



# SLOVENSKI STANDARD

## SIST EN 12012-3:2002

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### Rubber and plastics machines - Size reduction machines - Part 3: Safety requirements for shredders

Rubber and plastics machines - Size reduction machines - Part 3: Safety requirements for shredders

Gummi- und Kunststoffmaschinen - Zerkleinerungsmaschinen - Teil 3: Sicherheitsanforderungen für Walzenzerkleinerer

Machines pour le caoutchouc et les matières plastiques - Machines à fragmenter - Partie 3: Prescriptions de sécurité relatives aux déchiqueteurs

**Ta slovenski standard je istoveten z: EN 12012-3:2001**

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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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ICS 83.200

English version

## Rubber and plastics machines - Size reduction machines - Part 3: Safety requirements for shredders

Machines pour le caoutchouc et les matières plastiques -  
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relatives aux déchiqueteurs

Gummi- und Kunststoffmaschinen -  
Zerkleinerungsmaschinen - Teil 3:  
Sicherheitsanforderungen an Walzenzerkleinerer

This European Standard was approved by CEN on 18 January 2001.

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

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
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 September 2001, and conflicting national standards shall be withdrawn at the latest by September 2001.

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 EC Directives.

For relationship with EC Directives see informative Annex ZA which is an integral part of this standard.

This is the third in a series of standards on the safety of size reduction machines.

- Part 1 deals with blade granulators.
- Part 2 deals with strand pelletisers.

Annex A is normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## Introduction

This document is a type C standard as stated in EN 1070.

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 specifies the essential safety requirements applicable to the design and construction of shredders used for plastic and rubber.

The machine begins with the outer edge of the feed hopper and ends with the discharge area.

This standard does not deal with equipment for feeding material or discharging shredded material.

This standard does not deal with safety measures to reduce the risk from ignition of flammable residues in material to be shredded

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This standard does not deal with requirements for local exhaust ventilation systems

Only the significant hazards listed in clause 4 and dealt with in clause 5 are subject to this standard.

NOTE Directive 94/9/EC concerning equipment and protective systems intended for use in potentially explosive atmospheres can be applicable to the type of machine or equipment covered by this European Standard. The present standard does not necessarily comply with Directive 94/9/EC. Additional safety requirements in a future revision of this standard may be necessary to satisfy Directive 94/9/EC.

This standard applies to machines which are manufactured after the date of approval of this standard by CEN.

## 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 (including amendments).

EN 292-1:1991	Safety of Machinery - Basic concepts, general principles for design Part 1: Basic terminology, methodology
EN 292-2:1991 +A1:1995	Safety of Machinery - Basic concepts, general principles for design 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 418:1992	Safety of Machinery - Emergency stop equipment, functional aspects - Principles for design
EN 626-1:1994	Safety of Machinery - Reduction of risk to health from hazardous substances emitted by machinery - Part 1: Principles and specifications for machinery manufacturers
EN 953:1997	Safety of Machinery - Guards - General requirements for the design and construction of fixed and movable guards
EN 954-1:1996	Safety of Machinery - Safety related parts of control systems - Part 1: General principles for design
EN 999:1998	Safety of machinery – The positioning of protective equipment in respect of approach speeds of parts of the human body
EN 1037:1995	Safety of machinery - Prevention of unexpected start-up
EN 1070	Safety of machinery - Terminology
EN 1088:1995	Safety of Machinery - Interlocking devices associated with guards - Principles for design and selection
EN 50014	Electrical apparatus for potentially explosive atmospheres - General requirements
EN 50015	Electrical apparatus for potentially explosive atmospheres - Oil-immersion "o"
EN 50016	Electrical apparatus for potentially explosive atmospheres - Pressurised apparatus "p"
EN 50017	Electrical apparatus for potentially explosive atmospheres - Powder filling "q"

- EN 50018 Electrical apparatus for potentially explosive atmospheres - Flameproof enclosures "d"
- EN 50019 Electrical apparatus for potentially explosive atmospheres - Increased safety "e"
- EN 50020 Electrical apparatus for potentially explosive atmospheres - Intrinsic safety "i"
- EN 60204-1:1997 Safety of Machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:1997)
- EN 60529:1991 Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
- EN ISO 3741:1999 Acoustics - Determination of sound power levels of noise sources using sound pressure - Precision methods for reverberation rooms (ISO 3741:1999)
- EN ISO 3743-1:1995 Acoustics - Determination of sound power levels of noise sources - Engineering methods for small movable sources in reverberant fields - Part 1: Comparison method for hard-walled test rooms (ISO 3743:1994)
- EN ISO 3743-2:1996 Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering methods for small movable sources in reverberant fields - Part 2: Methods for special reverberation test rooms (ISO 3743-2:1994)
- EN ISO 3744:1995 Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)
- EN ISO 3746:1995 Acoustics - Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995)
- EN ISO 3747:2000 Acoustics - Determination of sound power levels of noise sources using sound pressure - comparison method for use in-situ (ISO 3747:2000)
- EN ISO 4871:1996 Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)
- EN ISO 9614-1:1995 Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 1: Measurement at discrete points (ISO 9614-1:1993)
- EN ISO 9614-2:1996 Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scanning (ISO 9614-2:1996)
- EN ISO 11201:1995 Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at the work station and at other specified positions - Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)



