



# austral solar

**Design, Installation and Maintenance of  
Solar Heating for Pools by Austral Solar**

Consultation  
Service

Quotation  
Solar Pool  
Heating Design

Installation of Solar  
Pool Heating

Handover

Swim



## Who is Austral Solar Group?

The Austral Solar Group has been established for over thirty years and is one of Australia's leading providers of solar heating systems. Being a second generation business the group has gained a superior knowledge and experience to design, manufacture and install solar heating for all pools Australia wide.

Austral Solar Group provides a comprehensive range of specialised services, technologies and products for the innovation, design, installation and maintenance of heated solar pools. An extensive network of clients, councils, builders, asset management and various organisations continues to grow and is testament to the unparalleled service, quality and standards provided.

Offering a comprehensive consultation process to all their customers, Austral Solar provides bespoke heating systems for all pools. Your system will be designed and installed using Australian made components.

The Austral Solar Groups impressive resume encompasses thousands of clients, numerous corporate and industrial firms across Australia including RACV, YMCA, Anaconda and many Local Councils. Rest assured in the knowledge that Austral Solar Group is health and safety compliant as well as fully insured.

Design

Installation

Maintenance

## What does the Austral Solar Group do so well?

Manufacturing the highest quality solar pool heating systems for more than 30 years is no easy feat and creates a sense of pride in the product and services on offer. Two generations of family values and reputation have ingrained a commitment to innovative quality in all facets of the Austral Solar Group.

The exceptional abilities of the Austral Solar Staff ensure expectations and standards are surpassed whilst eliminating comparable alternatives.

## What makes the Austral Solar Group so Special in the Industry?

Austral Solar is a great innovator in advanced solar technologies and continues to design and develop these technologies. The Austral Solar Group use innovative **Large Bore Tubular Collector Material**. Unlike small bore, the Austral Solar Large Bore Collector Material captures the energy of the sun throughout the entire day whilst delivering huge volumes of heated water in comparison. The system by the Austral Solar Group is mechanically and hydraulically superior to many other systems on the market. If you are looking for quality and expertise, it must be the Austral Solar Group.



## What can the Austral Solar Group offer to your Organisation?

- Consultation, Customer Service and Customer Experience
  - Initial and Ongoing consultation with other stakeholders.
  - Whole process aligned to your specific needs and managed through communication.
  - Excellent customer service and after sales exemplified by our highly respected clientele.
- Solar Heating Design
  - Thirty years' experience in the programming, design and building of solar pool heating systems.
  - A truly bespoke system to ensure that your system is both cost effective and eco-friendly.
- Solar Pool Heating Supply and Installation
  - The Austral Solar Group custom install the solar collector material and can integrate the plumbing, pump/s and auxiliary equipment with the existing filtration hydraulics
  - Ten Year Warranty
- Solar Heating Innovation and Australian Investment
  - The new and improved *Austral Control* features three permanent Temperature displays and sophisticated software to gain maximum efficiencies.
  - Australian Made, Owned and Manufactured components used wherever possible.
- Commitment to the Environment
  - The Austral Solar Group is committed to ensuring that the Solar Heating System offers a green solution. The Austral Solar Group utilises renewable energy and cuts down or replaces the need for non-renewable energy requirements to ensure that the carbon footprint of the client is reduced.
  - Austral Solar Group is supported by both community and government who recognise the benefits of green energy.

## What are the Benefits of choosing the Austral Solar Group?

One of the key benefits of choosing the Austral Solar Group is maximising the amount of energy your system generates compared with the many other systems on the market. It is common sense to use an Austral Solar Group due to their technological advances in solar. It is in this way that the Austral Solar Group can provide a reduction in your pool heating bill of up to 80%.

The Austral Solar Group has a highly knowledgeable workforce with skilled labour. A power house solution to your requirements will be designed to benefit the client and is; backed by refined technology, high standards and a level of quality synonymous with Austral Solars reputation. There is no other company in Australia which can offer you the same level of service.

## What Products and Materials are used?

Austral Solar are proudly Australian, utilising Australian quality controlled products and components. With decades of experience under their belt, they know what works and what doesn't and have built the most efficient and effective Solar Collector in the industry.

