SLOVENSKI STANDARD
SIST EN 1501-4:2023

01-julij-2023

Vozila za zbiranje odpadkov - Splošne in varnostne zahteve - 4. del: Navodilo za merjenje hrupa vozil za zbiranje odpadkov

Refuse collection vehicles - General requirements and safety requirements - Part 4: Noise test code for refuse collection vehicles

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Abfallsammelfahrzeuge - Allgemeine Anforderungen und Sicherheitsanforderungen - Teil 4: Geräuschprüfverfahren für Abfallsammelfahrzeuge

Véhicules de collecte de déchets - Exigences générales et exigences de sécurité - Partie 4: Code d'essai acoustique des bennes de collecte des déchets

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Ta slovenski standard je istoveten z: **EN 1501-4:2023**

ICS:

13.030.40	Naprave in oprema za odstranjevanje in obdelavo odpadkov	Installations and equipment for waste disposal and treatment
17.140.30	Emisija hrupa transportnih sredstev	Noise emitted by means of transport
43.160	Vozila za posebne namene	Special purpose vehicles

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1501-4

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ICS 17.140.30; 43.160

Supersedes EN 1501-4:2007

English Version

Refuse collection vehicles - General requirements and safety requirements - Part 4: Noise test code for refuse collection vehicles

Véhicules de collecte de déchets - Exigences générales et exigences de sécurité - Partie 4 : Code d'essai acoustique des véhicules de collecte des déchets

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This European Standard was approved by CEN on 17 April 2023.

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

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European foreword

This document (EN 1501-4:2023) 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 November 2023, and conflicting national standards shall be withdrawn at the latest by November 2023.

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 1501-4:2007.

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 (this part);

— Part 5: Lifting devices for refuse collection vehicles.

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This document provides a means for the determination and declaration of noise emission by refuse collection vehicles (RCVs) falling within the scope of the standards of the EN 1501 series. The determination of noise emission values is a prerequisite for a manufacturer to assess the noise reduction obtained at the design stage.

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In comparison with the previous edition, the following technical modifications have been made:

— This revision of the original standard EN 1501-4:2007 specifies a new test procedure for determining the sound power level. The vehicle is not tested in the loaded condition as before, as the test is carried out without refuse containers and refuse material. Since many different refuse containers are used in the EU and RCVs are loaded with many different refuse materials, the experts of CEN/TC183/WG2 have agreed that in a standardized noise measurement for RCVs, refuse containers and refuse material cannot be taken into account. In order to give the user a clear picture of the noise behaviour of RCVs, and since the EN 1501 series refers purely to RCVs, this standard only deals with the noise behaviour of RCVs itself. The noise behaviour of waste collection containers can mainly be influenced by design and construction under the responsibility of the container manufacturer. With this new method, the sound power level is not only measured during the loading process when the vehicle is stationary, as before, but also while the RCV approaches the loading point and leaves it after loading. This is intended to reflect future noise reductions through the use of alternative drive systems.

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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) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom.

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Introduction

This European Standard provides a procedure for the measurement and calculation of sound power emitted by RCVs thus enabling manufacturers and importers to mark and certify rear loaded, side loaded and front loaded RCVs.

The RCV work cycle for the measurement of the emission sound pressure levels at the working stations (L_{PA}) differs from the work cycle of the newly specified measurement of sound power level (L_{WA}), since the L_{WA} is measured while the refuse collection vehicle (RCV) approaches the loading point and leaves it after loading, whereby the L_{PA} is only measured stationary at the loading point. However, experience has shown that the noise emission due to the travelling RCV have no significant effects to the emission sound pressure levels at the working stations.

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

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.

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1 Scope

This document provides all of the information required in order to perform efficiently, and in standardized conditions, the determination, the declaration and the verification of noise emission values of refuse collection vehicles.

The document ensures the reproducibility of the determination of noise emission values within the limits established for the accuracy grade of the basic standard used to determine noise emission values.

