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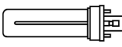

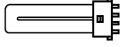

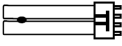



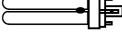



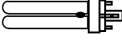





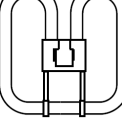


CAR PARK LUX
LEVELS

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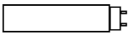

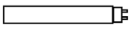

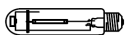


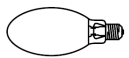


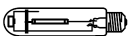


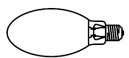


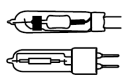


HEAT + FIRE
RESISTANCE
TESTING

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LAMP INFORMATION

NAME	LAMP TYPE	BASE	BALLAST			POWER W	FLUX lm	LIFE hrs	L max mm	
			MAG	MAG + START	E.B.					
CFLi			E27			9	400	10000	100	
					INT.	INT.	11	600	10000	110
							15	900	10000	115
							20	1200	10000	125
							23	1400	10000	140
							27	1700	10000	140
							42	2600	10000	145
TC-S			G23	•		5	250	8000	85	
				•		7	400	8000	115	
				•		9	600	8000	145	
				•		11	900	8000	215	
TC-SE			2G7	•	•	5	250	8 / 10000	85	
				•	•	7	400	8 / 10000	115	
				•	•	9	600	8 / 10000	145	
				•	•	11	900	8 / 10000	215	
TC-L			2G11	•	•	18	1200	8 / 10000	225	
				•	•	24	1800	8 / 10000	320	
				•	•	36	2900	8 / 10000	415	
					•	40	3500	10000	535	
					•	55	4800	10000	535	
TC-F			2G10	•	•	18	110	8 / 10000	122	
				•	•	24	1700	8 / 10000	165	
				•	•	36	2800	8 / 10000	217	
TC-D			G24d-1	•		12	900	8000	130	
					•		18	1200	8000	140
					•		26	1800	8000	160
TC-DE			G24q-1	•	•	13	900	8 / 10000	130	
					•	•	18	1200	8 / 10000	140
					•	•	26	1800	8 / 10000	160
TC-TE			GX24-q1		•	13	900	8 / 10000	90	
					•	18	1200	8 / 10000	110	
					•	26	1800	8 / 10000	130	
					•	32	2400	8 / 10000	145	
					•	42	3200	8 / 10000	155	
TC-DD			GR8	•		16	1050	10000	138 x 141	
				•		28	2050	10000	205 x 107	
			GR10q	•	•	10	650	10000	92 x 95	
				•	•	16	1050	10000	138 x 141	
				•	•	21	1350	10000	138 x 141	
				•	•	28	2050	10000	205 x 207	
				•	•	38	2850	10000	205 x 207	
					•	•	55	4000	10000	205 x 207
					GRy10q3					

LAMP INFORMATION

NAME	LAMP TYPE	BASE	BALLAST			POWER W	FLUX lm	LIFE hrs	L max mm		
			MAG	MAG + START	E.B.						
T8			G13	•	•	15	950	9 / 12000	438		
				•	•	18	1350	9 / 12000	590		
				•	•	30	2350	9 / 12000	895		
				•	•	36	3350	9 / 12000	1200		
				•	•	58	5200	9 / 12000	1500		
T5			G5	•	•	6	240	16 / 18000	212		
				•	•	8	330	16 / 18000	298		
				•	•	13	650	16 / 18000	517		
				•	•	14	1200	16 / 18000	549		
				•	•	21	1900	16 / 18000	1149		
				•	•	24	1750	16 / 18000	1449		
				•	•	28	2600	16 / 18000	849		
				•	•	35	3320	16 / 18000	1449		
				•	•	39	3100	16 / 18000	1149		
				•	•	49	4300	16 / 18000	1449		
				•	•	54	4450	16 / 18000	1149		
				•	•	80	6150	16 / 18000	1449		
				HST (SON)			E27	•	•	50	4400
•	•	70	6000					24000	156		
	E40	•	•			100	10000	24000	210		
		•	•			150	14500	24000	210		
		•	•			250	27000	24000	257		
HSE (SON)			E27	•	•	50	3500	24000	156		
				•	•	70	5600	24000	156		
			E40	•	•	100	9500	24000	183		
				•	•	150	14000	24000	226		
				•	•	250	25000	24000	226		
				•	•	400	47000	24000	290		
HIT (MH)			E27	•	•	70	6300	15000	155		
				•	•	100	8800	15000	210		
			E40	•	•	150	13500	15000	210		
				•	•	250	20000	15000	226		
				•	•	400	32000	15000	285		
HIE (MH)			E27	•	•	70	5000	15000	141		
				•	•	100	8000	15000	141		
				•	•	150	12500	15000	141		
			E40	•	•	250	24000	15000	226		
HIT (MH)			G8.5	•	•	20	1700	12000	80		
					G12	•	•	35	3500	12000	100
						•	•	70	7000	12000	100
						•	•	100	9500	12000	105
						•	•	150	14500	12000	105

LIGHTING TERMINOLOGY

There are four important parameters that should be taken into account to achieve a high level of visual comfort: a suitable colour temperature, a high CRI, a low UGR and a uniform illuminance in the task area.

COLOUR TEMPERATURE (K)

The colour temperature is a measurement of how warm or cold the light emitted by the lamp is. It is stated in units of absolute temperature called Kelvin (K). Low colour temperatures are referred to as warm colours and provide a red-yellow tone. High colour temperatures are referred to as cold colours and provide a blue tone. For example, a standard incandescent light bulb produces a yellow light with approximately 2700K, whereas an LED spotlight produces a cooler light at approximately 4000K. The colour temperature is closely linked with the visual comfort of a space and the function of a room will dictate temperature.

COLOUR RENDERING INDEX (CRI)

The CRI measures the ability of a lamp source to accurately reproduce all colours when compared with an ideal light source, such as sunlight or tungsten filament lamp. Numerically, the highest possible CRI value is 100, so luminaires close to this level will bring a higher visual comfort. Low CRI ratings will result in a low quality for the colours reproduced. This is an important index to consider when designing the lighting of a space. The higher the CRI index, the better the light quality. That is why Spear Lighting has taken into account this parameter when designing its LED luminaires. A high percentage of our LED luminaires is available in a CRI of 90. The regulations require a minimum CRI of 80 for interior use.

UNIFIED GLARE RATING (UGR)

One of the key ways to assess the quality of a luminaire is the control it has over glare and the level to which it keeps glare to a minimum. The International Commission on Illumination (CIE) defines glare as “visual conditions in which there is excessive contrast or an inappropriate distribution of light sources that disturbs the observer or limits the ability to distinguish details and objects”. The quantitative method for measuring direct glare is called the Unified Glare Rating. The unified glare rating (UGR) is a measurement of the light within a specific environment, as recommended by the International Commission on illumination. The lower the UGR, the greater the level of visual comfort.

LED PHOTOBIOLOGICAL SAFETY

Modern LEDs emit high-intensity optical radiation across the ultraviolet, visible and infrared spectrums, which has raised concerns about their potentially harmful photobiological effects. These include photochemical and thermal interactions, known to be of risk to the eyes and human skin, over the spectral range 200-3000nm.

Regulation addressing photobiological safety is constantly evolving commensurate with developments in LED technology. The photobiological requirements of IEC/EN 62471 and more recently IEC/TR 62471-2 and IEC TR 62778 lay out a process for assessing the safety of lamps and luminaires based on absolute radiance and irradiance levels against limits defined in the standard and assigns products to a particular risk group. There are four defined risk groups: exempt group (RG0), low risk group (RG1), moderate risk group (RG2) and high risk group (RG3).

Risk Group (RG)	Ultraviolet hazard efficacy of luminous radiation (mW/klm)
Exempt (RG0)	≤2
Low Risk (RG1)	>2 and ≤6
Moderate Risk (RG2)	>6 and ≤60

PROTECTION INDICES

IP RATING (INGRESS PROTECTION)

The IP rating is a two-digit number that indicates the degree of protection afforded to an enclosure (in accordance with IEC 529 -EN 60529 publication).

The 1st digit (E.g. IP6X) indicates the degree of protection against solid foreign bodies and dust.
The 2nd digit (E.g. IPX5) indicates the degree of protection against entry of moisture.

