SLOVENSKI STANDARD

SIST EN 415-8:2008

01-maj-2008

Varnost pakirnih strojev - 8. del: Stroji za pakiranje s trakovi

Safety of packaging machines - Part 8: Strapping machines

Sicherheit von Verkpackungsmaschinen - Teil 8: Umreifungs-Verschließmaschinen

Sécurité des machines d'emballage - Partie 8: Cercleuses

Ta slovenski standard je istoveten z: EN 415-8:2008

ICS:

55.200

SIST EN 415-8:2008 **en,fr**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 415-8

January 2008

ICS 55.200

English Version

Safety of packaging machines - Part 8: Strapping machines

Sécurité des machines d'emballage - Partie 8: Cercleuses

Sicherheit von Verpackungsmaschinen - Teil 8: Umreifungsmaschinen

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 415-8:2008: E

Contents

Foreword

This document (EN 415-8:2008) 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of an identical text or by endorsement, at the latest by July 2008, and conflicting national standards shall be withdrawn at the latest by July 2008.

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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 Directives.

For the relationship with EU Directives, see informative Annexes ZA and ZB, which are an integral part of this document.

Other standards produced by this Technical Committee are:

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: Palletizers and depalletizers.

Part 5: Wrapping machines.

Part 6: Pallet wrapping machines.

Part 7: Group and secondary packaging 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, 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 the United Kingdom.

Introduction

Strapping 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.

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

When provisions of this type C standard are different from those that 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 European Standard applies to the following groups of machines:

— powered hand strapping tools;

— semi-automatic strapping machines;

— automatic strapping machines;

— horizontal pallet strapping machines;

— vertical pallet strapping machines.

The individual machines are described in 3.3.

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

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

Exclusions

This European Standard is not applicable to the following machines:

— strapping tools that are powered exclusively by manual effort;

— strapping machines that were manufactured before the date of publication of this document by CEN.

This European Standard does not consider the following hazards:

— the use of strapping machines in potentially explosive atmospheres;

— the 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 can be associated with electromagnetic emissions from strapping machines;

— hazards that can be associated with decommissioning strapping 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 349:1993, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

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

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

EN 614-1:2006, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 619:2002, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of unit loads*

EN 626-1:1994, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

EN 626-2:1996, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures*

EN 811:1996, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*

EN 894-1:1997, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principals for human interactions with displays and control actuators*

EN 894-2:1997, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3:2000, *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 moveable guards*

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 999:1998, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body*

EN 1005-3:2002, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

EN 1037:1995, *Safety of machinery — Prevention of unexpected start-up*

EN 1050:1996, *Safety of machinery — Principles of 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 1760-1:1997, *Safety of machinery — Pressure sensitive protective devices — Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors*

EN 1760-2:2001, *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 13478:2001, *Safety of machinery — Fire prevention and protection*

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 reflective 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 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13849-1:2006, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13850:2006, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)*

EN ISO 14122-1:2001, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of a fixed means of access between two levels (ISO 14122-1:2001)*

EN ISO 14122-2:2001, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2001)*

EN ISO 14122-3:2001, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2001)*

EN ISO 14122-4:2004, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders (ISO 14122-4:2004)*

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

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 61310-1:1995, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals (ISO 61310-1:1995)*

EN 61310-3:1999, *Safety of machinery — Indication marking and actuation — Part 3: Requirements for the location and operation of actuators (ISO 61310-3:1999)*

EN 61496-1:2004, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (ISO 61496-1:2004, modified)*

CLC/TS 61496-3:2003, *Safety of machinery — Electro-sensitive protective equipment — Part 3: Particular requirements for Active Opto-electronic Protective Devices responsive to Diffuse Reflection (AOPDDR) (IEC 61496-3:2001)*

EN 61508-1:2001, *Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 1: General requirements (IEC 61508-1:1998 + Corrigendum 1999)*

EN 61508-2:2001, *Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems (IEC 61508-2:2000)*

EN 61508-3:2001, *Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 3: Software requirements (IEC 61508-3:1998 + Corrigendum 1999)*

EN 62061:2005 *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)*

ISO 7000:1989, *Graphical symbols for use on equipment — Index and synopsis*

IEC 60417:2002, *Graphical symbols for use on equipment*

3 Terms and definitions

3.1 General

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.

