

STN	Vozidlá na odvoz odpadu Všeobecné požiadavky a požiadavky na bezpečnosť Časť 2: Automobily na odvoz odpadu s vyklápacím zariadením na boku	STN EN 1501-2 30 0352
------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------

Refuse collection vehicles - General requirements and safety requirements - Part 2: Side loaded refuse collection vehicles

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 07/21

Obsahuje: EN 1501-2:2021

Oznámením tejto normy sa od 31.03.2022 ruší
STN EN 1501-2+A1 (30 0352) z apríla 2010

133074

EUROPEAN STANDARD

EN 1501-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2021

ICS 43.160

Supersedes EN 1501-2:2005+A1:2009

English Version

Refuse collection vehicles - General requirements and safety requirements - Part 2: Side loaded refuse collection vehicles

Véhicules de collecte de déchets - Exigences générales et exigences de sécurité - Partie 2 : Véhicules de collecte de déchets à chargement latéral

Abfallsammelfahrzeuge - Allgemeine Anforderungen und Sicherheitsanforderungen - Teil 2: Seitenlader

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

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.

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.

CEN members are the national standards bodies of 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 United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN 1501-2:2021 (E)

Contents		Page
European foreword		4
Introduction		6
1	Scope	8
2	Normative references	9
3	Terms and definitions	11
4	List of significant hazards	18
5	Safety requirements and protective measures	21
5.1	General	21
5.2	Danger Zones	21
5.2.1	General	21
5.2.2	Verification	23
5.3	Compaction mechanism	23
5.3.1	General	23
5.3.2	Interaction between bodywork and compaction mechanism	23
5.3.3	Hopper	24
5.3.4	Relationship between the compaction mechanism and the rave rail	24
5.3.5	Guide flap	24
5.3.6	Additional equipment(s)	24
5.3.7	Guards	24
5.3.8	Electro-sensitive protective equipment (ESPE)	25
5.3.9	Side loaded RCV with rotation drum body	25
5.3.10	Controls for the compaction mechanism	25
5.3.11	Rear of the cab protection	25
5.4	Discharge system	26
5.4.1	Controls for discharge system	26
5.4.2	Operation conditions for the tailgate or discharge door	27
5.4.3	Operation conditions for emptying the body	27
5.4.4	Laterally hinged discharge door	27
5.5	Requirements for refuse container lifting device(s) and interfaces	27
5.6	Top door(s) (if present)	27
5.6.1	Opening and closing of the top door	27
5.6.2	Top door warning	27
5.7	Hydraulic, pneumatic and electric systems	27
5.7.1	Hydraulic system	27
5.7.2	Pneumatic system	28
5.7.3	Electric system	28
5.8	Operating symbols	28
5.9	Riding on side loaded RCV by operator	30
5.9.1	General	30
5.9.2	Cab	30
5.10	Control systems	30
5.10.1	General requirements for safety circuits	30
5.10.2	Emergency stop devices	30
5.10.3	Control devices	31
5.11	Monitoring and warning	33
5.11.1	Closed-circuit television system	33

5.11.2	Communication	33
5.11.3	Warnings.....	33
5.12	Electrical components.....	35
5.12.1	General	35
5.12.2	Protective interlocks.....	35
5.12.3	Two-hand operating controls.....	35
5.12.4	Overload protection.....	35
5.12.5	Energy interruption.....	35
5.12.6	Position sensors	35
5.12.7	Terminals and wire connections	35
5.12.8	Electric cables and wiring harness.....	35
5.12.9	Working lights	36
5.13	Requirements for maintenance.....	36
5.13.1	Unexpected start-up	36
5.13.2	Raised discharge door or tilting body	36
5.13.3	Access and inspection door(s)	36
5.13.4	Requirements to avoid blockages.....	36
5.13.5	Cleaning.....	36
5.14	Stability and driving security	37
5.14.1	General	37
5.14.2	Stability in container lifting mode.....	37
5.14.3	Stability in discharging mode.....	37
5.14.4	Lateral stability	37
5.14.5	Minimum front axle mass	37
5.15	Exhaust pipe	37
5.16	Ventilation of the body	37
5.17	Vibration	38
5.17.1	Hand-arm vibration	38
5.17.2	Whole-body vibration.....	38
5.17.3	Uncertainty of vibration measurements.....	38
5.18	Noise control	38
6	Verification	39
7	Information for use.....	39
7.1	Instruction handbook	39
7.2	Maintenance	41
7.3	Spare parts list.....	42
7.4	Data sheet.....	42
7.5	Marking	42
	Annex A (normative) Components of the vehicle.....	43
	Annex B (informative) Volumes	45
	Annex C (normative) Basic scenarios of different danger zones.....	46
	Annex D (informative) Illuminated areas.....	54
	Annex E (normative) Warning signals	55
	Annex ZA (informative) Relationship between this Standard and the essential requirements of EU Directive 2006/42/EC aimed to be covered	56
	Bibliography	61

