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H & S Guidance - Lighting

INTRODUCTION

Regulation 8 of the Workplace (Health, Safety and Welfare) Regulations 1992 requires that every workplace has suitable and sufficient lighting. This should be by natural lighting, so far as is reasonably practicable. Good lighting, whether natural or artificial, has an important role to play in promoting health and safety at work. It helps us to see hazards and it can reduce the likelihood of visual fatigue and discomfort.

GUIDANCE

General guidance is available within the Approved Code of Practice on the Workplace Regulations, whilst more detailed considerations can be found in HS(G)38 Lighting at Work. Both have been used in the production of this element.

GENERAL

Lighting should be sufficient to allow people to work, use facilities and move from place to place safely and without experiencing eyestrain. Stairs should be well lit so that shadows are avoided. Where necessary, local lighting should be provided at individual workstations and at places of particular risk. Dazzling lights and annoying glare should be avoided. Lights should not be allowed to become obscured (e.g. by stacked goods)

Lighting should be subject to proper and efficient maintenance. Windows and skylights should where possible be cleaned regularly and allowed to admit maximum daylight whenever appropriate. Where workers are specially exposed to risk if normal lighting fails, emergency lighting must be provided.

DETAILED GUIDANCE

The table overleaf gives average illuminances and minimum measured illuminances for different types of work.



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General Activity	Typical locations/types of work	Average illuminance lux (lx)	Minimum measured illuminance lux (lx)
Movement of people, machines and vehicles ¹	Lorry parks, corridors, circulation routes	20	5
Movement of people, machines and vehicles in hazardous areas; rough work not requiring any perception of detail ¹	Construction site clearance, excavation and soil work, docks, loading bays, bottling and canning plants	50	20
Work requiring limited perception of detail ²	Kitchens, factories assembling components, potteries large	100	50
Work requiring perception of detail ²	Offices, sheet metal work, bookbinding	200	100
Work requiring perception of fine detail ²	Drawing factories assembling offices, electronic components, textile production	500	200

Notes

- 1 Only safety has been considered, because no perception of detail is needed and visual fatigue is unlikely. However, where it is necessary to see detail to recognise a hazard or where error in performing the task could put someone else at risk, for safety purposes as well as to avoid visual fatigue the figure should be increased to that for work requiring the perception of detail.
- 2 The purpose is to avoid visual fatigue; the illuminances will be adequate for safety purposes.

Recommended lighting levels for a wide variety of situations are contained in the CIBSE Code for Interior Lighting 1994. (See Reference/Further Details)



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MANAGING LIGHTING HAZARDS

There are many simple measures that can be taken to eliminate or reduce health and safety risks from lighting hazards. The following table provides some checks and solutions to typical lighting hazards in the work place.

Hazards	Checks	Solutions
Insufficient light on the task	<ul style="list-style-type: none">• Check illuminance levels are in line with lighting recommendations• Check spacing mounting height ratio against manufacturer's data.• Check for veiling reflections.	<ul style="list-style-type: none">• Clean lamps and luminaires.• Replace failed lamps.• Increase reflectance of room• Surfaces, for example change decor to light colours.• Remove obstructions.• Decrease spacing of luminaires or provide more fittings.• Provide local lighting.• Move the working area.
Uneven lighting	<ul style="list-style-type: none">• Check luminance levels across the working place and across surrounding areas.• Check that the ceilings and walls are	<ul style="list-style-type: none">• Replace failed lamps and clean luminaires.• Provide additional luminaires.



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adequately lit.

- Check spacing/mounting height ratio against manufacturer's data.

- Decrease spacing between luminaires.

- Change luminaires to give wide light distribution and more upward light without causing glare.

- Increase the reflectance of room surfaces.

- Remove any obstructions.

Luminaires too bright

- Evaluate effect of luminaire brightness by shielding eyes with hand.

- For bare lamps check whether the lamps are within the exclusion zone (see section on minimum lighting recommendations) is acceptable.

- If bare lamps are used, fit some form of light controller or move outside the exclusion zone.

- If linear luminaires are used, change the orientation to provide an end-on view.

- Raise height of luminaire the reduction in luminance.

- Increase reflectance of room surfaces against which

- luminaires are



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seen.

Hazards	Checks	Solutions
Natural light seen through windows or roof lights too bright	Check the effects of sky brightness by shielding direct view of window and/or roof light.	<ul style="list-style-type: none">• Fit blinds to windows and whitewash roof lights• Ensure that the walls and ceiling areas surrounding the windows and roof lights have a high reflectance.• rearrange work to avoid looking towards windows/roof lights.
Excessive range of brightness	<ul style="list-style-type: none">• Check reflectances of surfaces, particularly those around the task area.• Check location and relative outputs of luminaires.	<ul style="list-style-type: none">• Increase/decrease the reflectances of the room surfaces which are too low/too high.• Use diffusing panels.• Add or change lights to provide more even illuminance.
Bright reflected images adjacent to the task	<ul style="list-style-type: none">• Check whether there are any reflected images in the normal viewing position.• Locate sources of bright image by placing mirror on the image and looking at it from the worker's position.	<ul style="list-style-type: none">• Change workstation surface from a shiny to a matt finish.• Reposition task area.• Reposition sources of brightness• Avoid fluorescent lighting• use a high 'thermal inertia' lamp such as an incandescent filament design.



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Reduced contrast of task because of veiling reflections

- Evaluate degree of veiling reflections.
- Locate sources of veiling reflections by placing mirror on the task and looking at it from the worker's position.
- Change workstation surface to a matt finish.
- Move the workstation.
- Move any bright sources.
- Provide local lighting.
- Increase levels of illuminance between areas by increasing reflectance of room surfaces.

Strong shadows on the task

- Place a thin object, e.g. a pen, on the work surface and note the number and strength of any shadows.
- Increase the reflectance of the room surface.
- Change the luminaires or their spacings to provide a more even illuminance.
- Increase number of luminaires.
- Provide local or task lighting.

Hazards

Flicker

Checks

No test required.

Solutions

- Change lamps near the end of their life.
- Check electrical circuit for any faults in the supply.
- Use high frequency control gear.
- Supply adjacent rows of luminaires from different phases of the electricity supply.



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Stroboscopic effects	No test required.	<ul style="list-style-type: none">• Supply adjacent rows of luminaires from different phases of the electricity supply.• Provide a high frequency supply.• Replace or take away local lighting.• Use high frequency control gear where applicable.
Tasks are difficult to see	<p>Identify which aspects of the task need to be seen and their background.</p> <p>Check illuminance is suitable.</p> <p>check the task is free from veiling reflections and shadows</p>	<ul style="list-style-type: none">• Ensure task background is clear.• Provide appropriate lighting to see details clearly.• Increase contrast between the task and the background.• Provide magnification.

HS(G)38 contains extensive and useful information on lighting recommendations, equipment, installation and emergency lighting.

CHECKLIST - LIGHTING

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| 1. Are all parts of your premises suitably and sufficiently lighted? | YES NO |
| 2. Have there been any complaints or concerns about a lighting situation in the workplace? | YES NO |



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| 3. Do you maintain your lighting satisfactorily (including cleansing) and replace defective lighting units quickly? | YES NO |
| 4. Do you know where to look for specific advice or guidance on lighting matters? | YES NO |

REFERENCES/FURTHER DETAILS

1. HS(G)38 - Lighting at work (HSE) ISBN 0-7176-1232-5
2. CIBSE Code For Interior Lighting (CIBSE, Delta House, 222 Balham High Road, London SW12 9BS). Tel: 020 8675 5211.