

INTERNATIONAL STANDARD

IEC
60335-2-72

Second edition
2002-07

**Household and similar electrical appliances –
Safety –**

**Part 2-72:
Particular requirements for automatic
machines for floor treatment for commercial
and industrial use**

*Appareils électrodomestiques et analogues –
Sécurité –*

*Partie 2-72:
Règles particulières pour les machines automatiques
de traitement des sols à usage industriel et commercial*



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-72: Particular requirements for automatic machines
for floor treatment for commercial and industrial use**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

This part of International Standard IEC 60335 has been prepared by sub-committee 61J: Electrical motor-operated cleaning appliances for industrial use, of IEC technical committee 61: Safety of household and similar electrical appliances.

This second edition cancels and replaces the first edition published in 1995 and its amendment 1 (2000). It constitutes a technical revision.

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

FDIS	Report on voting
61J/130/FDIS	61J/135/RVD

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 part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fourth edition (2001) 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: Safety requirements for automatic machines for floor treatment for industrial and 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:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- 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.

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.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

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

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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.

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.

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.

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.

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-72: Particular requirements for automatic machines for floor treatment for commercial and industrial use

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of mains or battery supplied **portable** combined machines, with or without a built-in battery charger, having a chassis with or without traction drive, intended for commercial and industrial use indoors or outdoors for dry or wet treatment of hard floors or of floors with carpeting, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

NOTE 101 Examples of such appliances are catering equipment, cleaning appliances for industrial and commercial use, and appliances for hairdressers.

NOTE 102 Mobile equipment is defined as **portable** by part 1.

NOTE 103 Treatment within the meaning of this standard denotes for example

- scrubbing;
- wet or dry pick-up;
- polishing;
- application of wax and sealing products;
- shampooing.

It is also applicable to appliances making use of other forms of energy for the motor; but it is necessary that their influence is taken into consideration.

For machines denoted to handle hazardous dust in normal use, additional requirements are specified in Annex AA of IEC 60335-2-69.

NOTE 104 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.
- for machines denoted for operation or transport in public areas additional requirements may be specified by the national authorities responsible for road traffic licensing regulations.

NOTE 105 This standard does not apply to

- appliances intended exclusively for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- audio, video and similar electronic apparatus (IEC 60065);
- appliances for medical purposes (IEC 60601);
- hand-held motor-operated electric tools (IEC 60745);
- personal computers and similar equipment (IEC 60950);
- transportable motor-operated electric tools (IEC 61029).
- floor treatment machines for commercial and industrial use (IEC 60335-2-67).
- spray extraction appliances for commercial and industrial use (IEC 60335-2-68).
- wet and dry vacuum cleaners for commercial and industrial use (IEC 60335-2-69).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60312, *Vacuum cleaners for household use – Methods of measuring the performance*

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 industrial and commercial use*

NOTE Annex AA contains particular requirements for vacuum cleaners, suction sweeping machines and dust extractors for the collection of dusts hazardous to health.

ISO 3411, *Earth moving machinery – Human physical dimensions of operators and minimum operator space envelope*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

the load corresponding to the rated input or the highest obtainable load of all the particular loads of the various functions that can be operated at the same time in accordance with the manufacturer's instructions. For machines provided with a seat or an operator platform, a mass of 75 kg secured in position at the appropriate height is used to simulate the operator in the most unfavourable position.

Operational functions denote all treatment and driving functions.

The normal operation related to the operational functions is specified as follows:

3.1.9.101 Scrubbing and sweeping machines are operated on a surface of hydraulically pressed concrete paving slabs (see Annex AA) intermittently in accordance with the manufacturer's instructions, at least 30 min switched on, and for a period of 5 min switched off.

An alternative is a smooth concrete area of a surface consistency comparable with hydraulically pressed concrete paving slabs.

3.1.9.102 Dry and wet pick-up machines are operated according to IEC 60335-2-69.

3.1.9.103 Polishing and dry buffing machines are operated as follows.

PVC-surfaces are considered to be suitable for establishing normal operation. The peak of input occurring during the drying process of the chemical applied to treat the surface shall not be taken as normal operation but shall be averaged by extending measurements over a period of at least 10 min.

3.1.9.104 Carpet shampooers are operated on a test surface consisting of a carpet, in accordance with IEC 60312, the carpet being fastened to the floor. The brush of the shampooing machine has, prior to testing, to be conditioned by operating it for 15 min on a clean, dry concrete surface. After running on the concrete surface the brush has to be immersed in a shampoo solution for at least 30 min.

The operation has to be carried out over a period of 10 min where the solution tank has to be filled when starting the operation.

3.101

wet cleaning machines

machines for scrubbing and sucking up cleaning liquids on large surfaces indoors or outdoors, for example scrubbing machines. They may be designed also for combination of dry or wet cleaning and floor treatment with attachments for polishing, buffing, etc., and for sucking-up of dry dirt

3.102

walk-behind machines

machines with or without a traction drive that are guided or moved by the operator. They may be equipped with a sulky attachment with a seat for the operator, however they will be considered for the application as walk-behind machines also

3.103

ride-on machines with an operator platform

machines with a traction drive on which the operator is standing during operation

3.104

ride-on machines with an operator seat

machines with a traction drive on which the operator is sitting during the operation

3.105

sulky

device to enable the operation of machines in a sitting or standing position. They are also called trailers

3.106

instructed person

an individual adequately advised or supervised by a skilled person to enable that individual to avoid hazards that electricity can create

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.101 *In appliances for wet scrubbing and shampooing the liquid containers are filled to the highest level indicated by the manufacturer.*

5.102 *If additional weights are delivered with the appliance, these are inserted before normal operation.*

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Replacement:

Appliances shall be of **class I**, **class II** or **class III** with respect to the protection against electric shock.

Compliance is checked by inspection and by the relevant tests.

6.2 Addition:

Mains supplied and battery powered machines for indoor use intended for dry cleaning only, shall be at least IPX0. Other machines shall be at least IPX3.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Machines shall be marked in addition with:

- serial number indicating (for example, in the form of a code), the year of manufacture, if this is not directly marked;
- gross weight of the machine as ready for use in kilograms, if higher than 100 kg;
- reference to the capability of picking up hazardous dust, in accordance with Annex AA to IEC 60335-2-69;
- substance of the statement "Suitable for picking up hazardous dust", if the machine is capable of doing this;
- substance of the statement "Suitable for use only on surfaces with a gradient not exceeding 2 %" if the machine is not designed to be operated on higher gradients.

7.12 Addition:

The instructions shall contain, if applicable, the substance of the following warnings:

- CAUTION: The machine is not suitable for picking up hazardous dust;
- CAUTION: The machine shall not be used on surfaces with a gradient exceeding 2 %.

The instructions shall include the following regarding preparation for use, operation, maintenance and service, as far as relevant:

- the machine shall be used only by instructed and authorised persons;
- when cleaning, servicing or maintaining the machine, replacing parts or converting to another function the power source shall be switched off. Mains operated machines shall be disconnected by removing the power plug, and battery operated machines shall be disconnected by removing the key of the power switch, or any other effective means;
- before use all covers and doors shall be put in the position specified in the instructions for use.

For mains supplied machines:

- to avoid hazards that may occur when rotating brushes touch or cross the supply cord;
- to take care not to damage or impair the supply cord by stroking, crushing, stretching, etc.;
- to inspect regularly the supply cord for signs of damage or aging;
- to stop using the machine, if the condition of the supply cord is not satisfactory;
- the machine shall be fitted with only those types of supply cords or detachable cords that are specified by the manufacturer of the machine;