

The Little Book of Light



by tp24



tp24 strive for perfection with our honest, ground-breaking low cost lighting solutions. We vow to always put our customers first.



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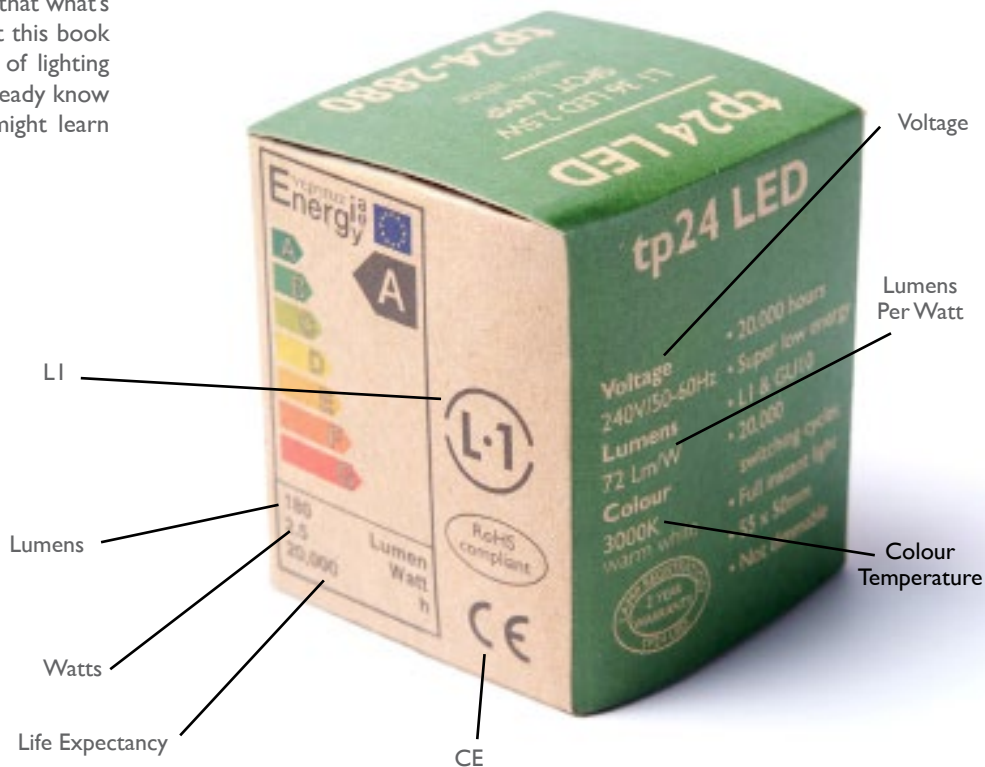
Understanding Light

Watts, Lumens, CRI and Colour Temperature; in this day and age it's more important than ever to make informed purchases, an adage especially true when purchasing light bulbs. The problem is we have to take for granted that what's on the back of the box is right for us. Throughout this book we will touch upon some of the core concepts of lighting and lamps. For those of you that are thinking "I already know all this stuff!", read on, you never know - you might learn something new!

LI - Most tp24 light fittings use lamps with LI caps. This means that the low energy lamp cannot later be replaced by an incandescent or normal light bulb which would be 5 times more expensive to run! Our fittings will not accept high energy lamps.

CE - With the CE marking on a product the manufacturer ensures that the product conforms with the essential requirements of the applicable European directives. CE now incorporates RoHS directives.

Life Expectancy - This refers to L70F50 standard method of measurement. When most lamps have an output of less than 70% of its original lumens. (Including total failure).



What is a Watt?

A watt is a measure of power consumption. The wattage of a bulb actually tells you how much electricity it uses, not how much light it produces. Traditionally lamps have always used watts as an indication of the light that can be expected from the bulb. However, with new technology and more efficient lamps, watts are becoming increasingly irrelevant and eventually all lamps will be measured in Lumens.

What is a Lumen?

