



**SLOVENSKI STANDARD**  
**SIST EN 1417:2000**

**01-april-2000**

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**Rubber and plastics machines - Two roll mills - Safety requirements**

Rubber and plastics machines - Two roll mills - Safety requirements

Gummi- und Kunststoffmaschinen - Walzwerke - Sicherheitsanforderungen

**iTeh STANDARD PREVIEW**

Machines pour le caoutchouc et les matières plastiques - Mélangeurs à cylindres -  
Prescriptions de sécurité

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**Ta slovenski standard je istoveten z: EN 1417:1996**

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**ICS:**

83.200

Oprema za gumarsko  
industrijo in industrijo  
polimernih materialov

Equipment for the rubber and  
plastics industries

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**en**

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EUROPEAN STANDARD

EN 1417

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Descriptors: rubber-working machines, plastic-working machines, mixers, safety of machines, accident prevention, hazards, hazardous areas, design, protection against mechanical hazards, specifications, information, utilization, marking

English version

## Rubber and plastics machines - Two roll mills - Safety requirements

Machines pour le caoutchouc et les matières  
plastiques - Mélangeurs à cylindres -  
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Gummi- und Kunststoffmaschinen - Walzwerke -  
Sicherheitsanforderungen

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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.

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**CEN**

European Committee for Standardization  
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Europäisches Komitee für Normung

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 145 "Rubber and plastics machines - Safety", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by March 1997, and conflicting national standards shall be withdrawn at the latest by March 1997.

This European Standard 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 Z, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of 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 the United Kingdom.

## 0 INTRODUCTION

This European standard is a type C standard as defined in EN 292-1 and has been elaborated by CEN/TC145/WG4.

The extent to which hazards are covered is indicated in the scope of this standard. In addition, machinery shall comply as appropriate with EN 292 for hazards which are not covered by this standard.

## 1 SCOPE

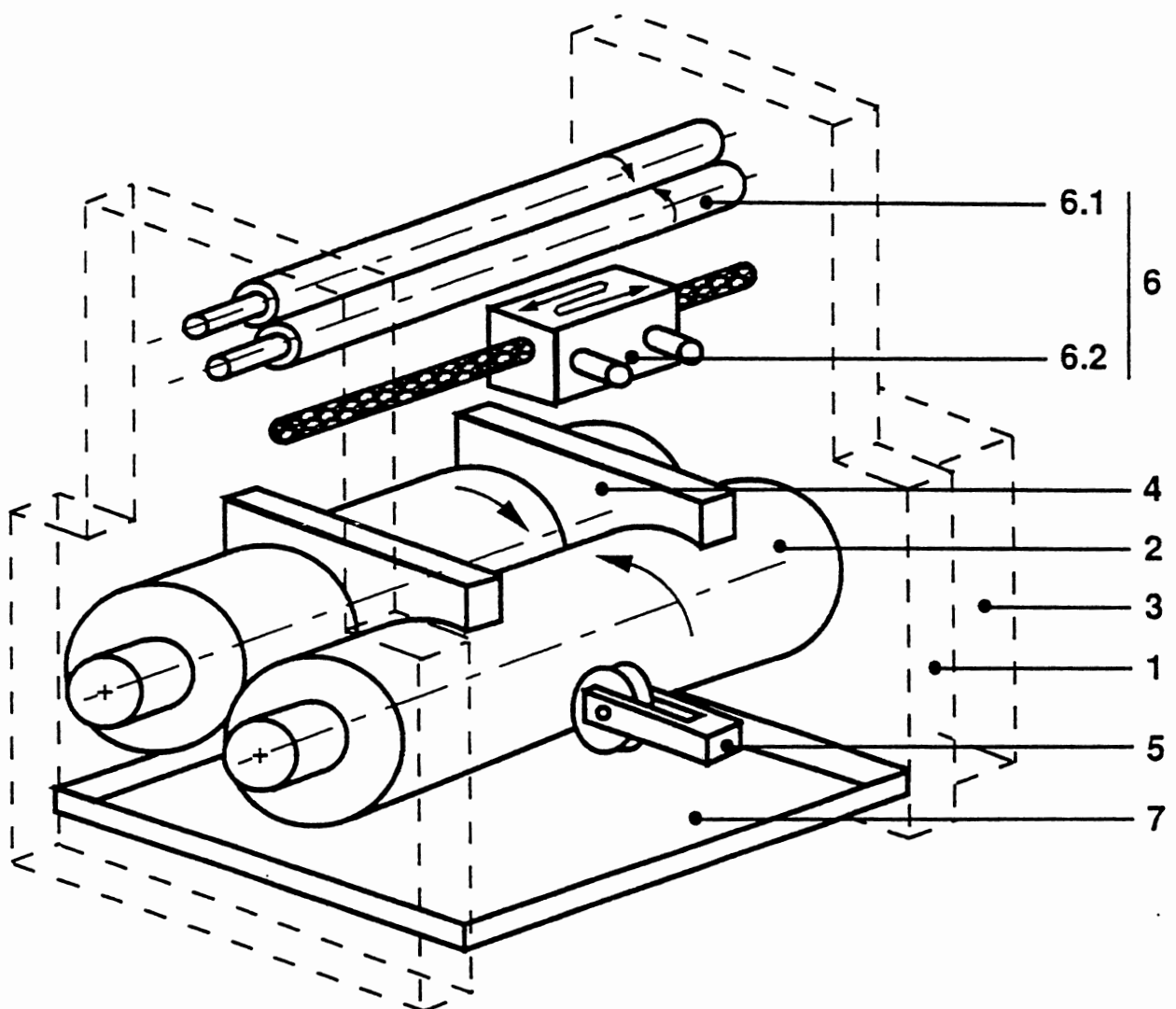
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This standard covers the essential health and safety requirements for all two roll mills for the processing of rubber and plastics. Significant hazards are listed in clause 4 and are covered by this standard. [SIST EN 1417:2000  
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Figure 1 shows the principal parts of a two roll mill.

