

# SVENSK STANDARD

## SS-EN ISO 6385:2016



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### **Ergonomiska principer vid utformning av arbetssystem (ISO 6385:2016)**

### **Ergonomics principles in the design of work systems (ISO 6385:2016)**

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Denna standard ersätter SS-EN ISO 6385:2004, utgåva 1.

The European Standard EN ISO 6385:2016 has the status of a Swedish Standard. This document contains the official English version of EN ISO 6385:2016.

This standard supersedes the Swedish Standard SS-EN ISO 6385:2004, edition 1.

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EUROPEAN STANDARD

**EN ISO 6385**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2016

ICS 13.180

Supersedes EN ISO 6385:2004

English Version

## Ergonomics principles in the design of work systems (ISO 6385:2016)

Principes ergonomiques de la conception des systèmes de travail (ISO 6385:2016)

Grundsätze der Ergonomie für die Gestaltung von Arbeitssystemen (ISO 6385:2016)

This European Standard was approved by CEN on 16 July 2016.

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.

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

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## **European foreword**

This document (EN ISO 6385:2016) 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of an identical text or by endorsement, at the latest by April 2017, and conflicting national standards shall be withdrawn at the latest by April 2017.

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

This document supersedes EN ISO 6385:2004.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### **Endorsement notice**

The text of ISO 6385:2016 has been approved by CEN as EN ISO 6385:2016 without any modification.

## **Introduction**

Technological, economic, organizational and human factors affect the work behaviour and well-being of people as part of a work system. Applying ergonomic knowledge in the light of practical experience in the design of a work system is intended to satisfy human requirements.

This International Standard provides a basic ergonomic framework for professionals and other people who deal with the issues of ergonomics, work systems and working situations. The provisions of this International Standard will also apply to the design of products for use in work systems.

Following the principles and requirements described in this International Standard will support management in making better decisions, for instance related to the sustainability of investments in work system innovation.

In the design of work systems in accordance with this International Standard, the body of knowledge in the field of ergonomics is taken into account. Ergonomic evaluations of existing or new work systems will show the need for, and encourage attention to, the role of the worker within those systems.

ISO 26800 provides a general starting point for thought on ergonomics and determines the essential general principles and concepts. This International Standard presents these in the context of the design and evaluation of work systems.

This International Standard is also valuable in the application of management systems such as OHSAS 18001. Besides guidelines for processes, it also offers guidance for achieving good human performance.



# Ergonomics principles in the design of work systems

## 1 Scope

This International Standard establishes the fundamental principles of ergonomics as basic guidelines for the design of work systems and defines relevant basic terms. It describes an integrated approach to the design of work systems, where ergonomists will cooperate with others involved in the design, with attention to the human, the social and the technical requirements in a balanced manner during the design process.

Users of this International Standard will include executives, managers, workers (and their representatives, when appropriate) and professionals, such as ergonomists, project managers and designers who are involved in the design or redesign of work systems. Those who use this International Standard can find a general knowledge of ergonomics (human factors), engineering, design, quality and project management helpful.

The term “work system” in this International Standard is used to indicate a large variety of working situations, including permanent and flexible work places. The intention of this International Standard is to assist in the improvement, (re)design or change of work systems. Work systems involve combinations of workers and equipment, within a given space and environment, and the interactions between these components within a work organization. Work systems vary in complexity and characteristics, for example, the use of temporary work systems. Some examples of work systems in different areas are the following:

- production, e.g. machine operator and machine, worker and assembly line;
- transportation, e.g. driver and car or lorry, personnel in an airport;
- support, e.g. maintenance technician with work equipment;
- commercial, e.g. office worker with workstation, mobile worker with a tablet computer, cook in a restaurant kitchen;
- other areas like health care, teaching and training.

The observance of ergonomic principles applies to all phases throughout the life cycle of the work system from conception through development, realization and implementation, utilization, maintenance and support to decommissioning.

The systems approach in this International Standard gives guidance to the users of this International Standard in existing and new situations.

The definitions and ergonomic principles specified in this International Standard apply to the design of optimal working conditions with regard to human well-being, safety and health, including the development of existing skills and the acquisition of new ones, while taking into account technological and economic effectiveness and efficiency.

