earlier on pages 12 and 13.

A reputable consultant will rarely claim to be able to heat your pool to a comfortable temperature all year round with a solar system alone. In most areas of Australia and New Zealand, there is insufficient warm weather during winter to heat a pool to a comfortable level.

The Zane method

At Zane we use “The Calculated Method” which is applied in either manual or computer calculations. In this method, we give a numerical value to each of the factors listed in Figure 1 and then relate them to the pool surface area. The working examples shown are substantiated by test data and actual case records. They graphically illustrate the difference which can occur and highlight the need to do the job properly. It can be readily seen the “Rule of Thumb” method would have been quite unsuitable in each instance.

In the case of example #1, the conditions were pretty well ideal for installing a solar pool heating system and only 28.8m² of solar absorber would be needed to obtain a “Full System” providing a season extension of four months (see opposite page re “Full System”).

In example #2, conditions were less desirable and 85.9m² of absorber material would be required to obtain exactly the same result. The “Rule of Thumb” suggested 41.8m² would be required and while this would have given an excellent result of #I, the customer would have paid almost twice as much for the extra material.

For #2, the result would have been quite poor with only 48% of the required absorber being provided by the “Rule of Thumb”. This owner would have a warmer pool during the normal season but not much in the way of an extended season.

WORKING EXAMPLES

ITEM	DATA #1	FACTOR	DATA #2	FACTOR
LOCATION	Sydney	1.00	Sydney	1.00
COLLECTOR ORIENTATION	North	1.00	45° West	1.05
COLLECTOR SLOPE	30°	1.00	20°	1.03
*ROOF COLOUR	Dark	0.85	Light	1.20
*ROOF TYPE	Metal	0.90	Tile	1.00
ROOF SHADE	Assume Nil	Assume Nil	Assume Nil	Assume Nil
ROOF WIND	Light	1.00	Strong	1.20
POOL SHADE	Nil	1.00	Shaded	1.10
POOL WIND	Protected	1.00	Exposed	1.20
POOL COLOUR	Brown	0.90	Mid blue	1.00
POOL SURFACE AREA	9.5 x 4.4 = 41.8m²	41.8	9.5 x 4.4 = 41.8m²	41.8
ABSORBER AREA REQ (m²)	41.8 x 0.85 x 0.9 x 0.9 = 28.8		41.8 x 1.05 x 1.03 x 1.2 x 1.1 x 1.2 x 1.2 = 85.9	

*NOTE: THESE FACTORS ONLY APPLY IF ABSORBER ARE INSTALLED “THE ZANE WAY” TO ENABLE THEM TO ABSORB CONDUCTED ENERGY FROM THE ROOF MATERIAL.

Tailored to suit you

Every pool owner's needs are different. For instance, you might presently swim at 20°C, while your neighbour needs, say, 25°C to be comfortable. Therefore, you may use your unheated pool for six months at present while your neighbour only uses his four months, so you will both benefit from solar heating in different ways.

For example, a system designed to give you both four months extension of season, will enable you to swim at your comfort level for, say, 10 months (six plus four), while your neighbour will be happy with eight months (four plus four).

The Zane method is designed to calculate the amount of collector required to achieve the maximum "Cost Effective" result. This is called the "Full System" and may provide a more comfortable pool during the existing season plus up to four months extension of that season. To predict the performance of your system with an acceptable degree of accuracy, it is necessary to first complete this calculation. Having completed the calculation, it is a simple matter to adjust the result either up or down to increase or decrease the system size to suit your personal needs e.g: 75% of the "Full" system area will provide you with 75% of the result, i.e: a more comfortable pool during your existing season plus a three months extension.

One of the most common problems encountered when designing solar pool heating systems is a lack of suitable roof area on which to lay out the solar absorbers.

Please keep in mind that a lack of correctly located solar absorber will produce a lesser result - the more absorber installed, the better the result, but of course more than necessary is a waste of money.

