
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

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)

Ta slovenski standard je istoveten z: prEN 1501-4

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ICS:

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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
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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 bennes de collecte des déchets

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

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 183.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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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	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions.....	6
4 Determination of the A-weighted emission sound pressure level at workstation(s)..	7
4.1 General.....	7
4.2 Measurement positions	7
5 Determination of the A-weighted sound power level.....	9
5.1 General.....	9
5.2 Measurement in travel mode.....	9
5.2.1 Travel path	9
5.2.2 Measuring path	9
5.2.3 Microphone positions.....	10
6 Installation and operating conditions.....	13
6.1 Installation conditions.....	13
6.2 Operating cycle	13
6.2.1 Sound pressure level measurement	13
6.2.2 Sound power level measurement	13
6.3 Operating conditions	14
7 Measurement uncertainties.....	15
7.1 Sound pressure level measurement	15
7.2 Sound power level measurement	15
8 Declaration of noise emission values, labelling and information for use	15
Annex A (informative) Test report.....	16
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	18
Bibliography	19

European foreword

This document (prEN 1501-4:2022) has been prepared by Technical Committee CEN/TC 183 “Waste management”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede 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.

Its purpose is to provide a means for the determination and declaration of noise emission by 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.

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

- This revision of the original standard EN 1501-4 from 2007 describes a new test procedure for determining the sound power level. The vehicle is not tested in loading mode as before, but also when approaching and leaving the charging point. This is intended to take into account future noise reductions through the implementation of alternative drive systems.

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.

prEN 1501-4:2022 (E)**Introduction**

EU Directive 2000/14/EC “Noise Emission in the Environment by Equipment for Use Outdoor” requires to mark and certify Refuse Collection Vehicles (RCVs) intended to be placed on the EU market with a guaranteed sound power level.

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 in compliance with the above mentioned EU Directive.

This standard also covers the noise information requirements of EU Directive 2006/42/EC relating to Machinery for the measurement of the sound pressure levels at the working station.

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.

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.

1 Scope

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

The use of this annex 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. The methods used to determine these noise emission values, corresponding to this normative annex, are grade 2 accuracy measurement methods according to EN ISO 11201:2010, 5.2.2.2.

This document deals with the noise measurement conditions for the types of RCVs defined and described in the standards of the EN 1501 series

This document applies to machines which are manufactured after the date of approval 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 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 1501-5:2021, *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)*

prEN 1501-4:2022 (E)**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 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/>

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**measurement run**

sum of all test cycles on the test track

3.4**steady state**

all operating fluids are at a temperature level which does not vary during the test bench run and/or test run

3.5**test cycle**

sum of the defined time proportions with different operating conditions

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Note 1 to entry: Refer to Table 2 for the time proportions of the test cycle.

3.6**vehicle weight**

mass of the refuse collection vehicle (RCV) in a ready to drive and ready for waste collection mode with full fuel and urea tank, full hydraulic and cooling systems, stated in kg

3.7**working cycle**

procedures which are to be performed during the vehicle downtime

3.8**working station**

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]

