

ENERGY EFFICIENT LED LIGHTING



- Durable
- Long lifespan
- Energy efficient
- Environment friendly
- Efficient illumination
- Dynamic light, colour and distribution



Guide to LED lighting



Introduction

Many people are still confused about the cost benefits of LED Lighting. Immediately being noticed is the higher cost price compared to CFL, Halogen and other types of lighting.

This guide will assist in understanding LED technology, the benefits and costs, and selecting the correct LED replacement.

Historically, the Watt (power) of a lamp was used to indicate the brightness (visible light) output. With the introduction of various new technologies, the Watt value could no longer be used as an indication of brightness. Now Watt will purely relate to the power consumption.

Light output (visible light) is measured in lumens (LM).

Different types of lights.

Incandescent (filament)



Uses a coiled filament of tungsten to produce lights. Less than 3% of the input energy is converted into usable light. Nearly all of the energy ends up as heat. Very inefficient. Lifespan around 1 000 hours.

Halogen



Uses a gas and sometimes a filament combination to produce light. Higher efficiencies (lumens per watt) and better live than incandescent types.

Fluorescent (Common tube lights)



Typically use around one-quarter to one-third the power of an incandescent. Lifespan around 15 000 hours. Produces around 60 lumens per watt.

Compact Fluorescent Lamp (CFL)



Typically use around one-fourth to one-fifth the power of an incandescent. One of the more recent lights – commonly known as 'energy savers'. Uses the same basic technology as normal Fluorescent Tubes – bus in a simpler, smaller form in order to replace the Incandescent lamp.

LED - Solid state Light Emitting Diode lamps



Lifespan around 50 000 hours. Extremely efficient. Very low heat.

Cost and Saving



Running Costs

10W LED Bulb vs 100W Incandescent Bulb

Item	100W Incandescent	10W LED Bulb
Wattage	100 Watts	10 Watts
Lifespan	1,000 Hours	50,000 Hours
Electricity Cost per Unit	R 1.25	R 1.25
Daily Operating Hours	10 Hours	10 Hours
Daily Watts Used	1000 Watts	100 Watts
Daily Running Costs	R 1.25	R 0.12
Monthly Running Costs (Daily x 30)	R 37.50	R 3.60
Yearly Running Costs (Monthly x 12)	R 450.00	R 43.20
Yearly Replacement Costs (Lifespan / Running Hours)	R 36.50	R 13.14

This calculation shows that it costs R486.50 to run and maintain a 100W Incandescent compared to a 10W LED Bulb which will cost you R56.34

In addition a 10W LED Bulb will last over 13 years if you are running them 10 hours a day so if we calculate the costs over a 13 year time frame a 100W Incandescent Bulb will cost you R6324.50 per bulb in electricity and maintenance costs whereas a 10W LED Bulb will only cost you R732.42. These figures exclude inflation and electricity costs - the actual savings could be far greater.

While the LED bulb does cost more to buy initially, the savings more than make up for it and you will start seeing a return on your investment in under 8 months i.e. your LED bulb will pay for itself though energy savings alone – excluding any of the other benefits.

With electricity costs soaring - now is the time to make the change to LED Lighting.

Selecting the correct LED lamp

Most people don't know what wattage LED Lights will replace their current lighting options they have in their home and business.

LED uses significantly less Watt (power) than any conventional light. With other types of lamps there is a fair relation between the Watt (power) and Lumens (light output). LED is slightly different - you should never assume eg 3W = 300lumens. The actual lumens produced by any LED light depends on a few factors.

The quality and type of LED chip being used varies from manufacturer to manufacturer and will produce different lumen values. Often you will find that a 3w light from different manufacturers produces significantly different lumens.

Lumens per watt can currently range anything between 20lm/w and 120lm/w. A Light producing less lumens than one of equal watt is also not necessary of lesser quality – just a different type of LED chip.

The colour temperature affect the actual lumens - a warm white LED will produce less lumens compared to the same light with cool/pure white colour output at the same watt from the same manufacturer.

The LED arrangement and lens type also affect the usable light – lights of the same watt and lumens but with different degrees of light output will seem to produce different light levels. A focused LED (say 30 degrees) will seem brighter than a wide LED (say 180 degrees) at the same lumens – the choice of a wide or focussed light depends on the application.

