



**SLOVENSKI STANDARD**  
**SIST EN 415-1:2001+A1:2009**  
**01-april-2009**

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**SIST EN 415-1:2001**

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Packaging machines safety - Part 1: Terminology and classification of packaging machines and associated equipment

Sicherheit von Verpackungsmaschinen - Teil 1: Terminologie und Klassifikation von Bezeichnungen für Verpackungsmaschinen und zugehörige Ausrüstungen

Sécurité des machines d'emballage - Partie 1: Terminologie et classification des machines d'emballage et de l'équipement associé

**Ta slovenski standard je istoveten z: EN 415-1:2000+A1:2009**

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**ICS:**

01.040.55	Pakiranje in distribucija blaga (Slovarji)	Packaging and distribution of goods (Vocabularies)
55.200	Pakirni stroji	Packaging machinery

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 415-1:2000+A1**

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ICS 01.040.55; 55.200

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## Packaging machines safety - Part 1: Terminology and classification of packaging machines and associated equipment

Sécurité des machines d'emballage - Partie 1:  
Terminologie et classification des machines d'emballage et  
de l'équipement associé

Sicherheit von Verpackungsmaschinen - Teil 1:  
Terminologie und Klassifikation von Bezeichnungen für  
Verpackungsmaschinen und zugehörige Ausrüstungen

This European Standard was approved by CEN on 16 April 1999 and includes Amendment 1 approved by CEN on 5 January 2009.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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**Contents**

Page

Foreword.....	3
Introduction .....	4
1 <b>Scope</b> .....	4
2 <b>Normative references</b> .....	5
3 <b>Definitions</b> .....	5
4 <b>Terminology used in this standard</b> .....	26
<b>Annex A</b> (informative) <b>Alphabetical list of packaging machines</b> .....	31
<b>Annex B</b> (informative) <b>Packaging machines named in English, French and German</b> .....	38
<b>Annex C</b> (informative) <b>Packaging machines named in English and Italian</b> .....	47
<b>Annex ZA</b> (informative) <b>Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC</b> <b>A1</b> .....	59
<b>Annex ZB</b> (informative) <b>Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC</b> <b>A1</b> .....	60

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## Foreword

This document (EN 415-1:2000+A1:2009) 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 August 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2009-01-05.

This document supersedes EN 415-1:2000.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\square_{A1}$   $\square_{A1}$ .

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).

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

Other parts of this standard will include

$\square_{A1}$  EN 415 Safety of packaging machines;  $\square_{A1}$

Part 2: Pre-formed rigid container packaging machines

Part 3: Form, fill and seal machines.

Part 4: Palletizers and depalletizers.

Part 5: Wrapping machines.

$\square_{A1}$  Part 6: Pallet wrapping machines.

Part 7: Group and secondary packaging machines.

Part 8: Strapping machines.

Part 9: Noise measurement methods for packaging machines, packaging lines and auxiliary equipment - Grade 2 and 3 accuracy.  $\square_{A1}$

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.

## Introduction

Packaging machines are used extensively in Europe, in an increasingly wide range of industries. They contain many hazards and have the potential to cause serious injury.

There are an enormous variety of packaging machines, but hitherto there has been no internationally agreed nomenclature. This has led to confusion when reporting accidents and interpreting accident and trade statistics. The purpose of this standard is to name and define each group of packaging machines uniquely. In most cases these names will already be in common use, however in some cases the commonly used name is ambiguous, a trade name, or used to describe more than one significantly different type of machine. In these cases a less familiar name will be defined. Designers, manufacturers, suppliers, importers, users, enforcing authorities and other interested bodies are encouraged to use this nomenclature to improve communication and to avoid confusion, particularly when reporting accidents and preparing the documentation required by EU Directives.

