



**SLOVENSKI STANDARD**  
**SIST EN ISO 13406-1:2001**  
**01-marec-2001**

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**Ergonomske zahteve za delo s prikazovalnimi zasloni na osnovi ravnih ekranov -  
1. del: Uvod (ISO 13406-1:1999)**

Ergonomic requirements for work with visual display based on flat panels - Part 1:  
Introduction (ISO 13406-1:1999)

Ergonomische Anforderungen an optische Anzeigeeinheiten in Flachbauweise - Teil 1:  
Einführung (ISO 13406-1:1999)

Exigences ergonomiques pour travail sur écrans de visualisation a panneaux plats -  
Partie 1: Introduction (ISO 13406-1:1999)

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**Ta slovenski standard je istoveten z: EN ISO 13406-1:1999**

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**ICS:**

13.180	Ergonomija	Ergonomics
35.180	Terminalska in druga periferna oprema IT	IT Terminal and other peripheral equipment

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EUROPEAN STANDARD

EN ISO 13406-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 1999

ICS 13.180; 35.180

English version

## Ergonomic requirements for work with visual display based on flat panels - Part 1: Introduction (ISO 13406-1:1999)

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

Ergonomische Anforderungen an optische Anzeigeeinheiten in Flachbauweise - Teil 1: Einführung (ISO 13406-1:1999)

This European Standard was approved by CEN on 3 September 1999.

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.

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 Central Secretariat has the same status as the official versions.

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CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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

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EN ISO 13406-1:1999

## Foreword

The text of the International Standard ISO 13406-1:1999 has been prepared by Technical Committee ISO/TC 159 "Ergonomics" in collaboration with Technical Committee CEN/TC 122 "Ergonomics", 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 April 2000, and conflicting national standards shall be withdrawn at the latest by April 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, 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 Standards are listed in annex ZA (normative).

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SVTHPLJMAN ROKOJA ON TEKONIM



**Annex ZA (normative)****Normative references to international publications  
with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 9241-11	1998	Ergonomic requirements for office work with visual display terminals (VDTs) - Part 11: Guidance on usability	EN ISO 9241-11	1998

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**Ergonomic requirements for work with  
visual displays based on flat panels —**

**Part 1:  
Introduction**

**iTeh STANDARD PREVIEW**  
*Exigences ergonomiques pour travail sur écrans de visualisation à  
panneaux plats —*  
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*Partie 1: Introduction*

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Reference number  
ISO 13406-1:1999(E)

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 13406-1 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction*, WG 2, *Visual display requirements*, in collaboration with IEC/SC 47C/WG 2 (responsible for flat-panel engineering standards).

ISO 13406 consists of the following parts, under the general title *Ergonomic requirements for work with visual displays based on flat panels*:

— Part 1: Introduction

— Part 2: Requirements for flat panel displays

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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.