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**Ergonomic requirements for work with
visual display based on flat panels - Part 1:
Introduction**

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based on flat panels - Part 1: Introduction

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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| <p>Käesolev Eesti standard EVS-EN ISO 13406-1:2000 sisaldab Euroopa standardi EN ISO 13406-1:1999 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 17.03.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p> | <p>This Estonian standard EVS-EN ISO 13406-1:2000 consists of the English text of the European standard EN ISO 13406-1:1999.</p> <p>This document is endorsed on 17.03.2000 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p> |
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| <p>Käsitlusala: This part of ISO 13406 establishes the rationale for ergonomic requirements and measurements methods for the flat panel displays and defines flat panel display. This part of ISO 13406 is applicable to flat panel technology applied to displays for office work and other work.</p> | <p>Scope: This part of ISO 13406 establishes the rationale for ergonomic requirements and measurements methods for the flat panel displays and defines flat panel display. This part of ISO 13406 is applicable to flat panel technology applied to displays for office work and other work.</p> |
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ICS 13.180, 35.180

Võtmesõnad: computer peripheral equipment, data terminal equipment, display devices, ergonomics, flat panel technology, generalities, office machines, specifications, tests, text processing

ICS 13.180; 35.180

English version

Ergonomic requirements for work with visual displays
based on flat panels

Part 1: Introduction
(ISO 13406-1 : 1999)

Exigences ergonomiques pour travail
sur écrans de visualisation à
panneaux plats – Partie 1: Introduc-
tion (ISO 13406-1 : 1999)

Ergonomische Anforderungen für
Tätigkeiten an optischen Anzeige-
einheiten in Flachbauweise – Teil 1:
Einführung (ISO 13406-1 : 1999)

This European Standard was approved by CEN on 1999-09-03.

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

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

International Standard

ISO 13406-1 : 1999 Ergonomic requirements for work with visual displays based on flat panels – Part 1:
Introduction,

which was prepared by ISO/TC 159 'Ergonomics' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 122 'Ergonomics', the Secretariat of which is held by DIN, as a European Standard.

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 2000 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of 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 13406-1 : 1999 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

ISO 13406 addresses the ergonomic considerations that should be taken into account when using flat-panel visual displays. ISO 13406 is based on the ergonomic foundations and principles addressed in ISO 9241. During the development of ISO 9241-3:1992, it was recognized that the use of the same ergonomic principles results in a different approach and specification for flat panels.

ISO 13406 exists for three reasons:

- a) ISO 9241 is sometimes not sufficient to ensure that a display meets basic front-of-screen ergonomic requirements when flat-panel visual displays are used instead of conventional CRT-based VDTs;
- b) ISO 9241 measurement methods are sometimes inappropriate for characterizing flat-panel visual displays;
- c) ISO 9241 addresses office work, but the scope of ISO 13406 includes extended uses and applications.

Examples of special flat-panel considerations are

- picture element discreteness (leading to the possibility of isolated defects);
- optical properties that strongly depend on viewing direction (leading to the need to carefully describe viewing direction during evaluation);
- slow response time of the electro-optical effect (leading to suitability questions when image dynamics are important for performance or comfort);
- panels that electrically vary the reflection properties at the picture element site (leading to complications in evaluation).

ISO 13406, where appropriate, provides physical requirements based on models in ergonomic research and physical measurement protocols to provide consistent compliance decisions. In ISO 9241-3, ISO 9241-7 and ISO 9241-8, an alternative decision route is sometimes appropriate and necessary. These three standards include annexes concerning visual performance tests. These tests address legibility, legibility when unwanted reflections exist on the display screen, and discriminability of colours. When these tests are approved, they will provide an alternative means to decide compliance. These tests (unmodified or with appropriate modifications to account for flat-panel specific environmental considerations) may be used to decide compliance to ISO 13406-2.

ISO 13406-2 treats the ergonomics of directly viewed flat-panel displays. It covers the ergonomic topics of ISO 9241-3, ISO 9241-7, and ISO 9241-8. The requirements and measurements in ISO 13406-2 treat panels with uniformly spaced and constructed pixels. In addition, panels are sufficiently large to display at least three measurement targets, of at least 400 pixels each, that do not overlap.

Figure 1 illustrates a directly viewed flat-panel configuration that cannot be evaluated under ISO 13406-2 because each pixel is specially sized and shaped to represent a specific portion of a numeric symbol. This type of display is known as a segmented display.

Figure 2 illustrates another directly viewed flat-panel configuration that cannot be evaluated under ISO 13406-2 because the uniformly constructed pixels are not uniformly spaced. For economic reasons, the pixel positions between character rows and columns are omitted. With this type of panel, measurement targets are unavailable.



Figure 1 — Segmented display

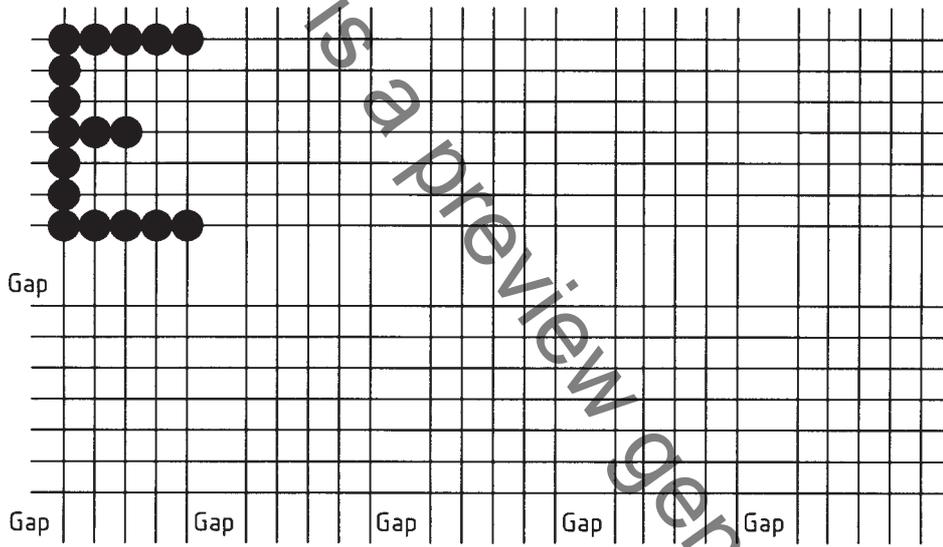


Figure 2 — Display with built-in gaps

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1 Scope

This part of ISO 13406 establishes the rationale for ergonomic requirements for work with visual displays based on flat panels.

This part of ISO 13406 is applicable to flat-panel technology applied to displays for office work and similar work.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 13406. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 13406 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9241-11:1998, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 11: Guidance on usability.*

3 Term and definition

For the purposes of this part of ISO 13406, the following term and definition applies.

3.1

flat panel

display that incorporates a flat surface > 2 m radius of curvature, for the presentation of information; the surface contains an active area consisting of a regular array of electrically alterable, discrete picture elements (pixels) in rows and columns