

INTERNATIONAL  
STANDARD

IEC  
60335-2-80

Second edition  
2002-09

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

**Part 2-80:  
Particular requirements for fans**

*Appareils électrodomestiques et analogues –  
Sécurité –*

*Partie 2-80:  
Règles particulières pour les ventilateurs*



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

## 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.
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- 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 IEC technical committee 61: Safety of household and similar electrical appliances.

This second edition cancels and replaces the first edition published in 1997. It constitutes a technical revision.

The text of this part of IEC 60335 is based on the following documents:

FDIS	Report on voting
61/2165/FDIS	61/2245/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 electric 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 publication will remain unchanged until 2003. At this date, the publication will be

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- withdrawn;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

The following differences exist in the countries indicated below.

- 6.2: This requirement is not applicable (USA).
- 6.101: Only fans for tropical climates are allowed (Australia).
- 7.1: The "T" marking is not required (USA).
- 7.1: Fans for installation in walls or windows are to be marked with a reference to the instructions for use (Germany).
- 7.12.1: The instructions for fans to be installed in walls or windows are to state the maximum negative pressure allowed in the room when the fan is operated simultaneously with an appliance supplied with energy other than electricity (Germany).
- 7.12.1: The fan blades are only required to be 2,1 m above the floor (Australia).
- 7.12.1: Other mounting heights are specified and have to be marked on the appliance (USA).
- 19.7: The addition is not applicable (USA).
- 20.1: The additional test for portable pedestal fans is not carried out (Japan).
- 20.2: The requirements are different (USA).
- 21.102: The loads are different (USA).
- 23.3: Different requirements apply (USA).
- 24.101: The requirement is not applicable (USA).

A bilingual version of this publication may be issued at a later date.

## 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.

# 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 International Standard 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.

NOTE 101 Examples of fans that are within the scope of this standard are

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

This standard also applies to separate controls supplied with fans.

Appliances not intended for normal household use but which nevertheless may 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

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 102 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 and similar authorities.

NOTE 103 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.

### 3 Definitions

This clause of Part 1 is applicable except as follows.



**3.1.9 Replacement:****normal operation**

operation of the appliance under the following conditions

Table and pedestal fans are operated with any oscillating mechanism in operation.

Ceiling fans are fixed to a ceiling.

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.

**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.

**5.7 Addition:**

*For fans intended to be used in tropical climates, the tests of Clauses 10, 11 and 13 are carried out at an ambient temperature of  $40\text{ °C} \pm 2\text{ °C}$ .*

**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.

#### **7.12.1 Addition:**

The installation instructions shall include the substance of the following:

- the model or type reference of a luminaire that may be installed in a fan constructed for this purpose;
- 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 and partition fans).

### **8 Protection against access to live parts**

This clause of Part 1 is applicable except as follows.

#### **8.1.1 Modification:**

*Lamps are not removed. However, during insertion or removal of lamps, protection against contact with **live parts** of the lamp cap shall be ensured.*

### **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.

#### **11.7 Replacement:**

*Appliances are operated until steady conditions are established.*

#### **11.8 Addition:**

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

## **12 Void**

## **13 Leakage current and electric strength at operating temperature**

This clause of Part 1 is applicable.

## **14 Transient overvoltages**

This clause of Part 1 is applicable.

## **15 Moisture resistance**

This clause of Part 1 is applicable except as follows.

### **15.1.1 Addition:**

*The outer part of appliances intended to be mounted in outside windows and walls is subjected to the test of subclause 14.2.4(a) of IEC 60529, the part of the appliance that is not mounted on the outside of the window or wall being protected against spray from the oscillating tube. The test is carried out with the appliance in the rest position and then in operation while supplied at **rated voltage** with shutters or similar devices in the open position.*

*Duct fans are subjected to the test of subclause 14.2.2 of IEC 60529 while in the rest position and then in operation while supplied at **rated voltage**.*

## **16 Leakage current and electric strength**

This clause of Part 1 is applicable.

## **17 Overload protection of transformers and associated circuits**

This clause of Part 1 is applicable.

## **18 Endurance**

This clause of Part 1 is not applicable.

## **19 Abnormal operation**

This clause of Part 1 is applicable except as follows.

### **19.1 Addition:**

*Fans incorporating shutters or similar devices operated by a control are also subjected to the test of 19.101.*

**19.7 Addition:**

Separate controls are mounted on a dull black-painted plywood board. Approximately 50 % of the area of each ventilating opening is blocked. The temperature of windings shall not exceed the values specified in Table 8 and the temperature rise of the board shall not exceed

- 50 K, for appliances with T marking;
- 65 K, for other appliances.

