

## Fact Sheet 3

# UltraDome™ Profile



All pool blankets have a finite useful life and will eventually deteriorate due to the effects of exposure to sunlight and highly corrosive pool chemicals.

Daisy Pool Covers have made a considerable investment in Research and Development in order to develop pool blankets that combine maximum durability, heating and heat-retention performance, and value-for-money.

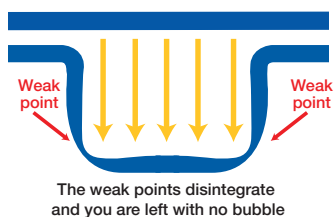
This Fact Sheet explains how Daisy's exclusive UltraDome™ bubble technology produces a stronger and longer-lasting pool blanket.

It also outlines how UltraDome™ technology contributes to Daisy pool blankets' insulating efficiency.

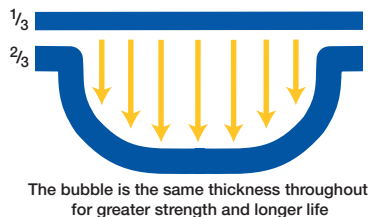
### What makes the UltraDome™ bubble different?

The first thing is the unique Daisy UltraDome™ bubble shape.

#### Stretched bubble shape



#### UltraDome™ Bubble Shape



A superior moulding technique used in the manufacture of UltraDome™ bubble material enables the polyethylene (PE) bubble layer to be formed in a profile of consistent thickness with 2/3rds of the total material in the bubble layer - as the diagram above illustrates.

This process eliminates 'stretching' at the 'corners' of bubble material with a squarer profile - as also illustrated above.

Stretching leads to weak points that are more susceptible to physical damage during normal use of the blanket.

As the stretched areas are thinner, there is also less PE material to physically resist degradation by sunlight and pool chemicals.

### Why is an UltraDome™ blanket stronger?

Four different bubble shapes and sizes have been field tested. The results of these tests have produced our present bubble shape and size.

All indications are that it is the optimum shape for a solar pool blanket. It affords maximum flotation, solar transfer, and is abrasion resistant.

The Daisy UltraDome™ bubble profile produces a 'bubble' layer of consistent thickness and without weak points.

This bubble layer is bonded during manufacture to a second layer of PE.

It is the bubble layer which is in contact with the pool water and corrosive chemicals whenever the blanket is in use.

The UltraDome™ profile ensures that a full two-thirds of the total PE material is contained in the lower layer.

This profile creates a more durable blanket.

The upper blanket layer must resist degradation by UV radiation from the sun, and some contact with pool water and chemicals.

However, the bubble layer is subject to both UV radiation and constant exposure to pool chemicals while the blanket is in use.

A thicker bottom layer will simply resist degradation for longer.

This fact has been independently confirmed by tests on a range of polyethylene, polyvinyl chloride (PVC) and polyethylene foam/PVC covers conducted by JLA Francey and BP Gleisner of the Monash University Physics Department.

### Why is strength so important?

An outdoor swimming pool lives in an extremely harsh environment.

Most pools are unshaded, to take advantage of solar heating of the water and maximise their use.

However, this means that most outdoor pools, their surrounds and equipment - particularly pool blankets - are exposed to damaging UV radiation from the sun for a large part of the year.

### The impact of Chlorine

Pool chemicals - although essential for sanitation - are highly corrosive.

Whether you have a salt water pool or not - any pool that is chemically sanitised uses Chlorine as the disinfectant.

For more information, please see: Facts about Chlorine section later in this Fact Sheet.

Molecular Chlorine (Cl<sub>2</sub>) is a highly corrosive greenish-yellow gas with an irritating odour.

In whatever form Chlorine is added to the water, or produced by a salt water chlorinator - it eventually returns to its natural state as a gas and escapes.

However, when a pool cover is in use it cannot simply disperse into the atmosphere.

It is trapped immediately below the blanket. This area is also heated most by the sun - increasing Chlorine transfer from the water - at a high temperature.

These factors combine to create extreme conditions that are likely to increase blanket degradation.

