

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Surface cleaning appliances –
Part 8: Dry vacuum cleaners for commercial use – Methods for measuring the
performance

Appareils de nettoyage des sols –
Partie 8: Aspirateurs à sec à usage commercial – Méthodes de mesure de
l'aptitude à la fonction



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 97.080

ISBN 978-2-8322-7294-70

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SURFACE CLEANING APPLIANCES –

Part 8: Dry vacuum cleaners for commercial use –
Methods for measuring the performance

FOREWORD

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International Standard IEC 62885-8 has been prepared by subcommittee 59F: Surface cleaning appliances, of IEC technical committee 59: Performance of household and similar electrical appliances.

This first edition cancels and replaces IEC PAS 62611, published in 2009.

This International Standard is to be used in conjunction with IEC 62885-2:2016. This document supplements and modifies the requirements of IEC 62885-2:2016. When a particular clause/subclause of IEC 62885-2:2016 is not mentioned in this document, that clause/subclause applies. Whenever a requirement of this document is in conflict with a requirement of IEC 62885-2:2016, the requirement of this document will take precedence. Additional specific provisions to those in IEC 62885-2:2016, given as individual clauses or subclauses, are numbered starting from 101.

The text of this International Standard is based on the following documents:

CDV	Report on voting
59F/368/CDV	59F/378A/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 62885 series, under the general title *Surface cleaning appliances*, can be found on the IEC website.

In this standard, the following print types are used:

- terms defined in Clause 3: **bold type**.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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SURFACE CLEANING APPLIANCES –

Part 8: Dry vacuum cleaners for commercial use – Methods for measuring the performance

1 Scope

Replace the scope of IEC 62885-2:2016 by the following:

This part of IEC 62885 is applicable for measurements of the performance of mains-operated **dry vacuum cleaners**, including **water filter vacuum cleaners**, for commercial use. The requirements for the construction and testing covered by this document are applied in addition to the requirements for commercial vacuum cleaners in IEC 60335-2-69.

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

NOTE 1 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 2 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 IEC 60335-1 and IEC 60335-2-69.

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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.

This clause of IEC 62885-2 is applicable with the following modifications:

Delete the references IEC 60704-1 and IEC 60704-2-1 and replace by the following reference:

IEC 60335-2-69, *Household and similar electrical appliances – Safety – Part 2-69: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use*

Insert, after the entry for IEC TS 62885-1, the following reference:

IEC 62885-2:2016, *Surface cleaning appliances – Part 2: Dry vacuum cleaners for household or similar use – Methods for measuring the performance*

3 Terms and definitions

This clause of IEC 62885-2:2016 is applicable with the following modifications:

Replace the first paragraph with the following:

For the purposes of this document, the terms and definitions given in IEC 60335-2-69 and the following apply.

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

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

4 General conditions for testing

This clause of IEC 62885-2:2016 is applicable with the following modifications:

4.6 Operation of the dry vacuum cleaner

4.6.1 General

Replace the content of 4.6.1 by the following:

The tube grip of cleaners with suction hose or the handle of other cleaners shall be held at a height of (800 ± 50) mm above the test surface. 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** 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 IEC 60335-2-69: "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."

The **dry vacuum cleaner** setting configurations, such as 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. Any electrical controls shall be set for maximum continuous airflow for the floor surface setting and, unless the manufacturer's instructions state otherwise, any manually operated air by-pass opening for reduction of the suction power shall be closed. A boost function on the vacuum cleaner, changing the **normal operation** mode as stated by the manufacturer, is not activated during any measurement. The **maximum operational power** including the boost function shall not exceed the result from the rated input power measurement as declared by the manufacturer, in accordance with IEC 60335-2-69. Motion resistance, as determined in 6.2, shall not be larger than 40 N for operating the commercial **dry vacuum cleaner** to determine its performance.

NOTE 1 A motion resistance of maximum 40 N is seen as acceptable for application in a professional environment. Higher motion resistance contradicts continuous duty in a professional environment owing to the large force to be applied by the operator during usage, which contradicts the applicability.

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 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 2 Performance in other settings/combinations may differ from the results in declaration settings, however, the document does not address those results.

NOTE 3 Ecodesign Regulation of the European Commission requires noise levels to be determined and declared in accordance with EN 60335-2-69.

