

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Household and similar electrical appliances – Safety –
Part 2-80: Particular requirements for fans

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-80: Exigences particulières pour les ventilateurs





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-80: Particular requirements for fans****FOREWORD**

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IEC 60335-2-80 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2015. This edition constitutes a technical revision.

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

- a) alignment with IEC 60335-1:2020;
- b) conversion of some notes to normative text (Clause 1);
- c) introduction of requirements for infant fans (7.12, 7.12.1, 8.1.1, 11.8, 20.2, 20.101, 21.103, 22.44, 22.54, 22.102, B.22.3, B.22.4);

- d) introduction of the use of test probe 19 (8.1.1, 20.2, B.22.3, B.22.4);
- e) introduction of surface temperature limits (Clause 11);
- f) clarification of testing of fans for use in a tropical climate (5.7, Annex P 11.8);
- g) clarification of requirements for remote operation of fans (22.40, 22.49, 22.51).

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

Draft	Report on voting
61/7282/FDIS	61/7306/RVD

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/publications.

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.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. 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 fans.

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 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, or
- revised.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can 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.

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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.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website:

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

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 can differ.

Other safety aspects as described in the ISO 8124 series of standards are applicable to infant fans.

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 publications, basic safety publications and group safety publications 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.

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.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-80: Particular requirements for fans

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric fans for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances including direct current (DC) supplied appliances and **battery-operated appliances**.

Examples of the types of fans that this standard is applicable to are

- ceiling fans;
- **duct fans**;
- **infant fans**;
- partition fans;
- pedestal fans;
- table fans.

This standard also applies to separate controls supplied with fans.

Infant fans are also tested to the applicable requirements of the ISO 8124 series, since it covers hazards other than those arising from the use of electricity such as toxicological hazards.

Appliances not intended for normal household use but which nevertheless can be a source of danger to the public, such as appliances intended for use in shops, in light industry and on farms, are within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account:

- persons (including children) whose
 - physical, sensory or mental capabilities; or
 - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on-board ships or aircraft, additional requirements can be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

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);
- fans incorporated in other appliances.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60245-3, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 3: Heat resistant silicone insulated cables*

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

ISO 8124-1 (all parts), *Safety of toys – Part 1: Safety aspects related to mechanical and physical properties*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.5 Definitions relating to types of appliances

3.5.101 duct fan
fan for installation within an enclosed airway so that the airflow is ducted on both the inlet and outlet sides

3.5.102 infant fan
fan intended for mounting on high-chairs, baby carriages, strollers, perambulators, buggies, bassinettes, cribs, playpens and similar locations

3.7 Definitions relating to safety components

3.7.101 suspension system
system which is used to secure the ceiling fan unit to the ceiling

3.7.102 safety suspension system device
device used to secure the motor with blades of the ceiling fan to the mounting rod of the fan

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.

5.5 Addition:

Fans are operated with any oscillating mechanism in operation.

5.7 Addition:

For fans intended to be used in tropical climates, the tests of Clause 10, Clause 11 and Clause 13 are carried out at an ambient temperature of 40 °C $^{+3} _{-0}$ °C.

For fans marked with an ambient operating temperature, the tests of Clause 10, Clause 11 and Clause 13 are carried out at the marked value $^{+3} _{-0}$ °C.

5.10 Addition:

Partition fans are installed in the centre of a suitable partition having dimensions at least four times the diameter of the air inlet.

Duct fans are installed in a duct in accordance with the installation instructions, the length of the duct being approximately four times the diameter of the fan.

6 Classification

This clause of Part 1 is applicable except as follows.

6.2 Addition:

Duct fans shall be at least IPX2.

6.101 Fans shall be of one of the following classes with respect to climatic conditions:

- fans for temperate climates;
- fans for tropical climates.

Compliance is checked by inspection.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Fans for tropical climates shall be marked with the letter T.

Fans intended for operation in locations where the local ambient temperature exceeds 40 °C shall be marked with the ambient operating temperature.

