

This is a preview of "DS/EN 12464-1:2011". [Click here to purchase the full version from the ANSI store.](#)

2011-06-24

Lys og belysning – Belysning ved arbejdspladser – Del 1: Indendørs arbejdspladser

Light and lighting – Lighting of work places – Part 1: Indoor work places



DANSK STANDARD
Danish Standards

Kollegievej 6
DK-2920 Charlottenlund
Tel: +45 39 96 61 01
Fax: +45 39 96 61 02
dansk.standard@ds.dk
www.ds.dk

This is a preview of "DS/EN 12464-1:2011". [Click here to purchase the full version from the ANSI store.](#)

DS-projekt: M241004
ICS: 91.160.10

Første del af denne publikations betegnelse er:

DS/EN, hvilket betyder, at det er en europæisk standard, der har status som dansk standard.

Denne publikations overensstemmelse er:

IDT med: EN 12464-1:2011.

DS-publikationen er på engelsk.

Denne publikation erstatter: DS/EN 12464-1:2003.

DS-publikationstyper

Dansk Standard udgiver forskellige publikationstyper. Typen på denne publikation fremgår af forsiden.

Der kan være tale om:

Dansk standard

- standard, der er udarbejdet på nationalt niveau, eller som er baseret på et andet lands nationale standard, eller
- standard, der er udarbejdet på internationalt og/eller europæisk niveau, og som har fået status som dansk standard

DS-information

- publikation, der er udarbejdet på nationalt niveau, og som ikke har opnået status som standard, eller
- publikation, der er udarbejdet på internationalt og/eller europæisk niveau, og som ikke har fået status som standard, fx en teknisk rapport, eller
- europæisk præstandard

DS-håndbog

- samling af standarder, eventuelt suppleret med informativt materiale

DS-hæfte

- publikation med informativt materiale

Til disse publikationstyper kan endvidere udgives

- tillæg og rettelsesblade

DS-publikationsform

Publikationstyperne udgives i forskellig form som henholdsvis

- fuldtekstpublikation (publikationen er trykt i sin helhed)
- godkendelsesblad (publikationen leveres i kopi med et trykt DS-omslag)
- elektronisk (publikationen leveres på et elektronisk medie)

DS-betegnelse

Alle DS-publikationers betegnelse begynder med DS efterfulgt af et eller flere præfikser og et nr., fx **DS 383**, **DS/EN 5414** osv. Hvis der efter nr. er angivet et **A** eller **Cor**, betyder det, enten at det er et **tillæg** eller et **rettelsesblad** til hovedstandard, eller at det er indført i hovedstandard.

DS-betegnelse angives på forsiden.

Overensstemmelse med anden publikation:

Overensstemmelse kan enten være IDT, EQV, NEQ eller MOD

- **IDT:** Når publikationen er identisk med en given publikation.
- **EQV:** Når publikationen teknisk er i overensstemmelse med en given publikation, men præsentationen er ændret.
- **NEQ:** Når publikationen teknisk eller præsentationsmæssigt ikke er i overensstemmelse med en given standard, men udarbejdet på baggrund af denne.
- **MOD:** Når publikationen er modificeret i forhold til en given publikation.

This is a preview of "DS/EN 12464-1:2011". [Click here to purchase the full version from the ANSI store.](#)

EUROPÄISCHE NORM

June 2011

ICS 91.160.10

Supersedes EN 12464-1:2002

English Version

Light and lighting - Lighting of work places - Part 1: Indoor work places

Lumière et éclairage - Eclairage des lieux de travail - Partie
1: Lieux de travail intérieurs

Licht und Beleuchtung - Beleuchtung von Arbeitsstätten -
Teil 1: Arbeitsstätten in Innenräumen

This European Standard was approved by CEN on 14 April 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

