

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-84: Particular requirements for toilet appliances

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-84: Exigences particulières pour les appareils de toilettes

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IEC 60335-2-84:2019

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –**
Part 2-84: Particular requirements for toilet appliances**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.
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This third edition cancels and replaces the second edition published in 2002, Amendment 1:2008 and Amendment 2:2013. This edition constitutes a technical revision.

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

- definitions have been renumbered (Clause 3);
- requirements for installation instructions have been updated to reflect the option in 7.101 of the label being placed on the appliance (7.12.1);
- some notes have been converted to normative text (7.101, 22.103, 27.1, 31);
- requirements have been added for appliances that have programmable electronic circuits that limit the number of heating elements and motors from being energized at the same time (22.105, Annex R).

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

CDV	Report on voting
61/5749/CDV	61/5846B/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 fifth edition (2010) 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 toilet appliances.

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 the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

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.

- 3.1.9: Normal operation is different (USA);
- 6.2: Toilets, spray seats and heated seats are allowed to be IPX3 (Japan);
- 22.103: The test is different (USA).

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 2-84: Particular requirements for toilet appliances

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric toilet appliances having a rated voltage being not more than 250 V, in which excrement is stored, dried or destructed or which wash or dry parts of the human body.

NOTE 101 Examples of such electric toilets are the following and they can be used to process garbage such as paper and food waste.

- **mouldering toilets;**
- **package toilets;**
- **freezing toilets;**
- **vacuum toilets.**

This standard also applies to electric equipment for use with conventional toilets.

NOTE 102 Examples of such electric equipment are

- automatic seat covering devices;
- chopping units; <https://standards.iteh.ai/catalog/standards/sist/e9a21b17-6d5d-44a3-a024-c22bf1b8585e/iec-60335-2-84-2019>
- heated seats;
- pumping units;
- water heaters for **spray seats;**
- spray seats.

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 young children playing with the appliance.

NOTE 103 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, the national water supply authorities and similar authorities.

NOTE 104 This standard does not apply to

- 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);
- chemical toilets;
- toilets in which excrement is destructed by combustion.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60068-2-52:1996¹, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Replacement:*

normal operation

operation of the appliance under the following conditions:

Appliances are operated in cycles, each cycle being initiated every 10 min, bowl covers being open or closed, whichever is more unfavourable. If the cycle is not automatically terminated, the appliance is operated for 15 s, or for the period specified in the instructions, whichever is longer.

For **spray seats**, if the cycle is not automatically terminated, the appliance is operated for 30 s. If the cycle is automatically terminated, the appliance is operated for 30 s or automatic operation time, whichever is shorter.

If warm air is provided for drying and if the cycle is not automatically terminated, the appliance is operated for 1 min. If the cycle is automatically terminated, the appliance is operated for 1 min or automatically terminating time, whichever is shorter.

If warm air is provided for drying, the drying cycle is initiated immediately after the end of the showering cycle, unless the sequence is automatic.

The excrement tank of **mouldering toilets** is empty or filled with peat, whichever is more unfavourable.

Package toilets are provided with bags.

For **freezing toilets**, 0,3 l of water having a temperature of 37 °C is added each cycle, controls being adjusted to the lowest temperature. They are also operated without water.

Spray seats are supplied with water at the most unfavourable pressure that provides an effective spray.

3.5 Definitions relating to types of appliances

3.5.101

mouldering toilet

appliance in which excrement is processed by drying

3.5.102

package toilet

appliance in which excrement is packed in bags and stored in a tank

¹ This 2nd edition was replaced in 2017 by a 3rd Edition IEC 60068-2-52:2017, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)* but the listed edition applies.

3.5.103**freezing toilet**

appliance in which excrement is frozen and stored in a tank

3.5.104**vacuum toilet**

appliance in which excrement is evacuated to a storage tank by negative pressure

3.5.105**spray seat**

appliance that sprays water for cleaning parts of the human body

Note 1 to entry: **Spray seats** can have functions such as heating the seat, drying, deodorizing or automatically opening/closing the seat and the bowl cover.

Note 2 to entry: **Spray seats** can be integrated with a toilet.

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.

5.2 Addition:

The tests of 31.101 are not carried out on a separate appliance.

5.3 Addition:

The tests of 31.101 are carried out before the test of Clause 8.

5.7 Addition:

The temperature of the water used for the tests is 15 °C ± 5 °C.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Modification:

Appliances incorporating water heaters having bare heating elements shall be **class I** or **class III**.

Spray seats shall be **class I**, **class II**, or **class III**.

6.2 Addition:

Toilets, **spray seats** and heated seats shall be at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.12 Addition:

The instructions shall state how to empty and clean the toilet safely. They shall include details about the final disposal of the excrement or its residue, unless the toilet is connected to the sewage system.

Modification:

The instructions concerning persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge and children playing with the appliance are not applicable.

7.12.1 Addition:

The installation instructions for **class 0I appliances** and **class I appliances** shall state that they have to be earthed.

The installation instructions for appliances incorporating water heaters having bare heating elements shall state the substance of the following:

- the resistivity of the water supply must not be less than ... Ωcm ;
- the appliance must be permanently connected to fixed wiring.

The installation instructions for toilets, except for flushing toilets, shall state that the label concerning glowing cigarettes is to be fixed in a conspicuous place beside or on the toilet.

7.101 Toilets, except flushing toilets, shall be provided with a label stating that glowing cigarettes and other burning materials must not be thrown into the toilet.

The label shall be suitable for permanent fixing.

The label may be fixed on the appliance if it is visible before using the toilet.

Compliance is checked by inspection.

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 also applied, as specified for test probe B.

8.2 Addition:

Test probe 18 of IEC 61032 is also applied, as specified for test probe B.

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.

11 Heating

This clause of Part 1 is applicable except as follows.

11.3 Addition:

Thermocouples attached to the small blackened disks are also used for measuring the temperature rise of warm air.

11.7 Replacement:

Spray seats are operated for 2 min unless the water flow stops automatically. Other appliances are operated until steady conditions are established.

11.8 Addition:

The temperature rises shall not exceed the values shown in Table 101.

Table 101 – Maximum normal temperature rises
(standards.iteh.ai)

Part	Temperature rise K
Surfaces likely to be in contact with the skin	23
Warm air for drying parts of the human body	40 ^a
Surfaces outside the bowl located within 250 mm of the seat	30
Interior of the excrement tank of mouldering toilets	60
Ducts through which excrement passes	60
^a The air temperature is measured 50 mm from the air outlet.	

The temperature of the water supplied by **spray seats** shall not exceed 45 °C.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.2 Addition:

Water heaters having bare heating elements are tested with water having the resistivity stated in the instructions.

NOTE 101 The appropriate resistivity can be obtained by adding ammonium phosphate to the water.

*For water heaters of **class I** having bare heating elements, the leakage current is measured between a metal sieve positioned 10 mm from the spray head of the **spray seat** and the earthing terminal. The terminals of the heating element are connected through the selector switch to each pole of the supply in turn, as shown in Figure 101.*