

INTERNATIONAL STANDARD

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Third edition
2002-11

Household and similar electrical appliances – Safety –

Part 2-60: Particular requirements for whirlpool baths

*Appareils électrodomestiques et analogues –
Sécurité –*

*Partie 2-60:
Règles particulières pour les baignoires à système
de brassage d'eau*



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-60: Particular requirements for whirlpool baths**

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

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

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

FDIS	Report on voting
61/2223/FDIS	61/2298/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 whirlpool baths.

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.

The following differences exist in the countries indicated below.

- 6.1: Class 0I appliances are allowed (Japan).
- 6.1: Class I portable appliances are allowed (Australia, Canada, Japan, Switzerland and USA).
- 7.12.1: The statement concerning earthed appliances is not required (Australia, Japan, Switzerland and USA).
- 22.35: Current limits apply instead of voltage limits (Canada and USA).
- 22.101: The test is different (USA).
- 22.103: The test is carried out ten times (USA).
- 25.1: Class I appliances may have a supply cord fitted with a plug (Australia, Canada, Japan, Switzerland and 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.

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-60: Particular requirements for whirlpool baths

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric whirlpool baths for indoor use, for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

This standard also applies to appliances for circulating air or water in conventional baths.

Appliances not intended for normal household use but that nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in hotels, fitness centres and similar places, 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 101 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 water supply authorities, the national authorities responsible for the protection of labour and similar authorities.

NOTE 102 This standard does not apply to

- equipment for water circulation in swimming and motion exercise pools;
- cleaning appliances for swimming pools;
- appliances intended for medical 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).

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

Whirlpool baths are filled with water to the maximum level allowed by the construction.

For separate appliances intended to be used with a conventional bath, the bath is filled with water to a depth of approximately 200 mm or to the maximum level specified in the instructions, whichever is more unfavourable.

3.6.4 Modification:

NOTE 1 Parts are considered to be **live parts** even if they comply with 8.1.4.

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:

If the tests are influenced by the temperature of the water, it is maintained at 40 °C or at the maximum value allowed by the control, whichever is greater.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Modification:

Portable appliances shall be **class II** or **class III**. **Stationary appliances** shall be **class I**, **class II** or **class III**.

6.2 Addition:

Whirlpool baths shall be at least IPX5. Other appliances shall be at least IPX4.

NOTE 101 Parts of appliances intended for mounting outside the bathroom may be IPX0.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.12 Addition:

The instructions shall provide details concerning cleaning and other maintenance.

The instructions for **portable appliances** shall state that no part of the appliance is to be located above the bath during use.

7.12.1 Addition:

The installation instructions shall state the substance of the following:

- parts containing live parts, except parts supplied with safety extra-low voltage not exceeding 12 V, must be inaccessible to a person in the bath;
- earthed appliances must be permanently connected to fixed wiring;

- parts incorporating electrical components, except remote control devices, must be located or fixed so that they cannot fall into the bath;
- the appliance should be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.

The installation instructions shall give details on how to follow the wiring rules, for example, specifying that parts are installed in the correct zone and that equipotential bonding is carried out.

If the appliance is intended to be fixed by screws or other permanent fixing devices, the installation instructions shall give details on how to fix the appliance.

NOTE 101 This instruction is not necessary if the method of fixing is obvious.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.4 Modification:

Any energized part is considered to be a **live part**.

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.

11.8 Addition:

If the appliance incorporates a heating element, the water temperature at the inlet of the bath shall not exceed 50 °C.

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.

15.1.2 Addition:

Whirlpool baths are tested without side panels fitted to the bath unless they are an integral part of the appliance.

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.

19.2 Addition:

For appliances in which water is circulated, the bath is filled and the appliance operated, after which it is switched off and the bath emptied. Heating elements are then switched on, if possible, the pump being operated or at rest, whichever is more unfavourable.

For appliances in which air is circulated, air inlets and outlets are blocked. Heating elements are then switched on, if possible, the blower being in operation.

19.7 Addition:

*The test is carried out with the bath filled as specified for **normal operation**.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.35 Addition:

Parts such as switches and controls accessible to the user in the bath shall only be supplied at **safety extra-low voltage** not exceeding 12 V.

22.101 Appliances in which air is circulated shall be constructed so that water cannot penetrate into the motor and come into contact with **live parts** or **basic insulation**.

Compliance is checked by the following test.

The overflow outlet of whirlpool baths is blocked and the bath filled until water overflows. Non-return valves are rendered inoperative one at a time.

*Separate appliances intended to be used with a conventional bath are placed on the floor, except that **portable mats** are placed in a bath filled with water. The mat is then raised to the most unfavourable position allowed by the construction of the appliance but to a height not exceeding 2 m. Non-return valves are rendered inoperative one at a time.*

NOTE The test is carried out with all possible methods of connecting the hose.

*After the test there shall be no trace of water on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

22.102 Whirlpool baths shall be constructed so that the quantity of water that remains in the appliance after emptying the bath, and is recirculated the next time the bath is used, shall not exceed 0,5 l or 0,2 % of the capacity of the bath, whichever is less.

NOTE The capacity of the bath is considered to be the volume of water required to fill the bath until water starts to flow through the overflow outlet.

Compliance is checked by any suitable method, such as measurements using chemical dilution, weighing or determination of volume.

22.103 Whirlpool baths shall be constructed so that hair cannot be drawn into apertures due to water suction if this could result in a hazard.

Compliance is checked by the following test.

*The appliance is filled as specified for **normal operation**.*

A mass of 50 g of medium or fine natural human hair is attached to a wooden rod, 25 mm in diameter and 300 mm in length, the free length of the hair being 400 mm. The hair is saturated for at least 2 min in the bath water.

*The free end of the hair is placed over the suction opening and the appliance operated while supplied at **rated voltage**. The hair is moved from side to side for up to 2,5 min in an attempt to get it sucked completely into the opening.*

The rod is pulled in order to withdraw the hair from the water and the pull force is measured with

- *the rod pulled vertically;*
- *the rod pulled at an angle of approximately 40° to the vertical.*

The force shall not exceed 20 N.

*If the bath is provided with a **detachable cover** for the suction opening, the test is also carried out with the cover in place. During the test, the hair is used to sweep the cover in an attempt to displace it.*

The test is carried out five times.

NOTE 1 If the bath has more than one suction opening, they are tested in turn.

NOTE 2 The hair is brushed periodically to keep it tangle free.

22.104 Portable appliances shall not have openings on the underside that would allow small items to penetrate and touch **live parts**.

*Compliance is checked by inspection and by measuring the distance between the supporting surface and **live parts** through openings. This distance shall be at least 20 mm.*

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.101 Thermal cut-outs incorporated in appliances for compliance with 19.4 shall not be self-resetting.

Compliance is checked by inspection.

24.102 Class III appliances shall be provided with a **safety isolating transformer** classified at least IPX4.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.1 Modification:

Class I appliances shall only be provided with means for permanent connection to fixed wiring.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable except as follows.

27.2 Addition:

Class I appliances shall be provided with a terminal for the connection of external equipotential bonding conductors.

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.

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Annexes

The annexes of Part 1 are applicable.

Bibliography

The bibliography of Part 1 is applicable.

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