SLOVENSKI STANDARD

SIST EN 1501-5:2011

01-oktober-2011

Nadomešča:

SIST EN 1501-1:2000+A2:2010

Vozila za zbiranje odpadkov - Splošne in varnostne zahteve - 5. del: Iztresalniki za vozila za zbiranje odpadkov

Refuse collection vehicles - General requirements and safety requirements - Part 5: Lifting devices for refuse collection vehicles

Abfallsammelfahrzeuge - Allgemeine Anforderungen und Sicherheitsanforderungen - Teil 5: Schüttungen für Abfallsammelfahrzeuge

Bennes de collecte des déchets - Exigences générales et exigences de sécurité - Partie 5: Lève-conteneurs pour bennes de collecte des déchets

Ta slovenski standard je istoveten z: EN 1501-5:2011

ICS:

43.160	Vozila za posebne namene	Special purpose vehicles

SIST EN 1501-5:2011 en,de

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1501-5

August 2011

ICS 43.160

Supersedes EN 1501-1:1998+A2:2009

English Version

Refuse collection vehicles - General requirements and safety requirements - Part 5: Lifting devices for refuse collection vehicles

Bennes de collecte des déchets - Exigences générales et exigences de sécurité - Partie 5: Lève-conteneurs pour bennes de collecte des déchets

Abfallsammelfahrzeuge und die dazugehörigen Schüttungen - Allgemeine Anforderungen und Sicherheitsanforderungen - Teil 5: Schüttungen für Abfallsammelfahrzeuge

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

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.

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Ref. No. EN 1501-5:2011: E

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Foreword

This document (EN 1501-5:2011) 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of an identical text or by endorsement, at the latest by February 2012, and conflicting national standards shall be withdrawn at the latest by February 2012.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 together with EN 1501-1:2011 supersedes EN 1501-1:1998+A2:2009.

It also updates and improves the description of and the requirements for the lifting devices of EN 1501-2:2005+A1:2009 (3.14 to 3.20 and 6.4), EN 1501-3:2008 (3.15 to 3.17, 4.4 and 6.5) and EN 14803:2006 (Figure A.1).

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.

The minimum essential criteria are considered to be of primary importance in providing safe, serviceable, economical and practical lifting devices.

This European Standard is one part of the series of co-ordinated standards EN 1501 about "Refuse collection vehicles — General requirements and safety requirements" dealing with specification; design, safety and testing of refuse collection vehicles (RCVs) and their associated lifting devices 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.*

The European Standards EN 1501-2:2005+A1:2009 and EN 1501-3:2008 will be revised after adoption of EN 1501-1 and this part of EN 1501.

For waste container lifting devices mounted on rear loaded RCVs, this Part 5 of the European Standard EN 1501 shall be enforced at the same time as Part 1 of this series.

In this document Annexes A and C are normative, Annexes B and ZA are informative.

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.

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.

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 requirements of the other standards, for machines that have been designed and built according to the requirements of this type C standard.

This European Standard should be read in conjunction with:

— the documents developed for refuse collection vehicles (EN 1501-1, EN 1501-2 and EN 1501-3) that are compatible with the waste container lifting devices specified in this standard;

— the documents developed for mobile waste containers (series of standards EN 840), for stationary waste containers (series of standards EN 12574) and for selective collection containers (series of standards EN 13071) that are compatible with the lifting devices specified in this European Standard;

— the documents developed for diamond and skip containers.

While producing this European Standard it was assumed that:

— only persons who have been appropriately trained will operate the lifting device;

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

— the guidelines issued by the RCV 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;

— harmful materials, such as asbestos, are not used as part of the lifting device;

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

— this European Standard is designed for careful consideration by designers, manufacturers, suppliers and users of lifting devices and RCVs.

1 Scope

This European Standard deals with all significant hazards, hazardous situations and events relevant to lifting devices used for the emptying of designated waste containers into RCVs and their fitting onto the RCVs when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer throughout their foreseeable lifetime as defined in Clause 4.

This European Standard is applicable to the design and construction of the waste container lifting devices and the mounting of other lifting devices so as to ensure that they are fitted for their function and can be operated, adjusted and maintained during their entire lifetime. It is not applicable to the end of life of the lifting devices.

This European Standard describes and gives the safety requirements of the lifting devices for emptying waste containers and their interfaces with the corresponding parts of the RCVs and shall be used in conjunction with Parts 1, 2 and 3 of EN 1501 for the rear, side and front loaded RCVs. It refers to EN 1501-4 for the noise test code.