CODE	1st Digit (Dust)	2nd Digit (Moisture)
0	No protection	No protection
1	Protected against solid foreign bodies greater than 50mm	Protected against vertically dipping water
2	Protected against solid foreign bodies greater than 12mm	Protected against diagonally dripping water (Angle of 15° from above)
3	Protected against solid foreign bodies greater than 2.5mm	Protected against diagonally dripping water (Angle of 60° from above)
4	Protected against solid foreign bodies greater than 1mm	Protected against water sprays from all directions
5	Protected against dust	Protected against low pressure jets of water from all directions
6	Fully protected against dust	Protected against strong jets of water from all directions
7		Protected against the effects of temporary immersion in water between 150mm and 1m
8		Protected against long periods of immersion in water under pressure

IK RATING

The IK rating indicates the degree of protection provided by enclosures for electrical equipment against external impacts (in accordance with IEC 62262)

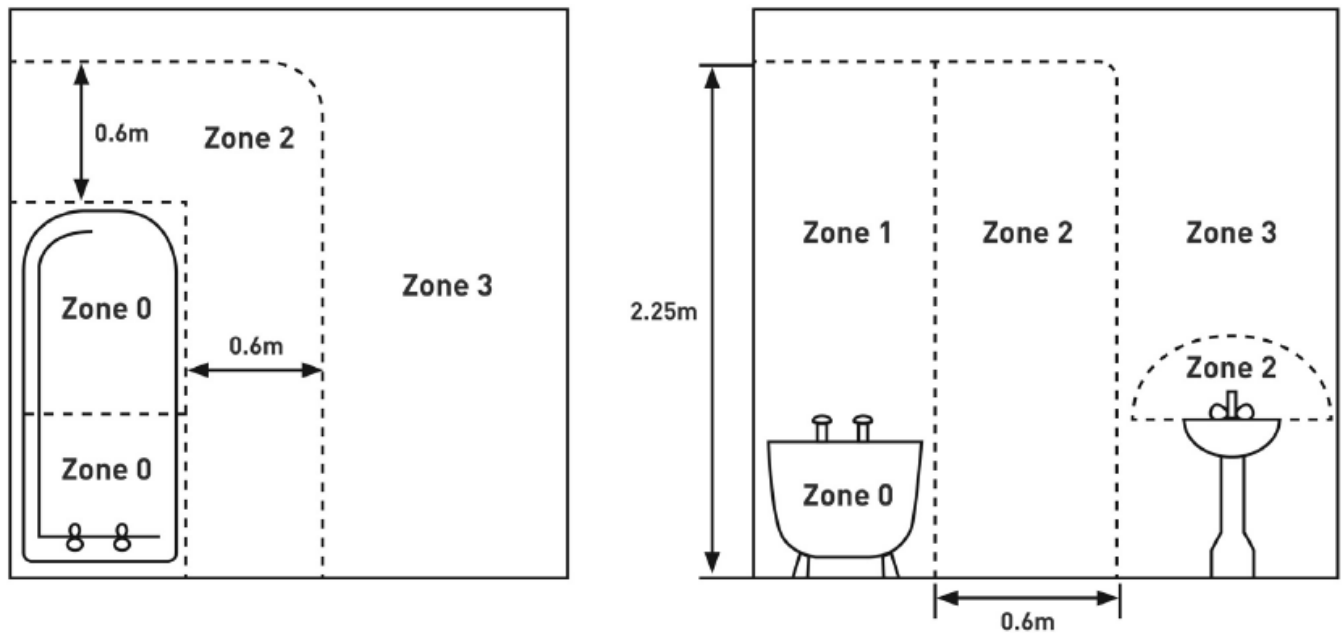
CODE	Impact Energy (joules)
00	No protection
01	0.14
02	0.20
03	0.35
04	0.50
05	0.70
06	1
07	2
08	5
09	10
10	20

BATHROOM ZONES

WHERE SHOULD THE IP65 FIRE RATED DOWNLIGHT BE USED?

IP stands for ingress protection; the IP65 fire rated downlight is completely protected against dust and protected against low pressure jets of water from all directions. The IP65 rating makes them ideal for use in bathrooms and shower facilities.

