IEC 60335-2-52

Edition 4.0 2021-11
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Household and similar electrical appliances – Safety – Part 2-52: Particular requirements for oral hygiene appliances

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC 60335-2-52

Edition 4.0 2021-11
REDLINE VERSION

INTERNATIONAL STANDARD

Household and similar electrical appliances – Safety – Part 2-52: Particular requirements for oral hygiene appliances

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 13.120; 97.170

ISBN 978-2-8322-1051-3

CONTENTS

FOREWORD 4
INTRODUCTION 2
1 Scope 8
2 Normative references 8
3 Terms and definitions 8
4 General requirement 9
5 General conditions for the tests 9
6 Classification 9
7 Marking and instructions 9
8 Protection against access to live parts 10
9 Starting of motor-operated appliances 10
10 Power input and current 10
11 Heating 10
12 ~~Void~~ Charging of metal-ion batteries 11
13 Leakage current and electric strength at operating temperature 11
14 Transient overvoltages 11
15 Moisture resistance 11
16 Leakage current and electric strength 11
17 Overload protection of transformers and associated circuits 11
18 Endurance 11
19 Abnormal operation 12
20 Stability and mechanical hazards 12
21 Mechanical strength 13
22 Construction 14
23 Internal wiring 14
24 Components 14
25 Supply connection and external flexible cords 14
26 Terminals for external conductors 15
27 Provision for earthing 15
28 Screws and connections 15
29 Clearances, creepage distances and solid insulation 15
30 Resistance to heat and fire 15
31 Resistance to rusting 15
32 Radiation, toxicity and similar hazards 15
Annexes 17
Annex B (normative) Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances 18
Bibliography 20

Figure 101 – Probe for measuring surface temperatures 16

Table 101 – Maximum temperature rises of external accessible surfaces under normal operating conditions 11
Table B.2 – Total area of openings for metal-ion cells 18
Table B.3 – Volume of air injected at 2 070 kPa 18

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-52: Particular requirements for oral hygiene 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.
2) The formal decisions or agreements of 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 IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60335-2-52:2002+AMD1:2008+AMD2:2017 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60335-2-52 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 2002, Amendment 1: 2008 and Amendment 2:2017. This edition constitutes a technical revision.

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

a) the text has been aligned with IEC 60335-1:2020;
b) some notes have been converted to normative text (Clause 1, 11.7, 22.101);
c) clarification of requirements for battery-operated appliances (Clause 1, 11.7, B.11.1);
d) application of test probe 19 has been introduced (8.1.1, 20.2);
e) the stability test has been updated to cover hand-held parts of battery-operated appliances when placed on their charging stand (20.1);
f) a drop test is introduced for hand-held parts of an appliance (21.101);
g) additional strength tests for detachable power supply parts are introduced (21.102);
h) Table B.2 and Table B.3 updated to reflect smaller cell capacities for battery-operated appliances covered by this Part 2 standard.

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

Draft	Report on voting
61/6368/FDIS	61/6418/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/standardsdev/publications.

A list of all parts in the IEC 60335 series, published 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 oral hygiene 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 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,
- 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.

– 6.1: Class 0 appliances are allowed (Japan).

– 6.1: Appliances may have other classifications (USA).

– 7.12.1: Additional instructions are required (USA).

– 11.7: The duration and number of cycles are different (USA).

– 19.101: The test is different (USA).

– 22.36: Hand-held parts may be class 0 construction (Japan).

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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 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~~ 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. ~~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.

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 2-52: Particular requirements for oral hygiene appliances

1 Scope

This clause of Part 1 is replaced by the following.

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

~~NOTE 101~~ Examples of appliances ~~covered by~~ that this standard is applicable to are

– oral irrigators;
– toothbrushes.

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 knowledge

  prevents them from using the appliance safely without supervision or instruction;
– children playing with the appliance.

~~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~~ 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.

~~NOTE 103~~ This standard does not apply to appliances for medical purposes (IEC 60601).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

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*~~ *Addition:*
~~**normal operation**~~
operation of the appliance under the following conditions:

Oral irrigators are operated with the reservoir filled with water having a temperature of approximately 45 °C, to the level specified in the instructions. In the absence of such instructions, the reservoir is filled to the maximum level.

Other appliances are operated without load.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 *Modification:*

Appliances shall be **class II** or **class III**.

6.2 *Addition:*

~~**Class II appliances** shall be at least IPX7 except that parts intended to be fixed, and transformers with pins for insertion into socket-outlets, shall be at least IPX4.~~

~~**Class III appliances** shall be at least IPX4. However, if the **rated voltage** does not exceed 24 V, they may be IPX0.~~

Appliances shall be at least IPX7.

This classification does not apply to:

– parts that are intended to be fixed and **detachable power supply parts** with pins for insertion into socket outlets that are at least IPX4; or
– **class III appliances** or parts of **class III construction**, including hand-held parts, that are at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.12.1 *Addition:*

The installation instructions shall state that parts that have to be fixed must be fixed so that they cannot fall into water, unless they are of IPX7 construction.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

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:*

*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 N ± 1 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 ~~*Replacement*~~ *Modification:*

Appliances are operated for five cycles, each cycle comprising an operating period of 3 min and a rest period of 1 min. During the rest period, the reservoir of oral irrigators is refilled.

