

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-69: Exigences particulières pour les aspirateurs fonctionnant en
présence d'eau ou à sec, y compris les brosses motorisées, à usage commercial**



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Edition 6.0 2021-04

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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	9
3 Terms and definitions	10
4 General requirement.....	13
5 General conditions for the tests	13
6 Classification.....	14
7 Marking and instructions.....	14
8 Protection against access to live parts.....	18
9 Starting of motor-operated appliances	18
10 Power input and current.....	18
11 Heating.....	18
12 Charging of metal-ion batteries.....	20
13 Leakage current and electric strength at operating temperature.....	20
14 Transient overvoltages	20
15 Moisture resistance.....	20
16 Leakage current and electric strength.....	22
17 Overload protection of transformers and associated circuits	22
18 Endurance	22
19 Abnormal operation.....	22
20 Stability and mechanical hazards.....	25
21 Mechanical strength	25
22 Construction	28
23 Internal wiring.....	30
24 Components	30
25 Supply connection and external flexible cords	31
26 Terminals for external conductors.....	32
27 Provision for earthing	32
28 Screws and connections	32
29 Clearances, creepage distances and solid insulation	32
30 Resistance to heat and fire	33
31 Resistance to rusting.....	33
32 Radiation, toxicity and similar hazards.....	33
Annexes	38
Annex A (normative) Routine tests.....	39
Annex B (normative) Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances	40
Annex AA (normative) Particular requirements for vacuum cleaners and dust extractors for the collection of hazardous dusts and combustible dusts.....	41
Annex BB (xxx) Void	60
Annex CC (xxx) Void.....	61

STANDARD PREVIEW
(standards.iteh.ai)

[IEC 60335-2-69:2021](#)

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Annex DD (normative) Particular requirements for vacuum cleaners for use in ESD protected areas.....	62
Annex EE (informative) Emission of acoustical noise	65
Annex FF (informative) Emission of vibration	74
Annex GG (normative) Particular requirements for mobile wet vacuum cleaners for rescue and firefighting services (MWF)	75
Bibliography.....	80
Index of defined terms	82
Figure 101 – Impact test apparatus.....	34
Figure 102 – Apparatus for testing the abrasion resistance of current-carrying hoses	35
Figure 103 – Apparatus for testing the resistance to flexing of current-carrying hoses	36
Figure 104 – Configuration of the hose for the freezing treatment	36
Figure 105 – Flexing positions for the hose after removal from the freezing cabinet.....	37
Figure 106 – Probe for measuring surface temperatures	37
Figure AA.1 – Warning label for dust class L, M and H machines	56
Figure AA.2 – Warning label for ACD	57
Figure AA.3 – Test method for essential filter material	57
Figure AA.4 – In situ essential filter element test.....	58
Figure AA.5 – Assembled machine test.....	58
Figure AA.6 – Sequence and selection of tests for dust class L, M and H machines according to Clause 22	59
Figure EE.1 – Position of vacuum cleaners and its accessories.....	70
Figure EE.2 – Position of upright machines.....	72
Figure EE.3 – Position of back-pack vacuum cleaners	73
Figure GG.1 – Warning label for flammable or combustible liquids.....	79
Table 101 – Maximum temperature rises for specified accessible external surfaces under normal operating conditions	19
Table 12 – Pull force and torque	32
Table AA.1 – Penetration limits.....	47

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-69: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use

FOREWORD

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IEC 60335-2-69 has been prepared by subcommittee 61J: Electrical motor-operated cleaning appliances for commercial use, of IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard

This sixth edition cancels and replaces the fifth edition published in 2016. It constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- editorial and technical alignment with IEC 60335-1:2020;
- addition of requirements for pick-up of combustible dusts in other than an explosive dust atmosphere.

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

CDV	Report on voting
61J/737/CDV	61J/745A/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

This part 2 is only to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- sub clauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new sub clause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or sub clause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The following differences exist in the countries indicated below.

- 21.107: Additional requirements for products intended to be lifted by crane exist (Europe).
- 22.207: A mobile power generator in accordance with DIN 14685 is required (Germany).
- 25.6: A safety plug in accordance with DIN 49443 is required. (Germany).