## 1 Scope

This European standard defines the field of packaging machines in detail in clause 3, but briefly these are:

Filling and Dosing machines

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Closing machines

Labelling, decorating and coding machines

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Cleaning, sterilising, cooling and drying machines

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Fill and seal machines

Inspection machines

Container and component handling machines

Form, fill and seal machines

Cartoning machines

Wrapping machines

Group or transit packaging machines

Pallet or loading unit forming, dismantling and securing machines

Annex A indicates where hazards and safety requirements for these machines can be found. In most cases this will be in one of the parts of EN415, but in some cases it may be another European or ISO standard. Where no specific standard covers a particular machine Annex A will indicate the most appropriate standard which can be referred to for advice.

## 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.

A1 *deleted text* A1

EN 415-2:1999, *Safety of packaging machines – Part 2: Pre-formed rigid container packaging machines.*

EN 415-3:1999, *Safety of packaging machines – Part 3: Form, fill and seal machines.*

EN 415-4:1997, *Packaging machines safety – Part 4: Palletizers and depalletizers.*

A1 EN 415-5:2006, *Packaging machines safety – Part 5: Wrapping machines.*

EN 415-6:2006, *Packaging machines safety – Part 6: Pallet wrapping machines.*

EN 415-7:2006, *Safety of packaging machines – Part 7: Group and secondary packaging machines.* A1

EN 422:1995, *Rubber and plastics machines – Safety - Blow moulding machines intended for the production of hollow articles - Requirements for the design and construction.*

A1 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).* A1

ISO 10 821, *Industrial sewing machines - Safety requirements for sewing machines, units and systems.*

## 3 Definitions

For the purposes of this standard the following definitions apply.

### 3.1

#### filling and dosing machines

packaging machines which measure out a product from bulk by some predetermined value, e.g. volume, level in a container, mass or count. The terms listed below describe the method of measuring out or dosing the product. The filling machine may comprise one or a number of dosing devices which may be arranged with or without a mechanism to control containers or packages as they are filled

#### 3.1.1 Volumetric filling machines

##### 3.1.1.1

##### volumetric cup filling machine

filling machine which measures out a product, usually free-flowing solids or powder, in a cup of predetermined volume

##### 3.1.1.2

##### volumetric piston filling machine

filling machine which measures out a product, usually a liquid, paste or gas, using a reciprocating piston of predetermined volume

**EN 415-1:2000+A1:2009 (E)****3.1.1.2.1****displacement filling machine**

filling machine which measures out a product, usually liquid, by displacing a predetermined volume of product with a loose fitting piston

**3.1.1.2.2****aerosol gassing machine**

volumetric piston filling machine designed specifically to fill propellant gas into an aerosol or gas canister

**3.1.1.3****rotating chamber filling machine**

filling machine which measures out a product, usually a liquid, paste or gas, using a metering pump which operates for a predetermined number of cycles

**3.1.1.4****flow meter filling machine**

filling machine which measures out a product, usually a liquid, using a flow meter

**3.1.1.5****auger filling machine**

filling machine which measures out a product, usually a powder, using an auger which rotates for a predetermined number of revolutions

**3.1.2 Level filling machines****3.1.2.1****vacuum filling machine**

filling machine which fills a product, usually a liquid or powder, to a predetermined level in a rigid container, flow being initiated by applying a vacuum to the container

**3.1.2.2****gravity filling machine**

filling machine which fills a product, usually a liquid or powder, to a predetermined level in a container, the product flowing under gravity

**3.1.2.3****pressure filling machine**

filling machine which fills a carbonated liquid product under gravity, to a predetermined level in a rigid container, with the product under pressure

**3.1.3****timed flow filling machines**

filling machines which measure out a product, usually a liquid or powder, by controlling the product flow duration to a predetermined value

**3.1.4 Gravimetric filling machines****3.1.4.1****nett weighing machine**

filling machine which measures out a predetermined mass of product, usually free-flowing solids, before dispensing it as a fill

**3.1.4.1.1****selective combination weighing machine**

nett weighing machine with multiple weighing units, which computes an appropriate combination of loads to achieve the predetermined mass and discharges them together as a fill