	Page
Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Lighting design criteria	8
4.1 Luminous environment	8
4.2 Luminance distribution	9
4.2.1 General.....	9
4.2.2 Reflectance of surfaces	9
4.2.3 Illuminance on surfaces	9
4.3 Illuminance	10
4.3.1 General.....	10
4.3.2 Scale of illuminance	10
4.3.3 Illuminances on the task area.....	10
4.3.4 Illuminance on the immediate surrounding area.....	12
4.3.5 Illuminance on the background area	12
4.3.6 Illuminance uniformity	12
4.4 Illuminance grid	13
4.5 Glare.....	14
4.5.1 General.....	14
4.5.2 Discomfort glare	14
4.5.3 Shielding against glare	15
4.5.4 Veiling reflections and reflected glare.....	15
4.6 Lighting in the interior space	15
4.6.1 General.....	15
4.6.2 Mean cylindrical illuminance requirement in the activity space.....	16
4.6.3 Modelling	16
4.6.4 Directional lighting of visual tasks	16
4.7 Colour aspects	16
4.7.1 General.....	16
4.7.2 Colour appearance	17
4.7.3 Colour rendering.....	17
4.8 Flicker and stroboscopic effects.....	17
4.9 Lighting of work stations with Display Screen Equipment (DSE)	18
4.9.1 General.....	18
4.9.2 Luminaire luminance limits with downward flux.....	18
4.10 Maintenance factor	19
4.11 Energy efficiency requirements	20
4.12 Additional benefits of daylight	20
4.13 Variability of light.....	20
5 Schedule of lighting requirements.....	20
5.1 Composition of the tables.....	20
5.2 Schedule of interior areas, tasks and activities	21
5.3 Lighting requirements for interior areas, tasks and activities.....	23
6 Verification procedures.....	47

This is a preview of "DS/EN 12464-1:2011". [Click here to purchase the full version from the ANSI store.](#)

	Page
6.1 General	47
6.2 Illuminances	48
6.3 Unified Glare Rating	48
6.4 Colour rendering and colour appearance	48
6.5 Luminaire luminance	48
6.6 Maintenance schedule	48
Annex A (informative) Typical values of grid point spacing	49
Annex B (informative) A-deviation	50
Bibliography	51
Index of interior areas, tasks and activities	52

Foreword

This document (EN 12464-1:2011) has been prepared by Technical Committee CEN/TC 169 "Light and lighting", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

This document supersedes EN 12464-1:2002.

The main technical changes in this revision are:

- importance of daylight is taken into account: Requirements for lighting are generally applicable independent if provided by artificial lighting, daylight or a combination of both;
- specification of a minimum illuminance on walls and ceilings;
- specification of cylindrical illuminance and detailed information on modelling;
- uniformity of illuminance is assigned to tasks and activities;
- definition of "background area" and lighting specification for this area;
- definition of an illuminance grid is in accordance with EN 12464-2;
- new luminance limits are set for luminaires used with Display Screen equipment (DSE), the description of display screens is according ISO 9214-307.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

This is a preview of "DS/EN 12464-1:2011". [Click here to purchase the full version from the ANSI store.](#)

Introduction

Adequate and appropriate lighting enables people to perform visual tasks efficiently and accurately. The degree of visibility and comfort required in a wide range of work places is governed by the type and duration of the activity.

It is important that all clauses of this European Standard are followed although the specific requirements are tabulated in the schedule of lighting requirements (see Clause 5).

1 Scope

This European Standard specifies lighting requirements for humans in indoor work places, which meet the needs for visual comfort and performance of people having normal ophthalmic (visual) capacity. All usual visual tasks are considered, including Display Screen Equipment (DSE).

This European Standard specifies requirements for lighting solutions for most indoor work places and their associated areas in terms of quantity and quality of illumination. In addition recommendations are given for good lighting practice.

This European Standard does not specify lighting requirements with respect to the safety and health of people at work and has not been prepared in the field of application of Article 153 of the EC treaty, although the lighting requirements, as specified in this European Standard, usually fulfil safety needs. Lighting requirements with respect to the safety and health of workers at work can be contained in Directives based on Article 153 of the EC treaty, in national legislation of member states implementing these directives or in other national legislation of member states.

This European Standard neither provides specific solutions, nor restricts the designers' freedom from exploring new techniques nor restricts the use of innovative equipment. The illumination can be provided by daylight, artificial lighting or a combination of both.

This European Standard is not applicable for the lighting of outdoor work places and underground mining or emergency lighting. For outdoor work places, see EN 12464-2 and for emergency lighting, see EN 1838 and EN 13032-3.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 12193, *Light and lighting — Sports lighting*

EN 12464-2, *Light and lighting — Lighting of work places — Part 2: Outdoor work places*

EN 12665, *Light and lighting — Basic terms and criteria for specifying lighting requirements*

EN 13032-1, *Light and lighting — Measurement and presentation of photometric data of lamps and luminaires — Part 1: Measurement and file format*

EN 13032-2, *Light and lighting — Measurement and presentation of photometric data of lamps and luminaires — Part 2: Presentation of data for indoor and outdoor work places*

EN 15193, *Energy performance of buildings — Energy requirements for lighting*

EN ISO 9241-307, *Ergonomics of human-system interaction — Part 307: Analysis and compliance test methods for electronic visual displays (ISO 9241-307:2008)*

EN ISO 9680:2007, *Dentistry — Operating lights (ISO 9680:2007)*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*