

# SLOVENSKI STANDARD SIST EN 60312-1:2017/A11:2022

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Vacuum cleaners for household use - Part 1: Dry vacuum cleaners - Methods for measuring the performance		
Staubsauger für den Hausgebrauch - Teil 1: Trockensauger - Prüfverfahren zur Bestimmung der Gebrauchseigenschaften		
Aspirateurs de poussière à usage domestique - Partie 1: Aspirateurs a sec - Méthodes de mesure de laptitude à la function		
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97.080 Aparati za čiščenje

Cleaning appliances

SIST EN 60312-1:2017/A11:2022

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# EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

# EN 60312-1:2017/A11

July 2022

ICS 97.080

**English Version** 

# Vacuum cleaners for household use - Part 1: Dry vacuum cleaners - Methods for measuring the performance

Aspirateurs de poussière à usage domestique - Partie 1: Aspirateurs à sec - Méthodes de mesure de l'aptitude à la fonction Staubsauger für den Hausgebrauch - Teil 1: Trockensauger - Prüfverfahren zur Bestimmung der Gebrauchseigenschaften

This amendment A11 modifies the European Standard EN 60312-1:2017; it was approved by CENELEC on 2022-03-21. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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#### en-60312-1-2017-a11-2022



European Committee for Electrotechnical Standardization Comité Européen de Normalisation Electrotechnique Europäisches Komitee für Elektrotechnische Normung

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

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## SIST EN 60312-1:2017/A11:2022

# EN 60312-1:2017/A11:2022 (E)

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# European foreword

This document (EN 60312-1:2017/A11:2022) has been prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be (dop) 2023-03-21 implemented at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards (dow) 2025-03-21 conflicting with this document have to be withdrawn

This document modifies by common modifications EN 60312-1:2017, which consists of the text of IEC 60312-1:2010+A1:2011 prepared by IEC/SC 59F "Surface cleaning appliances" of IEC/TC 59 "Performance of household and similar electrical appliances".

Significant technical differences are:

- a) rephrased subclause 4.6 on the operation of the dry vacuum cleaner;
- b) new debris pick-up test for hard floor and carpet;
- c) improvement of test with loaded dust receptacle in subclause 5.9;
- d) inclusion of a new subclause 5.10 on total emissions while vacuum cleaning;

e) tt new durability test for secondary hoses; s/sist/fa4b89ff-10cd-4b28-90ad-b50a9cd57989/sist-

f) two normative Annexes on the description and maintenance of the reference vacuum cleaner system RSB.

The addition of new tests has changed the structure of almost the entire Clause 5. Furthermore, changes have been made in numerous subclauses. Therefore, the entire Clause 5 has been inserted as an amendment.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

This document is foreseen as a document for future Commission Delegated Regulation on labelling and future Commission Regulation on ecodesign for vacuum cleaners.

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

# 1 Modification to Clause 1, Scope

#### Replace with:

"This document is applicable for measurements of the performance of mains-operated **dry vacuum cleaners**, including **water filter vacuum cleaners** for household or similar use.

NOTE 1 Measurements of the performance of mains-operated commercial **dry vacuum cleaners** are found in EN IEC 62885-8.

The purpose of this document is to specify essential performance characteristics of **dry vacuum cleaners** which are of interest to users and to describe methods for measuring these characteristics.

NOTE 2 Due to the influence of environmental conditions, variations in time, origin of test materials and proficiency of the operator, some of the described test methods will give more reliable results when applied for comparative testing of a number of appliances at the same time, in the same laboratory and by the same operator.

NOTE 3 The methods here can be applied with modifications for surface-cleaning product types or technologies not currently covered within the scope.

For safety requirements, reference is made to EN 60335-1 and EN 60335-2-2.

A recommendation on information for the consumer at the point of sale is given in Annex B."

## 2 Modification to Clause 2, Normative references

"

u

IEC/TS 62885-1:2020, Surface cleaning machines – Part 1: General requirements on test material and test equipment

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EN IEC 60704-2-1:2020, Household and similar electrical appliances - Test code for the determination of airborne acoustical noise - Part 2-1: Particular requirements for dry vacuum cleaners

Delete the following references:

IEC 60704-1, Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 1: General requirements

ISO 554, Standard atmospheres for conditioning and/or testing — Specifications

ISO 679, Cement — Test methods — Determination of strength

ISO 1763, Textile floor coverings — Determination of number of tufts and/or loops per unit length and per unit area

ISO 1765, Machine-made textile floor coverings - Determination of thickness

ISO 1766, Textile floor coverings — Determination of thickness of pile above the substrate

ISO 2424, Textile floor coverings - Vocabulary

ISO 8543, Textile floor coverings — Methods for determination of mass

## 3 Modification to Clause 3, Terms and definitions

#### 3.1

#### dry vacuum cleaner

Replace the word "ambient" with phrase "ambient air".