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

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

- reconfirmed,
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INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

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This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

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NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-69: Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electrical motor-operated vacuum cleaners, including **back-pack vacuum cleaners**, and **dust extractors**, for wet suction, dry suction, or wet and dry suction, intended for **commercial** indoor or outdoor use with or without attachments. These machines may be provided with a blowing or **inflating function**. The inner diameter of the dust container connector to the suction hose shall not exceed 200 mm.

It also deals with the safety of **centrally-sited vacuum cleaners**, excluding the installation of the system.

NOTE 101 Attention is drawn to the fact that additional requirements on the safe installation of **centrally-sited vacuum cleaners** are not addressed by this standard but need to be taken into account.

NOTE 102 This standard applies to machines for **commercial use**. The following list, although not comprehensive, gives an indication of locations that are included in the scope:

- public use areas such as hotels, schools, hospitals;
- industrial locations, for example factories and manufacturing shops;
- retail outlets, for example shops and supermarkets;
- business premises, for example offices and banks;
- all uses other than normal housekeeping purposes.

These machines are not equipped with a traction drive. The following power systems are covered:

- mains powered motors up to a **rated voltage** of 250 V for single-phase appliances and 480 V for other appliances,
- **battery-operated** motors.

NOTE 103 Machines for the same intended function but equipped with a traction drive are covered by IEC 60335-2-72.

This standard also applies to machines handling **hazardous dust**, such as asbestos, and **combustible dust** in other than an **explosive dust atmosphere**.

NOTE 104 Additional requirements for machines handling **hazardous dust** are given in normative Annex AA. Attention is drawn to the fact that in many countries additional requirements on hazardous substances might apply.

NOTE 105 Radioactive substances are not covered by definition of **hazardous dust** for the purposes of this standard.

This standard does not apply to

- vacuum cleaners and water-suction cleaning appliances for household use (IEC 60335-2-2);
- floor treatment machines for **commercial use** (IEC 60335-2-67, IEC 60335-2-72);
- spray extraction machines for **commercial use** (IEC 60335-2-68);

NOTE 106 IEC 60335-2-67 and IEC 60335-2-68 cover only machines without traction drive.

- hand-held mains-operated electrical garden blowers, vacuums and blower vacuums (IEC 60335-2-100);
- hand-held and transportable motor-operated electric tools (IEC 60745 series, IEC 61029 series, IEC 62841 series);
- appliances for medical purposes (IEC 60601-1);
- machines designed for use in corrosive environments;
- machines designed for picking up liquids with a flash point below 55 °C;
- machines designed for use in explosive environments (dust, vapour or gas), except those designed for use in zone 22;
- machines intended to vacuum ash from fireplaces, chimneys, ovens, ashtrays and similar places of ash accumulation.

NOTE 107 The flash point temperature limit can vary in different countries. National regulations will need to be taken into account.

NOTE 108 Requirements for vacuum cleaners and dust extractors providing equipment protection level Dc are given in IEC 62784.

NOTE 109 Attention is drawn to the fact that in many countries additional requirements on the safe use of the equipment covered can be specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60079-32-2:2015, *Explosive atmospheres – Part 32-2: Electrostatic hazards – Tests*

IEC TS 62885-1, *Surface cleaning appliances – Part 1: General requirements on test material and test equipment*

IEC 60335-2-41:2012 *Household and similar electrical appliances – Safety – Part 2-41: Particular requirements for pumps*

IEC 61540, *Electrical accessories – Portable residual current devices without integral overcurrent protection for household and similar use (PRCDs)*

ISO 2602, *Statistical interpretation of test results – Estimation of the mean – Confidence interval*

ISO 6344-2, *Coated abrasives – Grain size analysis – Part 2: Determination of grain size distribution of macrogrits P12 to P220*

ISO 7731, *Ergonomics – Danger signals for public and work areas – Auditory danger signals*

ISO 13849-1:2015, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Addition:

normal operation

conditions under which the machine is operated in normal use, obtained at the following power input P_m of the vacuum motor:

$$P_m = 0,5 (P_f + P_i)$$

where

P_f is the input, in watts, when the machine has been operated for 3 min, fitted with the nozzle and hose giving the highest input;

P_i is the input, in watts, when the machine has been operated for 20 s with the nozzle sealed, immediately following the 3-minute-period with the nozzle open. Any valve or similar device used to ensure a flow of air to cool the motor in the event of a blockage of a main air inlet is rendered ineffective.

