SLOVENSKI STANDARD
oSIST prEN 1417:2013

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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 matiéres plastiques et le caoutchouc - Mélangeurs à cylindres - Prescriptions de sécurité

Ta slovenski standard je istoveten z: **prEN 1417 rev**

ICS:

83.200	Oprema za gumarsko industrijo in industrijo polimernih materialov	Equipment for the rubber and plastics industries

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Plastics and rubber machines - Two roll mills - Safety requirements

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

Kunststoff- und Gummimaschinen - Walzwerke - Sicherheitsanforderungen

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

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Foreword

This document (prEN 1417:2013) has been prepared by Technical Committee CEN/TC 145 “Plastics and rubber machines”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1417:1996+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(s).

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

Introduction

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This standard covers the essential health and safety requirements for two roll mills for the processing of rubber and/or plastics. Significant hazards are listed in clause 4 and are covered by this standard.

This standard does not cover requirements for the design of a local exhaust ventilation system.

This document is not applicable to two roll mills manufactured before the date of its publication as an European Standard.

2 Normative references

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

EN 349:1993+A1:2008, *Safety of Machinery - Minimum gaps to avoid crushing of parts of the human body*

EN 574:1996+A1:2008, *Safety of machinery – Two-hand control devices – Functional aspects – Principles for design.*

EN 953:1997+A1:2009, *Safety of machinery – Guards – General requirements for the design and construction of fixed and moveable guards.*

EN 1088:1995+A2:2008, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection*

EN 1760-2:2001+A1:2009, *Safety of machinery – Pressure sensitive protective devices – Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars.*

EN 60204-1:2006, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements (IEC 60204-1:2005, modified).*

EN 61000-6-2:2005, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.*

EN 61000-6-4:2007, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.*

EN 61496-1:2004+A1:2008/AC:2010, *Safety of machinery – Electro-sensitive protective equipment – Part 1: General requirements and tests (IEC 61496-1:2004, modified).*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744).*

EN ISO 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746).*

EN ISO 3747:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment (ISO 3747).*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871).*

EN ISO 9614-2:1996, *Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 2: Measurement by scanning (ISO 9614-2).*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201).*

EN ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202).*

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204).*

EN ISO 11688-1:2009, *Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 1: Planning (ISO/TR 11688-1).*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100).*

EN ISO 13732-1:2008, *Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces – Part 1: Hot surfaces (ISO 13732-1).*

EN ISO 13849-1:2008, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design (ISO 13849-1).*

EN ISO 13850:2008, *Safety of machinery – Emergency stop – Principles for design (ISO 13850).*

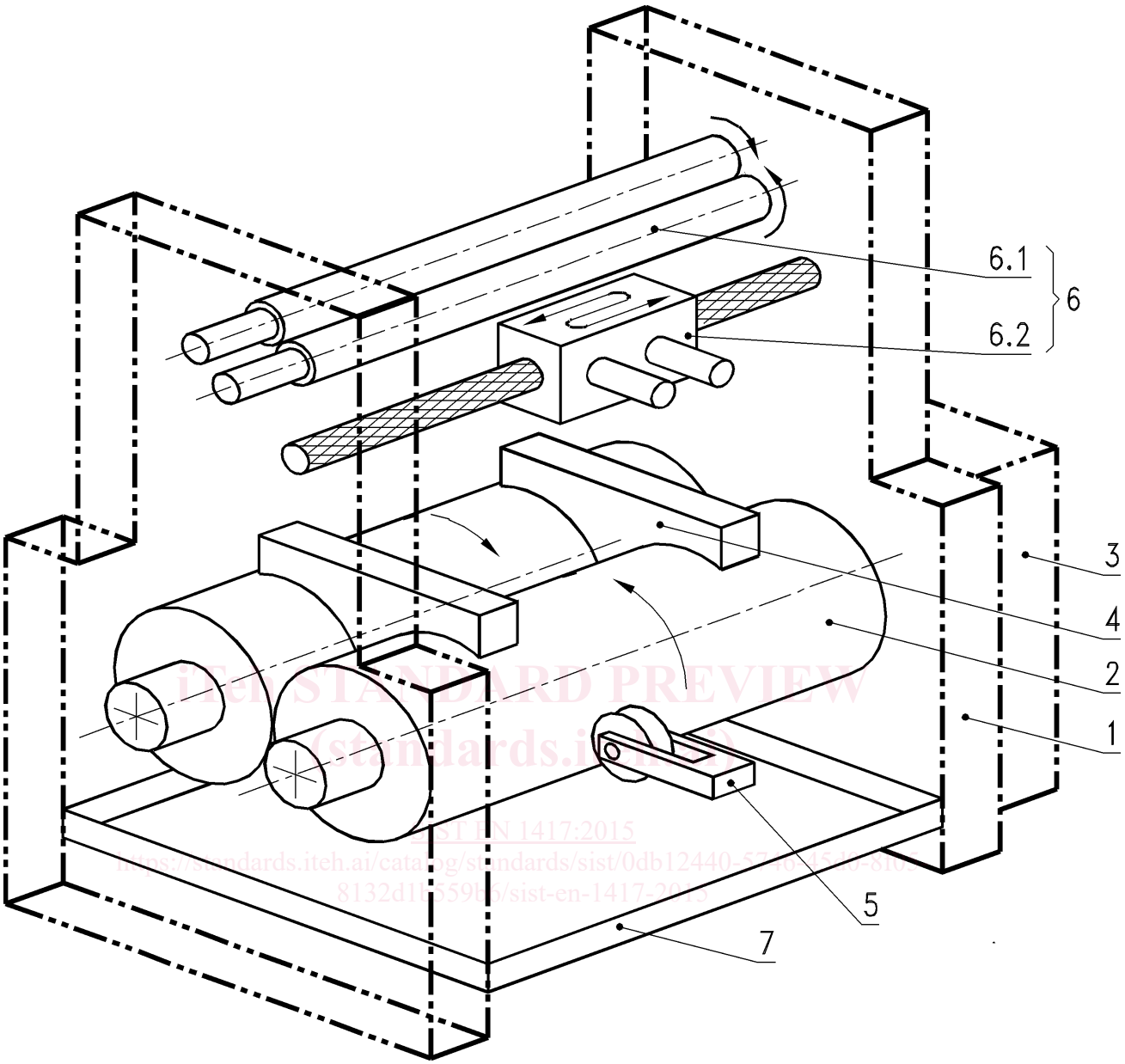
EN ISO 13855:2010, *Safety of machinery – Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855).*

EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857).*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12100:2010 and the following 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)



Key

1 Frame
2 Mill rolls
3 Drive and transmission unit
4 Stock guides
5 Strip cutting device
6 Stock blender
6.1 Stock blender rolls
6.2 Stock blender carriage
7 Mill tray

Figure 1 — Principal parts of a two roll mill

3.1.1
large two roll mills
two roll mills with a roll diameter of D ≥ 400 mm

3.1.2
small two roll mills
two roll mills with a roll diameter of D ≤ 200 mm

3.1.3
intermediate two roll mills
two roll mills with a roll diameter of 200 < D < 400 mm

3.2
principal crushing zone
zone extending over the full length of the mill rolls indicated by V in Figure 2

Dimensions in mm

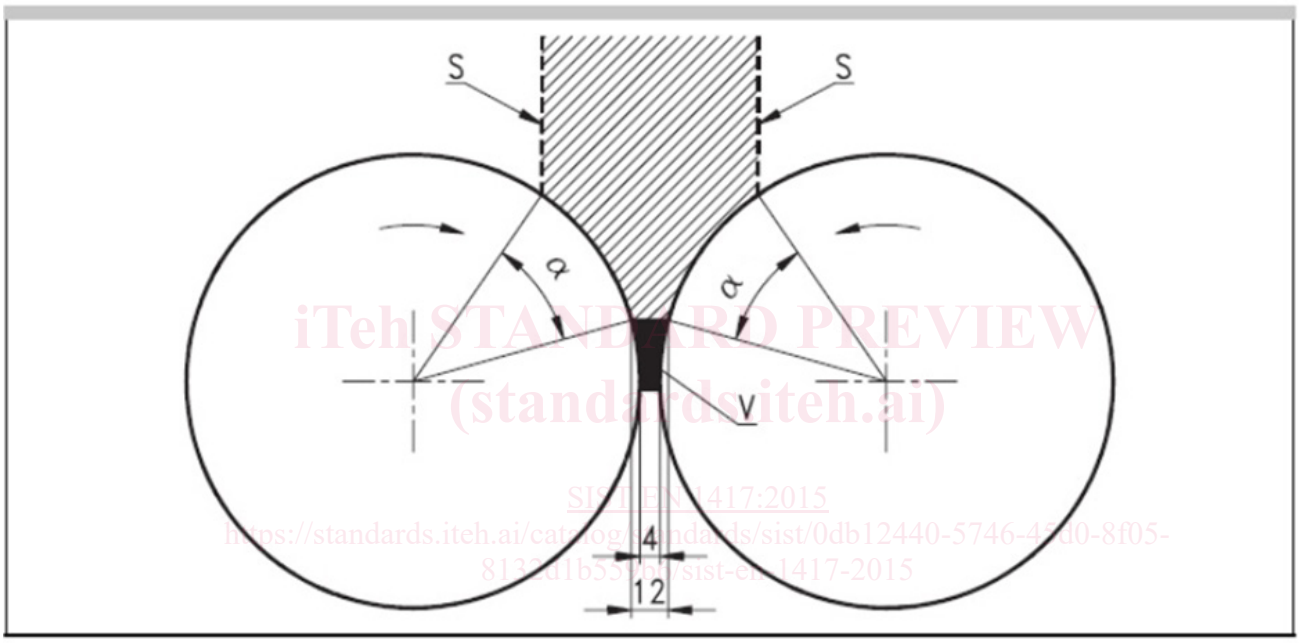


Figure 2 — Principal crushing zone V, safety limits S and stopping angle α

3.3
stopping angle α
the angle through which the mill rolls rotate from the stop signal triggered by a protective device until the rolls have come to rest with the machine unloaded, and running at maximum design speed

3.4
safety limit
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)

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
device 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 5)

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 4).

