

SLOVENSKI STANDARD

SIST EN ISO 9241-306:2018

01-december-2018

Nadomešča:

SIST EN ISO 9241-306:2009

Ergonomija medsebojnega vpliva človek-sistem - 306. del: Metode ocenjevanja polja elektronskih slikovnih zaslonov (ISO 9241-306:2018)

Ergonomics of human-system interaction - Part 306: Field assessment methods for electronic visual displays (ISO 9241-306:2018)

Ergonomie der Mensch-System-Interaktion - Teil 306: Vor-Ort-Bewertungsverfahren für elektronische optische Anzeigen (ISO 9241-306:2018)

Ergonomie de l'interaction homme-système - Partie 306: Méthodes d'appréciation sur le terrain des écrans de visualisation électroniques (ISO 9241-306:2018)

Ta slovenski standard je istoveten z: EN ISO 9241-306:2018

ICS:

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

SIST EN ISO 9241-306:2018

en,fr,de

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EUROPEAN STANDARD

EN ISO 9241-306

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2018

ICS 13.180; 35.180

Supersedes EN ISO 9241-306:2008

English Version

Ergonomics of human-system interaction - Part 306: Field assessment methods for electronic visual displays (ISO 9241-306:2018)

Ergonomie de l'interaction homme-système - Partie 306: Méthodes d'appréciation sur le terrain des écrans de visualisation électroniques (ISO 9241-306:2018)

Ergonomie der Mensch-System-Interaktion - Teil 306: Vor-Ort-Bewertungsverfahren für elektronische optische Anzeigen (ISO 9241-306:2018)

This European Standard was approved by CEN on 3 August 2018.

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European foreword

This document (EN ISO 9241-306:2018) has been prepared by Technical Committee ISO/TC 153 "Valves" 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of an identical text or by endorsement, at the latest by March 2019, and conflicting national standards shall be withdrawn at the latest by March 2019.

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INTERNATIONAL
STANDARD

ISO
9241-306

Second edition
2018-08

**Ergonomics of human-system
interaction —**

**Part 306:
Field assessment methods for
electronic visual displays**

iTeh STANDARD PREVIEW —
Ergonomie de l'interaction homme-système —

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*Partie 306: Méthodes d'appréciation sur le terrain des écrans de
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Reference number
ISO 9241-306:2018(E)

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Published in Switzerland

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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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction*.

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.

This second edition cancels and replaces the first edition (ISO 9241-306:2008), which has been technically revised. The main changes compared to the previous edition are as follows:

- cathode ray tubes (CRT) displays have been added to a new informative [Annex E](#);
- definitions of five chromatic text charts for elementary or device hue output have been added to [Annex D](#).

A list of all parts in the ISO 9241 series can be found on the ISO website.

ISO 9241-306:2018(E)

Introduction

This document is part of the ISO 9241 series which establishes requirements for the ergonomic design of electronic visual displays. At the same time, this “300” subseries replaces either partially or fully certain previously published parts of ISO 9241 as well as several other International Standards (see the Forewords of the respective parts for the details).

- An introduction to the subseries is given by ISO 9241-300.
- Terms and definitions related to electronic visual displays have been transferred to, and collected in, ISO 9241-302.
- While the areas previously covered in ISO 9241 and by ISO 13406 remain essentially unchanged, test methods and requirements have been updated to account for advances in science and technology.
- All generic ergonomic requirements have been incorporated into ISO 9241-303.
- The application of those requirements to different display technologies, application areas and environmental conditions — including test methods and pass/fail criteria — are specified in ISO 9241-307.
- Methods for performing formal display measurements to determine display characteristics and verify technical specifications (tests that can be very costly and time-consuming and that are normally performed under rigorous test conditions with a new device) are given in ISO 9241-305 and ISO 9241-307.
- In addition, guidance on the design of SED (surface-conduction electron-emitter displays) and OLED (organic light-emitting diode) displays is given in ISO/TR 9241-308 and ISO/TR 9241-309.

The overall modular structure of the subseries facilitates its revision and amendment, as ongoing technological development enables new forms of display interaction.

This document is concerned with ergonomic workplace assessment and is aimed at providing a means of assessing whether or not the visual ergonomic requirements specified in ISO 9241-303 are satisfied within a specified task setting. The intention is not necessarily to produce a perfect display with optimum visual characteristics, but rather to ensure that the needed qualities to perform the visual task satisfactorily are indeed present.