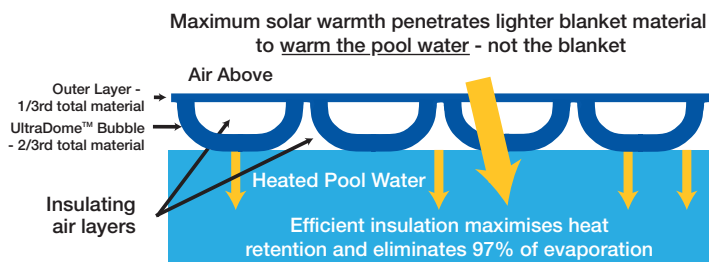
Daisy UltraDome™ Solar Pool Blankets combat potential degradation in the following ways:

- UltraDome™ bubble profile creates an even, thicker bottom layer with no weak points
- UltraDome™ material contains maximum UV absorbers, quenchers and stabilisers
- UltraDome™ material also contains tougheners to minimise the effect of solar and chemical degradation

# The Facts about Pool Blankets

## How do Daisy **UltraDome™** blankets insulate against heat loss?

The **UltraDome™** bubble profile results in a total insulating air layer to almost the entire bubble depth.



As the above illustration demonstrates, the air in the bubbles, and the air trapped between the top layer of the blanket and the water - between the bubbles - effectively form a thick layer of insulation across the entire blanket area.

Thermal resistance (R) is a measure of insulation effectiveness. In testing carried out to Australian Standards by Curtin University, Western Australia - the Daisy 500 micron Pool Blanket achieved the very high rating of 0.067 m<sup>2</sup>/K.

It is important to remember that the US National Renewable Energy Laboratory says that the vast majority of heat loss from pools is due to evaporation.

A Daisy Pool Cover will effectively eliminate evaporation - and through effective insulation will help substantially reduce the remaining small heat loss from convection and radiation.

For further information, please see our Fact Sheets No 1: Evaporation and No 2: Heating Capabilities.

## Why do Daisy Pool Blankets come in a range of thicknesses?

As we said earlier, the thickness of PE material used to manufacture a solar pool blanket is the primary factor in its durability.

This is basically common sense and affects both resistance to normal operating 'wear and tear' and to degradation by UV radiation and corrosive pool chemicals.

In order to offer pool blanket alternatives that balance initial cost with useful lifespan, Daisy manufactures its **UltraDome™** Solar Pool Blankets in a range of thicknesses.

Daisy Solar Pool Blanket	Blanket Thickness	Pro-Rata Warranty
<b>UltraDome™ Series 3</b> 3 - 4 year life expectancy	200 micron	3 years
<b>UltraDome™ Series 4</b> 4 - 5 year life expectancy	300 micron	4 years
<b>UltraDome™ Series 5</b> 5 - 6 year life expectancy	400 micron	5 years
<b>UltraDome™ Series 8</b> 8 - 10 year life expectancy	500 micron	8 years

**PLEASE NOTE:** 'Micron' is an abbreviation of micrometre - one millionth of a metre. To put it into perspective, a human hair is around 100 microns in diameter.

Blanket thickness also determines the weight of the blanket.

Although it is quite feasible to manufacture a blanket from PE material thicker than 500 micron, it may well prove too heavy and rigid in larger pool sizes for convenient domestic use.

And of course, a solar pool blanket that is not relatively light to handle and easy to use is less likely to be used frequently and correctly - therefore lessening the potential benefits gained.

## Facts about Chlorine

All Chlorine in Australia is produced from salt - Sodium Chloride.

If you have a salt water pool chlorinator, this produces Chlorine in the same basic way as it is manufactured commercially.

An electrolytic process in the salt water chlorinator converts salt water to Chlorine gas, Hydrogen gas and hydroxyl ions.

These gases react with the water to give hydrochlorous acid and hypochlorite ions - the primary disinfectants produced by the process.

If you add liquid chlorine to your pool - Pool Chlorine - this is actually a solution of Sodium Hypochlorite and water.

Granular chlorine and chlorine tablets are Calcium Hypochlorite.

When these compounds are added to water, they also produce hydrochlorous acid - a powerful disinfectant.

Whenever Chlorine is added to the water, or produced - it eventually comes out of solution as a gas and escapes.

## Every pool needs a Daisy Pool Blanket

A Daisy Pool Blanket can increase the months you can swim each year in a warmer pool, reduce cleaning time and chemical costs and almost eliminate evaporation - saving a vast amount of water.

The unique Daisy **UltraDome™** bubble profile creates a stronger pool blanket - that will last longer.

It also makes Daisy **UltraDome™** blankets highly efficient insulators against heat loss by radiation and convection.

Australian local, State and Federal Governments and all Water Authorities advocate pool blanket use, and an increasing number are providing rebates or subsidies for their installation.

## References

*Sealed Air Corporation, Solar Pool Blanket, John F Zaccaro & Associates*

*Francey, J L A; Gleisner. B P (1988) Plastics and Rubber Processing Applications, Vol 10 No 3 Department of Physics, Monash University, Calyton, Victoria*

*"Guarded Hotplate" Testing (2003), Curtin University, Western Australia*



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