



SLOVENSKI STANDARD
SIST EN 349:1997

01-december-1997

JUfbcghlfcYj !'BUa UbY]fUna]_ž_]dfYdfY i Yc'na Y _Ub]bY'bUXY]\
`cj Yy_Y[UHYgU

Safety of machinery - Minimum gaps to avoid crushing of parts of the human body

Sicherheit von Maschinen - Mindestabstände zur Vermeidung des Quetschens von Körperteilen

Sécurité des machines - Ecartements minimaux pour prévenir les risques d'écrasement de parties du corps humain

<https://standards.iteh.ai/catalog/standards/sist/ee610d4f-7576-4d80-b461-1213e7c71b33/sist-en-349-1997>

Ta slovenski standard je istoveten z: EN 349:1993

ICS:

13.110 Varnost strojev Safety of machinery

SIST EN 349:1997 **sl**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 349:1997

<https://standards.iteh.ai/catalog/standards/sist/ee610d4f-7576-4d80-b461-1213e7c71b33/sist-en-349-1997>

UDC 62-783.61 : 614.8 : 331.454

Descriptors: Safety of machines, accident prevention, hazards, human body, minimum distances.

English version

Safety of machinery

**Minimum gaps to avoid crushing
of parts of the human body[†])**

Sécurité des machines; écartements minimaux pour prévenir les risques d'écrasement de parties du corps humain Sicherheit von Maschinen; Mindestabstände zur Vermeidung des Quetschens von Körperteilen

This European Standard was approved by CEN on 1993-04-02.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

CEN

SIST EN 349:1997

<https://standards.iteh.ai/catalog/standards/sist/6199146755564480-b461-1203a771e33/sist-en-349-1997>
European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 114 'Safety of machinery', WG 2 'Safety distances'.

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

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by October 1993 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

0 Introduction

According to EN 292-1, machinery may be deemed to be safe if it can perform its function, be transported, installed, adjusted, maintained, dismantled and disposed of under the conditions of its intended use without causing injury or damaging health. One method of avoiding the hazard of crushing parts of the human body is to make use of the safety distances specified in this standard.

In specifying safety distances, a number of aspects must be considered, such as

- accessibility of the crushing zones,
- anthropometric parameters, such as ethnic groups living in European countries;
- technical and practical aspects.

If these aspects were developed further, the current state of the art reflected in this European Standard could be improved.

1 Scope

The object of this European Standard is to enable users (e.g. those involved in standards work and designers of machinery) to avoid hazards arising from crushing zones. It specifies safety distances as a function of parts of the human body and should be applied when adequate safety can be achieved by means of this method.

This European Standard deals with the risk of crushing only and is not applicable to other possible hazards (e.g. impact, shearing, drawing-in).

NOTE: The risk of impact, shearing, drawing-in, etc. requires that additional or other measures be taken.

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.

- EN 292-1 Safety of machinery; basic concepts, general principles for design. Part 1: Basic terminology and methodology
- EN 292-2 Safety of machinery; basic concepts, general principles for design. Part 2: Technical principles and specifications
- EN 294 Safety of machinery; safety distances to prevent danger zones from being reached by the upper limbs

3 Definition

For the purposes of this standard, the following definition applies along with those given in EN 292-1 and EN 294:

crushing zone: Zone in which the human body or parts of the human body are exposed to a crushing hazard. This hazard may be generated when

- two movable parts move towards one another, or
- one movable part moves towards a fixed part, (see also annex A).

4 Minimum safety distances

4.1 Methodology for the use of this European Standard

Use of this European Standard shall form part of the safety strategy outlined in clause 5 'Strategy for selecting safety measures' of EN 292-1.

The user of this European Standard shall:

- a) identify the crushing hazards;
- b) assess the risks from these hazards in accordance with EN 292-1, paying particular attention to the following:
 - Where it is foreseeable that the crushing hazard endangers different parts of the body, the minimum distance specified in table 1 for the largest of these parts shall be applied (see also item d)).
 - The unpredictable behaviour of children and their body size if children are included in the population at risk.
 - Whether parts of the body could enter the crushing zone in a configuration other than those illustrated in table 1.
 - Whether thick or bulky clothing (e.g. protective clothing for extreme temperatures) or tools have to be taken into account.
 - Whether machinery will be used by persons wearing thick-soled footwear (e.g. clogs) which will increase the effective size of the foot.

c) select from table 1 the appropriate minimum distance for the body part at risk (see also annex A).

d) If adequate safety cannot be achieved by maintaining the minimum distances selected from table 1, other or additional measures and/or means shall be used (see, for example, EN 292-1, EN 292-2 and EN 294).

If the minimum distance for the largest foreseen body part cannot be achieved, the following example describes one way to restrict access to smaller body parts.

EXAMPLE:

Access of larger body parts to the crushing zone can be prevented by the use of a protective structure provided with a restricted opening, as shown in figure 1.

