

INTERNATIONAL STANDARD



**Household and similar electrical appliances – Test code for the determination of
airborne acoustical noise –
Part 2-8: Particular requirements for electric shavers, hair clippers or trimmers**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
TEST CODE FOR THE DETERMINATION OF
AIRBORNE ACOUSTICAL NOISE –****Part 2-8: Particular requirements for electric shavers,
hair clippers or trimmers**

FOREWORD

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International Standard IEC 60704-2-8 has been prepared by subcommittee 59L: Small household appliances, of IEC technical committee 59: Performance of household and similar electrical appliances.

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

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

- a) the scope of the products has been enlarged to include hair clippers and trimmers;
- b) it includes standard deviations of sound power levels in 1.1.3;
- c) the normative references have been updated (ISO 3744:2010 and ISO 3743-1:2010);
- d) it is adjusted with respect to IEC 60704-1:2010;
- e) it has been updated to comply with the ISO/IEC Directives, Part 2.

The text of this standard is based on the following documents:

FDIS	Report on voting
59L/176/FDIS	59L/177/RVD

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

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

This Part 2-8 is intended to be used in conjunction with third edition (2010) of IEC 60704-1, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 1: General requirements*.

The relevant text of IEC 60704-1:2010 as amended by this standard establishes the test code for shavers, hair clippers or trimmers.

This Part 2-8 supplements or modifies the corresponding clauses in IEC 60704-1:2010, so as to establish the test code for shavers, hair clippers or trimmers. When a particular subclause of IEC 60704-1:2010 is not mentioned in this Part 2-8, that subclause is applicable as far as reasonable. Where this standard states "addition", "modification" or "replacement", the relevant requirements, test specifications or explanatory matter in IEC 60704-1:2010 should be adapted accordingly.

Subclauses, tables and figures that are numbered starting from 101 are additional to those in IEC 60704-1:2010.

Unless notes are in a new subclause or involve notes in IEC 60704-1:2010, they are numbered starting from 101, including those in a replaced clause or subclause.

Additional annexes are lettered AA, BB, etc.

A list of all parts in the IEC 60704 series, published under the general title *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://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.

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

The measuring conditions specified in this document provide for sufficient steadiness in the noise emitted and reproducibility in different laboratories, whilst simulating as far as possible the practical use of shavers, hair clippers or trimmers.

~~It is recommended to consider noise data as part of performance data.~~

It is recommended to consider the determination of noise levels as part of a comprehensive testing procedure covering many aspects of the properties and performance of shavers, hair clippers or trimmers.

NOTE As stated in the Introduction to IEC 60704-1:2010, this test code is concerned with airborne noise only.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – TEST CODE FOR THE DETERMINATION OF AIRBORNE ACOUSTICAL NOISE –

Part 2-8: Particular requirements for electric shavers, hair clippers or trimmers

1 Scope and object

This clause of IEC 60704-1:2010 is applicable except as follows:

1.1 Scope

1.1.1 General

Replacement:

This document applies to electric shavers, hair clippers or trimmers for domestic and similar use, supplied from mains or secondary batteries or primary batteries.

The term "similar use" is understood to mean the use in hotels, hospitals, shops, offices, etc.

NOTE 101 This document does not apply to shavers, hair clippers or trimmers that are powered by means other than electrical ~~means~~, for example by a spring-device.

NOTE 102 If possible, this document can also be applied to analogous electrically ~~operating~~ operated devices, such as ~~hair clippers and~~ depilating devices.

1.1.2 Types of noise

Replacement:

The methods specified in ISO 3743-1, ISO 3743-2 and ISO 3744 can be used for measuring noise emitted by shavers, hair clippers or trimmers

1.1.3 Size of the source

Replacement:

The method specified in ISO 3744:2010 is applicable to noise sources of any size. Limitations for the size of the source are given in Subclause 1.2 of ISO 3743-1:2010 and Clause 5 of ISO 3743-2:2018.

1.2 Object

Addition:

Requirements for the declaration of noise emission values are not within the scope of this document.

NOTE 101 For determining and verifying noise emission values declared in product specifications, see IEC 60704-3.

1.3 Measurement uncertainty

Replacement:

The estimated values of standard deviations of sound power levels determined in accordance with this document are given in Table 101.

Table 101 – Standard deviations of sound power levels

Standard deviation (dB)	
σ_r (repeatability)	σ_R (reproducibility)
0,4	0,8

Addition:

1.101 Standard deviation for declaration and verification

For the purpose of determining and verifying declared noise emission values in accordance with IEC 60704-3, the values in Table 102 apply.

