



SLOVENSKI STANDARD
SIST EN 16486:2014+A1:2021

01-februar-2021

Stroji za stiskanje odpadkov ali reciklirnih materialov - Kompaktorji (zgoščevalniki)
- Varnostne zahteve

Machines for compacting waste materials or recyclable fractions - Compactors - Safety requirements

Maschinen zum Verdichten von Abfällen oder recyclebaren Materialien - Verdichter - Sicherheitsanforderungen

Machines de compactage pour déchets ou matières recyclables - Compacteurs - Prescriptions de sécurité

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| 13.030.40 | Naprave in oprema za odstranjevanje in obdelavo odpadkov | Installations and equipment for waste disposal and treatment |
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EUROPEAN STANDARD

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Machines for compacting waste materials or recyclable fractions - Compactors - Safety requirements

Machines de compactage pour déchets ou matières recyclables - Compacteurs - Prescriptions de sécurité

Maschinen zum Verdichten von Abfällen oder recyclebaren Materialien - Verdichter - Sicherheitsanforderungen

This European Standard was approved by CEN on 28 May 2014 and includes Amendment 1 approved by CEN on 7 March 2020.

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EN 16486:2014+A1:2020 (E)**European foreword**

This document (EN 16486:2014+A1:2020) 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of an identical text or by endorsement, at the latest by November 2020 and conflicting national standards shall be withdrawn at the latest by November 2020.

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

This document supersedes A1 EN 16486:2014 A1.

This document includes Amendment 1 approved by CEN on 3 March 2020.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

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.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100:2010.

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 16486:2014+A1:2020 (E)**1 Scope**

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

This European Standard applies to:

- compactors using a horizontally moving screw, pendulum or plate as compacting part and where the materials move horizontally; and
- compactors that are mechanically fed and/or fed by hand.

These compactors can be:

- static compactors;
- transportable compactors;
- traversing systems.

The scope includes:

- any integral mechanical feed equipment (e.g. bin lift);
- feed hoppers/openings;
- any integral pre-conditioning equipment in the hopper (e.g. perforators, pre-crushing devices and shredders);
- any integral material flow control equipment;
- the interface between the compactor and any feed equipment (except those excluded from the scope).

The scope of this European Standard does not cover:

- compactors that are covered by EN 1501 (all parts);
- underground compactors, however if these compactors can be used above ground this standard applies;
- compactors using thermal technologies for compaction;
- vacuum compactors;
- compactors where materials are compacted vertically;
- containers for static compactors, however the interface between the compaction unit and the container is included;
- bins in which materials are collected for feeding into the compactor;
- any up-stream pre-treatment equipment that is not integral to the machine and is used to treat the materials before they are fed into the feed opening of the compactor;

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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)*

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 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 11200:2014, *Acoustics - Noise emitted by machinery and equipment - Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions (ISO 11200:2014)*

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)*

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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)*

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 13856-1:2013, *Safety of machinery - Pressure-sensitive protective devices - Part 1: General principles for design and testing of pressure-sensitive mats and pressure-sensitive floors (ISO 13856-1:2013)*

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 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.

3.1

compactor

machine, consisting of a compaction unit and container that compacts loose materials into a container (materials can include, but are not limited to, paper, plastics, textiles, cans, cardboard and mixed waste)

Note 1 to entry: A compactor can consist of e. g. a control system and control station, mechanical feed equipment such as a bin lift, feed hopper, compaction chamber, compacting equipment, container and any associated container closing device. Compactors can be manually or mechanically fed.

Note 2 to entry: Compactors can be:

- static, i. e. the compaction unit is fixed at one location and the container is transportable;
- transportable and used at different locations, i. e. it is transported to and from different locations by e.g. road vehicles;
- part of a traversing system.

