

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**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2021 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC online collection - oc.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

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**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 97.080

ISBN 978-2-8322-9721-6

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

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 |

| | |
|------------------------------------------------------------------------------------------------------------------------------|----|
| 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

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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.

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.

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.