SLOVENSKI STANDARD
SIST-TP CEN ISO/TR 22411:2021

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Nadomešča:
SIST-TP CEN ISO/TR 22411:2011

Ergonomski podatki in smernice za uporabo ISO/IEC Vodila 71 za proizvode in storitve, ki upoštevajo potrebe starejših in invalidnih oseb (ISO/DTR 22411:2020)

Ergonomics data and guidelines for the application of ISO/IEC Guide 71 to products and services to address the needs of older persons and persons with disabilities (ISO/DTR 22411:2020)

Ergonomische Daten und Leitlinien für die Anwendung des ISO/IEC Guide 71 für Produkte und Dienstleistungen zur Berücksichtigung der Belange älterer und behinderter Menschen (ISO/DTR 22411:2020)

Données d'ergonomie et lignes directrices pour l'application du Guide ISO/IEC 71 aux produits et services afin de répondre aux besoins des personnes âgées et de celles ayant des incapacités (ISO/DTR 22411:2020)

Ta slovenski standard je istoveten z: **CEN ISO/TR 22411:2021**

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01.120	Standardizacija. Splošna pravila	Standardization. General rules
11.180.01	Pripomočki za onesposobljene in hendikepirane osebe na splošno	Aids for disabled and handicapped persons in general
13.180	Ergonomija	Ergonomics

SIST-TP CEN ISO/TR 22411:2021 **en,fr,de**

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN ISO/TR 22411

January 2021

ICS 01.120; 11.180.01

Supersedes CEN ISO/TR 22411:2011

English Version

Ergonomics data for use in the application of ISO/IEC Guide 71:2014 (ISO/TR 22411:2021)

Données ergonomiques destinées à être utilisées dans le cadre de l'application du Guide ISO/IEC 71:2014 (ISO/TR 22411:2021)

Ergonomische Daten und Leitlinien für die Anwendung des ISO/IEC Guide 71 für Produkte und Dienstleistungen zur Berücksichtigung der Belange älterer und behinderter Menschen (ISO/TR 22411:2021)

This Technical Report was approved by CEN on 26 December 2020. It has been drawn up by the Technical Committee CEN/TC 122.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (CEN ISO/TR 22411:2021) 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.

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.

This document supersedes CEN ISO/TR 22411:2011.

Endorsement notice

The text of ISO/TR 22411:2021 has been approved by CEN as CEN ISO/TR 22411:2021 without any modification.

TECHNICAL REPORT

ISO/TR 22411

Second edition
2021-01

Ergonomics data for use in the application of ISO/IEC Guide 71:2014

Données ergonomiques destinées à être utilisées dans le cadre de l'application du Guide ISO/IEC 71:2014

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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).

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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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 122, *Ergonomics,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO/TR 22411:2008), which has been technically revised.

The main change compared to the previous edition is the replacement of ergonomics data on human abilities and capabilities with new or more elaborated data for use in the application of ISO/IEC Guide 71:2014.

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.

Introduction

This document is intended to help standards developers by providing ergonomics data related to human characteristics and capabilities to support ISO/IEC Guide 71:2014. This document is supposed to be used mainly by standards developers, but also by those responsible for design. The underlying idea is that products, services and environments encountered in all aspects of daily life and intended for the consumer market and the workplace should be designed to be accessible for people with a widest range of capabilities. This idea, called accessibility, has been spreading all over the world.

ISO/IEC Guide 71 was first published in 2001 to successfully address the importance of being aware of the needs of older persons and persons with disabilities and to direct the attention of standards developers to these needs when they draft or revise standards. In response to the publication of ISO/IEC Guide 71, ISO/TR 22411:2008 was developed to fulfil the gap between the concept and practice with offering ergonomic knowledge and data on human abilities.

After more than 10 years from the publication of ISO/IEC Guide 71 and ISO/TR 22411, together with new knowledge and experience in implementing these documents, ISO/IEC Guide 71 was revised into a more elaborated one and consequently the revision of ISO/TR 22411 was required.

This document provides updated ergonomics data as well as newly available data which are all publicly available and can be used to support standards developers in applying ISO/IEC Guide 71:2014 in their individual standards. These ergonomics data help standards developers to understand characteristics and capabilities of diverse users to be served by requirements and recommendations in a standard. The data provided in this document apply mainly to persons with disabilities and older persons. The intention in using these data is to formulate requirements and recommendations in standards that include the widest possible range of users. It can also be used by designers in order to increase accessibility as part of accessible design or universal design.

While the data covers a wide area of human abilities related to accessibility, data for some part of the area, for example cognitive abilities, is still missing. Furthermore, new data emerged or were updated during the development of this document, which is not included in this document either. This document, due to scientific reasons, does not necessarily adopt the ICF terminology but established terms in ergonomics.

Ergonomics data for use in the application of ISO/IEC Guide 71:2014

IMPORTANT — The electronic file of this document contains colours which are considered to be useful for the correct understanding of the document. Users should therefore consider printing this document using a colour printer.

1 Scope

This document provides ergonomics data for standard developers to use in applying ISO/IEC Guide 71:2014 to address accessibility in standards. These data can also be used by ergonomists and designers to support the development of more accessible products, systems, services, environments, and facilities.

The ergonomics data include quantitative data and knowledge about basic human characteristics and capabilities as well as context-specific and task-specific data, all being based on ergonomics research. The data focused on the effects of ageing and/or consequences of various types of human sensory, physical, and cognitive disabilities. It does not contain general ergonomics data that have no direct relation to ageing or disabilities.

The data presented in this document are not exhaustive due to no available data for some aspects of human characteristics and capabilities with regard to ageing and disabilities.