EN 1501-2:2021 (E)**European foreword**

This document (EN 1501-2:2021) 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 1501-2:2005+A1:2009.

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 restructured;
- European foreword and Introduction have been updated;
- Clause 1, Scope, has been slightly revised and clarified;
- 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 “Basic scenarios and applicable danger zones” and a completely new Annex C with multiple figures of danger zones has been added;
- previous Table 3 “Verification” has been deleted and information integrated in Table 1;
- previous Annex B “Types and examples of data sheet” has been deleted;
- requirements on lifting devices (5.5), riding on side loaded RCV by operator (5.9), remote controls (5.10.3.5), monitoring and warning (5.11), stability (5.14), noise control (5.18) and many more have been revised;
- new Annex D “Illuminated areas” has been added;
- 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 (this part)*
- *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 document will be enforced at the same time as EN 1501-5:2021 and applied whenever the RCV is fitted with a lifting device.

For combinations of side loaded RCVs with rear loading and/or front loading capability the corresponding clauses of EN 1501-1:2021, EN 1501-3:2021 and EN 1501-5:2021 apply.

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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 1501-2:2021 (E)**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, organisations 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 document is intended for careful consideration by designers, manufacturers, suppliers and users of side loaded RCVs.

This document should be read in conjunction with EN 1501-5:2021 developed for lifting devices which are compatible with the refuse collection vehicle specified in this standard.

While producing this document 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 document, 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 document;
- the guidelines issued by the chassis manufacturer have been taken into account;
- chassis related safety items are handled by the chassis manufacturer according to their state of the art and in compliance with the public road regulations;
- 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 m/s²;

- 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 the side loaded RCV;
- only persons who have been appropriately trained will operate the side loaded RCV.

EN 1501-2:2021 (E)**1 Scope**

This document applies to side loaded refuse collection vehicle (RCV), as defined in 3.2.

This document deals with all significant hazards, hazardous situations and events relevant to the side 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 document is applicable to the design and construction of the side loaded RCV so as to ensure that it is fit for its intended function and can be operated, cleaned (including unblocking), adjusted and maintained during its entire lifetime. It is not applicable to the end of life of the side loaded RCV.

This document describes and defines the safety requirements of side loaded RCV excluding the interface with the lifting device(s) and excluding the lifting device itself and excluding loader cranes, which could be mounted on the RCV.

Safety requirements for the lifting device(s) including the loader cranes and the interface to the RCV are defined in EN 1501-5:2021.

Safety requirements for loader cranes are defined in EN 12999:2020. Additional specific requirements to loader cranes installed on RCVs are defined in EN 1501-5:2021.

This document also applies to compactors, operated on a truck for collecting purposes.

This document is not applicable to:

- operation in severe conditions, e.g. extreme environmental conditions such as:
 - below -20 °C and above $+40\text{ °C}$ 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 refuses, acids and bases, radioactive materials, contaminated refuse, especially fragile loads, explosives);
- operation on ships.

This document is not applicable to machinery which is manufactured before the date of publication of this document 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 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 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 1501-4:2007, *Refuse collection vehicles and their associated lifting devices - General requirements and safety requirements - Part 4: Noise test code for refuse collection vehicles*

EN 1501-5:2021, *Refuse collection vehicles — General requirements and safety requirements — Part 5: Lifting devices for refuse collection vehicles*

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

EN 61496-1:2013, *Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests (IEC 61496-1:2012)*

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)*

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 1501-2:2021 (E)

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

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 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 13849-1:2015, *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 7000:2019, *Graphical symbols for use on equipment - Registered symbols*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN