

# SVENSK STANDARD

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### **Ergonomi vid människa-system interaktion – Del 333: Bildskärmar som förutsätter speciella glasögon för stereoskopiskt seende (ISO 9241-333:2017)**

### **Ergonomics of human-system interaction – Part 333: Stereoscopic displays using glasses (ISO 9241-333:2017)**

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EUROPEAN STANDARD

**EN ISO 9241-333**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2017

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ICS 13.180; 35.180

English Version

**Ergonomics of human-system interaction - Part 333:  
Stereoscopic displays using glasses (ISO 9241-333:2017)**

Ergonomie de l'interaction homme-système - Partie  
333: Écrans stéréoscopiques utilisant des lunettes (ISO  
9241-333:2017)

Ergonomie der Mensch-System-Interaktion - Teil 333:  
Stereoskopische Displays unter Verwendung von  
Brillen (ISO 9241-333:2017)

This European Standard was approved by CEN on 6 April 2017.

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# Contents

Page

<b>European foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
3.1 General terms .....	1
3.2 Human factors .....	3
3.3 Performance characteristics .....	4
<b>4 Display technologies and their guiding principles</b> .....	<b>4</b>
<b>5 Ergonomic requirements</b> .....	<b>5</b>
5.1 Viewing conditions .....	5
5.1.1 General .....	5
5.1.2 Design viewing distance .....	5
5.1.3 Design viewing direction .....	6
5.2 Luminance .....	6
5.2.1 General .....	6
5.2.2 Illuminance .....	6
5.2.3 Display luminance .....	6
5.3 Visual artefacts and fidelity .....	6
5.3.1 General .....	6
5.3.2 Luminance non-uniformity .....	7
5.3.3 Interocular luminance difference .....	7
5.3.4 Interocular crosstalk .....	7
<b>6 Optical laboratory test methods</b> .....	<b>8</b>
6.1 General .....	8
6.1.1 Basic measurements and derived procedures .....	8
6.1.2 Structure .....	8
6.2 Measurement conditions .....	9
6.2.1 Preparations and procedures .....	9
6.2.2 Test accessories .....	10
6.2.3 Test patterns .....	10
6.2.4 Alignment: measurement location and meter position .....	10
6.2.5 Light measuring device (LMD) .....	11
6.2.6 Measurement field .....	12
6.2.7 Angular aperture .....	12
6.2.8 Meter time response .....	12
6.2.9 Test illumination .....	12
6.2.10 Other ambient test conditions .....	12
6.3 Measurement methods .....	13
6.3.1 Basic light measurements .....	13
6.3.2 P 333.1: Luminance angular distribution .....	15
6.3.3 P 334.1: Luminance angular uniformity .....	15
6.3.4 Luminance analysis .....	16
6.3.5 P 337.1: Interocular luminance difference .....	18
6.3.6 P 338.1: Interocular crosstalk .....	18
<b>7 Analysis and compliance test methods</b> .....	<b>20</b>
7.1 Compliance routes .....	20
7.1.1 Intended context of use .....	20
7.1.2 Design viewing direction range (angle of inclination and azimuth) .....	21
7.1.3 Information about the technology .....	22
7.1.4 Compliance assessment .....	22
7.2 Conformance .....	27

**SS-EN ISO 9241-333:2017 (E)**

<b>Annex A</b> (informative) <b>Overview of the ISO 9241 series</b> .....	<b>28</b>
<b>Annex B</b> (informative) <b>Matrix of measurement procedures</b> .....	<b>29</b>
<b>Annex C</b> (informative) <b>Technical explanation of display technologies</b> .....	<b>30</b>
<b>Bibliography</b> .....	<b>32</b>



## **European foreword**

This document (EN ISO 9241-333:2017) 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 November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

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### **Endorsement notice**

The text of ISO 9241-333:2017 has been approved by CEN as EN ISO 9241-333:2017 without any modification.

## SS-EN ISO 9241-333:2017 (E)

### Introduction

Recently, due to the improvement of display technologies, users can easily experience stereoscopic displays using glasses, such as TVs with large screen, personal computers, etc. The displays are used not only in the field of leisure, but also in business, education and medical applications.

This document presents the requirements for visual display units (VDUs) with stereoscopic displays using glasses.

ISO 9241-303 covers the display hardware aspect and gives basic requirements for head-mounted displays (HMDs). ISO/TR 9241-331 presents the optical characteristics of autostereoscopic displays. These other documents are closely related to stereoscopic displays using glasses, but are not directly applicable to them, because the need for special glasses or its absence is an important factor in ergonomics. The visual factors of HMDs are also ergonomically different from those of other displays.

This document is not included in the current ISO 9241-300 subseries for 2D displays because stereoscopic displays have unique features. The development of a separate document to cover stereoscopic displays offers better understanding of its unique features. For an overview of the entire ISO 9241 series, see [Annex A](#).

Moreover, IWA 3:2005<sup>[19]</sup> was published (since withdrawn) to discuss the image contents aspect. This ISO International Workshop Agreement described image safety issues and means of reducing the incidence of undesirable biomedical effects caused by visual image sequences. Visual fatigue caused by stereoscopic images (VFSI) is one of these undesirable effects.

With this document and the related International Standards, the purpose is to develop guidelines for image content where activities are closely related to the use of stereoscopic displays with glasses.

To ensure effective and comfortable viewing, and to reduce VFSI, the standards will need to address both display hardware and the displayed contents. However, as the first step, this document focuses on the display hardware aspect in order to simplify the discussions.

# Ergonomics of human-system interaction —

## Part 333: Stereoscopic displays using glasses

### 1 Scope

This document specifies ergonomic requirements for stereoscopic displays using glasses designed to produce or facilitate binocular parallax. These requirements are stated as performance specifications, aimed at ensuring effective and comfortable viewing conditions for users, and at reducing visual fatigue caused by stereoscopic images on stereoscopic display using glasses. Test methods and metrology, yielding conformance measurements and criteria, are provided for design evaluation. See [Annex B](#) for measurement procedures.

This document is applicable to temporally or spatially interlaced types of display. These are implemented by flat-panel displays, projection displays, etc.

Stereoscopic displays using glasses can be applied to many contexts of use. However, this document focuses on business and home leisure applications (i.e. observing moving images, games, etc.). Only dark environments are specified in this document.

For technical explanation of display technologies, see [Annex C](#).

### 2 Normative references

There are no normative references in this document.

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at <http://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1 General terms

##### 3.1.1

##### **stereoscopic display**

3D display where depth perception is induced by *binocular parallax* ([3.2.1](#))

[SOURCE: ISO/TR 9241-331:2012, 2.1]

##### 3.1.2

##### **temporally interlaced type**

##### **temporally multiplexed type**

##### **temporally multiplexed display**

##### **temporally multiplexed stereoscopic display**

*stereoscopic display* ([3.1.1](#)) that shows each of stereoscopic images sequentially