~~NOTE 101~~ *If the reservoir empties during the operating period, it is refilled and the test is continued.*

*For appliances incorporating **integral batteries** or **separable batteries** not disconnected from the appliance for charging purposes:*

- *the **battery** that has been **fully discharged** is charged for 1 h, while the appliance is operated as specified, if allowed by the construction of the appliance;*
- *the **battery** that has been **fully discharged** is charged, for a duration of 24 h or until it is **fully charged** whichever is shorter, without the **battery-operated appliance** performing its intended function.*

11.8 ~~*Addition*~~ *Modification:*

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

Addition:

Table 101 – Maximum temperature rises of external accessible surfaces under normal operating conditions

Surface	*Temperature rise of external accessible surfaces* *K*
Bare metal	*38*
Coated metal [a]	*42*
Glass and ceramic	*51*
Plastic and plastic coating > 0,4 mm [b, c]	*58*
NOTE The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	
[a] *Metal is considered coated when a coating having a minimum thickness of 90 µm made ~~by~~ of enamel or non-substantially plastic coating is used.*	
[b] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*	
[c] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of the coated metal or of glass and ceramic material apply.*	

12 ~~Void~~ Charging of metal-ion batteries

This clause of Part 1 is applicable.

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.

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:*

Class II oral irrigators *are also subjected to the test of 19.101.*

19.2 *Addition:*

The test is carried out without water in the reservoir.

19.101 *The hose is punctured within the enclosure of the appliance at the most unfavourable location. Rubber hoses are punctured by means of a 0,8 mm diameter needle. Thermoplastic hoses are punctured by means of a 0,5 mm diameter heated needle, care being taken not to enlarge the hole.*

NOTE When reassembling the appliance, sealants such as silicone rubber ~~may~~ can be used to ~~insure~~ ensure that the joints are watertight.

The appliance is operated as specified in Clause 11, but with water containing 1 % NaCl. During the last cycle of operation, the water pressure in the hose is increased to the maximum obtainable by blocking the water outlet. The pressure is then reduced to its normal value.

A vessel of insulating material is filled with the saline solution and the hand-held part of the appliance is immersed to a depth of approximately 100 mm. The appliance is operated without restricting the water flow until 30 s after the reservoir has emptied. During the test, the leakage current is measured, as specified in 13.2. It is measured between any pole of the supply and a rectangular stainless steel electrode, having dimensions approximately 250 mm × 50 mm, placed in the solution.

The leakage current shall not exceed 0,5 mA.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 *Replacement:*

Appliances, other than **fixed appliances** and **hand-held appliances**, intended to be used on a surface such as the floor or a table, shall have adequate stability. Hand-held parts of appliances with a charging stand shall have adequate stability when the hand-held part is placed on its charging stand. However, adequate stability is not necessary if overturning of the appliance does not present a risk of fire, electric shock or injury.

Compliance is checked by the following test, appliances incorporating an appliance inlet being fitted with an appropriate connector and flexible cord. Hand-held parts of appliances with a charging stand are subjected to the test with the hand-held part placed on its charging stand.

The appliance, not connected to the supply mains, is placed in any normal position of use on a plane inclined at an angle of 10° to the horizontal, the ***supply cord*** *resting on the inclined plane in the most unfavourable position. However, if part of an appliance comes into contact with the horizontal supporting surface when the appliance is tilted through an angle of 10°, the appliance is placed on a horizontal support and tilted in the most unfavourable direction through an angle of 10°.*

The test on the horizontal support may be necessary for appliances provided with rollers, castors or feet. In this case, castors or wheels can be blocked to prevent the appliance from rolling.

Appliances intended to be filled with liquid by the user in normal use are tested empty or filled with the most unfavourable quantity of water up to the capacity indicated in the instructions.

The appliance shall not overturn unless the appliance or the part of the appliance that overturns complies with all of the following:

- *it only contains circuits operating at SELV in accordance with 8.1.4;*
- *it only contains low power circuits in accordance with 19.11.1;*
- *it is dropped from a height of 700 mm on a rigidly supported hard wood board five times, the appliance being held in different positions likely to occur. After the drops, the appliance or part of the appliance, as relevant, shall show no damage so that compliance with 15.1 and 20.2 is not impaired;*
- *it has a maximum weight of 450 g when ready for use;*
- *it does not have sharp edges when ready for use. An edge with a radius of 1 mm or more is not considered a sharp edge.*

The test is repeated on appliances with heating elements with the angle of inclination increased to 15°. If the appliance overturns in one or more positions, it is subjected to the tests of Clause 11 in each of these overturned positions.

During this test, temperature rises shall not exceed the values shown in Table 9.

20.2 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

Modification:

Test probe 18 and test probe 19 are not applied to appliances for commercial use.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 *Addition:*

Hand-held parts of appliances are also subjected to the test of 21.101.

21.101 *The hand-held part of the appliance is placed in a sling that is constructed by tying together the four corners of a single layer of cheesecloth. The lowest point of the sling is suspended at a height of 900 mm above a concrete, or similarly hard, surface.*

The hand-held part of the appliance in the sling is dropped from a stationary position. The test is carried out a total of five times with the hand-held part of the appliance being positioned so that it falls onto the concrete surface in five different orientations.