The following sketch of a bathroom space is divided into 4 zones. Each zone is numbered according to its distance from a source of water:



ZONE 0

The inside of the bath or shower that can hold water. This area has regular exposure to water, or complete immersion, Electrical products must be low voltage (no higher than 12V) and rated no lower than IP67.

ZONE 1

The area directly above the bath or shower tray up to a height of 225cm, such as the inside of a shower cubicle. Fittings in this area must be splash proof, carrying a minimum rating of IP44. If the fitting is subject to direct contact with water, a higher rating of IP65 (jet proof) is required.

ZONE 2

Any area in the bathroom within 60cm of the perimeter of the shower cubicle, bath or sink. Fittings in this area must be splash proof, carrying a minimum rating of IP44. Legislation states bathroom lighting in this area should be fit for purpose in compliance with BS7671.

ZONE 3

All other areas of the bathroom. Although no specific IP rating is required for this area many developers and contractors choose to install bathroom lights with a minimum rating of IP44. Legislation states bathroom lighting in this area should be fit for purpose in compliance with BS7671.

The above bathroom lighting zones information is intended as a guide only.

The information is based on the UK IEE Wiring regulations (BS7671) which may be subject to change.

ZHAGA TECHNICAL INFORMATION

GEN 4		SLE GEN4 ADVANCE (CRI >80)				SLE GEN4 EXCITE (CRI >90)				EUROPEAN STANDARDS	STANDARDS	LUMEN MAINTENANCE
Zhaga LES	Power	Current	MacAdam3		MacAdam3		MacAdam3		MacAdam3	EN 62031 EN 62471	IEC 62717 IEC 61000-4-2	>60,000hr Tp 65° Ambient temp 25°C
			CRI 80 / 3000K	CRI 80 / 4000K	CRI 80 / 4000K	CRI 90 / 3000K	CRI 90 / 4000K	CRI 90 / 4000K				
			Tc = 100°C		Tc = 100°C		Tc = 100°C					
W	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm
LES 19-3000	11	350	1520 (049/R049)	1690 (050/R050)	151	1690 (050/R050)	113	1270 (051/R051)	131	1470 (052/R052)		
LES 19-3000	16	500	2240 (053/R053)	2420 (054/R054)	147	2420 (054/R054)	113	1860 (055/R055)	129	2120 (056/R056)		
LES 19-3000	24	700	3110 (057/R057)	3290 (058/R058)	138	3290 (058/R058)	108	2570 (059/R059)	121	2890 (060/R060)		
LES 23-5000	23	700	3250 (061/R061)	3460 (062/R062)	151	3460 (062/R062)	116	2650 (063/R063)	124	2840 (064/R064)		
LES 23-5000	36	1050	4750 (065/R065)	4990 (066/R066)	140	4990 (066/R066)	108	3840 (067/R067)	117	4180 (068/R068)		
LES 23-5000	49	1400	5970 (069/R069)	6250 (070/R070)	127	6250 (070/R070)	99	4900 (071/R071)	107	5270 (072/R072)		
Photometric code			830 / 369	840 / 369			930 / 369			940 / 369		
Zhaga LES	Power	Current	MacAdam3		MacAdam3		MacAdam3		MacAdam3	EN 62031 EN 62471 EN 61547 EN 55015	IEC 62717	51,000hr Tp 65° Ambient temp 25°C
			CRI 80 / 3000K	CRI 80 / 4000K	CRI 80 / 4000K	CRI 80 / 4000K	CRI 80 / 4000K	CRI 80 / 4000K				
			Tc = 65°C		Tc = 65°C		Tc = 65°C					
W	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm
FLE G1-30	72	1400	6600 (073/R073)	7500 (074/R074)	151	7500 (074/R074)						
FLE G1-40	81	1750	8650 (075/R075)	9400 (076/R076)	138	9400 (076/R076)						
Photometric code			830 / 349	840 / 349								

HAZARDOUS CODES



ATEX CODING



EU - EXPLOSIVE ATMOSPHERE SYMBOL

II

Equipment group:

- | Mining
- || Remaining potentially explosive environments besides mines.

