

**Ergonomics of human-system interaction - Part
304: User performance test methods for electronic
visual displays**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 9241-304:2008 sisaldab Euroopa standardi EN ISO 9241-304:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 15.12.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 15.11.2008.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 9241-304:2008 consists of the English text of the European standard EN ISO 9241-304:2008.

This standard is ratified with the order of Estonian Centre for Standardisation dated 15.12.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 15.11.2008.

The standard is available from Estonian standardisation organisation.

ICS 13.180, 35.180

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EUROPEAN STANDARD

EN ISO 9241-304

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2008

ICS 13.180; 35.180

Supersedes EN 29241-3:1993

English Version

**Ergonomics of human-system interaction - Part 304: User
performance test methods for electronic visual displays (ISO
9241-304:2008)**

Ergonomie de l'interaction homme-système - Partie 304:
Méthodes d'essai de la performance de l'utilisateur pour
écrans de visualisation électroniques (ISO 9241-304:2008)

Ergonomie der Mensch-System-Interaktion - Teil 304:
Prüfverfahren zur Benutzerleistung für elektronische
optische Anzeigen (ISO 9241-304:2008)

This European Standard was approved by CEN on 11 July 2008.

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Foreword

This document (EN ISO 9241-304:2008) 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of an identical text or by endorsement, at the latest by May 2009, and conflicting national standards shall be withdrawn at the latest by May 2009.

This document supersedes EN 29241-3:1993.

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Endorsement notice

The text of ISO 9241-304:2008 has been approved by CEN as a EN ISO 9241-304:2008 without any modification.

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Introduction

ISO 9241 was originally developed as a seventeen-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 ISO 9241 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, “Ergonomics of human-system interaction”, reflects these changes and aligns the standard with the overall title and scope of Technical Committee ISO/TC 159, Subcommittee SC 4. The revised multipart standard is structured as 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.

ISO 9241-3:1992, Annex C, offered users a provisional alternative method for testing the visual quality of a display, intended for novel display technologies for which no optical test method was available. The Amendment ISO 9241-3:1992/Amd.1:2000 replaced this test method and made the previously informative Annex C normative. ISO 9241-7:1998, ISO 9241-8:1997 and ISO 13406-2:2001 (all three of which have since been cancelled and replaced by other parts of the ISO 9241 “300” subseries) referred to that Amendment as providing an alternative user performance test method.

This part of ISO 9241 not only incorporates the Amendment, but extends its basis to provide guidance on the general process of assessing the visual ergonomics of displays in a specific context of use by means of a user performance test method. The test method specified in this part of ISO 9241 is applicable only to user tasks involving the handling and processing of text. However, it is expected that test procedures will also be developed for using maps and for handling and interpreting photographs and moving images, with these then being incorporated into a future edition.

The structure of this part of ISO 9241 is an exception in the ISO 9241 “300” subseries in that it establishes the conformance of a visual display used for text rendition according to its own user performance test method, instead of by means of a compliance route given in ISO 9241-307 (in which no compliance route relevant to this part of ISO 9241 is provided).

Ergonomics of human-system interaction —

Part 304:

User performance test methods for electronic visual displays

1 Scope

This part of ISO 9241 provides guidance for assessing the visual ergonomics of display technologies with user performance test methods (as opposed to the optical test methods given in ISO 9241-305). Its use will help to ensure that, for a given context of use, a display meets minimum visual ergonomics requirements. It covers only visual attributes and does not address the ergonomics or usability of the whole product that houses a visual display.

The general principles laid down by this part of ISO 9241 apply to any colour or monochrome visual display attached to a system with which human beings interact. This includes, but is not limited to, visual displays used with desktop and portable computers, those used on mobile devices such as mobile telephones, digital cameras and personal digital assistants, and status displays used on consumer electronics equipment such as printers, in-car navigation systems and microwave ovens. It extends the basic idea of the visual performance and comfort test specified in ISO 9241-3:1992/Amd.1:2000 to the use of the performance and judgment of the display end users themselves for evaluating the quality of a display, and includes a more diverse range of technologies, users, tasks and environments.

Because of this diversity, it is not feasible for this part of ISO 9241 to stipulate a single, generic test method that can be used with all display technologies. Instead, the basic principles for generating a test method are given. This method will be valid for evaluating specific displays in specific contexts of use: the method generated according to Clause 8 is applicable only to tasks involving the handling and processing of text. No other examples are given. An essential property of the process is that it permits the verification of the usability of a visual display for a representative task, performed by representative users, taking their performance and judgment as measured quality values. It does not, however, permit the measurement of specific perceptual attributes such as luminance contrast or display flicker in isolation.

The main users of this part of ISO 9241 will be those who procure displays or who need to measure display performance during product development. Its application assumes a background in behavioural science.

2 Normative references

The following referenced documents are indispensable for the application 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 9241-5, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 5: Workstation layout and postural requirements*

ISO 9241-6, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 6: Guidance on the work environment*

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

ISO 9241-303:2008, *Ergonomics of human-system interaction — Part 303: Requirements for electronic visual displays*

ISO/IEC 8859 (all parts), *Information technology — 8-bit single-byte coded graphic character sets*

3 Terms and definitions

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

4 Guiding principles

The guiding principles of this part of ISO 9241 are that visual displays should help people carry out their tasks effectively and efficiently, and that displays should be satisfying to use and not in any way be harmful to their users' health.

Formal optical test methods as specified in ISO 9241-305 might not be available to support the procurement of newer display technologies. In such cases, requiring manufacturers to demonstrate evidence of the usability of their displays provides the most effective route for ensuring good ergonomics quality. This is the approach taken by this part of ISO 9241.

It sets out four steps for generating test methods that can be used to measure the ergonomics visual quality of visual displays:

- a) specify the visual ergonomic test objectives (see Clause 6);
- b) define the test procedure (see Clause 7);
- c) carry out the test (see Clause 8);
- d) analyse the data (see Clause 8).

5 Conformance

Whereas ISO 9241-303 and ISO 9241-305 refer to the compliance routes defined in ISO 9241-307 to establish the conformance of a visual display, this part of ISO 9241 itself specifies a test method for establishing such conformance.

If the test display is compared to a benchmark display and the test procedure is based on either alphanumeric or non-alphanumeric text, conformance is achieved when both

- the search speed for the test display is not statistically significantly lower than the search speed obtained with the benchmark display, and
- the perceived quality, as measured by its visual comfort rating, of the test display is not statistically significantly lower than that of the benchmark display.

The procedure used for determining search speed and perceived quality shall be in accordance with Clause 8.