The hand-held part of the appliance shall not be damaged to such an extent that compliance with 8.1 and Clause 29 is impaired.

21.102 For appliances with a **detachable power supply part**, the enclosure of the **detachable power supply part** shall have adequate mechanical strength against dropping.

The requirement is not applicable to a **detachable power supply part** with pins for insertion into a socket outlet.

Compliance is checked by the following test.

*The **detachable power supply part** is placed in a sling that is constructed by tying together the four corners of a single layer of cheesecloth. The lowest point of the sling is suspended at a height of 900 mm above a concrete, or similarly hard, surface.*

*The **detachable power supply part** in the sling is dropped from a stationary position. The test is carried out a total of five times with the **detachable power supply part** being positioned so that it falls onto the concrete surface in five different orientations.*

*The **detachable power supply part** shall not be damaged to such an extent that compliance with 8.1 and Clause 29 is impaired.*

22 Construction

This clause of Part 1 is applicable except as follows.

22.36 *Addition:*

Hand-held parts shall be **class III construction** having a **working voltage** not exceeding 24 V.

22.101 **Class II appliances** shall be constructed so that parts intended to be fixed can be fixed securely, unless they are classified at least IPX7.

~~NOTE Keyhole slots, hooks and similar means, without further means to prevent the appliance being inadvertently lifted off the support, are not considered to be adequate means for fixing the appliance securely.~~

The **Class II appliances** shall not be fixed by keyhole slots, hooks and similar means, without further means to prevent the appliance being inadvertently lifted off the support.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 *Addition:*

Type X attachment is not allowed for appliances classified IPX7.

Type Z attachment is allowed.

25.23 *Addition:*

Interconnection cords for parts of **class III construction** are not required to comply with the requirements for **supply cords**.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is not 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.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2 *Modification:*

Replace the two dashed items in the compliance statement with the following:

For oral hygiene appliances, 30.2.2 is applicable.

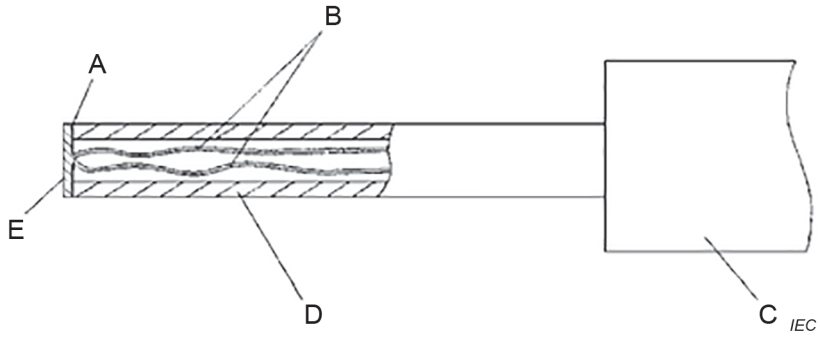
~~**30.2.3** Not applicable.~~

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.



Key

A adhesive

B thermocouple wires 0,3 mm diameter according to IEC 60584-1 Type K ~~(chrome-alumel)~~

C handle arrangement permitting a contact force of 4 N ± 1 N

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with flat contact face

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows.

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

Annex B of Part 1 is applicable except as follows.

11 Heating

B.11.1 *Modification:*

Battery-operated appliances *are tested under the conditions of* ***normal operation*** *with the appliance operated for five cycles, where each cycle comprises an operating period of 3 min and a rest period of 1 min. During the rest period, the reservoir of oral irrigators is refilled. If the reservoir empties during the operating period, it is refilled and the test is continued.*

For appliances incorporating ***integral batteries*** *or* ***separable batteries*** *not disconnected from the appliance for charging purposes, and that cannot perform their intended function while the* ***batteries*** *are being charged, the appliance is operated as specified until it cannot perform its intended function due to the depletion of the* ***batteries****.*

20 Stability and mechanical hazards

B.20.1 *Modification:*

Table B.2 – Total area of openings for metal-ion cells

Capacity of the single metal-ion cell with the highest capacity *Ah*	***Min. total area of openings*** *mm^2*
0,2 ≤ Ah < 1	*6*
1 ≤ Ah < 3	*10*
3 ≤ Ah < 5	*20*
5 ≤ Ah < 25	*30*
25 ≤ Ah < 100	*50*
Ah ≥ 100	*100*

Table B.3 – Volume of air injected at 2 070 kPa

Capacity of the single metal-ion cell with the highest capacity *Ah*	***Volume of air (±10 %)*** *ml*
0,2 ≤ Ah < 1	*6*
1 ≤ Ah < 3	*10*
3 ≤ Ah < 5	*20*
5 ≤ Ah < 25	*30*
25 ≤ Ah < 100	*50*
Ah ≥ 100	*100*

22 Construction

B.22.3 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

B.22.4 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

Bibliography

The bibliography of Part 1 is applicable.

