SLOVENSKI STANDARD
SIST EN 1501-1:2011

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Vozila za zbiranje odpadkov - Splošne in varnostne zahteve - 1. del: Vozila za zbiranje odpadkov z nakladanjem zadaj

Refuse collection vehicles - General requirements and safety requirements - Part 1: Rear loaded refuse collection vehicles

Abfallsammelfahrzeuge - Allgemeine Anforderungen und Sicherheitsanforderungen - Teil 1: Hecklader

Bennes de collecte des déchets - Exigences générales et exigences de sécurité - Partie 1: Bennes à chargement arrière

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ICS:

13.030.40	Naprave in oprema za odstranjevanje in obdelavo odpadkov	Installations and equipment for waste disposal and treatment
43.160	Vozila za posebne namene	Special purpose vehicles

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EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 1501-1

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English Version

Refuse collection vehicles - General requirements and safety requirements - Part 1: Rear loaded refuse collection vehicles

Bennes de collecte des déchets - Exigences générales et exigences de sécurité - Partie 1: Bennes à chargement arrière

Abfallsammelfahrzeuge und die dazugehörigen Schüttungen - Allgemeine Anforderungen und Sicherheitsanforderungen - Teil 1: Hecklader

This European Standard was approved by CEN on 11 June 2011.

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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.

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Foreword

This document (EN 1501-1:2011) has been prepared by Technical Committee CEN/TC 183 “Waste management”, 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of an identical text or by endorsement, at the latest by February 2012, and conflicting national standards shall be withdrawn at the latest by February 2012.

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 1501-1:1998+A2:2009.

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 Directive(s), see informative Annex ZA, which is an integral part of this document.

This document and EN 1501-5:2011 which covers the requirements for the lifting devices supersedes EN 1501-1:1998+A2:2009.

The requirements for the lifting devices are covered by EN 1501-5:2011.

The minimum essential criteria are considered to be of primary importance in providing safe, serviceable, economical, and practical rear loaded refuse collection vehicles.

This European Standard is one part of the series of co-ordinated standards of EN 1501 about "Refuse collection vehicles" comprising the following parts:

— *Part 1: Rear loaded refuse collection vehicles*

— *Part 2: Side loaded refuse collection vehicles*

— *Part 3: Front loaded refuse collection vehicles*

— *Part 4: Noise test code for refuse collection vehicles*

— *Part 5: Lifting devices for refuse collection vehicles*

This European Standard is the revision of the first one of the series of standards dealing with specification, design, safety and testing of refuse collection vehicles (RCVs).

Technical changes with respect to the previous edition, EN 1501-1:1998+A2:2009, address:

— definitions and requirements for lifting devices deleted (moved and improved in the separate part 5);

— terms and definitions improved, including through detailed drawings, with trilingual glossary deleted;

— references to types A and B standards updated, especially safety categories replaced with performance levels;

— requirements improved for: open and closed systems, guards and protective devices, footboards;

— new requirements for: narrow vehicle, loading edge, remote controls, stability, vibrations, interchangeable body, warning signals;

— table of verification merged with table of hazards;

— items to be described in the information for use manual.

This part 1 of the series of standards shall be enforced at the same time as part 5 of this series whenever the rear loaded RCV is fitted with (a) lifting device(s).

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, 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

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 European Standard.

The user's attention is drawn to the possibility that for refuse collection vehicles described within EN 1501-1, compliance with this European Standard may require the use of an invention covered by patent rights.

By publication of this part of EN 1501, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. However, each patent holder listed in this annex has filed with the CEN-European Committee for Standardisation a statement of willingness, to grant a licence under such rights that they hold on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain such a licence.

Information regarding patents related to the reverse limitation for the RCV with occupied footboard can be obtained from:

GEESINK B.V.
Betonweg 8
P.O. Box 52
8300 AB Emmeloord
NETHERLANDS

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 according to the provisions of this type C standard.

While producing this European Standard it was assumed that:

— the guidelines issued by the chassis-cab manufacturer have been taken into account;

— components without specific requirements are designed in accordance with the usual engineering practice and calculation codes, including all failure modes, of sound mechanical and electrical construction and made of materials with adequate strength and of suitable quality;

— components are kept in good repair and working order, so that the required characteristics remain despite wear;

— harmful materials, such as asbestos, are not used as part of the rear loaded RCV;

— only persons who have been appropriately trained will operate the rear loaded RCV.

This European Standard is designed for careful consideration by designers, manufacturers, suppliers and users of rear loaded RCVs.

1 Scope

This European Standard applies to rear loaded refuse collection vehicles (RCV), as defined in 3.2.