4 List of significant hazards

The locations of the hazards in 4.1 and 4.2 are shown in Figures 3, 4 and 5.

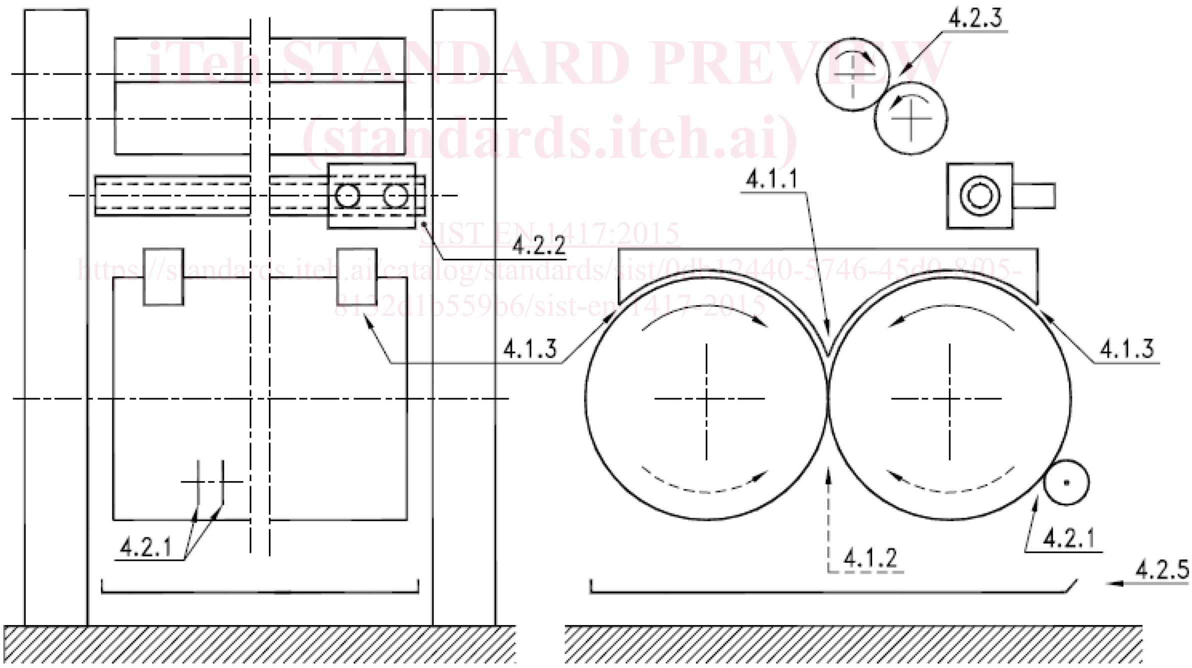


Figure 3 — Location of mechanical hazards on a two roll mill shown with a strip cutting device and a stock blender

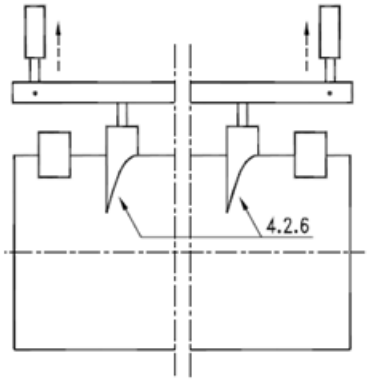


Figure 4 — Location of mechanical hazards on a two roll mill with retractable ploughs

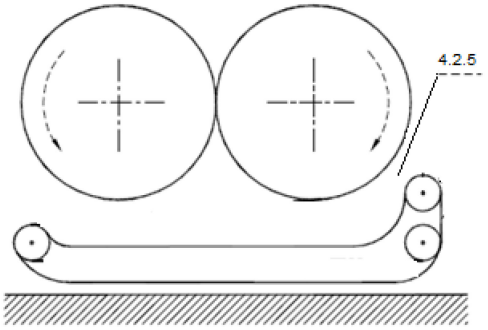


Figure 5 — Location of mechanical hazards on a two roll mill with a recovery conveyor belt

Table 1 — List of significant hazards

	Significant hazards	Applicable subclauses in Clause 5
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	5.2.1.1 5.2.1.6 5.2.2.1 5.2.3 5.2.4
4.1.2	Hazard of drawing-in and crushing between the mill rolls during reverse operation	5.2.1.2 5.2.1.6
4.1.3	Hazards resulting from loss of braking efficiency	5.2.1.3
4.1.4	Hazards of drawing-in and crushing in the drive mechanism of the mills rolls	5.2.1.4
4.1.5	Hazard of drawing-in and crushing between the stock guides and the mill rolls	5.2.1.5
4.2	**Mechanical hazards related to other equipment on large two roll mills**	