#### 3.2

#### upright vacuum cleaner

Replace the phrase "vacuum cleaner" with "dry vacuum cleaner".

#### 3.3

#### cleaning head

Replace the phrase "vacuum cleaner" with "dry vacuum cleaner".

# 3.4 active nozzle

Replace Note by:

Note 1 to entry: The agitation device can be driven by an incorporated electric motor (motorized nozzle), an incorporated turbine powered by the air flow (air-turbine nozzle), or an incorporated friction or gear mechanism actuated by moving the **cleaning head** over the surface to be cleaned (mechanical nozzle).

Delete term entry 3.9 "cleaning cycle"

3.10 stroke pattern Replace by: (standards.iteh.ai)

"arrangement of the forward strokes and return strokes on the surface to be cleaned"

**3.11** <u>SIST EN 60312-1:2017/A11:2022</u> parallel pattern ds.iteh.ai/catalog/standards/sist/fa4b89ff-10cd-4b28-90ad-b50a9cd57989/sist-*Replace by:* en-60312-1-2017-a11-2022

"stroke pattern where the **forward strokes** and the **return strokes** are congruent and are carried out in the direction of the carpet pile (direction of manufacture) unless otherwise specified"

3.12 stroke speed Replace by:

"speed of the **cleaning head**, moved as uniformly as possible, during a **forward stroke** or a **return stroke**"

#### **3.14 double stroke** *Replace by:*

"one forward and one backward movement of the **cleaning head** performed according to the appropriate stroke pattern"

#### **3.15 forward stroke** *Replace Note by:*

"

Note 1 to entry: On test carpets, forward strokes are carried out in the direction of the carpet pile."

#### 3.Z1

#### reference vacuum cleaner system

Replace title and definition with:

"

#### 3.Z1

#### reference vacuum cleaner system RSB

electrically operated laboratory equipment intended to provide different laboratories with a similarly constructed vacuum cleaner to measure the reference dust removal ability on carpets for passive and active nozzles to improve the reproducibility of results

Note 1 to entry: The reference vacuum cleaner system RSB may be used with active or passive nozzles.

Note 2 to entry: The **reference vacuum cleaner system RSB** is not intended for tests other than dust pick-up from Wilton test carpets.

Note 3 to entry: The **reference vacuum cleaner system RSB** is described in Annex ZB. Maintenance of the RSB is described in Annex ZC.

Note 4 to entry: The **reference vacuum cleaner system RSB** is required for measurements in accordance with legislation in the European Union."

#### 3.Z2

hybrid vacuum cleaner Replace by: I I Ch STANDARD PREVIEW

"dry vacuum cleaner that can be either mains and/or battery-operated"

#### 3.Z3

battery operated active nozzle

cordless active nozzle

**cleaning head** provided on a mains-operated machine with an agitation device to assist dirt removal driven by a battery-operated motor"

3.Z4 cylinder vacuum cleaner Replace by:

"portable **dry vacuum cleaner** having a nozzle separated from the cleaner housing by a hose; in use, only the nozzle is guided over the surface area to be cleaned

Note 1 to entry: These dry vacuum cleaners are generally floor-supported.

Note 2 to entry: The **dry vacuum cleaner** may have detachable passive or active nozzles, attachments, and **tubes** for both floor and above the floor cleaning."

#### 3.Z6

#### water filter system

Replace the word "which" with "that".

Add:

"

#### 3.Z7

hand-held cleaner

dry vacuum cleaner that will not be used on the floor by the user from an erect standing position

Note 1 to entry: The hand-held dry vacuum cleaner may also be used on stairs from a standing position.

#### 3.Z8

#### in-house reference vacuum cleaner

electrically operated laboratory equipment designated for internal comparison within a laboratory

#### 3.Z9

#### maximum operational power

power level that the machine is not capable of exceeding in any operating condition set either by the user or automatically by the appliance

#### 3.Z10

## stroke single traverse of the cleaning head over the test area

#### 3.Z11 test



entirety or superset of all **trials** and **trial** batches of all samples to be measured for a single **vacuum cleaner** model

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#### trial

single instance of a performance measurement carried out under identical conditions that can be repeated multiple times

# 3.Z13

#### tube

rigid length or lengths of hollow pipe that connect the end of the hose to various vacuum cleaner accessories

Note 1 to entry: The tube may be of fixed length, in multiple parts or telescopic, passive or energized."

