

MASINAOHUTUS. OHUTUSKAITSEVAHENDITE ASUKOHA  
MÄÄRAMINE INIMESE KEHAOSADE  
LÄHENEMISKIIRUSEST LÄHTUDES

Safety of machinery - Positioning of protective  
equipment with respect to the approach speeds of parts  
of the human body

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 13855:2010 sisaldab Euroopa standardi EN ISO 13855:2010 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 13855:2010 consists of the English text of the European standard EN ISO 13855:2010.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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## ICS 13.110

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English Version

**Safety of machinery - Positioning of safeguards with respect to  
the approach speeds of parts of the human body (ISO  
13855:2010)**

Sécurité des machines - Positionnement des moyens de  
protection par rapport à la vitesse d'approche des parties  
du corps (ISO 13855:2010)

Sicherheit von Maschinen - Anordnung von  
Schutzeinrichtungen im Hinblick auf  
Annäherungsgeschwindigkeiten von Körperteilen (ISO  
13855:2010)

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## Foreword

This document (EN ISO 13855:2010) has been prepared by Technical Committee ISO/TC 199 "Safety of machinery" in collaboration with Technical Committee CEN/TC 114 "Safety of machinery" 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of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

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 999:1998+A1:2008.

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.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

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

### Endorsement notice

The text of ISO 13855:2010 has been approved by CEN as a EN ISO 13855:2010 without any modification.

## **Annex ZA** **(informative)**

### **Relationship between this International Standard and the Essential Requirements of EU Directive 2006/42/EC**

This International Standard has been prepared under a mandate given to CEN by the European Commission the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

**WARNING:** Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

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## Introduction

The structure of safety standards in the field of machinery is as follows:

- a) type-A standards (basic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery;
- b) type-B standards (generic safety standards) dealing with one safety aspect or one or more type(s) of safeguard that can be used across a wide range of machinery:
  - type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);
  - type-B2 standards on safeguards (e.g. two-hand controls, interlocking devices, pressure-sensitive devices, guards);
- c) type-C standards (machine safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This document is a type-B standard as stated in ISO 12100-1.

The requirements of this document can be supplemented or modified by a type-C standard.

For machines which are covered by the scope of a type-C standard and which have been designed and built according to the requirements of that type-C standard, the following applies: if the requirements of that type-C standard deviate from the requirements in type-B standards, the requirements of that type-C standard take precedence over the provisions of other standards.

The effectiveness of certain types of safeguard described in this International Standard to minimize risk relies, in part, on the relevant parts of that equipment being correctly positioned in relation to the hazard zone. In deciding on these positions, a number of aspects are taken into account, such as:

- the necessity of a risk assessment according to ISO 14121-1;
- the practical experience in the use of the machine;
- the overall system stopping performance;
- the time taken to ensure the safe condition of the machine following operation of the safeguard, for example to stop the machine;
- the bio-mechanical and anthropometric data;
- any intrusion by a part of the body towards the hazard zone until the protective device is actuated;
- the path taken by the body part when moving from the detection zone towards the hazard zone;
- the possible presence of a person between the safeguard and the hazard zone;
- the possibility of undetected access to the hazard zone.

# Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body

## 1 Scope

This International Standard establishes the positioning of safeguards with respect to the approach speeds of parts of the human body.

It specifies parameters based on values for approach speeds of parts of the human body and provides a methodology to determine the minimum distances to a hazard zone from the detection zone or from actuating devices of safeguards.

The values for approach speeds (walking speed and upper limb movement) in this International Standard are time tested and proven in practical experience. This International Standard gives guidance for typical approaches. Other types of approach, for example running, jumping or falling, are not considered in this International Standard.

NOTE 1 Other types of approach can result in approach speeds that are higher or lower than those defined in this International Standard.

Safeguards considered in this International Standard include:

- a) electro-sensitive protective equipment [see IEC 61496 (all parts)], including:
  - light curtains and light grids (AOPDs);
  - laser scanners (AOPDDRs) and two-dimensional vision systems;
- b) pressure-sensitive protective equipment (see ISO 13856-1, ISO 13856-2 and ISO 13856-3), especially pressure-sensitive mats;
- c) two-hand control devices (see ISO 13851);
- d) interlocking guards without guard locking (see ISO 14119).

This International Standard specifies minimum distances from the detection zone, plane, line, point or interlocking guard access point to the hazard zone for hazards caused by the machine (e.g. crushing, shearing, drawing-in).

Protection against the risks from hazards arising from the ejection of solid or fluid materials, emissions, radiation and electricity are not covered by this International Standard.

NOTE 2 Anthropometric data from the 5th to the 95th percentile of persons of 14 years and older were used in the determination of the intrusion distance value “C” in the equations.

NOTE 3 The data in this International Standard are based on experience of industrial application; it is the responsibility of the designer to take this into account when using this International Standard for non-industrial applications.

NOTE 4 Data specifically for children have not been used in this International Standard. Until specific data are available for approach speeds for children, it is the responsibility of the designer to calculate the distances taking into account that children might be quicker and that a child might be detected later.