The principles in this International Standard are applicable to many other human activities, e.g. in the design of products for domestic and leisure activities. A more general description of the principles in this International Standard can be found in ISO 26800.

**NOTE 1** This International Standard is considered to be the core ergonomic standard for work systems from which many others on specific issues are derived.

**Note 2** Although elements of the system can be the same, this International Standard is not intended to be applied to systems used in a non-work context (e.g. the use of a vehicle for private purposes).

## SS-EN ISO 6385:2016 (E)

## 2 Terms and definitions

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

**2.1 well-being**  
<work system> sustainable internal state resulting from satisfaction of the physical and cognitive needs of the *worker* (2.4) during his/her activity

Note 1 to entry: Well-being can contribute to the quality of working life.

**2.2 work system**  
system comprising one or more *workers* (2.4) and *work equipment* (2.6) acting together to perform the *system function* (2.21), in the *workspace* (2.9), in the *work environment* (2.8), under the conditions imposed by the *work tasks* (2.17)

**2.3 ergonomics human factors**  
scientific discipline concerned with the understanding of interactions among human and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human *well-being* (2.1) and overall system performance

[SOURCE: ISO 26800:2011, 2.2]

**2.4 worker**  
person performing one or more activities to achieve a goal within a *work system* (2.2)

[SOURCE: ISO 26800:2011, 2.11, modified — synonym “operator” omitted]

**2.5 work organization**  
interacting *work systems* (2.2) acting to produce a specific overall outcome

Note 1 to entry: The process of work organization includes coherent actions in relation to establishing the form and mode of organization to be adopted (e.g. individual or collective work, teams working separately or interdependently, etc.). It is also necessary to define and allocate resources and determine the means and channels of communication. All these actions lead to the definition and assignment of prescribed tasks to the operators involved.

**2.6 work equipment**  
tools, including hardware and software, machines, vehicles, devices, furniture, installations and other components used in the *work system* (2.2)

**2.7 work process**  
sequence in time and space of the interaction of *workers* (2.4), *work equipment* (2.6), materials, energy and information within a *work system* (2.2)

**2.8 work environment**  
physical, chemical, biological, organizational, social and cultural factors surrounding a *worker* (2.4)

**2.9 workspace**  
volume allocated to one or more persons in the *work system* (2.2) to complete the *work task* (2.17)

## 2.10

### **external work load work stress**

external conditions and demands in a *work system* (2.2) which influence a person's physical and/or mental internal load

Note 1 to entry: In some countries, "external work load" is referred to as "work stress".

Note 2 to entry: Compare ISO 26800:2011, 2.4.

## 2.11

### **work strain**

internal response of a *worker* (2.4) to being exposed to *external work load* (2.10) depending on his/her individual characteristics (e.g. body size, age, capacities, abilities, skills, etc.)

Note 1 to entry: In ISO 26800, "work strain" is called "internal load".

Note 2 to entry: Compare ISO 26800:2011, 2.6.

## 2.12

### **usability**

extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

Note 1 to entry: Systems, products or services are part of *work systems* (2.2) and used by *workers* (2.4) within those systems.

Note 2 to entry: In this International Standard, the context of use is within a work system.

[SOURCE: ISO 9241-210:2010, 2.13]

## 2.13

### **human-centred design**

approach to systems design and development that aims to make interactive systems more usable by focusing on the use of the system and applying *human factors/ergonomics* (2.3) and *usability* (2.12) knowledge and techniques

[SOURCE: ISO 9241-210:2010, 2.7, modified — Notes 1 and 2 to entry omitted]

## 2.14

### **accessibility**

extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use

[SOURCE: ISO 26800:2011, 2.1, modified — Notes 1 and 2 to entry omitted]

Note 1 to entry: Products, systems, services and facilities are part of *work systems* (2.2) and used by *workers* (2.4) within those systems.

Note 2 to entry: In this International Standard, the context of use is within a work system.

## 2.15

### **allocation of functions**

process of deciding whether *system functions* (2.21) will be implemented by humans, by equipment and/or hardware and/or software

## 2.16

### **job**

organization and sequence in time and space of an individual's *work tasks* (2.17) or the combination of all human performance by one *worker* (2.4) within a *work system* (2.2)