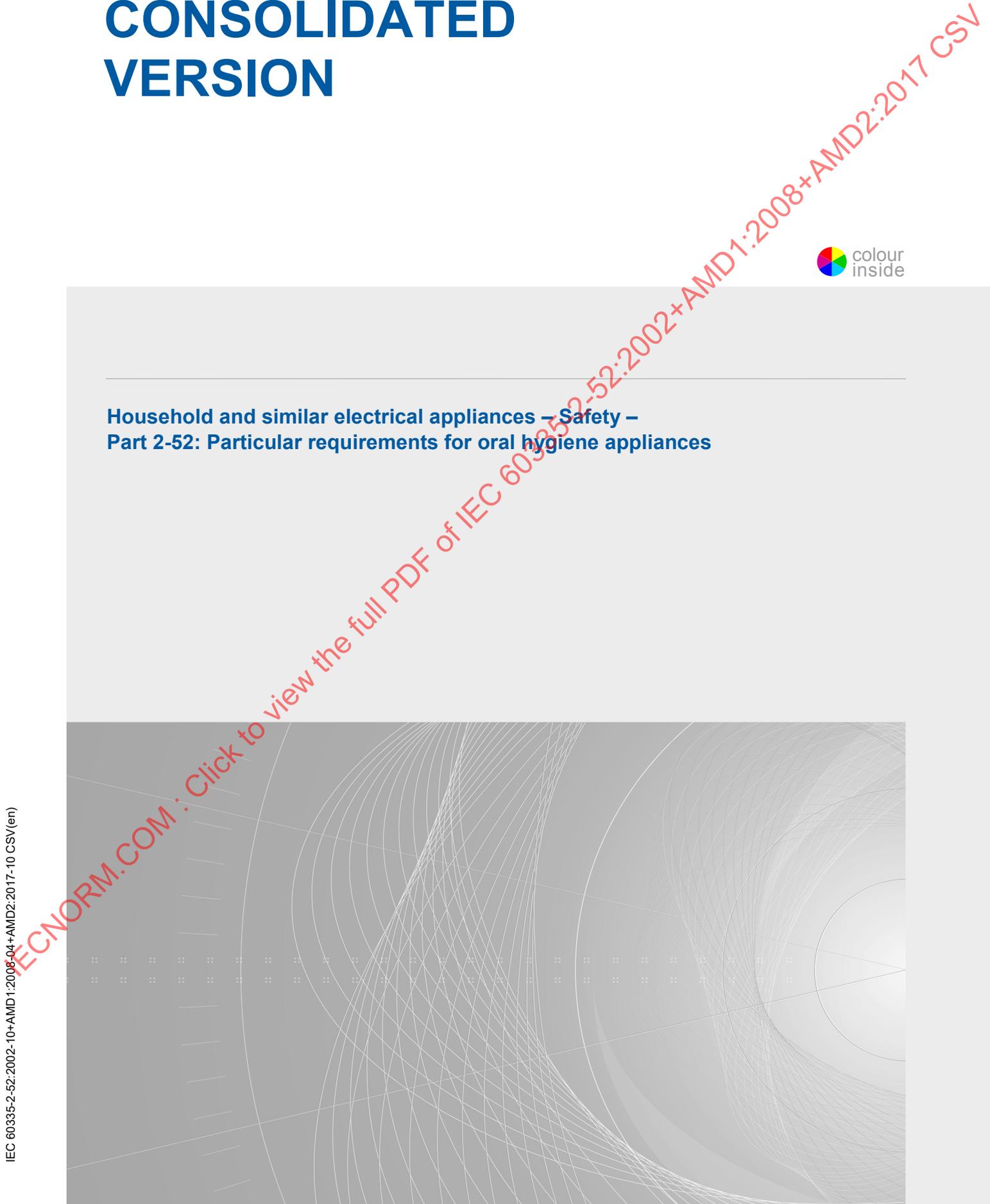


## CONSOLIDATED VERSION



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





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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –  
SAFETY –**

**Part 2-52: Particular requirements for oral hygiene appliances**

FOREWORD

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This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

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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.

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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.

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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.

## 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

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

- persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledgeprevents 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 <sup>a</sup>	42
Glass and ceramic	51
Plastic and plastic coating > 0,4 mm <sup>b, c</sup>	58

<sup>a</sup> Metal is considered coated when a coating having a minimum thickness of 90 µm made by enamel or non-substantially plastic coating is used.

<sup>b</sup> The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.

<sup>c</sup> 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 specified in 13.2. It is measured between any pole of the supply and a rectangular stainless steel electrode, having dimensions approximately 250 mm x 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.

## 21 Mechanical strength

This clause of Part 1 is applicable.

## 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.

*Compliance is checked by inspection.*

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.