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**3.1.4.2****gross weighing machine**

filling machine which measures out a predetermined mass of product, which may be liquid, powder, gas or solids, directly into the package, while it rests on a weighing instrument which controls the filling operation

**3.1.5****count filling machines**

filling machines which measure out solids according to a predetermined count

**3.2****closing machines**

packaging machines which seal or close filled packages

**3.2.1 Closing machines which do not use a closure or closing material****3.2.1.1****fold closing machine**

closing machine which seals a package, usually a bag or collapsible tube, by folding

**3.2.1.2****tuck closing machine**

closing machine which closes a package, usually a carton, by engaging pre-cut tabs in slots. See also 3.9.2.1

**3.2.1.3****crimp closing machine**

closing machine which closes a package, usually a bag or collapsible tube, by crimping

**3.2.1.4****weld sealing machine**

sealing machine which seals a package, usually metal, by welding

**3.2.1.5****fusion sealing machine**

sealing machine which seals a package, usually glass, by fusion welding

**3.2.1.6****solder sealing machine**

sealing machine which seals a package, usually metal, by soldering

**3.2.1.7****heat sealing machine**

sealing machine which seals a package, usually plastic, by heat sealing

**3.2.1.7.1****blister sealing machine**

sealing machine which seals a filled plastic blister to a piece of coated cartonboard, by the application of heat

**3.2.1.7.2****rigid container sealing machine**

sealing machine which seals a lid or flexible film to a tray, cup, bottle or other container by the application of heat

**3.2.1.7.3****bag sealing machine**

sealing machine which seals a bag by the application of heat

**EN 415-1:2000+A1:2009 (E)****3.2.1.7.4****sack sealing machine**

sealing machine which seals a sack by the application of heat

**3.2.1.8****induction sealing machine**

sealing machine which seals a foil laminate lid to a container in a electromagnetic field

**3.2.2 Closing machines which use a closure****3.2.2.1****screw capping machine**

closing machine which applies a threaded cap or lid, usually to a rigid container

**3.2.2.2****steam capping machine**

closing machine which sterilises the cap and filled rigid container with steam during the closing process

**3.2.2.3****plugging; corking machine**

closing machine which pushes a plug or cork into the mouth of a rigid container

**3.2.2.4****press-on lidding machine**

closing machine which pushes a lid, usually metal, plastic or other material, on to a rigid container

**3.2.2.5****crown capping machine**

closing machine which places a pre-formed metal cap over the mouth of a rigid container, before crimping the edges of the cap to secure it to the container

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**3.2.2.6****roll-on capping machine**

closing machine which places a deformable capsule over the mouth of a rigid container, before rolling the capsule to form a thread and secure the capsule to the container

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**3.2.2.7****can seaming machine**

closing machine which places a pre-formed lid onto the mouth of a can, before rolling the edges of the lid and can together to form a seal

**3.2.2.8****cork wiring machine**

closing machine which applies a wire cage to the neck and cork of a rigid container, to prevent the cork being pushed out by gas pressure in the container

**3.2.2.9****aerosol valve closing machine**

closing machine which places an aerosol valve into the mouth of a rigid container before seaming the valve to the container

**3.2.2.10****pump applicator**

closing machine which places a dispensing pump into the mouth of a rigid container before attaching the pump to the container

### 3.2.3 Closing machines which use a closing material

#### 3.2.3.1

##### **staple closing machine**

closing machine which closes packages, usually corrugated cases, with metal staples. See also 3.11.3.3.

#### 3.2.3.2

##### **nail closing machine**

closing machine which closes packages, usually wooden boxes, with nails

#### 3.2.3.3

##### **rivet closing machine**

closing machine which closes packages, usually metal, with rivets

#### 3.2.3.4

##### **clip closing machine**

closing machine which closes packages, usually rigid containers, with metal clips

#### 3.2.3.5

##### **sewing machine**

closing machine which closes packages, usually paper sacks, by sewing

#### 3.2.3.6

##### **glue sealing machine**

sealing machine which seals packages, usually bags, cartons or corrugated board cases, with an adhesive. See also 3.11.3.1

#### 3.2.3.7

##### **gummed tape sealing machine**

sealing machine which seals packages, usually corrugated board cases, with gummed tape. See also 3.11.3.2.2

#### 3.2.3.8

##### **tape sealing machine**

sealing machine which seals packages, usually corrugated board cases, with pressure sensitive tape. See also 3.11.3.2.1

#### 3.2.3.9

##### **strapping machine**

sealing machine which seals packages with a metal or plastic strap

#### 3.2.3.10

##### **twist-tie closing machine**

closing machine which closes packages, usually bags, by twisting a wire closure around the neck of the package

#### 3.2.3.11

##### **foil sealing machine**

packaging machine which applies a reel fed foil or plastic cover to a rigid container, which is usually plastic

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**EN 415-1:2000+A1:2009 (E)**

- 3.3**  
**labelling, decorating and coding machines**  
packaging machines which apply labels, decoration or codes and other markings to packages
- 3.3.1 Labelling machines**
- 3.3.1.1**  
**wet glue labelling machine**  
labelling machine which applies labels, usually to a rigid container, using an adhesive which is liquid at room temperature
- 3.3.1.2**  
**hot melt glue labelling machine**  
labelling machine which applies labels, usually to a rigid container, using an adhesive which is solid at room temperature
- 3.3.1.3**  
**pressure sensitive labelling machine**  
labelling machine which applies pre-glued labels, which are supplied on a reel of release paper or film
- 3.3.1.4**  
**heat seal labelling machine**  
labelling machine which applies labels coated with a heat sealable material
- 3.3.1.5**  
**pre-gummed label applicator**  
labelling machine which applies pre-gummed labels to packages
- 3.3.1.6**  
**print and apply labelling machine**  
labelling machine on which a label is first printed and then applied to a package
- 3.3.2 Decorating machines**
- 3.3.2.1**  
**tag labelling machine**  
packaging machine which applies a tag, usually to a rigid container, either by placing it over the neck of the container, or by fixing it to the container with glue
- 3.3.2.2**  
**foiling machine**  
packaging machine which applies a decorative foil to the neck of a closed rigid container
- 3.3.2.3**  
**shrink sleeving machine**  
packaging machine which places a tube of plain or printed thermoplastic material over the neck of a rigid container, before heat shrinking it so that it closely fits the container
- 3.3.2.4**  
**capsuling machine**  
packaging machine which applies a decorative capsule to the neck of a rigid container
- 3.3.2.5**  
**stretch sleeving machine**  
packaging machine which stretches a tube of plain or printed plastic material over the neck of a rigid container

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### 3.3.3 Coding machines

#### 3.3.3.1

##### **emboss coder**

machine attachment which marks a package by embossing or debossing with raised type

#### 3.3.3.2

##### **wet ink coder**

machine attachment which marks a package by printing it with wet ink

#### 3.3.3.3

##### **hot foil coder**

machine attachment which marks a package by transferring dry ink, carried on a reel of film, with a heated die

#### 3.3.3.4

##### **solid ink coder**

machine attachment which marks a package by transferring dry ink from a solid block, with a heated die

#### 3.3.3.5

##### **ink jet coder**

machine attachment which marks a package by jetting ink in a predetermined pattern

#### 3.3.3.5.1

##### **drop-on-demand ink jet coder**

ink jet coder which prints a character by jetting ink from a matrix of nozzles

#### 3.3.3.5.2

##### **continuous stream ink jet coder** (standards.iteh.ai)

ink jet coder which prints a character by applying varying electrostatic charges to droplets of ink

#### 3.3.3.6

##### **laser coder**

machine attachment which marks a package with a laser

### 3.4

#### **cleaning, sterilising, cooling and drying machines**

machines which clean, sterilise, cool or dry containers or filled packages

#### 3.4.1 Cleaning machines

##### 3.4.1.1

##### **air cleaning machine**

packaging machine which cleans the inside of rigid containers by injecting a gas, usually air, into the inverted containers