The possibility of access to a crushing zone for a particular part of the body depends on the following:

- the distance, a , between the fixed and moving part or between two moving parts;
- the depth, b , of the crushing zone;
- the size, c , of the opening in the protective structure and its distance, d , from the crushing zone.

NOTE: The dimensions of openings for safety purposes are given in EN 294.

e) For certain applications there may be justifiable reasons to deviate from the minimum distances specified in table 1. Standards dealing with these applications shall indicate how adequate safety can be achieved.

4.2 Safety distances

Table 1 gives values for minimum distances to avoid crushing parts of the human body. For selecting the appropriate value, see 4.1.

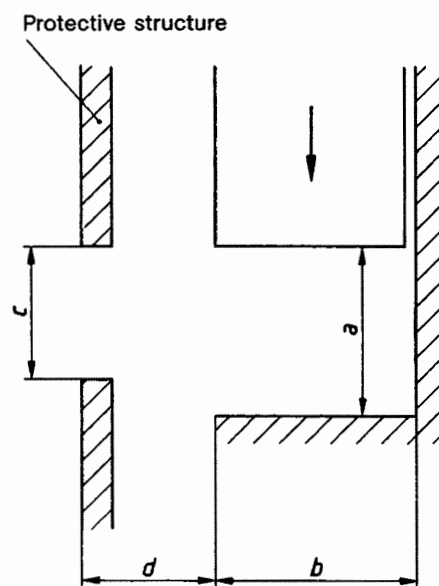


Figure 1


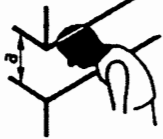


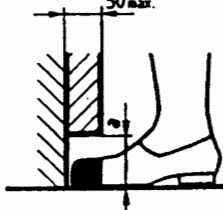



iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 349:1997](https://standards.iteh.ai/catalog/standards/sist/ee610d4f-7576-4d80-b461-1213e7c71b33/sist-en-349-1997)

<https://standards.iteh.ai/catalog/standards/sist/ee610d4f-7576-4d80-b461-1213e7c71b33/sist-en-349-1997>

Table 1

Dimensions in mm

Part of body	Minimum distance, a	Illustration
Upper body	500	
Head (least favourable position)	300	
Leg	180	
Foot	120	
Toes	50	
Arm	120	
Hand Wrist Fist	100 SIST EN 349:1997	
Finger	25	

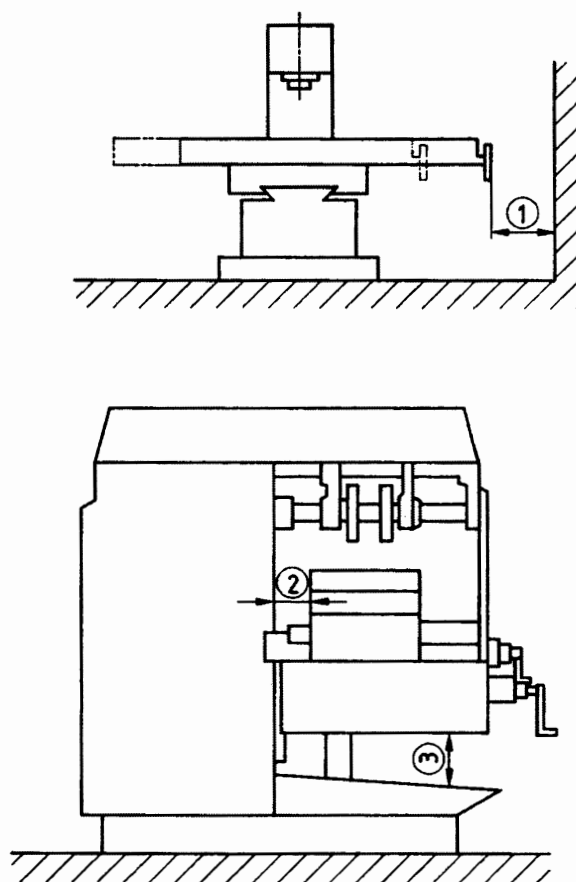
iTeh STANDARD PREVIEW
(standards.iteh.ai)

100
[SIST EN 349:1997](https://standards.iteh.ai/catalog/standards/sist/ee610d4f-7575-4d80-b461-1213e7c71b33/sist-en-349-1997)
<https://standards.iteh.ai/catalog/standards/sist/ee610d4f-7575-4d80-b461-1213e7c71b33/sist-en-349-1997>

Annex A (informative)

Illustration of crushing zones

The crushing zones and the parts of the human body illustrated are examples only. For the assessment of risk, see 4.1.



Key:



SIST EN 349:1997
Figure A.1
<https://standards.iteh.ai/catalog/standards/sist/cc610d4f-7576-4d80-b461-1213e7c71b33/sist-en-349-1997>