

5 important things to consider when selecting an underwater LED light for your pool or spa.

# Selecting the right LED light for you.

Proudly produced by **SPA ELECTRICS** to assist pool owners select the best LED lighting products for their pools & spas.

## Why use an LED light?

LEDs are replacing traditional lighting in many aspects of our lives because of their superior energy efficiency, reliability, brightness and colour range.

However some LEDs are better than others and identifying the difference can be difficult.

This guide is designed to give you the information, tips and important criteria for selecting the correct LED for your underwater application.

## Cool LEDs are efficient & reliable

The aim of any superior LED light design is to keep the LED and electronics at their ideal operating temperature so they can perform with optimum efficiency, reliability and life span. High output LEDs are prone to premature failure if they are not cooled properly.

A quality LED light should include a heat sink to cool the LED module. Advanced systems will utilise technology such as a ceramic engine to further improve cooling performance.

## Consistent colour is important

The colour output from all mass-produced LEDs varies by up to 10-15% from the specified 'target' colour resulting in visibly different shades of light.

As a result LEDs are graded and priced according to how close they are to their target colour (wavelength). The highest grade being so close to 'target' that any variation is not visible.

Variation is most obvious when multiple lights are used in close proximity (eg. pool) so it is important to only use lights with high grade LEDs to ensure every light looks the same colour and intensity.

## Brightness vs. Energy consumption

When choosing halogen lights, a higher wattage has always equalled a brighter light, and the only way to produce more light was to use more power.

However one of the key benefits of a high-quality LED is the ability to deliver **MORE LIGHT** while using **LESS POWER**. As technology improves LEDs are becoming brighter while their energy consumption remains the same or even reduces! Therefore it is possible for an advanced 10W LED light to have a noticeably higher light output than a less advanced 20W LED light.

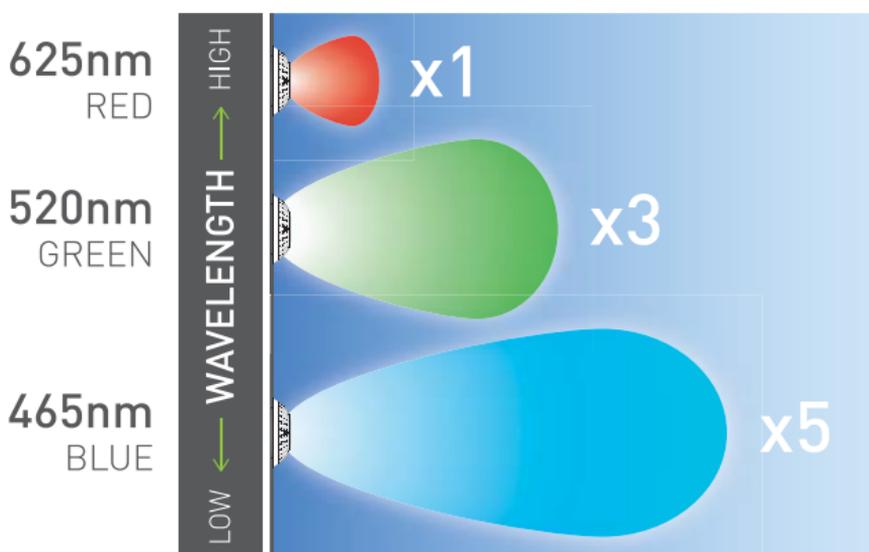
The technical term for this is **Luminous Efficacy** - how many lumens of light are produced for every Watt of power used.

A common mistake is selecting an LED light based on Lumens or Watts alone. LED light selection should be based on **Luminous Efficacy** to ensure that you get both a bright **AND** efficient LED light for your application.

## Light looks different under water

While Lumens are a good indication of how bright your LED light is out of water, lights placed underwater behave very differently.

Each colour light has a specific wavelength, and water absorbs each wavelength at a different rate. This effects how bright a light looks to the human eye. For instance, blue LEDs can appear up to 5 times brighter (and illuminate larger areas) underwater than red LEDs - even though their rated 'lumens output' may be identical.



Relative illuminated areas of different coloured light of equal output

Therefore you must consider both colour **AND** output, as higher wavelength colours (eg. red) will require a higher output to achieve the same result as a lower wavelength colour.

## What if something goes wrong?

Whilst properly designed and cooled LEDs will operate for many years, they will deteriorate over time and eventually require replacement.

Most underwater lights are very difficult to service because they are permanently sealed during manufacture. Replacing faulty components is virtually impossible in these products – the only option to replace the entire light; a costly solution if it's warranty has expired.

Make sure you select an underwater light that can be fully serviced to avoid unnecessary repairs and replacement costs in the future.