P_f and P_i are measured with the supply voltage adjusted to **rated voltage**, or to a voltage equal to the mean value of the **rated voltage range** if the difference between the limits of the **rated voltage range** does not exceed 10 % of the mean value of the range. If the difference between the limits of the **rated voltage range** exceeds 10 % of the mean value, the tests are carried out with the supply voltage set to the upper limit of the range.

The measurements are made with the machine fitted with a clean dust bag and filter and with the water container, if any, empty. If the machine is intended for use only with a hose, detachable nozzles are removed and the hose is laid out straight. If the machine is provided with a hose as an optional accessory, it is operated without the hose.

Electrically driven devices, if any, are in operation but are not in contact with the floor or any other surface or with the means used to seal the air inlet.

The normal load is equal to the mean load P_r for the electrically driven agitating device such as a motor driven brush determined in accordance with the following:

- the agitating device operates on a carpet as specified in IEC TS 62885-1;
- the mean load P_r is determined when using the device in the following way:
 - After setting the device, the device is moved twice over a distance of 5 m in the direction giving the highest load;
- the motor responsible for the airflow operates under the same conditions as for determining P_f , i.e. no airflow restrictions, and measurements are taken after 3 min;
- the device is adjusted to the carpet pile height;
- it is necessary to move the agitating device slowly across the carpet to avoid carpet damage.

Soiled water discharge pumps, if applicable, are operated as follows.

The pump delivers a continuous flow of water without any soiled water discharge hose attached to the soiled water outlet of the machines unless the discharge hose is permanently attached to the machine. The vacuum motor works during the test, unless an interlock device is provided to prevent combined operation of both motors.

Machines equipped with an **inflating function** are also operated whilst equipped with the hose as described in the instructions for use. The hose is placed in a straight line away from the machine. Power adjustment controls are set to the highest input power.

Machines equipped with a **blowing function** are also operated whilst equipped with the two hoses or as described in the instructions for use. Both hoses are placed in a straight line away from the machine. Power adjustment controls are set to the highest input power. The blowing hose is not equipped with any attachments, e.g. nozzles.

3.9.3 Addition:

Note 101 to entry: Electronic overcurrent or overtemperature protection circuits are regarded as **PECs**.

Note 102 to entry: Electronic water level sensing devices for protective purposes are regarded as **PECs**.

3.101

water-suction cleaning machine

machine for sucking up a water-based cleaning solution

3.102

back-pack vacuum cleaner

vacuum cleaner designed to have the power source and collector carried on the **operator's** back by means of a supporting device

3.103

motorized cleaning head

hand-held or hand-guided cleaning device connected to the machine, with an integrated electrical motor

Note 1 to entry: The permanently attached main cleaning head is not regarded as a **motorized cleaning head**.

3.104

hazardous dust

non-radioactive dust which is hazardous to health if inhaled, ingested or in contact with the skin

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Note 1 to entry: IEC Directive 79/831/EEC amending 67/548/EEC lists dusts for which the general indication of nature of risk is specified as very toxic, harmful, corrosive or irritant; some dusts can be subject to an exposure limit in the country of use; micro-organisms can be considered as dusts creating a hazard to the health of a person.

Note 2 to entry: Requirements for machines intended to pick up **hazardous dust** are specified in normative Annex AA.

3.105

combustible dust

finely divided solid particles, 500 µm or less in nominal size, which may be suspended in air, may settle out of the atmosphere under their own weight, may burn or glow in air, and may form explosive mixtures with air at atmospheric pressure and normal temperatures

Note 1 to entry: This includes dust and grit as defined in ISO 4225.

Note 2 to entry: The term solid particles is intended to address particles in the solid phase and not the gaseous or liquid phase, but does not preclude a hollow particle.

[SOURCE: IEC 60050-426:2020, 426-02-18, modified – The second part of the definition has been changed]

3.106

explosive dust atmosphere

mixture with air, under atmospheric conditions, of flammable substances in the form of dust, fibres or flyings which, after ignition, permits self-sustaining propagation

Note 1 to entry: Requirements for machines intended to pick up **combustible dust** in an **explosive dust atmosphere** are specified in IEC 62784.