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 https://www.iso.org/obp

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

3.1
accessibility
extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of user needs, characteristics and capabilities to achieve identified goals in identified contexts of use

Note 1 to entry: Context of use includes direct use or use supported by assistive technologies.

[SOURCE: ISO 9241-112:2017, 3.15]

3.2
accessible design
design focused on diverse users to maximize the number of potential users who can readily use a system in diverse contexts

Note 1 to entry: This aim can be achieved by (1) designing systems that are readily usable by most users without any modification, (2) making systems adaptable to different users (by providing adaptable user interfaces) and (3) having standardized interfaces to be compatible with assistive products and assistive technology.

Note 2 to entry: Terms such as universal design, accessible design, design for all, barrier-free design, inclusive design and transgenerational design are often used interchangeably with the same meaning.

[SOURCE: ISO/IEC Guide 71:2014, 2.19]

3.3
impairment
problem in body function or structure related to a significant deviation or loss

Note 1 to entry: Impairments can be temporary or permanent; progressive, regressive or static; intermittent or continuous.

[SOURCE: ICF 2001, WHO]

3.4
system
product, service, or built environment or any combination of them with which the user interacts

[SOURCE: ISO/IEC Guide 71:2014, 2.1]

3.5
universal design
design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design

Note 1 to entry: Universal design shall not exclude assistive devices for particular groups or persons with disabilities where this is needed.

Note 2 to entry: Terms such as universal design, accessible design, design for all, barrier-free design, inclusive design and transgenerational design are often used interchangeably with the same meaning.

[SOURCE: ISO/IEC Guide 71:2014, 2.18]

3.6
user
individual who accesses or interacts with a system

[SOURCE: ISO 9241-11:2018, 3.1.5, modified — In the definition, "person" has been changed to "individual", "accesses or" has been added, and "product or service" has been removed.]

4 Supporting ISO/IEC Guide 71 with human data

ISO/IEC Guide 71:2014 provides standards developers with guidance on addressing accessibility in standards through two approaches, as shown in Figure 1:

1) the first approach defines accessibility goals for the product or system under development and the user accessibility needs associated with fulfilling those goals (denoted by Clause 6 in Figure 1);

2) the second approach provides accessibility-related design considerations, based on an understanding of human abilities and characteristics (denoted by Clause 7 in Figure 1).

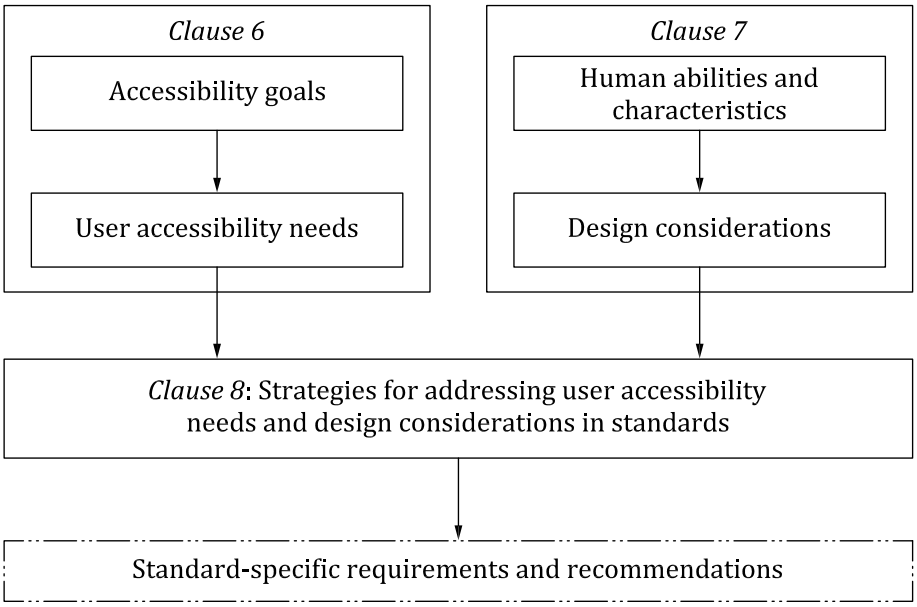

Figure 1 — Two approaches to address accessibility in standards described in ISO/IEC Guide 71:2014

The user accessibility needs (first approach) or design considerations (second approach) can serve as the basis for accessibility requirements and recommendations in standards. Regardless of which approach is used, the accessibility requirements and recommendations in the standards are derived through the appropriate selection of strategies (denoted by Clause 8 in Figure 1) that can meet the accessibility needs or address the design considerations.

Ergonomics data are relevant throughout both approaches and especially important in determining which strategies are the most effective in a situation. In some cases, the data can provide a source of nominal values or numerical specifications which can be included in the requirements and recommendations of standards. In other cases (especially with respect to cognitive variables), the available data are qualitative in nature and/or reflect small sample sizes, but can still be used to evaluate the feasibility of applying particular strategies to meet accessibility needs or to address design considerations.

In addition to the role that ergonomics data play in standards development, these data are directly relevant to the product and system designers, who are attempting to fulfil accessibility requirements and recommendations by developing and implementing technical solutions that make use of the existing data.

One of the challenges for standards developers and designers is that ergonomics data relevant to specific populations is distributed across multiple standards and other guidance documents, as well as in published research reports, papers and books from a variety of academic disciplines. The purpose of this document is to bring the most valid and applicable data together in one document. This will assist standards developers to address accessibility and consider the widest range of user needs when formulating requirements and recommendations. Having a single source of information will also be of value to designers.

5 Data selection and format

5.1 Data selection

The data in this document were selected from various sources existing in scientific books and journals, standards, as well as databases of universities, research institutes or projects. They are all relevant for demonstrating effects of ageing and disabilities and the committee regards valid and worth citing in this document. Most of the data are well-supported in academia and related technical fields or based on