# 4 Modification to Clause 4, General conditions for testing

## 4.1 Atmospheric conditions

#### Replace with:

"Unless otherwise specified, the test procedures and measurements shall be carried out under the following conditions:

#### Standard atmosphere 23/50

Temperature:	(23 ± 2) °C
Relative humidity:	(50 ± 5) %
Absolute air pressure:	91,3 kPa to 106,3 kPa

Temperature and humidity conditions within the specified ranges are required for good repeatability and reproducibility. Care should be taken to avoid changes during a **test**.

For test procedures and measurements carried out at other than standard atmospheric conditions, the ambient temperature shall be maintained at  $(23 \pm 5)$  °C."

Delete the Note in Clause 4.1.

#### 4.2 Test equipment and materials

Replace with:

"

#### 4.2.1 General

To minimize the influence of electrostatic phenomena, measurements on carpets shall be carried out on a flat floor consisting of a smooth untreated pine plywood or equivalent panel, at least 15 mm thick and of a size equal to or larger than the test carpet.

Equipment and materials for measurements (devices, test carpets, test dust, etc.) to be used in a test shall, prior to the test, be stored for at least 16 h at standard atmospheric conditions in accordance with 4.1.

Carpets that have already been used shall be stored unbeaten at standard atmospheric conditions in accordance with 4.1.

When not in use, carpets shall be hanging free, or lying flat, pile upwards and uncovered. Carpets shall not be rolled when stored between testing. Carpets that have been rolled shall be laid flat for a minimum of 16 h before use.

#### 4.2.2 Pile direction

Machine or manufacturing direction is an indication of the projected pile direction for carpet production. Pile direction is what is important for dust pick-up (DPU) testing.

If the pile direction is clearly parallel to the test bed, as is required by the applicable test procedures, the carpet is acceptable for use for that test. If the pile direction is at an angle to the test bed, the laboratory will be required to decide as to that carpet panel's usability for relevant comparative testing.

NOTE The procedure for determining pile direction can be found in IEC TS 62885-1:2020."

#### 4.3 Voltage and frequency

#### Replace 2nd paragraph with:

"**Dry vacuum cleaners** designed for DC only shall be operated at DC. **Dry vacuum cleaners** designed for both AC and DC shall be operated at AC. **Dry vacuum cleaners** not marked with rated frequency shall be operated at either  $(50 \pm 1)$  Hz or  $(60 \pm 1)$  Hz with a total harmonic distortion of  $\leq 3$  %, as is common in the country of use."

Replace the phrase "vacuum cleaner" with "dry vacuum cleaner" in 3rd paragraph.

#### Replace 4th paragraph with:

"If the rated voltage differs from the nominal system voltage of the country concerned, measurements carried out at rated voltage can give test results that are misleading for the consumer, and additional measurements can be required. If the test voltage differs from the rated voltage, this shall be reported."

#### 4.4 Running-in of vacuum cleaner

Replace the phrase "vacuum cleaner" with "dry vacuum cleaner,".

#### 4.5 Equipment of the dry vacuum cleaner

Replace the phrase "vacuum cleaner" with "dry vacuum cleaner" in the 1st paragraph.

#### Replace 2nd paragraph with:

"If the **dry vacuum cleaner** is provided with a reusable dust receptacle (as the sole original dust receptacle or as an enclosure for disposable dust receptacles), the dust receptacle and any additional filters removable without the aid of tools shall, prior to each measurement, be cleaned according to the manufacturer's instructions until its mass is within 1 % or 2°g of its original mass, whichever is the lower."

Replace the 4th and 5th paragraph with:

"For **dry vacuum cleaners** equipped with separation devices, being part of the appliance, used to separate the dust from the air flow and/or having additional filters to be changed or cleaned by the user, without the use of tools, the change in mass of such specific devices shall be taken into account for dust removal ability.

**Dry vacuum cleaners** with disposable or reusable dust receptacles may have secondary filtration stage devices which do not collect meaningful dust in removal ability tests, but which do impact on filtration and life tests. Replacement and/or maintenance of such devices shall be in accordance with relevant clauses and carried out according to the manufacturer's instructions."