Lumens are a measure of light. Typically one lumen is equivalent to the light emanating from a wax candle. A conventional 40 watt light bulb would have a lumen output of around 450lm. A CFL (Compact Fluorescent Lamp) with the same lumen output would only use approximately 9 watts and an LED considerably less depending on the type. As a general guide the efficacy of an incandescent lamp is 10-12 lum/w, a compact fluorescent is around 50-60 lum/w and an LED can vary from 40-90 lum/w. Remember: the higher the lumens the brighter the lamp.

What does voltage mean?

Voltage is the pressure within the circuit that's generated by the electricity company from the national grid. Different countries use different voltages according to their infrastructure system, it's generally referred to as the electrical potential.

In the UK the current used is typically 240 volts, in America 120 volts and in most of Europe and the Far East the current is typically 220 volts.

In general different plug sockets are used to ensure people use the correct equipment relevant to their local current.

A good analogy is to imagine the pressure behind the flow of electrons in a circuit similar to water pressure in a hose.

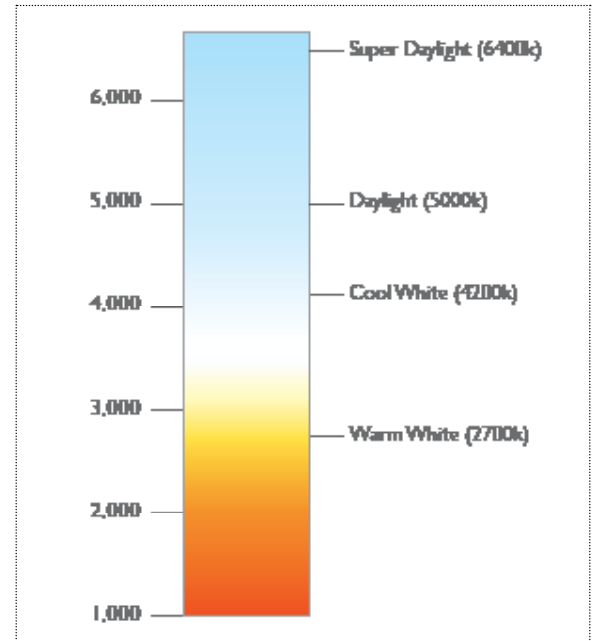


What does colour temperature mean?

Correlated Colour Temperature (also known as CCT) describes the appearance of the light in degrees Kelvin. It is the measure of the colour of light emitted; it can be quite yellow (2700k) or very blue white (6500k). In the UK most lamps are 2700k to 3500k.

Did you know? Some countries prefer to use lamps with high colour temperatures, particularly in Australia where 6000k is not unusual. This temperature gives off a very cool blue/ white colour.

Colour Temperature



Graph to show colour differences.



*How many psychiatrists does it take to change a light bulb?
None; the bulb will change itself when it is ready.*

What does CRI mean?



CRI, or colour rendering index, measures the light quality of a light source as compared with sunlight (which is given the maximum CRI value of 100). The closer a light-source's CRI is to 100, the better its ability to show true colours. Lamps with a CRI of 85-90 are suited for venues such as art galleries, retail shops and photography where showing a good colour rendition is critical.

In early 2013 a change in European regulations meant that all new LED imported lamps must now have a minimum CRI of 80 for indoor use and 65 for external use. This change has considerably improved the light quality for domestic living spaces.



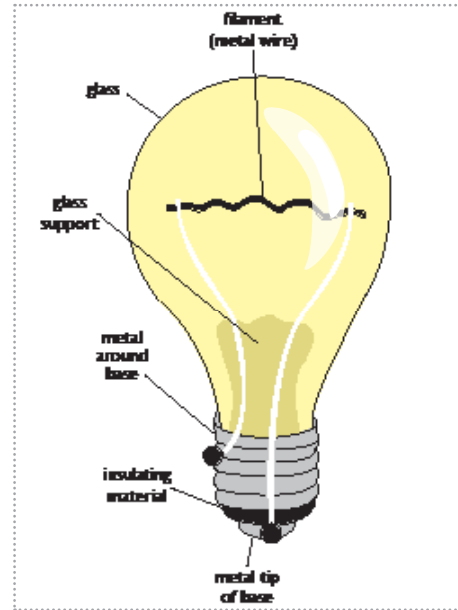
Incandescent or Filament Lamps: The traditional “Classic” light bulb

As electricity passes through the wire in the lamp, friction is generated by the passing of electrons, heating the wire until it glows very brightly.

