

Australian/New Zealand Standard™

Interior and workplace lighting

Part 2.5: Hospital and medical tasks



AS/NZS 1680.2.5:2018

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee LG-001, Interior and workplace lighting, to supersede AS/NZS 1680.2.5:1997.

This Standard is issued as a joint Australian/New Zealand Standard to form part of the AS/NZS 1680.2 series.

The objective of this Standard is to set out recommendations aimed at the provision of a visual environment conducive to the safe and efficient performance of tasks associated with hospitals and medical premises. It is intended to be read in conjunction with the general recommendations of AS/NZS 1680.1 and with other specific recommendations in the AS/NZS 1680.2 series which may apply depending on the function of the interior space or the specific visual tasks involved.

This Standard parallels the structure of AS/NZS 1680.1 and contains recommendations that either add to or amend the recommendations of that Standard. While the sections of this Standard correspond with those of AS/NZS 1680.1, the clauses within each section are numbered consecutively and do not directly relate to the clauses in AS/NZS 1680.1.

Changes from the previous edition are as follows:

- (a) Appendix F, Table F1 format has changed to reflect the working area rather than a specific activity as the primary classification.
- (b) Glare recommendations for specific tasks have been amended.
- (c) Recommendations for tasks requiring clinical observation lighting have been amended.

The terms ‘normative’ and ‘informative’ are used in a Standard to define the application of the appendices or annexes to which they apply. A ‘normative’ appendix or annex is an integral part of a Standard, whereas an ‘informative’ appendix or annex is only for information and guidance.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE.....	5
1.2 APPLICATION	5
1.3 REFERENCED DOCUMENTS.....	5
1.4 DEFINITIONS.....	6
SECTION 2 GENERAL REQUIREMENTS OF GOOD INTERIOR LIGHTING	
2.1 OVERVIEW	7
2.2 FUNDAMENTAL CONSIDERATIONS	7
SECTION 3 TASK VISIBILITY	
3.1 OVERVIEW	8
3.2 GENERAL CONSIDERATIONS FOR MEDICAL TASKS.....	8
3.3 UNIFORMITY OF ILLUMINANCE IN BEDDED AREAS	8
SECTION 4 DIRECTIONAL EFFECTS OF LIGHTING	
4.1 OVERVIEW	9
4.2 DIRECTION OF LIGHTING	9
SECTION 5 UNWANTED REFLECTIONS	
5.1 OVERVIEW	10
5.2 EFFECT OF REFLECTING SURFACES	10
5.3 SCREEN-BASED TASKS.....	10
SECTION 6 SURFACES	
6.1 OVERVIEW	11
6.2 SURFACE COLOURS FOR CLINICAL OBSERVATION AREAS.....	11
6.3 REFLECTANCES OF SURFACES IN OPERATING ROOMS.....	11
6.4 NATURE OF SURFACE FINISHES.....	11
SECTION 7 LIGHT SOURCE COLOUR	
7.1 OVERVIEW	12
7.2 THE IMPORTANCE OF COLOUR DISCRIMINATION.....	12
7.3 CYANOSIS OBSERVATION LIGHTING	12
7.4 GENERAL DERMATOLOGICAL EXAMINATIONS.....	13
7.5 USE OF COLOUR-BASED DIAGNOSTIC TESTS	13
SECTION 8 GLARE AND RELATED EFFECTS	
8.1 OVERVIEW	14
8.2 APPLICATION OF GLARE CONTROL SYSTEMS.....	14
8.3 LUMINANCE OF SURFACES IN VISUAL FIELD OF PATIENTS	14
8.4 GLARE CONTROL IN OPERATING THEATRES.....	14
SECTION 9 LIGHT SOURCES, LUMINAIRES AND CONTROL SYSTEMS	
9.1 OVERVIEW	15
SECTION 10 LIGHTING SYSTEMS	
10.1 OVERVIEW	16
10.2 NIGHT LIGHTING	16