Table 102 – Standard deviations for declaration and verification

Standard deviation (dB)		
σ_P (production)	σ_t (total)	σ_M (reference)
0,7 to 1,3	1,1 to 1,5	1,5

2 Normative references

This clause of IEC 60704-1:2010 is applicable except as follows:

Addition:

~~IEC 704-1: 1996, Household and similar electrical appliances – Test code for the Determination of airborne acoustical noise – Part 1: General requirements~~

~~IEC 1254: 1993, Electric shavers for household use – Methods for measuring the performance~~

Replacement:

ISO 3743-1:2010, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for small movable sources in reverberant fields – Part 1: Comparison method for a hard-walled test room*

ISO 3743-2:2018, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering methods for small, movable sources in reverberant fields – Part 2: methods for special reverberation test rooms*

ISO 3744:2010, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane*

3 Terms and definitions

This clause of IEC 60704-1:2010 is applicable except as follows:

Addition:

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

~~3.101 **mains shaver:** Shaver which can be operated directly from the mains supply.~~

~~3.102 **rechargeable shaver:** Shaver which is supplied by a secondary battery belonging to it.~~

~~3.103 **battery shaver:** Shaver which is supplied by primary batteries.~~

~~3.104 **trimmer:** Accessory incorporated in the shaver to groom particular facial hair, for example, moustache, beard or side whiskers.~~

3.101**mains powered**

shaver, hair clipper or trimmer that can be operated directly from the mains supply

3.102**rechargeable**

shaver, hair clipper or trimmer that is supplied by a secondary battery belonging to it

3.103**battery powered**

shaver, hair clipper or trimmer that is supplied by primary batteries

3.104**trimmer accessory**

accessory incorporated in the shaver to groom particular facial hair, for example, moustache, beard or side whiskers

4 Measurement methods and acoustical environments

This clause of IEC 60704-1:2010 is applicable except as follows:

4.2 Direct method

Addition:

~~NOTE — Shavers can produce pure tones. If pure tone components are present in the noise emitted, proper precautions should be taken as specified in ISO 3743-1, ISO 3743-2 and ISO 3744.~~

Shavers, hair clippers or trimmers can produce pure tones. If pure tone components are present in the noise emitted by the source, the estimated standard deviation of the measured sound pressure levels in the special reverberation room can increase. In such cases, additional microphone positions or source positions can be necessary, as specified in ISO 3743-2.

4.3 Comparison method

Addition:

~~NOTE — Shavers can produce pure tones. If pure tone components are present in the noise emitted, proper precautions should be taken as specified in ISO 3743-1, ISO 3743-2 and ISO 3744.~~

If pure tone components are present in the noise emitted by the source, the estimated standard deviation of the measured sound pressure levels in the hard-walled test room or in the special reverberation room can increase. In such cases, additional microphone positions or source positions can be necessary, as specified in ISO 3743-1 or ISO 3743-2.

5 Instrumentation

This clause of IEC 60704-1:2010 is applicable.

6 Operation and location of appliances under test

This clause of IEC 60704-1:2010 is applicable except as follows:

~~Addition:~~

~~NOTE During handling, care should be taken to avoid any damaging, especially of the shaving parts of the appliance as these parts tend to be very delicate.~~

6.1 Equipping and pre-conditioning of appliances

6.1.1

Replacement:

Shavers, hair clippers or trimmers shall be equipped as for ordinary shaving, clipping or trimming. Shavers, hair clippers or trimmers with a cutting selector shall be adjusted in such a way that the ~~shaving~~ cutting head is in the least visible position that the construction allows.

The shaver, hair clipper or trimmer shall be clean, including the hair chamber, if any. The appliance shall be oiled with a light oil having a viscosity not exceeding 20 cSt at 50 °C. If the manufacturer prescribes a different method of cleaning or lubrication, the manufacturer's method should be followed.

NOTE 101 During handling, take care to avoid any damage, especially to the cutting parts of the appliance as these parts tend to be very delicate.

6.1.3

Replacement:

Prior to noise measurements, the appliance shall have been in operation for at least 10 min, unless otherwise specified by the manufacturer.

6.1.4

Replacement:

Immediately before each series of noise measurements, the ~~shaver~~ appliance is operated for 35 s ± 5 s to stabilize, without load, at the highest speed.

6.2 Supply of electric energy and of water or gas

6.2.2

Replacement:

Battery-operated shavers, hair clippers or trimmers are started, for noise measurements, with fully loaded batteries as specified by the manufacturer. The batteries have to be replaced

when the voltage under load has dropped below 0,9 times the battery voltage under load with fully loaded batteries.

Rechargeable shavers, hair clippers or trimmers are measured with fully charged batteries, and disconnected from any external power source.

6.4 Loading and operating of appliances during tests

6.4.1

Replacement:

The shaver, hair clipper or trimmer is to be measured under no-load condition. If speed control is provided, the highest speed setting has to be chosen.

~~When shavers are equipped with more than one shaving head and if a selection switch for shaving heads is available, that switch setting shall be measured which gives the highest noise value.~~

When shavers, hair clippers or trimmers are equipped with more than one cutting head and if a cutting selector for cutting heads is available, the selector setting that gives the highest noise value shall be used.

