



# SLOVENSKI STANDARD

## SIST EN 1005-1:2002

01-september-2002

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Safety of machinery - Human physical performance - Part 1: Terms and definitions

Sicherheit von Maschinen - Menschliche körperliche Leistung - Teil 1: Begriffe

**iTeh STANDARD PREVIEW**

Sécurité des machines - Performance physique humaine - Partie 1: Termes et définitions

Ta slovenski standard je istoveten z: **EN 1005-1:2001**

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### ICS:

01.040.13	Varstvo okolja in zdravja. Varnost (Slovarji)	Environment and health protection. Safety (Vocabularies)
13.110	Varnost strojev	Safety of machinery
13.180	Ergonomija	Ergonomics

**SIST EN 1005-1:2002**

**en**

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ICS 01.040.13; 13.110; 13.180

English version

## Safety of machinery - Human physical performance - Part 1: Terms and definitions

Sécurité des machines - Performance physique humaine -  
Partie 1: Termes et définitions

Sicherheit von Maschinen - Menschliche körperliche  
Leistung - Teil 1: Begriffe

This European Standard was approved by CEN on 30 September 2001.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document has been prepared 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 April 2002, and conflicting national standards shall be withdrawn at the latest by April 2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

EN 1005 consists of the following Parts, under the general title "Safety of machinery – Human physical performance":

- Part 1: Terms and definitions;
- Part 2<sup>1)</sup>: Manual handling of machinery and component parts of machinery;
- Part 3: Recommended force limits for machinery operation;
- Part 4<sup>1)</sup>: Evaluation of working postures and movements in relation to machinery;
- Part 5<sup>1)</sup>: Risk assessment for repetitive handling at high frequency.

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According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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<sup>1)</sup> This European Standard is under preparation by CEN/TC 122/WG 4 "Biomechanics".

## Introduction

Ergonomically designed work systems enhance safety, effectiveness and efficiency, improve human working and living conditions, and counteract adverse effects on human health and performance. Good ergonomic design therefore exerts a favourable influence on the work system, and on the reliability of the human being within it.

This European Standard is one of several ergonomic standards for the safety of machinery.

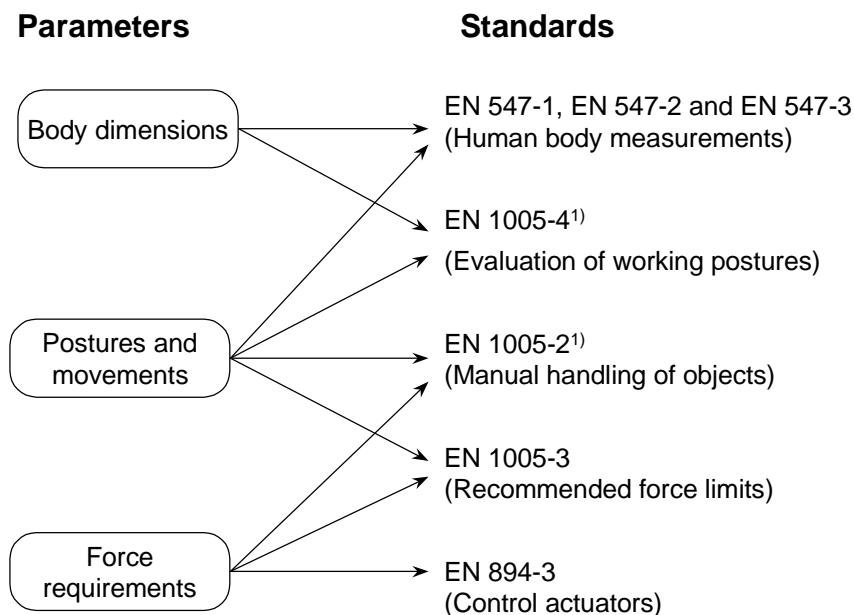
EN 614-1 describes the principles manufacturers should adopt in order to take account of ergonomic factors. This standard has been prepared to be a harmonised standard in the sense of the Machinery Directive and associated EFTA regulations.

This European Standard is a type B standard as stated in EN 1070. The provisions of this document may be supplemented or modified by a type C standard.

**NOTE** For machines which are covered by the scope of a type C standard and which have been designed and built according to the provisions of that standard, the provisions of that type C standard take precedence over the provisions of this type B standard.

