
Stroji za stiskanje odpadkov ali reciklirnih materialov - Stiskalnice za bale - Varnostne zahteve

Machines for compacting waste materials or recyclable fractions - Vertical baling presses - Safety requirements

Maschinen zum Verdichten von Abfällen oder recyclebaren Materialien - Vertikal arbeitende Ballenpressen - Sicherheitsanforderungen

Machines à compactage pour déchets ou matières recyclables - Presses à balles verticales - Prescriptions de sécurité

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Ta slovenski standard je istoveten z: EN 16500:2014

ICS:

13.030.40	Naprave in oprema za odstranjevanje in obdelavo odpadkov	Installations and equipment for waste disposal and treatment
25.120.10	Kovaški stroji. Stiskalnice. Škarje	Forging equipment. Presses. Shears

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EUROPEAN STANDARD

EN 16500

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2014

ICS 13.030.40; 25.120.10

English Version

Machines for compacting waste materials or recyclable fractions - Vertical baling presses - Safety requirements

Machines de compactage pour déchets ou matières
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Sicherheitsanforderungen

This European Standard was approved by CEN on 14 June 2014.

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EN 16500:2014 (E)**Foreword**

This document (EN 16500:2014) has been prepared by Technical Committee CEN/TC 397 “Project Committee - Baling presses - Safety requirements”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by February 2015 and conflicting national standards shall be withdrawn at the latest by February 2015.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 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.

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.

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Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous 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 in accordance with the provisions of this type C standard.

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EN 16500:2014 (E)**1 Scope**

This European Standard specifies the safety requirements for the design, manufacture and information for safe use of vertical baling presses for compacting waste material or recyclable fractions (e. g. paper, plastics, textiles, cans, cardboard, mixed waste), hereafter referred to as materials.

This standard covers vertical baling presses:

- that are manually or mechanically fed; and
- with fixed enclosed baling chambers (single or multiple chamber presses); and
- with a mechanically, hydraulically or pneumatically operated compacting equipment; and
- where the compacted bale is tied manually in the baling chamber; and
- with manual unloading or mechanical ejection of the compacted bale.

The scope of this standard includes any mechanical feed equipment, such as belt type conveyors or bin lifts, forming an integral part of the baling press assembly. It also includes integral material flow control equipment.

This standard does not apply to:

- vertical baling presses without fixed enclosed baling chamber(s); or
- round balers or roll baling machines; or
- machines where the material is compacted into a bag; or
- pneumatic conveying systems; or
- equipment for transporting the bales; or
- local exhaust ventilation for the removal of dusts or vapours; or
- hazards arising from any integral pre-conditioning equipment; or
- hazards arising from the materials being processed (e.g. asbestos, clinical waste, flammable or explosive materials, unhealthy or poisonous waste).

This standard does not apply to cranes, lift trucks or other mobile plant used to load materials into the feed opening. Nor does it apply to hazards arising from loading materials into the feed opening using cranes, lift trucks or other mobile plant.

This standard does not include specifications to meet the requirements of the ATEX Directive 94/9/EC.

All hazards mentioned in Clause 4 are dealt with in this European Standard.

This European Standard is not applicable for vertical baling presses which are manufactured before the date of its publication as an EN.

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 349:1993+A1:2008, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body*
- EN 574:1996+A1:2008, *Safety of machinery - Two-hand control devices - Functional aspects - Principles for design*
- EN 620:2002+A1:2010, *Continuous handling equipment and systems - Safety and EMC requirements for fixed belt conveyors for bulk materials*
- EN 953:1997+A1:2009, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards*
- EN 1005-1:2001+A1:2008, *Safety of machinery - Human physical performance - Part 1: Terms and definitions*
- EN 1005-2:2003+A1:2008, *Safety of machinery - Human physical performance - Part 2: Manual handling of machinery and component parts of machinery*
- EN 1005-3:2002+A1:2008, *Safety of machinery - Human physical performance - Part 3: Recommended force limits for machinery operation*
- EN 1005-4:2005+A1:2008, *Safety of machinery - Human physical performance - Part 4: Evaluation of working postures and movements in relation to machinery*
- EN 1037:1995+A1:2008, *Safety of machinery - Prevention of unexpected start-up*
- 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 61496-1:2004, *Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests (IEC 61496-1:2004, modified)*
- CLC/TS 61496-2:2006, *Safety of machinery - Electro-sensitive protective equipment - Part 2: Particular requirements for active opto-electronic protective devices (AOPDs) (IEC 61496-2:2006)*
- CLC/TS 61496-3:2008, *Safety of machinery - Electro-sensitive protective equipment - Part 3: Particular requirements for active opto-electronic protective devices responsive to diffuse reflection (AOPDDR) (IEC 61496-3:2008)*
- EN 62262:2002, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code) (IEC 62262:2002)*
- EN 82079-1:2012, *Preparation of instructions for use - Structuring, content and presentation - Part 1: General principles and detailed requirements (IEC 82079-1:2012)*
- EN ISO 3744:2010, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*
- EN ISO 3746:2010, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:2010)*

