



UL 60335-2-52

STANDARD FOR SAFETY

Household and Similar Electrical
Appliances – Safety – Part 2-52:
Particular Requirements for Oral
Hygiene Appliances

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UL Standard for Safety for Household and Similar Electrical Appliances – Safety – Part 2-52: Particular Requirements for Oral Hygiene Appliances, UL 60335-2-52

First Edition, Dated April 24, 2020

Summary of Topics

Adoption of the First Edition of UL 60335-2-52, Standard For Household and Similar Electrical Appliances – Safety – Part 2-52: Particular Requirements for Oral Hygiene Appliances. UL 60335-2-52 is an adoption of IEC 60335-2-52, Edition 3.2, issued by the IEC October 2017. The consolidated version 3.2 of IEC 60335-2-52 consists of the third edition issued October 2002, Amendment 1 issued April 2008, and Amendment 2 issued October 2017. Please note that the National Difference document incorporates all of the U.S. national differences for UL 60335-2-52.

The new requirements are substantially in accordance with Proposal(s) on this subject dated February 7, 2020.

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1

UL 60335-2-52

Standard for Household and Similar Electrical Appliances – Safety –

Part 2-52: Particular Requirements for Oral Hygiene Appliances

First Edition

April 24, 2020

This ANSI/UL Standard for Safety consists of the First Edition.

The most recent designation of ANSI/UL 60335-2-52 as an American National Standard (ANSI) occurred on April 24, 2020. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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CONTENTS

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

Annexes**Bibliography**

No Text on This Page

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Preface

This UL Standard is based on IEC Publication 60335-2-52: edition 3.2, Household and Similar Electrical Appliances – Safety – Part 2-52: Particular Requirements for Oral Hygiene Appliances. IEC publication 60335-2-52 is copyrighted by the IEC.

This edition has been issued to satisfy UL Standards policy.

This UL Standard 60335-2-52 Standard for Safety for Household and Similar Electrical Appliances – Safety – Part 2-52: Particular Requirements for Oral Hygiene Appliances, is to be used in conjunction with the latest edition of UL 60335-1. The requirements for oral hygiene appliances are contained in this Part 2 Standard and UL 60335-1.

Requirements of this Part 2 Standard, where stated, amend the requirements of UL 60335-1.

Where a particular subclause of UL 60335-1 is not mentioned in UL 60335-2-52, the UL 60335-1 subclause applies.

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Note – Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

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NATIONAL DIFFERENCES

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60335-2-52, Household and Similar Electrical Appliances – Safety – Part 2-52: Particular Requirements for Oral Hygiene Appliances, copyright 2017, are indicated by notations (differences) and are presented in bold text.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

DR – These are National Differences based on the **national regulatory requirements**.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

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FOREWORD

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY – Part 2-52: Particular requirements for oral hygiene appliances

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.

DISCLAIMER

This Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.

This Consolidated version of IEC 60335-2-52 bears the edition number 3.2. It consists of the third edition (2002-10) [documents 61/2221/FDIS and 61/2296/RVD], its amendment 1 (2008-04) [documents 61/3546/FDIS and 61/3600/RVD] and its amendment 2 (2017-10) [documents 61/5314/CDV and 61/5430A/RVC]. The technical content is identical to the base edition and its amendments.

This Final version does not show where the technical content is modified by amendments 1 and 2. A separate Redline version with all changes highlighted is available in this publication.

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 constitutes a technical revision.

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 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 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).

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

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

101DV D2 Modification to replace the fifth paragraph and NOTE 1 (following the DISCLAIMER of the Foreword) with the following:

This Part 2-52 is to be used in conjunction with the latest edition of UL 60335-1.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to UL 60335-1.

102DV DE Modification of NOTE 2 by adding the following:

– The numbering system in the standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. For example, 1 000 means 1,000 and 1,01 means 1.01.

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INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

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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 International Standard deals with the safety of electric oral hygiene appliances for household and similar purposes, their **rated voltage** being not more than 250 V.

NOTE 101 Examples of appliances covered by this standard 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 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 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

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.

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.

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 $4\text{ N} \pm 1\text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.

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

11.7 Replacement:

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.

11.8 Addition:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in [Table 101](#).

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
^a Metal is considered coated when a coating having a minimum thickness of 90 µm made by 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

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 be used to insure 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