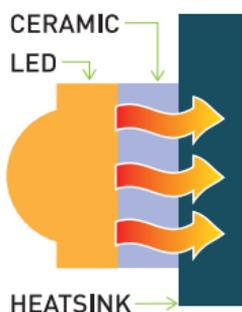
# WHY CHOOSE SPA ELECTRICS?

## Cool LEDs are efficient & reliable

The following features keep Spa Electrics LED lights working at an optimum temperature:

### Ceramic Light Engine

Most LEDs are mounted via a multi-layer structure of plastic, aluminium, glue and then attached to a heat sink. Each layer joint slows the rate at which heat can escape reducing LED



performance. Our Ceramic Light Engine works by attaching the LED to a ceramic plate directly mounted to the heat sink. The highly-efficient ceramic material & fewer layers allows for a higher flow rate of heat away from the LED.

### Convective heat sinking

Our lights include advanced heat sinks (including DUOSINK®), which are chemically protected and designed to efficiently draw heat away from LED and electronics, dispersing it into the surrounding pool water.

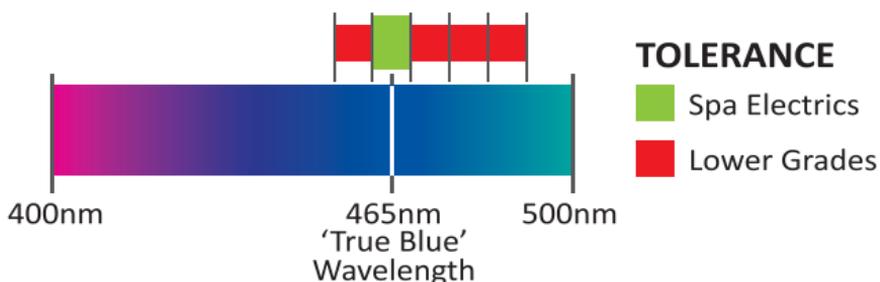


CONVECTIVE HEATSINK ACTION OF SURROUNDING WATER

This allows our LED modules to produce more light at the ideal operating temperature, ensuring optimum efficiency and life span.

## Consistent colour is important

Our lights only use the highest grades of LEDs with a strict tolerance of 5-10nm from target wavelength. This ensures every one of our lights produce colours that are visually identical with perfect colour blending.



### RELATIVE COLOUR VARIATION RANGES

## Brightness vs. Energy consumption

Our Ceramic light engines utilise advanced LEDs with a luminous efficacy up to 45lm/w. This makes them one of the most efficient 12 volt coloured LEDs available.

## Light looks different under water

Spa Electrics works with our LED manufacturer to specify the optimal colour wavelengths for the underwater environment. By allowing for the effects of water attenuation and interior colour absorption, we produce the brightest and most efficient coloured lights possible for your pool. For example, by using an accurate 'true blue' wavelength (465Nm) we can illuminate an underwater area at least equal to, if not better than our competitors while using less power.

## What if something goes wrong?

Our lights can be fully disassembled to allow servicing by Spa Electrics of internal electronics down to individual components. This means that all of our lights can be repaired rather than fully replaced.

Spa Electrics has developed & manufactured underwater lights in Australia for over 30 years. Our experience, research & development, and quality system have produced underwater LED lights which set the standard in performance and reliability. We are confident our lights provide class-leading illumination, efficiency and reliability and encourage you to use this checklist to compare the alternatives for yourself.

# UNDERWATER LED LIGHT CHECKLIST

	1 Spa Electrics	2	3
<b>COOLING</b>			
Does light include Ceramic Engine technology to efficiently cool LED source?			
Does light use convective heat sink to efficiently disperse heat into pool water?			
<b>COLOUR</b>			
Does light use highest grade LEDs, and what is allowable colour variation?	 <i>variation of 5-10nm</i>		
Is each colour wavelength & output optimal for underwater applications?			
<b>ENERGY EFFICIENCY</b>			
What is the light's Luminous Efficacy?  Use formula provided to work out Luminous Efficacy if not stated	<i>up to 45lm/W*</i>	$\frac{\text{Lumen}}{\text{Watts}}$	$\frac{\text{Lumen}}{\text{Watts}}$
		= $\text{lm/W}$	= $\text{lm/W}$
<b>SERVICING</b>			
Can light be easily removed & disassembled to service internal electronics?			

\* GK 7 Series White & WN9 Series White.

Contact Spa Electrics for data specific to model you are considering



Phone: +61 (0)3 9793 2299

Fax: +61 (0)3 9793 1799

Email: [info@spaelectrics.com.au](mailto:info@spaelectrics.com.au)

Web: [www.spaelectrics.com.au](http://www.spaelectrics.com.au)