



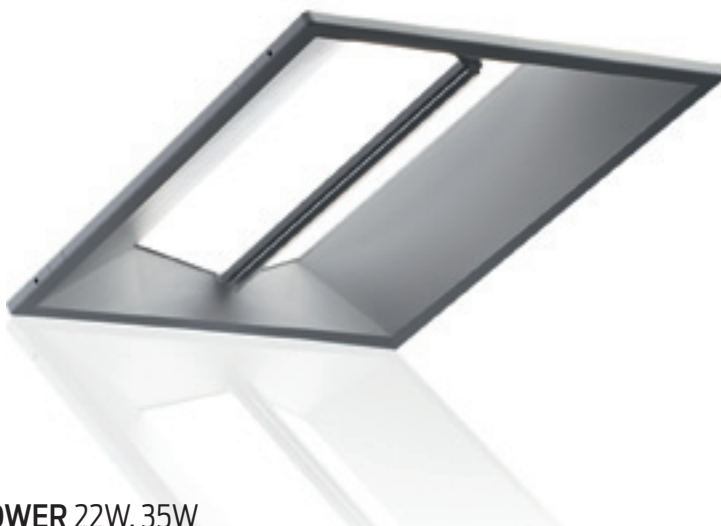
Fair and square

One of the last bastions of conventional lighting – the office – is about to fall to an army of 600 x 600 LED panels. **Lux** investigates

LED products have had a tough time getting a foot in the office door. But there are numerous excellent high-quality LED luminaires out there. This month the *Lux* testing team took a close look at seven of the best

LED replacements for the workhorse of office lighting: the 600 x 600mm recessed modular ceiling fitting. Some are flat light panels but others have innovative designs built around the characteristics of LEDs. Here's how they got along. **TL**

Cree CR22



POWER 22W, 35W
OUTPUT 2,000 lm, 3,000 lm
EFFICACY 90 luminaire lm/W, 86 luminaire lm/W
CCT 3000K, 4000K
CRI >90
PRICE £180, £195 for Dali/1-10V version

Cree's CR22 is radically different from the LED moduls based on edge-lit prismatic panels. Here, the LEDs are mounted in a single row on an extruded aluminium heatsink that sits – crucially – on the outside of the fitting rather than on the inside or at the back where they'll get hot.

The LEDs are positioned vertically to uplight a 'mixing chamber'. The light hits a back-reflector and exits through the two diffusers panels. It's a circuitous journey that makes its stonking 90 luminaire lumens per watt rating all the more remarkable. CRI is 90 and surface brightness above 65 degrees is just 2,498cd/m². The 22W version delivers 2,000 lm and the 35W has an output of 3,000 lm. Rumours are the next generation will give 130 luminaire lumens per watt.

The fitting looks pretty smart and, thanks to its unique shape, the photometry is awesome, hitting right up to the ceiling. In fact, in a standard 2.4 x 2.4m grid, this complies with LG7.

To our mind, the best bit is the superb light quality from Cree's TrueWhite Technology.

The CR22 fits in standard exposed-T 600 x 600 ceilings and the UK distributor – Rehmat Lighting – is promising mods so it will work with all ceiling variants. Cree says the next generation will keep the same footprint, so a CR22 installation is futureproof.

TL **VERDICT:** Super efficient with beautiful light and great value ★★★★★

Goodlight flat panel



POWER 40W
OUTPUT 3,000 lm
EFFICACY 75 lm/W

CCT 4000-4300K
CRI >84
PRICE £141

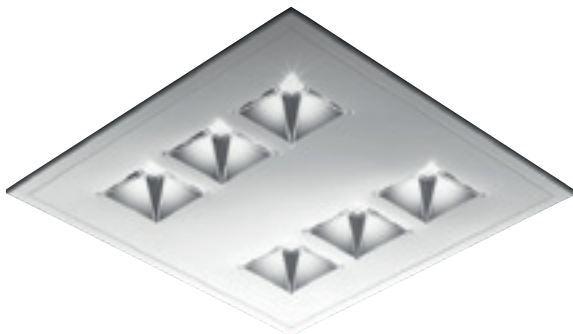
This unit from LED Eco Lights' Goodlight range is a good quality piece of kit, and comes at a lower price than the other comparable fittings we looked at.

The panel, edge-lit by Epistar LEDs, is just 11mm thin, and because the driver is remote it appears even smaller. The frame surrounding the panel is of ribbed, anodised aluminium and the fitting is available with a driver for 1-10V dimming. The light output of the Goodlight fitting is quoted as 3,000 lm, the colour rendering index as higher than 84 and colour temperature as 4000-4300K. This gives a notional efficacy of 75 lm/W – pretty good.