_____

IEC 60335-2-52

Edition 4.0 2021-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-52: Particular requirements for oral hygiene appliances

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-52: Exigences particulières pour les appareils d'hygiène buccale

IEC 60335-2-52:2021-11 (en-fr)

CONTENTS

FOREWORD 4
INTRODUCTION 7
1 Scope 8
2 Normative references 8
3 Terms and definitions 9
4 General requirement 9
5 General conditions for the tests 9
6 Classification 9
7 Marking and instructions 9
8 Protection against access to live parts 10
9 Starting of motor-operated appliances 10
10 Power input and current 10
11 Heating 10
12 Charging of metal-ion batteries 11
13 Leakage current and electric strength at operating temperature 11
14 Transient overvoltages 11
15 Moisture resistance 11
16 Leakage current and electric strength 11
17 Overload protection of transformers and associated circuits 11
18 Endurance 11
19 Abnormal operation 12
20 Stability and mechanical hazards 12
21 Mechanical strength 13
22 Construction 14
23 Internal wiring 14
24 Components 14
25 Supply connection and external flexible cords 14
26 Terminals for external conductors 15
27 Provision for earthing 15
28 Screws and connections 15
29 Clearances, creepage distances and solid insulation 15
30 Resistance to heat and fire 15
31 Resistance to rusting 15
32 Radiation, toxicity and similar hazards 15
Annexes 17
Annex B (normative) Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances 18
Bibliography 20

Figure 101 – Probe for measuring surface temperatures 16

Table 101 – Maximum temperature rises of external accessible surfaces under normal operating conditions 11
Table B.2 – Total area of openings for metal-ion cells 18
Table B.3 – Volume of air injected at 2 070 kPa 18

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-52: Particular requirements for oral hygiene 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.
2) The formal decisions or agreements of 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 IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60335-2-52 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 2002, Amendment 1: 2008 and Amendment 2:2017. This edition constitutes a technical revision.

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

a) the text has been aligned with IEC 60335-1:2020;
b) some notes have been converted to normative text (Clause 1, 11.7, 22.101);
c) clarification of requirements for battery-operated appliances (Clause 1, 11.7, B.11.1);
d) application of test probe 19 has been introduced (8.1.1, 20.2);
e) the stability test has been updated to cover hand-held parts of battery-operated appliances when placed on their charging stand (20.1);

f) a drop test is introduced for hand-held parts of an appliance (21.101);

g) additional strength tests for detachable power supply parts are introduced (21.102);

h) Table B.2 and Table B.3 updated to reflect smaller cell capacities for battery-operated appliances covered by this Part 2 standard.

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

Draft	Report on voting
61/6368/FDIS	61/6418/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/standardsdev/publications.

A list of all parts in the IEC 60335 series, published 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 oral hygiene 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 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,
- 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.

– 6.1: Class 0 appliances are allowed (Japan).
– 6.1: Appliances may have other classifications (USA).
– 7.12.1: Additional instructions are required (USA).
– 11.7: The duration and number of cycles are different (USA).
– 19.101: The test is different (USA).
– 22.36: Hand-held parts may be class 0 construction (Japan).

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 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 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 2-52: Particular requirements for oral hygiene appliances

1 Scope

This clause of Part 1 is replaced by the following.

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

Examples of appliances that this standard is applicable to are

– oral irrigators;
– toothbrushes.

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 knowledge

  prevents 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 for medical purposes (IEC 60601).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Addition:*
operation of the appliance under the following conditions:

Oral irrigators are operated with the reservoir filled with water having a temperature of approximately 45 °C, to the level specified in the instructions. In the absence of such instructions, the reservoir is filled to the maximum level.

Other appliances are operated without load.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 *Modification:*

Appliances shall be **class II** or **class III**.

6.2 *Addition:*

Appliances shall be at least IPX7.

This classification does not apply to:

– parts that are intended to be fixed and **detachable power supply parts** with pins for insertion into socket outlets that are at least IPX4; or
– **class III appliances** or parts of **class III construction**, including hand-held parts, that are at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.12.1 *Addition:*

The installation instructions shall state that parts that have to be fixed must be fixed so that they cannot fall into water, unless they are of IPX7 construction.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

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:*

*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 N ± 1 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:*

Appliances are operated for five cycles, each cycle comprising an operating period of 3 min and a rest period of 1 min. During the rest period, the reservoir of oral irrigators is refilled. If the reservoir empties during the operating period, it is refilled and the test is continued.

*For appliances incorporating **integral batteries** or **separable batteries** not disconnected from the appliance for charging purposes:*

– *the **battery** that has been **fully discharged** is charged for 1 h, while the appliance is operated as specified, if allowed by the construction of the appliance;*
– *the **battery** that has been **fully discharged** is charged, for a duration of 24 h or until it is **fully charged** whichever is shorter, without the **battery-operated appliance** performing its intended function.*

11.8 *Modification:*

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

Addition:

Table 101 – Maximum temperature rises of external accessible surfaces under normal operating conditions

Surface	*Temperature rise of external accessible surfaces* *K*
Bare metal	*38*
Coated metal [a]	*42*
Glass and ceramic	*51*
Plastic and plastic coating > 0,4 mm [b, c]	*58*
NOTE The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	
[a] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.*	
[b] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*	
[c] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of the coated metal or of glass and ceramic material apply.*	

12 Charging of metal-ion batteries

This clause of Part 1 is applicable.

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.

