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Customer Presentation 2019



Evaporation
Control



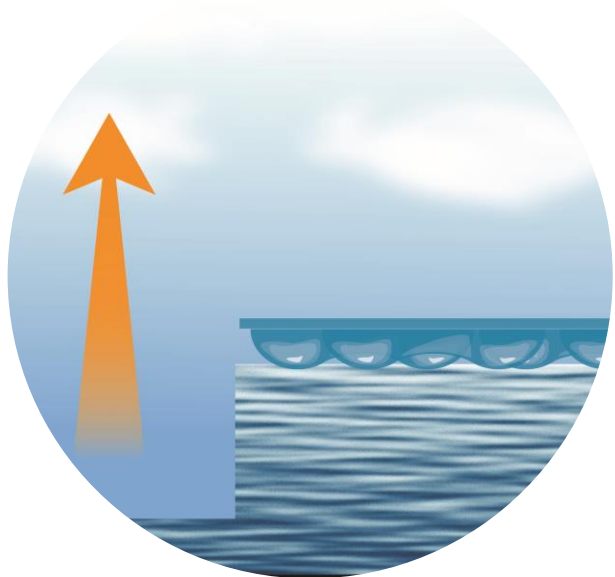
Heat
Retention



Debris
Prevention

11/04/2019

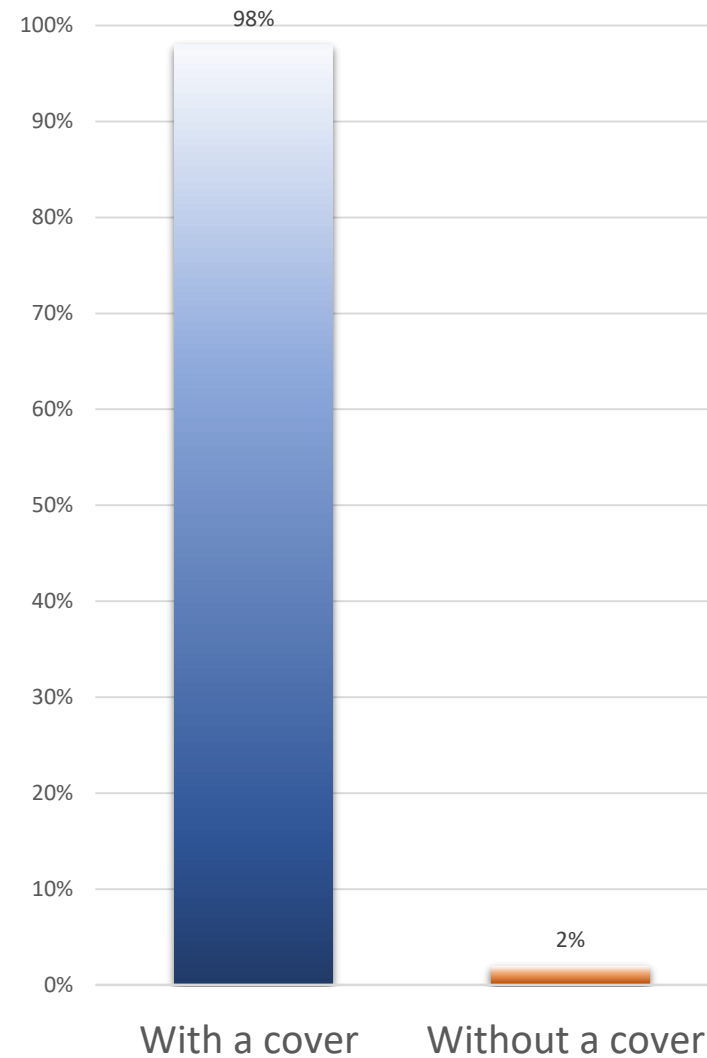
Why use a pool cover?



Evaporation Control

- Evaporation control is a trait provided by all pool covers.
- A pool cover works as a physical barrier to evaporation.
- This attribute maintains water levels, reducing the need to top up the pool thus saving a vital resource.
- It also serves an energy saving purpose by reducing evaporative cooling.

Evaporation Prevention

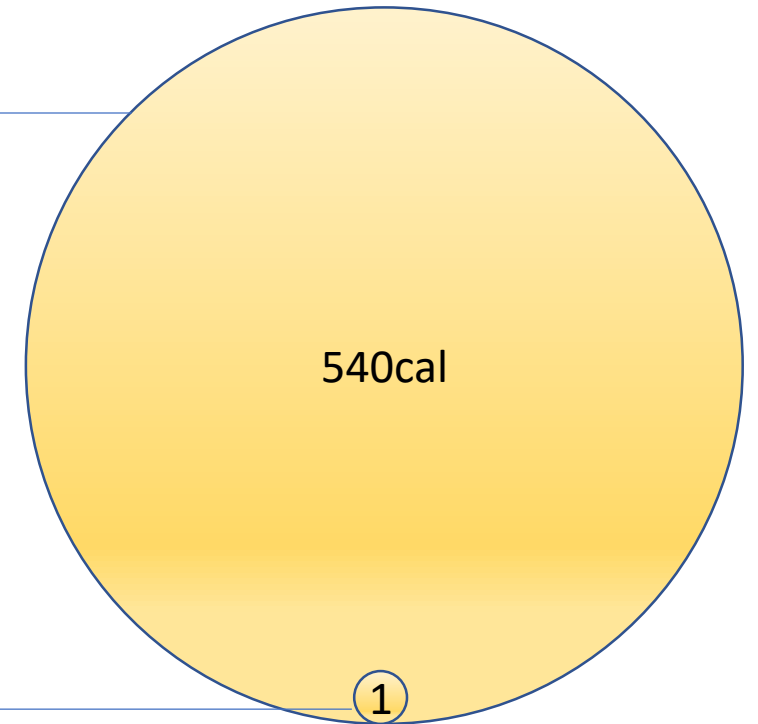




Evaporation Control

- It also serves an energy saving purpose by reducing evaporative cooling.
- Reducing the largest cause of heat loss to the pool.

Energy (calories)
required to vaporise
1g of water



Energy (calories)
Required to heat 1g of
water 1°C



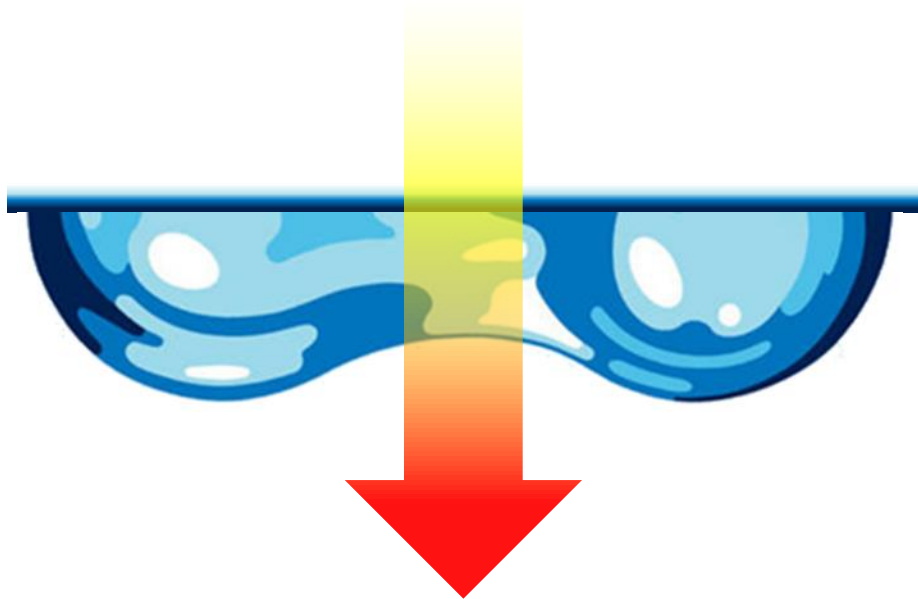
Heat Retention

Cover type	Thermal Resistance per 5.5mm Layer (m ² ·K·W ⁻¹)	U-Value (W/m ² ·K)	K-Value (W/mK)
400 Light Blue	0.068	14.71	0.0809
500 Sol+Guard	0.072	13.89	0.0764

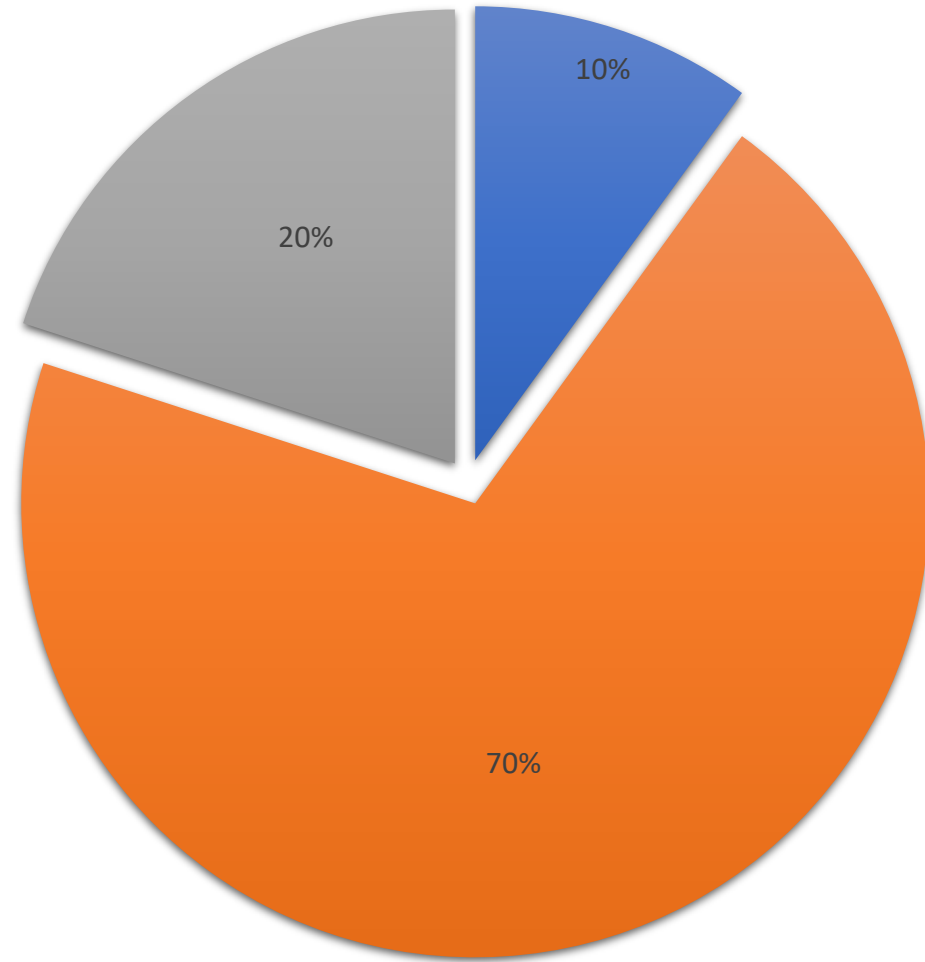
This testing was completed to the standards of ISO 8301:1991

- The thermally insulating properties of a pool cover are largely determined by the amount of air held within the material.
- As such, a large tall bubble is desirable to form a insulating layer to slow the rate of heat loss.
- The lower the U-Value the greater the materials ability to retain heat into the pool
- This should not be mistaken for a ability to add heat to the pool.

- ∞ A pool cover reduces the energy consumption and water recourses required to maintain a pool.
- ∞ By reducing evaporation by over 98%+, a pool cover dramatically reduces the energy losses from the pool.
- ∞ The pool cover's insulating properties slow the heat flow from the pool to the environment, helping to maintain temperature.
- ∞ A solar cover provides the added benefit of allowing solar energy through to heat the pool directly.



