EESTI STANDARD EVS-EN ISO 9241-8:2000

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Kuvaritega kontoritöö ergonoomianõuded. Osa 8: Nõuded kuvatavatele värvustele

Ergonomic requirements for office work with visual display terminals (VDTs) - Part 8: Requirements for displayed colours

EESTI STANDARDIKESKUS

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 9241-8:2000 sisaldab Euroopa standardi EN ISO 9241-8:1997 ingliskeelset teksti. Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 9241-8:2000 consists of the English text of the European standard EN ISO 9241-8:1997. This document is endorsed on 11.01.2000 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Standard kirjeldab teksti, graafiliste jooniste ning kujutiste üksikpunktidest koosnevatele värvustele kohaldatavaid minimaalseid ergonoomianõudeid ja -soovitusi. Standardis toodud tehnilised andmed ei käsitle fotosarnaseid kujutisi ega graafikat. Standard kehtib nii kuvarite riistvara kui ka tarkvara kohta, sest need mõlemad juhivad ekraanil kuvatava värvuse esitust ja kvalitatiivseid omadusi.	**Scope:**

ICS 13.180, 35.180

Võtmesõnad: andmeterminal, andmetöötlusseadmed, ergonoomia, kontoriseadmed, kuvamisseadmed, tehnilised andmed, tekstitöötlus, värvus

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Eesti Standardikeskusele kuulub standardite reprodutseerimis- ja levitamisõigus

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English version

Ergonomic requirements for office work with visual display terminals (VDTs)

Part 8: Requirements for displayed colours
(ISO 9241-8 : 1997)

Exigences ergonomiques pour travail de bureau avec terminaux à écrans de visualisation (TEV) – Partie 8: Exigences relatives aux couleurs affichées (ISO 9241-8 : 1997)

Ergonomische Anforderungen für Bürotätigkeiten mit Bildschirmgeräten – Teil 8: Anforderungen an Farbdarstellungen (ISO 9241-8 : 1997)

This European Standard was approved by CEN on 1997-06-16.

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 Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

International Standard

ISO 9241-8 : 1997 Ergonomic requirements for office work with visual display terminals (VDTs) – Part 8: Requirements for displayed colours,

which was prepared by ISO/TC 159 'Ergonomics' of the International Organization for Standardization, has been adopted by CEN/BT as a European Standard.

EN ISO 9241 comprises the following Parts under the general title 'Ergonomic requirements for office work with visual display terminals (VDTs)':

Part 1: General introduction
Part 2: Guidance on task requirements
Part 3: Visual display requirements
Part 4: Keyboard requirements
Part 5: Workstation layout and postural requirements
Part 6: Environmental requirements
Part 7: Requirements for display with reflections
Part 8: Requirements for displayed colours
Part 9: Requirements for non-keyboard input devices
Part 10: Dialogue principles
Part 11: Guidance on usability
Part 12: Presentation of information
Part 13: User guidance
Part 14: Menu dialogues
Part 15: Command dialogues
Part 16: Direct manipulation dialogues
Part 17: Form-filling dialogues

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by April 1998 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 9241-8 : 1997 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

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Introduction

The purpose of this part of ISO 9241 is to prescribe basic specifications for colours on computer display terminals to ensure their visibility, identification and discrimination.

The specifications in this part address colour images (visual "stimuli"), their appearance (visual "perception") and identification (colour "naming"). The specifications thus address both the perceptual components of colour (such as detection of saturation and lightness) and some cognitive components (such as naming of specific colours). Other cognitive components will be addressed in ISO 9241-12.

The ability to detect, identify and discriminate colours on display terminals determines the usefulness of colour in the perception and interpretation of the computer-generated image. Colour perception of displayed images depends on a number of factors such as:

- hardware and software components of the *display* system,
- physical characteristics of the display *image,*
- the ability of the *viewer* to perceive the colours,
- the lighting in the viewing *environment.*

The primary characteristics of these factors (that is display, image, viewer and environment) that affect colour appearance are shown in table 1.