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:*

Class II oral irrigators *are also subjected to the test of 19.101.*

19.2 *Addition:*

The test is carried out without water in the reservoir.

19.101 *The hose is punctured within the enclosure of the appliance at the most unfavourable location. Rubber hoses are punctured by means of a 0,8 mm diameter needle. Thermoplastic hoses are punctured by means of a 0,5 mm diameter heated needle, care being taken not to enlarge the hole.*

NOTE When reassembling the appliance, sealants such as silicone rubber can be used to ensure that the joints are watertight.

The appliance is operated as specified in Clause 11, but with water containing 1 % NaCl. During the last cycle of operation, the water pressure in the hose is increased to the maximum obtainable by blocking the water outlet. The pressure is then reduced to its normal value.

A vessel of insulating material is filled with the saline solution and the hand-held part of the appliance is immersed to a depth of approximately 100 mm. The appliance is operated without restricting the water flow until 30 s after the reservoir has emptied. During the test, the leakage current is measured, as specified in 13.2. It is measured between any pole of the supply and a rectangular stainless steel electrode, having dimensions approximately 250 mm × 50 mm, placed in the solution.

The leakage current shall not exceed 0,5 mA.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 *Replacement:*

Appliances, other than **fixed appliances** and **hand-held appliances**, intended to be used on a surface such as the floor or a table, shall have adequate stability. Hand-held parts of appliances with a charging stand shall have adequate stability when the hand-held part is placed on its charging stand. However, adequate stability is not necessary if overturning of the appliance does not present a risk of fire, electric shock or injury.

Compliance is checked by the following test, appliances incorporating an appliance inlet being fitted with an appropriate connector and flexible cord. Hand-held parts of appliances with a charging stand are subjected to the test with the hand-held part placed on its charging stand.

The appliance, not connected to the supply mains, is placed in any normal position of use on a plane inclined at an angle of 10° to the horizontal, the ***supply cord*** *resting on the inclined plane in the most unfavourable position. However, if part of an appliance comes into contact with the horizontal supporting surface when the appliance is tilted through an angle of 10°, the appliance is placed on a horizontal support and tilted in the most unfavourable direction through an angle of 10°.*

The test on the horizontal support may be necessary for appliances provided with rollers, castors or feet. In this case, castors or wheels can be blocked to prevent the appliance from rolling.

Appliances intended to be filled with liquid by the user in normal use are tested empty or filled with the most unfavourable quantity of water up to the capacity indicated in the instructions.

The appliance shall not overturn unless the appliance or the part of the appliance that overturns complies with all of the following:

- *it only contains circuits operating at SELV in accordance with 8.1.4;*
- *it only contains low power circuits in accordance with 19.11.1;*
- *it is dropped from a height of 700 mm on a rigidly supported hard wood board five times, the appliance being held in different positions likely to occur. After the drops, the appliance or part of the appliance, as relevant, shall show no damage so that compliance with 15.1 and 20.2 is not impaired;*
- *it has a maximum weight of 450 g when ready for use;*
- *it does not have sharp edges when ready for use. An edge with a radius of 1 mm or more is not considered a sharp edge.*

The test is repeated on appliances with heating elements with the angle of inclination increased to 15°. If the appliance overturns in one or more positions, it is subjected to the tests of Clause 11 in each of these overturned positions.

During this test, temperature rises shall not exceed the values shown in Table 9.

20.2 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

Modification:

Test probe 18 and test probe 19 are not applied to appliances for commercial use.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 *Addition:*

Hand-held parts of appliances are also subjected to the test of 21.101.

21.101 *The hand-held part of the appliance is placed in a sling that is constructed by tying together the four corners of a single layer of cheesecloth. The lowest point of the sling is suspended at a height of 900 mm above a concrete, or similarly hard, surface.*

The hand-held part of the appliance in the sling is dropped from a stationary position. The test is carried out a total of five times with the hand-held part of the appliance being positioned so that it falls onto the concrete surface in five different orientations.

The hand-held part of the appliance shall not be damaged to such an extent that compliance with 8.1 and Clause 29 is impaired.

21.102 For appliances with a **detachable power supply part**, the enclosure of the **detachable power supply part** shall have adequate mechanical strength against dropping.

The requirement is not applicable to a **detachable power supply part** with pins for insertion into a socket outlet.

Compliance is checked by the following test.

*The **detachable power supply part** is placed in a sling that is constructed by tying together the four corners of a single layer of cheesecloth. The lowest point of the sling is suspended at a height of 900 mm above a concrete, or similarly hard, surface.*

*The **detachable power supply part** in the sling is dropped from a stationary position. The test is carried out a total of five times with the **detachable power supply part** being positioned so that it falls onto the concrete surface in five different orientations.*

*The **detachable power supply part** shall not be damaged to such an extent that compliance with 8.1 and Clause 29 is impaired.*

22 Construction

This clause of Part 1 is applicable except as follows.

22.36 *Addition:*

Hand-held parts shall be **class III construction** having a **working voltage** not exceeding 24 V.

22.101 **Class II appliances** shall be constructed so that parts intended to be fixed can be fixed securely, unless they are classified at least IPX7.

The **Class II appliances** shall not be fixed by keyhole slots, hooks and similar means, without further means to prevent the appliance being inadvertently lifted off the support.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 *Addition:*

Type X attachment is not allowed for appliances classified IPX7.

