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Part 1: Indoor

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 document 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).

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For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 274, *Light and lighting*, in cooperation with the International Commission on Illumination (CIE).

This first edition of ISO/CIE 8995-1 cancels and replaces ISO 8995-1:2002, which has been technically revised

The main changes are as follows:

— prior document reference numbers (CIE S 008:2002, ISO 8995-1:2002) replaced with a combined reference number, ISO/CIE 8995-1;

— scope revised;

— Annex A, Annex B, Annex C and Annex D added;

— editorially updated.

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

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Good lighting will create a visual environment that enables people to see, to move about safely and to perform visual tasks efficiently, accurately, and safely without causing undue visual fatigue and discomfort. The illumination can be provided by daylight, electric light sources, or a combination of both.

Good lighting requires equal attention to the quantity and quality of the lighting. While the provision of sufficient illuminance on the task is necessary, in many instances the visibility depends on the way in which the light is delivered, the colour characteristics of the light source and surfaces together with the level of glare from the system. In this document, opportunity was taken to specify for various work places and task types, not just the illuminance, but also the limiting of discomfort glare and minimum colour rendering index of the source. Parameters to create comfortable visual conditions are proposed in the body of this document. The recommended values are considered to represent a reasonable balance, having regard to the requirements for safe, healthy, and efficient work performance. The values can be achieved with practical energy efficient solutions.

There are also visual ergonomic parameters such as perceptual ability and the characteristics and attributes of the task, which determine the quality of the operator's visual skills, and hence performance levels. In some cases, enhancement of these influencing factors can improve performance without the need to raise illuminance. This can be achieved, for example by improving the contrast of the task attributes, enlarging the task by the use of up to date visual aids (e.g. glasses) and by the provision of special lighting systems with local directional lighting capability.

Adequate and appropriate lighting enables people to perform visual tasks efficiently and accurately including tasks performed over a prolonged time period or of a repetitive nature. The degree of visibility and comfort required in a wide range of work places is governed by the type and duration of the activity. The lighting also affects circadian rhythms and mood as well as improving performance and well-being.

The final designed, installed and operated lighting system should provide efficient and effective good quality lighting for the user needs tailored to their visual capacity, e.g. visual capacity of elderly users in work places.

It is important that all clauses of this document are followed although the target values for lighting criteria and specific requirements, depending of each type of task/activity, are tabulated in the schedule of lighting requirements (see Clause 7).

This document reflects the generally recognized best practice at the time of publication.

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Light and lighting — Lighting of work places —

Part 1: Indoor

1 Scope

This document specifies lighting requirements for humans in indoor work places, which meet the needs for visual comfort, performance and safety of people having normal, or corrected to normal visual capacity and response to light.

This document specifies requirements for lighting solutions for typical indoor work places and their associated areas in terms of quantity and quality of illumination. The illumination can be provided by daylight, electric light sources, or a combination of both.

This document gives recommendations for good lighting to fulfil the needs of integrative lighting.

This document neither provides specific solutions nor recommendations for atmosphere or aesthetics created by lighting. It does not restrict the designers' freedom from exploring new techniques nor restrict the use of innovative equipment.

This document is not applicable for emergency lighting. For emergency lighting, see ISO 30061.

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.

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 9680, *Dentistry — Operating lights*

ISO/CIE TS 22012, *Light and lighting — Maintenance factor determination — Way of working*

CIE S 017, *ILV: International Lighting Vocabulary*

CIE S 026, *CIE System for Metrology of Optical Radiation for ipRGC-Influenced Responses to Light*

CIE 58, *Lighting for sports halls*

CIE 62, *Lighting for swimming pools*

IEC 60601-2-41, *Medical electrical equipment - Part 2-41: Particular requirements for the basic safety and essential performance of surgical luminaires and luminaires for diagnosis*

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 terminology databases for use in standardization at the following addresses:

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

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