IEC 62885-9

Edition 1.0 2019-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Surface cleaning appliances – Part 9: Floor treatment machines with or without traction drive, for commercial use – Methods for measuring the performance

Appareils de nettoyage des sols – Partie 9: Machines de traitement des sols avec ou sans commande de dispositif de déplacement, à usage commercial – Méthodes de mesure de l'aptitude à la fonction

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FOREWORD

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International Standard IEC 62885-9 has been prepared by subcommittee SC 59F: Surface cleaning appliances, of IEC technical committee TC 59: Performance of household and similar electrical appliances.

This first edition of IEC 62885-9 cancels and replaces IEC 62826:2014 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 62826:2014

a) reference to a dated version of IEC 60335-2-72 to ensure consistency between the two standards;
b) a new calculation for the nominal current consumption in 22.1;
c) a new calculation for the maximum net run-time of commercial floor treatment machines in 22.2;
d) update of the Bibliography.

The text of this standard is based on the following documents:

CDV	Report on voting
59F/359/CDV	59F/371/RVC

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

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

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

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

SURFACE CLEANING APPLIANCES –

Part 9: Floor treatment machines with or without traction drive, for commercial use – Methods for measuring the performance

1 Scope

This part of IEC 62885 lists the characteristic performance parameters for walk-behind and ride-on floor scrubbers and sweepers and other floor cleaning machines in accordance with IEC 60335-2-72:2016.

The intent is to serve the manufacturers in describing parameters for their manuals and their literature. This may include all or some of the parameters listed in this definition document.

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.

IEC 60335-1:2010, *Household and similar electrical appliances – Safety – Part 1: General requirements*
IEC 60335-1:2010/AMD 1:2013[1]

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*

IEC 60335-2-72:2016, *Household and similar electrical appliances – Safety – Part 2-72: Particular requirements for floor treatment machines with or without traction drive, for commercial use*

ISO 1585, *Road vehicles – Engine test code – Net power*

EN 12281, *Printing and business paper – Requirements for copy paper for dry toner imaging processes*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 60335-2-72:2016 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

[1] There exists a consolidated edition 5.1 (2013) that comprises edition 5 (2010) and its Amendment 1 (2013).

3.1.1
pad
cleaning tool of round, oval or other shape, attached to a scrubber in order to clean the surface (floor) by abrasive rotations

Note 1 to entry: It consists of a coarse or fine synthetic membrane. The abrasiveness can be recognized by the colour. The structure (open/closed) determines the suitability for high/low speeds.

3.1.2
brush
cleaning tool of round, oval or other shape, attached to a scrubber in order to clean the surface (floor) by abrasive rotations

Note 1 to entry: It consists of natural or synthetic fibres of different kinds of hardness fixed in a holder. The hardness is subject to the tasks to be executed, such as scrubbing, polishing or shampooing.

3.1.3
broom
cleaning tool of round shape, attached to a sweeper in order to clean the surface (floor)

Note 1 to entry: Regarding the automatic cleaning brooms, distinction can be made between the main broom (main cylindrical brush) and the side broom. The main broom is located normally close to the hopper. The bristles of the main broom are normally arranged as straight, spiral or spiral-vee lines of bristles. Thereby they generate the necessary skidding and there is room enough for bigger particles between the lines of bristles. The function of the side broom is to sweep away dirt from corners and borders towards the course of the main broom.

3.2 Abbreviated terms

FOPS falling-object protective structures

GVW gross vehicle weight

ROPS roll over protection system

4 General conditions for testing

4.1 Atmospheric conditions

Where required, 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) %
Air pressure:	86 kPa to 106 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.

4.2 Machine loading

The machine is loaded for testing to its GVW, as specified in 8.1, unless otherwise stated.

4.3 Machine set-up

Machine settings shall be as described under normal operation as defined in IEC 60335-2-72:2016, except as noted elsewhere in this document. Throughout the measurements, the same type of pad or brush has to be used.

5 Working path width

5.1 Working scrubbing path width

The path the machine cleans, based solely on the width of the brushes or pads. This is the width that is exposed to the full cleaning process, to indicate the effective cleaning width of the machine, not the outside physical width of the machine.