Type Z attachment is allowed.

25.23 *Addition:*

Interconnection cords for parts of **class III construction** are not required to comply with the requirements for **supply cords**.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is not 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.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2 *Modification:*

Replace the two dashed items in the compliance statement with the following:

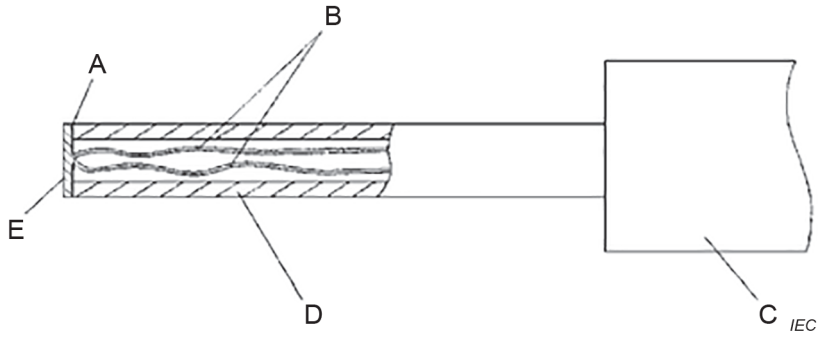
For oral hygiene appliances, 30.2.2 is applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.



Key

A adhesive

B thermocouple wires 0,3 mm diameter according to IEC 60584-1 Type K

C handle arrangement permitting a contact force of 4 N ± 1 N

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with flat contact face

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows.

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

Annex B of Part 1 is applicable except as follows.

11 Heating

B.11.1 *Modification:*

Battery-operated appliances *are tested under the conditions of* ***normal operation*** *with the appliance operated for five cycles, where each cycle comprises an operating period of 3 min and a rest period of 1 min. During the rest period, the reservoir of oral irrigators is refilled. If the reservoir empties during the operating period, it is refilled and the test is continued.*

For appliances incorporating ***integral batteries*** *or* ***separable batteries*** *not disconnected from the appliance for charging purposes, and that cannot perform their intended function while the* ***batteries*** *are being charged, the appliance is operated as specified until it cannot perform its intended function due to the depletion of the* ***batteries****.*

20 Stability and mechanical hazards

B.20.1 *Modification:*

Table B.2 – Total area of openings for metal-ion cells

Capacity of the single metal-ion cell with the highest capacity *Ah*	***Min. total area of openings*** *mm^2*
0,2 ≤ Ah < 1	*6*
1 ≤ Ah < 3	*10*
3 ≤ Ah < 5	*20*
5 ≤ Ah < 25	*30*
25 ≤ Ah < 100	*50*
Ah ≥ 100	*100*

Table B.3 – Volume of air injected at 2 070 kPa

Capacity of the single metal-ion cell with the highest capacity *Ah*	***Volume of air (±10 %)*** *ml*
0,2 ≤ Ah < 1	*6*
1 ≤ Ah < 3	*10*
3 ≤ Ah < 5	*20*
5 ≤ Ah < 25	*30*
25 ≤ Ah < 100	*50*
Ah ≥ 100	*100*

22 Construction

B.22.3 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

B.22.4 *Addition:*

For toothbrushes, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

Bibliography

The bibliography of Part 1 is applicable.

_____

SOMMAIRE

AVANT-PROPOS 24
INTRODUCTION 27
1 Domaine d'application 28
2 Références normatives 28
3 Termes et définitions 29
4 Exigences générales 29
5 Conditions générales d'essais 29
6 Classification 29
7 Marquage et instructions 29
8 Protection contre l'accès aux parties actives 30
9 Démarrage des appareils à moteur 30
10 Puissance et courant 30
11 Echauffements 30
12 Charge des batteries à ions métalliques 31
13 Courant de fuite et rigidité diélectrique à la température de régime 31
14 Surtensions transitoires 31
15 Résistance à l'humidité 31
16 Courant de fuite et rigidité diélectrique 31
17 Protection contre la surcharge des transformateurs et des circuits associés 31
18 Endurance 31
19 Fonctionnement anormal 32
20 Stabilité et dangers mécaniques 32
21 Résistance mécanique 33
22 Construction 34
23 Conducteurs internes 34
24 Composants 34
25 Raccordement au réseau et câbles souples extérieurs 35
26 Bornes pour conducteurs externes 35
27 Dispositions en vue de la mise à la terre 35
28 Vis et connexions 35
29 Distances dans l'air, lignes de fuite et isolation solide 35
30 Résistance à la chaleur et au feu 35
31 Protection contre la rouille 35
32 Rayonnement, toxicité et dangers analogues 35
Annexes 37
Annexe B (normative) Appareils alimentés par batteries, batteries séparables et batteries amovibles pour appareils alimentés par batteries 38
Bibliographie 40

Figure 101 – Calibre pour le mesurage des températures de surface 36

Tableau 101 – Echauffements maximaux pour les surfaces accessibles extérieures en conditions de fonctionnement normal 31
Tableau B.2 – Surface totale des ouvertures des éléments à ions métalliques 38
Tableau B.3 – Volume d'air injecté à 2 070 kPa 38