Drivers of heat loss from a pool

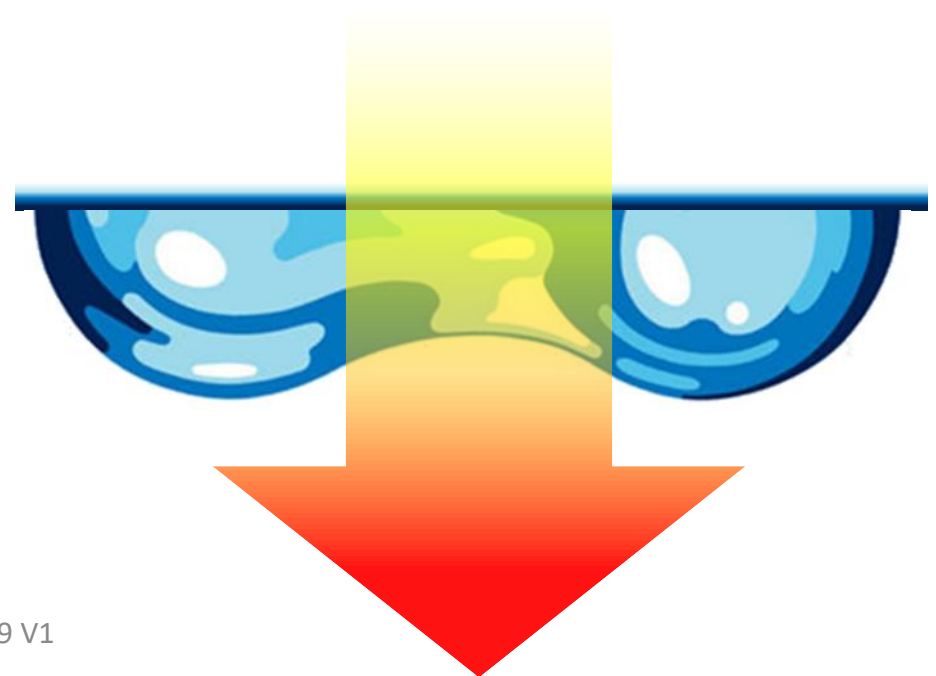
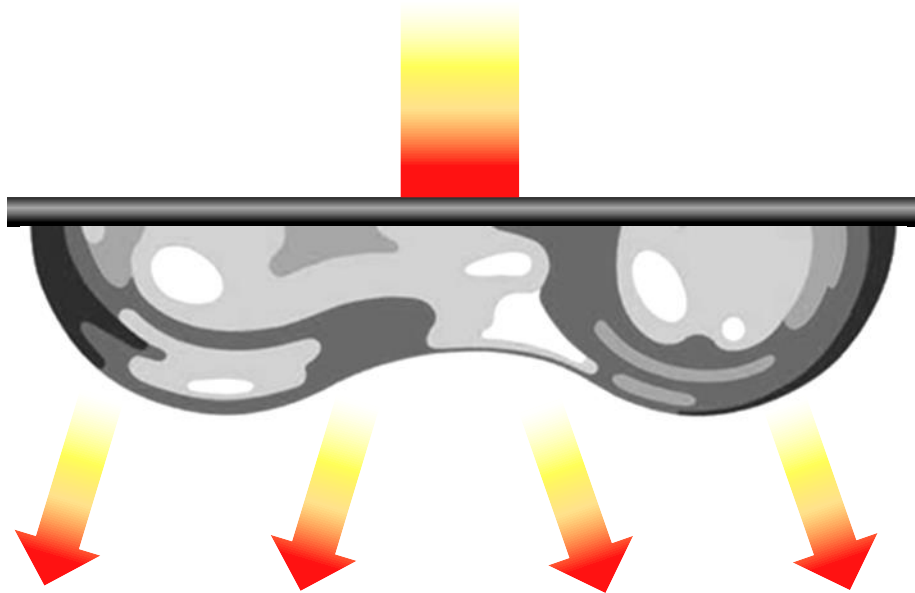


■ Conduction ■ Evaporation ■ Radiation

- ∞ Most common materials use two basic methods to pass energy from the sun to the pool:
 - ∞ Absorption covers:

Dark coloured or opaque materials that absorb the sun's energy in the material, passing this energy to the surface of the pool in contact with the cover by a process known as conduction.
 - ∞ Transmission covers:

These are clear materials with high transmission across the visible and IR (infrared) spectrum. This allows for solar energy to pass directly to the water in the pool.





Debris Prevention

- ∞ A pool cover works as a barrier to dirt and debris entering the pool, which in turn reduces chemical consumption.
- ∞ Only 10% of the chlorine added to a pool is required to disinfect the environment. The other 90% is used in the oxidation of biological and environmental matter.
- ∞ A pool cover also works as a barrier to UV light which can deactivate free chlorine, converting it into less efficient sanitisers. This process is known as Photolysis and is why stabilizers are added to chlorines granules. A pool cover's ability to reduce this process increases the efficiency of the chlorine as less is decayed before it can perform its function.

Standard Product Example

400micron Light Blue

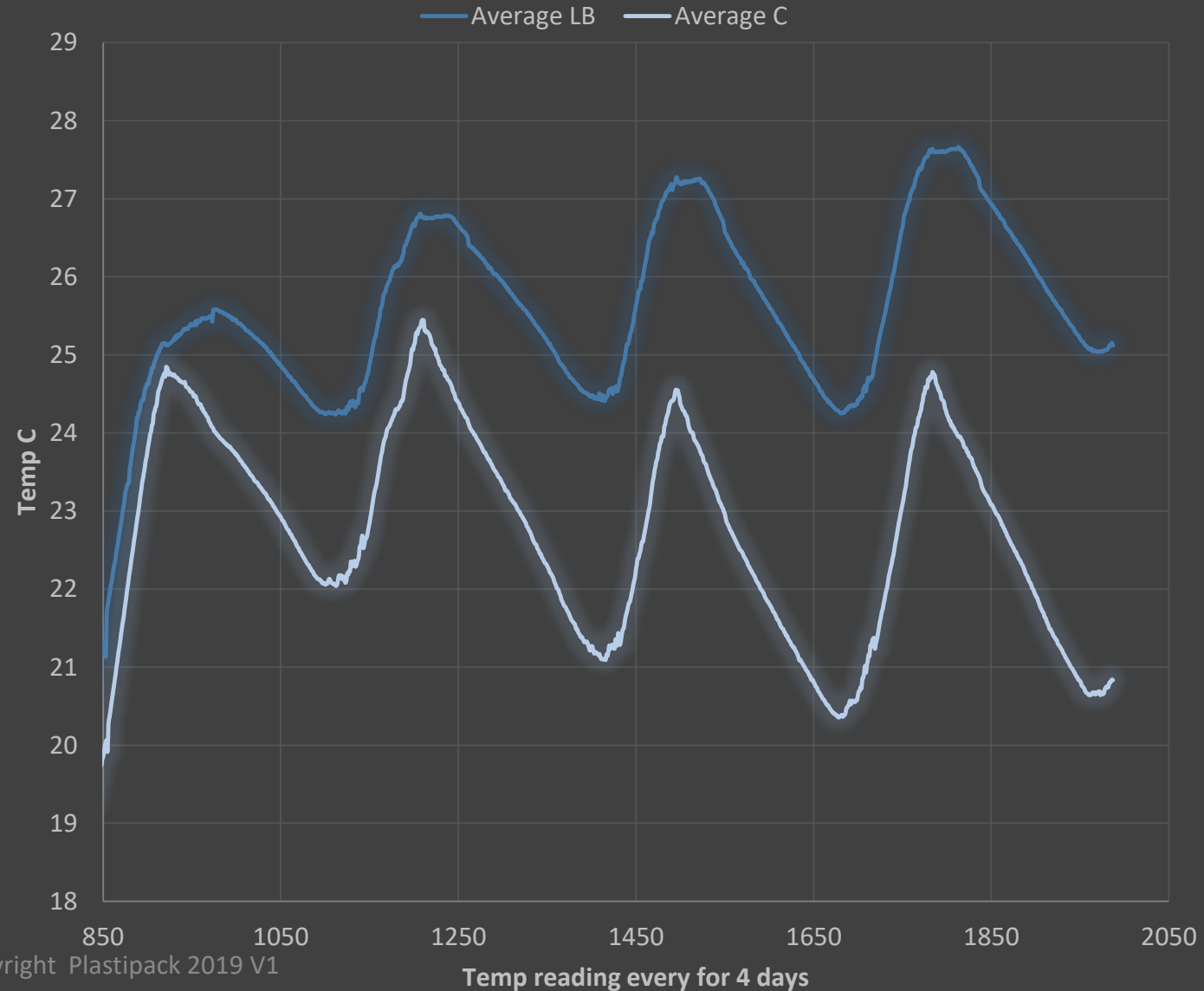


Performance compared to a uncovered pool

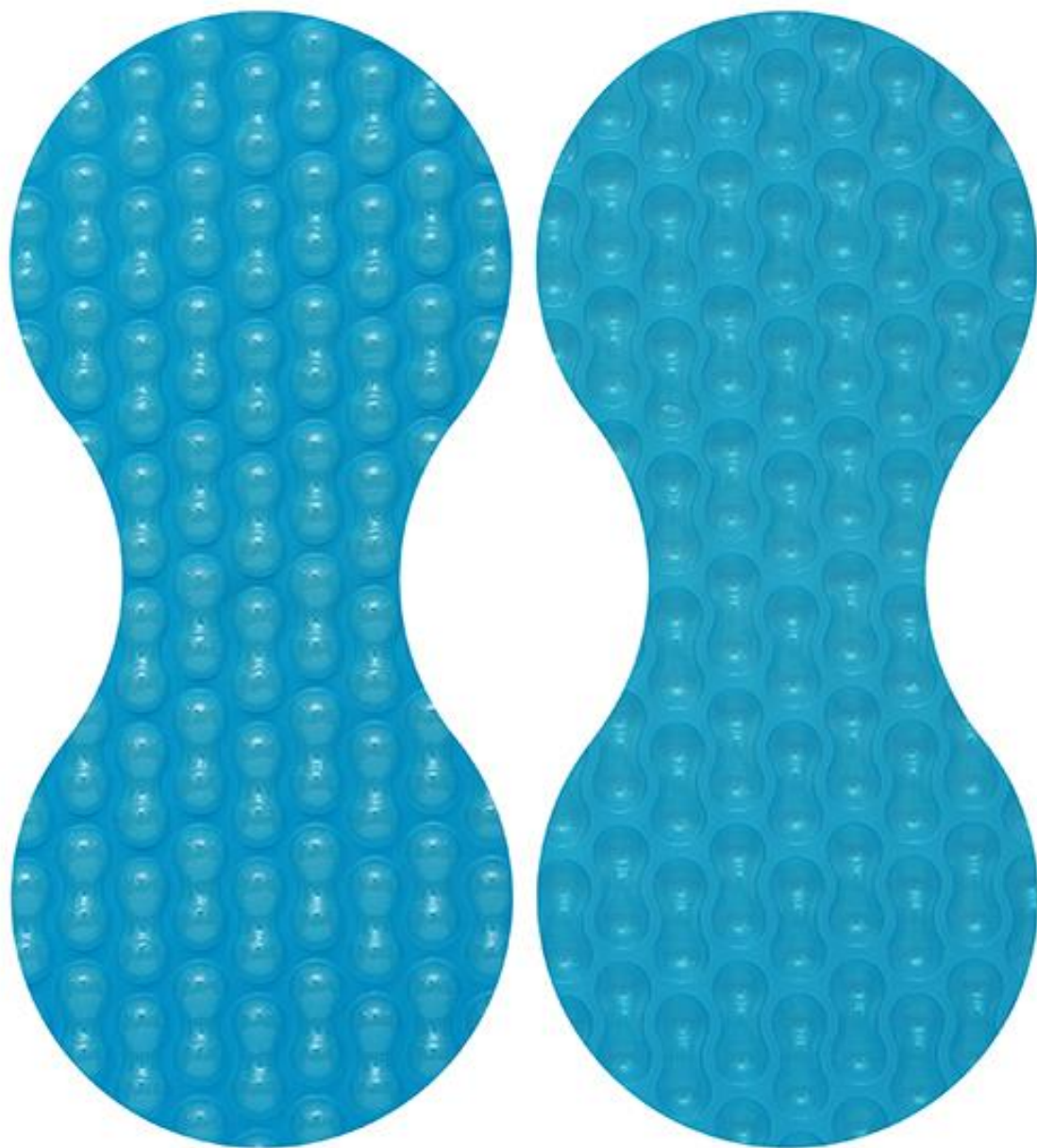
- The graph on the right demonstrates a short temperature performance test conducted in the UK.
- The test ran for 4 days and consisted of two unheated pools. The first, an uncovered control pool; the second covered with our standard light blue material.
- The results show clearly the effects of evaporation control, insulation and solar energy gains on the pool.
- The Light Blue (LB) cover shows increased temperature in the day and reduced energy loss at night compared to the Uncovered control pool (C).