5.2 Total pad/brush width

The nominal width of the cleaning pads or brushes, not taking into account overlap of the pads or brushes. The purpose of this value is to communicate to the end user the size of the pads or brushes that are to be used with the machine.

NOTE This value can be given as follows (example): W_{Pad} = 300 mm for a single pad, or W_{Pad} = 2 × 300 mm for two pads.

5.3 Maximum squeegee width

The path that is covered by the squeegee while operating in a straight line.

5.4 Minimum working sweeping path width

The path the machine sweeps based solely on the nominal width of the main broom, to indicate the effective sweeping width of the machine, not the outside physical width of the machine.

5.5 Maximum working sweeping path width

The path the machine sweeps based solely on the nominal width of the main broom and the side brooms. It is intended to indicate the effective sweeping width of the machine, not the outside physical width of the machine.

5.6 Measurement method

The working path width is the measured width of the floor that is swept or wetted and scrubbed while cleaning in a straight line. All measurements shall be carried out with the machine in the minimum down force setting.

NOTE 1 The more down force that is applied to brushes, the larger the overall diameter of the contact circle with the floor. Testing at the minimum setting will minimise this effect.

NOTE 2 The maximum working path width can be visually detected and measured by letting the brooms/pads/brushes work on a wax coated floor or a soiled floor (e.g. with sand for sweepers and paint for scrubbers).

5.7 Reporting

The values shall be given for a standard machine, and the widths for machines fitted with options shall be noted separately. The values are reported in mm.

6 Minimum aisle turn-around width

6.1 General

The minimum aisle width the machine can turn around in without reversing is an indication of the manoeuvrability of the machine during operation.

6.2 Measurement method

Aisle turn-around width is measured as the minimum distance between two parallel vertical planes that allows the machine to turn 180°, during normal operation, without contacting either of the planes. The planes used shall be higher than the highest elements of the machine under test. The test has to be carried out in both directions.

Flexible components such as squeegees or brushes are allowed to contact the planes.

6.3 Reporting

The value is reported in mm. If the test results for both directions are different, then both figures shall be reported.

7 Machine transport width

7.1 General

The minimum width the machine can pass through, to indicate the manoeuvrability of the machine during transport, not the effective cleaning width of the machine.

7.2 Measurement method

Machine width is measured as the minimum distance between two parallel vertical planes that allows the machine to pass between the planes, while moving in a straight line. Any removable machine part taken off as indicated in the operating manual for this measurement shall be reported with the result.

7.3 Reporting

The value is reported in mm for each machine configuration.

8 Weight

8.1 Gross vehicle weight (GVW) taken from IEC 60335-2-72:2016

The maximum allowable fully laden weight of the machine and its payload, as ready for use, to indicate the maximum weight of the machine.

The GVW includes, if applicable, full clean water tanks, empty dirty water tanks (half full for recycling systems), hopper and dust bags loaded at rated weight capacity, the largest recommended batteries, all options such as cords, hoses, wands, cleaning agents, brooms, brushes, air conditioning and cabins. For ride-on machines, the GVW shall include a standard operator weighing 75 kg.

NOTE 1 A sweeper with a full hopper is not ready for use, but is the heaviest configuration for a sweeper.

NOTE 2 GVW could be apportioned into front and rear axle weight.

8.2 Empty weight

The empty weight of the operational machine, to indicate the maximum weight of the machine without options and batteries.

NOTE This value along with the weight of the container and packaging can be used to calculate the shipping weight.

The empty weight of the operational machine shall exclude

– traction batteries,
– options (e.g. driver cabin, FOPS, ROPS, second and third side broom, front mounted sweeping attachment for scrubbers),
– waste water,
– cleaning detergent,
– swept debris,
– fresh water (in the case of scrubbers or combined machines), and
– the operator's weight.

The weight of options and batteries can be noted separately.

8.3 Transportation weight

The transportation weight of the machine, in kilograms, which includes the batteries but excludes options (e.g. driver cabin, FOPS, second and third side broom, front-mounted sweeping attachment for scrubbers), fresh water (in the case of scrubbers or combined machines), and the weight of a standard operator (75 kg).

8.4 Reporting

The values are reported in kg. The actual mass may vary by ±5 %.

9 Maximum scrub deck down force

9.1 General

The maximum down-force on the floor is intended to be an indication of the maximum scrubbing force that can be generated by the machine in normal operation, without overloading motors or circuit protection devices.