This European Standard deals with all significant hazards, hazardous situations and events relevant to the rear loaded RCV, when it is used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer, throughout its foreseeable lifetime, as defined in Clause 4.

This European Standard is applicable to the design and construction of the rear loaded RCV so as to ensure that it is fit for its function and can be operated, adjusted and maintained during its entire lifetime. It is not applicable to the end of life of the rear loaded RCV.

This part 1 describes and defines the safety requirements of rear loaded RCVs excluding the interface tailgate/discharge door with the lifting device(s) and the lifting device(s) as illustrated in Figure A.1.

Safety requirements for the lifting device(s) and the interface with the tailgate/discharge door are defined in EN 1501-5.

This European Standard is not applicable to:

— operation in severe conditions, e.g. extreme environmental conditions such as:

  — below – 25 °C and above + 40 °C temperatures;

  — tropical environment;

  — wind velocity in excess of 75 km/h;

— contaminating environment;

— corrosive environment;

— operation in potentially explosive atmospheres;

— handling of loads the nature of which could lead to dangerous situations (e.g. hot wastes, acids and bases, radioactive materials, contaminated waste, especially fragile loads, explosives);

— operation on ships.

This European Standard is not applicable to machinery which is manufactured before the date of publication of this document by CEN.

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 349:1993+A1:2008, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 547-1:1996+A1:2008, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 547-2:1996+A1:2008, *Safety of machinery — Human body measurements — Part 2: Principles for determining the dimensions required for access openings*

EN 574:1996+A1:2008, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*

EN 894-1:1997+A1:2008, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*

EN 894-3:2000+A1:2008, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 3: Control actuators*

EN 953:1997+A1:2009, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 1037:1995+A1:2008, *Safety of machinery — Prevention of unexpected start-up*

EN 1088:1995+A2:2008, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1501-4:2007, *Refuse collection vehicles and their associated lifting devices — General requirements and safety requirements — Part 4: Noise test code for refuse collection vehicles*

EN 1501-5:2011, *Refuse collection vehicles and associated lifting devices — General requirements and safety requirements — Part 5: Lifting devices for refuse collection vehicles*

EN 13309:2010, *Construction machinery — Electromagnetic compatibility of machines with internal power supply*

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 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

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

EN ISO 4414:2010 *Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)*

EN ISO 7731:2008, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731:2003)*

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 13849-2:2008, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2003)*

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

ISO 7000:2004, *Graphical symbols for use on equipment — Index and synopsis*

IEC 60417-DATA BASE, *Graphical symbols for use on equipment — Part 1: Overview and application*

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
refuse collection vehicle
RCV
vehicle used for the collection and transportation of refuse (e.g. household waste, bulky waste, recyclable materials) based on loading via waste containers or by hand

NOTE It consists of a chassis-cab onto which a bodywork is mounted.

3.2
rear loaded RCV
RCV, in which refuse is loaded into the body from the rear

3.3
cab
enclosure mounted on the chassis in front of the bodywork where the operative drives and controls the rear loaded RCV and where other operative(s) can sit

3.4
bodywork
assembly of all components fitted on the chassis-cab of the refuse collection vehicle which includes the body

NOTE The bodywork can be fixed or interchangeable. The bodywork also includes either a compaction mechanism, a lifting device or (a) footboard(s) or any combination of the three.

3.5
body
part of the bodywork in which the collected waste is transported

NOTE 1 See 3 in Figure A.1 and in 1 Figure A.2.

NOTE 2 To discharge the collected waste, the body is either tilted or rotated, or an ejection system is used (see 3.17).

3.6
capacity of the rear loaded RCV
internal volume available for waste, measured in cubic metres rounded off to one decimal place

NOTE See V1 in Figure A.2.

3.7
tailgate
rear part of the bodywork connected to the body incorporating a compaction mechanism. It is designed to be opened to discharge the collected waste from the body

3.8
discharge door
rear part of the bodywork connected to the body without compaction mechanism. It is designed to be opened to discharge the collected waste from the body

3.9
hopper
part of the bodywork into which the waste is loaded either manually or mechanically

3.10
capacity of the hopper
volume of non-compacted waste the hopper contains up to the edge of the rave rail not including the guide flap, measured in cubic metres rounded off to one decimal place

NOTE 1 See V2 in Figure A.2.

NOTE 2 The additional volume created by the guide flap is V3 (as shown in Figure A.2).

3.11
loading edge
perimeter of the loading opening

NOTE See Figure A.2 and Figures B.1, B.2 and B.3.

3.12
rave rail
lowest fixed limit of the loading edge

NOTE See Figures B.1, B.2 and B.3.

