The Lighting Industry Federation

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TECHNICAL STATEMENT

LIF Technical Statement No. 48

The Lighting Industry Federation Ltd's introduction to the 2010 edition of the Building Regulations Approved Documents L for the Conservation of Fuel and Power

The Department for Communities and Local Government in England, has now published the 2010 editions of its ADLs covering England and Wales. These come into force on 1st October 2010. In parallel, both the Scottish and Northern Ireland Governments have published their equivalents which have similar requirements and implementation dates but are presented in a slightly different manner. In the UK Regulations, there are four documents which give the energy efficiency requirements for the following building types:

Approved Document L1A – Conservation of fuel and power in New Dwellings
Approved Document L1B – Conservation of fuel and power in Existing Dwellings
Approved Document L2A – Conservation of fuel and power in New Buildings other than Dwellings
Approved Document L2B – Conservation of fuel and power in Existing Buildings other than Dwellings.

The majority of the content of these documents deals with the building envelope and fixed building services giving guidance on how to meet the requirements of the Building Regulations.

However, there is very little reference to lighting in these documents. The lighting requirements appear in the Compliance documents which have the same legal standing as the Regulations. There are two Compliance Documents:

- New and existing buildings other than domestic; "Non-Domestic Buildings Services Compliance Guide: 2010 Edition"
- New and existing domestic buildings; "Domestic Buildings Services Compliance Guide: 2010 Edition"

An extract from the two compliance documents showing the requirements of lighting are shown in the following Annexes:
Annex A-**"Energy performance compliance of lighting for new and existing buildings other than domestic buildings (non-domestic)"**

Annex B-"Energy performance compliance of lighting for new and existing domestic buildings"

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Annex A

"**Energy performance compliance of lighting for new and existing buildings other than domestic buildings (non-domestic)"**

Section 12 - Lighting

12.1 Introduction

This section provides guidance on specifying lighting for new and existing buildings to meet minimum energy efficiency standards in building regulations.

12.2 Scope of guidance

The guidance in this section applies to the following types of lighting:

- general interior lighting;
- display lighting.

12.3 Key terms

Office area **means a space that involves predominantly desk-based tasks, eg a classroom, seminar or conference room.**

Daylit space **means any space:**

a. within 6 m of a window wall, provided that the glazing area is at least 20% of the internal area of the window wall; or
b. below roof lights provided that the glazing area is at least 10% of the floor area.

The normal light transmittance of the glazing should be at least 70%; if the light transmittance is below 70%, the glazing area should be increased proportionately for the space to be defined as daylit.

Space classification for control purposes[1]:

Owned space **means a space such as a small room for one or two people who control the lighting, eg a cellular office or consulting room.**

Shared space **means a multi-occupied area, eg an open-plan office or factory production area.**

Temporarily owned space **means a space where people are expected to operate the lighting controls while they are there, eg a hotel room or meeting room.**

[1] These definitions are given in more detail in BRE Information Paper IP6/96 *People and lighting controls* and BRE Digest 498 *Selecting lighting controls.*

Occasionally visited space **means a space where people generally stay for a relatively short period of time when they visit the space, eg a storeroom or toilet.**

Unowned space **means a space where individual users require lighting but are not expected to operate the lighting controls, eg a corridor or atrium.**

Managed space **means a space where lighting is under the control of a responsible person, eg a hotel lounge, restaurant or shop.**

Local manual switching **means, in local or flexible manual switching, the distance on plan from any local switch to the luminaire it controls should generally be not more than six metres, or twice the height of the light fitting above the floor if this is greater. Where the space is a daylit space served by side windows, the perimeter row of lighting should in general be separately switched.**

Photoelectric control **is a type of control which switches or dims lighting in response to the amount of incoming daylight.**

Presence detection **is a type of control which switches the lighting on when someone enters a space, and switches it off, or dims it down, after the space becomes unoccupied.**

Absence detection is a type of control which switches the lighting off, or dims it down, after the space becomes unoccupied, but where switching on is done manually.