Approximately 90% of the energy used by an incandescent light bulb is lost in the form of heat with only 10% of its output being actual light.

This technology has not significantly evolved since the original designs were developed over 100 years ago.

Did you know? Thomas Edison, neither invented the light bulb, nor held the first patent to the modern design of the light bulb. In reality, light bulbs used as electric lights existed 50 years prior to Thomas Edison's 1879 patent date. In fact, Edison lost all patent rights to the light bulb both in Britain and the United States



- High electricity consumption, very inefficient
- Instant start
- Dimmable

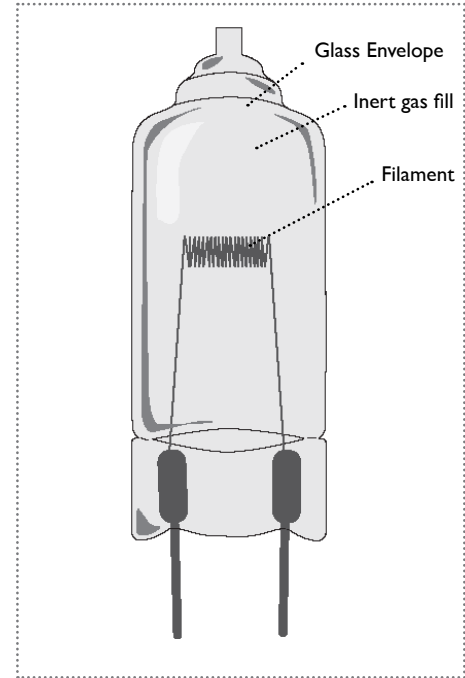


Halogen Light Bulbs



A halogen light bulb is an incandescent lamp with a tungsten filament contained within. When combined with an inert gas and a small amount of halogen the chemical cycle deposits evaporated tungsten back onto the filament, extending the life of the bulb. This makes them more efficient than traditional incandescent bulbs, although they are nowhere near as efficient as LEDs or CFLs.

Halogen lamps are generally small (G9, GU10) and generate a lot of heat so can only be used in fittings that will withstand high temperatures. Due to their size, halogen lamps are perfect for smaller light fittings though they lack the sophistication and energy saving attributes of the alternatives.



- High electricity consumption, very inefficient (even the so called energy saver options)
- Instant start
- Dimmable
- Gets very hot



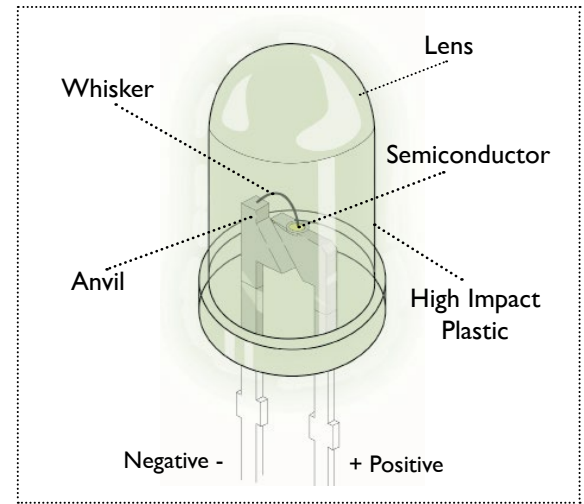
Light Emitting Diode or LED: The cutting edge in lighting solutions

An LED is what's called "solid-state lighting" technology. Basically, instead of emitting light from a vacuum (as in an incandescent bulb) or a gas (as in a CFL), an SSL emits light from a piece of solid matter. In the case of a traditional LED, that piece of matter is a semiconductor.

Stated very simply, an LED produces light when electrons move around within its semiconductor structure.

A semiconductor is made up of a positively charged and a negatively charged component. The positive layer has "holes" - openings for electrons; the negative layer has free electrons floating around in it. When an electric charge strikes the semiconductor, it activates the flow of electrons from the negative to the positive layer. Those excited electrons emit light as they flow into the positively charged holes.