This standard does not cover requirements for the design of an exhaust system.

This standard applies to two roll mills which are manufactured after the date of issue of this standard.



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Key:

- |   |                             |   |     |                        |
|---|-----------------------------|---|-----|------------------------|
| 1 | Frame                       | <a href="https://standards.iteh.ai/catalog/standards/sist/264fe990-183e-4867-9007-72e8e32e5690/sist-en-1417-2000">https://standards.iteh.ai/catalog/standards/sist/264fe990-183e-4867-9007-72e8e32e5690/sist-en-1417-2000</a> | 6   | Stock blender          |
| 2 | Mill rolls                  |   | 6.1 | Stock blender rolls    |
| 3 | Drive and transmission unit |   | 6.2 | Stock blender carriage |
| 4 | Stock guides                |   | 7   | Mill tray              |
| 5 | Strip cutting device        |   |     |                        |

**Figure 1: Principal parts of a two roll mill**

## 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 below. For dated references, subsequent amendments or revisions of these publications apply to this European Standard only when incorporated in it by amendment or revision. For non-dated references the latest edition of the publication referred to applies.

- |                               |  |
|-------------------------------|--|
| EN 292-1 : 1991               | Safety of Machinery - Basic concepts - General principles for design<br>Part 1 : Basic terminology - Methodology                 |
| EN 292- 2 : 1991<br>+ A1:1995 | Safety of Machinery - Basic concepts - General principles for design<br>Part 2 : Technical principles and specifications.        |
| EN 294 : 1992                 | Safety of Machinery - Safety distances to prevent danger zones being reached by the upper limbs.                                 |
| EN 349 : 1993                 | Safety of Machinery - Minimum gaps to avoid crushing of parts of the human body.   |
| EN 418 : 1992                 | Safety of Machinery - Emergency stop equipment, functional aspects - Design principles.  |
| EN 563 : 1994                 | Safety of Machinery - Temperature of touchable surfaces - Ergonomic data to establish temperature limit values for hot surfaces. |
| prEN 574 : 1991               | Safety of Machinery - Two-hand control devices - Functional aspects, principles for design.                                      |
| prEN 953 : 1992               | Safety of Machinery - General requirements for the design and construction of guards ( fixed, movable )                          |

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EN 1088:1995 Safety of Machinery - Interlocking devices with and without guard locking - General principles and provisions for design.

prEN 50100-1 : 1994 Safety of Machinery - Electro-sensitive protective systems.  
Part 1: General requirements and tests.

EN 60204-1 : 1992 Safety of Machinery - Electrical equipment of machines.  
Part 1 : General requirements.

### 3. DEFINITIONS

For the purposes of this standard, the following definitions apply:

#### 3.1 Two roll mill

A machine with two counter-rotating cylinders (known as mill rolls) which are not covered, which may be smooth or grooved, and whose axes are on substantially the same horizontal plane (see figure 1).

#### 3.2 Principal crushing zone

Zone extending over the full length of the mill rolls indicated by V in figure 2.