If in doubt, a professional Zane Solar Consultant will always complete the calculation and compare it with what can be fitted on the selected roof. This will show you what kind of result you can reasonably expect and help to dispel any lingering doubts.

Selecting your system

There are only a few good solar pool heating systems on the market at present which are available from people who have had years of experience in the solar pool heating industry.

New brands often appear almost overnight, most of which are blatant copies of the well established brands. Many claim to be the "latest" - "improved" - "most efficient", etc, etc, but there are quite a few people who have been left to their own devices when some of these businesses have ceased trading.

Select a good stable company with a proven track record in this industry and professionally qualified people on staff. Ask to speak to some of their existing customers.

TYPES OF COLLECTORS

Pool collectors are generally constructed of plastic material. Plastic collectors may consist of extruded strips or sheets with integral waterways, or coils or rigid panels of plastic pipe. Plastics used include polyethylene, nylon, polypropylene, ABS, TPR and EPDM. Most contain an ultraviolet inhibitor which lengthens the life of the plastic under exposure to sunlight.

Today, Zane uses thermoplastic rubber (TPR) for the flexible matte type absorber which is specifically designed for swimming pool solar heating. On both commercial and indoor pools PVC and EPDM have been shown to have serious shortcomings, resulting in the total replacement of the absorber after a very short time.

In 1984 Zane's Research and Development Department formulated TPR, an expensive polymer comprising 14 chemical elements. Extensive testing shows TPR is stronger, longer lasting and resistant to chemical, fungal and bacterial breakdown that caused the earlier problems. TPR's inherent strength enables the construction of thinner walled solar absorbers without sacrificing tensile strength. The reduction in wall thickness increases the heat transfer efficiency of the solar absorber.TPR absorber has been used on domestic and commercial projects since 1986 without a problem.

In 2008 after extensive research, development and testing Zane released fixed size rigid panels for solar pool heating which are precision injection-moulded from a high-grade formulated polymer, selected for its outstanding heat transfer properties and its exceptional durability. The design and materials also ensure the panel system withstands extreme weather conditions, is resistant to bird and wildlife attacks, UV stabilised, and is easy to install and use.

BLACK OR COLOURED

For solar absorbers to be effective as absorbers of solar radiation the absorber surface must be black in colour. Colour is an important factor in solar absorption and that's why black or dark coloured objects absorb solar radiation and become hotter while white or light coloured objects reflect solar radiation back into the atmosphere.

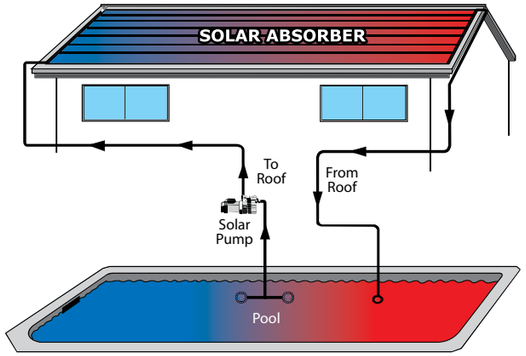
Radiant heat from lamps shining on various colours under identical conditions for a set length of time gave the following rise in temperature of water.

Colour	Temperature Rise °C
Red	2
Green	2.4
Blue	4
Yellow	1.5
Black	6

A solar system can be installed either as an independent system or an integrated system.

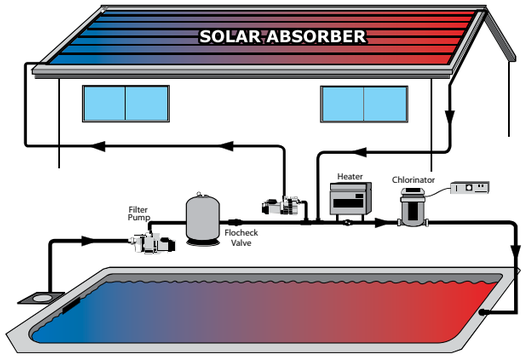
INDEPENDENT SYSTEMS

- In an independent system, the pool water is pumped directly from the pool to the solar absorber on the roof and then returns the heated water back to the pool.
- Independent systems require the pool builder to plan for solar, or to have the professional support of a Zane dealer from the initial stages.
- Independent systems are simple to install and do not interrupt the filtration system.