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-52: Exigences particulières pour les appareils d'hygiène buccale

AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 60335-2-52 a été établie par le comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette quatrième édition annule et remplace la troisième édition parue en 2002 et l'Amendement 1:2008 et l'Amendement 2:2017. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) alignement du texte sur l'IEC 60335-1:2020;
b) conversion en texte normatif de certaines notes (Article 1, 11.7, 22.101);
c) clarification des exigences pour les appareils alimentés par batteries (Article 1, 11.7, B.11.1);

d) introduction de l'application du calibre d'essai 19 (8.1.1, 20.2);

e) mise à jour de l'essai de stabilité pour couvrir les parties tenues à la main des appareils alimentés par batteries lorsqu'ils sont placés sur leur socle de charge (20.1);

f) introduction d'un essai de chute pour les parties tenues à la main des appareils (21.101);

g) introduction d'essais de résistance supplémentaires pour les parties d'alimentation amovibles (21.102);

h) mise à jour du Tableau B.2 et du Tableau B.3 pour refléter les capacités des éléments de plus petite taille pour les appareils alimentés par batteries couverts par la présente Partie 2.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
61/6368/FDIS	61/6418/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Le présent document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 60335, publiées sous le titre général *Appareils électrodomestiques et analogues – Sécurité*, se trouve sur le site web de l'IEC.

La présente Partie 2 doit être utilisée conjointement avec la dernière édition de l'IEC 60335-1 et ses amendements, sauf si cette édition l'exclut. Dans ce cas, la dernière édition qui n'exclut pas la présente Partie 2 est utilisée. Elle a été établie sur la base de la sixième édition (2020) de cette norme.

NOTE 1 L'expression "la Partie 1" utilisée dans la présente norme fait référence à l'IEC 60335-1.

La présente Partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les appareils d'hygiène buccale.

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans cette Partie 2, ce paragraphe s'applique pour autant que cela soit raisonnable. Lorsque la présente norme mentionne "addition", "modification" ou "remplacement", le texte correspondant de la Partie 1 doit être adapté en conséquence.

NOTE 2 Le système de numérotation suivant est utilisé:

– les paragraphes, tableaux et figures qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101;

– à l'exception de celles qui sont dans un nouveau paragraphe ou de celles qui concernent des notes de la Partie 1, les notes sont numérotées à partir de 101, y compris celles des articles ou paragraphes qui sont remplacés;

– les annexes qui sont ajoutées sont désignées AA, BB, etc.

NOTE 3 Les caractères d'imprimerie suivants sont utilisés:

– exigences: caractères romains;

– *modalités d'essais: caractères italiques;*

– notes: petits caractères romains.

Les termes en **gras** dans le texte sont définis à l'Article 3. Lorsqu'une définition concerne un adjectif, l'adjectif et le nom associé figurent également en gras.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

NOTE 4 L'attention des Comités nationaux est attirée sur le fait que les fabricants d'appareils et les organismes d'essai peuvent avoir besoin d'une période transitoire après la publication d'une nouvelle publication IEC, ou d'une publication amendée ou révisée, pour fabriquer des produits conformes aux nouvelles exigences et pour adapter leurs équipements aux nouveaux essais ou aux essais révisés.

Le comité recommande que le contenu de cette publication soit entériné au niveau national au plus tôt 12 mois et au plus tard 36 mois après la date de publication.

Les différences suivantes existent dans les pays indiqués ci-après.

– 6.1: Les appareils de la classe 0 sont admis (Japon).
– 6.1: Les appareils peuvent avoir d'autres classifications (Etats-Unis).
– 7.12.1: Des instructions supplémentaires sont exigées (Etats-Unis).
– 11.7: La durée et le nombre de cycles sont différents (Etats-Unis).
– 19.101: L'essai est différent (Etats-Unis).
– 22.36: Les parties tenues à la main peuvent être de la classe 0 (Japon).

INTRODUCTION

Il a été considéré en établissant cette Norme internationale que l'exécution de ses dispositions était confiée à des personnes expérimentées et ayant une qualification appropriée.

Les documents de recommandations concernant l'application des exigences de sécurité pour les appareils peuvent être consultés dans les documents de support du CE 61, accessibles sur le site web de l'IEC à l'adresse:

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

Cette information est donnée à l'intention des utilisateurs de la présente Norme internationale et n'a pas pour objet de remplacer le texte normatif de la présente norme.

La présente norme reconnaît le niveau de protection internationalement accepté contre les dangers électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions du fabricant. Elle couvre également les situations anormales auxquelles on peut s'attendre dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent affecter le fonctionnement sûr des appareils.

Cette norme tient compte autant que possible des exigences de l'IEC 60364, de façon à rester compatible avec les règles d'installation quand l'appareil est raccordé au réseau d'alimentation. Cependant, des règles nationales d'installation peuvent être différentes.

Si un appareil relevant du domaine d'application de la présente norme comporte également des fonctions couvertes par une autre Partie 2 de l'IEC 60335, la Partie 2 correspondante est appliquée à chaque fonction séparément, dans la limite du raisonnable. Si cela est applicable, on tient compte de l'influence d'une fonction sur les autres fonctions.