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EN ISO 3747:2010, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering/survey methods for use in situ in a reverberant environment (ISO 3747:2010)*

EN ISO 4413:2010, *Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power - General rules and safety requirements for systems and their components (ISO 4414:2010)*

EN ISO 4871:2009, *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 11201:2010, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11202:2010, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202:2010)*

EN ISO 11204:2010, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

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EN ISO 13732-1:2008, *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 13849-1:2008, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13850:2008, *Safety of machinery - Emergency stop - Principles for design (ISO 13850:2006)*

EN ISO 13855:2010, *Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)*

EN ISO 13856-2:2013, *Safety of machinery - Pressure-sensitive protective devices - Part 2: General principles for design and testing of pressure-sensitive edges and pressure-sensitive bars (ISO 13856-2:2013)*

EN ISO 13856-3:2013, *Safety of machinery - Pressure-sensitive protective devices - Part 3: General principles for design and testing of pressure-sensitive bumpers, plates, wires and similar devices (ISO 13856-3:2013)*

EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN ISO 14119:2013, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection (ISO 14119:2013)*

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)*

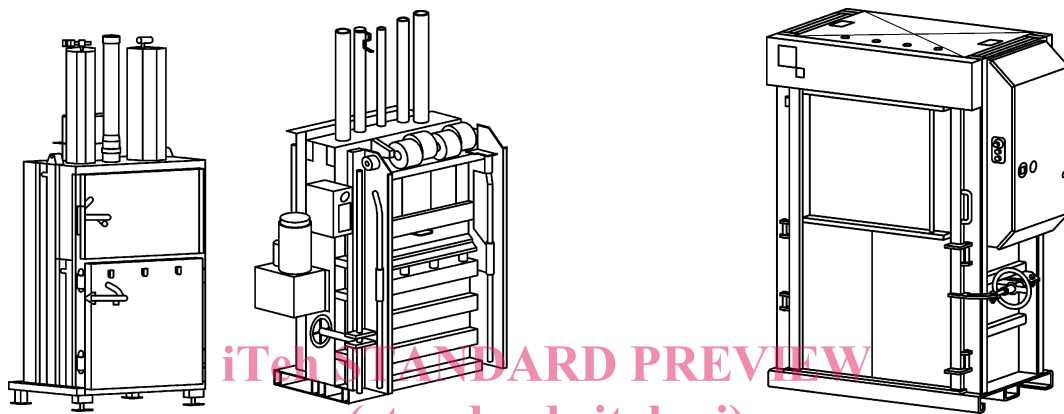
EN ISO 14122-2:2001, *Safety of machinery - Permanent means of access to machinery - Part 2: Working platforms and walkways (ISO 14122-2:2001)*

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)*

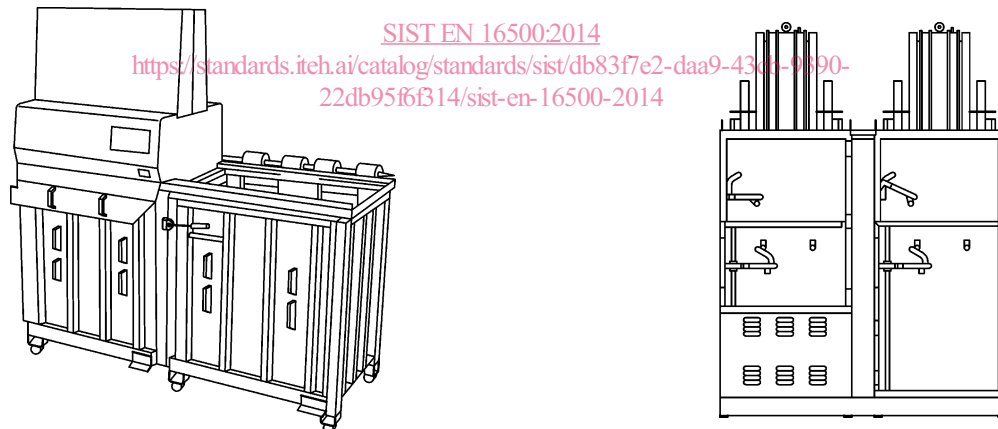
EN ISO 14122-4:2004, *Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders (ISO 14122-4:2004)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.