This document specifies the noise measurement conditions for the types of RCVs defined and described in the standards of the EN 1501:2021 series.

This document applies to machines which are manufactured after the date of approval of this document by CEN.

Noise emissions of mobile waste and recycling containers are excluded.

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

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

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EN 1501-3:2021, *Refuse collection vehicles — General requirements and safety requirements — Part 3: Front loaded refuse collection vehicles*

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

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

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 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 3744:2010, EN ISO 4871:2009, EN ISO 12100:2010, EN ISO 11201:2010 and in the series of standards EN 1501:2021 apply, together with the following.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
continuous compaction
compacting devices which continuously and without reversing follow the direction of movement of individual components after commissioning and which have no defined starting position

3.2
discontinuous compaction
components of the compression device, which always traverse the same route curve in the operation in compaction cycles, return to their defined starting position after one compaction cycle

3.3
operating cycle
combination of travel cycle and collection cycle

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3.4
collection cycle
procedures which are performed when the vehicle is stationary at the loading point

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3.5
collection cycle time
duration of a collection cycle

3.6
collection cycle mode
function sequence of a collection cycle

3.7
travel cycle
approaching and leaving the loading point

3.8
working station
operator's position
location where the RCV is operated during normal use

Note 1 to entry: Inspection, cleaning and maintenance are excluded.

[SOURCE: EN 1501-5:2021, 3.25, modified – alternative term "operator's position" added]

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3.9
vehicle length
distance between two vertical planes perpendicular to the longitudinal median plane (of the vehicle) and touching the front and rear of the vehicle respectively

Note 1 to entry: All parts of the vehicle, including any parts projecting from front or rear are contained between these two planes.

[SOURCE: ISO 612:1978, 6.1.1, modified – term shortened and reference in the definition deleted]

3.10
vehicle width
distance between two planes parallel to the longitudinal median plane (of the vehicle) and touching the vehicle on either side of the said plane

Note 1 to entry: All parts of the vehicle, including any lateral projections of fixed parts (wheel hubs, door-handles, bumpers, etc.) are contained between these two planes, except the rear-view mirrors, side marker lamps, tyre pressure indicators, direction indicator lamps, position lights, customs seals, flexible mud guards, retractable steps, snow chains and the deflected part of the tyre walls immediately above the point of contact with the ground.

[SOURCE: ISO 612:1978, 6.2, modified – reference in the definition deleted]

3.11
vehicle centre
centre of the vehicle related to the vehicle length and vehicle width

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3.12
main outside control device
outside control device which is mainly used by the operator during the collection cycle of the RCV

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4 Determination of the A-weighted emission sound pressure level(s) at working station(s)

4.1 General

The A-weighted emission sound pressure level(s) at working station(s) shall be measured according to the method specified in EN ISO 11201:2010, accuracy grade 2.

A-weighted emission sound pressure level(s) at working station(s) shall be determined at the working station(s). Measurements shall be done with the operator absent.

The operating conditions for the determination of the A-weighted emission sound pressure level(s) at working station(s) are specified in 6.2.

4.2 Measurement positions

4.2.1 Working station(s) outside the cab

If there are working stations outside the cab (e.g. main outside control device of the lifting device) the microphone shall be positioned where the operator would normally stand:

— at a height of 1,60 m ± 0,05 m;

— in a horizontal distance of 0,50 m ± 0,05 m to the centre of the main outside control device;

— at an angle of 45° horizontally to the centre of the main outside control device in the direction outward away from the danger zone.

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NOTE Examples of measuring positions (R7, R8, S7 and S8) for the different types of RCV are shown in Figures 1 a) and 1 b).

