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Ergonomija medsebojnega vpliva človek-sistem - 5. del: Ureditev delovnega mesta in zahteve za položaj telesa (ISO/DIS 9241-5:2023)

Ergonomics of human-system interaction - Part 5: Workstation layout and postural requirements (ISO/DIS 9241-5:2023)

Ergonomische Anforderungen für Bürotätigkeiten mit Bildschirmgeräten - Teil 5: Anforderungen an Arbeitsplatzgestaltung und Körperhaltung (ISO/DIS 9241-5:2023)

Ergonomie de l’interaction homme-système - Partie 5: Aménagement du poste de travail et exigences relatives aux postures (ISO/DIS 9241-5:2023)

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Ergonomics of human-system interaction —

Part 5: Workstation layout and postural requirements

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

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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).

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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*, Working Group WG 3, *Controls, workplace and environmental requirements.*

This second edition cancels and replaces the first edition (ISO 9241-5:1998), which has been technically revised.

The main changes compared to the previous edition are as follows:

— The principle of fit was changed to include a reference to ISO/TR 9241-514

— References were updated.

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

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

The purpose of this part of ISO 9241 is to promote and enhance performance and comfort while minimizing risks to users' safety and health. Users of interactive systems typically adopt a range of postures (seated with leaning, upright or reclining torso, standing or a combination of both). Workplaces which accommodate such usage can encourage movement, promote comfort and reduce physical, mental and visual problems.

This part of ISO 9241 is intended for use by product and workstation designers and implementers.

Ergonomics of human-system interaction —

Part 5: Workstation layout and postural requirements

1 Scope

This part of ISO 9241 specifies ergonomic guiding principles which apply to the user requirements, design, and procurement of workstation equipment for using interactive systems with visual displays.

In particular, the general principles and requirements specified in this part of ISO 9241 apply to the standards specifying technical design of furniture and equipment constituting the workplace. They are intended for use by product and workstation designers and implementers.

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 6385:2016, *Ergonomics principles in the design of work systems*

ISO 26800:2011, *Ergonomics — General approach, principles and concepts*

ISO 7250, *Basic human body measurements for technological design — Part 1: Body measurement definitions and landmarks*

ISO 2813:2014, *Paints and varnishes — Determination of gloss value at 20°, 60° and 85°*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

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

3.1
angle of view
angle between the line-of-sight and the line orthogonal to the surface of the display at the point where the line-of-sight intersects the image surface of the display

[SOURCE: ISO 9241-302:2008]

3.2
anthropometry
study and measurement of the physical dimensions of the human body

3.3
armrest
support for the lower arms

3.4
back rest
part of a work chair which provides support for the back

3.5
castor
wheeled component on the bottom of furniture to facilitate appropriate movement on the floor surface

3.6
design reference posture
posture specified for the purpose of workstation design to define relative positions and dimensions

3.7
deviation
alteration from the neutral position

3.8
dynamic posture
body position which changes, with relative movements of the limbs or other parts of the human body in relation to one another or with respect to a fixed object (such as a workstation)

3.9
extension
movement that increases the angle between two adjacent bones

Note 1 to entry: Dorsal pertains to the back of the hand, palmar to the palm.

Note 2 to entry: Hand extension is the movement of the hand in the dorsal direction.

Note 3 to entry: Neck extension (cervical extension) is the movement of the head backward.

3.10
flexion
movement that decreases the angle between two adjacent bones

Note 1 to entry: Palmar pertains to the palm of the hand.

Note 2 to entry: Hand flexion is the movement of the hand in the palmar direction.

Note 3 to entry: Neck flexion is the movement of lowering the chin down to the chest.

3.11
gloss
the mode of appearance by which reflected highlights of objects are perceived as superimposed on the surface due to the directionally selective properties of that surface

[SOURCE: http://cie.co.at/eilvterm/17-24-080, downloaded 2021-04-22]

3.12
gloss unit
measure for quantifying the gloss of a surface

3.13
interactive system
combination of hardware and/or software and/or services and/or people that users interact with in order to achieve specific goals

Note 1 to entry: This includes, where appropriate, packaging, user documentation, on-line and human help, support and training.

[SOURCE: ISO 9241-11:2018, 3.1.5]

3.13.1
kyphosis
convex curvature of the thoracic spine

3.14
intended user population
group of human beings for which a product or a workstation is designed

EXAMPLE Male and female workers of South-East Asian origin aged between 45 and 65 years.

3.15
line-of-sight angle
the angle between a horizontal line and the visual axis of the eye (the line connecting the point of fixation and the centre of the pupil)

3.16
lordosis
concave curvature of the spine

3.17
lumbar
region of the back between the thorax and the pelvis

3.18
popliteal
of or pertaining to the back of the knee

3.19
posture
overall position of the body, or body parts in relation to each other, with respect to the workplace and its components

3.20
reference plane
surface designed to support the feet

Note 1 to entry: If not otherwise indicated, the reference plane is the ground. Any other level higher or lower than the ground level may be used as a reference plane for the calculation of the height of support surfaces.

3.21
static posture
adoption of a body position which is fixed over time and where there is muscle contraction without motion

3.22
task analysis
analytical process employed to determine the specific behaviours required of people when operating equipment or doing work

Note 1 to entry: The task analysis is not a risk assessment of the workplace according to legal requirements.

3.23
workplace
arrangement of workstations allocated to one person to complete a work task

3.24
work space
volume of space allocated to one or more persons in the work system to complete a work task

3.25
worksurface
surface on which equipment and task materials are used

3.26
workstation
assembly comprising display equipment with or without a central processing unit, which may be provided with a keyboard and/or input device and/or software determining the operator/machine-interface, optional accessories, peripherals and the immediate work environment

4 Guiding principles

4.1 General considerations

Workplace design should be based on the task requirements. Therefore, it should be preceded by an analysis of the tasks that it is to support. Such an analysis should give information about the different tasks and sub-tasks which are performed and about the use of related equipment. It should also identify the relative priority given to different information sources within the user's task with respect to placement of displays, equipment location and job aids. For example, in many data-entry tasks, viewing of the hard copy has greater priority than viewing of the display. For many other tasks, the visual display is the main source of information and needs to be placed accordingly.

The task analysis should include consideration of

a) **major tasks and their inter-relationships**: frequency, importance, position of visual objects, duration and type of use of all associated equipment and their interrelationships,

b) task analysis should also reference type of work, e.g. individual or collaborative, whether it is a shared workspace

c) **the position and use of the hands**: implications for posture, reach, and device manipulation by the relative positioning of the equipment and task materials, frequency, duration and complexity of movements.

For the design and selection of workplaces the following five interrelated principles apply:

— versatility-flexibility;

— fit;

— postural change;

— user information;

— maintainability-adaptability.

The statements of this clause are intended to provide general principles and guidelines underlying the requirements and recommendations given in Clause 5.

4.2 Versatility and flexibility

Workstations should enable the intended user population to perform a range of tasks comfortably and efficiently. In addition, workstation design should be appropriate for the range of tasks to be performed at the workstation, taking into account user characteristics (e.g. keyboard skills, anthropometric variation and user preferences). It should also be dependent upon usage times such that the longer the time spent at the interactive system, the more important is the observance of good workstation design.

4.3 Fit

Selection and design of furniture and equipment requires a fit to be achieved between a range of task requirements and the needs of users. The concept of fit concerns the extent to which furniture and equipment (work chairs, work surfaces, visual display units, input devices, etc.) can accommodate individual users' needs.