



**SLOVENSKI STANDARD**  
**SIST EN 1417:2000+A1:2008**

**01-november-2008**

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**Stroji za predelavo gume in plastike - Valjarji - Varnostne zahteve**

Plastics and rubber machines - Two roll mills - Safety requirements

Kunststoff- und Gummimaschinen - Walzwerke - Sicherheitsanforderungen

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

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**Ta slovenski standard je istoveten z: EN 1417:1996+A1:2008**

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**ICS:**

83.200

Oprema za gumarsko  
industrijo in industrijo  
polimernih materialov

Equipment for the rubber and  
plastics industries

**SIST EN 1417:2000+A1:2008**

**en**

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EUROPEAN STANDARD

EN 1417:1996+A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2008

ICS 83.200

Supersedes EN 1417:1996

English Version

## Plastics and rubber machines - Two roll mills - Safety requirements

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

Kunststoff- und Gummimaschinen - Walzwerke -  
Sicherheitsanforderungen

This European Standard was approved by CEN on 16 August 1996 and includes Amendment 1 approved by CEN on 8 June 2008.

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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 CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## Foreword

This document (EN 1417:1996+A1:2008) has been prepared by Technical Committee CEN/TC 145 "Plastics and rubber machines", 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of an identical text or by endorsement, at the latest by February 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-06-08.

The main changes compared to the previous version are:

- Modification of the main element of the title
- Editorial modification of Annex ZA
- Addition of Annex ZB
- editorial changes of EN 292-1:1991 to EN ISO 12100-1:2003 and of EN 292-2:1991 to EN ISO 12100-2:2003 in the following clauses: Introduction, 2 and sub-clauses: 5.1.1.1, 5.1.1.2, 5.1.1.3, 5.1.1.4.6, 5.1.2.2, 5.2.1, 5.8, 7.1.1
- minor changes of Foreword, 7th paragraph and of sub-clause 7.2.1, 2nd and 3rd indents
- technical change of sub-clause 7.1.1, last indent.

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This document supersedes EN 1417:1996.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 and A1.

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).

A1 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. A1

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, 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 United Kingdom.

**EN 1417:1996+A1:2008 (E)****Introduction**

This European standard is a type C standard as defined in **EN ISO 12100** 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 ISO 12100** for hazards which are not covered by this standard.

**1 Scope**

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.

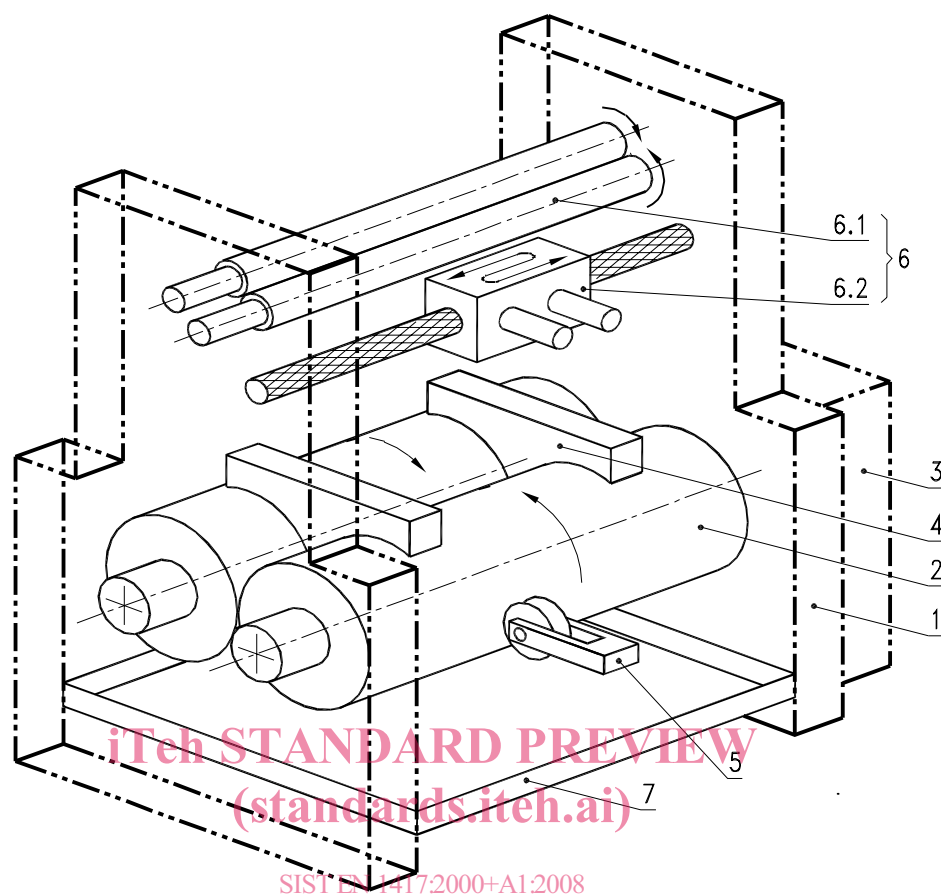
Figure 1 shows the principal parts of a two roll mill.

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                       | 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.