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Average Temperature of a pool covered with a Standard light blue GeoBubble™ cover compared to a uncovered control pool. 01/08/13 to 05/08/13



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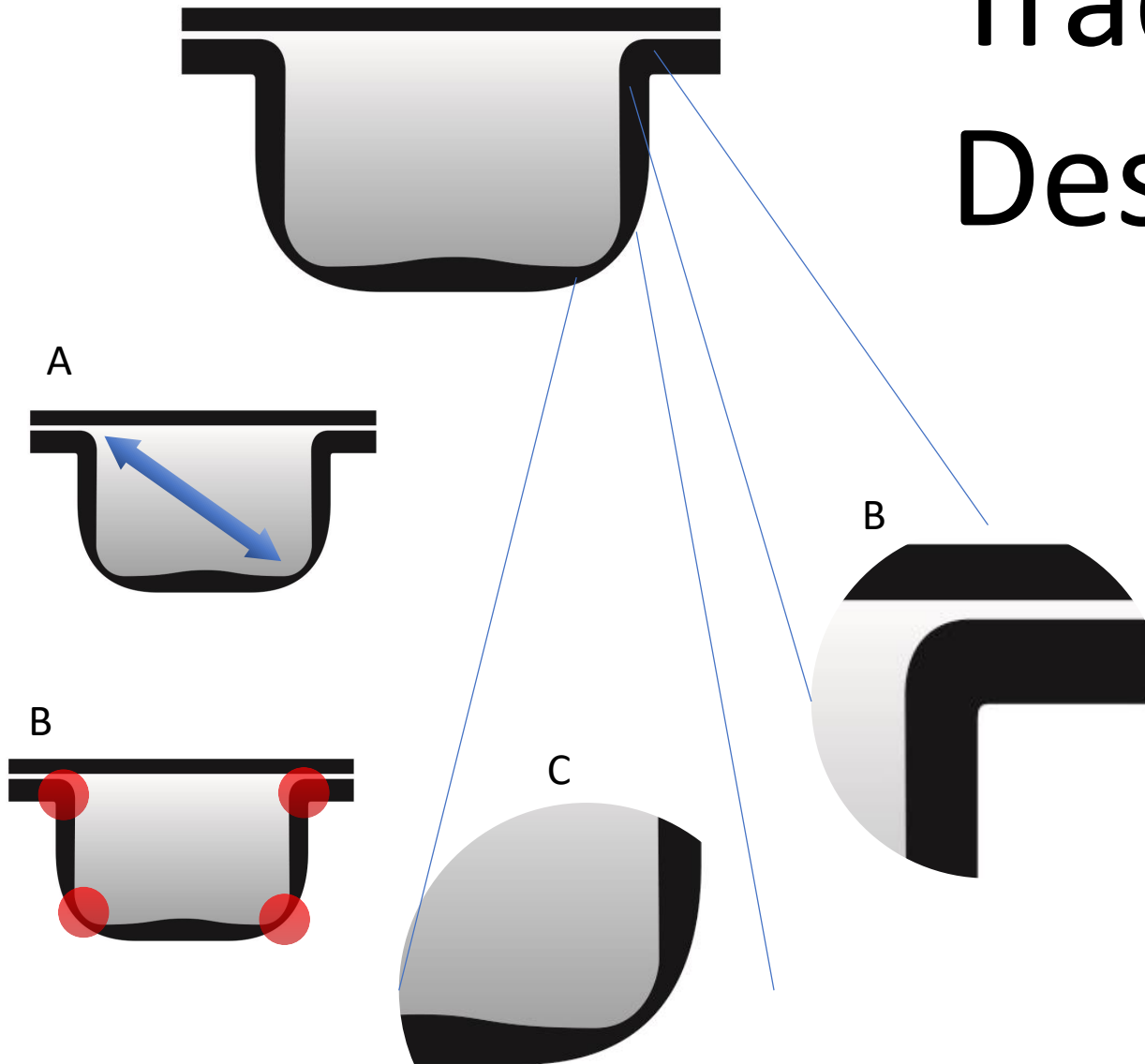
400Micron Light Blue

- Increases the pool's water temperature by up to 2-3°C
- Reduces chemical consumption
- Reduces energy consumption
- Eliminates water evaporation by 98% +
- Saves money
- Reduces debris contamination
- Reduce the pool's carbon footprint
- 3 year pro rata warranty



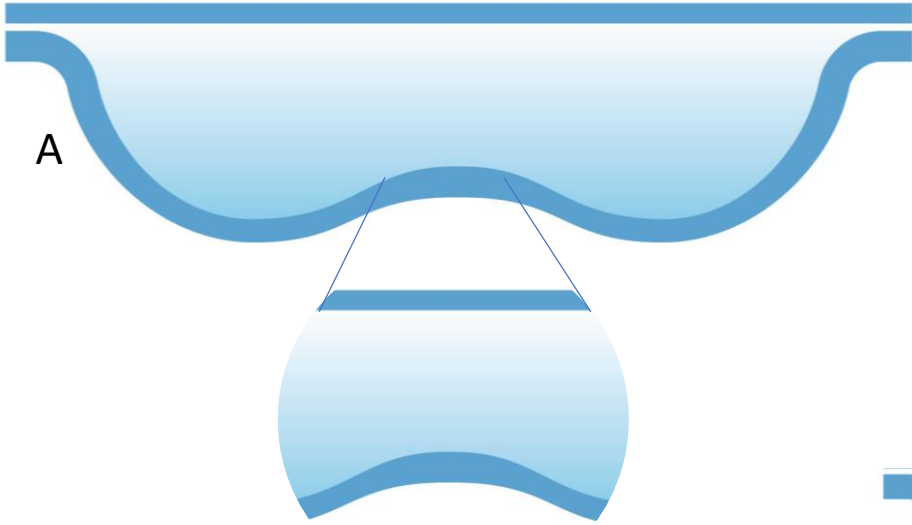
What is GeoBubble™ Technology

Traditional Bubble Design

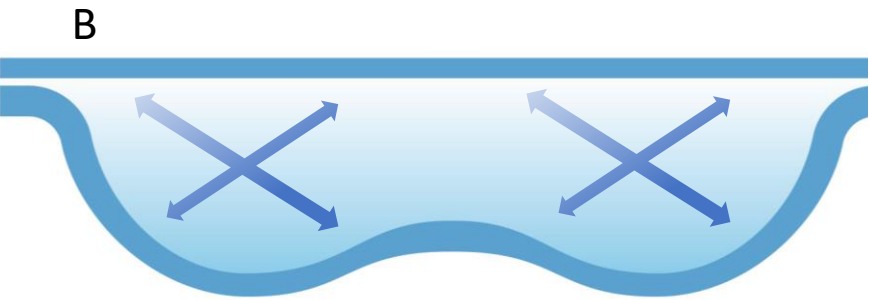


- A. Limited Room for Expansion
- B. Sharp edges place residual stress into the material.
- C. As well generating thin points as the bubble forms in the mould.

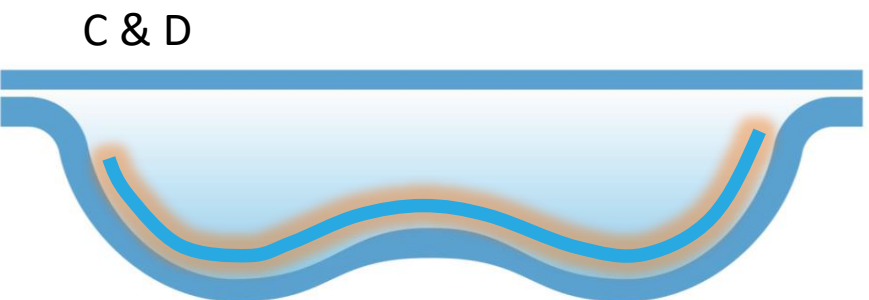
Resulting in areas prone to premature UV and Chemical decay.



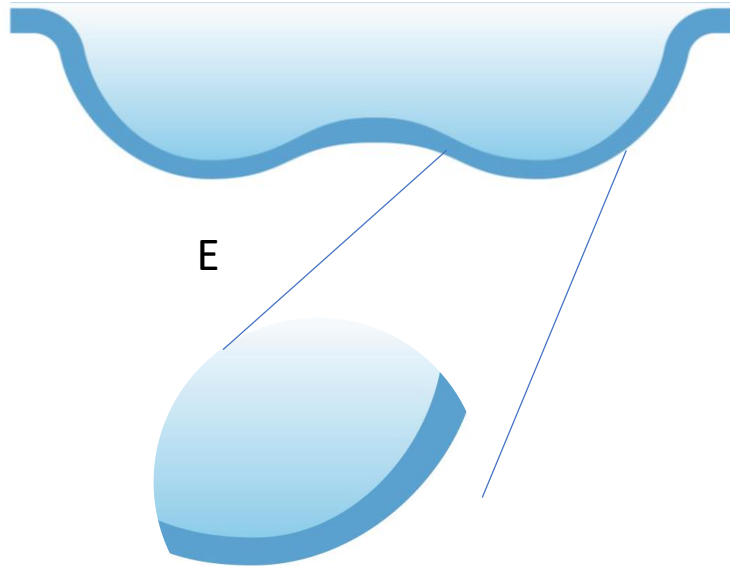
A



B



C & D



E

Key Points:

1. Stronger Shape.
2. Thicker and more even profile.
3. Last 25% longer.



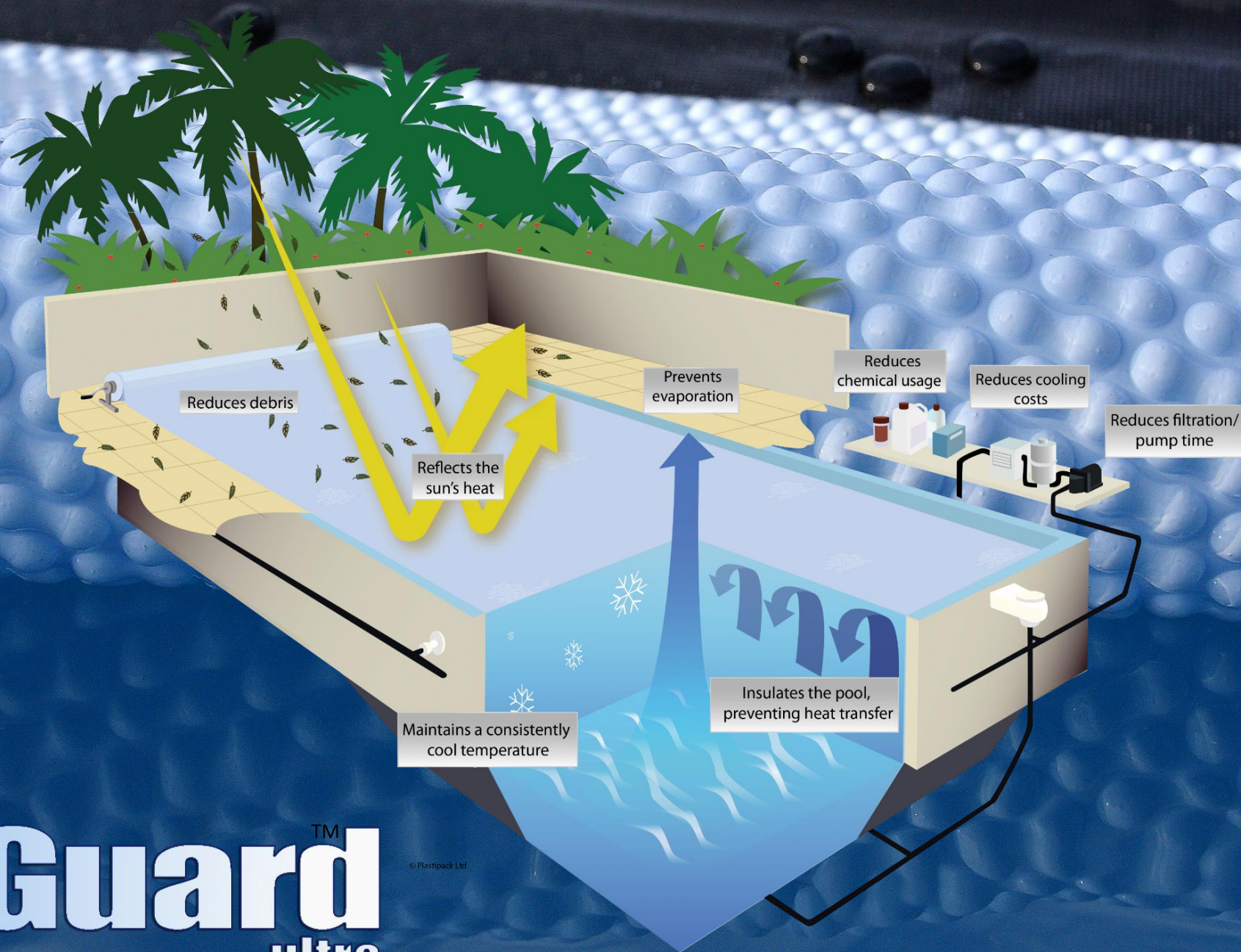
- A. Strong supporting arch that resists collapse.
- B. Large footprint to withstand air expansion.
- C. Smooth shape with uniform thickness.
- D. No sharp corners that would create high stress and thin points.
- E. 50% thicker at its thinnest points than standard bubble design.

