
Ergonomija medsebojnega vpliva človek-sistem - 394. del: Ergonomske zahteve za zmanjšanje neželenih biomedicinskih učinkov potovalne slabosti, ki jih povzročajo vizualni dražljaji pri gledanju elektronskih slik (ISO 9241-394:2020)

Ergonomics of human-system interaction - Part 394: Ergonomic requirements for reducing undesirable biomedical effects of visually induced motion sickness during watching electronic images (ISO 9241-394:2020)

Ergonomie der Mensch-System-Interaktion - Teil 394: Ergonomische Anforderungen zur Reduzierung unerwünschter biomedizinischer Effekte der visuell induzierten Bewegungskrankheit bei der Betrachtung elektronischer Bilder (ISO 9241-394:2020)

<https://standards.iteh.ai/catalog/standards/sist/424e7201-07ac-4459-a0cd-46558a9b584e/sist-en-iso-9241-394-2022>

Ergonomie de l'interaction homme-système - Partie 394: Exigences ergonomiques pour la réduction des effets biomédicaux indésirables des cinétoses induites par stimulus visuel lors de l'observation d'images électroniques (ISO 9241-394:2020)

Ta slovenski standard je istoveten z: EN ISO 9241-394:2022

ICS:

13.180

Ergonomija

Ergonomics

SIST EN ISO 9241-394:2022

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 9241-394

March 2022

ICS 13.180

English Version

**Ergonomics of human-system interaction - Part 394:
Ergonomic requirements for reducing undesirable
biomedical effects of visually induced motion sickness
during watching electronic images (ISO 9241-394:2020)**

Ergonomie de l'interaction homme-système - Partie 394: Exigences ergonomiques pour la réduction des effets biomédicaux indésirables des cinétoses induites par stimulus visuel lors de l'observation d'images électroniques (ISO 9241-394:2020)

Ergonomie der Mensch-System-Interaktion - Teil 394: Ergonomische Anforderungen zur Reduzierung unerwünschter biomedizinischer Effekte der visuell induzierten Bewegungskrankheit bei der Betrachtung elektronischer Bilder (ISO 9241-394:2020)

This European Standard was approved by CEN on 13 March 2022.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	3
------------------------	---

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 9241-394:2022

<https://standards.iteh.ai/catalog/standards/sist/424e7201-07ac-4459-a0cd-4f558a9b584c/sist-en-iso-9241-394-2022>

European foreword

The text of ISO 9241-394:2020 has been prepared by Technical Committee ISO/TC 159 "Ergonomics" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 9241-394:2022 by 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 September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 9241-394:2020 has been approved by CEN as EN ISO 9241-394:2022 without any modification.

<https://standards.iteh.ai/catalog/standards/sist/424e7201-07ac-4459-a0cd-4f558a9b584c/sist-en-iso-9241-394-2022>

INTERNATIONAL
STANDARDISO
9241-394First edition
2020-04

**Ergonomics of human-system
interaction —**

Part 394:

**Ergonomic requirements for reducing
undesirable biomedical effects of
visually induced motion sickness
during watching electronic images***Ergonomie de l'interaction homme-système —**Partie 394: Exigences ergonomiques pour la réduction des effets
biomédicaux indésirables des cinétoses induites par stimulus visuel
lors de l'observation d'images électroniques*Reference number
ISO 9241-394:2020(E)

© ISO 2020

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 9241-394:2022

<https://standards.iteh.ai/catalog/standards/sist/424e7201-07ac-4459-a0cd-4f558a9b584c/sist-en-iso-9241-394-2022>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Guiding concepts	2
4.1 Contexts of image viewing	2
4.2 Basis of guiding concepts.....	3
4.3 Major factors of VIMS.....	3
5 Ergonomic requirements and recommendations	4
5.1 General.....	4
5.2 Images presented in passive viewing environments.....	5
5.2.1 Potentially unwanted conditions of visual rotation	5
5.2.2 Potentially unfavourable conditions of visual rotation	5
5.2.3 Basis of the requirements and recommendations.....	5
5.2.4 Reference information on effects of visual motion combination.....	6
5.3 Images presented in active viewing environments.....	6
5.3.1 General.....	6
5.3.2 Potentially unfavourable conditions of visual rotation	6
5.3.3 Reference information on effects of visual motion combinations	7
5.3.4 Potentially unfavourable conditions of large visual field images or VR-type HMDs	7
6 Conformance and usages of ergonomic recommendations	7
6.1 General.....	7
6.2 Measurement methods.....	8
6.3 Procedure of conformance and report.....	8
Annex A (informative) Overview of the ISO 9241 series	9
Annex B (informative) Viewing conditions	10
Annex C (informative) Effects of visual motion combination	11
Annex D (informative) General methods of alleviating VIMS	15
Annex E (informative) Measurement method of visual global motion	17
Annex F (informative) Measurement method of time delay of head tracking	20
Annex G (informative) Sample procedure for assessing applicability and conformance	21
Annex H (informative) Individual viewer factors	23
Bibliography	24

ISO 9241-394:2020(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.

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, *Human-system interaction*.

SIST EN ISO 9241-394:2022

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.

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

Introduction

With the advancement in image technologies, it is now possible to experience various new types of images through different kinds of electronic displays, for example, ultra-high definition (UHD) images and virtual reality images. These technologies make our daily lives more convenient and enable different lifestyles.

The new products of advanced image technologies can be popularized both by solving technical issues and by devising countermeasures for reducing incidences of undesirable biomedical effects, such as visually induced motion sickness.

This document describes the basic and minimal conditions for reducing incidences of visually induced motion sickness. It is intended to promote an environment in which viewers can enjoy the benefits of images without the adverse effects of visually induced motion sickness. In such an environment, new technologies for images can also be actively developed and applied in various fields. This document is not intended to restrict the freedom of expression or artistic creativity in the image culture.

This document is based on scientific findings related to the possible undesirable effects of visually induced motion sickness. In the future, this document could be revised as new scientific data become available.

This document is part of the ISO 9241 series, which specifies human–system interaction standards. Readers who need guidance on other aspects of human–system interaction can therefore refer to other documents in the ISO 9241 series. See [Annex A](#) for an overview of the ISO 9241 series.

iteh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 9241-394:2022

<https://standards.iteh.ai/catalog/standards/sist/424e7201-07ac-4459-a0cd-4f558a9b584c/sist-en-iso-9241-394-2022>