3.1.1

static compactor

compactor on which the compaction unit is fixed and the container is not integral with the compactor

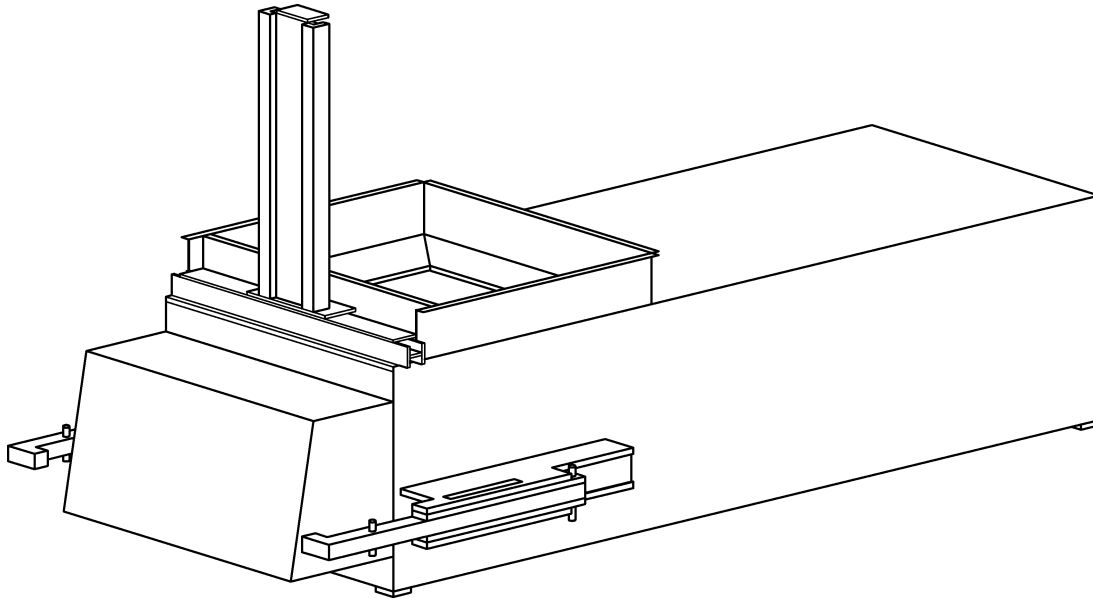


Figure 1 — Example of a static compactor

3.1.2

transportable compactor

self-contained compaction unit and container, which can be transported as a complete unit

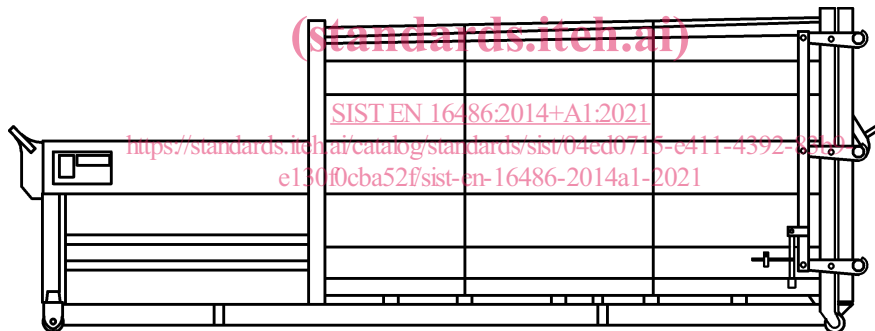


Figure 2 — Example of a transportable compactor

3.2

container

the material-receiving container into which the loose material is compacted by the compaction unit

Note 1 to entry: On a transportable compactor the container is an integral part of the compactor.

Note 2 to entry: On a static compactor the container is not an integral part of the compactor, however the interface between the compaction unit and the container is covered in this standard, see Scope.

3.3

coupling device

mechanism for clamping the container to the main body of the compaction unit and holding it in position

3.4

traversing system

installation composed of:

- either several containers that are placed on a carrier system that traverses (e.g. on rails) in front of a static compactor;
- or several containers that are placed in front of a traversing compactor (e.g. on rails)

Note 1 to entry: Where the containers traverse only the compactor, the carrier system and the interface between the compactor and containers are covered by this standard

3.5

integral pre-conditioning equipment

equipment that is mounted/fixed to the compactor and is used to treat the material being fed into the compactor to help compaction, e.g. perforators, rufflers, pre-crushers and shredders

Note 1 to entry: These devices can be fixed, or inserted into and retracted from, the feed hopper.

