



# SLOVENSKI STANDARD

## SIST EN 415-1:2014

01-september-2014

Nadomešča:

SIST EN 415-1:2001+A1:2009

---

### **Pakirne naprave - Varnost pakirnih naprav - 1. del: Terminologija in razvrščanje pakirnih strojev ter pripadajoče opreme**

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

Sicherheit von Verpackungsmaschinen - Teil 1: Terminologie und Klassifikation von Bezeichnungen für Verpackungsmaschinen und zugehörigen 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 415-1:2014**

---

#### **ICS:**

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

**SIST EN 415-1:2014**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 415-1:2014

<https://standards.iteh.ai/catalog/standards/sist/b4e582e3-7c4e-4d0f-b2c4-d2369bbe851d/sist-en-415-1-2014>

EUROPEAN STANDARD

EN 415-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2014

ICS 01.040.55; 55.200

Supersedes EN 415-1:2000+A1:2009

English Version

## Safety of packaging machines - 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 Verpackungsmaschinen und zugehörigen Ausrüstungen

This European Standard was approved by CEN on 4 January 2014.

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

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

[SIST EN 415-1:2014](https://standards.iteh.ai/catalog/standards/sist/b4e582e3-7c4e-4d0f-b2c4-d2369bbe851d/sist-en-415-1-2014)

<https://standards.iteh.ai/catalog/standards/sist/b4e582e3-7c4e-4d0f-b2c4-d2369bbe851d/sist-en-415-1-2014>



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

## Contents

Page

|   |           |
|---|-----------|
| Foreword.....   | 3         |
| Introduction .....  | 4         |
| <b>1 Scope .....</b>  | <b>5</b>  |
| <b>2 Normative references .....</b>   | <b>5</b>  |
| <b>3 Terms and definitions .....</b>  | <b>6</b>  |
| <b>3.1 Filling machines.....</b>  | <b>6</b>  |
| <b>3.2 Closing machines .....</b>   | <b>8</b>  |
| <b>3.3 Labelling, decorating and coding machines.....</b>   | <b>11</b> |
| <b>3.4 Cleaning, sterilising, cooling and drying machines.....</b>  | <b>13</b> |
| <b>3.5 Fill and seal machines.....</b>  | <b>15</b> |
| <b>3.6 Inspection machines .....</b>  | <b>16</b> |
| <b>3.7 Container and packaging component handling machines .....</b>  | <b>18</b> |
| <b>3.8 Form, fill and seal machines.....</b>  | <b>19</b> |
| <b>3.9 Carton erecting, carton closing and cartoning machines .....</b>   | <b>21</b> |
| <b>3.10 Wrapping machines.....</b>  | <b>23</b> |
| <b>3.11 Group or secondary packaging machines .....</b>   | <b>25</b> |
| <b>3.12 Palletizers, depalletizers and ancillary equipment.....</b>   | <b>27</b> |
| <b>3.13 Pallet wrapping machines.....</b>   | <b>29</b> |
| <b>3.14 Strapping machines .....</b>  | <b>30</b> |
| <b>3.15 Terms used in this standard and other parts of EN 415.....</b>  | <b>31</b> |
| <b>Annex A (normative) Safety requirements for packaging machines.....</b>  | <b>40</b> |
| <b>Annex B (informative) Packaging machine names in English, French, German and Italian .....</b>   | <b>48</b> |
| <b>Annex C (informative) New Machines and Definitions .....</b>   | <b>62</b> |
| <b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC .....</b> | <b>63</b> |

## Foreword

This document (EN 415-1:2014) 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 January 2015 and conflicting national standards shall be withdrawn at the latest by January 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 415-1:2000+A1:2009.

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 Directives, see informative Annex ZA, which is an integral part of this document.

This part 1 of EN 415, *Safety of packaging machines* belongs to a series of documents, the other parts of which are the following:

- *Part 2: Pre-formed rigid container packaging machines*
- *Part 3: Form, fill and seal machines*
- *Part 4: Palletisers and depalletisers*
- *Part 5: Wrapping machines*
- *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 associated equipment, grade of accuracy 2 and 3*
- *Part 10: General requirements*

### Standards for packaging machines

The appropriate standard to find safety requirements for a particular packaging machine defined in Clause 3, is indicated in Annex A of this standard.

**NOTE** In most cases the safety requirements will be found in another part of EN 415, however for a few machines the safety requirements will be found in another type of standard .

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**EN 415-1:2014 (E)****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. The identification of specific types of packaging machines and their definition assists in the correct application of the EN 415 series of standards and other standards that may be relevant for packaging machines. Machine designers, manufacturers, suppliers, importers, users, enforcing authorities and other interested bodies are encouraged to use the nomenclature in this type "C" standard to improve communication and to avoid confusion, particularly when reporting accidents and preparing the documentation required by EU Directives.

**iTeh STANDARD PREVIEW  
(standards.iteh.ai)**

[SIST EN 415-1:2014](https://standards.iteh.ai/catalog/standards/sist/b4e582e3-7c4e-4d0f-b2c4-d2369bbe851d/sist-en-415-1-2014)

<https://standards.iteh.ai/catalog/standards/sist/b4e582e3-7c4e-4d0f-b2c4-d2369bbe851d/sist-en-415-1-2014>

## 1 Scope

This European Standard defines the field of packaging machines. The machines defined fall within the following general groups:

- filling machines;
- closing machines;
- labelling, decorating and coding machines;
- cleaning, sterilizing, cooling and drying machines;
- fill and seal machines;
- inspection machines;
- container and packaging component handling machines;
- form, fill and seal machines;
- carton erecting, carton closing and cartoning machines;
- wrapping machines;
- group or secondary packaging machines;
- palletizers, depalletizers and ancillary equipment;
- pallet wrapping machines;
- strapping machines.

This part of EN 415 indicates the relevant machine specific part of EN 415, or another relevant standard, where safety requirements for dealing with the hazards associated with these machines can be found.

## 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 415-2, *Packaging machines safety — Part 2: Pre-formed rigid container packaging machines*

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

EN 415-4, *Safety of packaging machines — Part 4: Palletisers and depalletisers*

EN 415-5, *Safety of packaging machines — Part 5: Wrapping machines*

EN 415-6, *Safety of packaging machines — Part 6: Pallet wrapping machines*

EN 415-7, *Safety of packaging machines — Part 7: Group and secondary packaging machines*

**EN 415-1:2014 (E)**

EN 415-8, *Safety of packaging machines — Part 8: Strapping machines*

EN 415-10, *Safety of packaging machines — Part 10: General requirements*

EN 422, *Plastics and rubber machines — Blow moulding machines — Safety requirements*

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

EN ISO 10821, *Industrial sewing machines — Safety requirements for sewing machines, units and systems (ISO 10821)*

EN ISO 11553-1, *Safety of machinery — Laser processing machines — Part 1: General safety requirements (ISO 11553-1)*

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

**3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

**3.0****packaging machine**

machine used to package a product

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

**3.1 Filling machines**

SIST EN 415-1:2014

This group of packaging machines measures 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.

Filling machines of all kinds are typically supplied in three main forms:

- a) single head machines;
- b) in-line machines - with several filling heads arranged side by side;
- c) rotary machines - with several filling heads arranged on a rotating carousel.

NOTE The term filling machine will generally be used when the product is being dispensed into a package, however the identical machine may also be termed a dosing machine or depositor when the product is dispensed into something other than a package, e.g. onto a tray to form part of a ready meal.

**3.1.1 Volumetric filling machines**

This group of filling machines measures out the product using a means of measuring volume which does not relate to the volume of the container in which they are placed e.g. measuring the volume in a cup, a piston or with a flowmeter.

**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

**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**

SIST EN 415-1:2014

This group of filling machines measure out the product using the level of product in the container in which the product is being packed as an approximation to a required volume of product.

**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 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**

This group of filling machines measure out the product by mass.

**EN 415-1:2014 (E)****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****multi-head weigher; 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

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

filling machine which measures out a predetermined mass of product, directly into the package, while the package rests on a weighing instrument which controls the filling operation

Note 1 to entry: The product may be liquid, powder, gas or solid.

**3.1.5****count filling machine**

filling machine which measures out solids according to a predetermined count

**3.2 Closing machines**

These packaging machines seal or close filled packages and may be supplied as stand-alone machines or integrated with one of the types of filling machine listed in 3.1 as a combined filling and closing machine.

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

This group of closing machines closes packages by folding, crimping, heat-sealing or welding without the need for a closure like a cap or closing material like sewing thread or staples.

**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

Note 1 to entry: A similar machine is defined in 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 made from metal, by soldering

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

sealing machine which seals a package by the application of heat

**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

**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 an electromagnetic field

**3.2.2 Closing machines which use a closure**

This group of closing machines closes packages using a closure like a cap, cork or lid.

Closing machines of this type are typically supplied in three main forms:

- a) single head machines;
- b) rotary machines - with several closing heads arranged on a rotating carousel;
- c) combined rotary filling and closing machines.

**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 injects steam between the cap and the top of the filled rigid container before closing, to create a vacuum in the closed container after cooling

**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

**EN 415-1:2014 (E)****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

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

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

**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 actuator and a cap onto the aerosol 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

**3.2.2.11****syringe assembling machine**

closing machine which places a plunger into a pre-filled syringe

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/b4e582e3-7c4e-4d0f-b2c4-415-1-2014>

**3.2.3 Closing machines which use a closing material**

This group of closing machines closes packages using closing materials like staples or adhesive tape.

**3.2.3.1****staple closing machine**

closing machine which closes packages, usually corrugated cases, with metal staples

Note 1 to entry: 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 flexible packages or 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

Note 1 to entry: A similar machine is defined in 3.11.3.1.

**3.2.3.7****gummed tape sealing machine**

sealing machine which seals packages with pre-gummed tape

Note 1 to entry: A similar machine for sealing cases is defined in 3.11.3.2.2.

**3.2.3.8****tape sealing machine**

sealing machine which seals packages with self-adhesive tape

Note 1 to entry: A similar machine for sealing cases is defined in 3.11.3.2.1.

**3.2.3.9****twist-tie closing machine**

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

**3.2.3.10****foil sealing machine**

machine which applies a reel fed foil or plastic cover to a rigid container, sealing it to the container by the application of heat

<https://standards.iteh.ai/catalog/standards/sist/b4e582e3-7c4e-4d0f-b2c4-d2369bbe851d/sist-en-415-1-2014>

**3.3 Labelling, decorating and coding machines****3.3.1 Labelling machines**

This group of packaging machines all apply a label to a package.

Labelling machines are typically supplied in two main forms:

- a) single head machines;
- b) in-line machines - with two or more labelling heads arranged side by side;
- c) rotary machines - where containers are transported past one or more labelling heads on a rotating carousel.

**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

**EN 415-1:2014 (E)**

Note 1 to entry: The glue is activated on the machine by the application of heat.

**3.3.1.3****self-adhesive 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

Note 1 to entry: The adhesive is activated on the machine by the application of heat.

**3.3.1.5****pre-gummed labelling machine**

labelling machine which applies pre-gummed labels to packages

Note 1 to entry: Water is applied to the label on the machine to activate the glue.

**3.3.1.6****print and apply labelling machine**

labelling machine on which a label is first printed and then applied to a package

**3.3.1.7****shrink labelling machine**

machine which places a tube of printed thermoplastic material over the neck of a rigid container, before shrinking it with hot air or steam so that it closely fits the container

**3.3.2 Decorating machines**

This group of packaging machines applies some form of decoration like a foil or tag to a package.

Decorating machines are typically supplied in three main forms:

- a) single head machines;
- b) in-line machines - with two or more decorating heads arranged side by side;
- c) rotary machines - where containers are transported past one or more labelling heads on a rotating carousel;
- d) combined labelling and decorating machine.

**3.3.2.1****tag labelling machine**

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 adhesive

**3.3.2.2****foiling machine**

machine which applies a decorative foil to the neck of a closed rigid container

**3.3.2.3****shrink sleeving machine**

machine which places a tube of plain or printed thermoplastic material over the neck of a rigid container, before shrinking it with hot air or steam so that it closely fits the container

**3.3.2.4****capsuling machine**

machine which applies a decorative capsule to the neck of a rigid container

**3.3.2.5****stretch sleeving machine**

machine which stretches a tube of plain or printed plastic material over the neck of a rigid container

**3.3.3 Coding equipment**

This group of machine attachments apply a code to a package, packaging component or material.

**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 liquid 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**

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****3.4.1 Cleaning machines**

This group of packaging machines is typically used to clean pre-formed rigid containers, plastic trays or crates.

**3.4.1.1****air cleaning machine; air rinsing machine**

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

iTeh STANDARD PREVIEW  
(standards.itteh.ai)

SIST EN 415-1:2014

<https://standards.itteh.ai/catalog/standards/sist/14e582e3-7e4e-4d0f-b2c4-d2369bbe851d/sist-en-415-1-2014>