Early LEDs had quite low outputs but recent improvements have allowed for much better performance. You can now find some LED replacement bulbs for candle & spot lamps and even GLS styles equivalent to a 60w incandescent. Rapid improvements in technology will see prices eventually drop and performances consistently improve.



- Very low power consumption
- Instant start
- No mercury
- Some are now dimmable, but are expensive and don't work with all regular dimmer switches

Compact Fluorescent Lamps: also known as CFLs

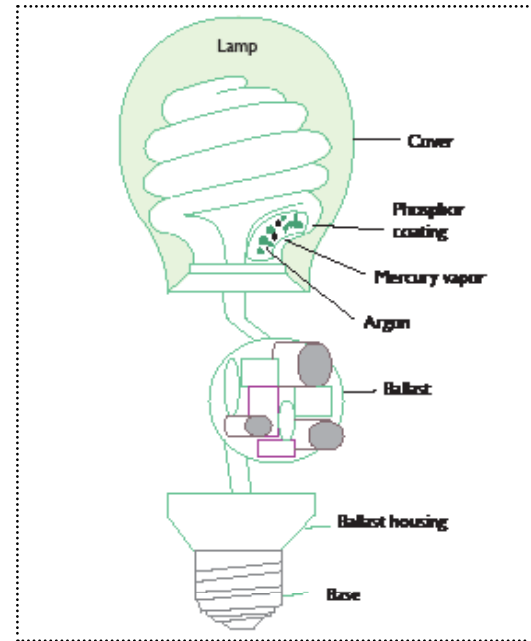


The central element in a fluorescent lamp is a sealed glass tube. The tube has two electrodes, one at each end, which are wired to an electrical circuit running an alternating current. Inside the tube is a cocktail of mercury and gases (typically argon) which is kept under very low pressure.

When you turn the lamp on, an electrical arc passes through the glass tube; as the arc passes through the mercury in the tube turns from a liquid/solid to a gas.

This combination causes ultraviolet light photons to be released. Our eyes don't register ultraviolet photons, so it needs to be converted into light the human eye can register. Coated along the inside of the tube is a special phosphor powder that, when combined with ultraviolet light, creates a visible light, making it possible for manufacturers to vary the colour of the light by using different combinations of phosphors.

Specifically in a 'compact' fluorescent lamp the tube is folded to make the lamp smaller and the ballast is normally built in so the lamp can replace the conventional light bulb.



- Slow start time
- Contain tiny amounts of mercury
- 80% more efficient than halogens and incandescents

How you can save...

Typically your modern domestic kitchen light fitting uses 5 spot lamps. This table illustrates the results of using three different kinds of light bulbs for 8 hours a day, 7 days a week for an entire year!*



Test Results**

Type of bulb	Cost of 5 Lamps (est.)	Annual Energy Cost	Lamp Life (hours)
Incandescent/ Halogen	£9.95	£95.37	1000
tp24 CFL Lamp	£24.96	£20.98	10,000
tp24 LED Lamp	£34.92	£4.77	20,000

From the table the significant saving from using LED lamps is obvious. What's more, the payback for the additional cost of LEDs is only 4 months and during the long lifetime of these LED lamps, you would have needed to replace your halogen lamps many times over (halogen lamps last 1000-2000 hours only).

**Test results based upon average energy use from the top 6 energy suppliers. Tariff based on standard rate of 13.1 pence/kilowatt-hour, paid on sight of bill, for domestic electricity only. Where initial rate is applied (in lieu of standing charge) this has been ignored and second rate has been used. Rates checked 2/12/2011 from the data on www.energyhelpline.com (CFL Spot tp24-2318 3000k) (LED L1/GU10 36 LED tp24-2880 Wide Angle Spot).

*Daily usage may vary for each room and each customer depending on the function and season.

www.tp24.com

**Save up to £90
per year in energy costs
in just one room
when you change to
tp24 LED
Lamps.***

* Based on the cost of electricity at 13.1 pence/kwh. Using 5x2.5W LED Lamps (tp24-2880) compared with 5x50W Halogen lamps running at 8 hours a day, 52 weeks a year.