Note 2 to entry: Requirements for machines intended to pick up **combustible dust** in other than an **explosive dust atmosphere** are specified in normative Annex AA.

[SOURCE: IEC 60050-426:2020, 426-01-08, modified – "fibres or flyings" and the notes to entry have been added]

3.107

ESD protected area

EPA

area with a minimum risk for electrostatic discharge that could damage electronic devices, and in which people present in that area are not subjected to any additional risk

Note 1 to entry: Requirements for machines intended to pick up dust in **ESD protected areas** are specified in normative Annex DD.

3.108

dust extractor

stationary or portable equipment specifically designed to be connected to dust-generating machines

Note 1 to entry: A vacuum cleaner is designed to pick up already settled dust.

3.109

centrally-sited vacuum cleaner

vacuum cleaner that is connected to a ducting system installed in the building

Note 1 to entry: During use, the nozzle and its associated hose are connected to one of the suction inlets of the ducting system.

3.110

guard

part of the machine specifically designed to provide protection by means of a physical barrier, such as, for example, a casing, a shield, a cover, a screen, a door, an enclosure or a fence; other parts of the machine that fulfil a primarily operational function, such as, for example, the frame of the machine, may also fulfil a protective function but are not referred to as **guards**

Note 1 to entry: Three main kinds of **guards** can be distinguished: fixed **guards**, interlocking moveable **guards** and adjustable **guards**. Interlocking movable **guards** are required where frequent access is envisaged, while fixed **guards** can be used where frequent access is not envisaged.

3.111

operator

person in direct physical contact with the machine and performing one or more of the following tasks: installing, operating, adjusting, cleaning, moving or performing user maintenance on the machine

3.112

test solution

solution which consists of 20 g of NaCl and 1 ml of a solution of 28 % by mass of dodecyl sodium sulphate in each 8 l of water

Note 1 to entry: The chemical designation of dodecyl sodium sulphate is $C_{12}H_{25}NaSO_4$.

3.113

commercial use

intended use of machines covered by this standard, i.e. not intended for normal housekeeping purposes by private persons but which may be a source of danger to the public

I.e. in particular that

- the machines may be used by cleaning contractors, cleaning staff, etc.;
- they are used in commercial or public premises (i.e. offices, shops, hotels, hospitals, schools, etc.) or in industrial (plants, etc.) and light industrial (workshops, etc.) environments.

Note 1 to entry: **Commercial use** is also called professional use.

3.114

mobile machine

machine capable of being moved from one location to another

Note 1 to entry: This includes portable and hand-held appliances, and excludes fixed and stationary appliances.

[SOURCE: IEC 60050-151:2001, 151-16-45, modified – The term has been modified, deletion of the mention of the use of vehicles in the definition and addition of the note to entry]

3.115

MWF vacuum cleaner

vacuum cleaner for picking up liquids, intended to be used by rescue and firefighting services, integrating a pump for a continuous disposal of the sucked-up liquid

Note 1 to entry: **MWF** is the abbreviation of Mobile Wet vacuum cleaners for rescue and Firefighting and rescue services.

Note 2 to entry: Additional requirements for **MWF** are given in normative Annex GG.

3.116

inflating function

operation mode with the clean air exhaust used to inflate objects with the standard suction hose connected to the air outlet of the machine

Note 1 to entry: Only one hose is connected to the machine at a time.

3.117

blowing function

operation mode with the clean air exhaust connected to an air exhaust hose as specified in the instructions for use, the purpose being to transport the clean exhaust air away from the working location

Note 1 to entry: In this case, two hoses are connected to the vacuum cleaner simultaneously.

4 General requirement

This clause of Part 1 is applicable except as follows.

Replacement of the first paragraph by the following:

Machines shall be constructed so that they function safely so as to cause no danger to persons or surroundings during normal use, even in the event of carelessness, and during installation, adjusting, maintenance, cleaning, repairing or transportation.

Addition:

For the purpose of this standard, the term 'appliance' as used in Part 1 is to be read as 'machine'.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.101 *The test solution is to be stored in a cool atmosphere and used within seven days after its preparation.*