5 Dry vacuum cleaning tests

This clause of IEC 62885-2:2016 is applicable, with the following additions:

5.3 Dust removal from carpets

5.3.1 Test carpet

Add, after the last paragraph, the following two sentences:

The two carpet hold-downs serve the purpose of holding the test carpet in position during test, and of acting as guides to keep the **cleaning head** in a straight line as it is moved over the test area. The guides should have a distance of 10 mm from the carpet's surface to ensure an undisturbed flow.

5.101 Debris removal from hard floor

[IEC 62885-8:2019](https://standards.iteh.ai/catalog/standards/sist/0478d583-7d73-4044-b30fe25555edc4ca/iec-62885-8-2019)

5.101.1 Test equipment

<https://standards.iteh.ai/catalog/standards/sist/0478d583-7d73-4044-b30fe25555edc4ca/iec-62885-8-2019>

The surface is conditioned once before the first use, in accordance with 7.3.101. Conditioning only needs to be repeated if the surface is also used for other testing that could impair the smoothness of surface.

Two hold-downs in accordance with 7.3.4 serve the purpose of acting as guides to keep the **cleaning head** in a straight line as it is moved over the test area. The guides should have a distance of 10 mm from the surface to ensure an undisturbed flow.

5.101.2 Test area and stroke length

The double stroke shall start with a **forward stroke** for the first test sequence and with a **backward stroke** for the second test sequence on the test area. The length of the test area is 700 mm ± 5 mm. The width of the test area is equal to the **cleaning head width** (see 3.7).

A length of at least 200 mm shall be added before the beginning of the test area and at least 300 mm added after the test area in order to allow for acceleration and deceleration of the cleaning head. The stroke speed at the deceleration zone shall for the first 50 mm shall not drop below $(0,45 \pm 0,02)$ m/s to ensure that the contact time between nozzle and debris pushed into the deceleration area is not enlarged artificially.

Thus, the **stroke length** is between 1 200 mm and 1 600 mm for the given test length of 700 mm. The centreline of the front edge of the **cleaning head** is aligned to the centreline of the beginning of the acceleration area at the commencement of the stroke, allowing a distance between 200 mm and 300 mm to be used for acceleration. The **cleaning head** shall reach the end of the stroke when the rear edge of the **active depth of the cleaning head** is between 200 mm and 600 mm past the end of the test area, thus allowing a suitable distance for deceleration. The **reverse stroke** is carried out in the same manner until the front edge of

the **cleaning head** is once again lined up with the beginning of the acceleration length in front of the test area.

The **active depth of the cleaning head** shall move at a uniform **stroke speed** of 0,50 m/s ± 0,02 m/s and in a straight line over the test area.

Dry vacuum cleaners equipped with a self-drive device shall be operated at the prescribed **stroke speed** of (0,5 ± 0,02) m/s if possible. Otherwise, the **stroke speed** is determined by the **dry vacuum cleaner**. For optimum control of the **double stroke** movement, it is recommended that a mechanical operator (see 4.8) be used.

5.101.3 Distribution of test debris

Debris is placed flat on the test on the surface perpendicular to the direction of motion of the nozzle as given in Figure 101. Firstly, three rows, each consisting of 5 washers, followed by three lines of nuts. The rows are arranged alternately every 140 mm with respect to the hold-downs and the motion direction: the odd lines are aligned with the right hold-down, the even lines with the left hold-down, each with a distance of 15 mm. The distance of neighbouring debris components depends on the nozzle width and is calculated as follows:

$$d_{nn} = \frac{w_{nozzle} - 15}{6}$$

where

d_{nn} = distance between next neighbours of debris component and
 w_{nozzle} = nozzle width (equal to **cleaning head width B**).

All the distances refer to the centres of the drop-off points of the debris components. So, the outermost washer of the first line starts with a distance of $b = 15$ mm to the right hold-down, then distance of the next neighbouring washer is d_{nn} , etc. The next line with washers is aligned to the left hold-down etc. Figure 101 shows a sketch of a thus obtained debris pattern.

The nuts used for the tests shall be hexagon regular nuts of types ISO 4032 – M3 – CU2, made out of brass CuZn37. In order to ensure consistency, the mass of the nuts need to be within a tolerance range; 100 nuts shall have a mass of between 32,0 g and 35,0 g.

The washers used for the tests shall be plain washers, normal series of types ISO 7089 – 3 – 200 CU2, made out of brass CuZn37. In order to ensure consistency, the mass of the washers need to be within a tolerance range; 100 washers shall have a mass of between 10,0 g and 12,0 g.