High Performance Products

CoolGuardTM
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ultra

EnergyGuardTM
© Plastipack Ltd
Selective Transmission

Sol+GuardTM
© Plastipack Ltd



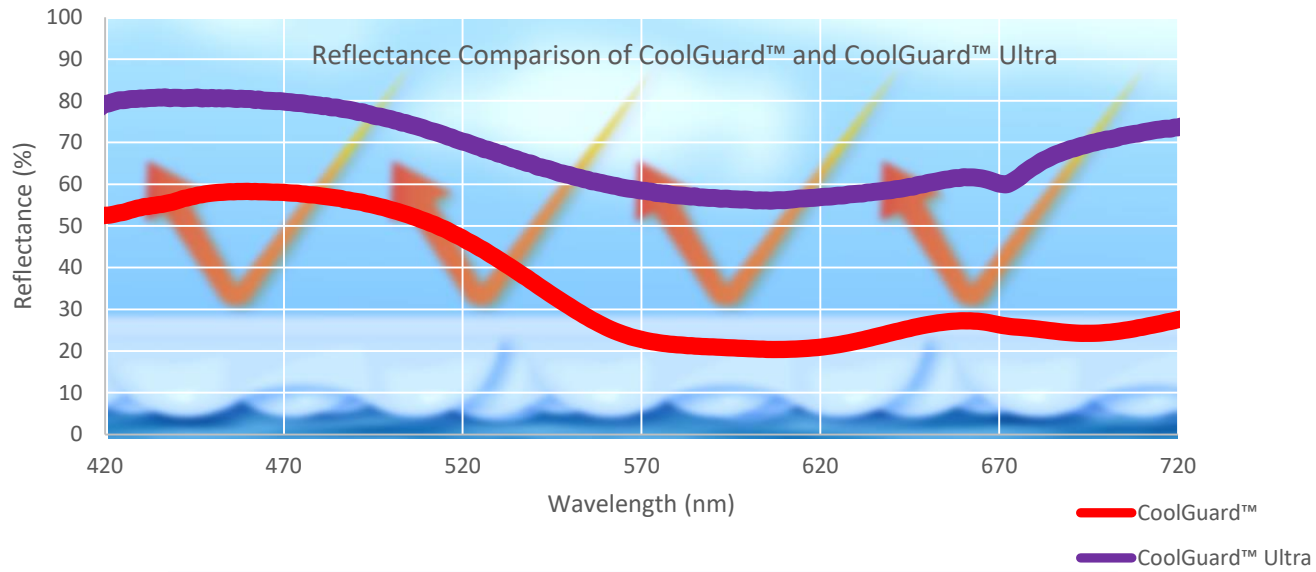
CoolGuardTM ultra

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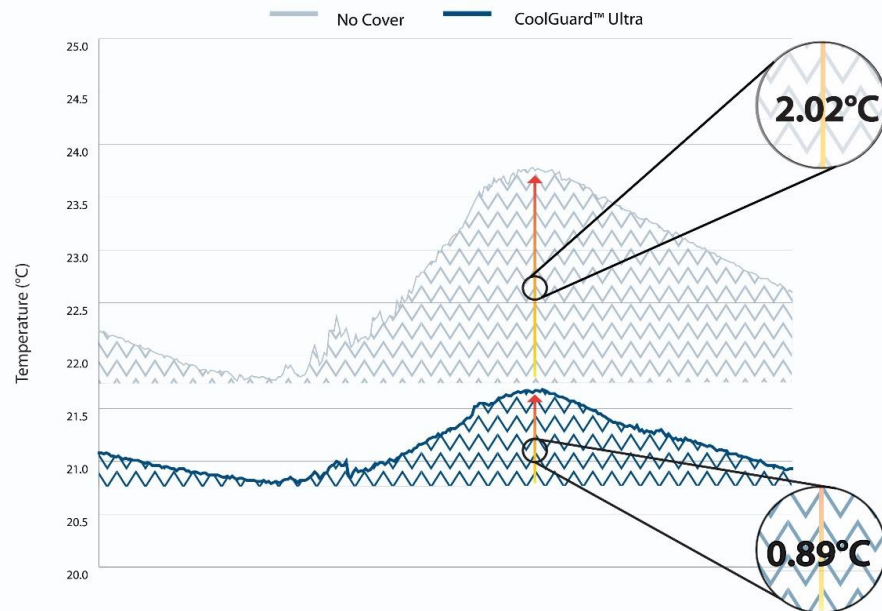
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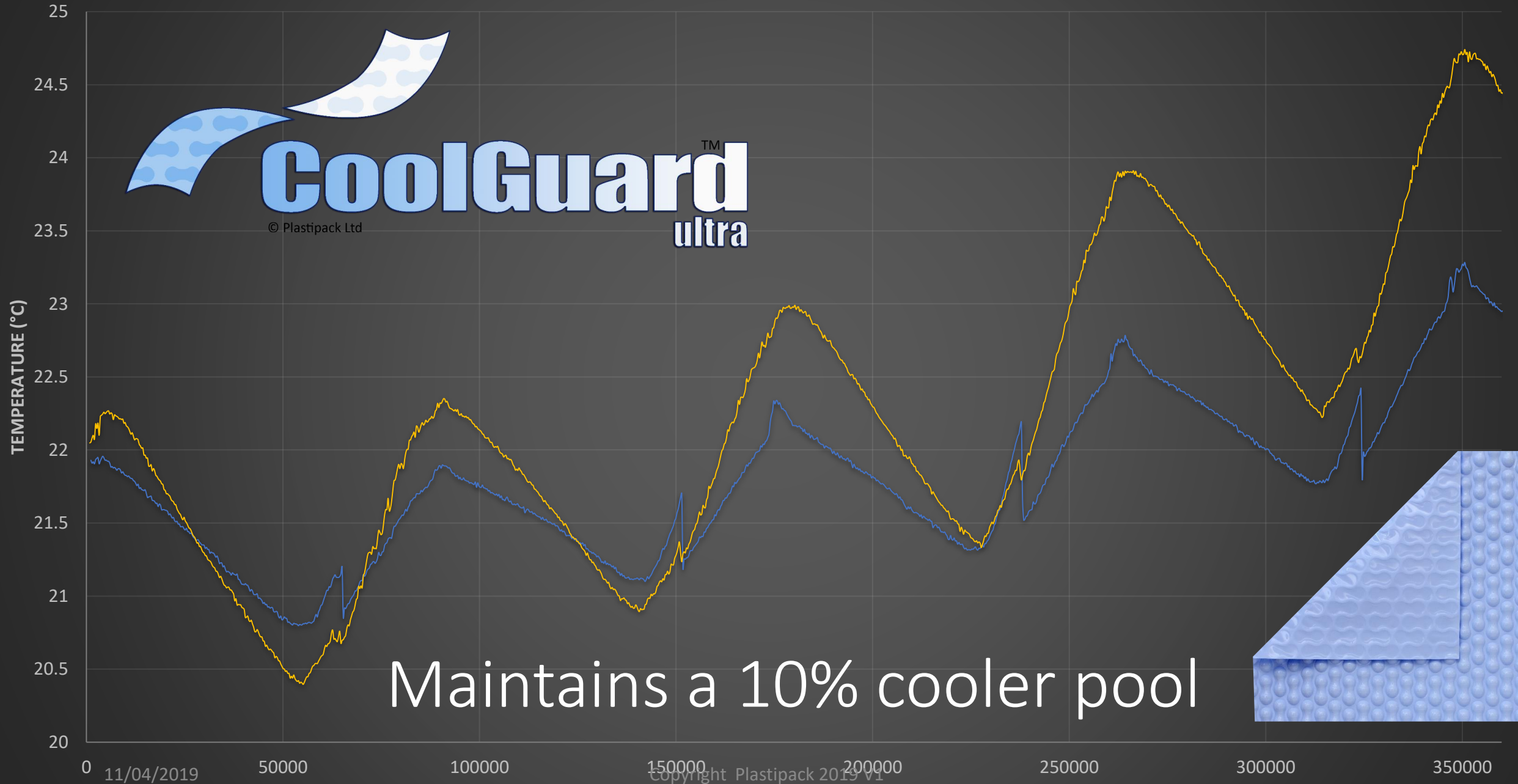


Increased reflectivity

- The new CoolGuard™ Ultra pigment formulation has been designed and tested in collaboration with the University of Surrey.
- Focusing on increasing reflection across the visible and IR spectrums.
- Minimise daily solar gains by 55%.