The product's life is stated as 50,000 hours although there's no mention of lumen depreciation. And the most important thing: when illuminated, the panel appears totally uniform to the naked eye at all angles.

 **VERDICT: Nice build quality, sleek appearance and good value for money** ★★★★★

Trilux Aurista



POWER 41W
OUTPUT 3,300 lm
EFFICACY 80 lm/W

CCT 3000-4000K
CRI >80
PRICE ON APPLICATION

Trilux's Aurista fitting is unlike any of the others we looked at. Instead of a flat panel or a standard louvred effect, Trilux has come up with a new way of using LEDs.

Aurista is a sturdy luminaire containing several star-shaped LED modules. A combination of translucent plastic and metal reflectors makes each star highly efficient. The 'light star' effect may not be for everyone, but this is certainly an innovative design, and the finished product is well made and provides even light distribution.

It comes in various versions with five, six or seven 'stars', so designers can vary light levels in different parts of a scheme. The one we looked at was the six-star version, which packs 3,300 lm at an impressive efficacy of 80 lm/W, and is Dali dimmable.

 **VERDICT: Innovative, efficient and well built** ★★★★★

Light Planet flat panel




POWER 42W
OUTPUT 3,000 lm
EFFICACY 71 lm/W

CCT 5000K
CRI 80
PRICE £165

This fitting, made by Young Lighting and distributed in the UK by Light Planet, doesn't feel as sturdy as the others we looked at – the visible screws and brushed metal edging lack the reassuring feel of something like the GE Lumination. Light Planet's standard guarantee is three years, with five years offered in some circumstances.

However, once you've installed this in your ceiling and switched it on, you won't be complaining – the light from the edge-lit panel is even with a large illuminated area, and will help keep your bills right down. Compatibility with 1-10V dimming makes this a flexible option, and although it's designed to lay in a suspended ceiling, it can be secured to a ceiling too.

 **VERDICT: Efficient and even, if not as sturdy as the competition** ★★★★★

GE Lumination flat panel



POWER 50W
OUTPUT 3,450 lm
EFFICACY 69 lm/W

CCT 3000-4000K
CRI 80
PRICE £220

As soon as GE's Lumination fitting arrives, you know you're dealing with a quality product. It's weighty (a whole 3kg heavier than the Goodlight panel, for instance), sturdily packed and clearly labelled. Opening the box confirms those first impressions, revealing the chunky pressed aluminum back surface. The driver is the Philips Xitanium, ready for connection to a Dali or 1-10V control. There's a five-year warranty and lumen depreciation at L85 (not just L70) is given as 50,000 hours. At 50W it's the highest wattage product we looked at, so with light output said to be 3,450 lm it has an efficacy of 69 lm/W. The edge-lit illuminated panel is smaller than the other flat panels we tested at, with its 50mm grey frame. When illuminated the panel appears uniform from all directions.

VERDICT: Great build quality and long life
 make up for relatively high power use ★★★★★

Aurora AU-LP100A flat panel



POWER 45W (with driver)
OUTPUT 3,398 lm
EFFICACY 76 lm/W

CCT 4000K
CRI >80
PRICE £220

Aurora's edge-lit light panel provides a good 'out of the box' experience. It's robust to handle (even though it's only 12mm thick) and comes with a five-year guarantee, promising 50,000 hours at L70. Consuming 45W with its driver and putting out nearly 3,400 lm gives the product an efficacy of 76 lm/W.

The 4000K light is nice and even, and passed the Tube map test, with all colours appearing vibrant and clear. It also creates a good level of spill light to the sides, so walls should be well lit. A dimmable version is also available, as well as a 3,700 lm version with adjustable colour temperature.

VERDICT: Looks good, feels good and distributes light effectively ★★★★★

Thorn Menlo³ Circular



POWER 47W
OUTPUT 3,700 lm
EFFICACY 78 luminaire lm/W

CCT 4000K
CRI 80
PRICE ON APPLICATION

Menlo³ Circular LED is a round luminaire design worked into a standard square ceiling fitting, and Thorn seem to have pulled it off. The Menlo³ has even surface illumination with less than 3,000cd/m² above 65 degrees. Efficiency is good at 78 luminaire lm/W_{ctt} – giving 3,700 lm at 47W. It's a well-constructed, robust unit that can fit in a range of ceiling grids and looks great.

The datasheet is comprehensive, with typical value propositions in new and refurb installations, when compared with incumbent technology. A 10-year fixture life is implied in the worked examples, although the datasheet and photometric files do not mention lamp life, lumen depreciation or warranty period. The Menlo³ is available in Dali dimmable and emergency lighting options.

VERDICT: Efficient and attractive
 although clearer data would be nice ★★★★★