This European standard is not applicable to:

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

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

  — tropical environment;

  — wind velocity in excess of 75 km/h;

— contaminating environment;

— corrosive environment;

— operation in potentially explosive atmospheres;

— lifting and transportation of persons;

— emptying waste containers other than those manufactured according to EN 840, EN 12574, EN 13071, and those described as paladin, diamond, skip containers;

— loading bulky waste by means of platform or forks;

— 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;

— fitting and operation on stationary compactors.

This European Standard is not applicable to machinery which is manufactured before the date of its publication 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 374-1:2003, *Protective gloves against chemicals and micro-organisms — Part 1: Terminology and performance requirements*

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

EN 818: 1996+A1:2008 (all parts) *Short link chain for llifting purposes*

EN 840-1:2004, *Mobile waste containers — Part 1: Containers with 2 wheels with a capacity up to 400 l for comb lifting devices, dimensions and design*

EN 840-2:2004, *Mobile waste containers — Part 2: Containers with 4 wheels with a capacity up to 1 300 l with flat lid(s), for trunnion and/or comb lifting devices — Dimensions and design*

EN 840-3:2004, *Mobile waste containers — Part 3: Containers with 4 wheels with a capacity up to 1 300 l with dome lid(s), for trunnion and/or comb lifting devices — Dimensions and design*

EN 840-4:2004, *Mobile waste containers — Part 4: Containers with 4 wheels with a capacity up to 1 700 l with flat lid(s), for wide trunnion or BG-and/or wide comb lifting device — Dimensions and design*

EN 840-5:2004, *Mobile waste containers — Part 5: Performance requirements and test methods*

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 894-2:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

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 1501-1:2011, *Refuse collection vehicles — General requirements and safety requirements — Part 1: Rear loaded refuse collection vehicles.*

EN 1501-2:2005+A1:2009, *Refuse collection vehicles and associated lifting devices — General requirements and safety requirements — Part 2: Side loaded refuse collection vehicles*

EN 1501-3:2008, *Refuse collection vehicles and their associated lifting devices — General requirements and safety requirements — Part 3: Front loaded refuse collection vehicles*

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 12574-1:2006, *Stationary waste containers — Part 1: Containers with a capacity up to 10 000 l with flat or dome lid(s), for trunnion, double trunnion or pocket lifting device — Dimensions and design*

EN 13071-1:2008, *Stationary waste containers up to 5 000 l, top lifted bottom emptied — Part 1: General requirements*

EN 13071-3:2011, *Stationary waste containers up to 5 000l, top lifted and bottom emptied — Part 3: Recommended lifting connections*

EN 13135-1:2003+A1:2010, *Cranes — Equipment — Part 1: Electrotechnical equipment*

EN 13135-2:2004+A1:2010, *Cranes — Equipment — Part 2: Non-electrotechnical equipment*

EN 13155:2003+A2:2009, *Cranes — Non-fixed load lifting attachments*

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

EN 13557:2003+A2:2008, *Cranes — Controls and control stations*

EN 14492-1:2006+A1:2009, *Cranes — Power driven winches and hoists — Part 1: Power driven winches*

EN 14803:2006, *Identification and/or determination of the quantity of waste*

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 61131-2:2003, *Programmable controllers — Part 2: Equipment requirements and tests (IEC 61131-2:2007)*

EN 61984, *Connectors — Safety requirements and tests (IEC 61984:2008)*

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 6743-4:2001, *Lubricants, industrial oils and related products (class L) — Classification — Part 4: Family H (Hydraulic system) (ISO 6743-4:1999)*

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, *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)*

EN ISO 14121-1:2007, *Safety of machinery — Risk assessment — Part 1: Principles (ISO 14121-1:2007)*

ISO 3448:1992, Industrial liquid lubricants — *ISO viscosity classification*

ISO 4406:1999, *Hydraulic fluid power — Fluids — Method for coding the level of contamination by solid particles*

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

ISO 7241-1:1987, *Hydraulic fluid power — Quick-action couplings — Part 1: Dimensions and requirements*

ISO 11898-1:2003, *Road vehicles — Controller area network (CAN) — Part 1: Data link layer and physical signalling*

ISO 11898-2:2003, *Road vehicles — Controller area network (CAN) — Part 2: High-speed medium access unit*

ISO 11898-3:2006, *Road vehicles — Controller area network (CAN) — Part 3: Low-speed, fault tolerant, medium-dependent interface*

ISO 11898-4:2004, *Road vehicles — Controller area network (CAN) — Part 4: Time-triggered communication*

ISO 11898-5:2007, *Road vehicles — Controller area network (CAN) — Part 5: High-speed medium access unit with low power mode*

ISO 15817:2005, *Earth-moving machinery — Safety requirements for remote operator control*

IEC 60417-DB, *Graphical symbols for use on equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100 and EN 1501-1 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. It consists of a chassis-cab onto which a bodywork is mounted

3.1.1
rear loaded RCV
RCV in which the waste is loaded into the body from the rear

NOTE See Figure A.1-1.