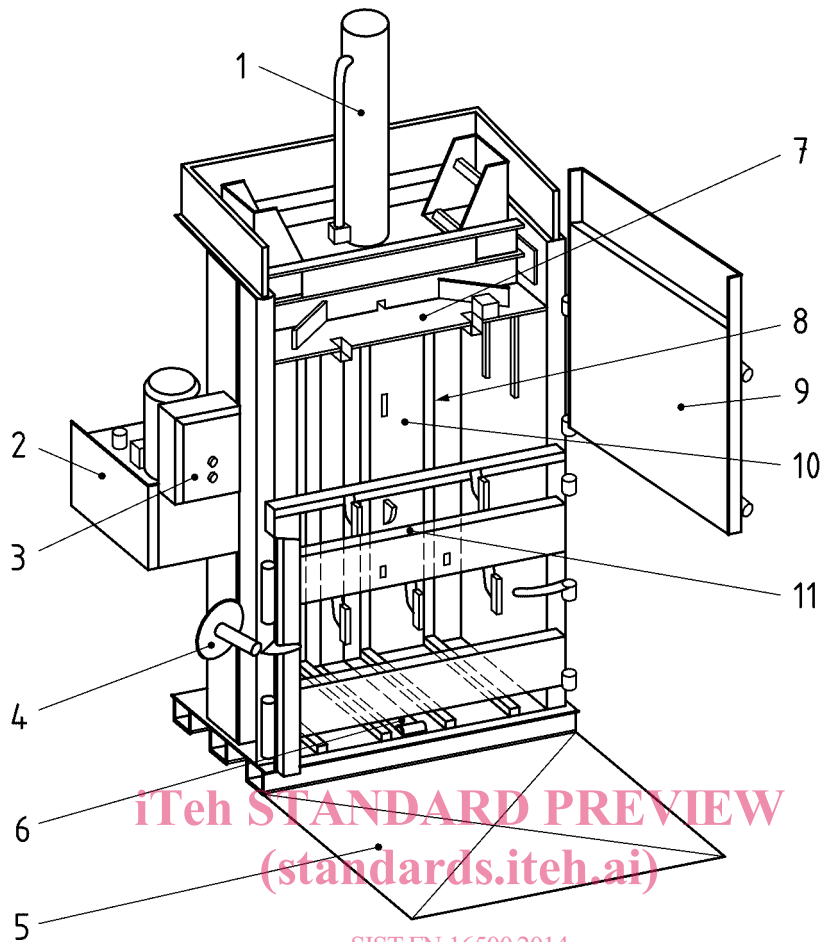
a) Front/ side -loaded single chamber baling presses with fixed position compacting head



b) Top-loaded multi chamber baling press with moveable position compacting head

c) Front-loaded multi chamber baling press with fixed position compacting head

Figure 1 — Examples of vertical baling presses



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Key

- 1 hydraulic cylinder
- 2 integrated power unit
- 3 control station
- 4 door locking device
- 5 bale ejection area
- 6 bale ejection device
- 7 compression plate
- 8 area for installing wires or ties
- 9 feed door
- 10 baling chamber
- 11 discharge door

Figure 2 — Principle drawing of a vertical baling press

3.1 vertical baling press
machine intended for compacting loose materials into a bale where the compacting pressure is applied vertically and downward from the feed opening and the bale is subsequently tied by strings, straps or wires

Note 1 to entry: A vertical baling press may consist of one or more baling chambers, a control system and control station, a compacting equipment, equipment for manually binding the bale and equipment for ejection of the bale.

3.1.1**vertical baling press with fixed position compacting head**

vertical baling press that is fed at the front, side or rear of the machine, by hand or mechanical means and the compacting head is in a fixed position

Note 1 to entry: On a multiple chamber vertical baling press there will be more than one compacting head and each head is in a fixed position.

3.1.2**vertical baling press with movable position compacting head**

a single or multiple chamber baling press that is fed usually from the top or sometimes from the front, side or rear of the baling press by hand or mechanical means and the compacting head position can be moved

Note 1 to entry: Whether it is a single or multiple chamber machine there will usually be a single compacting head that can be moved mechanically or by hand across the chamber(s) to allow loading. Once loaded, the head is then moved back over the chamber and the compression plate moves vertically to compact materials.

3.2**integral mechanical feed equipment**

equipment used for feeding materials into the baling chamber through the feed opening i.e. conveyors or bin lifts where:

- the equipment is mounted/fixed to the vertical baling press;
- its power supply and control system are linked into the vertical baling press systems

3.3**conveyor**

conveyor onto which materials are deposited and transported to the feed opening

3.4**bin (sometimes called skip)**

container, usually fitted with wheels, in which materials may be collected ready for feeding into the baling press

3.5**bin lift (sometimes called skip hoist)**

mechanical device for lifting a bin containing materials and tipping the contents into the baling chamber through the feed opening

3.6**manual feeding**

loading materials into the baling chamber by hand

3.7**feed area**

area where the operator loads the materials into the baling chamber for compaction

3.8**feed opening**

opening through which the materials are loaded into the baling chamber

3.9**feed door**

hinged or sliding door covering the feed opening that is opened for manually loading materials into the baling chamber

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