Imagine
how much you could
**save in your
whole house!**



tp24 LEDs



Super low energy and highly efficient tp24 LEDs are the LEDs for the home. They have a lifetime of up to 20,000 hours and are 90% energy saving when compared to regular incandescent lamps. Like our CFLs, they also comply with current building regulations and are some of the best performing, affordable LED lamps on the market. Some of our latest LED lamps are achieving up to 100lm/w. Our unwavering vision to create better and brighter lighting solutions that don't cost the earth ensures that tp24 customers are always up to date with the latest advances. We believe everyone should be able to save energy, regardless of price.

All our latest LED lamps have individual serial numbers that allow us better traceability and enables us to offer an additional 12 months warranty in addition to our standard warranty to those customers who register their bulbs on our website. To our knowledge, tp24 are the only lighting company that offers this service.

LI & G40 LED Lamps



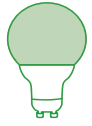
2896
Cluster Clear Tube LI
Lumens 300
3.5W



2898
Cluster Frosted Tube LI
Lumens 270
3.5W



2905
Flat Plate LI
Lumens 400
4.5W



4900
Frosted Candle LI
Lumens 340
4W



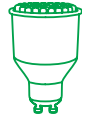
2880
Spot LI
Lumens 180
2.5W



2882
Spot LI
Lumens 270
3W



2884
Spot LI
Lumens 180
2.5W



2886
Spot LI
Lumens 270
3W



4930
Clear GLS LI
Lumens 440
5W



4933
Frosted GLS LI
Lumens 560
7W



5413
Square G40
Lumens 190
2.5W



5411
Square G40
Lumens 270
3W



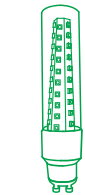
Clear Pygmy LI-X
Lumens 240
3W



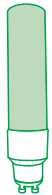
5412
Round G40
Lumens 190
2.5W



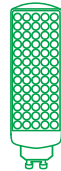
5410
Round G40
Lumens 270
3W



2896
Cluster Clear Tube LI
Lumens 300
3.5W



2898
Cluster Frosted Tube LI
Lumens 270
3.5W



2905
Flat Plate LI
Lumens 400
4.5W



4900
Frosted Candle LI
Lumens 340
4W

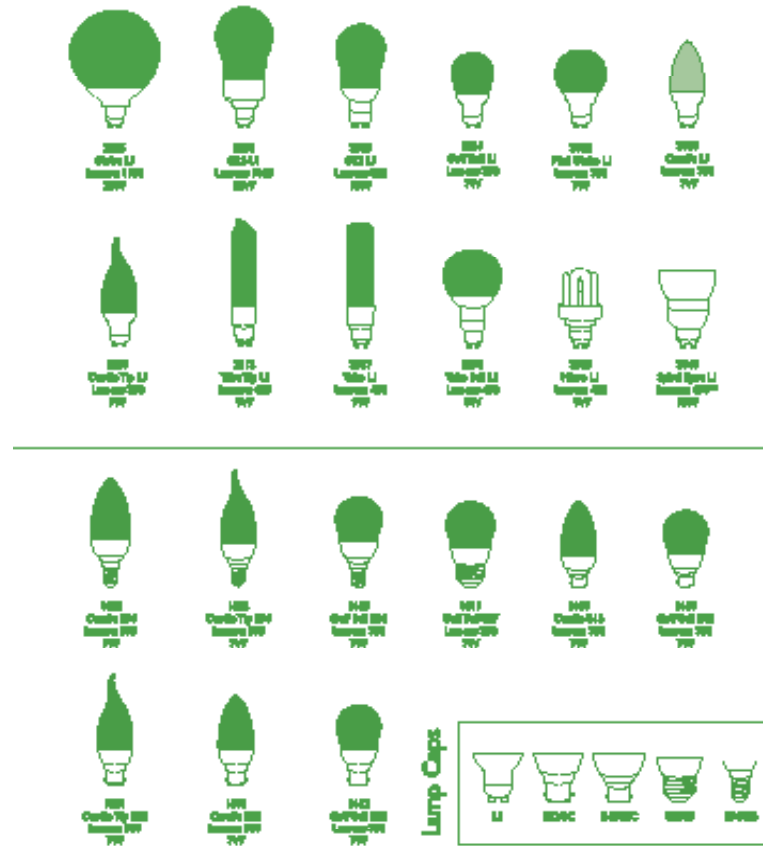
We're constantly innovating and expanding our product range, with new lamps being added regularly, so check out our website for the latest information.