The large bore collectors have a unique design to allow more heat to be trapped – not only does this increase the sun catchment area up to 130% but can also increase the volume capacity of the unit to a massive 250%! Simply put, the large bore collectors are able to heat large volumes of water quicker than anything else out there and this can be achieved at a fraction of the cost of powered systems.

The collector is made from a high grade thermal plastic which is more robust than the commonly used EPDM and PVC.

Header connections are commercial grade ASA rather than Polly irrigation barbs.

The header connections have a nine millimetre Internal Diameter and are less restrictive than many internal/external locking compression fittings. Austral Solars customized barbs are welded to the collector material which eliminates leaks.





***Austral Solar System doesn't require additional filtration, drawing unfiltered water directly from your pool without risk of blockages.***

Generic small bore systems that attempt to draw unfiltered water commonly suffer from blockages caused by debris rendering these systems useless!

Blockages often go undetected resulting in high pressure leaks or further restricting the flow of water, resulting in decreased efficiencies and increased pumping costs. Likewise systems requiring additional filtration require more ongoing maintenance as clogged and dirty filters will limit water flow and efficiency.

**Austral Solar contracted several independent bodies to carry out extensive practical trials to determine the best materials and pigmentations for solar collector.** It was determined that the traditional black collector material is by the far the most efficient in absorbing energy.

Although Austral Solar can supply coloured collector they choose not to enter the arena of the aesthetic sell. Colour and even multi-coloured collector extrusions can't match the efficiencies or practical applications of the proven black collector. Coloured pigments have a tendency to migrate from the collector material over time and dual / multi coloured extrusions have been known to de-laminate, all of which contribute to a reduced life expectancy and efficiency of the collector.

**The Austral Solar's TCS01 Temperature Differential Controller** is a further innovation in solar systems brought to you by the Austral Solar Group. The TCS01 is one of the only temperature controls for solar heating which is designed and manufactured in Australia. It is both used and recommended by those in the trade.



The quality of the TCS01 controller is improved by rigorous testing in the field and supported by the highest level of quality control. The TCS01 brings proven reliability with thousands of units used reliably across pools in Australia, over a substantial time frame and in varied environments.

The TCS01 has superior processing power which enables high speed functioning. The unit also has an extremely user friendly interface and can be used by anyone to ensure that their pool heating system is working at its most efficient.

- **Highly Visible, Easy to Read Displays**
- **Simple Navigation of Features**
- **Practical & Reliable Yet Highly Sophisticated**
- **Intelligent Software – Provides 24/7 Analysis & Response**
- **Durable, Adaptable & Functional**
- **2 Year Back to Base Warranty**
- **Australian Made**
- **Designed, Built & Used by the Industry**
- **Size: 200 x 150 x 75 (approx.)**



## ***The Austral Solar Track Record***

The Austral Solar Group is proud to be responsible for the installation of thousands of residential & commercial solar heating systems.

Altona Gate Fitness Centre  
Anaconda Frankston  
Brennan Park School  
Birchip Pool  
Camberwell Girls Grammar  
Carlton Baths  
Churchill Leisure Centre  
Cobden Pool  
Coburg Technical School  
Cowes Community Pool  
Crib Point Pool  
Donald Pool  
Eaglehawk Pool  
Firbank Girls School  
Frankston Pines Pool  
H.M.A.S Lonsdale  
Hamilton Children's School  
Holbrook Shire Pool

Inglewood Pool  
Jeparit Pool  
Korowa Girls School  
Leongatha Pool  
Lower Plenty Swim Centre  
Mitcham Special School  
Neerim South Pool  
Pascoe Vale Pool  
Peninsula Holiday Park Dromana  
Portarlington Caravan Park  
Preston Club  
Puckapunyal Army Camp  
RACV Inverloch  
Shepparton Swimming Complex  
Tallangatta Pools  
Timboon Swim Centre  
Warracknabeal Pool



The Austral Solar Group has certification, accreditation and memberships from key organisation involved in the solar industry across Australia.

