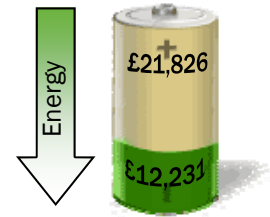


Application

PhotonStar were invited to supply a low energy lighting solution for a 4 story new build office in London.

The project comprised of 4 floors with a total area of 650m², The original specification for each office area utilized a number of 52W (2 x 26W) Compact Fluorescent "PL" downlighters which would require 22.32W/m² to achieve 500lx at the work plane (desk level) to provide a well lit office. Consideration had to be given to glare in the main office areas. Regulations required an additional emergency lighting system throughout the building. The stairwells had some concrete ceilings requiring a bright surface mount product.

The low energy building design included the use of occupancy and lux sensors in stairwells, bathrooms and other areas to further reduce power consumption. CFLs do not function well with these sensors due to slow warm up time and flickering. Repeated switching dramatically reduces the life of CFL lamps.



Solution

The PhotonStarLED solution utilised 3 LED products from the CeilingStar range.

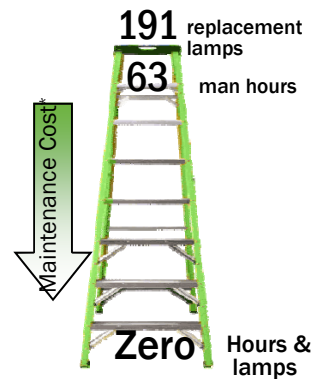
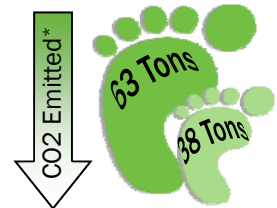
The main office area lighting on each floor was provided by 185 CS16 35W downlighters requiring only 12.96W/m² to achieve 500lx at the work plane (desk level). The CS16 offers a unified glare rating of 19, making it applicable to high performance commercial applications and reduces glare from VDUs.

The stairwells were lit by 11 CeilingStar30 18W LED luminaires which are surface mounted and suitable for concrete ceilings. The corridors and bathrooms were lit by 28 CeilingStar5 7W LED luminaires which are rated to IP65 as required in bathroom areas. A range of beam angles provide an efficient use of light in the corridors.

Illuminating instantly, the CeilingStar range worked perfectly with zoned occupancy sensors to further reduce costs. Multiple lux level sensors were added to zone fittings near windows benefiting from additional natural light when available. All CeilingStar luminaires are cool to the touch, efficiently turning almost all of the energy into light. Excess heat is thus reduced and this results in further savings in air conditioning costs.

The CeilingStar range has an excellent colour rendering index of 86, and in this example emits light at 4000K. With projected lifetimes of 80,000hrs (L70) and a UK manufacturers guarantee of 5 years, the impact of lamp replacement (inconvenience, health and safety, lamp replacement cost) is eliminated.

The area required a number of emergency lights, and due to the ultra low power requirements of the CS16, CS5 & CS30 the project was fully backed by integrated emergency packs, maintaining the design concept and providing a fully illuminated emergency solution. The CS30 has the option of an emergency pack enclosed within the unit - ideal for concrete ceilings.



*Based on energy cost of 0.10 per kWh, 0.4Kg CO₂/kWh, savings over 1 year based on 10 hours use per day. See table on page 3 for more calculations.

Key Features

- 80,000hr projected lifetime with 5 year guarantee.
- 40% more efficient than equivalent output CFL in similar fitting.
- Excellent colour rendering (CRI 86)
- Low cost integrated NiMh emergency pack will run multiple fittings
- Project Efficacy of 2.59 W/m²/100lx in main office areas
- IP65 rated (CS5)
- Payback in approximately 40 months
- Suitable for use with occupancy and lux sensors (instant on, not damaged by repeated switching)

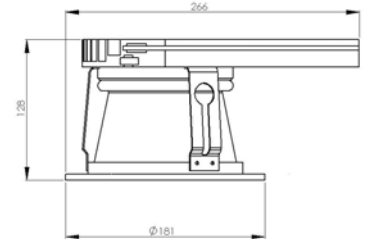
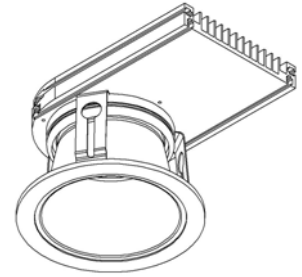


CS16

High Power Very Low Glare Fixed Downlighter

The innovative CeilingStar16 range is designed for commercial new builds, refurbishments or retrofit. It is constructed of materials that are designed for long life including a 99.9% purity aluminium reflector cup. This reflector cup reduces the glare and makes the unit suitable for suspended ceiling commercial applications such as hotel, office and retail applications with unified glare rating (UGR) of 19.

The CS16 is compatible with occupancy sensor and versions are 1-10v dimmable. The CS16 is "instant on" with none of the warmup time or flicker associated with CFLs. The LEDs 80,000 hours operational lifetime is not reduced by turning the fitting on and off. The unit is available in NeutralWhite (CCT 4000K) with an excellent colour rendering index (CRI) of 86



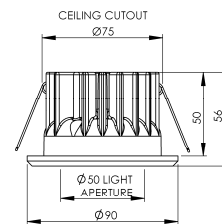
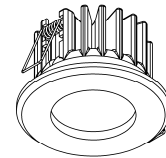
CS5 NIC

Fixed LED Downlighter

The innovative CeilingStar5 (CS5) range can be used in residential and commercial new builds, refurbishments or retrofits. The CeilingStar5-NIC is an energy efficient and zero maintenance light fitting which is a superior replacement for MR16 and GU10 ceiling downlighters or incandescent downlighters. It is IP65 rated, making it suitable for zones 1, 2 and 3. These light fittings make changing light bulbs a thing of the past.

The CeilingStar5 is constructed of materials that are designed for long life. It contains the most efficient, ultra bright, long life LEDs available today. Keeping LEDs cool is essential to efficiency and long life. The CS5 has a high performance die cast heatsink with integral spring fixings employing proprietary surface treatment technology, providing improved lifetime, efficiency and an increased ambient temperature operation in a durable Matt Black finish.

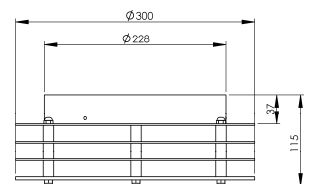
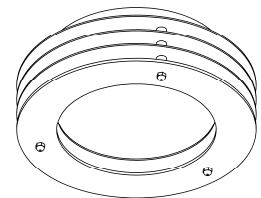
The CS5 offers equivalent illumination to 35W and 50W GU10 halogens consuming 7W and 10W a durable powder coated aluminum bezel. To create a calm relaxing environment we have WarmWhite (CT 3000K) with a colour rendering index (CRI) of 83 offering excellent quality illumination. For a pure, invigorating feel we have pure NeutralWhite (CCT 4000K, CRI 86)



CS30

High Power Surface Mount Downlight

The generation 2 CeilingStar30 range can be used in residential and commercial new builds, refurbishments or retrofit and can be mounted on any surface. These energy efficient and zero maintenance light fittings are a superior replacement for ceiling Lights such as halogens and fluorescents. It conforms to EU 'A' energy rating and UK building regulations Part L and contains an integral power supply unit allowing direct connection to the mains. With a total fitting wall plug efficiency of 46-63 lumens per Circuit Watt this product is fully Part L compliant as a dedicated low energy fitting. Versions of the product are dimmable. The CeilingStar30 is constructed of materials that are designed for longevity an anodized aluminium body. The CS30-20W version of the Luminaire produces the equivalent light output to 150W halogen or 32W fluorescent whilst only consuming 24W.



Luminaire type	Number of fittings	Circuit power	Total Power of all lamps	Avg. Illuminance E_{av} [lx]	Relative Energy Cost Saving over 5Yr operation (1)	Annual Energy-Cost Saving (1)	Annual Carbon Dioxide Saving (kg) (1)	Fitting location
CeilingStar16-30W	36	36 W	1296 W	529	£7655*	£1531*	6124*	Ground Floor
CeilingStar16-30W	43	36 W	1548 W	542	£9143*	£1828*	7314*	First Floor
CeilingStar16-30W	59	36 W	1620 W	551	£12545*	£2509*	10,036*	Second Floor
CeilingStar16-30W	47	36 W	1692 W	536	£9994*	£1998*	7995*	Third Floor
CeilingStar5-7W	8+6+8+6=28	9 W	252 W	151	£6785**	£1357**	5428**	Gnd+1st+2nd+3rd
CeilingStar30-18W	2+3+3+3	21 W	231 W	151	£1860***	£372***	1488***	Gnd+1st+2nd+3rd

Above based on today's energy costs of 0.10 per kWh and 0.4kg of carbon dioxide being produced per kWh. All Illuminance values are based on simulated results. 1—assumes 24hr operation and A/C load *-compared to 2x26W CFL (LED version is 40% more efficient) **compared to 35W MR16 halogen (LED version is 80% more efficiency, ***compared to 2x18W CFL (LED version is 40% more efficient)