9.2 Measurement method

Maximum scrub deck down force is measured as the reactive force while operating the machine in a stationary position, with the deck on a smooth stainless-steel surface (not more than 1,5 mm above or under the ground plane).

NOTE Squeegees that are mounted on the scrubbing unit will affect the result of the measurement. This is acceptable for the purpose of this measurement.

9.3 Reporting

The reported value in N is the recorded maximum force that the measurement does not drop below during a 15 s measurement period, using clean tap water. For a cylindrical deck, the manufacturer shall specify the type of brush material to be used. For a disc deck, a typical medium grade pad shall be used.

The brush or pad material type and the machine scrub setting shall be stated in the report.

If the machine design is such that the down force varies as the power input changes, the minimum value during the 15 s measurement period shall be recorded. All side skirts that contact the stainless-steel plate during the test shall be positioned, or fixed, so that they are capable of supporting as much weight as they would if the machine were propelled forward.

10 Maximum scrub deck down pressure

10.1 General

The scrub deck down pressure is calculated as the force per pad/brush contact area.

10.2 Determination method

The scrub deck down pressure is calculated by dividing the scrub deck down force (see Clause 9) by the complete pad or brush contact area.

The contact area can be visualized (and subsequently measured) by letting the pad or brush work on a wax-coated floor or a soiled (painted) floor. For cylindrical brushes or pads, the area inside of the rectangular pattern that the pad/brush visualized on the floor is relevant.

Alternatively, the contact area of disc brushes or pads may be calculated as follows:

$$A = \pi \cdot \left(r_o^2 - r_i^2 \right)$$

where

r_o is the outer radius of the contact area (total pad or brush width, see 5.2);

r_i is the inner radius of the contact area, i.e. the internal area without bristles, if applicable.

For orbiting scrub systems, the contact area shall be calculated.

NOTE Owing to the orbiting system, a visualization as previously described would enlarge the measured area incorrectly.

10.3 Reporting

Maximum scrub deck down pressure is reported in N/cm^2. The type of pad or brush should be noted along with the machine scrub setting used during this measurement.

11 Rotational speed of pads, brushes and brooms

11.1 General

The rotational speed indicates the number of revolutions per minute that the cleaning attachment will attain at the stated load.

11.2 Measurement method – unloaded operation

Maximum rotational speed attainable without the cleaning attachment in contact with the floor. The nominal speed of the output shaft of the pad/brush/broom motor gearbox combination can be taken as indication for the maximum rotational speed.

NOTE It can be impossible to measure this value because machine controls switch off the drive of the unloaded cleaning attachment.

11.3 Measurement method – loaded operation

Maximum rotational speed attainable while operating the cleaning attachment under maximum scrub deck down force (see Clause 9).

11.4 Reporting

The rotational speed is reported in r/min.

12 Maximum floor load and wheel contact pressure

12.1 General

The maximum pressure exerted onto a floor surface by any wheel or caster on the machine during expected operation or transport mode.

These parameters are intended to indicate the suitability of the machine for specific floor surfaces. The values can be compared against the static load limit rating of the floor surface.

12.2 Measurement method

The maximum floor load shall be measured in accordance with Annex A on concrete precast paving slabs that conform to IEC 60335-2-72:2016.

12.3 Reporting

The value is reported in accordance with Annex A.

13 Speed

13.1 Maximum transport mode speed (power-driven machines)

The transport speed of the machine, moving in a straightforward direction, on a flat smooth surface. This parameter is intended to indicate the maximum transport speed of the machine, with no other machine functions operating.

13.2 Maximum working mode speed

The working speed, as defined by the manufacturer, at which the machine is travelling in a straight, forward direction, on a straight, flat, smooth concrete surface. This parameter is intended to indicate the recommended maximum working speed of the machine, with all floor cleaning functions of the machine operating simultaneously.

13.3 Measurement method

Transport mode speed is measured after acceleration to the maximum speed is achieved.

Working mode speed is measured after acceleration to the working speed is achieved.

13.4 Reporting

The values are reported in km/h.

14 Sound

14.1 Sound power level

The overall A-weighted emission sound power level of the machine, to indicate of the total sound power emitted by the machine.