



**SLOVENSKI STANDARD**  
**SIST EN 415-5:2006**  
**01-oktober-2006**

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**Pakirne naprave – Varnost pakirnih naprav – 5. del: Zavijalni stroji**

Safety of packaging machines - Part 5: Wrapping machines

Sicherheit von Verpackungsmaschinen - Teil 5: Einschlagmaschinen

Sécurité des machines d'emballage - Partie 5 : Fardeleuses/enveloppeuses

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**Ta slovenski standard je istoveten z: EN 415-5:2006**

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**ICS:**

55.200

Pakirni stroji

Packaging machinery

**SIST EN 415-5:2006**

**en**

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ICS 55.200

English Version

## Safety of packaging machines - Part 5: Wrapping machines

Sécurité des machines d'emballage - Partie 5 :  
Fardeleuses/enveloppeuses

Sicherheit von Verpackungsmaschinen - Teil 5:  
Einschlagmaschinen

This European Standard was approved by CEN on 23 March 2006.

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.

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

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## Foreword

This document (EN 415-5:2006) has been prepared by Technical Committee CEN/TC 146 "Packaging 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of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

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.

EN 415 Safety of packaging machines

Part 1: Terminology and classification of packaging machines and associated equipment

Part 2: Pre-formed rigid container packaging machines

Part 3: Form, fill and seal machines

Part 4: Palletisers and depalletisers

Part 6: Pallet wrapping machines

Part 7: Group and secondary packaging machines

Part 8: Strapping machines

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

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## **Introduction**

Wrapping machines are used extensively in Europe, in an increasingly wide range of industries.

They contain several significant hazards and have the potential to cause serious injury.

This document is a type C standard as defined in EN ISO 12100-1:2003.

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

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.

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## 1 Scope

This European Standard applies to the following groups of machines:

- wrapping machines which partially wrap products (see Figures 1-4)
- wrapping machines which form a complete wrap without sealing (see Figures 5-7)
- wrapping machines which form a complete wrap with sealing (see Figures 8-14)
- shrinking equipment which is connected to wrapping machines covered by this standard (see Figures 15-16)

The individual machines are described in 3.2 of this standard.

This European Standard deals with safety requirements for machine design, construction, installation, commissioning, operation, adjustment, maintenance and cleaning of wrapping machines.

The extent to which hazards, hazardous situations and events are covered are indicated in Clause 4 of this document.

Exclusions:

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This standard is not applicable to larger examples of wrapping machines designed to handle products higher than 400 mm and wider than 400 mm. These machines are covered by EN 415-6.

This document is not applicable to wrapping machines which are manufactured before the date of publication of this document by CEN.

This standard does not consider the following hazards:

- Use of wrapping machines in potentially explosive atmospheres;
- Health, safety or hygiene hazards associated with the products that may be handled by the machines but does include general advice on this subject;
- Hazards that may be associated with electromagnetic emissions from wrapping machines;
- Hazards that may be associated with decommissioning wrapping machines.

## 2 Normative references

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

EN 294:1992, *Safety of machinery - Safety distance to prevent danger zones being reached by the upper limbs*

EN 415-1:2000, *Packaging machines safety - Part 1: Terminology and classification of packaging machines and associated equipment*

EN 418, *Safety of machinery - Emergency stop equipment, functional aspects - Principles for design*

EN 563, *Safety of machinery - Temperatures of touchable surfaces - Ergonomics data to establish temperature limit values for hot surfaces*

## EN 415-5:2006 (E)

EN 574:1996, *Safety of machinery - Two-hand control devices - Functional aspects - Principles for design*

EN 614-1:1995, *Safety of machinery - Ergonomic design principles – Part 1: Terminology and general principles*

EN 619, *Continuous handling equipment and systems – Safety and EMC requirements for equipment for mechanical handling of unit loads*

EN 626-1, *Safety of machinery - Reduction of risks to health from hazardous substances emitted by machinery - Part 1: Principles and specifications for machinery manufacturers*

EN 626-2, *Safety of machinery - Reduction of risks to health from hazardous substances emitted by machinery – Part 2: Methodology leading to verification procedures*

EN 811, *Safety of machinery – Safety distances to prevent danger zones being reached by the lower limbs*

EN 894-1, *Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 1: General principles for human interactions with displays and control actuators*

EN 894-2, *Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 2: Displays*

EN 894-3, *Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 3: Control actuators*

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 982:1996, *Safety of machinery – Safety requirements for fluid power systems and their components - Hydraulics*

EN 983:1996, *Safety of machinery - Safety requirements for fluid power systems and their components – Pneumatics*

EN 999, *Safety of machinery - The positioning of protective equipment in respect of approach speeds of parts of the human body*

EN 1005-2, *Safety of machinery – Human physical performance – Part 2: Manual handling of machinery and components parts of machinery*

EN 1005-3, *Safety of machinery – Human physical performance – Part 3: Recommended force limits for machinery operation*