G

Gas	0
	1
	2

D

Dust	20
	21
	22

3

Equipment category:

- M1** Presence (methane, dust)
- M2** Risk of presence (methane, dust)
[In presence of explosive atmosphere]
- 1** Very high protection
- 2** High protection
- 3** Normal protection

COMPOUND GROUP - DUST

IIIA	Combustible flyings
IIIB	Non-conductive dust
IIIC	Conductive dust

COMPOUND GROUP - GAS

I	Methane (mining only)
IIIA	Propane
IIIB	Ethylene
IIIC	Hydrogen

Gases are classified according to the ignitability of gas-air mixture. Refer to IEC/EN 60079-20-1 for classification of common gases and vapours.

TEMPERATURE CLASS

Class T	Maximum Surface Temperature
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

EQUIPMENT PROTECTION LEVEL

Equipment Protection Level	Zone
Ga	0
Gb	1
Gc	2
Da	20
Db	21
Dc	22
Ma	Energised*
Mb	De-energised*

G Gas **D** Dust **M** Mining *in explosive atmospheres

HAZARDOUS CODES

GAS

Application Areas	Protection	Norms	Protection Type
Zone 0	ia	EN / IEC 60079-11	Intrinsic safety
	ma	EN / IEC 60079-18	Encapsulation
Zone 1	ib	EN / IEC 60079-11	Intrinsic safety
	d	EN / IEC 60079-1	Flameproof
	e	EN / IEC 60079-7	Increased safety
	mb	EN / IEC 60079-18	Encapsulation
	o	EN / IEC 60079-6	Oil filled immersion
	pxb	EN / IEC 60079-2	Pressurised
	pyb	EN / IEC 60079-2	Pressurised
	q	EN / IEC 60079-5	Powder filled
	b	EN 13463-6*	Control of ignition source
	c	EN 13463-5*	Constructional safety
	d	EN 13463-3*	Flameproof
	p	EN 13463-7*	Pressurisation
	k	EN 13463-8*	Liquid immersion
Zone 2	ic	EN / IEC 60079-11	Intrinsic safety
	pzc	EN / IEC 60079-2	Pressurised
	nA	EN / IEC 60079-15	Non-sparking
	nL	EN / IEC 60079-15	Energy limited
	nR	EN / IEC 60079-15	Restricted breathing
	nC	EN / IEC 60079-15	Enclosed break
	mc	EN / IEC 60079-18	Encapsulation
	fr	EN 13463-2*	Flow restriction

DUST

Application Areas	Protection	Norms	Protection Type
ZONE 0	ia	EN / IEC 60079-11	Intrinsic safety
	ta	EN / IEC 61241-1	Enclosure
	ma	EN / IEC 60079-18	Encapsulation
ZONE 1	ibD	EN / IEC 60079-11	Intrinsic safety
	mb	EN / IEC 60079-18	Encapsulation
	tb	EN / IEC 61241-1	Enclosure
	p	EN / IEC 61241-2	Pressurised
	d	EN 13463-3*	Flameproof
	c	EN 13463-5*	Constructional safety
	b	EN 13463-6*	Control of ignition source
	p	EN 13463-7*	Pressurisation
k	EN 13463-8*	Liquid immersion	
ZONE 2	fr	EN 13463-2*	Flow restriction
	tc	EN / IEC 61241-1	Enclosure
	mc	EN / IEC 60079-18	Encapsulation
	ic	EN / IEC 60079-11	

STANDARDS, NORMS + REGULATIONS

EN 60598-1	Luminaires - General requirements and tests
EN 60598-2-1	Fixed general purpose luminaires. Particular requirements
EN 60598-2-2	Recessed luminaires. Particular requirements
EN 60598-2-13	Ground recessed luminaires. Particular requirements
EN 62031	LED modules for general lighting
EN 62471	Photobiological safety of lamps and lamp systems
EN 12464-1	Lighting of work places. Indoor work places
EN 50102	Test to determine the degree of enveloping protection

VERIFICATION OF LIGHT LEVELS

The light levels below indicate those issued. Verification is listed in the adjacent columns and are taken from the existing standards to date, and the source is listed adjacent to each group.

The information contained will also seek to include a separate reference for updated changes where we are informed these are in consultation. The following are abridged recommendations taken from the existing standards. To avoid confusion, the designer must refer to the standards directly.