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Dimensions in mm

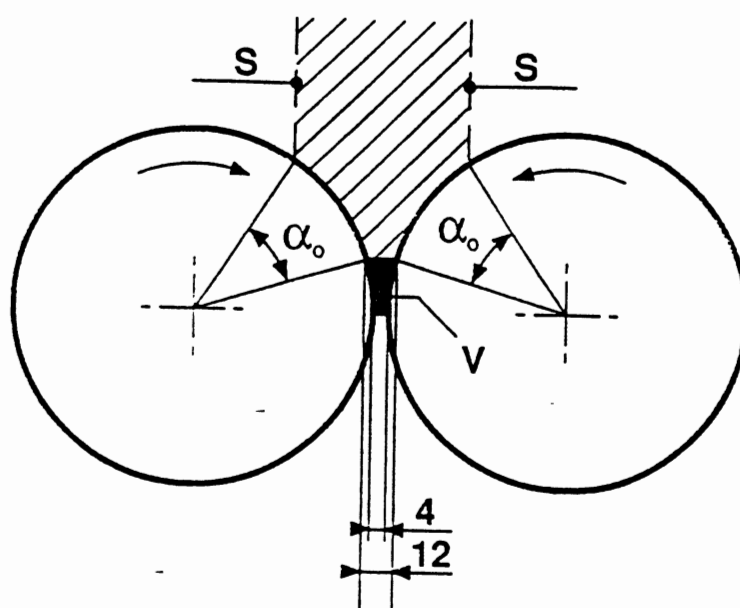


Figure 2: Principal crushing zone V, safety limits S and specified stopping angle  $\alpha_o$ .

### 3.3 Stopping angle

The following stopping angle definitions are related to two roll mills equipped with a mechanically actuated trip device in the form of a bar (trip bar).

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The stopping angle  $\alpha$  is the angle through which the mill rolls rotate from the actuation of the trip bar until the rolls have come to rest.

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#### 3.3.1 Specified stopping angle $\alpha_o$

The stopping angle specified by the machine manufacturer (see figure 2), related to the following conditions:

- machine unloaded
- machine running at maximum speed

### 3.3.2 Maximum stopping angle $\alpha_{\max}$

The upper limit value of the stopping angle.

### 3.3.3 Measured stopping angles $\alpha_m$

Stopping angles measured in order to compare with:

- $\alpha_0$  under the conditions given in 3.3.1
- $\alpha_{\max}$  under the same conditions and, in addition, power assisted braking (if existing) inoperative (simulation of a power failure).

These measured braking angles are intended to verify the state of the braking system.

### 3.4 Safety limit

This definition applies only to two roll mills equipped with a trip bar.

The safety limit is the vertical plane indicated by line S in figure 2 demarcating the zone which is unsafe for operators who can reach into it without actuating the trip bar.

### 3.5 Stock guide (also known as "ear")

A part which prevents material in process from going beyond the mill roll end (see figure 1, location 4).

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### 3.6 Strip cutting device

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A device, equipped with rotating or stationary blades, to cut off strips of the material from a mill roll (see figure 1, location 5).

### 3.7 Stock blender

Equipment used to continuously recirculate the material in process to obtain a uniform mixing, distributing it with a reciprocating motion along the length of the mill rolls (see figure 1, location 6).

### 3.8 Mill tray

Equipment for catching material which falls under the mill rolls (see figure 1, location 7).

### 3.9 Recovery conveyor belt

Equipment for recirculating material which falls under the mill rolls (see figure 3c).

### 3.10. Retractable plough

Equipment which can be moved towards the mill roll in order to cut and turn over the material, and which can be retracted (see figure 3b).

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## 4. LIST OF HAZARDS

The locations of the hazards in 4.1 and 4.2 are shown in figure 3.

### 4.1 Mechanical hazards related to the mill rolls

- 4.1.1 Hazard of drawing-in and crushing between the mill rolls during normal (forward) operation.
- 4.1.2 Hazard of drawing-in and crushing between the mill rolls during reverse operation.
- 4.1.3 Hazard of drawing-in and crushing between the stock guides and the mill rolls.
- 4.1.4 Hazards resulting from loss of braking efficiency.

### 4.2 Mechanical hazards related to equipment as defined in clauses 3.6 to 3.10

- 4.2.1 Hazard of cutting hazard from the blades of the strip cutting device.
- 4.2.2 Hazard of crushing between the stock blender carriage and the machine frame.
- 4.2.3 Hazard of drawing-in and crushing between the stock blender rolls.
- 4.2.4 Hazard of drawing-in and crushing between the recovery conveyor belt and the mill roll, when the rolls are in reverse motion.  
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- 4.2.5 Hazard of impact due to the ejection of the mill tray
- 4.2.6 Hazard of drawing-in and crushing between the retractable ploughs and the mill roll.