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

4.1 General

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

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

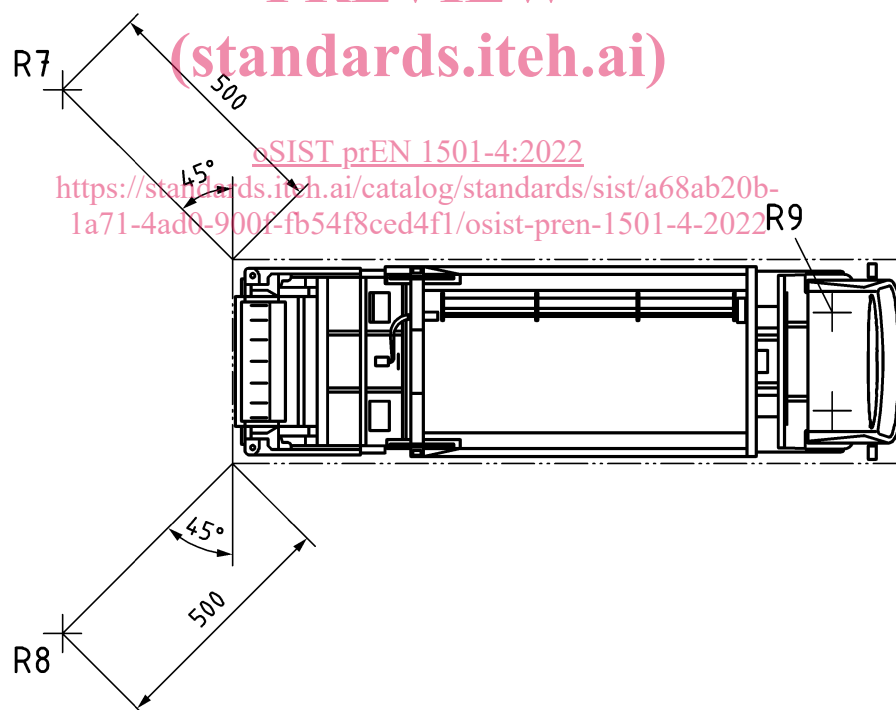
4.2 Measurement positions

The microphone shall be positioned at a height of $1,60\text{ m} \pm 0,05\text{ m}$ in the position where the operator would normally stand (e.g. footboard) or at a height of $0,50\text{ m} \pm 0,05\text{ m}$ measured in comparison with the seat index point (SIP) and with the seat adjusted in its average position (e.g. driver seat).

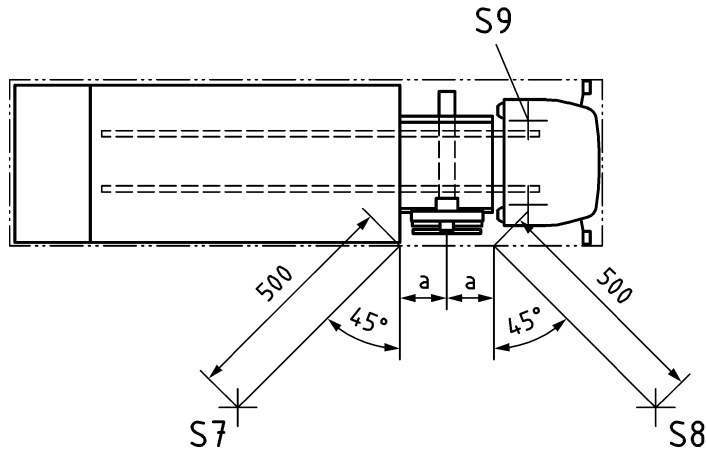
When several workstations exist, the A-weighted emission sound pressure level at each of the workstations shall be measured and declared. The in-cab noise measurements shall be taken with the windows closed.

For the different types of RCV, the microphones shall be positioned at workstations as shown in Figures 1a to 1c. The distances are related to the reference box. The reference box (see EN ISO 3744:2010, 3.10) shall be a parallelepiped that covers the machine, but which does not include accessories extending beyond the vehicle's body elements that do not generate noise.