A1 *deleted text* A1

**EN 1417:1996+A1:2008 (E)**

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 – Principles for design*

EN 563:1994, *Safety of Machinery – Temperature of touchable surfaces – Ergonomic data to establish temperature limit values for hot surfaces*

Ⓐ<sub>1</sub> EN 574:1996, *Safety of machinery - Two-hand control devices - Functional aspects - Principles for design* Ⓐ<sub>1</sub>

Ⓐ<sub>1</sub> EN 953:1997, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards* Ⓐ<sub>1</sub>

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*

Ⓐ<sub>1</sub> EN ISO 12100-1:2003, *Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles (ISO 12100-2:2003)* Ⓐ<sub>1</sub>

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**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



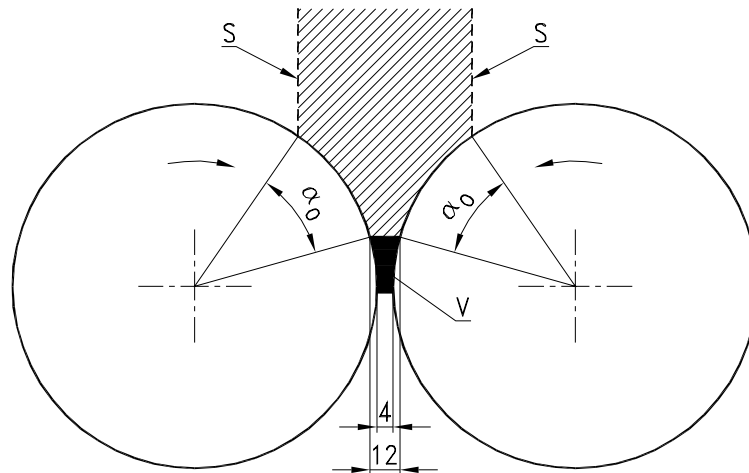


Figure 2 — Principal crushing zone V, safety limits S and specified stopping angle  $\alpha_0$

### 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).

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.

#### 3.3.1

##### specified stopping angle $\alpha_0$

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.

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- 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)
- 3.6**  
**strip cutting device**  
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.

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#### 4.1 Mechanical hazards related to the mill rolls

- 4.1.1 Hazards of drawing-in and crushing between the mills 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
- 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

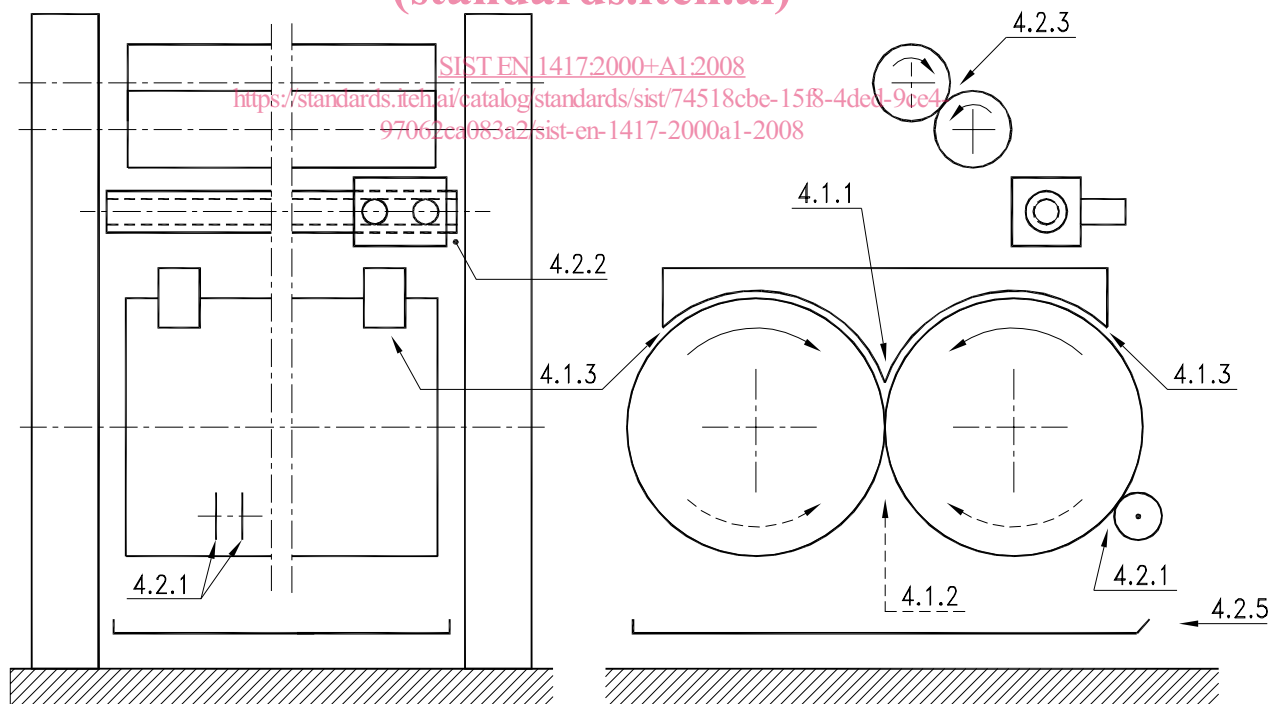


Figure 3a — Two roll mill shown with strip cutting device and stock blender