This European Standard has five parts that are intended to cover the range of human physical performance variables relating to machinery design. The scope contained within each document defines the boundaries of their application. Figure 1 illustrates the relationship between the standards concerning the different aspects of human performance. The relationship between standards proceed from those between the different aspects of human physical performance: body dimensions directly influence the shape of postures and movements as well as the available muscle strength, which further vary with postures and movements.

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**Figure 1 — Relation between physical performance parameters and standards**

<sup>1)</sup> This European Standard is under preparation by CEN/TC 122/WG 4 "Biomechanics".

EN 1005-2<sup>1)</sup>, EN 1005-3 and EN 1005-4<sup>1)</sup> adopt a risk assessment approach. The procedures in each part of the standard are different.

The study of human physical loading whilst handling/operating machinery relies on methods and techniques developed by different research disciplines (e.g. epidemiology, biomechanics, physiology, psychophysics). This document aims to define relevant concepts to further co-operation between research disciplines in this field, and to improve the application of standards when designing machinery.

## 1 Scope

This European Standard provides terms and definitions on concepts and parameters used for EN 1005-2<sup>1)</sup>, prEN 1005-3:2001, EN 1005-4<sup>1)</sup> and EN 1005-5<sup>1)</sup>.

Basic concepts and general ergonomic principles for the design of machinery are dealt with in EN 292-1, EN 292-2 and EN 614-1.

This document is not applicable to specify the machinery which is manufactured before the date of publication of this document by CEN.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 292-1:1991, *Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology.*

EN 1005-2<sup>1)</sup>, *Safety of machinery – Human physical performance – Part 2: Manual handling of machinery and component parts of machinery.*

prEN 1005-3:2001, *Safety of machinery – Human physical performance – Part 3: Recommended force limits for machinery operation.*

EN 1005-4<sup>1)</sup>, *Safety of machinery – Human physical performance – Part 4: Evaluation of working postures and movements in relation to machinery.*

EN 1005-5<sup>1)</sup>, *Safety of machinery – Human physical performance – Part 5: Risk assessment for repetitive handling at high frequency.*

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070 together with the following apply.

### 3.1

#### **abduction**

movement of a limb away from the median plane. See Figure 2 and Figure 3

### 3.2

#### **action**

the activation of a muscle(s) during a task in order to perform a task/operation (as opposed to rest)

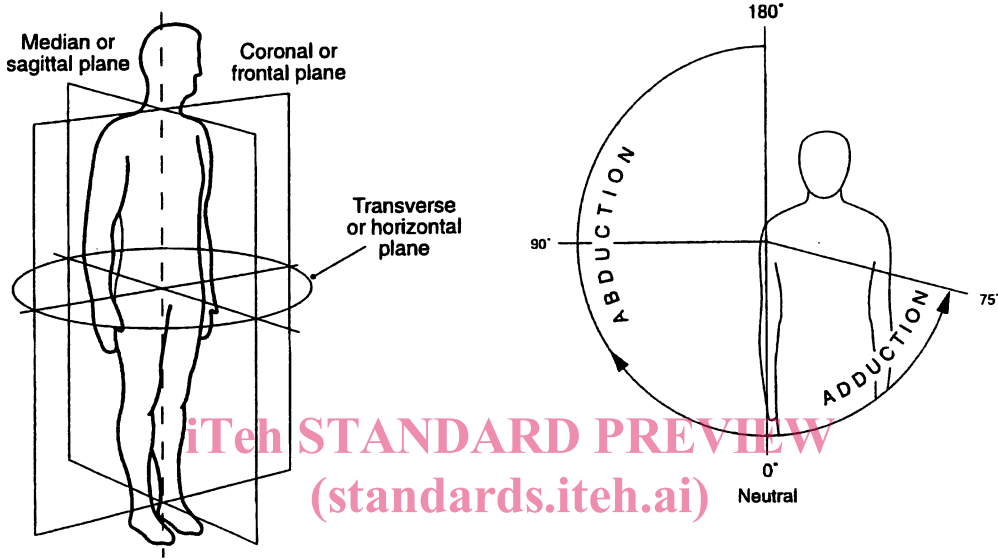
<sup>1)</sup> This European Standard is under preparation by CEN/TC 122/WG 4 "Biomechanics".