Table 1 - Examples of factors affecting colour appearance

Source	Factor affecting colour appearance
Display	Luminance
	Spectral distribution and range
	Phosphor type
	Screen treatment for reflection control
	Resolution
Image	Adjacent colours
	Size
	Spatial frequency content
Viewer	State of visual adaptation
	Colour-perception ability
Room	Illumination level
	Colour temperature of the illumination

Colour interpretation depends on the ability of the viewer to associate a colour with a specific meaning, function, or action. It is thus important that colours assigned to images on displays be carefully chosen to achieve intended effects or convey intended meaning. However, the appearance of colours may vary among different suppliers' displays. For example, the blue on one display may appear darker and more purple than on another, and red may appear more orange.

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1 Scope

This part of ISO 9241 describes minimum ergonomic requirements and recommendations to be applied to colours assigned to text and graphic applications and images in which colours are discretely assigned. The specifications in this part thus exclude photorealistic images and graphics.

This part of ISO 9241 applies to both hardware and software for visual display terminals, because both these sources control the presentation and appearance of colour on the display screen.

The specifications, measurements and test procedures described in this part of ISO 9241 are for displays that produce colour images and are intended to be independent of display technologies unless otherwise specified.

The specifications in this part of ISO 9241 are for images on computer displays that meet minimum requirements for users with normal colour vision. Displays conforming to this part will be suboptimal for persons with colour vision deficiencies.

This part of ISO 9241 is complementary to ISO 9241-3. The tasks and conditions of use in this part are similar to those described in ISO 9241-3, unless otherwise specified. This part of ISO 9241 is not intended to be a specification on colour coding.

Although the primary users of this part of ISO 9241 are intended to be hardware and software user-interface designers and manufacturers, it will also be useful to those persons responsible for procuring colour displays and those evaluating the use of colour in the user-interface of the computer system.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9241. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9241 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9241-3 : 1992 *Ergonomic requirements for office tasks with visual display terminals* (VDTs) – *Part 3 : Visual display requirements.*

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ISO 9241-5:—[1], *Ergonomic requirements for office tasks with visual display terminals* (VDTs) – *Part 5*: *Workplace requirements.*

3 Definitions

For the purposes of this part of ISO 9241, the following definitions apply.

3.1 achromatic (perceived) colour:
(1) <perceptual sense> Perceived colour devoid of hue.

The colour names white, gray and black are commonly used or, for transmitting objects, colourless and neutral.

(2) <psychophysical sense> See achromatic stimulus 845-03-06. [CIE 17.4 / IEC 50, 845-02-26]

3.2 adaptation (visual): Process by which the state of the visual system is modified by previous and present exposure to stimuli that may have various luminances, spectral distributions and angular subtenses. [CIE 17.4 / IEC 50, 845-02-07]

3.3 additive mixing: Stimulation that combines on the retina the actions of various colour stimuli in such a manner that they cannot be perceived individually. [CIE 17.4 / IEC 50, 845-03-15]

3.4 brightness: Attribute of a visual sensation according to which an area appears to emit more or less light. [CIE 17.4 / IEC 50, 845-02-28]

3.5 chroma: Chromaticness, or colourfulness, of an area judged as a proportion of the brightness of a similarly illuminated area that appears white or highly transmitting. [CIE 17.4 / IEC 50, 845-02-42]

3.6 chromaticity: Property of a colour stimulus defined by its chromaticity coordinates, or by its dominant or complementary wavelength and purity taken together. [CIE 17.4 / IEC 50, 845-03-34]

3.7 chromaticity coordinates: Ratio of each of a set of three tristimulus values relative to their sum. [CIE 17.4 / IEC 50, 845-03-33]

NOTES
1 As the sum of the three chromaticity coordinates equals one, two of them are sufficient to define a chromaticity.
2 In the CIE standard colorimetric systems, the chromaticity coordinates are represented by the symbols x, y, z and x_{10}, y_{10}, and z_{10}.

3.8 chromaticity diagram: Plane diagram in which points specified by chromaticity coordinates represent the chromaticities of colour stimuli. [CIE 17.4 / IEC 50, 845-03-35]

NOTE –In the CIE standard colorimetric systems, *y* is normally plotted as ordinate and *x* as abscissa, to obtain an *x, y* chromaticity diagram (see figure 1 and 3.10).

1) To be published.

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