Lorsqu'une Partie 2 ne comporte pas d'exigences complémentaires pour couvrir les risques traités dans la Partie 1, la Partie 1 s'applique.

NOTE 1 Cela signifie que les comités d'études responsables pour les Parties 2 ont déterminé qu'il n'était pas nécessaire de spécifier des exigences particulières pour l'appareil en question en plus des exigences générales.

Cette norme est une norme de famille de produits traitant de la sécurité d'appareils et a préséance sur les normes horizontales et génériques couvrant le même sujet.

NOTE 2 Les publications horizontales, les publications fondamentales de sécurité et les publications groupées de sécurité couvrant un risque ne sont pas applicables parce qu'elles ont été prises en considération lorsque les exigences générales et particulières ont été étudiées pour la série de normes IEC 60335.

Un appareil conforme au texte de la présente norme ne sera pas nécessairement jugé conforme aux principes de sécurité de la norme si, lorsqu'il est examiné et soumis aux essais, il apparaît qu'il présente d'autres caractéristiques qui compromettent le niveau de sécurité visé par ces exigences.

Un appareil utilisant des matériaux ou présentant des modes de construction différents de ceux décrits dans les exigences de cette norme peut être examiné et essayé en fonction de l'objectif poursuivi par ces exigences et, s'il est jugé pratiquement équivalent, il peut être estimé conforme aux principes de sécurité de la norme.

NOTE 3 Les normes traitant des aspects non relatifs à la sécurité des appareils électrodomestiques sont:

– les normes IEC publiées par le comité d'études 59 concernant les méthodes de mesure d'aptitude à la fonction;
– les normes CISPR 11 et CISPR 14-1, ainsi que les normes applicables de la série IEC 61000-3 concernant les émissions électromagnétiques;
– la norme CISPR 14-2 concernant l'immunité électromagnétique;
– les normes IEC publiées par le comité d'études 111 concernant l'environnement.

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-52: Exigences particulières pour les appareils d'hygiène buccale

1 Domaine d'application

L'article de la Partie 1 est remplacé par le texte suivant.

La présente partie de l'IEC 60335 traite de la sécurité des **appareils d'hygiène buccale** électriques destinées à un usage domestique et analogue, dont la **tension assignée** est inférieure ou égale à 250 V, y compris les appareils alimentés en courant continu et les **appareils alimentés par batteries**.

La présente norme est applicable aux exemples d'appareils suivants, tels que:

– les jets dentaires;

– les brosses à dents.

Dans la mesure du possible, la présente norme traite des dangers courants que présentent les appareils et auxquels sont exposés tous les individus situés à l'intérieur et autour de l'habitation. Cependant, cette norme ne tient pas compte en général:

– des personnes (y compris des enfants) dont:

  - les capacités physiques, sensorielles ou mentales; ou
  - le manque d'expérience et de connaissance

  les empêchent d'utiliser l'appareil en toute sécurité sans surveillance ou instruction;

– de l'utilisation de l'appareil comme jouet par des enfants.

L'attention est attirée sur le fait que:

– pour les appareils destinés à être utilisés dans des véhicules ou à bord de navires ou d'avions, des exigences supplémentaires peuvent être nécessaires;

– dans de nombreux pays, des exigences supplémentaires sont spécifiées par les organismes nationaux de la santé, par les organismes nationaux responsables de la protection des travailleurs et par des organismes similaires.

La présente norme ne s'applique pas aux appareils à usage médical (IEC 60601).

2 Références normatives

L'article de la Partie 1 est applicable, avec l'exception suivante.

Addition:

IEC 60584-1, *Couples thermoélectriques – Partie 1: Spécifications et tolérances en matière de FEM*

3 Termes et définitions

L'article de la Partie 1 est applicable, avec l'exception suivante.

3.1 Définitions relatives aux caractéristiques physiques

3.1.9 *Addition:*
fonctionnement de l'appareil dans les conditions suivantes:

Les jets dentaires sont mis en fonctionnement, leur réservoir étant rempli d'eau à une température d'environ 45 °C jusqu'au niveau spécifié dans les instructions. En l'absence de telles instructions, le réservoir est rempli jusqu'au niveau maximal.

Les autres appareils sont mis en fonctionnement sans charge.

4 Exigences générales

L'article de la Partie 1 est applicable.

5 Conditions générales d'essais

L'article de la Partie 1 est applicable.

6 Classification

L'article de la Partie 1 est applicable, avec les exceptions suivantes.

6.1 *Modification:*

Les appareils doivent être de la **classe II** ou de la **classe III**.

6.2 *Addition:*

Les appareils doivent être au moins IPX7.

Cette classification ne s'applique pas:

– aux parties destinées à être fixées et aux **parties d'alimentation amovibles** qui comportent des broches destinées à être introduites dans des socles de prise de courant qui sont au moins IPX4; ou
– aux **appareils de la classe III** ou aux parties de **construction de classe III**, y compris les parties tenues à la main, qui sont au moins IPX4.

7 Marquage et instructions

L'article de la Partie 1 est applicable, avec l'exception suivante.

7.12.1 *Addition:*

Les instructions d'installation doivent indiquer que les parties qui doivent être fixées doivent être fixées de telle sorte qu'elles ne puissent pas tomber dans l'eau, sauf si elles sont IPX7.