Additionally, it shall be ensured that the washers and nuts, lying flat on the test surface, have a smooth surface and are free of sharp edges.

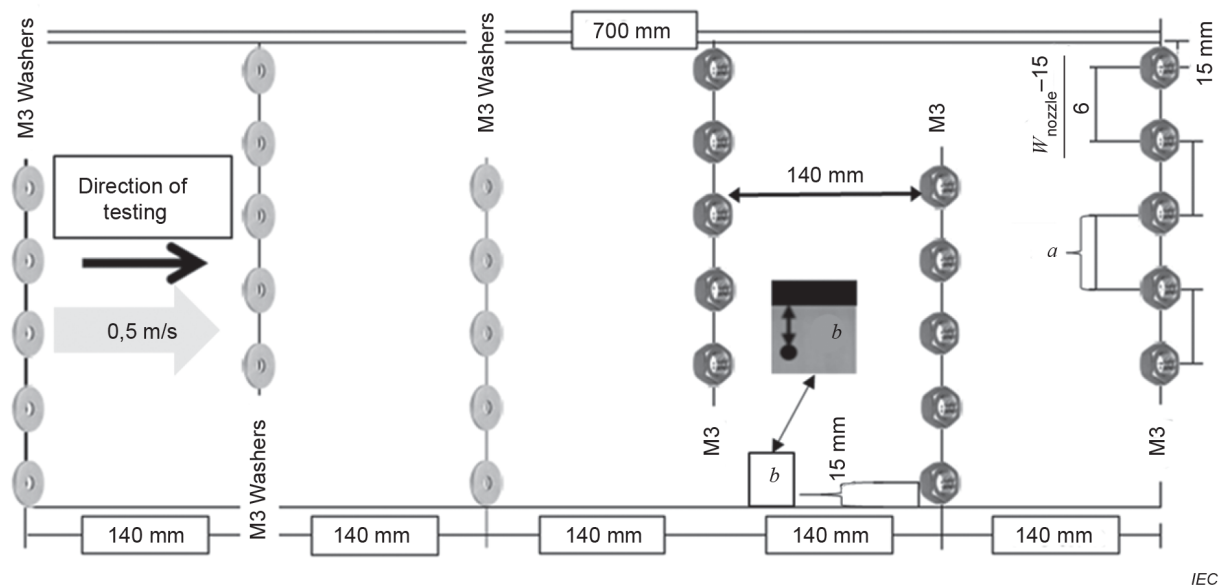


Figure 101 – Debris distribution and distances

5.101.4 Determination of debris removal ability

Prior to starting the test, the vacuum cleaner is conditioned by letting it run for 10 minutes. After this, the **cleaning head** is passed over the testing area by performing **double strokes**, starting with a **forward stroke** or a **backward stroke** as described in 5.2.3, in a **parallel pattern** at a **stroke speed** of $(0,50 \pm 0,02)$ m/s, keeping the **cleaning head** to the centre of the test plate. The quantity of debris removed from the surface after five **double strokes** is determined as the difference of the amount of debris before and after cleanings, both values being recorded. The test is finalised after ten **cleaning cycles**. It shall be ensured that before lifting the nozzle after the test, the vacuum cleaner shall be switched off. Any debris inside or stuck in the brush, if applicable, of the nozzle shall be regarded as not having been picked up.

NOTE The test consists of 20 cleaning cycles where 10 cycles start with a **forward stroke** and 10 cycles start with a **backwards stroke**.

The debris removal ability, in per cent, is calculated in accordance with the following formula as the ratio of the quantity of debris removed to the quantity of debris initially laid onto the testing area.

The mean value of dust removal ability for 20 **cleaning cycles** is calculated as follows:

$$k_{de}(20) = (k_{de}(1) + k_{de}(2) + k_{de}(3) + k_{de}(4) + k_{de}(5) + k_{de}(6) + k_{de}(7) + k_{de}(8) + [...] + k_{de}(19) + k_{de}(20)) / 20$$

$$k_{de} = \frac{m_{da}}{m_{db}} \times 100$$

where

k_{de} is the debris removal ability for a single **cleaning cycle**, in percent;

m_{db} is the debris quantity in the testing area before cleaning, in parts;

m_{da} is the debris quantity remaining on the testing area after cleaning, in parts;