EN 1037, *Safety of machinery - Prevention of unexpected start-up*

EN 1050, *Safety of machinery - Principles for risk assessment*

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

EN 1672-2:2005, *Food processing machinery - Basic concepts – Part 2: Hygiene requirements*

EN 1760-2, *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 13478, *Safety of machinery - Fire prevention and protection*

EN 60204-1:1997, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:1997)*

- EN 61310-1:1995, *Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:1995)*
- EN 61310-3, *Safety of machinery - Indication, marking and actuation - Part 3: Requirements for the location and operation of actuators (IEC 61310-3:1999)*
- EN 61496-1:2004, *Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests (IEC 61496-1:2004, modified)*
- EN 62061, *Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)*
- 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 9614-2:1996, *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 a 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 a work station and at other specified positions - Survey method in situ (ISO 11202:1995)*
- EN ISO 11204:1995, *Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at a work station and at other specified positions - Method requiring environmental corrections (ISO 11204:1995)*
- EN ISO 12001:1996, *Acoustics - Noise emitted by machinery and equipment - Rules for the drafting and presentation of a noise test code (ISO 12001:1996)*
- 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)*
- EN ISO 14122-1:2001, *Safety of machinery - Permanent means of access to machinery - Part 1: Choice of fixed means of access between two levels (ISO 14122-1:2001)*
- EN ISO 14122-2, *Safety of machinery - Permanent means of access to machinery - Part 2: Working platforms and walkways (ISO 14122-2:2001)*
- EN ISO 14122-3, *Safety of machinery - Permanent means of access to machinery - Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2001)*
- EN ISO 14122-4, *Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders (ISO 14122-4:2004)*
- ISO 7000, *Graphical symbols for use on equipment – Index and synopsis*
- IEC 60417:2002, *Graphical symbols for use on equipment*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in Clause 3 of EN ISO 12100-1:2003, EN 415-1:2000 and the following apply.

#### 3.1 Definition of terms

##### 3.1.1

##### **band**

strip of packaging material

##### 3.1.2

##### **cold adhesive**

adhesive which is liquid at room temperature

##### 3.1.3

##### **deformable material**

material which can be formed by the application of pressure only

##### 3.1.4

##### **change parts**

machine parts designed to handle a specific product, packaging material or pack size or kind, that need to be changed when the machine is set up to handle a different product, packaging material or pack size or kind

##### 3.1.5

##### **film compensator**

device which maintains tension in the film during the intermittent motion of the wrapping cycle. It is also called "tension roller assembly"

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##### 3.1.6

##### **film (packaging material) reel**

continuous sheet of paper, carton board, plastics film, metal foil or flexible laminate wound on a cylindrical core

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##### 3.1.7

##### **film web**

continuous sheet of paper, plastic film, metal foil or laminate

##### 3.1.8

##### **fold wrapping**

wrap in which the material, due to its plasticity, keeps the fold

##### 3.1.9

##### **fin seal**

seal in which the two edges of the material are joined together inner surface to inner surface

##### 3.1.10

##### **flexible packaging material**

relatively thin paper, plastic film or flexible laminate

##### 3.1.11

##### **hand operated**

machine functions or modes where the only power source is directly applied manual effort

##### 3.1.12

##### **hot melt adhesive**

adhesive that is solid at room temperature and which is melted so that it can be applied

##### 3.1.13

##### **lay flat tubular film**

continuous tube of plastic film usually supplied wound on a core

**3.1.14****longitudinal seal**

seal made on a package in line with the direction of material travel in the machine

**3.1.15****magazine**

mechanical assembly designed to hold stacks of cartons, carton blanks, leaflets, labels, lids or stackable containers

**3.1.16****mandrel**

mechanical assembly around which a bag or carton is formed and also a film reel support

**3.1.17****modified atmosphere**

when a normal atmosphere within a package or unit load is replaced by one or more selected gases. The objective is to extend shelf or storage life of the packaged products

**3.1.18****overlap seal**

seal in which two edges of the material are joined together inner surface to outer surface

**3.1.19****pack, package**

assembly of product and packaging materials produced by packaging machine

**3.1.20****packaging material**

material used to make a package e.g. paper, polypropylene

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**3.1.21****packaging material transport mechanism**

mechanical assembly which transports packaging material through the packaging machine

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**3.1.22****paper laminate**

paper that has been coated or bonded to one or a number of other materials e.g. polyethylene or aluminium foil

**3.1.23****product**

the substance or article being packed in a wrapping machine

**3.1.24****roll wrapping**

wrap of cylindrical products with a roll shaped form

**3.1.25****shrink wrapping**

process in which a package is wrapped in a thermoplastic film which is then heated so that the film shrinks and closely fits to the package

**3.1.26****skin packaging**

packaging process in which a product is covered by a closely fitting usually transparent plastic film. The product is placed on a porous rigid paperboard sheet, which is often printed. Heated film is draped over it and vacuum is applied to draw the film tightly over the article

**3.1.27****stretch film**

flexible, elastic plastic film which can be pulled tightly around a package. It may stick to itself on contact or require heat sealing