INTEGRATED SOLAR SYSTEM

- An integrated system involves diverting the flow of water after the filtration system. Generally a secondary pump pushes the filtered water up to the solar absorber on the roof and returns the heated water back to the pool via the existing pool water return lines.
- An integrated system can be easily retro-fitted without affecting any other part of the pool structure and it uses the filtered water of the pool to ensure that clean water is sent to the roof absorber.



Making it compatible

In most cases, glazed collectors should be considered only if the pool is in use all year, and if it is located indoors or has a good insulating cover that is used conscientiously.

WHAT WILL IT LOOK LIKE ON MY HOME?

Interestingly enough, even though solar pool heating systems are of necessity quite large, their design renders them less conspicuous than their hot water cousins, mainly because they usually employ a system solar absorber which sits neatly on the roofing material. Of course, they do not require a storage tank on the roof as your pool is the storage system.

HOW WILL IT AFFECT MY FILTER, PUMP AND OTHER POOL EQUIPMENT?

Good solar pool heating systems are compatible with most normal items of pool plant equipment, and any adjustments required in the regime of cleaning and heating the pool are usually quite minor. For instance, it is usually necessary to have the filter pump running to provide water to the solar system during the sunny part of each day. This may mean running the pump for a few more hours per day, but at only a few cents per hour for the average pool pump, this is a minor expense.

Quite often, the existing filter and pump can supply all of the water required to enable the solar system to operate. But, where the flow is insufficient or perhaps where excessive filter pressure is likely, a separate pump is installed. The cost of an additional pump is quite modest, and again, the running cost is not significant. A qualified solar consultant will be familiar with the requirements and performance of the various brands of filtration equipment and will take steps to ensure you have the correct system.

Pool chemical consumption is not usually altered to any marked degree, because the temperature generated is still relatively low when compared to very hot water - in fact, quite often, owners notice a reduction in chemical consumption because of the increase in filtering hours, which removes many of the problems from the water instead of leaving them there to be bombarded with chemicals.

Good solar systems are completely compatible with automatic chlorinators, including salt water chlorinators, as these are controlled by their own time clock which simply cuts in or out while the filter and solar system are running.

Possibly, the item most likely to be affected by a solar pool heating system is the automatic pool cleaner, or looking at the other point of view, automatic pool cleaners can affect the performance of the solar system.

Pool cleaners come in three basic types:

1. Those that operate from their own pump
2. Operate from the skimmer box, using suction generated by filter pump
3. Operate on the return water pressure flowing from the filter pump

In the case of 1. Zane have developed a simple but effective device that synchronises the cleaner pump with the solar system to avoid any conflict in the operation of the two systems.

Item 2. may require an adjustment to either the owner's present method of operation or the sizing of the filter pump, as these cleaners create a marked drop in flow through the filter, and there may not be sufficient water flow to feed the solar system while the cleaner is operating.

Owners usually adjust by running the solar system during the sunny part of the day and the cleaner at other times. Naturally, an increase in pump and possibly filter size can also provide the solution.

Items in 3. such as whip hoses etc. have little effect on the system.

Cost effective

From experience, it has been found that there are very few pools which cannot be successfully solar heated. Of course the ideal time to install solar heating is during the course of construction of a new pool, but existing pool owners need not be intimidated by the prospect of installing a system. Systems which have been professionally designed and professionally installed dovetail perfectly into an existing setting and usually only require one or two days from start to final commissioning.

SOLAR CONTROLLERS

A solar controller ensures your pool's temperature is constantly monitored, without the need for your direct supervision.

This means you can enjoy the relaxing qualities of a heated pool, day or night, without having to constantly refer to your pool heating system or resort to guesswork.

The controller, once programmed to your needs, will determine precisely if, and by how much, to heat or cool your pool or spa.

Two temperature sensing probes are used to measure the pool water and roof temperatures. When roof temperature exceeds pool temperature, the solar controller senses a solar gain and automatically activates the pool heating system. If the temperature of the pool water is above your pre-determined 'top out', no heating will occur until pool water cools below 'top out'.

If you select the cooling mode, the system will cool the pool overnight to provide refreshing water on very hot days. Some controllers may not contain all the features outlined above.

SOLAR POOL HEATING PAYS FOR ITSELF

The cost of a solar pool heating system can range from $3,500 or more. The price is determined by the size of the pool, the conditions that aid or retard heating (such as good wind protection or lots of afternoon shade), the length of your swimming season and the desired temperature.

For example, if you are heating a spa or hot tub as well as a pool, you will need to achieve higher temperatures than if you are heating a pool alone.

The chief economic advantage of solar pool heating is that a solar system pays for itself in just a few years. The longer your swimming season or the higher your preferred water temperature, the shorter the payback period. As the cost of conventional heating climbs, solar heating looks better and better.

Correct Installation

The installation of a solar pool heating system is a simple process. We recommend solar pool heating systems are installed by an experienced contractor.

Correct installation is critical if optimum system performance is to be achieved and an aesthetically pleasing finished result is required.

KEY INSTALLATION POINTS ARE:

1. Provision of sufficient solar absorber to achieve the desired result (see the section in this booklet “Sizing the Solar Collector”)

2. Locating the solar collector on the best possible surface e.g: the one nearest to North facing. Metal roofs are better than other types. Dark coloured roofs are better than light coloured ones.

3. Correct sizing of pipe work i.e: the manifold pipes feeding water to the solar absorbers and the delivery and return pipes between the plant room and the roof.

4. Correct hydraulic arrangement of all pipe work to ensure an even distribution of water to all points in the solar collector array and to eliminate airlocks.

5. Providing adequate water flow to the solar collectors. This will require checking the suitability of the existing filter pump and perhaps the installation of an additional circulating pump THIS IS A CRITICAL PART OF SYSTEM DESIGN THAT NEEDS TO BE PERFORMED BY SUITABLY QUALIFIED AND TRAINED PERSONNEL.

6. Every system should be fitted with a vacuum relief valve to allow the system to drain down and to avoid damage from negative internal pressure.

7. A non-return or check valve should be fitted to prevent water draining back to the pool via the filter, otherwise filtered debris may be backwashed into the pool.

8. If a separate solar circulating pump is required (see 5) it will require a flow protection device if it operates in tandem with the filter pump.

9. An automatic solar controller should always be fitted, otherwise the system will not perform to its full capability. It is possible for a manually controlled system to overheat the pool to an unpleasant level and even cool the pool instead of heating it. (Some automatic controllers have an in built cooling function to enable the pool to be cooled during the hot weather by circulating water through the system in the cool of the evening).

10. The system should be properly commissioned, tested for leaks and correct solar performance, then handed over to the owner with appropriate training and operating instructions.

Zane Solar Pool Heating Systems

Zane Solar pool heating can be used in conjunction with Waterco Electroheat pool heat pumps and Turbotemp gas pool heaters to provide year round swimming.

The solar system will be used to heat the pool whenever free energy is available. When the sun has set or clouds obscure sunlight during the colder winter months, the secondary form of heating will take over.

A Zane solar controller has the ability to enable the system to operate as the first option and then switch over automatically to an additional form of heating.

There are two types of solar collectors available from Zane – Gulfpanel and Gulfstream.

↑ Example of a Zane Gulfpanel installation

Gulfpanel

Zane Gulfpanel is manufactured in fixed size lengths, which are laid side by side to form a large grid. These systems generally require a larger rectangular area for installation and are commonly referred to as panel type systems within the industry.

- More resistant to wildlife attacks in regions where this is a problem
- One piece panels with fewer joints

Gulfstream

Zane Gulfstream systems are custom built to blend in with the contours of your roof, allowing maximum coverage. Gulfstream systems are commonly referred to as rubber or strip type systems within the industry.

- Easily fitted to odd-shaped smaller roofs to maximise roof coverage
- Flexible installation around valleys and rides of the roof

Example of a Zane Gulfstream installation →

Electr Heat MKV

Smart controls - for temperature management and self diagnosis

Dual coil titanium heat exchanger - Maximising water contact for efficient heat transfer

Unique modern robust design – noise & vibration reduction

Hydrophilic Blue fin evaporator technology – improved corrosion resistance

Improved condensate collection – two fitted spigots to allow drainage hose connection

POOL HEAT PUMPS

Reliable, highly efficient and economical to run like the Electroheat heat pump range by Waterco, extract heat from the air (similar to a reverse cycle air conditioner), and transfer that heat to the pool water.

Compared to gas and electric, heat pumps use just a fraction of the energy to generate the same amount of heat output. Although initially heat pumps take longer than gas heaters to warm up the pool or spa water, they are much more economical and will then maintain the heating as well as gas heaters.

Benefits of heat pumps include their high energy efficiency and lower running costs. As a guide, you can save up to 80% over LPG and 50% over natural gas fuelled heaters. And the best thing about heat pump pool heaters is that they operate regardless of the weather.

One of the disadvantages of this type of system is that they can lose their high energy efficiency slightly once the weather really cools down, as the heat pump needs to work harder to heat the water against the outside temperature. However, unless you live in an area that does experience very low winter temperature, this is not a concern.

Pool heat pumps may be expensive to install initially, but the low operating costs should make up for this in no time at all compared to other forms of conventional pool heating.

9, 12, 15, 19 & 23kW MKV models

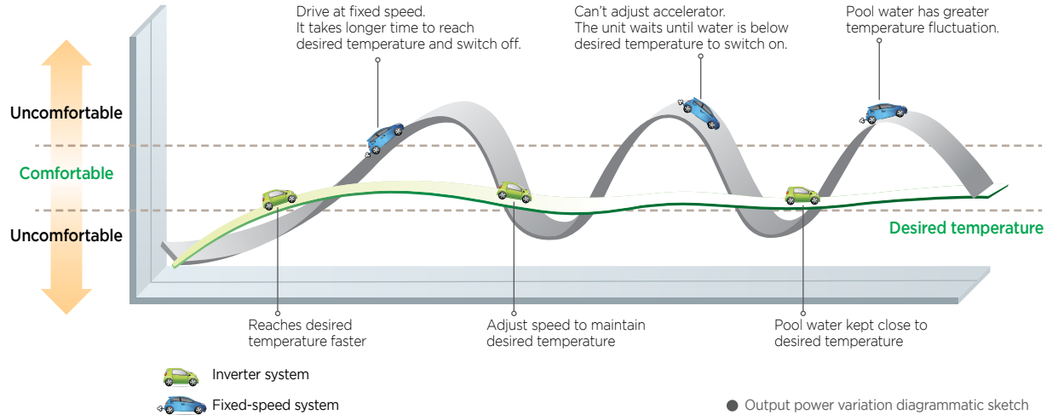
12, 17, 21 & 25 kW inverter models

Electr Heat

ENERGY EFFICIENT INVERTER POOL HEAT PUMP TECHNOLOGY

Inverter pool heat pumps like Waterco's Electroheat ECO-V utilise a variable speed compressor to regulate the pool water temperature automatically and independently.

- inverter technology uses a variable speed compressor motor similar to a car's engine
- it slows down and speeds up as needed to hold a selected desired temperature or speed
- the desired temperature will be reached more quickly and maintained more efficiently
- inverter technology provides a more precise water temperature without the fluctuations and power wastage of fixed speed systems
- inverter technology is significantly more energy efficient with energy savings of between 15 – 30% over fixed speed systems
- the speed control of the compressor and fan motor also means quieter operation



Output power variation diagrammatic sketch

Electroheat ECO-V Inverter heat pumps are more energy efficient than standard heat pumps and can heat the pool even when the ambient air temperature is close to 0°C.

- 15 - 30% in energy savings
- Quiet operation
- Automatic evaporator de-icing
- Available in 12kW heating and 17, 21 & 25kW heat & cool models

Turbotemp™
POOL AND SPA HEATING

FAST, EFFICIENT, COMPACT, QUIET SAFE AND ECO-FRIENDLY

No matter what you're seeking in your swimming pool heater, the Turbotemp gas pool heater measures up. Compare this list of features to anyother and you'll see why Turbotemp heaters are setting a new standard for total value.

- Very compact design.
- A fully pre-mixed burner system with a highly efficient air and gas mixture.
- Hot surface ignition eliminating the requirement for a pilot.
- Push button digital controls with easy to view rotating display.
- Engineered for quiet operation.
- Certified for low NOx emissions.
- Operation through a series of safety features
- Cupro nickel heat exchanger.

GAS POOL HEATERS

Gas pool heating like the Turbotemp by Waterco or Raypak by Rheem is the fastest method for heating your pool, providing a comfortable temperature for swimming on demand. Put simply, they could extend your swimming season all year round.

Gas heating systems use natural gas or LPG, heating the pool water by drawing it through a heat exchanger.

A key advantage of gas pool heating is it can heat pool water much faster than a solar or heat pump system can, and will heat the pool and spa water up to 40°C, no matter how cold the climate is.

Selecting the right size gas heater depends on three key factors:

- The amount of water to be heated;
- How long you are prepared to wait for your pool to heat up;
- Your preferred swimming temperature.

Many heaters offer dual pool / spa temperature settings which is ideal for spas, which are heated to higher temperatures than pools.

However, no system is without some drawbacks; gas could be considered inefficient compared to heat pumps and solar heating systems, but depends largely on the climate you live in, how you wish to use your pool and availability of gas supply.

Turbotemp™
POOL AND SPA HEATING

Raypak®
A Rheem® Company

POOL AND SPA AUTOMATION

Automation revolutionising the way everyday people are taking care of their pools and spas.

Pool owners are demanding more and more automation like Waterco's AquaMaster Pool and Spa Automation system. Control is through a wall mounted panel which enables users to control their pool's pump, filter, heating, cleaner, lighting and water features with the touch of a button.

The benefits of automating your pool are numerous. Here's just a few:

Simplify maintenance

The main advantage to automating your pool is the whole process becomes much simpler. You have control at your fingertips and may turn on the spa, heating or lights with the push of a button.

Save money on energy bills

How many times have you accidentally left some of your pool equipment running for longer than they needed to be? Having pumps, pool lights, and chlorinators on timers controlled by an automation system means they will only be running for as long as they need to be, saving you on associated energy costs.

The prevalence of multi-speed and variable speed pumps also lends itself to automation, as these devices can require a sophisticated control system to manage the speed and flow of the pump, maximising your energy savings without sacrificing the enjoyment of your pool.

Save time and effort in continuous maintenance work

It can be quite time consuming to manage all the bits and pieces that go into making sure your pool is in running order. An automation system essentially does the hard work for you, such as turning on and off pumps, dosing your pool with sanitiser and monitoring the water chemistry.

Although installing an automated system definitely makes pool and spa care much easier, it is important to remember that you cannot simply 'set and forget'. You will still need to check everything is running smoothly; this is, of course, much less time consuming than what you would be doing without an automation system!

Prevent damage to your pool and its equipment

When you let your pool maintenance slip by the wayside, you may find that your pool becomes host to a myriad of issues that could include anything from incorrect pH balance, cloudy water, mineral imbalances to a full blown algae growth.

These problems can, in turn, cause damage to your pool and its equipment. If your pool is constantly monitored and dosed with sanitiser by means of automation, it is unlikely these issues would occur in the first place, preventing damage.

Commercial Pool Heating

Similar to a backyard pool, heating systems are available for commercial pools. Solar, heat pump and gas heating systems may be combined on a larger scale to provide heating efficiency and performance to keep recreational and competition pools at constant temperatures for patrons.