Shavers can be equipped with a trimmer accessory. When the trimmer accessory can be switched on and off, the following measurements shall be made:

- only shaving heads,

and the following measurements could be made:

- shaving heads + trimmer accessory (if possible);
- only trimmer accessory (if possible).

~~If there is more than one position for the trimmer, that trimmer position shall be measured which gives the highest noise value.~~

If there is more than one position for the trimmer accessory, the trimmer accessory position that gives the highest noise value shall be measured.

6.4.3

Addition:

NOTE— For shavers that operate with an operational cycle, the loudest part of the cycle should be measured. This is preferably done by forcing the machine to operate in this loud part of the cycle. If this is not possible, the actual measurement should be done during that particular loud part of the cycle.

6.5 Location and mounting of appliances

6.5.1

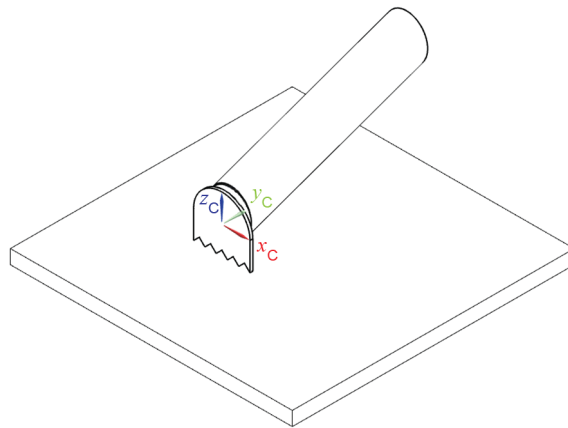
Not applicable.

6.5.2

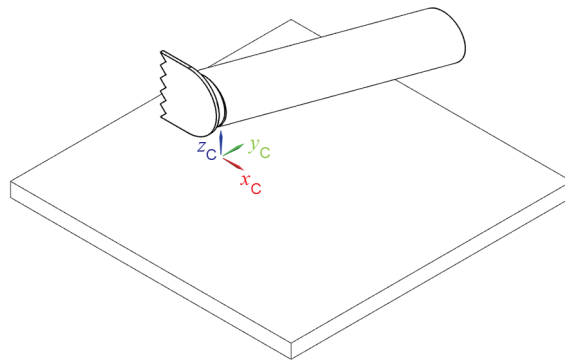
Addition:

Shavers, hair clippers or trimmers are positioned in such a way that the tangent plane of the surface, which is normally in contact with the skin, is located vertically. The longitudinal axis of the shaver, hair clipper or trimmer is located horizontally, if possible. The height, z_C , of 25 cm is measured from the centre of the cutting area towards the bottom surface.

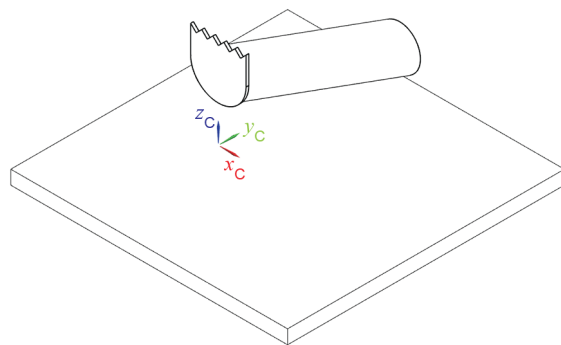
Figure 101 show the different isometric position views.



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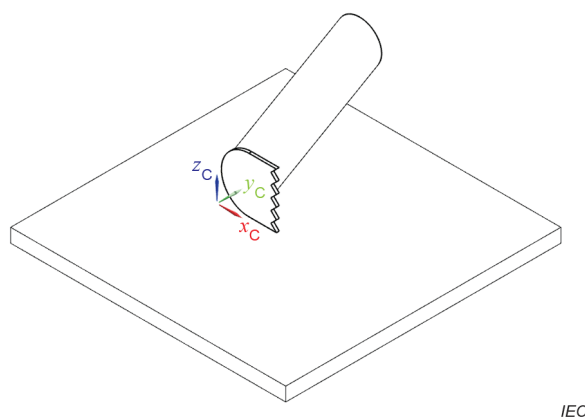
a) Isometric position view, -z direction.

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b) Isometric position view, -x direction

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c) Isometric position view, +z direction



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d) Isometric position view, +x direction

Figure 101 – Isometric position views of the shaver, hair clipper or trimmer

6.5.3

Not applicable.

6.5.4

Not applicable.

6.5.5

Not applicable.

7 Measurement of sound pressure levels

This clause of IEC 60704-1:2010 is applicable except as follows:

7.1 Microphone array, measurement surface and RSS location for essentially free-field conditions over reflecting plane(s)

7.1.1

Not applicable.

7.1.2

Not applicable.

7.1.3

Not applicable.

7.1.5

Not applicable.

7.1.6

Not applicable.

7.4.1

Addition: