



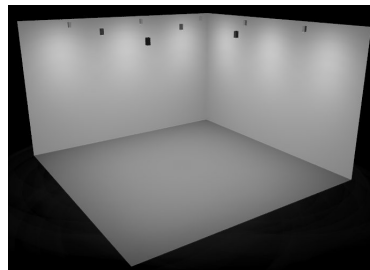
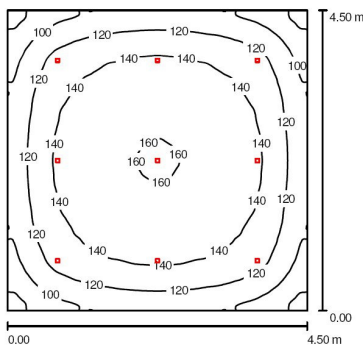
Application Example—Generation two CeilingStar5 4.5mx4.5m Kitchen

Using the generation two CeilingStar5– 7W Luminaire illuminating a 4.5m x 4.5m room

Kitchens need to be well lit typically achieving >130 Lux on the work surfaces to allow easy food preparation. Good colour rendering is also required to ensure food looks natural and appealing this is typically achieved using Halogen downlighters which have a high colour rendering index (CRI) above 90. However these bulbs are not very efficient and have a relatively short life. The same affect can be achieved with warm white (3000k) CeilingStar5 based on LEDs these offering a good colour rendering index (86) compared to other energy saving light sources such as Compact Fluorescent Lamps (CFL). The CeilingStar5 is can be used with occupancy sensors and PhotonStar LED Luminaires offer an 'instant on' with none of the warm up time or flicker associated with CFLs. The LED 50,000 to 100,000 hr operational lifetime is not reduced by turning them on and off thus allowing for a maintenance free solution. The CeilingStar5 has a glass diffuser to provide gentle but effective illumination and being IP65 wont be effected by a kitchen type environment as they are suitable for zones 1,2 and 3. The generation 2 CeilingStar5-7W (7 LEDs) achieves >55 Luminaire Lumens per Circuit Watt making it 40% more energy efficient than a CFL downlighter.

The density plot indicates the uniformity of the Illuminance across a work plane 1m above the floor. Reflectance's = 80/50/20. Averaging across 75% of work plane area. The room is 4.5m (W) x 4.5m (L) x 2.76m (H). The Work-plane height is at 0.76m.

The application employs 9 units in a 3 x 3 array of CeilingStar5-7W Downlighters spaced roughly 1.5m apart.



Height of Room: 2.743 m, Mounting Height: 2.743 m, Light loss factor: 0.80

Values in Lux, Scale 1:58

The Average Illuminance on the work plane is 130lux

Surface	ρ [%]	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$
Workplane	/	130	70	162	0.54
Floor	20	110	64	139	0.59
Ceiling	80	29	22	32	0.76
Walls (4)	50	64	32	93	/

Equivalent illumination Performance of CeilingStar5 and other downlighters in the 4.5x4.5m room

Lamp type	Number of lamps	Power per lamp	Total Power of all lamps	Energy Cost over 50,000 hrs operation	Relative Energy Saving over 50,000 hrs operation	Annual Energy Cost	Carbon Dioxide (kg) emitted over 50,000 hrs operation	Relative Carbon Dioxide (kg) saved over 50,000 hrs operation
65W BR30	9	65 W	585W	£2925	-	£128.12	11700 kg	-
14 W CFL	9	14 W	126W	£630	£2295	£27.59	2520 kg	9180 kg
35W MR16	9	35 W	315W	£1575	£1350	£68.99	6330 kg	5400 kg
35W PAR30	9	35 W	315W	£1575	£1350	£68.99	6330 kg	5400 kg
CeilingStar5	9	8 W	72W	£360	£2565	£15.77	1440 kg	10260 kg

Above based on today's energy costs of 0.10 per kWh and 0.4kg of carbon dioxide being produced per kWh

In addition, over the 50,000 hrs operation of the 9 CeilingStar5 LED products you will most likely buy, change and dispose of a staggering 450 incandescent light bulbs or 72 low energy light bulbs !

Performance EcoLighting Solutions