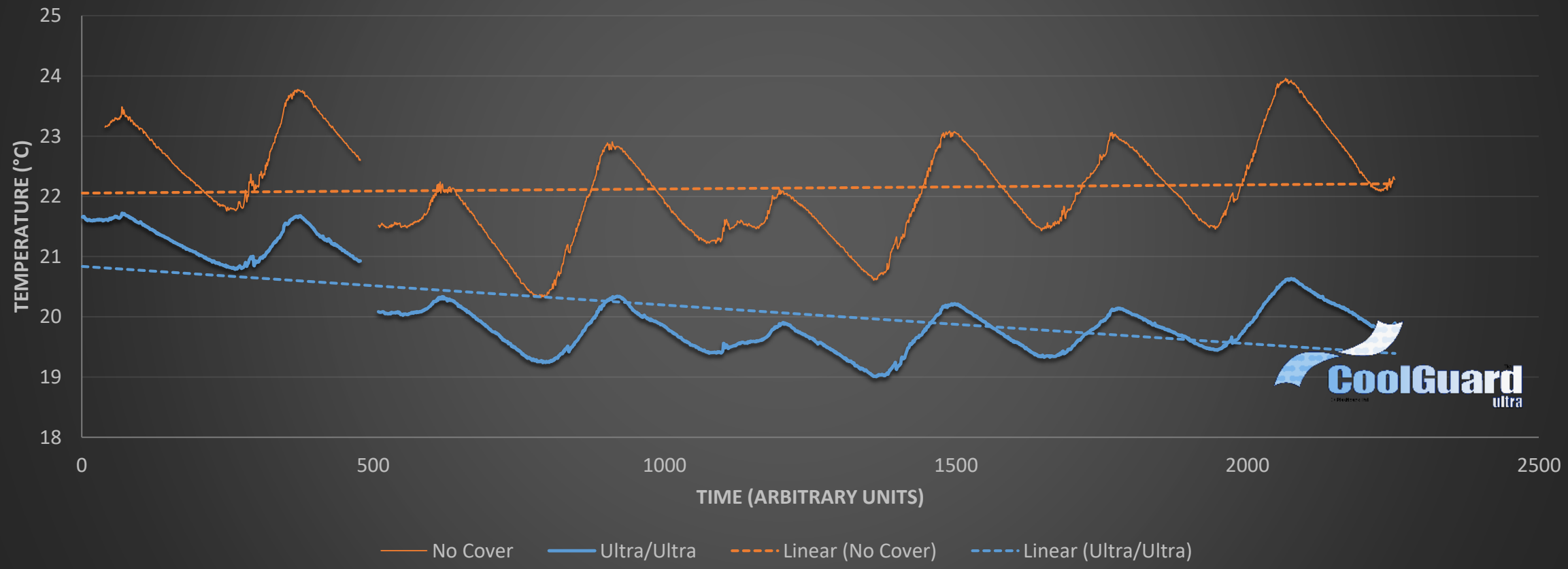


Average Pool Temperatures 22nd - 26th June 2018



Excellent temperature Control

CoolGuard™ comparison with uncovered pool over 11 days 1st June – 11th June 2018

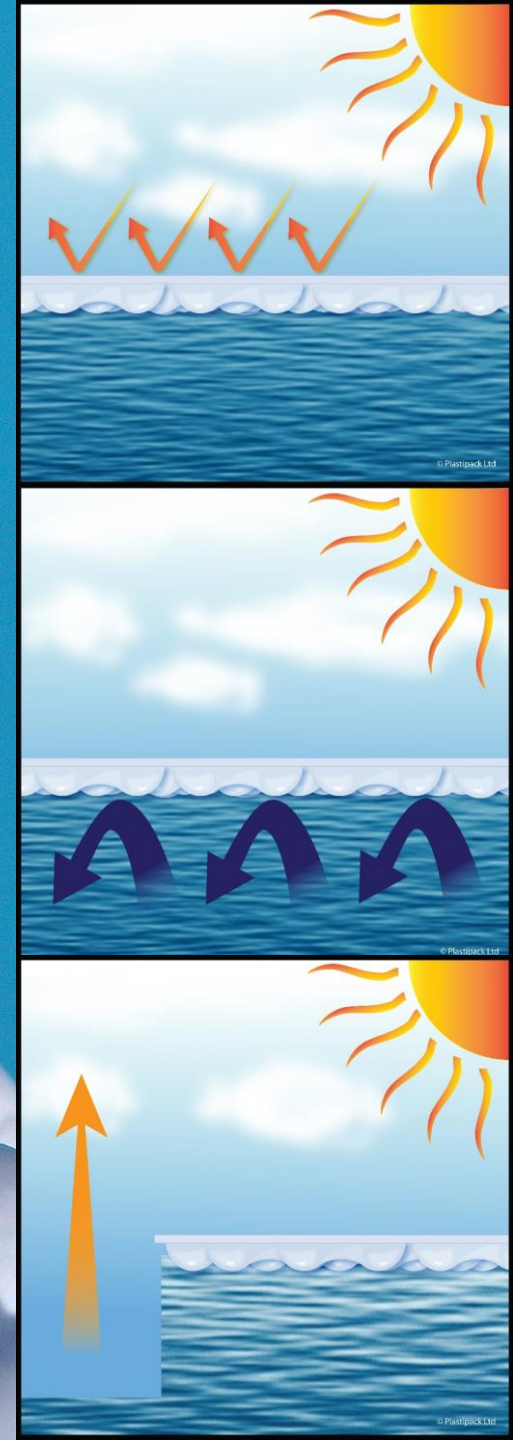


Specific Benefits:

- Minimise daily solar gains by 55%.
- Maintain a 10% cooler pool.
- Reduce energy consumption by up to 50%

General cover benefits:

- Eliminate water evaporation by 98%+.
- Reduce debris and contamination.
- Save money and reduce your carbon footprint.
- 6 year expected lifespan.
- With GeoBubble technology.

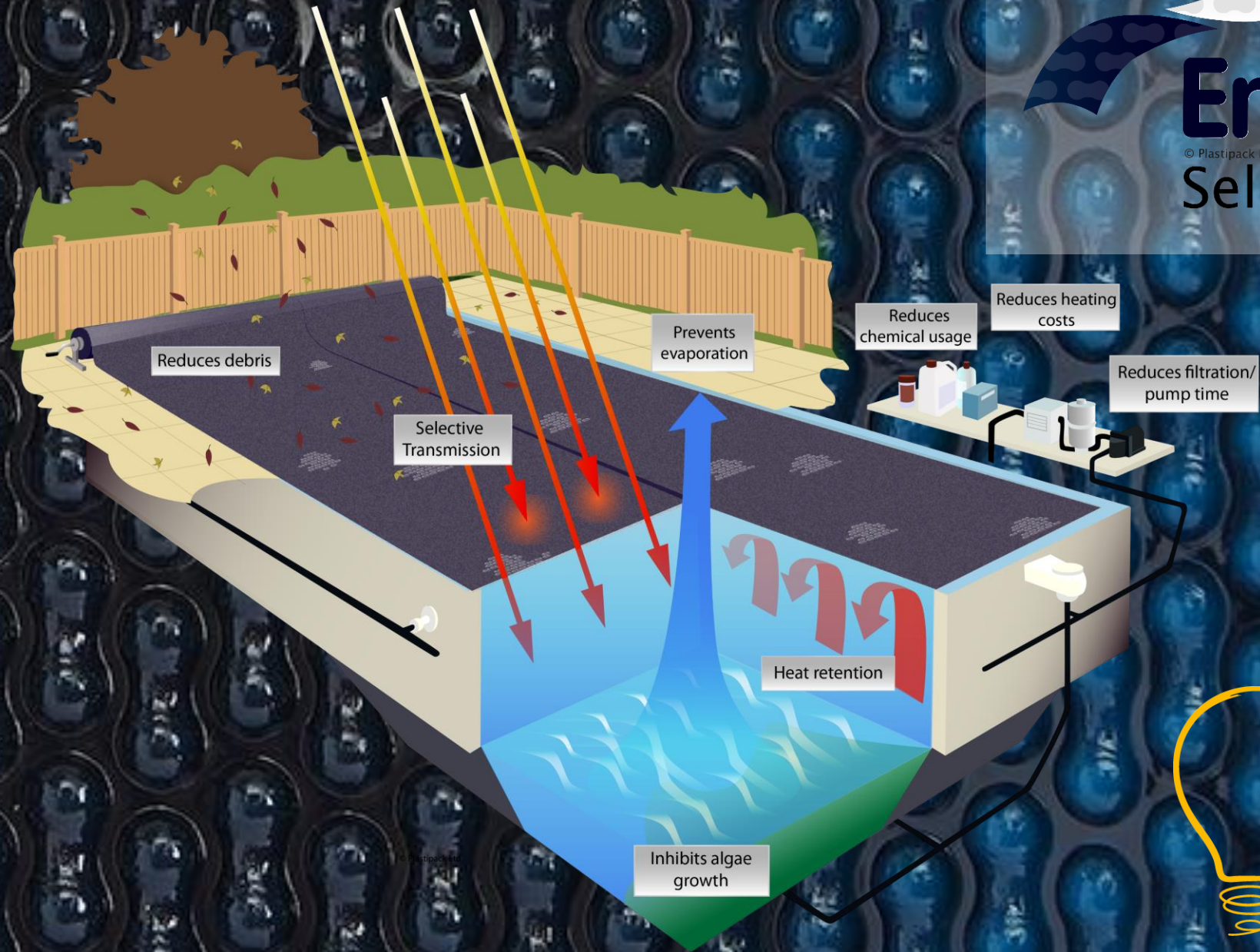




EnergyGuard™

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Selective Transmission



**Business
Innovation
Award 2018**

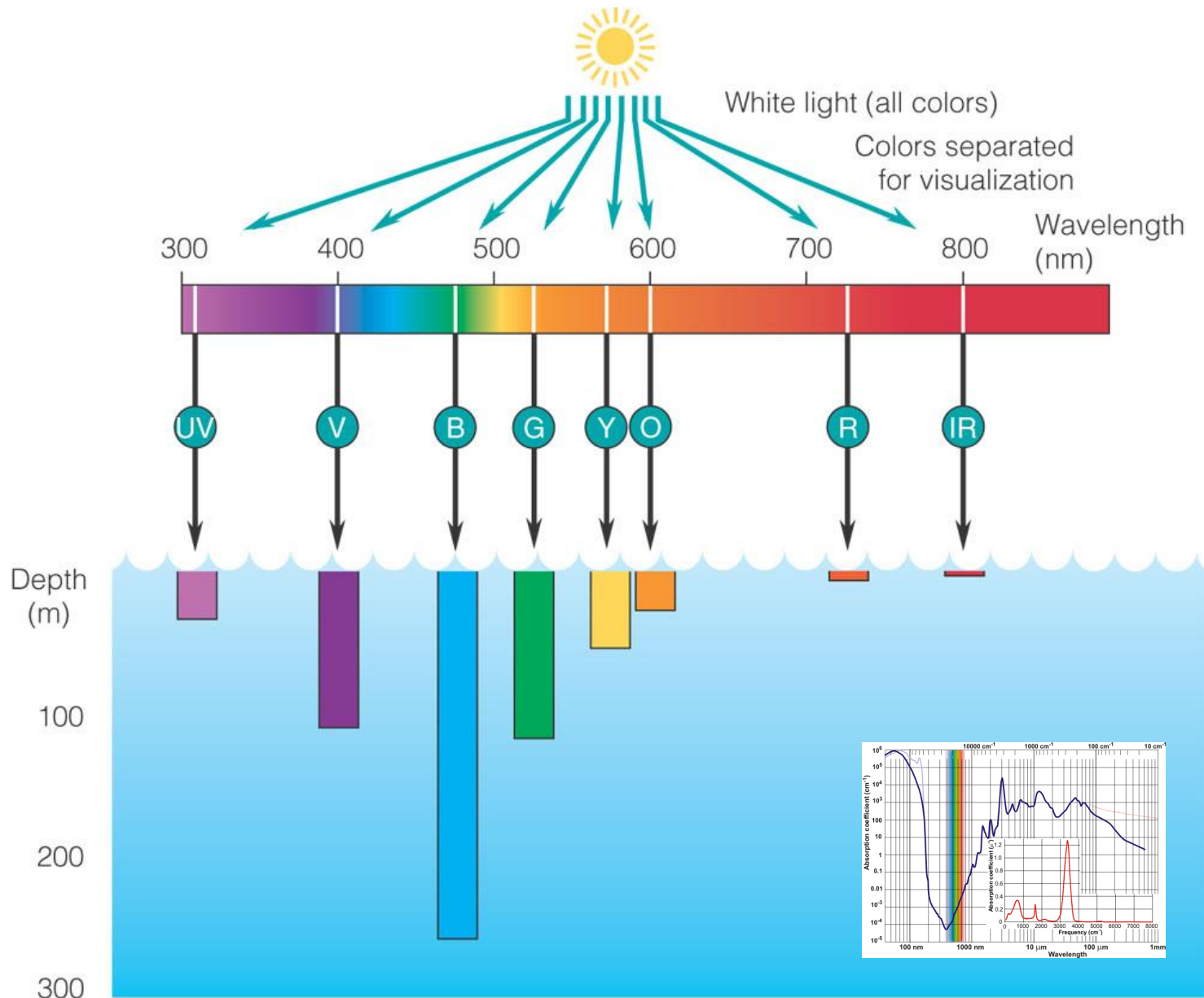
IOP Institute of Physics

What is Selective transmission?

- This refers to the pigment technology that turns the cover into a Long pass filter. Allowing for long wavelength Infrared Radiation (IR) to pass through the cover to heat the water directly.
- The Pigment technology absorbs short wavelengths in the visible spectrum which algae use for Photosynthesis.
- This absorbed energy is then passed to the pools surface.
- It is this efficient and patented feature of EnergyGuard™ that was awarded the Business Innovation award by the IOP (Institute of Physics).

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- Water absorbs visible light poorly. Passing little heat to the pool in the few meters available.
- However these wavelengths are used by algae for photosynthesis.
- The Infrared spectrum is absorbed very efficiently.
- By absorbing the visible light into the material's bubble layer, the energy can be transferred to the pool.



