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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1501-5:2021 sisaldab Euroopa standardi EN 1501-5:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 1501-5:2021 consists of the English text of the European standard EN 1501-5:2021.
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English Version

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

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

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

This European Standard was approved by CEN on 15 February 2021.

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

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Contents

Page

European foreword.....	3
Introduction	5
1 Scope.....	7
2 Normative references.....	8
3 Terms and definitions	10
4 List of significant hazards	19
5 Safety requirements and/or protective measures	23
5.1 General.....	23
5.2 Requirements for lifting the designated refuse containers.....	26
5.3 Requirements for lifting devices mounted on rear loaded RCVs.....	30
5.4 Requirements for refuse container lifting devices mounted on side and front loaded RCV's	34
5.5 Requirements for loader cranes mounted on RCV's	35
5.6 Hydraulic system.....	36
5.7 Pneumatic system.....	36
5.8 Electric system	36
5.9 Operating symbols.....	36
5.10 Control systems	38
5.11 Requirement for field of vision	40
5.12 Electrical components.....	41
5.13 Noise	42
5.14 Maintenance.....	43
5.15 Lifting points.....	43
5.16 Signals and warning devices	44
6 Verification.....	44
7 Information for use	44
7.1 Signals and warning devices	44
7.2 Instruction handbook.....	44
7.3 Maintenance.....	46
7.4 Data sheet	46
7.5 Marking.....	46
Annex A (normative) Danger zones, dimensions and connections.....	47
Annex B (informative) Types of special containers and their pick-up systems	74
Annex C (normative) Requirements for pin connections and data sheets.....	82
Annex ZA (informative) Relationship between this Standard and the essential requirements of EU Directive 2006/42/EC aimed to be covered.....	88
Bibliography.....	94

European foreword

This document (EN 1501-5:2021) 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 September 2021 and conflicting national standards shall be withdrawn at the latest by March 2022.

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 EN 1501-5:2011.

This document has been prepared under a standardization request 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 main changes compared to the previous edition are listed below:

- document has been completely revised and partly restructured;
- European foreword and Introduction have been updated;
- Clause 2, Normative references, have been updated;
- In Clause 3, new terms and definitions have been added and others revised;
- Table 1 has been updated;
- Table 2 “Speed and acceleration” has been added;
- requirements on “lifting devices mounted on rear loaded RCV’s” (5.3), “lifting devices mounted on side and front loaded RCV’s” (5.4), “control systems” (5.10), “field of vision” (5.11), maintenance (5.14), “instruction handbook” (7.2) and many more have been revised;
- Annex A, B and C have been revised.
- Annex ZA has been updated.

EN 1501 consists of the following parts under the general title *Refuse collection vehicles — General requirements and safety requirements*:

- *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 part).*

This document will be enforced at the same time as EN 1501-1:2021, EN 1501-2:2021 and EN 1501-3:2021 and applied whenever the RCV is fitted with a lifting device.

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 document is a type-C standard as stated in EN ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements 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 is intended for careful consideration by designers, manufacturers, suppliers and users of RCVs.

This European Standard should be read in conjunction with:

- the documents developed for refuse collection vehicles (EN 1501-1:2021, EN 1501-2:2021 and EN 1501-3:2021) which are compatible with the refuse container lifting devices specified in this standard;
- the documents developed for mobile refuse containers according to EN 840:2020 (all parts), for stationary refuse containers according to EN 12574:2017 (all parts) and for selective collection containers according to EN 13071:2019 (all parts) which are compatible with the lifting devices specified in this European Standard.

While producing this standard it was assumed that:

- for RCV the requirements of road traffic regulations apply. Where road traffic regulations are in conflict with the provisions of this standard, the road regulations have priority;
- due to the European regulations on the approval of vehicles for use on public roads, the requirements of UN/ECE R10:2019 for an RCV with regard to EMC applies. Therefore, EMC is not further considered in this standard;
- the guidelines issued by the chassis manufacturer have been taken into account;
- the guidelines of the lifting device manufacturer have been taken into account;

- that based on measurements on different types of RCVs hand-arm vibrations are in general lower than $2,5 \text{ m/s}^2$;
- that based on measurements on different types of RCVs whole-body vibrations are lower than $0,5 \text{ m/s}^2$;
- 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 and tear;
- harmful materials, such as asbestos, are not used as part of RCV's;
- only persons who have been appropriately trained will operate on RCV's.

1 Scope

This document deals with all significant hazards, hazardous situations and events relevant to lifting devices used for the emptying of designated refuse 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 document is applicable to the design and construction of the refuse 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 document describes and gives the safety requirements of the lifting devices for emptying refuse containers and their interfaces with the corresponding parts of the RCVs and will be used in conjunction with EN 1501-1:2021 for the rear, side and front loaded RCVs. It refers to EN 1501-4:2007 for the noise test code.