##### 3.4.1.2

##### **rinsing machine**

packaging machine which cleans the inside of a rigid container by injecting a liquid, usually water, into the inverted container

##### 3.4.1.3

##### **bottle washing machine**

packaging machine which cleans the inside and outside of rigid containers, usually with water and detergent

##### 3.4.1.4

##### **crate washing machine**

packaging machine which cleans crates, usually with water and detergent

**EN 415-1:2000+A1:2009 (E)****3.4.2 Sterilising machines****3.4.2.1****container sterilising machine**

packaging machine which sterilises empty rigid containers, before they are filled

**3.4.2.2****continuous steriliser**

packaging machine which sterilises packaged products by heating and then cooling them continuously under controlled conditions

**3.4.2.3****batch steriliser**

packaging machine which sterilises packaged products by heating and then cooling them under controlled conditions in a batch process

**3.4.3 Pasteurising machines****3.4.3.1****continuous pasteuriser**

packaging machine which pasteurises packaged products by heating and then cooling them continuously under controlled conditions

**3.4.3.2****batch pasteuriser**

packaging machine which pasteurises packaged products by heating and then cooling them under controlled conditions in a batch process

**3.4.4 Cooling, warming and drying machines****3.4.4.1****cooling machine**

packaging machine which reduces the temperature of empty or filled and sealed packages

**3.4.4.2****drying machine**

packaging machine which removes surface moisture from empty containers or filled sealed packages

**3.4.4.3****warming machine**

packaging machine which raises the temperature of empty or filled and sealed packages

**3.5****fill and seal machines**

packaging machines which combine the functions of filling and closing in one machine. There are a great variety of machines combining the functions of filling machines in 3.1. and closing machines in 3.2. However the following machines are typically supplied as combined fill and seal machines

**3.5.1 Rigid container fill and close machines****3.5.1.1****ampoule/vial fill and close machine**

packaging machine in which glass ampoules or vials are first filled with a liquid and then fitted with a closure or fusion sealed

**3.5.1.2****bottle fill and cap machine**

packaging machine in which bottles are first filled with a liquid and then fitted with cap or other closure

**3.5.1.3****can fill and seam machine**

packaging machine in which cans are first filled and then seamed

**3.5.1.4****cask or keg fill and seal machine**

packaging machine in which casks or kegs are first filled and then sealed

**3.5.2 Flexible package fill and seal machines****3.5.2.1****bag fill and seal machine**

packaging machine in which a pre-made bag is taken from a magazine, opened, filled with product and then sealed

**3.5.2.1.1****reel fed bag fill and seal machine**

packaging machine in which a bag is separated from a reel of pre-made bags, before being opened, filled with product and then sealed

**3.5.2.2****sack fill and close machine**

packaging machine in which a pre-made sack is taken from a magazine, before being opened, filled with product and then closed

**3.5.2.3****tube fill and seal machine**

packaging machine in which collapsible tubes are taken from a magazine, filled and then folded, crimped or heat sealed

**3.5.2.4****cup/tub fill and seal machine**

packaging machine in which a pre-made cup or tub is taken from a magazine, filled and then closed with a heat sealed foil or a press-on lid

**3.5.2.5****blister fill and seal machine**

packaging machine in which a pre-formed plastic blister is taken from a magazine, filled with product and then sealed to a backing card

**3.5.2.6****liquid bag-in-box fill and seal machine**

packaging machine in which pre-made bag is filled with liquid before being placed into a carton which is then sealed

**3.6****inspection machines**

packaging machines which inspect products, packages or packaging components, for a particular attribute, e.g. colour, size, mass, and reject items which fall outside pre-set values

**3.6.1 Inspection machines for products****3.6.1.1****checkweigher**

measuring instrument which measures the mass of a package or product, usually as it travels on a conveyor, records the mass of the item and rejects any that fall outside pre-set values

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