

MALAYSIAN STANDARD

MS 1525 : 2019

(THIRD REVISION)

Chapter 6 Lighting

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WG members for Lighting

- Association of Consulting Engineers Malaysia
- Energy Commission
- Jabatan Kerja Raya
- Malaysia International Commission on Illumination
- Philips Lighting Commercial (M) Sdn Bhd
- SIRIM Berhad
- SIRIM QAS International Sdn Bhd
- The Electrical and Electronics Association of Malaysia
- The Institution of Engineers, Malaysia

Major modifications for Chapter 6

- a) Exclusions to use of energy efficient lighting is redefined
- b) General principles of efficient lighting is expanded
- c) Minimum CRI requirement is removed
- d) Maintenance factor is introduced
- e) Minimum allowable efficiency of electronic control gear is now stipulated

6. Lighting

6.1 Introduction

6.2 General principles of efficient lighting practice

6.3 Interior building lighting power density requirements

(Maximum allowable power density for illumination systems)

6.4 Building exterior lighting power density requirements

6.5 Lighting controls

6.6 Operation and maintenance manual and as built drawing

(Control accessibility is deleted)

6.1 Introduction

These subclauses apply to the energy efficiency requirements of lighting **except** those required for emergency, security and special purposes such as entertainment facilities, agriculture, recreational facilities, medical and advertisement.

Note: 2014 edition lists 12 (a to l) activities/facilities

6.2 General principles of efficient lighting practice

Lighting shall be selected for their lighting power density, efficacy, recommended average illuminance level, efficient distribution of light with minimum glare, losses, uniformity, maintenance factor, flicker and control gear.

6.2.1 Lighting shall provide a suitable visual environment within a particular space i.e. sufficient and suitable lighting for the performance of a range of tasks and provision of a desired appearance. The Colour Rendering Index (CRI) for a particular task application should also be considered in conjunction with the illuminance level.

(Note: 2014 edition prescribed the CRI)

Table 13: Recommended average illuminance levels - Lux

Task and applications	2001	2007	2014	2019
a) Lighting for infrequently used area:				
- Minimum service illuminance	20	20	20	20
- Interior walkway and car-park	50	100	100	100
- Hotel bedroom	100	100	100	100
- Lift interior	100	100	100	100
- Corridor, passageways, stairs	100	100	100	100
- Escalator, traveller	150	150	150	150
- Entrance and exit	100	100	100	100
- Staff changing room, locker and cleaner room, cloak room, lavatories, stores	100	100	100	100
- Entrance hall, lobbies, waiting room	100	100	100	100
- Inquiry desk	300	300	300	300
- Gate house	200	200	200	200

Table 13: Recommended average illuminance levels - Lux

Task and applications	2001	2007	2014	2019
b) Lighting for working interiors				
- Infrequent reading and writing	200	200	200	200
- General offices, shops and stores, reading and writing	300-400	300-400	300-400	300-400
- Drawing office	300-400	300-400	300-400	300-400
- Restroom	150	150	150	150
- Restaurant, canteen, cafeteria	200	200	200	200
- Kitchen	150-300	150-300	150-300	150-300
- Lounge	150	150	150	150
- Bathroom	150	150	150	150
- Toilet	100	100	100	100
- Bedroom	100	100	100	100
- Classroom, library	300-500	300-500	300-500	300-500
- Shop/supermarket/department store	200-750	200-750	200-750	200-750
- Museum and gallery	300	300	300	300
c) Localised lighting for exacting task				
- proof reading	500	500	500	500
- exacting drawing	1000	1000	1000	1000
- Detailed and precise work	2000	2000	2000	2000

6.2.3 Maintenance factor

The lighting scheme should be designed with a maintenance factor calculated for the selected lighting equipment (such as luminaire, lamp and control gear), environment and specified maintenance schedule.

Maintenance factor (MF) is a factor that allows for the fact that, as lighting systems age, the amount of light they deliver decreases. The use of MF ensures that the system is still delivering the correct illuminance when the system is maintained.

Table 14: Recommended loss values for control gear

No.	Lamp type	Maximum allowable losses	
		2019	2014
1	Fluorescent lamp	4W	4W
2	Sodium 70W	15W	15W
3	Sodium 100W	20W	20W
4	Sodium 150W	22W	22W
5	Sodium 250W	30W	30W
6	Sodium 400W	45W	45W
7	Metal Halide 70W	16W	16W
8	Metal Halide 100W	16W	16W
9	Metal Halide 150W	20W	20W
10	Metal Halide 250W	34W	34W
11	Metal Halide 400W	40W	40W
12	Metal Halide 1000W	60W	60W
13	Mercury 80W		12W
14	Mercury 125W		15W
15	Mercury 250W		18W
16	Mercury 400W		28W

Minimum allowable efficiency of electronic control gear i.e. LED drivers shall be 80%

Table 15: Interior lighting power density (including ballast loss) allowance for typical building area

Type of usage	Maximum lighting power density (W/m ²)			
	2001	2007	2014	2019
a) Lighting for infrequently used area:				
- Minimum service illuminance	-	-	3	3
- Interior walkway and car-park	-	-	5	5
- Lift interior	-	-	5	5
- Corridor, passageways, stairs	17,10	-	5	5
- Escalator, traveller	-	-	6	6
- Entrance and exit	-	-	5	5
- Staff changing room, locker and cleaner room, cloak room, lavatories, stores	-	-	5	5
- Entrance hall, lobbies, waiting room	-	-	5	5
- Inquiry desk	-	-	11	11
- Gate house	-	-	8	8
- Hotel bedroom	17	15	5	-

Table 15: Interior lighting power density (including ballast loss) allowance for typical building area

Type of usage	Maximum lighting power density (W/m ²)			
	2001	2007	2014	2019
a) Lighting for working interiors:				
- Infrequent reading and writing	-	-	8	8
- General offices, shops and stores, reading and writing	20	15	14	12
- Drawing office	-	-	14	14
- Restroom	17,10	-	6	6
- Restaurant, canteen, cafeteria	14	15	8	8
- Kitchen	-	-	11	11
- Lounge	-	-	6	6
- Bathroom	-	-	6	6
- Toilet	-	-	5	5
- Bedroom	-	-	5	5
- Classroom, library, reading area	18	15	18	15
- Retail	30,20	25	24	24
- Museum and gallery	-	-	11	11
- proof reading	-	-	18	18
- exacting drawing	-	-	40	40
- Detailed and precise work	-	-	60	60
- Lobbies/Atriums/Concourse	-	20	-	-
- Auditoriums/Concert Halls	25	15	-	-
- Carparks	5	5	-	-
- Fastfood	20	-	-	-

NOTE: For other areas not listed, refer to ANSI/ASHRAE/IES Standard 90.1

Table 16: Building exteriors maximum lighting power intensity allowance

Building exteriors	Maximum lighting power intensity (W/m²)
Uncovered parking areas	2
Uncovered drive-ways	2
Pedestrian malls	5
Landscape areas	5

6.5 Lighting controls

6.5.1 All lighting systems except those required for emergency, security or exit lighting should be provided with manual, automatic or programmable controls. For appropriate area or lighting loads exceeding 100kW, automatic control shall be provided.

6.5.5 Exterior lighting not intended for 24 hours continuous use should be automatically switched by time and/or photocell.