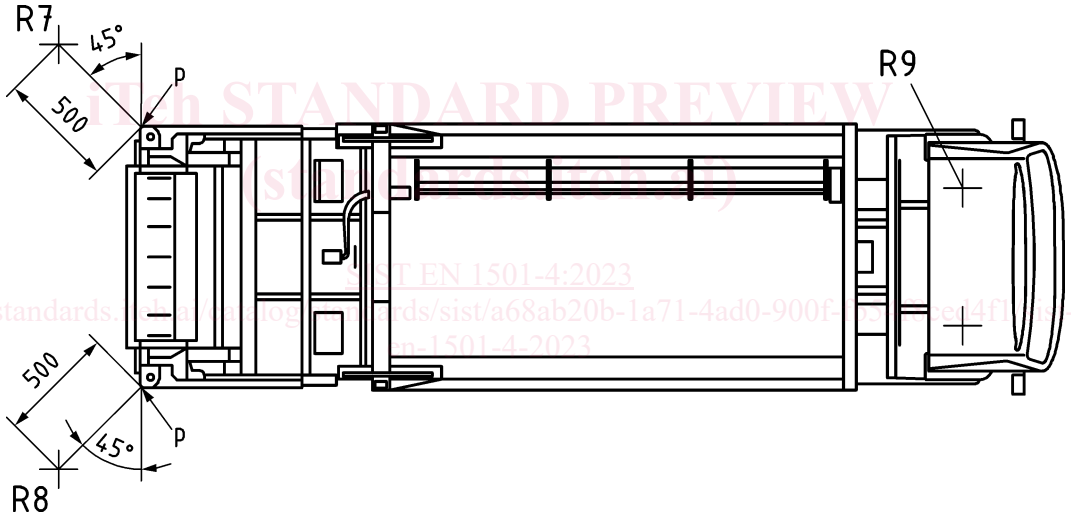
4.2.2 Working station(s) in the cab

Even if there are multiple working stations in the cab, the emission sound pressure level at working station shall be measured at the driver's seat. Therefore, the microphone shall be positioned at a height of 0,50 m ± 0,05 m measured in comparison with the seat index point (SIP) and with the seat adjusted in its average position.

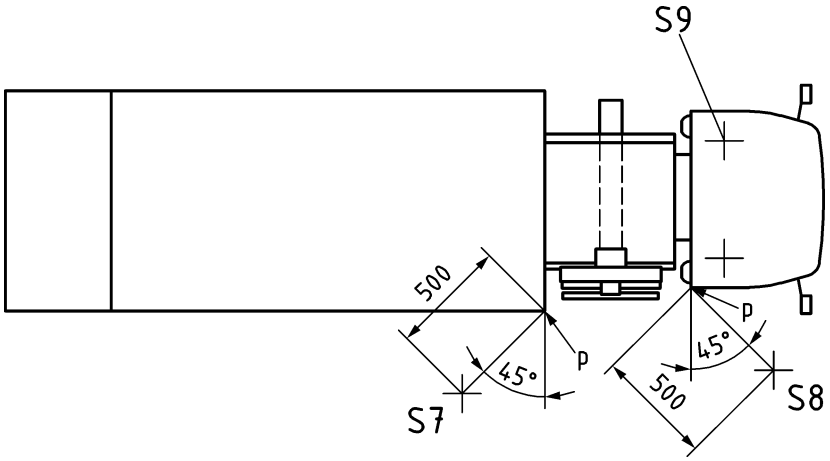
The in-cab noise measurements shall be taken with the doors and windows closed and the air conditioning and/or ventilation system in operation. If there is more than one operating speed available, the air conditioning and/or pressurized ventilation system, shall be operated at the second speed for systems up to four speeds. For systems of more than four speeds, the third speed shall be used and for continuously variable speeds the mid-range speed. If the air-conditioning and/or ventilating system have a recirculation and outside air position control, the control shall be set for outside air.

NOTE Examples of measuring positions (R9, S9 and F9) for the different types of RCV are shown in Figures 1 a) to 1 c).

Dimensions in mm



a) Rear loaded RCV with working stations outside the cab (EN 1501-1:2021)



b) Side loaded RCV with working stations outside the cab (EN 1501-2:2021)