3.2 Terms and definition

3.2.1
bayonet; lance; sword
section of strap chute that moves under power, typically to feed strap through a pallet

3.2.2
change parts
machine parts designed to handle a specific product, packaging material or pack size, that need to be changed when the machine is set up to handle a different product, packaging material or pack size

3.2.3
compression strapping
strapping process in which the product is compressed before straps are applied. Most of the types of strapping machine identified in 3.3 can be equipped with attachments to compress the product and may be termed compression strapping machines

3.2.4
hand operated
machine functions or modes where the only power source is directly applied manual effort

3.2.5
pack, package
assembly of product and packaging materials produced by a packaging machine

3.2.6
product
article or articles that are to be strapped by the strapping machine

3.2.7
strap
tape of material, usually made from mild steel, polypropylene or polyester that is passed around a group of products, tensioned and then sealed to hold the products together

3.2.8
strap accumulator
mechanism or container located between the strap feed mechanism and the strap sealing mechanism which stores strap between the strap dispenser and the strap feed mechanism

3.2.9
strap arch; strap chute
device that guides the strap around the product

3.2.10
strap coil
length of strap wound around a core or in a container e.g. in a corrugated board box

3.2.11
strap cutting mechanism
device that cuts the strap

3.2.12
strap dispenser
mechanism that holds the strap coil and from which the strap is drawn off or which dispenses strap in a controlled manner

3.2.13
strap feed mechanism
powered mechanism that feeds the strap

3.2.14
strap gripping mechanism
device that grips the end of the strap while the strap is tensioned around the product

3.2.15
strap retraction mechanism
powered mechanism that pulls the strap around the product and applies tension to the strap

3.2.16
strap sealing mechanism
device that joins the strap using a clip, by welding the strap, or by cutting and interlocking the strap

3.2.17
strap tension mechanism
powered mechanism that applies tension to the strap around the product

3.2.18
strapping head
assembly mounted in a strapping machine comprising a strap feed mechanism, a strap retraction mechanism, a strap tensioning mechanism (not fitted to all strapping heads) a strap gripping mechanism and a strap sealing mechanism

3.2.19
strapping machine
packaging machine that applies a strap made from metal, plastic or paper around a product or group of products

3.2.20
strap tension
tension applied to the length of a strap during the strapping process

3.3 Description of machines

3.3.1
general
this European Standard identifies five different groups of strapping machines

3.3.2
powered hand strapping tool

characteristic features of a hand strapping tool are listed below. On a powered hand strapping tool at least one of these mechanisms will be powered e.g. by electricity or compressed air:

- strap gripping device;

- strap retraction mechanism;
- strap tension mechanism (optional);
- strap cutting device;
- strap sealing mechanism

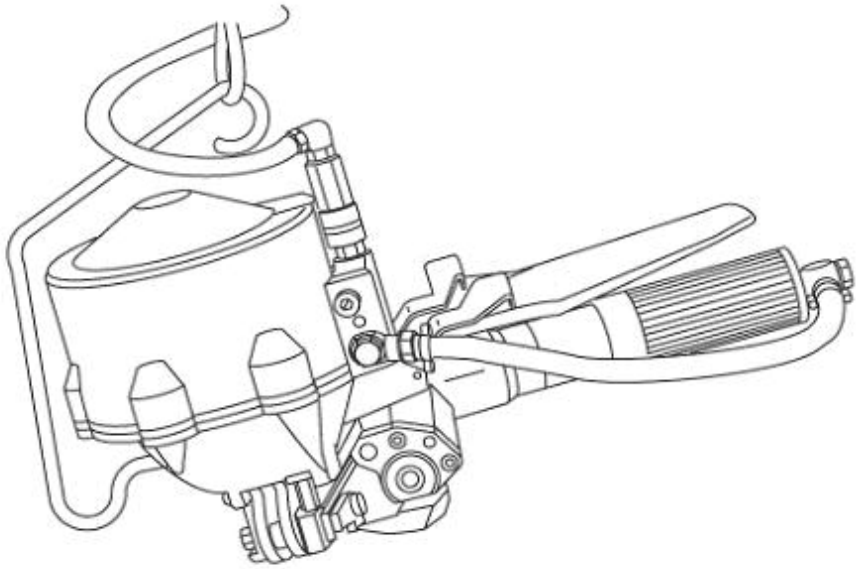

Figure 1 — Powered hand strapping tool

3.3.3
semi-automatic strapping machine
strapping machine that tensions and seals a strap around a product or a group of products, once an operator has placed the strap around the product and inserted the strap back into the machine manually. The strap will typically be made from plastic or paper. The characteristic features are:

- strap dispenser;
- strap feeding mechanism;
- strap gripping device;
- strap retraction mechanism;
- strap tension mechanism;
- strap cutting device;
- strap sealing mechanism;
- compression device (optional)

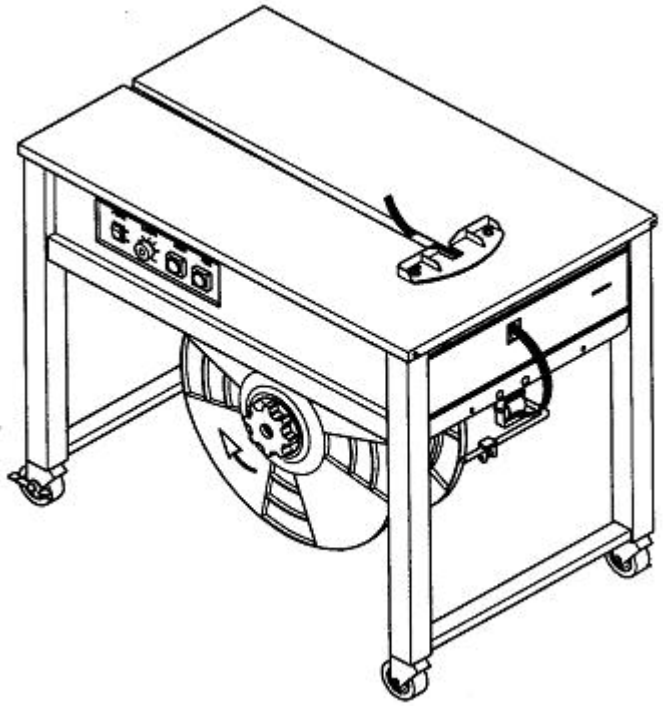

Figure 2 — Semi-automatic strapping machine

3.3.4
automatic strapping machine
strapping machine that applies a strap automatically around a product or a group of products. The product may be positioned under the arch either manually or automatically. The strap will typically be made from plastic, metal or paper. The characteristic features are:

- strap dispenser;
- strap feeding mechanism;
- strap arch or strap chute;
- strap accumulator;
- strap gripping device;
- strap retraction mechanism;
- strap tension mechanism;
- strap cutting device;
- strap sealing mechanism;
- compression device (optional);
- product feeding, discharging or positioning devices (optional);
- turntable to rotate the product (optional)

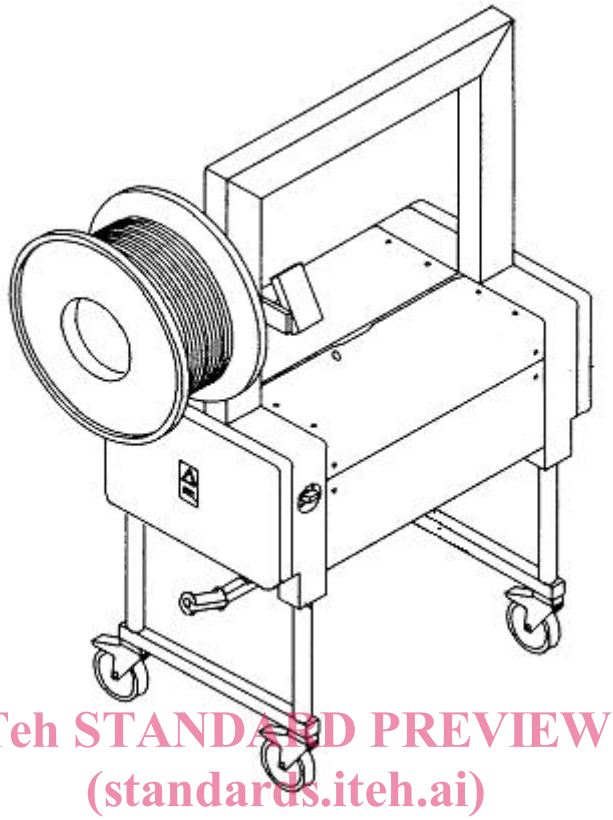

Figure 3 — Automatic strapping machine

3.3.5
horizontal pallet strapping machine
strapping machine that applies one or more straps horizontally around a pallet load. Machines of this type will typically be fully automatic. The strap will typically be made from plastic or metal. The characteristic features are:

- strap dispenser;
- strapping head;
- strap accumulator;
- mechanism to move the strapping head towards and away from the product;
- horizontal strap arch or strap chute;
- mechanism to raise and lower the strap arch or strap chute;
- product positioning device;
- compression device (optional);
- product conveying mechanism (optional)