Zane Pool Heating have commercial pool heating systems installed at a diverse range of Australian and international locations, from Olympic sized pools, hotels, water parks, resorts, universities and schools.

↑ Beasley Pool Heating / Zane Pool Heating Adelaide

Dealers & Contractors

There are a number of different ways a solar pool heating system may be purchased.

Some products are supplied “off the shelf” to anyone who wishes to purchase them, such as retail stores, pool builders and pool owners.

Others are only available from appointed dealers or other similar forms of authorised outlets.

The level of protection provided to the purchaser is usually commensurate with the size of the principal supplier and the extent of their involvement in marketing the product by training designers and installers. They should also be engaged directly in the after sales service and warranty activities offered with the product.

In short, the situation can be very much “Buyer Beware” when a product is available to all and sundry with no real effort being made to ensure the system design is correct and the product is correctly installed and fully operational for the benefit of the end user.

If the principal supplier stands behind every aspect as previously detailed, the end user is more likely to end up with a satisfactory result and be afforded a much greater level of protection in terms of workmanship, product warranties and system performance.

To illustrate this important point, we have outlined the method of distribution of Zane systems.

Zane’s systems are only available from Authorised Outlets. In this way, Zane can do everything possible to ensure that every Zane system that is sold is correctly designed and installed.

Zane dealers are required to undertake intensive training programs - this is a mandatory requirement - and they enter into a formal agreement with Zane that requires them to adhere to Zane’s design and installation practices.

Every Zane system owner is covered by an exclusive Customer Protection Plan which provides them with direct cover from Zane as detailed later.

In the unlikely event that a dealer does not do the right thing, Zane has the right to correct the problem and charge the dealer. If a dealership should change hands, Zane still stands behind the product, including the installing dealer’s warranty obligations.

Warranties & After Sales Service

As with most products, there are a wide variety of warranties on offer in the solar pool heating industry.

Just remember - there is little likely cost to a supplier who does not have the financial stability or support facilities to stand behind their product.

You are fully protected by law and to be of value, any warranty offered by a supplier should provide you with some additional form of cover if it is to be seen as offering something extra.

As a prospective purchaser, it is also important for you to realise that most suppliers will build in some protection for themselves to ensure that their warranty policy does not become a “blank cheque” to cover owners who fail to operate and care for their systems in the proper manner.

Product warranties do not cover owners for service calls for routine maintenance although most suppliers will be sensible and allow a settling down period (around 90 days) before a service call charge is levied - although this could well depend on the nature of the problem and the time and distance involved.

At Zane, all product warranties are issued direct from our state offices to the owner.

It is a good idea to enter into a seasonal maintenance program with your dealer.

For a nominal charge, the dealer will call and check your system each year.

Because seasonal checks are usually made before the busy season commences, the dealer is able to schedule them efficiently and economically by doing all those in the same locality around the same time.

The Australian Standards Committee has established standards for Solar Pool Heating Systems. Zane Solar Systems conforms in every way with the Australian Standards.

Established in 1981 and listed on the ASX in 1989, Waterco (ASX:WAT) manufactures and distributes a diverse range of products for the international swimming pool and water treatment markets. Waterco is also the franchisor of Swimart, Australia and New Zealand’s largest network of pool and spa retail outlets, and is also the distributor of Zane Pool Heating solutions via a network of Australian dealerships.

Waterco delivers high quality, innovative products at exceptional value in over 40 countries. This includes a comprehensive range of swimming pool & spa equipment and chemicals as well as domestic and industrial water treatment equipment.

The company’s head office is in Sydney, Australia with international offices, manufacturing plants and warehouses located in Australia, New Zealand, Malaysia, Indonesia, Singapore, China, US, Canada and the UK.

WATERCO
water, the liquid of life

www.waterco.com

ZANE
Pool Heating

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New Zealand	088 765 279
Web	www.zane.com.au

WATERCO
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