Lamp lumens **means the sum of the average initial (100 hour) lumen output of all the lamps in the luminaire.**

Circuit-watt **is the power consumed in lighting circuits by lamps and, where applicable, their associated control gear (including transformers and drivers) and power factor correction equipment.**

Lamp lumens per circuit-watt **is the total lamp lumens summed for all luminaires in the relevant areas of the building, divided by the total circuit-watts for all the luminaires.**

LOR **is the light output ratio of the luminaire, which means the ratio of the total light output of the luminaire under stated practical conditions to that of the lamp or lamps contained in the luminaire under reference conditions.**

Luminaire lumens per circuit-watt **is the (lamp lumens x LOR) summed for all luminaires in the relevant areas of the building, divided by the total circuit-watts for all the luminaires.**

12.4 Lighting in new and existing buildings

a Lighting in new and existing buildings should meet the minimum standards for

efficacy (averaged over the whole area of the applicable type of space in the building) in Table 44.

b Metering of lighting for new and existing buildings (to record the lighting energy consumption) should meet the minimum standards in Table 46.

c Lighting controls in new and existing buildings should meet the minimum standards in Table 47, or follow the guidance in BRE Digest 498 Selecting lighting controls**. Display lighting, where provided, should be controlled on dedicated circuits that can be switched off at times when people will not be inspecting exhibits or merchandise or being entertained.**

Table 44: Minimum lighting efficacy in new and existing buildings

Lighting type	**Minimum lighting efficacy, %**
General lighting in office, industrial and storage areas	The average initial efficacy should be not less than 55 luminaire lumens per circuit-watt. In calculating the average luminaire lumens per circuit-watt, the circuit-watts for each luminaire may first be multiplied by the control factors in Table 45. Note: The value entered in the NCM tools for calculating the $C0_2$ emission rate for new buildings (BER) should be the value before the control factor is applied, since NCM tools already take account of additional controls by reducing the BER.
General lighting in other types of space	The average initial efficacy should be not less than 55 lamp lumens per circuit-watt.
Display lighting	The average initial efficacy should be not less than 22 lamp lumens per circuit-watt.

Table 45: Luminaire control factors for use in new and existing buildings

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Light output control	Control Factor
a. The luminaire is in a daylit space and its light output is controlled by photoelectric switching or dimming control, with or without override.	0.9
b. The luminaire is in a space that is likely to be unoccupied for a significant number of operating hours, and where a sensor switches off the lighting in the absence of occupants but switching on is done manually except where this would be unsafe.	0.9
c. Circumstances a. and b. combined.	0.85
d. None of the above.	1.0

Table 46: Minimum provisions for metering of general and display lighting in new and existing buildings

	Minimum provision
Metering for general or display lighting	a. kWh meters on dedicated lighting circuits in the electrical distribution; or b. local power meter coupled to or integrated in the lighting controllers of a lighting or building management system; or c. a lighting management system that can calculate the consumed energy and make this information available to a building management system or in an exportable file format. (This could involve logging the hours run and the dimming level, and relating this to the installed load.)

Table 47: Recommended controls for general and display lighting in new and existing buildings

Space classification[47]	**Control type**
Owned	Manual by door
Shared	Flexible manual switching, eg local pull cords or wireless transmitter
Temporarily owned	Local manual switching*
Occasionally visited	Local manual switching*
Unowned	Time switching
Managed	a) Time switching; or b) Centralised manual

***Note definition of local manual switching given above**

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SUMMARY OF CHANGES 2006 TO 2010 NON-DOM

	2006 Non-dom New	Existing Non-dom Refurb	New Non-dom new and refurb	New non-dom refurb
General interior Luminaire lm/cct watt	45	45	55	55
Controls factors	NO	Yes	Yes	Yes
General in all other spaces Lamp-lms/cct w	50	50	55	55
Display lighting Lamp-lms/cct w	15	15	22	22
Controls	Yes	Yes	Enhanced	Enhanced
Metering	No	No	Yes	Yes
Daylight	Yes	yes	Same	Same

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Annex B

"Energy performance compliance of lighting for new and existing domestic buildings"

Section 12 – Lighting

12.1 Scope of guidance

This section provides guidance on the specification of fixed internal and external lighting for new and existing dwellings to meet minimum energy efficiency standards in building regulations.