7.12 *Addition:*

If the instructions state that the guard has to be removed for cleaning purposes, the instructions shall state the substance of the following:

Ensure that the fan is switched off from the supply mains before removing the guard.

The instructions for ceiling fans shall include the substance of the following warning:

WARNING: If unusual oscillating movement is observed, immediately stop using the ceiling fan and contact the manufacturer, its service agent or suitably qualified persons.

The instructions for ceiling fans shall include the following:

- the maintenance cycle and method of maintenance;
- the weight of the appliance in kilograms;
- that the replacement of parts of the **safety suspension system device** shall be performed by the manufacturer, its service agent or suitably qualified persons.

The instructions for fans incorporating motors containing brushes shall include the substance of the following:

If it is necessary to replace the live or neutral brushes to ensure operation of the motor, both brushes and the earth brush shall be replaced at the same time. The brushes shall only be replaced by a suitably qualified person.

The instructions for an **infant fan** shaped or decorated like a toy shall include the substance of the following:

This is not a toy. This is an electrical appliance and must be operated and maintained by an adult.

7.12.1 *Addition:*

Instructions for **fixed appliances** intended for installation above 850 mm in normal use shall include the substance of the following:

Do not mount this product lower than 850 mm from the floor.

The instructions for ceiling fans shall include the following information:

- that the fixing means for attachment to the ceiling, such as hooks or other devices, shall be fixed with a sufficient strength to withstand 4 times the weight of the ceiling fan;
- that the mounting of the **suspension system** shall be performed by the manufacturer, its service agent or suitably qualified persons;
- that the fan is to be installed so that the blades are more than 2,3 m above the floor;
- the model or type reference of a luminaire that may be installed in a fan constructed for this purpose.

The instructions for other fans shall include the following information:

- whether the fan is intended for mounting in outside windows or walls (for partition fans);
- that the fan is to be installed so that the blades are more than 2,3 m above the floor (for fans intended to be mounted at high level);
- that precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances (for **duct fans** and partition fans).

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 Addition:

*Test probe 18 of IEC 61032 is not applied to ceiling fans, **duct fans**, or fans that according to the instructions are required to be mounted at a height exceeding 1,8 m above the floor.*

*In addition to the use of test probe 18, test probe 19 of IEC 61032 is applied wherever test probe 18 is used and with the same test conditions used for test probe 18. For other than **infant fans**, test probe 19 of IEC 61032 is not applied to parts of fans that are located at a height greater than 850 mm in normal use, and to fans which according to the instructions are required to be mounted at a height exceeding 850 mm.*

Commercial fans intended to be used in household environments, such as those used for drying carpets after professional cleaning or flooding/water damage are considered to be fans that are installed in an area open to the public.

8.2 Addition:

*After the removal of **detachable parts** for the purposes of **user maintenance**, the **basic insulation** of internal wiring may be touched provided that it is electrically equivalent to the insulation of cords complying with IEC 60227 or IEC 60245.*

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable except as follows.

10.1 Addition:

Appliances are tested with shutters or similar devices in the open position.

10.2 Addition:

Appliances are tested with shutters or similar devices in the open position.

11 Heating

This clause of Part 1 is applicable except as follows.

11.3 Addition:

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of $4 \text{ N} \pm 1 \text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used.

11.7 Modification:

Replace the first paragraph with the following:

Appliances are operated until steady conditions are established.

11.8 Modification:

Replace the first paragraph with the following:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101.

*Table 101 does not apply to ceiling fans, **duct fans** and fans which according to the instructions are required to be mounted at a height exceeding 2,3 m above the floor.*

Addition:

The temperature rise limits for appliances for tropical climates are reduced by 15 K.

The temperature rise limits for fans marked with an ambient operating temperature are reduced by the difference between the marked value and 25 °C.

The temperature rise of handles or grips of vents and air shutters shall not exceed the value specified in Table 3 for surfaces of handles, knobs, grips and similar parts which are held for short periods only in normal use.