

# SVENSK STANDARD

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### **Ergonomi vid människa-systeminteraktion – Del 920: Vägledning vid taktil och haptisk interaktion (ISO 9241-920:2009)**

### **Ergonomics of human-system interaction – Part 920: Guidance on tactile and haptic interactions (ISO 9241-920:2009)**

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EUROPEAN STANDARD

**EN ISO 9241-920**

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2016

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English Version

**Ergonomics of human-system interaction - Part 920:  
Guidance on tactile and haptic interactions (ISO 9241-  
920:2009)**

Ergonomie de l'interaction homme-système - Partie  
920: Lignes directrices relatives aux interactions  
tactiles et haptiques (ISO 9241-920:2009)

Ergonomie der Mensch-System-Interaktion - Teil 920:  
Anleitung zu taktilen und haptischen Interaktionen  
(ISO 9241-920:2009)

This European Standard was approved by CEN on 12 June 2016.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**



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## **European foreword**

The text of ISO 9241-920:2009 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 9241-920:2016 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of an identical text or by endorsement, at the latest by January 2017, and conflicting national standards shall be withdrawn at the latest by January 2017.

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### **Endorsement notice**

The text of ISO 9241-920:2009 has been approved by CEN as EN ISO 9241-920:2016 without any modification.

## Introduction

Tactile and haptic interactions are becoming increasingly important as candidate interaction modalities in computer systems such as special-purpose computing environments (e.g. simulation) and in assistive technologies. While considerable research exists, a lack of ergonomic standards in this area could result in systems being developed without sufficient concern for either ergonomics or interoperability, leading to serious ergonomic difficulties for users of multiple, incompatible or conflicting tactile/haptic devices/applications. This part of ISO 9241 provides ergonomics 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.

# Ergonomics of human-system interaction —

## Part 920: Guidance on tactile and haptic interactions

### 1 Scope

This part of ISO 9241 gives recommendations for tactile and haptic hardware and software interactions. It provides guidance on the design and evaluation of hardware, software, and combinations of hardware and software interactions, including

- the design/use of tactile/haptic inputs, outputs, and/or combinations of inputs and outputs, with general guidance on their design/use as well as on designing/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, and
- interaction techniques.

It does not provide recommendations specific to Braille, but can apply to interactions that make use of Braille.

The recommendations given in this part of ISO 9241 are applicable to at least the controls of a virtual workspace, but they can also be applied to an entire virtual environment — consistent, in as far as possible, with the simulation requirements.

**NOTE** It is recognized that some interactive scenarios might 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 haptic interaction by virtue of the situation being modelled.

### 2 Applying ISO 9241-920

#### 2.1 Recommendations

Individual recommendations given in Clauses 5 to 7 should be evaluated for their applicability. The applicable recommendations should be implemented unless there is evidence that to do so would cause deviation from the design objectives.

#### 2.2 Evaluation of products

If a product is claimed to have met the applicable recommendations in this part of ISO 9241 then the procedures used to establish the product's requirements, and to evaluate the product, shall be specified. The level of detail of the specification is a matter of negotiation between the involved parties.