During the lifetime of a display, the context in which it is used can often vary; “ageing” normally takes place as the display is used and, as a result, the performance of the display can be reduced over time. The lighting conditions under which a display is used also often vary.

In actual VDT workstation use, the main ergonomic concerns are the visual task being performed and the input devices being used to accomplish the task.

There are several factors that make the performance of a visual task using a VDT different from that in many other non-VDT or paper tasks. These factors are related to the positioning of the various elements needed for performing the visual task.

The ergonomic goal is to be able to read the information on the display comfortably, easily, accurately and quickly (where necessary) — as when a paper “hardcopy” placed on the work desk is read.

One consideration is what can be called the *positional sensitivity* of the screen. If positioned poorly, displays are susceptible to external light sources: these can be reflected back to the viewer and can contribute to reduced legibility of the information on the screen. In more compelling environments, these light sources can give rise to glare. They can come from either natural light from windows or from artificial lighting systems such as overhead mounted luminaries in offices.

Given the size and dimensions of most displays, a display is typically oriented in a vertical rather than horizontal position. This orientation and position of the information to be read is considerably different than that when a book or paper placed on the desk is read. The line of sight from the eye to the visual

task is raised up to 45°, giving rise to a quite different visual background, often with a varying luminous background arising from walls and other objects in the environment. These factors can affect the working posture of a user trying to compensate between the line of sight angle to the display needed to be maintained and the distance to the visual task.

These, and other, considerations demonstrate that the positioning of a display is much more important than the mere positioning of paper or other hardcopy reading materials. They give rise to the need to be able to adjust the display for orientation and height and to have the flexibility to set up the workstation equipment so that the needs of a specific user can be met. The combination of display, lighting environment and workstation equipment are the basics for an ergonomically well-designed workplace.

Unlike most visual task materials, displays are intended to be used for several years. Many other kinds of work materials are used only once or a few times, or are renewed or refreshed when visibility is too low or possibly too uncertain (e.g. safety instructions or warnings), or else simply remain unchanged over time.

The display assessment methods presented in this document do not, in most cases, require expensive measuring equipment and can generally be carried out easily in a working field environment. In conducting these assessments, it ought to be possible to determine whether a problem is related to:

- a) the display itself (or the display in combination with the graphic adapter);
- b) the application software; or
- c) physical environmental conditions.

In cases involving the display, it is beneficial that the workstation set-up be reviewed to determine whether it meets the supplier's recommendations; if it does not, another assessment is performed to determine how it can be made to meet them. In cases involving the application software, it can be necessary to contact the software developers of the application product in order to ascertain possible corrective action. In cases involving conditions in the physical environment, simple re-orientations or the repositioning of the workstation and/or display can be a satisfactory solution; whereas, in more complex situations, it can be necessary to make arrangements with the relevant interested parties in order to ascertain appropriate actions and their feasibility. For details, see [Annex B](#).

The ISO 9241 series was originally developed as a 17-part International Standard on the ergonomics requirements for office work with visual display terminals. As part of the standards review process, a major restructuring of the ISO 9241 series was agreed to broaden its scope, to incorporate other relevant standards and to make it more usable. The general title of the revised ISO 9241 series, (Ergonomics of human-system interaction) reflects these changes and aligns the series with the overall title and scope of Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction*. The revised series is structured as a series of standards numbered in the "hundreds": the 100 series deals with software interfaces, the 200 series with human centred design, the 300 series with visual displays, the 400 series with physical input devices and so on.

See [Annex A](#) for an overview of the entire ISO 9241 series.

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Ergonomics of human-system interaction —

Part 306:

Field assessment methods for electronic visual displays

1 Scope

This document establishes optical, geometrical and visual inspection methods for the assessment of a display in various contexts of use according to ISO 9241-303.

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 9241-302, *Ergonomics of human-system interaction — Part 302: Terminology for electronic visual displays*

ISO 9241-303:2011, *Ergonomics of human-system interaction — Part 303: Requirements for electronic visual displays*

ISO 9241-307, *Ergonomics of human-system interaction — Part 307: Analysis and compliance test methods for electronic visual displays*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9241-302 apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Preparation for assessment

4.1 Cleaning

Ensure that the visual display is clean; otherwise, clean it according to the manufacturer's instructions.

4.2 Set-up

The visual display shall be physically prepared for assessment. Drive the visual display with the following parameters:

- resolution: use the native resolution or the resolution recommended by the manufacturer;
- in case of CRT, see [Annex E](#);
- image size: adjust to a specified size.