3.13
guide flap
removable or foldable extension to the rave rail

NOTE See Figure A.2 and Figure B.2-1.

3.14
operating mode
type of control for a mechanism to achieve its function

3.14.1
manual mode
operating mode where the mechanism achieves each movement by a single command

3.14.2
semi-automatic mode
operating mode where the mechanism achieves each sequence of movements (two or more movements in one sequence) by a single command

3.14.3
automatic mode
operating mode where the mechanism achieves a complete cycle of movements by a single command

3.15
compaction mechanism
mechanism used to compact and/or transfer waste into the body

NOTE See for example Figures A.2 and A.3.

3.16
open and closed systems
distinct configurations of the compaction mechanism in relation to its accessibility for the operative

3.16.1
open system
configuration where the operative can reach the hazardous area of the compaction mechanism from the level on which he is standing (ground or footboard(s) when fitted)

NOTE See Figures B.1 and B.2-1.

3.16.2
closed system
configuration where the operative cannot reach the hazardous area of the compaction mechanism from the level on which the operative is standing (ground or footboard(s) when fitted)

NOTE See Figures B.2 and B.3.

3.17
discharge system
mechanism and movement for emptying the body

NOTE Examples for discharge systems are ejection plate system, rotating drum system, tipping system.

3.17.1
ejection plate system
means of emptying the body by moving the ejection plate to the rear after opening the tailgate or the discharge door if needed

3.17.2
rotating drum system
means of emptying of the body by rotation of the drum after opening the tailgate or the discharge door if needed

3.17.3
tipping system
means of emptying of the body by tilting the body after opening the tailgate or the discharge door if needed

3.18
waste container lifting device
mechanism fitted onto a RCV for emptying designated waste containers

3.19
interchangeable waste container lifting device
waste container lifting device designed to be capable of being fitted on different designated RCVs provided with one standard interface (mechanical, hydraulic, electrical, dimensional and functional aspects)

3.20
interface
connections between two parts and/or systems of the RCV

3.20.1
interface with the lifting device(s)
provisions for power supply, controls and mechanical devices to ensure safe connections between the tailgate or discharge door and its lifting device(s)

NOTE See 8 in Figure A.1.

3.20.2
interface with the chassis
provisions for power supply, controls and mechanical devices to ensure safe connections between the bodywork and the chassis

NOTE See 7 in Figure A.1.

3.21
functional space
space covered by the movements of the lifting device and of the designated waste container(s) when lifted by a lifting device as specified by the manufacturer

NOTE See Figures A.4-1 and A.4-2.

3.22
operative
person trained to operate the RCV

3.23
operating space
space occupied by the movement of any part of the rear loaded RCV

NOTE It includes the functional space defined in 3.21.

3.24
visible space
area visible by the operative from his working station, either in or outside of the cab

3.24.1
visible space from the cab working station
operative's view of the operating space from the working station in the cab

NOTE See areas V8-1, V 8-2 and V 10 according to Figure A.4-1.

3.24.2
visible space for the working station located outside the cab
operative's view of the operating space from the working station outside the cab

NOTE See areas V5 and V7 according to Figure A.4-1.

3.25
working station
location outside of the functional space, where the RCV is operated during normal use

NOTE 1 See keys 5 to 9 in Figure A.4-1.

NOTE 2 Inspection, cleaning and maintenance are excluded.

3.26
footboard
platform situated at the rear of the rear loaded RCV on which the operative(s) can stand for riding

NOTE See Figure A.3 and Figure B.4.

3.27
travel movement
unrestricted motorised movement of the RCV

3.28
restricted travel movement
limited motorised movement of the RCV (e.g. when the footboard(s) is (are) occupied)

3.29
satellite vehicle
designated refuse collection vehicle that can discharge its collected waste directly into a RCV

3.30
adaptation frame for waste container lifting device
framework onto which the waste container lifting device is fitted. It can be hinged or fixed to the tailgate or to the discharge door

4 List of significant hazards

This clause contains all the significant hazards, risk areas and hazardous situations and events as far as they are dealt with in this European Standard, identified by risk assessment performed according to EN ISO 12100 as significant for this type of machinery and which require action to eliminate or reduce the risk.

The verification methods to be used to demonstrate conformity include:

— *V* visual inspection verifies the required features of the components;

— *T* test/check verifies that the features provided perform their function in such a way that the requirement is met;

— *M* measurement verifies that requirements are met to the specified limits;

— *D* drawings and/or calculations verify that the design characteristics of the components provided meet the requirements. Documents and instructions for use are available.