	<i>Page</i>
10.3 OPERATING ROOMS.....	16
10.4 SPECIAL PURPOSE EXAMINATION LIGHTS.....	16
10.5 ROOFLIGHTS AND WINDOWS.....	16
SECTION 11 LIGHTING DESIGN PROCEDURE	
11.1 OVERVIEW.....	17
SECTION 12 MAINTENANCE OF LIGHTING SYSTEMS AND EQUIPMENT	
12.1 OVERVIEW.....	18
APPENDICES	
A LIST OF REFERENCED DOCUMENTS.....	19
B MEASUREMENT OF ILLUMINANCE.....	20
C NOTES ON THE USE OF UTILIZATION FACTOR TABLES BY THE LIGHTING DESIGNER.....	21
D NOTES ON CHANGES TO ILLUMINANCE RECOMMENDATIONS.....	22
E BIBLIOGRAPHICAL REFERENCES.....	23
F SPECIFIC RECOMMENDATIONS FOR HOSPITALS AND MEDICAL PREMISES.....	24
G METHOD FOR DETERMINATION OF CYANOSIS OBSERVATION INDEX OF A LIGHT SOURCE.....	30
H COMMENTARY ON CHANGES TO RECOMMENDATIONS FOR LAMP COLOUR CHARACTERISTICS FOR THE DETECTION OF CYANOSIS.....	34

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Australian/New Zealand Standard
Interior and workplace lighting

Part 2.5: Hospital and medical tasks

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out lighting recommendations for a variety of tasks carried out within hospitals and medical premises, particularly tasks associated with clinical observation, treatment and care. The recommendations also apply to related tasks, such as the visual examination of biological solutions and pathology specimens, in medical laboratories.

1.2 APPLICATION

A lighting system should conform with the general recommendations of AS/NZS 1680.1 and the applicable recommendations of this and other appropriate Standards in the AS/NZS 1680.2 series.

If any recommendation in this Standard differs from the general recommendations of AS/NZS 1680.1, the recommendation in this Standard should prevail.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard (see also Appendix A).

NOTE: Documents referenced for informative purposes are listed in the Bibliography in Appendix E.

AS/NZS

- | | |
|----------|---|
| 1680 | Interior and workplace lighting |
| 1680.1 | Part 1: General principles and recommendations |
| 1680.2.1 | Part 2.1 Specific applications—Circulation spaces and other general areas |
| 1680.2.2 | Part 2.2: Specific applications—Office and screen-based tasks |

AS/NZS IEC

- | | |
|-------|--|
| 62471 | Photobiological safety of lamps and lamp systems |
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IEC

- | | |
|-----------|---|
| 60050 | International electrotechnical vocabulary |
| 60050-845 | Chapter 845: Lighting |

CIE

- | | |
|------------------|--|
| Publication 15.2 | Colorimetry, 3 rd Edition, 2004 |
|------------------|--|

1.4 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 1680.1 and those below apply. In addition, reference may need to be made to relevant medical literature for the meaning of certain terms pertaining to the medical profession.

1.4.1 Clinical observation area

An area of a hospital or medical facility in which it may be necessary to assess the condition of a patient, by means of visual observation of skin colour or changes in skin colour, for example, to detect the presence or onset of cyanosis.

1.4.2 Cyanosis observation index (COI)

An open-ended numerical scale ranking the suitability of a light source for the purpose of visual detection of the presence or onset of cyanosis. The lower the value of the index, the better the light source is deemed to be for that purpose.

1.4.3 Operating room

A room within which surgical, obstetrical or endoscopic procedures are performed.

SECTION 2 GENERAL REQUIREMENTS OF GOOD INTERIOR LIGHTING

2.1 OVERVIEW

This Section of AS/NZS 1680.1 applies except as follows.

2.2 FUNDAMENTAL CONSIDERATIONS

Hospital and medical applications generally have different and sometimes conflicting sets of lighting requirements, that is, those for patients and staff. These requirements include—

- (a) the comfort and wellbeing of the patients;
- (b) the lighting needs of medical staff for the examination, treatment and observation of patients; and
- (c) the lighting needs of staff involved in the cleaning of the areas involved.

The relative importance of the requirements depends on the purpose of the space and the needs at the time.

In rooms that are designed solely for patient occupation and not for examination or treatment (dayrooms, waiting rooms and similar), the main emphasis should be placed on the physiological and psychological wellbeing of the patient. In areas that are primarily designed for medical procedures, the lighting system should be designed for the efficient undertaking of the procedure. The comfort of the patients should, however, be catered for wherever possible without adversely affecting medical procedure. In bedded areas, the needs of the patient should be given precedence. However, it may still be required that the facility be a suitable visual environment for local examination and some basic treatments.