tp24 CFLs

With our growing portfolio of CFL lamps we can offer a variety of options providing a sophisticated choice for luminaire design. Our CFLs offer up to 80% energy saving and have a very long life (6,000-10,000 hours). They have a minimum efficacy of 45lm/w and CRI of 80 and comply with parts L1 and L2 of the building regulations and also comply with the sustainable building codes.

Our designers are constantly pushing the latest developments in technology so make sure our lamps are the very best they can be. We make some of the smallest, most attractive and affordable CFLs on the market and have managed to hold our prices for the last five years, regardless of huge increases in material costs.

We are proud to offer a 12 month guarantee on all our CFL products and, unlike many of our competitors, send out free replacements to the end user in the unlikely event that problems occur.



Lamp Caps



Retrofit LEDs: Freshen up your lights

To retrofit something is to update what we already have, without having to replace it entirely. At tp24 we can help you do exactly that.

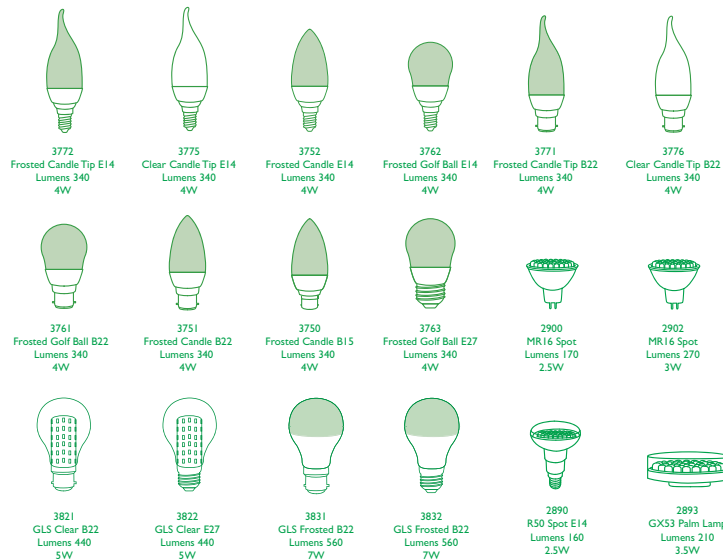
Retrofit LEDs fit straight into your existing fittings. There's no need to replace your old ones or switch to a different cap type, just simply change the light bulb.

They're available in a range of different shapes and sizes, caps and finishes. Whether it's a frosted candle tip with a bayonet cap, or a standard spot lamp for your kitchen, we've got it covered.

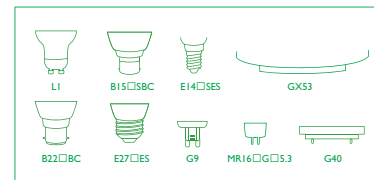
Like the rest of our LEDs, our retrofit range is also covered by our unique two year extended warranty scheme. Simply register the serial numbers on the side of the lamp on our website, and in the unlikely event that something goes wrong, we'll send you a free replacement



tp24 Retrofit Collection



Lamp Caps



tp24 LEDs
aren't dimmable.
But they are
switchable...



Did you know? If every home in the UK swapped 3 light bulbs for energy saving ones, enough energy would be saved to light the UK's street lamps.



Traditional domestic dimming is very inefficient; dimming a fitting by 50% still uses 80% of the power and can also stress your lamps.