#### 4.6 Operation of the vacuum cleaner

Replace title with:

#### "Operation of the dry vacuum cleaner"

#### 4.6.1 General

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"The grip of cleaners with suction hose or the handle of other cleaners shall be held at a height of  $(800 \pm 50)$  mm above the test surface. Any telescopic **tubes** or sticks shall be extended to maximum length. For nozzles without pivoting connectors, it shall be ensured that the bottom of the **cleaning head** be made parallel with the test surface by adjusting the handle height within the tolerances. If this is not possible, the length of a telescopic **tube** or stick may be adjusted. Any adjustment shall be reported.

During measurements where the agitation device of an **active nozzle** is not used as in normal operation, the agitation device shall be running but not in contact with any surface.

The following wording regarding declaration and compliance shall also apply to EN IEC 60704-2-1:2020: "For declaration and compliance purposes, related tests conducted on a surface type (carpet or hard surface with or without crevice) shall be conducted with the same **dry vacuum cleaner** setting configurations such as power, **cleaning head** and **cleaning head** setting."

Related tests are:

- tests measuring the dust removal from carpet, the debris removal from carpet, the energy consumption for cleaning a carpet, and the noise level on carpet.
- tests measuring the dust removal from hard floor with crevices, the debris removal from hard floor, the energy consumption for cleaning a hard floor with crevices, and the noise level on hard floor.

Unless otherwise specified, the dry vacuum cleaner setting configurations, such as power, **cleaning head** and **cleaning head** setting, shall be used, and adjusted in accordance with the manufacturer's instructions for the surface to be cleaned (e.g. carpet or hard floor) for the test to be carried out.

In the absence of unambiguous instructions within the manufacturer's instructions, the product shall be tested with settings that are in accordance with any explicitly clear text, symbol or pictogram that is identifiable on the product.

If, after following the above order of checks, the tester believes the device under test to be in a configuration that is ambiguous, or that multiple configurations are possible with no way to clearly determine which is the most suitable for a given task, then the manufacturer shall be contacted for additional guidance.

Complete details of the settings used for each cleaning task, such as suction power, height settings and the like shall be recorded in the test documentation.

If values for the performance of a product measured in accordance with this document are published/declared, e.g. in the technical documentation, accurate and unambiguous details of the settings that were used during the test procedure shall be provided.

NOTE Performance in other settings or combinations can differ from the results in the declaration settings, however this document does not address those results."

#### 4.6.2 Operation of water filter vacuum cleaners, additional requirements

#### 4.6.2.1 Determining the water loss

Replace with:

"Prior to the preconditioning the water loss of the water filter vacuum cleaner shall be determined.

The **water filter vacuum cleaner** shall be run according to the manufacturer's instructions for a period of 10 min with the suction nozzle lifted 20 mm from the floor in accordance with 4.1. Before and after this running time of 10 min the mass of the water filter system shall be measured with an accuracy of at least 0,1 g. This trial shall be repeated 3 times and an average of these 3 trials shall be noted.

Since ambient conditions have a significant influence on the water loss, standard conditions shall be carefully maintained."

**4.6.2.2 Filter conditions** en-60312-1-2017-a11-2022

Replace with:

"

#### 4.6.2.2.1 For dust and debris removal from hard flat floors and from carpets

If the value measured according with 4.6.2.1 is lower than 0,1 g/min, the **water filter vacuum cleaner** shall be used in accordance with the manufacturer's instructions for the dust removal from hard flat floors and carpet.

The water filter vacuum cleaner should not be moved to minimize loss of water.

NOTE 1 The mass of water lost during the measuring time is low and has no relevant influence on the test result.

If the value measured according to 4.6.2.1 is equal or higher than 0,1 g/min and the **water filter vacuum cleaner** is equipped with a dust collection system that does not use water, this collecting system shall be included to determine the dust and debris removal from hard flat floors and dust and debris removal from carpet.

The air data in accordance with 5.11 shall be measured with the water filter system used according to the manufacturer's instructions. Then the vacuum cleaner shall be equipped with the dust collecting system without water and the maximum airflow shall be adjusted to  $\pm 3$  % of the measured values with water filter system.

In all other cases, the dust and the debris removal from hard flat floors and from carpets shall be performed using the dust collecting box (see 7.3.Z2) as pre-filter system. The vacuum cleaner shall be used in accordance with the manufacturer's instructions.