- Best of both worlds:
- The unique features of the EnergyGuardTM provide an algae inhibiting cover with a performance tantamount to a clear cover.
- This provides the end user with a warmer pool, using less chemicals and reduced maintenance time.

Figure 1. Average pool temperatures
09/07/2013 to 10/07/2013

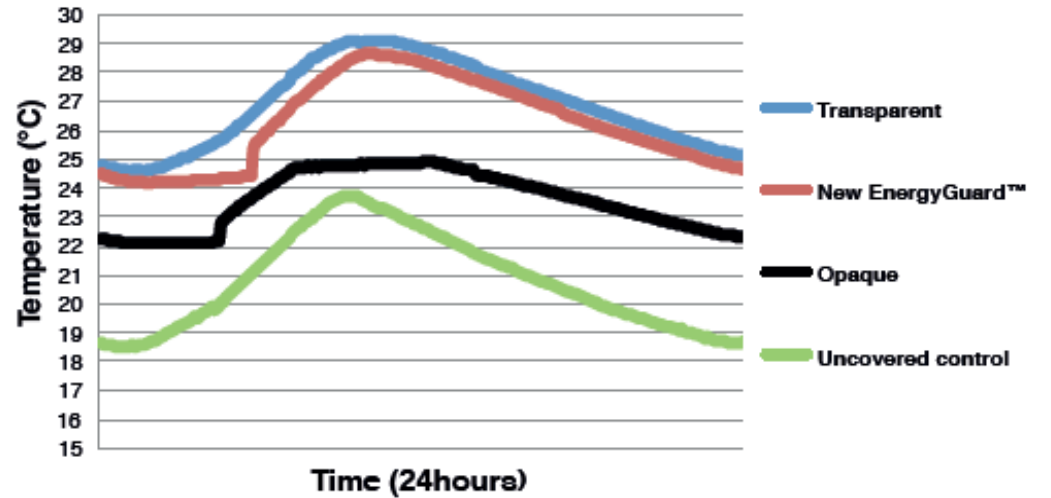
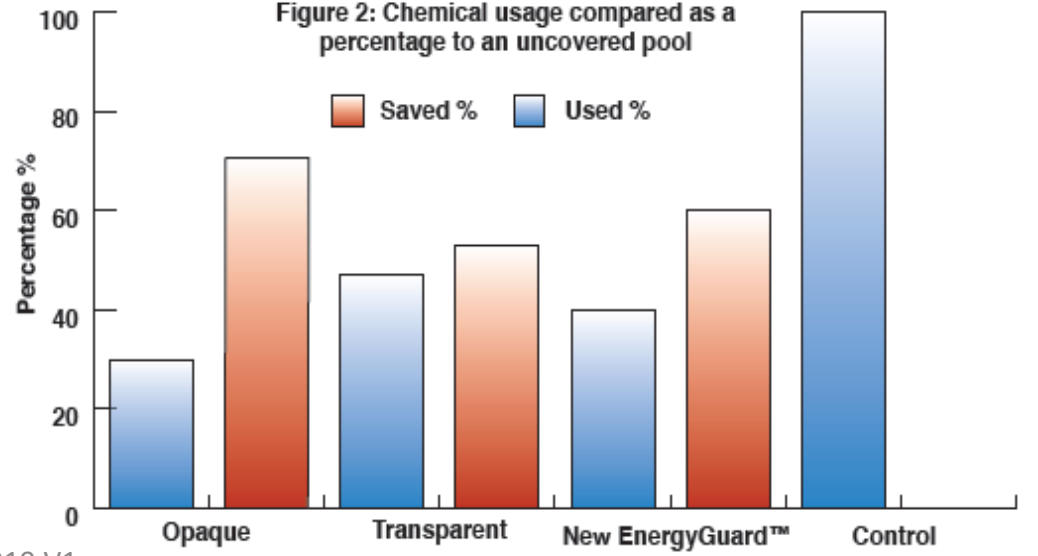
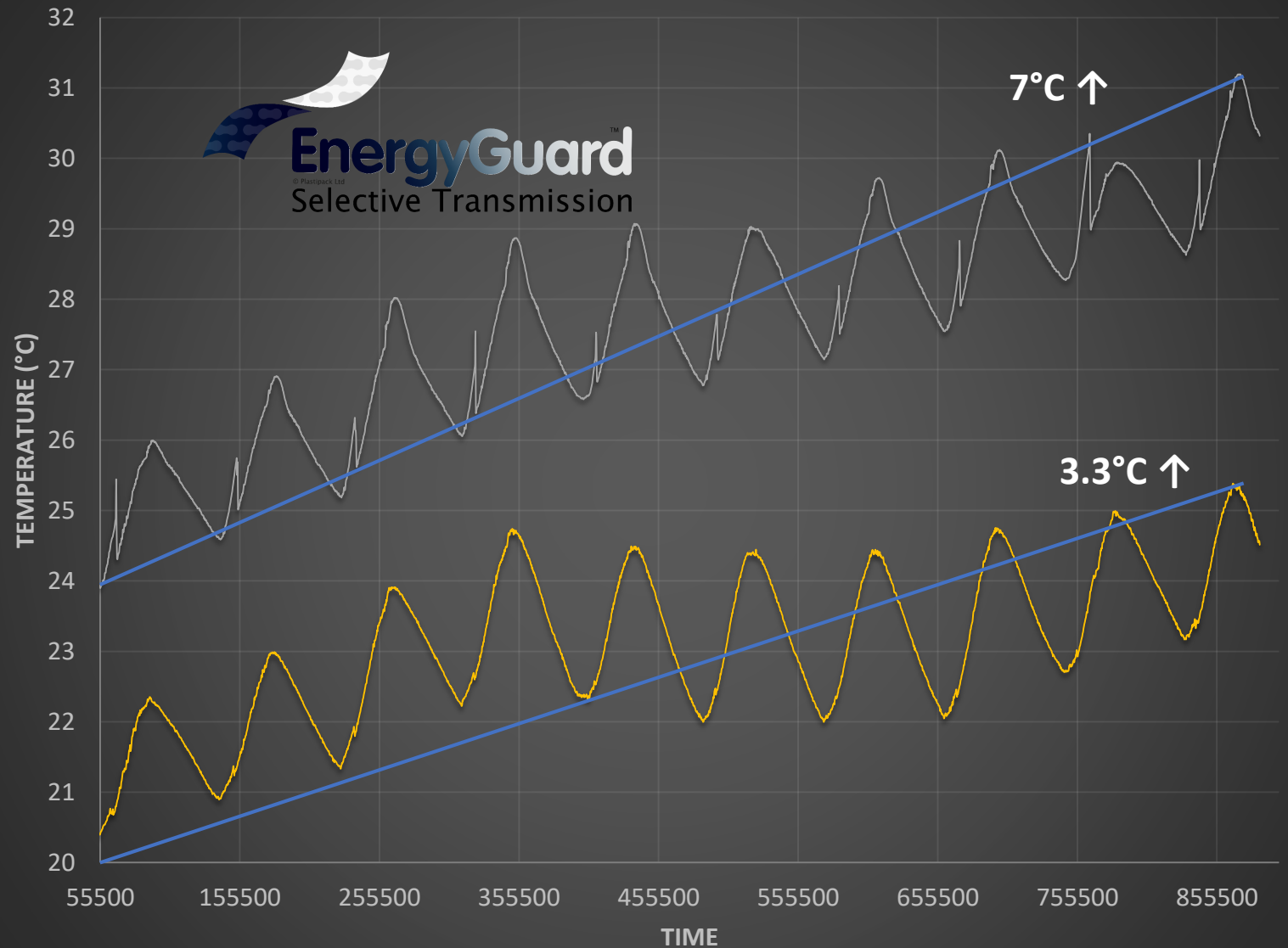


Figure 2: Chemical usage compared as a percentage to an uncovered pool



- EnergyGuard™ is a solar heating solution.
- The graph shows the EnergyGuard™ compared to a uncovered pool during the heat wave in the UK 2018.
- The test clearly demonstrates the cover's ability to pass energy into the pool and retain it.
- In usual conditions, EnergyGuard™ can expect a increase of up to 5°C compared to a uncovered pool in the UK.

Guard Testing 22nd June - 3rd July 2018





EnergyGuard™

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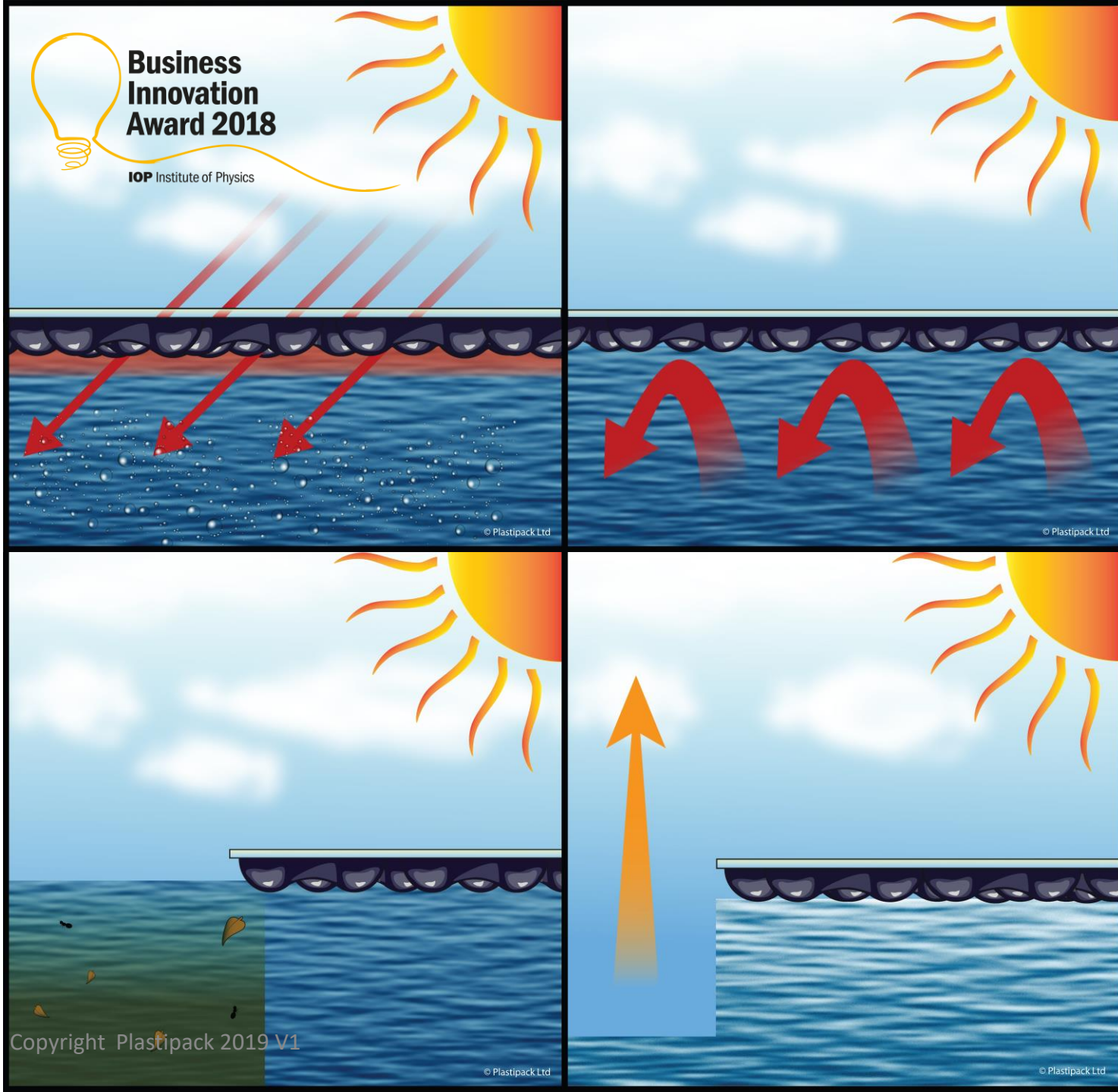
Selective Transmission