3.1.2
side loaded RCV
RCV in which the waste is loaded into the body from the sides

NOTE See Figure A.1-2.

3.1.3
front loaded RCV
RCV in which the waste is loaded into the body from the front

NOTE The trajectory of the waste container is over the top of the cab, parallel to the axis of the vehicle regardless of where the waste container is picked up (see Figure A.1-3).

3.1.4
travel movement
unrestricted motorised movement of the RCV

3.1.5
positioning movement
limited motorised movement of the RCV (e.g. when approaching and picking up a waste container)

3.2
lifting device
mechanism fitted onto the RCV for loading refuse into its body

3.3
waste container lifting device
mechanism fitted onto a RCV for emptying designated waste containers

3.3.1
split waste container lifting device
two or more adjacent waste container lifting devices with their own independent functional spaces

3.3.2
combined waste container lifting device
two or more waste container lifting devices which share a common functional space

3.3.3
integrated waste container lifting device
waste container lifting device designed to be permanently attached to the body of the RCV

3.3.4
demountable waste container lifting device
waste container lifting device designed to be detachable (e.g. bolted) from the body of the RCV

3.3.5
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)

3.4
mechanical interface
mechanical connections between the lifting device and the corresponding part of the RCV

3.5
hydraulic/pneumatic interface
hydraulic/pneumatic connections between the lifting device and the corresponding part of the RCV

3.6
electrical interface
electrical connections between the lifting device and the corresponding part of the RCV

3.7
mounting frame
framework used to fit the interchangeable or demountable waste container lifting device on the RCV

NOTE The mounting frame is provided as a fixed opening, a demountable frame, or a swivel hinged frame.

3.8
lifting carriage
sub-assembly onto which the pick-up system is normally fitted

3.9
guide system
component(s) to laterally locate the pick-up system of the designated waste container

3.10
locking system
mechanism which locks the pick-up system of the designated waste container to the waste container lifting device for emptying purpose

3.11
pushing pad
component of the lifting device onto which the front wall of the designated refuse container body rests when it is being lifted

3.12
container restraint device
system located towards the top of the loading opening of the RCV enabling the movement of the designated refuse container to be stopped progressively beyond the emptying angle of the lifting device

3.13
lid opener
device which opens the lid of the designated refuse container during the emptying cycle

3.14
pick-up system
part(s) of the lifting device intended to be in contact with the waste container for receiving its corresponding part with the purpose of holding, lifting and emptying it

3.14.1
comb pick-up system
horizontal row of upward facing teeth and locking system to retain the designated waste container according to frontal receivers forms A, B, and C of EN 840-1, EN 840-2, EN 840-3 and EN 840-4 during emptying

NOTE See Figure A.2.

3.14.2
trunnion pick-up system
pair of lateral arms with trunnion receiver and locking mechanism to retain the designated waste container according to lateral receivers type A of EN 840-2, EN 840-3, EN 840-4 and EN 12574-1 during emptying

NOTE See Figures A.4-1, A.4-2 and A.4-3.

3.14.3
double trunnion pick-up system
pair of lateral arms with two trunnion receivers and locking mechanism to retain the designated waste container according to lateral receivers type B of EN 12574-1 during emptying

NOTE See Figure A.4-4.

3.14.4
diamond pick-up system
triangular shaped element(s) with one corner of the triangle facing upwards and locking system to retain designated diamond waste container

NOTE See Figure A.5.

3.14.5
BG pick-up system
pair of lateral arms and locking mechanism to retain the designated BG waste container complying with lateral receivers type B of EN 840-4 during emptying

NOTE See Figure A.6.

3.14.6
pocket pick-up system
pair of lateral arms and locking mechanism to retain the designated waste container complying with lateral receivers type C of EN 12574-1 during emptying

NOTE See Figure A.7.