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Lighting of work places —

Part 3: Lighting requirements for safety and security of outdoor work places

Éclairage des lieux de travail —

Partie 3: Exigences requises de l'éclairage des lieux de travail extérieurs en matière de sûreté et de sécurité

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by CIE and Technical Committee ISO/TC 274, *Light and lighting*.

This first edition cancels and replaces ISO 8995-3:2006/CIE S 016:2005, of which it constitutes a minor revision. (ISO 8995-3:2006/CIE S 016:2005 was prepared by CIE Division 5.)

A list of all parts in the ISO 8995 series can be found on the ISO website.

Introduction

To enable people to perform visual tasks efficiently and accurately, especially during the night, adequate and appropriate lighting has to be provided.

The degree of visibility and comfort required in a wide range of outdoor work places is governed by the type and duration of activity.

Lighting of work places —

Part 3:
Lighting requirements for safety and security of outdoor work places

1 Scope

This document specifies the lighting requirements which will contribute to the visual needs for safety and security within outdoor work places.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CIE S 015, *Lighting of outdoor work places*

CIE S 017, *ILV: International Lighting Vocabulary*

CIE 112, *Glare evaluation system for use within outdoor sports- and area lighting*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CIE S 017 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
maintained average illuminance
$\bar{E}_{\mathrm{m}}$
value below which the average illuminance on the specified surface is not allowed to fall

Note 1 to entry: It is the average illuminance at the time maintenance should be carried out.

[SOURCE: CIE S 017/E:2011, Term 17-750]

3.2
illuminance uniformity
U_{o}
ratio of minimum illuminance to average illuminance on a surface

[SOURCE: CIE S 017/E:2011, Term 17-552]

3.3
glare rating limit
$R_{G,L}$
maximum allowed value given by the CIE Glare Rating system

[SOURCE: CIE S 017/E:2011, Term 17-494]

3.4
colour rendering index
R
measure of the degree to which the psychophysical colour of an object illuminated by the test illuminant conforms to that of the same object illuminated by the reference illuminant, suitable allowance having been made for the state of chromatic adaptation

[SOURCE: CIE S 017/E:2011, Term 17-222]

3.5
CIE 1974 general colour rendering index
R_a
mean of the CIE 1974 special colour rendering indices for a specified set of eight test colour samples

[SOURCE: CIE S 017/E:2011, Term 17-154]

4 Lighting requirements for safety and security

NOTE In the following Table 1:

— Column 2 gives the maintained average illuminance, $\bar{E}_m$ on the reference surface for the area, task or activity given in column 1.

— Column 3 gives the minimum illuminance uniformity, U_0, on the reference surface for the area, task or activity given in column 1.

— Column 4 gives the Glare Rating limit, $R_{G,L}$, where applicable to the situations listed in column 1.

— Column 5 gives the minimum CIE 1974 general colour rendering index, R_a, for the situation listed in column 1.

Table 1

Risk level	$\bar{E}_m$	U_o	$R_{G,L}$	R_a	Remarks
Very low risks, i.e. — Storage areas with occasional traffic in industrial yards; — Coal fields in power plants; — Timber storage, sawdust and wood chip fields in saw mills; — Occasionally used service passages and stairs, waste water cleaning and aeration tanks, filter and sludge digestion tanks in water and sewage plants.	5	0,25	55	20	
Low risks, i.e. — General lighting in harbours; — Areas of risk free process and occasionally used platforms and stairs in petrochemical and other hazardous industries; — Sawn timber storage areas in saw mills.	10	0,40	50	20	In harbours, U_o may be 0,25
Medium risks, i.e. — Vehicle storage areas and container terminals with frequent traffic in harbours, industrial yards and storage areas; — Vehicle storage areas and conveyors in petrochemical and other hazardous industries; — Oil stores in power plants; — General lighting and storage areas for prefabricated goods in shipyards and docks; — Regularly used stairs, basins and filters of clean water plants in water and sewage plants.	20	0,40	50	20	In shipyards and docks, U_o may be 0,25
High risks, i.e. — Element mould, timber and steel storage, building foundation hole and working areas on sides of the hole at building sites; — Fire, explosion, poison and radiation risk areas in harbours, industrial yards and storage areas; — Oil stores, cooling towers, boilers compressors, pumping plants, valves, manifolds, operating platforms, regularly used stairs, crossing points of conveyors, electric switch-yards in petrochemical and other hazardous industries; — Switch yards in power plants; — Crossing points of conveyors, fire risk areas in saw mills.	50	0,40	45	20	At building sites and in saw mills, $R_{G,L}$ may be 50

Lighting control may be required to achieve adequate flexibility for the variety of tasks performed.

The application of the lighting design criteria glare rating and colour rendering need to be considered according to Annex A.