Swimming Pool & Spa Association of Victoria (SPASA)  
Master Builders Association of Victoria  
Housing Industry Association (HIA)  
Association of Aquatic Professionals  
Australasian Building Sciences  
Community of Plastic Professionals  
Green Build Council of Australia  
Society of Plastic Engineers, Inc

Solar Energy Consultants  
Solar Energy Network  
Swimming Pool Industry – Australia  
The Association of Pool & Spa Professionals  
ThinkGreen: BuildGreen  
Radiant Heating Trade Forum  
Pool Genius Network



## Technical Review – Independent

The following data and information below has been provided via Dr. Boris V. Balakin

MSci (MEPhI), PhD (UoB), Bergen 2011.

“Heat exchange rates through the collector are dependent upon the flow rate achievable and turbulence (water agitation). Both factors are necessary to facilitate optimum heat transfer. It is therefore important to select the pipeline (collector) diameter correctly, so that the heat exchange is at the maximum possible level whilst head loss across the collector is at a minimum. Most of the solar collectors used in Australia (since the early 1970's), are manufactured with a pipeline ID of 5.95 mm.”

In a current study it was proven that a 5.95mm bore size is not optimal and showed a collector bore sized to 9.3 mm ID performs better.

### Reasons as follows:

A.) Less friction head loss as calculated according to the Darcy-Weisbach equation. The mean (average) flow velocity is lower in the case of 5.95mm ID.

B.) Frictional pressure gradients calculated by the friction factor; the measure of flow turbulisation (Reynolds Number) and the dynamic viscosity of the water calculated the cost of pumping at 84% less for large Tube collector as opposed to a 5.95 mm Small Tube collector.

C.) “We ought to also look into the heat exchange which can be characterised by a dimensionless criteria called Nusselt number, Nu, and which is constructed from the heat exchange coefficient, pipeline diameter and heat conductivity of water. According to Dittus-Boelter correlation is related to both measure of flow turbulisation and to Prandtl number. However the amount of heat transferred to water from the hot wall is also proportional to the total area of piping and to the time spent within the collector as calculated to the residential time definition by Levenspiel; where total volume of solar collector is 104% higher in the case of the larger 9.3mm ID collector material”

D.) “Summing up the factors which influence the heat exchange in the collector pipes, we can formulate a heat transfer parameter by their multiplication. Differing volume flow rates in the system clearly provides the evidence supporting that the heat exchange is almost 115% higher in case of the larger 9.30mm pipe.”

### Conclusion

The following are identified as the critical factors influencing heating efficiencies of large volumes of water with low grade heat (eg swimming pools):-

- \* Flow Rates
- \* Turbulence
- \* Pressure Gradients
- \* Exchange Coefficient

In each of the above categories, the 9.3mm ID bore was found to be superior when compared to the standard 5.95mm ID profile.

### References:

\* Balakin, H. Pedersen, Z.Kilinc, A.C. Hoffmann, P.J. Kosinski and S. Høiland. Turbulent flow of Freon R11 hydrate slurry. Journal of Petroleum Science and Engineering, 70(3), 177-182, 2010.

4. O. Levenspiel. Chemical Reaction Engineering. Third Edition. ISBN 0-471-25424.

## Physical Data

Physical Data	Unit of Measurement	Large Bore Collector	Standard Collector
Tube ID	mm	9.3	5.95
Tube OD	mm	13.61	7.97
Width	mm	106.1	99.1
Wall Thickness	mm	1.9	0.97
Water Volume	l	3.2	1.68

### Why Austral?

As a result of 30 years of hard work, dedication and customer feedback, Austral Solar has graciously fostered a reputation for quality, innovation, practicality and value.

We believe this success is testament to our unwavering principles and beliefs:

- Employ, Develop & Provide the BEST Products, Services, Practices & People
- Adopt, Apply or Refine only when such actions collectively improve:
  - Value for Money
  - Quality
  - Customer Satisfaction
  - Industry Practices & Standards
  - Company Branding & Reputation

### How is Austral Solar Different?

Specialised, Focused & Dedicated to Solar Pool Heating

CUSTOM BUILT Systems ON SITE to compliment the roof profile and surroundings. We don't use prefabricated kits.