EDUCATIONAL LUX LEVELS

Guidance from CIBSE LG4 BSEN12464-1 2011; SLL Lighting Handbook 2018

EDUCATIONAL BUILDINGS LIGHTING LEVEL GUIDE

Nursery School , Play School

Location	LUX	UGR	Uo	Notes
Play Room	300	22	0.4	Sec 5.35.1 Use Low Luminance
Nursery	300	22	0.4	Sec 5.35.2 Use Low Luminance
Handicraft Room	300	19	0.6	Sec 5.35.3

Educational Buildings

Location	LUX	UGR	Uo	Notes
Classrooms, Tutorial Rooms	300	19	0.6	With Dimming
Classrooms for Evening & Adult Education	500	19	0.6	With Dimming
Auditorium, Lecture Halls	500	19	0.6	With Dimming
Blackboards	500	19	0.7	Vertical Illuminance include presenter
Demonstration Table	500 / (750 in Lecture Hall)	19	0.7	
Art Rooms	500	19	0.6	Use ART Grade LED
Art Rooms in Art School	500	19	0.7	Use ART Grade LED
Technical Drawing Room	750	16	0.7	
Teaching Workshop	500	19	0.6	
Music Practise Rooms	300	19	0.6	
IT Rooms	300	19	0.6	Special Conditions
Language Laboratory	300	19	0.6	
Prep Rooms & Workshops	500	22	0.6	
Entrance Halls	200	22	0.4	
Circulation Areas, Corridors	100	25	0.4	
Stairs	150	25	0.4	
Student Common Rooms & Assembly Halls	200	22	0.4	
Staff Room/Office	300	19	0.6	
Library: Bookshelves	200	19	0.6	Vertical Illumination
Library: Reading Areas	500	19	0.6	
Sports Halls, Gyms, Swimming pools	300			LG4 and association requirements
Canteens	200	22	0.4	
Kitchen	500	22	0.6	
Practical Rooms & Laboratories	500	19	0.6	

* The information above is included to serve solely as a point of reference for convenience and is liable to change. Please consult the latest CIBSE guide for comprehensive recommendations and SLL Lighting Handbook.

HEALTHCARE LUX LEVELS

Guidance from CIBSE LG2 :2008; BSEN 21464-1 :2011; SLL Lighting Handbook

HEALTHCARE LIGHTING LEVEL GUIDE

Public Areas

Location	LUX	LUX Emax	UGR	Uo	Notes
Entrance	200		22		At floor level. Section 3.3 should include drama as in commercial buildings
Reception	300	520	19		At Floor Level
Enquiry Desk	500		22		Task Area with facial recognition
Hospital Streets & Corridors	200	350	19	0.7	At Floor Level. Specific corridors may have specific other night criteria
Stairs	150		25		On Landing and treads. Specific Emergency Escape requirements
Changing Rooms/WC's	100 - 150		22	0.4	Lower level for small areas only
Dining Areas	200				At Floor allow atmospheric lighting
	300	520	22		At working plane
Floor	50		22		Allow for cleaning, security and maintenance levels

Wards

Location	LUX	LUX Emax	UGR	Notes
Bed Areas	300	520	19	At bed level
	300	520	19	At bed level
	100	170	19	At floor
Ward Corridors	200	350	19	At floor
	50	75	19	At floor
Nurses Station	300	520	19	At working plane
	30 - 200	250	22	At working plane using general and/or task lighting
Day Rooms	200		22	Apply a comfortable but non clinical feel

Clinical Areas

Location	LUX	LUX Emax	UGR	Notes
Operating Theatre	10,000 - 100,000		Refer to standard	At table level. Use Art Level LEDs Conformity to BSEN 60601-2-41
Scrub Room	500	860	19	At sink top
Recovery Rooms	500	860	19	At sink top
Transfers	300	520	19	
Minor Operations	15,000 - 30,000		Refer to standard	Use Art Level LEDs Conformity to BSEN 60601-2-41
Examination Rooms	500	850	19	At working plane.

* The information above is included to serve solely as a point of reference for convenience and is liable to change. Please consult the latest CIBSE guide for comprehensive recommendations and SLL Lighting Handbook.

OFFICE LUX LEVELS

Guidance from CIBSE LG2 :2008; BSEN 21464-1 :2011; SLL Lighting Handbook

OFFICE BUILDING LIGHTING LEVEL GUIDE

General

Location	Eave LUX	EC Modelling Ratio	UGR	Uo	Notes
Open Plan Offices	300	30-60%	19		0.6 Uo if the task area unknown
	500	30-60%	19		Task Area
Deep Plan Offices	see notes	30-60%	19		500 or 750 Day & 300 or 500 Dusk onwards
Cellular Offices	300	30-60%	19		Task area
	500	30-60%	19		Task area
Graphics Work Station	300	30-60%	19		Task area
Executive Offices	300 - 500	30-60%	19		Task area
Meeting Rooms	300	30-60%	19		Task area
	500	30-60%	19		Task area
Conference Rooms	300	30-60%	19		Task area
	500	30-60%	19		Task area
Board Room	300	30-60%	19		Task area
	500	30-60%	19		Task area
Training Rooms	300	30-60%	19		Task area
	500	30-60%	19		Task area
Libraries	200		19	0.4	Ev Vertical to Bottom Shelf
	300		19	0.4	To Working Plane
	500	30-60%	19		Task Area
Refreshment Points/Rest Rooms	200	30-60%	22		
	300	30-60%	22		Task Area
Canteens/Restaurants	200	30-60%	22		Task Area
	300	30-60%	22		Task Area
	500	30-60%	22		Task Area
Entrance Halls/Reception	200	30-60%	22		Task Area
	300	30-60%	22		Task Area
	300	30-60%	22		Task Area
Corridors	100	30-60%	25		At Floor level. 150Lux if vehicles are used. Use transition zones
Plant Rooms	200	by assessment	25	0.4	At Working plane, On the vertical for control panels and Emergency use
Store	100 & 200 Vertical		25	0.4	At Working plane, For shelving vertical performance levels
	300 & 200 Vertical		25	0.6	For vertical rack, Uo 0.4

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RESIDENTIAL LUX LEVELS

Performance standards Guidance LG9, BSEN 12464-1 and HSG38

COMMUNAL RESIDENTIAL BUILDING LIGHTING LEVEL GUIDE

General

Location	LUX	LUX Emin	UGR	Uo	Notes
Entrance	200				Apply modelling ratio 30-60% under HSG38 Risk Guidance for facial intent
Corridors - Day	100		28	0.4	It's a cleaners workplace hence BSEN 12464-1
Corridors - Night	20	5			
Stairs	100		25	0.4	Performance on treads see also LG16 Guidance
Toilets	100		25	0.4	It's a cleaners workplace hence BSEN 12464-1
Bathrooms	150		25	0.4	It's a cleaners workplace hence BSEN 12464-1
Lounge	100-200		22	0.4	Higher levels if elderly opr visually impaired. 200Lux Task lighting for reading (5.28.3)
TV Lounge	50				
Lift Lobbies	100		25	0.4	Highlight lift doors to 200Lux (5.1.3)
Kitchens	200		22	0.4	(5.2.1)
Dining Area	150				
Galleys	150				
Utility Rooms & Laudrettes	200				

Bedrooms

Location	LUX	UGR	Uo	Notes
General	100			
Desk	250	N/A	N/A	Task Area
Bedhead	100			Task Area

Exterior

Location	LUX	UGR	Uo	Notes
Pathway	10	50	0.25	EN12464-2 Sec 5.4 Table 5.1.1
Car Park	10			Refer to section on car parks See Car Park Levels

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LEISURE CENTRE LUX LEVELS

Guidance from BSEN 12564-1 :2011 ; BSEN 12193:2018

LEISURE CENTRE LIGHTING LEVEL GUIDE

General

Location	LUX	UGR	Uo	Notes
Entrance Halls / Reception	200	22	0.4	
	300	22	0.6	
Corridors	100	28	0.4	
WCs	200	24	0.4	Other references -SLL lighting guide 2018 100Lux at Floor Uo 0.40; Other measurements at 0.6m for toilet cubical
Changing Room	100	22	0.4	
Boiler / Plant Room	200	25	0.4	
Store	100	25	0.4	Open floor areas
	200	25	0.4	If continuously occupied and /or Vertically across shelving / filing systems