It may not be possible to satisfy these conflicting requirements by the use of a single lighting system. In many of the areas, flexibility of the lighting system can only be achieved with relatively sophisticated lighting control systems.

SECTION 3 TASK VISIBILITY

3.1 OVERVIEW

This Section of AS/NZS 1680.1 applies except as follows.

3.2 GENERAL CONSIDERATIONS FOR MEDICAL TASKS

The purpose of this clause is to provide information on the attributes of some tasks performed in hospitals and medical premises and the implications for lighting. It is not intended to replace specific recommendations by particular authorities.

Many visual tasks in health care premises are similar to those found in other building types. However, in certain cases, the tasks can be classified as exceptionally difficult for the reasons given below. Furthermore, in certain applications, very good colour rendering is required, for example, where visual inspection is used to detect changes in the vital signs (of life) which are indicated by changes in skin colour.

Many surgical procedures are difficult visual tasks for the following reasons:

- (a) The structures being observed (and operated upon) are often small with similar colour and reflectance characteristics to supporting or surrounding (background) structures, therefore high acuity and high contrast rendering are required.
- (b) Even where techniques are used to keep areas dry, surfaces may be moist and glossy, creating contrast rendition problems due to unwanted reflections.
- (c) Often, procedures are conducted in restricted cavities where the lighting may be obstructed by the cavity surrounds and by the surgeon's hands.

The lighting solutions may include local task lighting in the form of relatively simple adjustable spotlights; lighting attached to the surgeon's head in some way; special overhead operating (theatre) luminaires; or, in some cases, fibre optics.

The heat produced as a consequence of the need for high illuminances for some procedures means that appropriately designed luminaires should be used to minimize the damage to tissue because of heat. To avoid excessive contrasts around the task area, surrounds (e.g. linen) of a colour other than white are commonly used.

In most cases the lighting needs of exceptionally difficult tasks are met using specially designed lighting equipment. For example, operating theatre luminaires have to meet various requirements to ensure their safe and effective use. Ophthalmoscopes are examples of specialized hand-held (or head-worn) luminaires used for the interior examination of the eyes.

Tasks that are less visually demanding may be performed under the lower illuminances provided by conventional task, localized or general lighting systems.

3.3 UNIFORMITY OF ILLUMINANCE IN BEDDED AREAS

The uniformity of illuminance recommended in Section 3 of AS/NZS 1680.1 need not be provided in bedded areas, for example, hospital wards. However, excessive variations in illuminance should be avoided, and areas of higher illuminance should not have a defined edge but should merge gradually into the surrounding general illumination.

SECTION 4 DIRECTIONAL EFFECTS OF LIGHTING

4.1 OVERVIEW

This Section of AS/NZS 1680.1 applies except as follows.

4.2 DIRECTION OF LIGHTING

Circumstances often exist in hospitals and medical premises where, because of the position(s) occupied by the patient, the room is not viewed from the normal perspective, for example, sitting or standing. Furthermore, the patient may not have the freedom to change his or her position. It is, therefore, important that where these conditions can be predicted, the lighting be directed or controlled to avoid discomfort to the patient (see Section 8).

SECTION 5 UNWANTED REFLECTIONS

5.1 OVERVIEW

This Section of AS/NZS 1680.1 applies except as follows.

5.2 EFFECT OF REFLECTING SURFACES

Gloss or specular reflecting surfaces, for example, stainless steel, are often used to facilitate the maintenance of a clean, sterile environment. Furthermore, task details often have to be seen against a reflective, for example, wet, background. Such circumstances can produce reflections that reduce the visibility of the task or that are troubling or distracting during the performance of the task. These problems can be minimized by the use of large-area, low-luminance luminaires or lighting systems.

5.3 SCREEN-BASED TASKS

Advice on the avoidance of unwanted reflections in screen-based tasks is given in AS/NZS 1680.2.2.

Screen-based tasks are commonly performed in operating theatres and this should be taken into account in the selection of appropriate luminaires/lighting systems for such areas.