EXCLUSIVE PRODUCT, designed, tried and tested by us to suit the intended application. We don't use off the shelf product or materials.

Seasoned installation teams who are TRAINED, QUALIFIED, EXPERIENCED and insured.

While we embrace technology, we don't jump from gimmick to gimmick looking for a marketing point of difference. Our products and installation procedures are based on real world hydraulic principles and practicalities.

Our products are not imported, rebadged, generically manufactured or available from our competitors.

### Ideal Solar Locations:

Any surface that faces: North, West or is flat in orientation.

### Solar Coverage:

Often referred to as a percentage (%) of the pools surface area.

A pool that is 10 x 4 meters has a surface area of 40 square meters (length x width).

40 square meters of solar collector is therefore 100% of the pools surface area.

### Recommended Coverage:

Based on Melbourne's weather it is common practice to instal at least 100% solar coverage however additional coverage will increase performance, usage and decrease the time required to achieve your desired swim temperature.

### Considerations:

Our coverage recommendations take into account all known factors that may influence the efficiencies of the proposed system while catering to the clients expectations/requirements.

- Flow Rates Influenced by System Design & Location
- Roof Direction, Pitch & Material
- Wind & Shade
- Pool Colour, Collector Colour
- Water Features, Negative Edges, Slides etc.
- Spa Jets, Aeration
- Use of Pool Covers & the Types of Covers (Bubble, Foam, Mesh, etc.)

### Temperature:

The majority of our clients desire a swimming temperature of 28-30 degrees. Such temperatures are often achieved within two (2) consecutively warm days.

### Swimming Season:

Typically Melbourne's swimming season will commence in September and conclude in late March.

### Colour:

Black Solar collector is not only the best colour for absorbing heating, but it also lasts longer – however we can offer alternatives.

### Sales, Service, Distribution:

Austral Solar is 100% Australian owned and operated, with our head office located in Mornington, Victoria. Our exclusive products, services and materials are selectively distributed by authorised agents in Shepparton, Geelong, Mansfield, Gippsland and Outer Melbourne.

## Why more people say YES to Austral Solar Systems:

Company	Austral	Other Solar Co.
Australian Owned Company	✓	
Fully Insured	✓	
OH&S Compliant	✓	
Local (Mornington, Shepparton, Geelong & Mansfield)	✓	
Industry Leaders for more than 30 years	✓	
In House Installation, Sales & Service	✓	
Used by the Trade	✓	
Recognized by the industry	✓	
HIA members	✓	
Commercial, Domestic & Insurance	✓	
Highly Recommended	✓	
<b>People</b>		
Professional Australian based work force	✓	
OH&S Trained & Certified	✓	
Full Time Seasoned – Staff, Contractors	✓	
Insured	✓	
Installation teams with 10+ years' knowledge & experience	✓	
Sales staff with 15+ years knowledge & experience	✓	
Police Checked	✓	
Customer focused	✓	
Service driven, great communication	✓	
<b>Product &amp; Material</b>		
Unique & Exclusive to Austral's distribution network	✓	✗
Australian Made & Manufactured	✓	
Custom Built systems on site	✓	✗
Full flow manifold connections	✓	
High Volume Solar Collector 9.3mm tubes	✓	✗
Barbs are welded to collector material	✓	
High Heat Transfer to water	✓	
High Surface Area for heat absorption	✓	
Hydraulic Pumping Efficiencies – low friction, low head loss	✓	
Independently tested	✓	
Specialized High grade thermoplastic elastomers, PVC/Nitrile	✓	✗
Resistance to perforation - Thick tube wall	✓	
Painted PVC pipes to blend with surroundings	✓	
Full 10 Year UV Warranty	✓	
Full 10 Year Chemical Warranty	✓	
Adaptable & Accommodating of flues, skylights etc.	✓	
Easily serviced and repairable on site	✓	
Hydraulically balanced	✓	
<b>Solar Controls</b>		
Australian Made	✓	
3 permanent temperature displays	✓	
Shared Suction Compatible	✓	✗
2 year warranty	✓	

*Others may compare but they cannot compete.*



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