Dimmable LED lamps tend to be costly and in order to use them you'll need to buy a special LED dimmer switch, which are extremely expensive.

tp24 have developed their own solution, 'switchable'. By incorporating switching into some of their larger, multi-arm fittings, you can now enjoy variable mood settings and balanced light reduction with 100% efficiency. Switchable fittings turn on fully illuminated but can then be switched down by up to four steps, depending on the fitting. No additional wiring is necessary and switching is operated from a standard wall switch.

2 years ago, LEDs
were only achieving
25-35 lm/watt, but..

Today,

tp24 LEDs

achieve

65-100

lm/watt

How we can help..

With a clear mission statement of providing a dedicated service for new home developers and buyers, our team has managed to bridge the gap offering easy to implement solutions as well as giving choice to a whole range of lighting options.

One of the primary reasons we got into the lighting business was to enable new home owners to move in minus all the hassle of sourcing, buying & fitting their lights. At tp24 we are always working to improve performance, brightness and savings as well as making all our products attractive and desirable.

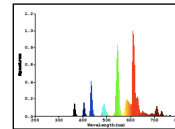
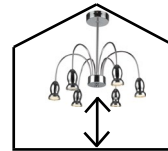
We care about our customers



- ✓ 12 month warranty
- ✓ Register for a free extended year on your LEDs
- ✓ Maintained stock levels
- ✓ Switching - not dimming
- ✓ Attractive lamps
- ✓ Patented quick fit system
- ✓ Designed for your home
- ✓ We care about our customers
- ✓ A company you can trust

Warranties – All tp24 lamps are guaranteed for 12 months and we send out free replacements to the end user. tp24 LED lamps also come with an additional year's warranty if registered with us on our website. On occasion we do get failures. However, this can be caused by fluctuating electric currents. As a result, every return we get is fully investigated and resolved to the best of our ability. This is why our products are constantly improving, so the lamp you receive is the best product we produce.

Maintained stock levels - We focus on carrying stock and delivering on time. All fittings are supplied with light bulbs and are well packaged to ensure they reach you in perfect condition.

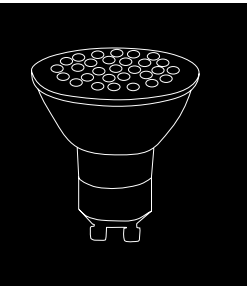


Switching – Many of our large multi-arm fittings incorporate switching which allow sections of the light fitting to be turned off giving full energy saving, variable mood settings and balanced light reduction.

Simple quick fit system – Our unique HSR & HSS systems make fitting lights quicker and easier than ever before. You don't need a qualified electrician to fit our lights as there is no complicated wiring (full step by step instructions are included with each product). Visit [youtube.com/tp24tv](https://www.youtube.com/tp24tv) to see the HSR system in action.

No banging your head! – The majority of our fittings are designed to fit into a new home with a standard 2.4m high ceiling. We have a large range of flush and semi flush fittings, as well as ceiling pendants, which create a design statement without taking over the room or hanging too low.

Test Reports – We upload all of our in-house test reports for CFL and LED lamps that we manufacture on our website: www.tp24.com. We are confident in our products and want our customers to be able to see exactly what they are getting.



We pride ourselves on providing our **low energy solutions to **real people** with **real homes** that want to **save money** and **save the environment.****

tp24  outlet

**Come and visit
Europes largest LED Store**

2nd Floor Lighting Department
Croydon Village Outlet



**SAVE UP TO £90 A
YEAR WITH
TP24 LED LAMPS!**



Looking ahead...

If you move in to a new home you are very likely to find tp24 light fittings already installed. The current building regulations now require 75% of the lighting to be low energy. Rest assured that we will be there to support you long into the future life of your new home.

By working closely with the larger house builders and some of the biggest developers tp24 are able to help shape the future of new home lighting. We believe that we can make our low energy lighting desirable, affordable and truly energy saving.

Our ground breaking products include the unique G40 system, which picked up the award for Best Low Energy Design at the Lighting Design Awards 2013. We're always seeking to create new and exciting products that not only serve a purpose, but are also stylish and affordable. Our goal is to change the perception of low energy lighting for everyone; together, we can make a difference.



For an honest
approach to low
energy lighting
visit www.tp24.com
or contact one of
our stockists.

www.tp24.com