## 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.

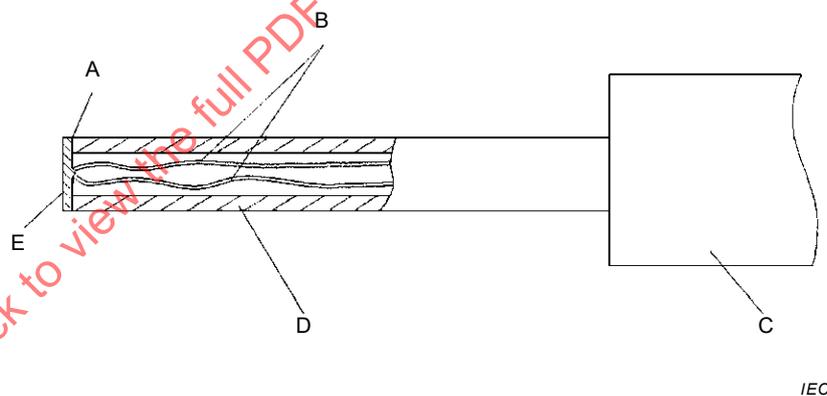
30.2.3 Not applicable.

## 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  $4\text{ N} \pm 1\text{ N}$
- D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm
- E tinned copper probe: 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.

## **Bibliography**

The bibliography of Part 1 is applicable.

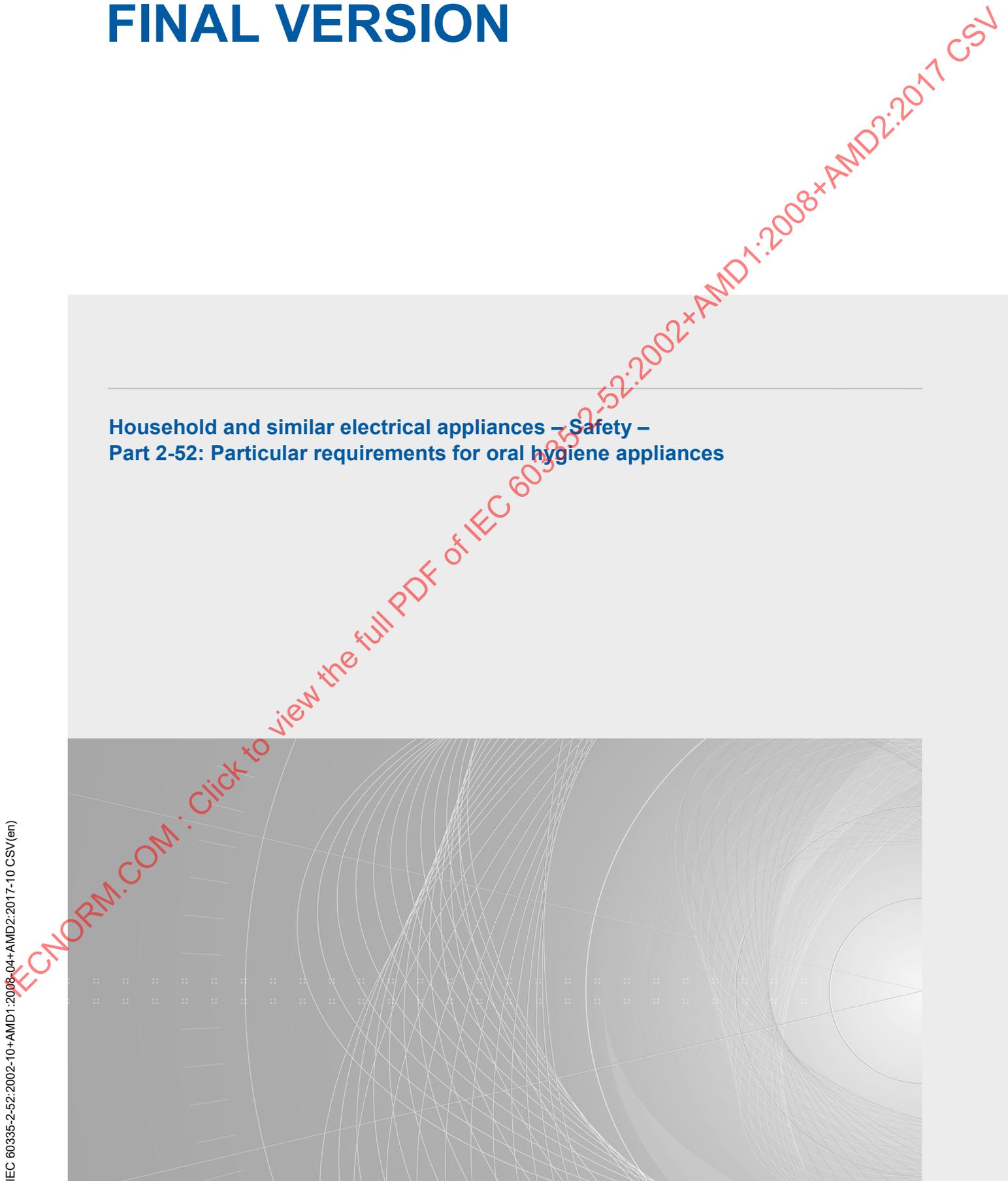
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- replaced by a revised edition, or
- amended.

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.

## INTRODUCTION

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

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

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

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

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

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

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

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

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

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

# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

## Part 2-52: 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 knowledgeprevents 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.