This document is not applicable to:

- operation in severe conditions e.g. extreme environmental conditions such as:
 - temperatures below -20 °C and above $+40\text{ °C}$;
 - 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 refuse containers other than those manufactured according to EN 840:2020 (all parts), EN 12574:2017 (all parts), EN 13071:2019 (all parts), and those described as paladin, diamond, skip containers;
- loading bulky refuse by means of platform or forks;
- handling of loads the nature of which could lead to dangerous situations (e.g. hot refuses, acids and bases, radioactive materials, contaminated refuse, especially fragile loads, explosives);
- operation on ships;
- fitting and operation on stationary compactors.

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 818-1:1996+A1:2008, *Short link chain for lifting purposes - Safety - Part 1: General conditions of acceptance*

EN 840-1:2020, *Mobile waste and recycling containers - Part 1: Containers with 2 wheels with a capacity up to 400 l for comb lifting devices - Dimensions and design*

EN 840-2:2020, *Mobile waste and recycling 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 840-3:2020, *Mobile waste and recycling 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 840-4:2020, *Mobile waste and recycling 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 devices - Dimensions and design*

EN 840-5:2020, *Mobile waste and recycling containers - Part 5: Performance requirements and test methods*

EN 840-6:2020, *Mobile waste and recycling containers - Part 6: Safety and health requirements*

EN 894-1:1997+A1:2008, *Safety of machinery - Ergonomics 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 - Ergonomics requirements for the design of displays and control actuators - Part 3: Control actuators*

EN 894-4:2010, *Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 4: Location and arrangement of displays and control actuators*

EN 1501-1:2021, *Refuse collection vehicles - General requirements and safety requirements - Part 1: Rear loaded refuse collection vehicles*

EN 1501-2:2021, *Refuse collection vehicles - General requirements and safety requirements - Part 2: Side loaded refuse collection vehicles*

EN 1501-3:2021, *Refuse collection vehicles - 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 1677-1:2000+A1:2008, *Components for slings - Safety - Part 1: Forged steel components, Grade 8*

EN 1677-6:2001+A1:2008, *Components for slings - Safety - Part 6: Links - Grade 4*

EN 12574-1:2017, *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 12574-2:2017, *Stationary waste containers - Part 2: Performance requirements and test methods*
- EN 12574-3:2017, *Stationary waste containers - Part 3: Safety and health requirements*
- EN 12999:2011+A2:2018, *Cranes - Loader cranes*
- EN 13071-1:2019, *Stationary waste containers up to 5 000 l, top lifted and bottom emptied - Part 1: General requirements*
- EN 13071-2:2019, *Stationary waste containers up to 5 000 l, top lifted and bottom emptied - Part 2: Additional requirements for underground or partly underground systems*
- EN 13071-3:2019, *Stationary waste containers up to 5 000 l, top lifted and bottom emptied - Part 3: Recommended lifting connections*
- EN 13135:2013+A1:2018, *Cranes - Safety - Design - Requirements for equipment*
- EN 13155:2003+A2:2009, *Cranes - Safety - Non-fixed load lifting attachments*
- EN 13557:2003+A2:2008, *Cranes - Controls and control stations*
- EN 14803:2020, *Identification and/or determination of the quantity of waste*
- EN 14492-1:2006+A1:2009, *Cranes - Power driven winches and hoists - Part 1: Power driven winches*
- EN 60204-1:2018, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016, modified)*
- EN 60529:1991¹⁾, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*
- EN 61131-2:2007, *Programmable controllers - Part 2: Equipment requirements and tests (IEC 61131-2:2007)*
- EN 61984:2009, *Connectors - Safety requirements and tests (IEC 61984:2008)*
- EN ISO 374-1:2016²⁾, *Protective gloves against dangerous chemicals and micro-organisms - Part 1: Terminology and performance requirements for chemical risks (ISO 374-1:2016)*
- 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 6743-4:2015, *Lubricants, industrial oils and related products (class L) - Classification - Part 4: Family H (Hydraulic systems) (ISO 6743-4:2015)*
- EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

1) As impacted by EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013.

2) As impacted by EN ISO 374-1:2016/A1:2018.

EN ISO 13849-1:2015, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13849-2:2012, *Safety of machinery - Safety-related parts of control systems - Part 2: Validation (ISO 13849-2:2012)*

EN ISO 13850:2015, *Safety of machinery - Emergency stop function - Principles for design (ISO 13850:2015)*

EN ISO 13854:2019, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body (ISO 13854:2017)*

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 13857:2019, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)*

EN ISO 14118:2018, *Safety of machinery - Prevention of unexpected start-up (ISO 14118:2017)*

EN ISO 14120:2015, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

IEC 60417:2002, *[online database], Graphical symbols for use on equipment*

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

ISO 4406:2017, *Hydraulic fluid power - Fluids - Method for coding the level of contamination by solid particles*

ISO 7000:2019, *Graphical symbols for use on equipment - Registered symbols*

ISO 7241:2014, *Hydraulic fluid power - Dimensions and requirements of quick-action couplings*

ISO 11898-1:2015, *Road vehicles - Controller area network (CAN) - Part 1: Data link layer and physical signalling*

ISO 11898-2:2016, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and EN 1501-1:2021 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>