**3.3**  
**action period**

the duration of a single cycle of a recurrent event which includes both the rest and action time

**3.4**  
**adduction**

movement of a limb towards the median plane. See Figure 2 and Figure 3



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Figure 2 — Planes

Figure 3 — Abduction and adduction

**3.5**  
**angle of asymmetry**

the angle formed between the lines that result from the intersections of the mid-sagittal plane and the plane of asymmetry. If the feet are repositioned during the lift/lower sequence, the referent planes shall be determined at the point in the action sequence wherein the largest degree of asymmetrical twist is encountered. See Figure 4



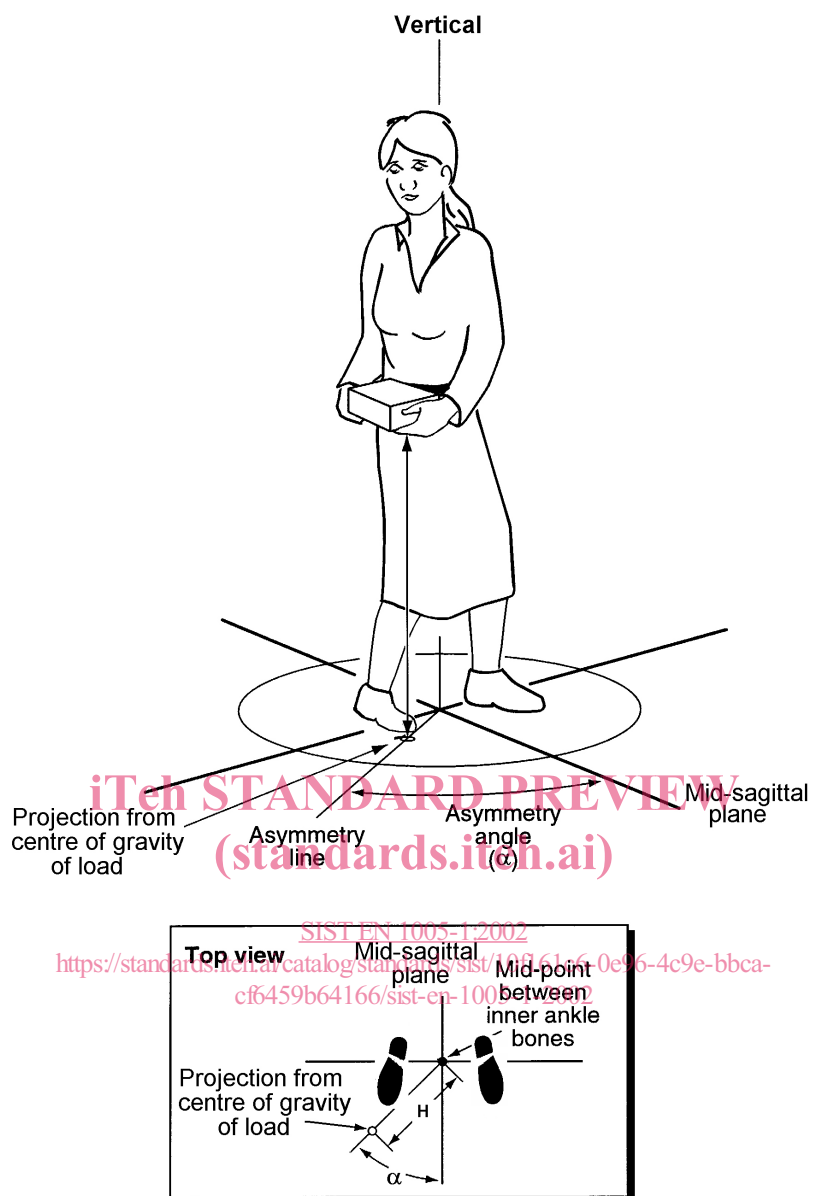


Figure 4 — Angle of asymmetry

### 3.6

#### general working population

the adult working population which does not include:  
the physically disadvantaged and those under the legal minimum working age

### 3.7

#### grip of object

the manner by which objects can be handled (held and/or moved with the hands). The type of grip applied (e.g. pinch grip, hook grip, power grip), and the design and placement in relation to the characteristics of both the task and the object handled will determine the degree of difficulty of the handling task

#### 3.7.1

##### pinch grip

grip made with the thumb and the forefinger. See Figure 5