SIST

SLOVENSKI STANDARD
SIST EN ISO 13855:2010

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Nadomešča:
SIST EN 999:2000+A1:2008

Varnost strojev - Postavitev varovalne opreme glede na hitrost približevanja delov človeškega telesa (ISO 13855:2010)

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

Sicherheit von Maschinen - Anordnung von Schutzeinrichtungen im Hinblick auf Annäherungsgeschwindigkeiten von Körperteilen (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)

Ta slovenski standard je istoveten z: EN ISO 13855:2010

ICS:

13.110	Varnost strojev	Safety of machinery
13.180	Ergonomija	Ergonomics

SIST EN ISO 13855:2010 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13855

May 2010

ICS 13.110

Supersedes EN 999:1998+A1:2008

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)

This European Standard was approved by CEN on 22 April 2010.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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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of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.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.

INTERNATIONAL STANDARD

ISO 13855

Second edition
2010-05-01

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

Sécurité des machines — Positionnement des moyens de protection par rapport à la vitesse d'approche des parties du corps

Reference number
ISO 13855:2010(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 13855 was prepared by Technical Committee ISO/TC 199, *Safety of machinery*.

This second edition cancels and replaces the first edition (ISO 13855:2002), which has been technically revised.

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.

The International Standard is not applicable to safeguards (e.g. pendant two-hand control devices) that can be moved, without using tools, nearer to the hazard zone than the calculated minimum distance.

The minimum distances derived from this International Standard are not applicable to safeguards used to detect the presence of persons within an area already protected by a guard or electro-sensitive protective equipment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12100-1, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by the upper and lower limbs*

ISO 14121-1:2007, *Safety of machinery — Risk assessment — Part 1: Principles*

IEC 61496-1:2004, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100-1 and the following apply.

3.1.1
actuation
⟨safeguards⟩ physical initiation of the safeguard when it detects a body or parts of a body

3.1.2
overall system stopping performance
T
time interval between the actuation of the sensing function and the termination of the hazardous machine function

NOTE Adapted from IEC 61496-1:2004.

3.1.3
detection capability
d
sensing function parameter limit specified by the supplier that will cause actuation of the protective equipment

[IEC/TS 62046:2008, 3.1.4]

3.1.4
electro-sensitive protective equipment
ESPE
assembly of devices and/or components working together for protective tripping or presence-sensing purposes and comprising at a minimum:

— a sensing device,

— controlling/monitoring devices,

— output signal switching devices

[IEC 61496-1:2004, definition 3.5]

NOTE ESPEs refer only to non-contact sensing devices.

3.1.5
indirect approach
approach where the shortest path to the hazard zone is obstructed by a mechanical obstacle

NOTE The hazard zone can only be approached by going around the obstacle.

3.1.6
circumventing the detection zone
reaching the hazard zone without actuation of the protective device by passing over, under or to the side of the detection zone

3.1.7
termination of the hazardous machine function
condition achieved when the hazard parameters are reduced to a level which cannot cause physical injury or damage to health

NOTE See examples in Annex B.

3.1.8
detection zone
zone within which a specified test piece is detected by the protective equipment

NOTE 1 The detection zone may also be a point, line or plane.

NOTE 2 Adapted from IEC 61496-1:2004, definition 3.4.

3.1.9
minimum distance
S
calculated distance between the safeguard and the hazard zone necessary to prevent a person or part of a person reaching the hazard zone before the termination of the hazardous machine function

NOTE Different minimum distances may be calculated for different conditions or approaches, but the greatest of these minimum distances is used for selecting the position of the safeguard.

3.1.10
intrusion distance
C
distance that a part of the body (usually a hand) can move past the safeguard towards the hazard zone prior to actuation of the safeguard