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Information technology — Office equipment — Viewing environment guideline for office equipment

Technologies de l'information — Équipements de bureau — Visualisation de la directive d'environnement pour les équipements de bureau

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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 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 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 Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 28, *Office equipment*.

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Introduction

Viewing conditions for imaging devices such as 2D and 3D printers/scanners, copiers, projectors, fax, displays and systems are specified in the various international standards and technical reports and can be categorized according to their objectives. Those objectives are colour assessment such as direct visual assessment and corresponding colorimetric measurements, defining colour space and colour comparison between display and print.

CIE 15 provides CIE recommendations for basic colorimetry which recommends CIE illuminant D65 used whenever possible and when D65 cannot be used, it is recommended that one of the daylight illuminants D50, D55 or D75 be used. ISO 13655 provides requirements for spectral measurements and colorimetric computations for graphic arts images and specifies CIE illuminant D50, which is used throughout the printing industry and provides a consistent and unambiguous framework for assessing colour.

ISO 3664 similarly provides requirements for the visual assessment of colour for graphic technology and photography and specifies CIE illuminant D50 for the same reasons as ISO 13655. IEC 61966-2-1 provides Default RGB colour space – sRGB which specified CIE illuminant D50 by referring ISO 3664. These and other international standards designed for graphic arts specify CIE illuminant D50 as the viewing illuminant ensuring consistent colour evaluation conditions.

The colour temperature of viewing illuminant in international standards specifying office lighting ranges from 5 000 K to 7 500 K. However, the colour temperature of the viewing illuminant where the product will be finally seen is largely a matter of personal taste. The general preference is to use cool colours for a business-like atmosphere (e.g. in offices, factories, shops) and warm colours for a social atmosphere (e.g. in hotels and homes). In office environment, popular viewing illuminants are F2 (4 230 K) and F6 (4 150 K) which are generally inexpensive and compromising business and social atmosphere.

End users have various requirements but in all cases it is beneficial to agree a reference viewing environment. A typical end user issue is where it is claimed that clouds and snows in original document have become too reddish in printed copy. Without having an agreed reference viewing illuminant the cause of such problems is hard to find and may be due, for example, to an incorrect assumption for the intended viewing environment.

For office equipment, reference viewing conditions are not specified or explained with relevant background information in any international standards. It is desirable to provide a guideline for selecting viewing conditions for office equipment colour assessment. This document provides an overview of an office viewing environment for the purpose of colour assessment, colorimetry and colour evaluation. It also provides a colour characterization guideline for use with office equipment. The objective of this document is to avoid misunderstanding of various viewing conditions recommended by many international standards and to help office equipment manufacturers selecting proper viewing conditions, so that they can provide products with suitable colour reproduction performance to satisfy user needs in various viewing environments.

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Information technology — Office equipment — Viewing environment guideline for office equipment

1 Scope

This document provides an overview of office viewing environment and colour characterization guidelines for use with office equipment, in particular colour printing devices that have digital imaging capabilities, including multi-function devices.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
viewing environment
environment in which something is viewed

3.2
viewing conditions
description of the surrounding environmental conditions during the process of viewing

[SOURCE: ISO/TS 18173:2005, 2.28]

4 Viewing conditions

4.1 General

Information relating to viewing conditions are reviewed in this clause, including international standards, technical reports and web-based articles (as shown in Annex A). In general, colour assessment related standards specified viewing conditions. Colour assessment can be done basically in two ways. One is to use the human eyeball as a detector and the human brain to compute colour as a psychometric feeling – so called visual assessment. The other is to use an artificial sensor as a detector and a computer chip to compute colour coordinates – so called colorimetry. In multimedia systems and equipment, viewing conditions are specified for defining colour space. In graphic technology, viewing conditions are specified for proofing which involves colour comparison of the display and the printer.

4.2 Visual assessment

4.2.1 General

Viewing conditions for the visual assessment of colour are specified in several international standards. ISO 8995 applies to the lighting of indoor workplaces. ISO 3664 applies to viewing conditions for graphic

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