ICS 13.180, 35.180 SLOVENSKÁ TECHNICKÁ NORMA Január 2025

STN	**Ergonómia Interakcia človek-systém Časť 920: Dotyková a hmatová interakcia (ISO 9241-920: 2024)**	**STN EN ISO 9241-920** 83 3580

Ergonomics of human-system interaction - Part 920: Tactile and haptic interactions (ISO 9241-920:2024)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/24

Obsahuje: EN ISO 9241-920:2024, ISO 9241-920:2024

Oznámením tejto normy sa ruší
STN EN ISO 9241-920 (83 3580) z novembra 2016

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 9241-920

October 2024

ICS 13.180; 35.180

Supersedes EN ISO 9241-920:2016

English Version

Ergonomics of human-system interaction - Part 920: Tactile and haptic interactions (ISO 9241-920:2024)

Ergonomie de l'interaction homme-système - Partie 920: Interactions tactiles et haptiques (ISO 9241-920:2024)

Ergonomie der Mensch-System-Interaktion - Teil 920: Taktile und haptische Interaktionen (ISO 9241-920:2024)

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Ref. No. EN ISO 9241-920:2024 E

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European foreword

This document (EN ISO 9241-920:2024) 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of an identical text or by endorsement, at the latest by April 2025, and conflicting national standards shall be withdrawn at the latest by April 2025.

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.

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Endorsement notice

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International Standard

ISO 9241-920

Ergonomics of human-system interaction —

Part 920: Tactile and haptic interactions

Ergonomie de l'interaction homme-système —

Partie 920: Interactions tactiles et haptiques

Second edition
2024-10

Reference number
ISO 9241-920:2024(en)

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Published in Switzerland

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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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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*, 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 9241-920:2009), which has been technically revised.

The main change is as follows:

— The document has been updated to reflect newer research in tactile/haptic interactions.

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

Tactile and haptic interactions have become increasingly important interaction modalities. Mobile interaction relies on gesture-based touch interaction and tactile/haptic control devices and can utilize vibration-based displays as one of several ways to provide information or experiences to the user. Touch, vibration and tactile/haptic interactions are also found in special-purpose computing environments (e.g. simulation, remote control or surgery) and in assistive technologies.

While considerable research exists, a lack of ergonomic standards in this area can possibly result in systems being developed without sufficient concern for either ergonomics or interoperability, leading to serious difficulties related to ergonomics for users of multiple incompatible or conflicting tactile/haptic devices or applications.

This document provides ergonomics requirements and recommendations for tactile and haptic hardware and software interactions, including guidance related to the design and evaluation of hardware, software and combinations of hardware and software interactions. The guidelines are not technology-dependent and will also be applicable to future technologies.

ISO 9241-910 provides a common set of terms, definitions and descriptions of the various concepts central to designing and using tactile/haptic interactions. It also provides an overview of the range of tactile/haptic applications, objects, attributes and interactions.

ISO 9241-940 provides ways of evaluating tactile/haptic interactions for their usability, the validation of requirements and the verification that systems meet the requirements.

ISO 9241-960 focuses on gestures as a specific type of tactile/haptic interaction and describes their features and usability requirements. Information on gesture-based interfaces can be found in the ISO/IEC 30113 series. Information on contactless gestures can be found in ISO TS 9241-430.

For guidance and recommendations on the accessibility of tactile/haptic interactions, including information on the use of braille, see ISO 9241-971. It does not provide recommendations specific to braille but can apply to interactions that make use of braille.

International Standard **ISO 9241-920:2024(en)**

Ergonomics of human-system interaction —

Part 920:
Tactile and haptic interactions

1 Scope

This document specifies requirements and recommendations for tactile/haptic hardware and software interactions. It provides guidance on the design and selection of hardware, software and combinations of hardware and software interactions, including:

— the design or use of tactile/haptic inputs, outputs and/or combinations of inputs and outputs, with general guidance on their design or use as well as on designing or using combinations of tactile and haptic interactions for use in combination with other modalities or as the exclusive mode of interaction;

— the tactile/haptic encoding of information, including textual data, graphical data and controls;

— the design of tactile/haptic objects;

— the layout of tactile/haptic space;

— interaction techniques.

The recommendations given in this document are applicable to a variety of tactile/haptic devices, representing the real world or virtual or mixed realities (e.g. exoskeletons, wearables, force feedback devices, touchables, tangibles) and stimulation types (e.g. acoustic radiation pressure, electrical muscle stimulation) and they can also be found in virtual and augmented environments.

This document provides general information about how various forms of tactile/haptic interaction can be applied to various user tasks.

This document does not include guidance on the role of walking in virtual or mixed realities for tactile/haptic interaction.

NOTE It is recognized that some interactive scenarios can be constrained by the limitation that a real workspace is to be modelled in a virtual environment. Objects can be in suboptimal positions or conditions for tactile/haptic interaction by virtue of the situation being modelled.

2 Normative references

There are no normative references in this document.