3.6

integral material flow control equipment

equipment that is mounted/fixed to the compactor and helps material in the feed opening flow into the compaction chamber and/or prevent blockages or bridging, e.g. forced feeding device for screw compactors

3.7

feed equipment

equipment used for feeding materials to be compacted into the compaction chamber

3.8

integral feed equipment

mechanical feed equipment i.e. conveyor or bin lift that is:

- mounted/fixed to the compactor;
- the power supply and control system of which are linked into the compactors systems

3.9

bin lift

mechanical feed equipment for lifting a bin containing materials and tipping the contents into the compaction chamber of the compactor

3.10

bin

container, usually fitted with wheels, in which material are collected ready for feeding into the compaction chamber of the compactor

3.11

feed hopper

chute through which materials being fed to the compactor are guided into the compaction chamber

3.12

feed opening

opening through which materials are fed into the compaction chamber

3.13

manual feeding

loading materials directly into the feed hopper/opening by hand

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3.14**mechanical feeding**

loading materials into the feed hopper/opening by mechanical means, e.g. conveyors, bin lifts

3.15**compaction chamber**

chamber into which material is fed and in which one or more compacting parts move to press and compact the material into the receiving container

3.16**compacting part**

device for the compacting process/movement; the device can be a plate, a screw or a pendulum

3.17**compacting equipment**

all components directly involved in pressing the loose materials into the container and compacting them inside the container (e.g. hydraulic system, compacting parts, compaction chamber)

3.18**compaction unit**

the part of the compactor containing the compacting equipment

3.19**cycle of the compacting part**

complete forward and reverse movement of the compacting part or a complete 360° rotation

3.20**multiple cycle**

operating mode in which the machine cycles during a pre-set time, then stops automatically

3.21**automatic initiation of cycles**

operating mode in which the successive cycles of compacting equipment are initiated by either a sensing device detecting the presence of materials to be compacted or by time delay

3.22**container closing device**

device inserted across the container feed opening to prevent the compacted materials falling out of the container when it is separated from the compaction unit for transport. This device can be e. g.:

- a series of pins and tubes, or
- a frame, or
- cables, or
- a power or manually-operated door

3.23**discharge door**

door that allows emptying compacted materials out of the container

3.24**control station**

place from which the compactor is started, stopped or controlled by an operator

3.25**access platform**

permanent platform that allows access at height for operating and feeding the compactor (including viewing the interior of the feed hopper and/or compacting chamber), troubleshooting or maintenance

Note 1 to entry: Access platforms can be fixed to the compactor, floor or building structure.

3.26**work station**

a position in the vicinity of the machine which is intended for the operator

EXAMPLES: control station, feeding position, bin lift operation control station.

3.27**maintenance**

combination of all technical, administrative and managerial actions during the life cycle of an item intended to retain it in, or restore it to, a state in which it can perform the required function

[SOURCE: 2.1 of EN 13306:2010]

3.28**troubleshooting**

identification and rectification of operational failures (e. g. clearing blockages or removing unwanted items from the compaction chamber)

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3.29**sensitive protective equipment (SPE)**

equipment for detecting persons or parts of persons which generates an appropriate signal to the control system to reduce risks to the persons detected

Note 1 to entry: The signal can be generated when a person or part of a person goes beyond a predetermined limit – for example enters a hazard zone – (tripping) or when a person is detected in a predetermined zone (presence sensing), or in both cases.

[SOURCE: 3.28.5 of EN ISO 12100:2010]

4 List of significant hazards

Table 1 lists the significant hazards that are present on compactors. It cross-references the subclauses of this standard in which the corresponding safety requirements and/or protective measures are specified.