**19.9** Not applicable.

**19.101** Fans incorporating shutters or similar devices that are operated automatically are supplied at **rated voltage** and operated with the shutters or similar devices held in the closed or open position, whichever is more unfavourable.

**20 Stability and mechanical hazards**

This clause of Part 1 is applicable except as follows.

**20.1 Addition:**

**Portable pedestal fans** having a height exceeding 1,7 m and a mass exceeding 10 kg are placed on a horizontal surface. A force of 40 N is applied to the appliance at a height of 1,5 m in the most unfavourable horizontal direction.

*The appliance shall not overturn.*

NOTE 101 Suitable means may be used to prevent the appliance from sliding.

**20.101** Fan blades, other than those of fans for mounting at high level, shall be guarded unless their leading edges and tips are rounded and

- they have a hardness less than D 60 Shore, or
- they have a peripheral speed less than 15 m/s when the fan is supplied at **rated voltage**, or
- the fan has a power output not exceeding 2 W when supplied at **rated voltage**.

NOTE An edge with a radius of not less than 0,5 mm is considered to be rounded.

*Compliance is checked by inspection and by measurement.*

**21 Mechanical strength**

This clause of Part 1 is applicable except as follows.

Appliances are also subjected to the test of 21.101.

**21.101** Fan guards are subjected to a push force and a pull force of 20 N applied along the axis of the fan motor. After the test, it shall not be possible to touch dangerous moving parts with a test probe that is similar to test probe B of IEC 61032, but having a circular stop face with a diameter of 50 mm instead of the non-circular face.

**21.102** Ceiling fans shall have adequate strength.

*Compliance is checked by the following test.*

*Ceiling fans are mounted in accordance with the installation instructions. A load equal to four times the mass of the fan is suspended from the body of the fan for 1 min.*

*A torque of 1 Nm is then applied to the fixed body of the fan for 1 min. The test is repeated with the torque applied in the reverse direction.*

*The suspension system shall not break and the fan shall not be damaged to such an extent that compliance with 8.1, 16.3 and Clause 29 is impaired.*

## **22 Construction**

This clause of Part 1 is applicable except as follows.

### **22.1 Addition:**

NOTE 101 The enclosure defined in IEC 60529 does not include guards for fan blades.

### **22.11 Modification:**

*The 50 N force is not applied to clips used to fasten fan guards. Instead, a force of 15 N is applied in any direction to the clips in an attempt to release them.*

**22.101** Appliances having provision for attaching a luminaire shall incorporate appropriate terminals and internal wiring.

*Compliance is checked by inspection.*

## **23 Internal wiring**

This clause of Part 1 is applicable except as follows.

### **23.3 Modification:**

*Instead of moving the movable part backwards and forwards, fans with an oscillating mechanism are tested as follows.*

*Fans are supplied at **rated voltage** and operated under **normal operation**, the angle of oscillation being the maximum allowed by the construction. The test is carried out for 100 000 cycles of oscillation.*

## **24 Components**

This clause of Part 1 is applicable except as follows.

### **24.2 Addition:**

Appliances having a **rated power input** not exceeding 25 W may be fitted with a switch in the **supply cord**.

**24.101 Thermal cut-outs** incorporated in duct fans in order to comply with Clause 19 shall not be self-resetting.

*Compliance is checked by inspection.*

## **25 Supply connection and external flexible cords**

This clause of Part 1 is applicable except as follows.

### **25.5 Addition:**

**Type Z attachment** is allowed for **portable fans**.

## **26 Terminals for external conductors**

This clause of Part 1 is applicable.

## **27 Provision for earthing**

This clause of Part 1 is applicable.

## **28 Screws and connections**

This clause of Part 1 is applicable.

## **29 Clearances, creepage distances and solid insulation**

This clause of Part 1 is applicable except as follows.

### **29.2 Addition:**

The microenvironment is pollution degree 3 unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance.

## **30 Resistance to heat and fire**

This clause of Part 1 is applicable except as follows.

**30.2.2** Not applicable.

## **31 Resistance to rusting**

This clause of Part 1 is applicable.

## **32 Radiation, toxicity and similar hazards**

This clause of Part 1 is applicable.

## **Annexes**

The annexes of Part 1 are applicable.

## **Bibliography**

The bibliography of Part 1 is applicable.

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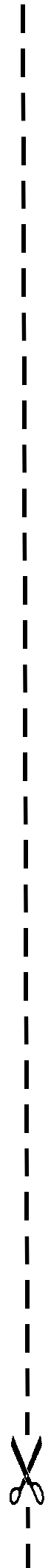
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