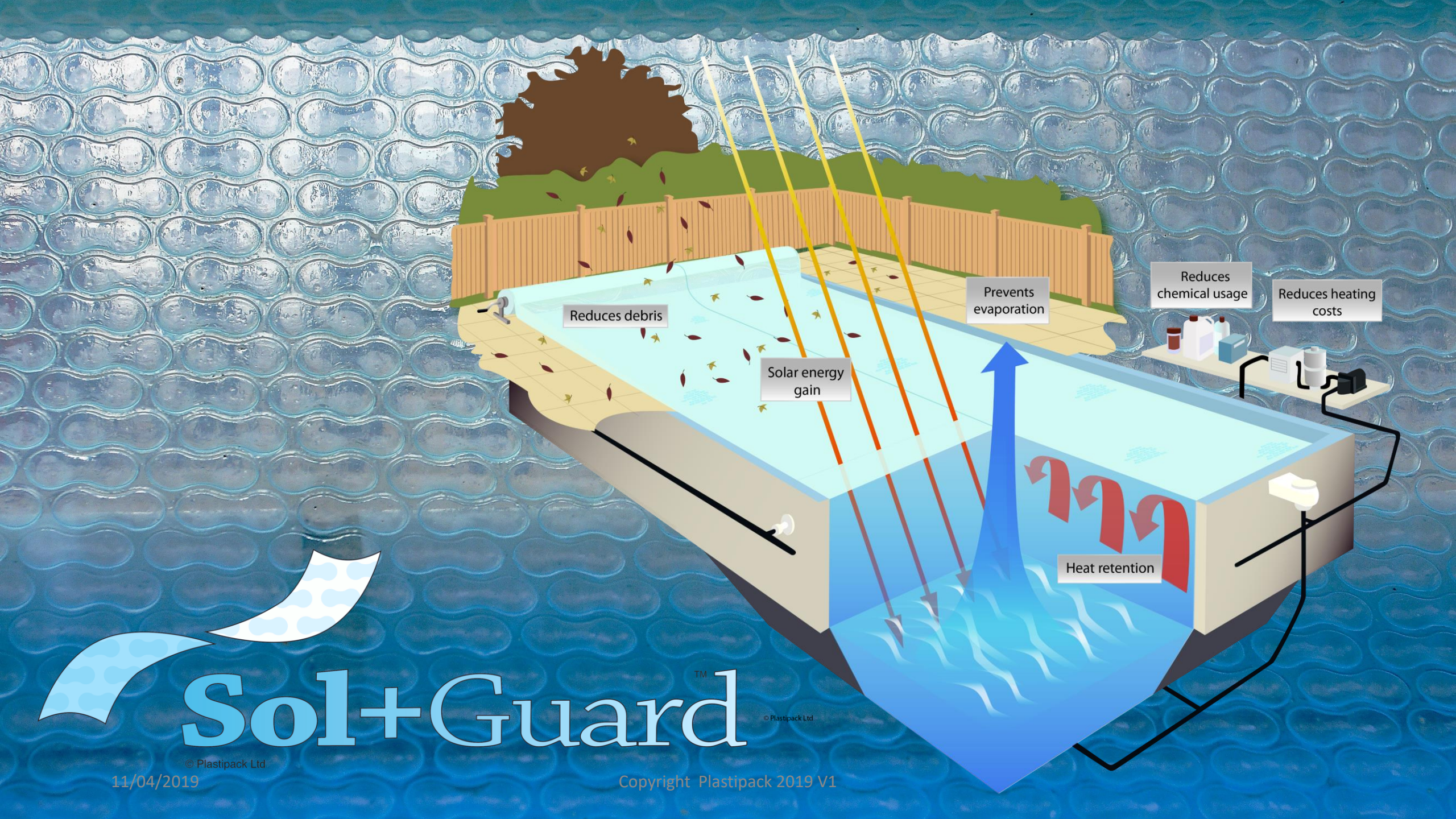
EnergyGuard™ specific benefits:

- ∞ Increases water temperature by up to 7°C
- ∞ Inhibits algae growth
- ∞ Reduces filtration times by up to 50%
- ∞ Reduces chemical consumption by up to 60%
- ∞ Reduces energy consumption by up to 60%
- ∞ Reduces time spent on maintenance
- ∞ 6 year pro rata manufacturer's warranty
- ∞ Can be used as a winter pool cover

General cover benefits:

- ∞ Available with GeoBubble™ technology
- ∞ Eliminates water evaporation by 98% +
- ∞ Reduces debris contamination
- ∞ Reduces the pool's carbon footprint





Reduces debris

Solar energy gain

Prevents evaporation

Reduces chemical usage

Reduces heating costs

Heat retention



Sol+Guard™

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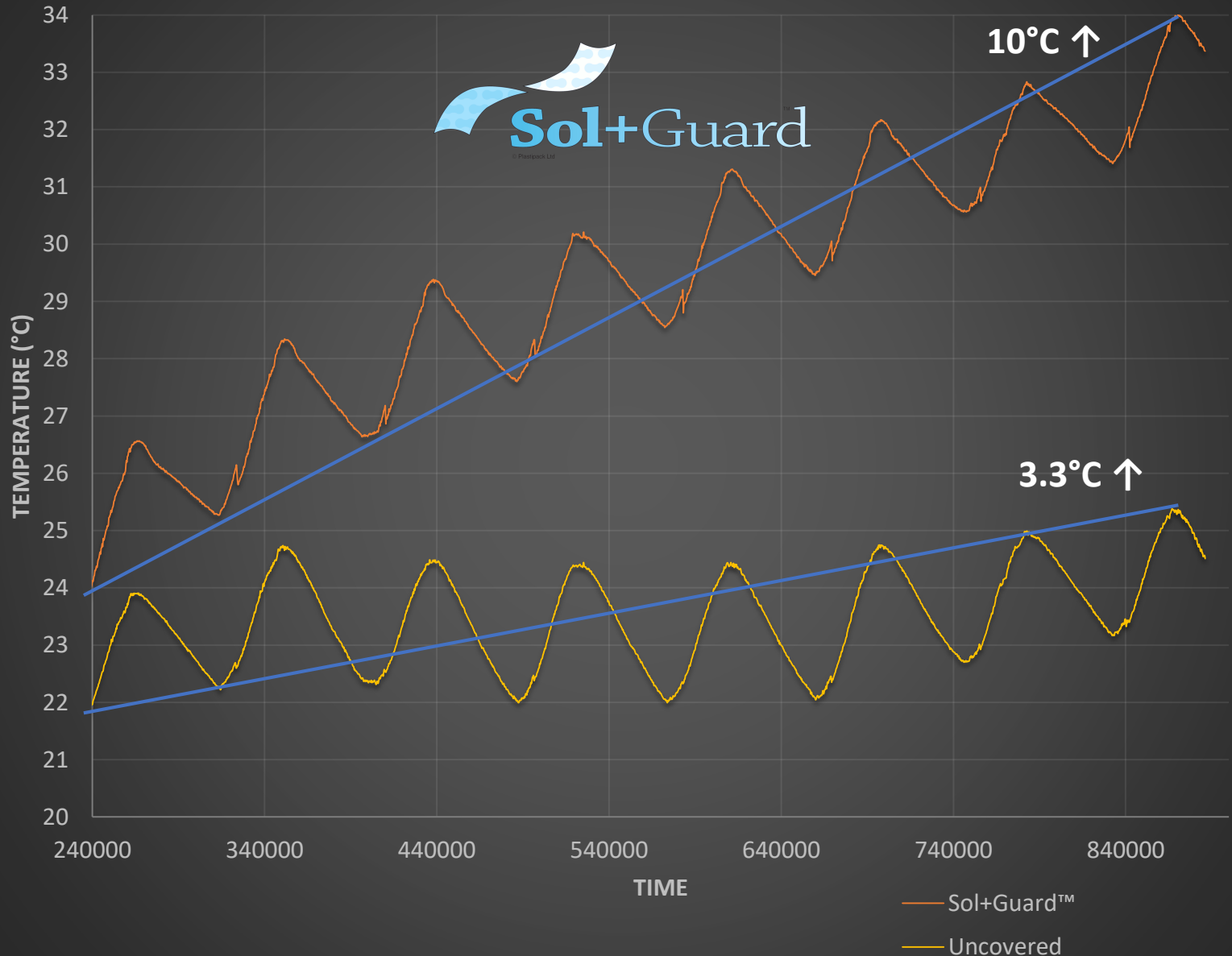
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- Sol+Guard™ is a solar heating solution.
- The graph shows Sol+Guard™ compared to a uncovered pool during the heat wave in the UK 2018.
- The test clearly demonstrates the cover's ability to pass energy into the pool and retain it.
- In usual conditions Sol+Guard™ can expect a increase of up to 6°C compared to a uncovered pool in the UK.

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Sol+Guard™ Testing 22nd June - 3rd July 2018



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Sol+Guard™ specific benefits:

- Increases water temperature by up to 6°C
- Reduces chemical consumption by up to 40%
- Reduces energy consumption by up to 70%
- Reduces time spent on maintenance
- 6 year pro rata manufacturer's warranty

General cover benefits:

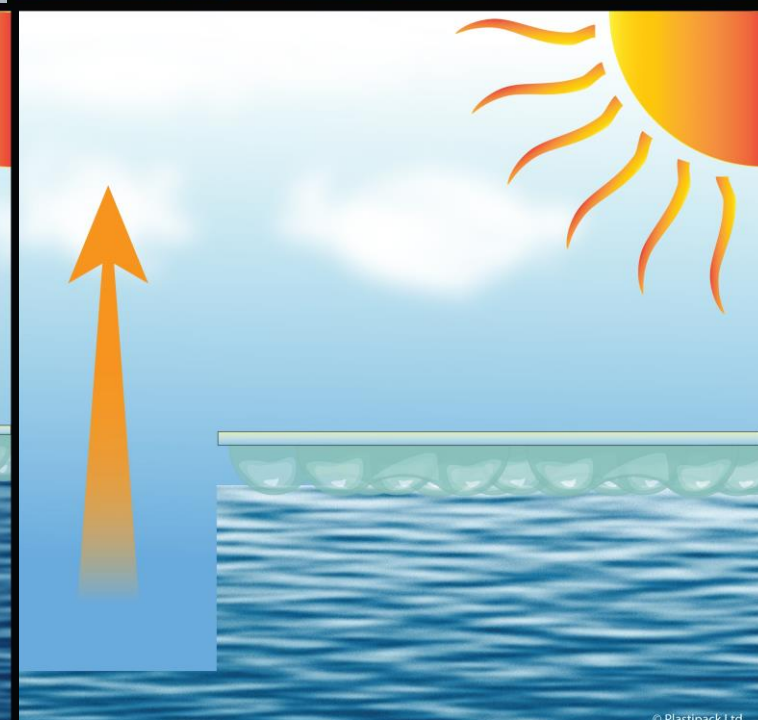
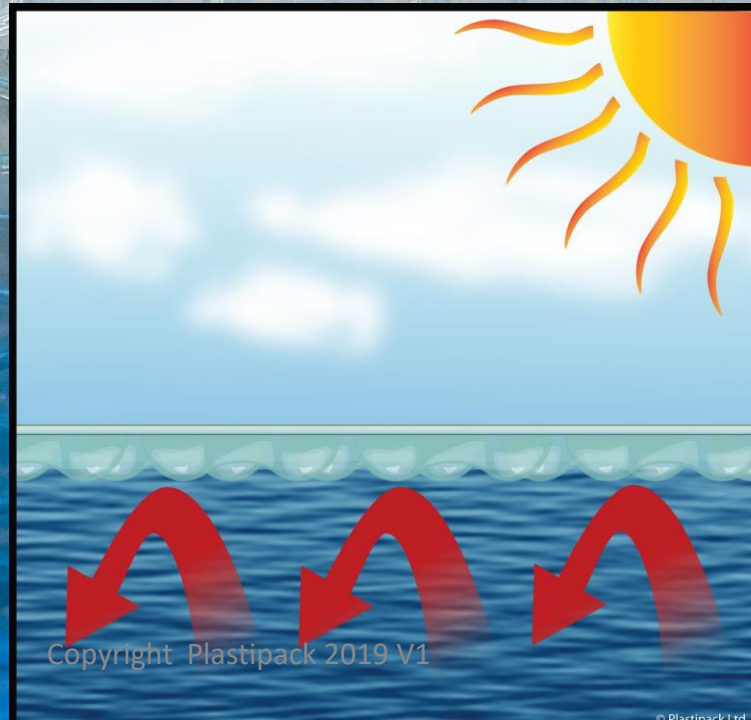
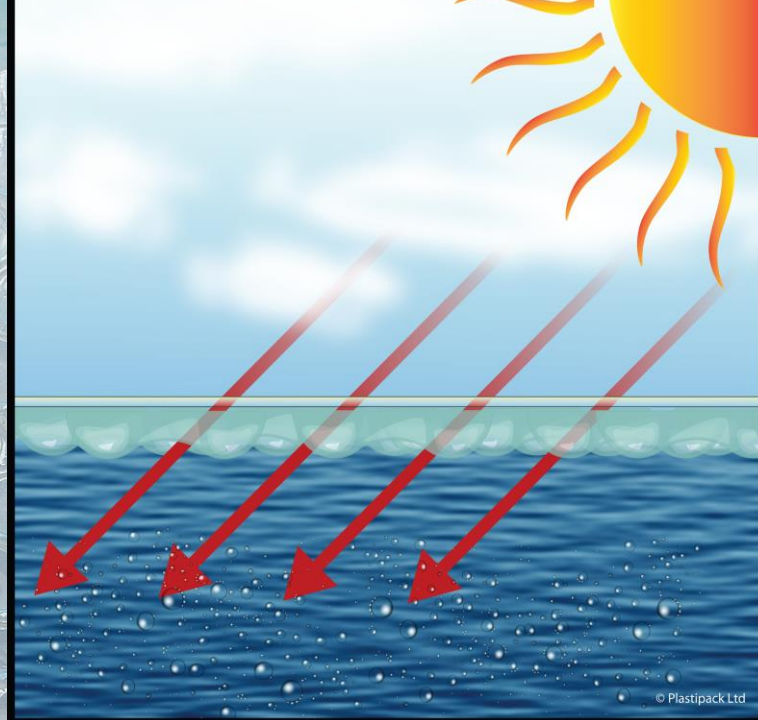
- Available with GeoBubble™ technology
- Eliminates water evaporation by 98% +
- Reduces debris contamination
- Reduces the pool's carbon footprint