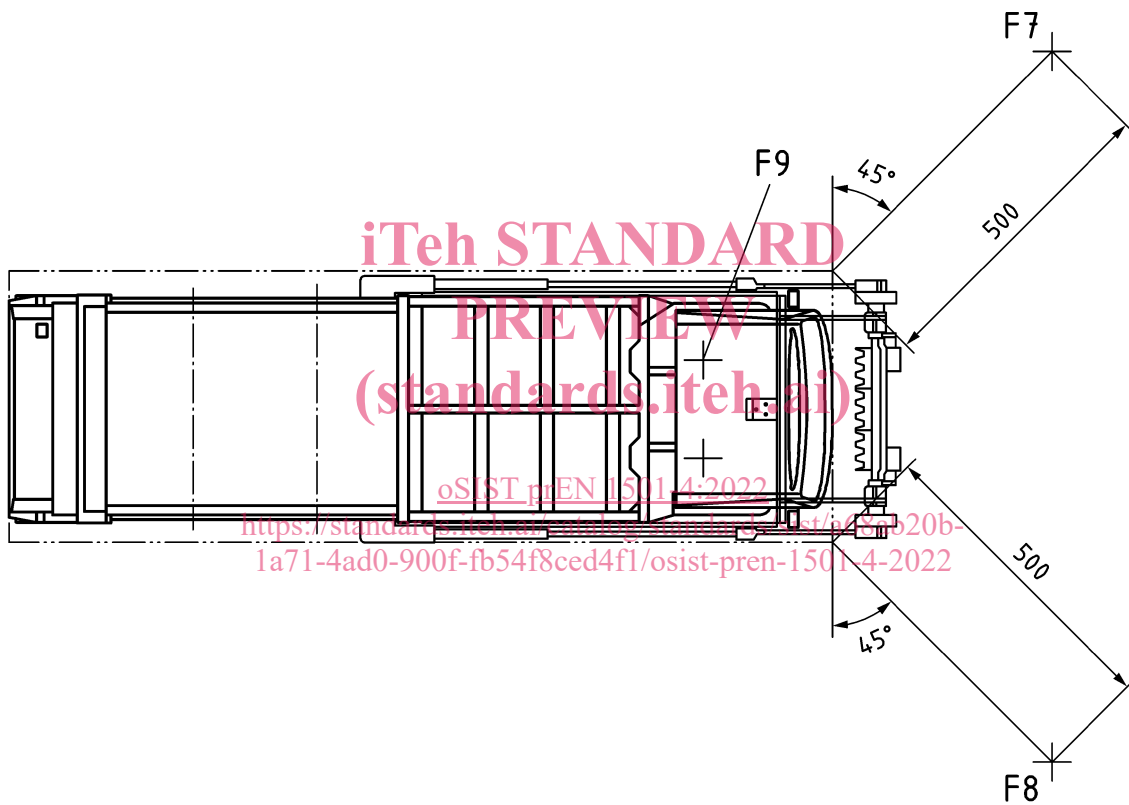
Dimensions in mm



a) Rear loaded RCV (EN 1501-1:2021)



b) Side loaded RCV (EN 1501-2:2021)



c) Front loaded RCV (EN 1501-3:2021)

Key

- R7 to R8 microphone positions outside of the rear loader
- R9 microphone position in the cab of the rear loader
- S7 to S8 microphone positions outside of the side loader
- S9 microphone position in the cab of the side loader
- F7 to F8 microphone positions outside front loader
- F9 microphone position in the cab of the front loader
- reference box

Figure 1 — Microphone positions for the determination of the emission sound pressure level at working stations

5 Determination of the A-weighted sound power level

5.1 General

Depending on the type of vehicle, measurements shall be made in a combination of travel mode and stationary work cycle.

5.2 Measurement in travel mode

5.2.1 Travel path

The travel path of the vehicle is shown in Figure 2. The centre line of the vehicle travel path shall be the x-axis and the longitudinal axis of the vehicle shall coincide with this axis.

The travel path length shall be S_T to E_T , which length is 40 m.

The travel path shall be separated in two parts:

- First part of the vehicle travel path S_T to C. The length of the first part of the travel path is 20 m.
- Second part of the vehicle travel path C to E_T . The length of the second part of the vehicle travel path is 20 m.

5.2.2 Measuring path

The measuring path is shown in Figure 2. The measuring path is congruent with the travel path.

- The measurement starts when the front of the RCV passes point S_M .
- The measurement ends when the rear of the RCV passes point E_M .

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