12.2 Key terms

Circuit-watt means the power consumed in lighting circuits by lamps and, where applicable, their associated control gear (including transformers and drivers) and power factor correction equipment.

Light fitting means a fixed light or lighting unit that can comprise one or more lamps and lampholders, control gear and an appropriate housing. The control gear may be integrated in the lamp or located elsewhere in or near to the fixed light.
Fixed external lighting means lighting fixed to an external surface of the dwelling supplied from the occupier's electrical system. It excludes lighting in common areas of blocks of flats and in other communal accessways.

12.3 Internal and external lighting

Fixed internal and external lighting should meet the minimum standards for efficacy and controls in Table 40.

Table 40: Minimum provisions for fixed internal and external lighting

Lighting	New and replacement systems	Supplementary information
Fixed internal lighting	a. In the areas affected by the building work, provide low energy ***light fittings*** (fixed lights or lighting units) that number not less than three per four of all the ***light fittings*** in the main dwelling spaces of those areas (excluding infrequently accessed spaces used for storage, such as cupboards and wardrobes). b. Low energy ***light fittings*** should have lamps with a luminous efficacy greater than 45 lamp lumens per circuit-watt and a total output greater than 400 lamp lumens. c. ***Light fittings*** whose supplied power is less than 5 circuit-watts are excluded from the overall count of the total number of light fittings.	***Light fittings*** *may be either:* d. *dedicated fittings which will have separate control gear and will take only low energy lamps (eg pin based fluorescent or compact fluorescent lamps); or* e. *standard fittings supplied with low energy lamps with integrated control gear (eg bayonet or Edison screw base compact fluorescent lamps).* ***Light fittings*** *with GLS tungsten filament lamps or tungsten halogen lamps would not meet the standard.* *The Energy Saving Trust publication GIL 20, "Low energy domestic lighting", gives guidance on identifying suitable locations for fixed energy efficient lighting.*
Fixed	Where fixed external lighting is installed, provide	

external lighting	***light fittings*** with the following characteristics. a. Either: i. lamp capacity not greater than 100 lamp-watts per light fitting; and ii. all lamps automatically controlled so as to switch off after the area lit by the fitting becomes unoccupied; and iii. all lamps automatically controlled so as to switch off when daylight is sufficient. b. Or iv. lamp efficacy greater than 45 lumens per circuit-watt; and v. all lamps automatically controlled so as to switch off when daylight is sufficient; and vi. light fittings controllable manually by occupants.	
		British Standards *BS EN 15193:2007 "Energy performance of buildings – Energy requirements for lighting".* ***Other related documents*** *CE80 "Domestic lighting innovations", Energy Efficiency Best Practice in Housing.* *CE61 "Energy efficient lighting – guidance for installers and specifiers", Energy Saving Trust.* *EP84 "Housing for people with sight loss", Thomas Pocklington Trust Design Guide.* *IP412 "Making the most of your sight: Improve the lighting in your home", RNIB and Thomas Pocklington Trust.*

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SUMMARY OF CHANGES DOMESTIC 2006 TO 2010

	2006 New Domestic	2006 Refurbish Domestic	2010 New Domestic	2010 Refurbish Domestic
Internal	40 Lamp-lms/cct w At least 1 every 25 m^2	40 Lamp-lms/cct w At least 1 every 25 m^2	"low energy light fittings" 45 Lamp-lms/cct w & over 400 lm	"low energy light fittings" 45 Lamp-lms/cct w & over 400 lm
External	Max 150 Watts/fitting Controls OR 40 lms/cct w	Max 150 Watts/fitting Controls OR 40 lms/cct w	Max 100 lamp Watts FULL Auto controls OR 45 Lamp-lms/cct w Timer/manual	Max 100 lamp Watts FULL Auto controls OR 45 Lamp-lms/cct w Timer/manual