- EN ISO 11202:1995 Acoustics - Noise emitted by machinery and equipment -  
Measurement of emission sound pressure levels at the work station and at other  
specified positions - Survey method in situ (ISO 11202:1995)
- EN ISO 11203:1995 Acoustics - Noise emitted by machinery and equipment -  
Determination of emission sound pressure levels at the work station  
and at other specified positions from the sound power level (ISO 11203:1995)
- EN ISO 11204:1995 Acoustics - Noise emitted by machinery and equipment -  
Measurement of emission sound pressure levels at the work station and at other  
specified positions - Method requiring environmental corrections (ISO 11204:1995)
- EN ISO 11688-1:1998 Acoustics - Recommended practice for the design of low-noise  
machinery and equipment - Part 1: Planning (ISO/TR 11688-1:1995)
- ISO 3745:1977 Acoustics - Determination of sound power levels of noise sources -  
Precision methods for anechoic and semi-anechoic rooms

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### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1070 and the following terms and definitions apply:

#### 3.1

##### **shredder**

machine with one or more low speed rotating shafts on which cutting tools are fitted which shred the material between the tools on the revolving shaft(s) or between the tools on one shaft and a stationary cutting tool

#### 3.2

##### **shredding chamber**

part of the machine where shredding takes place

#### 3.3

##### **rotor**

one or more rotating devices including the shaft(s), tools and/or cutting tools inside the shredding chamber

#### 3.4

##### **stationary cutting tool**

single or multiple tools fixed inside the shredding chamber

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#### 3.5

##### **feeding device**

part of the machine used for feeding the material into the shredding chamber. The feeding device can be fixed, e.g. a hopper or similar device, or moveable, e.g. a conveyor belt(s)

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#### 3.6

##### **feeding area**

area of the machine where the feeding of material takes place

#### 3.7

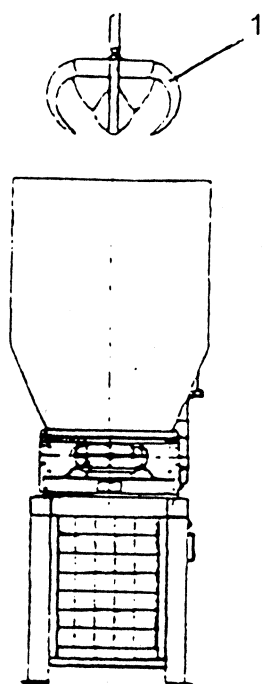
##### **discharge area**

area where the cut material leaves the shredding chamber

#### 3.8

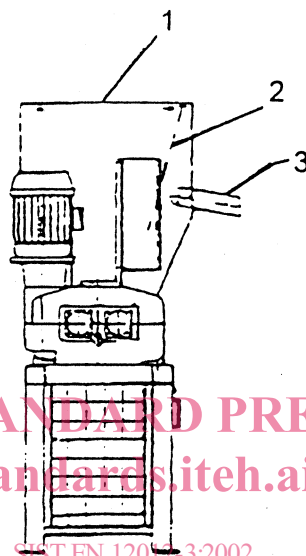
##### **working level**

surface on which the person who feeds the machine stands



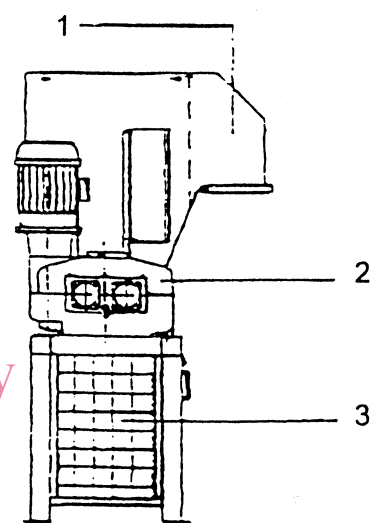
1 Grab

Figure 1a



1 Fixed guard  
2 Protective flap  
3 Conveyor belt

Figure 1b



1 Feeding area  
2 Shredding chamber  
3 Discharge area

Figure 1c

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Figure 1 - Examples of shredders