Indoor

Location	LUX	UGR	Uo
Badminton	300	N/A	0.7
Squash			
Basketball	200	N/A	0.7
5-a-side Football			
Netball			
Volleyball			
Aerobics	200	N/A	0.6
Gymnastics			
Gym Work			
Tennis	300	N/A	0.5-0.7
Swimming	200	N/A	0.5-0.7
Boxing	500	N/A	0.5-0.8

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CAR PARK LUX LEVELS

CAR PARK LIGHTING LEVEL GUIDE

Light Traffic

Location	Outdoor Parking			Indoor Parking			Notes
	LUX	GR	Uo	LUX	UGR	Uo	
E.g. Parking areas of shops, terraced houses and apartments, cycle parks	5	By Risk G4, G5 or G6 class and ≤ 55	0.25	75	<25	0.4	Indoor - BSEN 12464-1 Sec 5.34.4. Ramps and traffic lanes have further requirements. Use method from BS5489-1. Outdoor - By Risk Assessment comprising G4, G5 and G6 classes from BS5489-2:2015 Section A3

Medium Traffic

Location	Outdoor Parking			Indoor Parking			Notes
	LUX	GR	Uo	LUX	UGR	Uo	
E.g. Parking areas of department stores, office buildings, plants, sports and multi-purpose building complexes	10	By Risk G4, G5 or G6 class and ≤ 50	0.25	75	<25	0.4	

Heavy Traffic

Location	Outdoor Parking			Indoor Parking			Notes
	LUX	wGR	Uo	LUX	UGR	Uo	
E.g. Parking areas of schools, churches, major shopping centres, major sports and multi-purpose building complexes	20	By Risk G4, G5 or G6 class and ≤ 50	0.25	75	<25	0.4	
Ticket Office		N/A		300	19	0.6	

Ramp IN/OUT

Location	Outdoor Parking			Indoor Parking			Notes
	Eav LUX	GR	Emin LUX	LUX	UGR	Uo	
Open to sunlight - Ramp in/out day							
Open to sunlight - Ramp in/out night	30	50	15				From BS5489-1 :2013 Sec 7.4.7.1 Table 4
Enclosed from sunlight - Ramp in/out day	350	50	150	300	<25	0.4	At floor level From BS5489-1 :2013 Sec 7.4.7.1 Table 5
Enclosed from sunlight - Ramp in/out night	100	50	50	75	<25	0.4	At floor level From BS5489-1 :2013 Sec 7.4.7.1 Table 6

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HEAT + FIRE RESISTANCE TESTING

Thermoplastic materials undergo certain tests to certify their ability to withstand heat and fire. The requirements are established by Building Regulations Approved Document B, which sets out the fire safety of buildings. Section B2 covers internal fire spread. There are three possible fire-extinguishing ratings that are used for thermoplastic (TP) diffuser materials:

1. No rating

Luminaires with no rating pose the greatest risk and should be avoided. There is currently no stipulation in the UK Building Regulations regarding the use of non-rated thermoplastic diffusers. However, luminaires that form part of a ceiling (i.e. recessed) must be either TP(a) or TP(b) rated and be installed in accordance with the Part B regulations relating to that rating.

2. TP(a) rating

TP(a) usually relates to polycarbonate diffusers with a thickness of at least 3mm. The testing procedure requires that the material self-extinguishes, and any flaming and afterglow must not exceed five seconds once the source of flame is removed. There are no restrictions on the use of a TP(a) rated diffuser material.

3. TP(b) rating

TP(b) materials tend to be acrylic or polystyrene, which can catch fire therefore their use is limited by the extent of the installation. The total area of diffuser panels must not exceed 15% of the total floor area in circulation areas or 50% in offices. The testing for TP(b) requires that the spread of flame must be no more than 50mm per minute, which equates to 12 minutes for a 600mm wide panel.

Glow wire testing is an electrical safety test designed to evaluate the flame-resistant properties of plastic materials used in electrical products and protect against the risk of fire. The glow wire simulates an over-heated part that comes into contact with plastic materials. In the UK, the temperature of the glow wire must be 850°C for luminaires of general purpose in publicly accessible buildings.

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