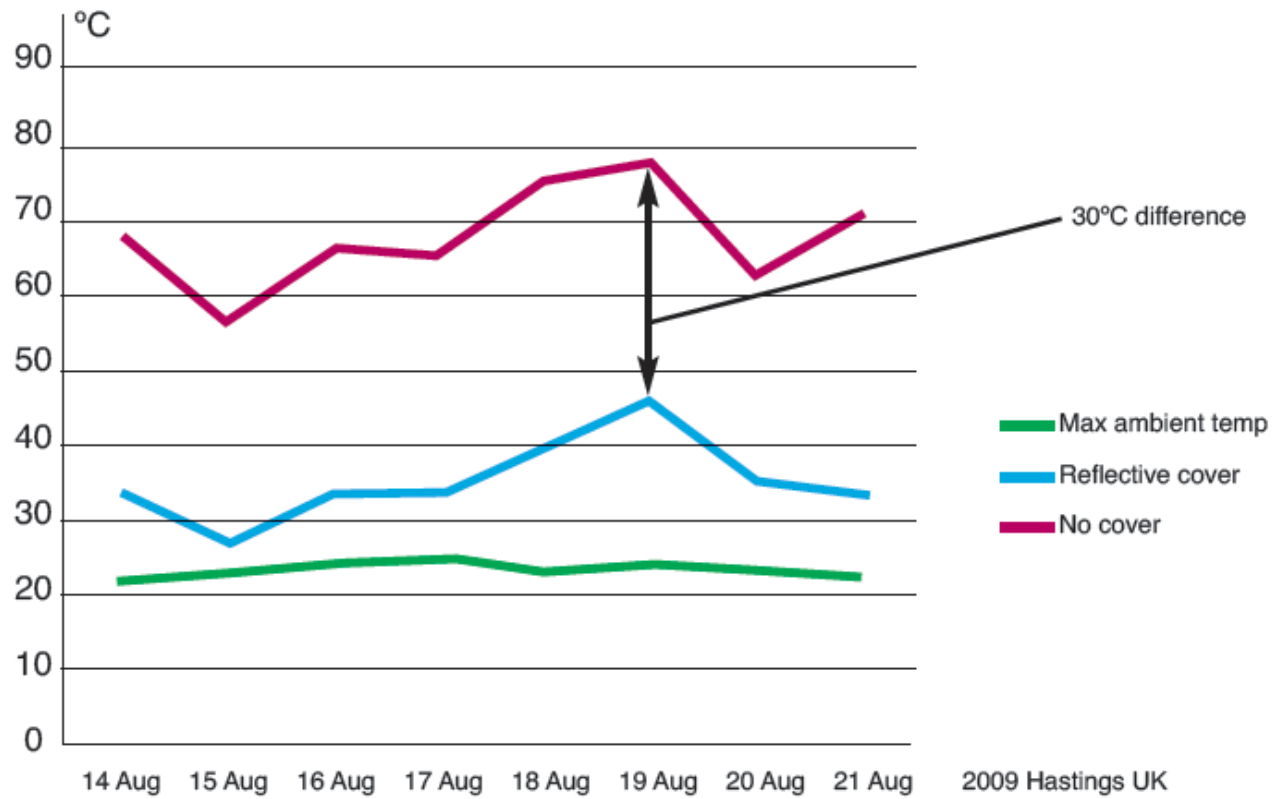


Sol+Guard™

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Permanent damage will occur to the pool cover above 90°C

Reflective Sheeting

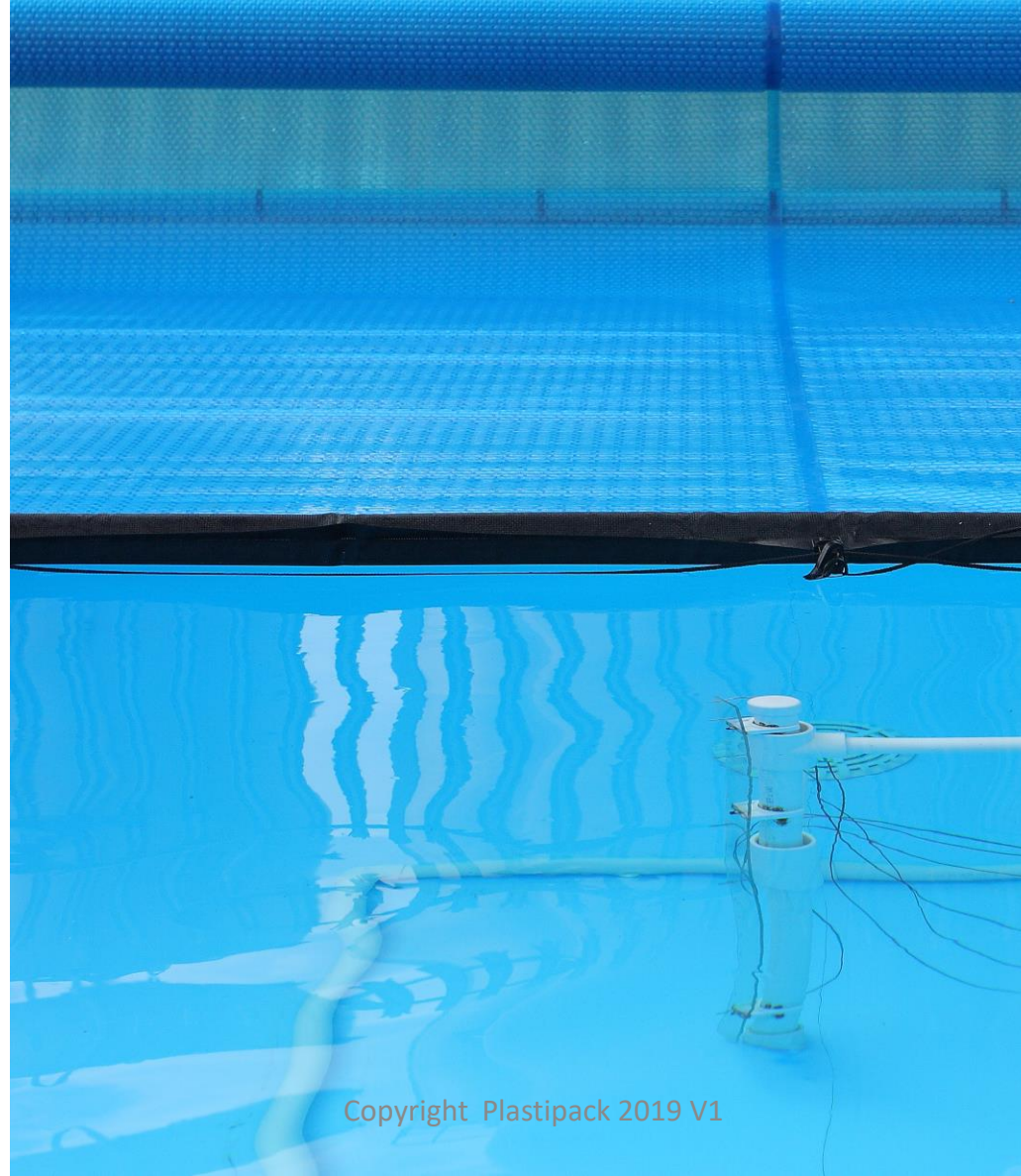
Protecting the cover.



- By protecting the cover when off the pool the reflective sheet prevents heat building between the layers of material.
- As it cools the cover will set to the shape of the reel system.
- In extreme cases covers have been known to weld their layers together.

Our Testing Facility and Development Work

- Our Testing facility has been designed to monitor our materials performance.
- Consisting of five 8x4m pools 1.2m deep. Two are insulated to comply with the Part L insulation value.
- The monitoring system has been designed to ensure accurate and adaptable monitoring variables.
- It was developed in collaboration with the University of Surrey's Advance technology Institute.



Performance guidance chart.

Product	Heating the pool	Keeping the pool cool	Algae Inhibition	Evaporation Control	Chemical reduction	Filtration reduction	Heating reduction	Heat retention	Durability	Winter cover	Expected life span
CoolGuard™ Ultra		○○○○	●	●●●●	●●			●●●●	●●●		●●●●
EnergyGuard™ ST	●●●●		●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●	○○○○	●●●●
Sol+Guard™	●●●●			●●●●	●		●●●●	●●●●	●●●		●●●●
Polyweave 400μ	●		●	●●●●	●		●●	●●●●	●●●●		●●●
Solarweave 400μ	●●		●	●●●●	●		●●	●●●●	●●●●		●●●
Standard Light Blue 400μ	●●		●	●●●●	●		●●	●●●●	●●		●●

- From the chart we can see that if you wish to provide the maximum temperature gains/ Heating cost reductions. The [Sol+Guard™](#) would be the ideal choice.
- However should you wish to also prevent algae growth and reduce chemical demand, while increasing pool temperatures the [EnergyGuard ST](#) would be a more appropriate choice.
- If your requirement is to maintain a comfortable pool temperature in hot climates the [CoolGuard™](#) would be the optimum cover.
- We can also see that if you are concerned about durability for commercial application for example, the [Solarweave or Polyweave](#) would be a appropriate choice for your consideration.

Key	
High	●●●●
Good	●●●
Moderate	●●
Some	●
Not applicable	

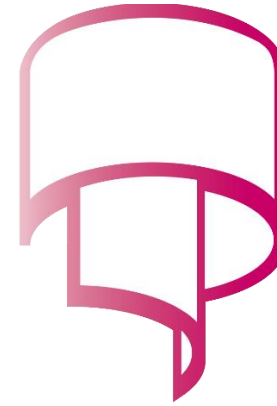
Thank you

Useful contacts:

Marketing: sarah.duggan@plastipack.co.uk
Technical: tim.fielder@plastipack.co.uk
Sales: stephen.daly@plastipack.co.uk

Useful information available on our [downloads page](#):

- Who Killed the cover (issues guide)
- Use and care guide
- Selecting the right material
- What is UV light
- Specifications
- Brochures
- Performance case studies appreciated



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