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INTERNATIONAL STANDARD

Method of measuring performances of electric hair clippers or trimmers for household use

IEC 62863:2017-08(en)

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Method of measuring performances of electric hair clippers or trimmers for household use

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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METHOD OF MEASURING PERFORMANCES OF ELECTRIC HAIR CLIPPERS OR TRIMMERS FOR HOUSEHOLD USE

FOREWORD

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International Standard IEC 62863 has been prepared by subcommittee 59L: Small household appliances, of IEC technical committee 59: Performance of household and similar electrical appliances.

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

FDIS	Report on voting
59L/144/FDIS	59L/146/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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.

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

METHOD OF MEASURING PERFORMANCES OF ELECTRIC HAIR CLIPPERS OR TRIMMERS FOR HOUSEHOLD USE

1 Scope

This document applies to reciprocating electric hair clippers or trimmers for household use.

This document deals with the methods of measuring performances of electric hair clippers or trimmers for household use with a rated voltage not greater than 250V.

This document does not specify safety or performance requirements.

This document does not apply to professional hair clippers or trimmers, animal shearers and animal clippers, or shavers. For shavers, refer to IEC 61254.

NOTE This document does not cover safety requirements (see IEC 60335-2-8).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60704-2-8, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2: Particular requirements for electric shavers*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1
clipper
trimmer
appliance that is designed to cut hair that consists of a motor, drive system, fixed blade containing teeth and a moving blade containing teeth moving in a reciprocating motion intended for clipping/trimming, not shaving

Note 1 to entry: Depending on the specific function, clippers are also called trimmers.

3.2
battery-operated hair clipper
battery-operated hair trimmer
hair clipper or trimmer deriving its energy solely from primary batteries or secondary batteries and not designed for connection to the mains supply or a charger, or from the battery packs that are supplied by manufacturers together with the hair clipper or trimmer

Note 1 to entry: If the manufacturer supplies a specific charger and rechargeable batteries with the clipper or trimmer, the combined device is considered as a rechargeable hair clipper or trimmer when performance is measured.

3.3
rechargeable hair clipper
rechargeable hair trimmer
hair clipper or trimmer powered by rechargeable batteries or battery packs that are recharged in the hair clipper or trimmer

Note 1 to entry: There are two types, cordless rechargeable hair clipper or trimmer and cord/cordless rechargeable hair clipper or trimmer.

3.4
cordless rechargeable hair clipper
cordless rechargeable hair trimmer
rechargeable hair clipper or trimmer that is not intended to run while connected to the mains supply or a charger

3.5
cord/cordless rechargeable hair clipper
cord/cordless rechargeable hair trimmer
cordless rechargeable hair clipper or trimmer that can be operated while connected to the mains supply with discharged batteries

3.6
corded hair clipper
corded hair trimmer
hair clipper or trimmer without batteries or battery packs, that can operate only while connected to the mains supply

3.7
cool state
state in which one hour passes after the outside of the device has fallen to ambient temperature

3.8
stationary blade tooth plane
SEE: Figure 1.

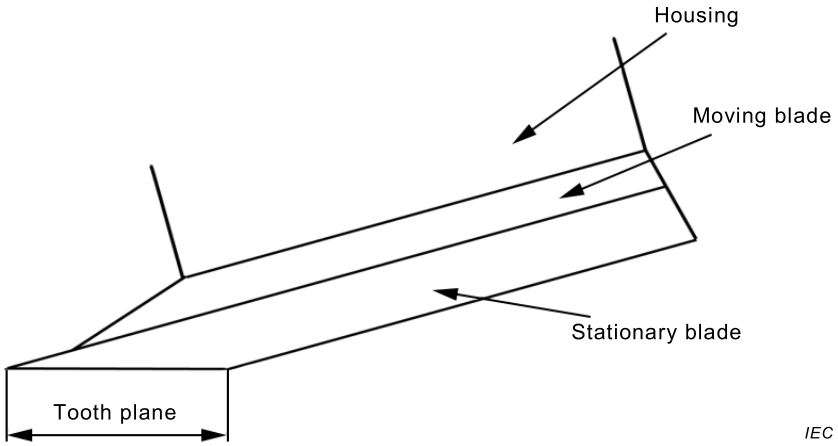


Figure 1 – Sketch for the stationary blade tooth plane

3.9
soft surface
surface that prevents the device from moving while running and should have limited impact on the temperature of the device

4 General conditions for the tests

4.1 General

Unless otherwise specified, the tests are carried out in accordance with Subclauses 4.1 to 4.8.

Unless otherwise specified, the tests are carried out when the controller of the hair clipper or trimmer is set to the highest setting.

4.2 Pre-conditioning

For rechargeable hair clippers, preconditioning shall be carried out according to 5.2.1 before performing the tests specified in this document.

For hair clippers or trimmers other than rechargeable types, a preconditioning run shall be carried out according to 5.2.2 before performing the tests specified in this document.

4.3 Battery condition

For battery-operated hair clippers or trimmers, new batteries shall be used, unless otherwise specified.

For rechargeable hair clippers or trimmers, the battery shall be fully charged before each test according to the manufacturer's instructions.

4.4 Test environment

The tests are carried out in draft-free indoor environment at an ambient temperature of (23 ± 2) °C.

4.5 Limits of voltage variation

During the test, the variation in the voltage shall not exceed ± 1 % of the test voltage.

4.6 Test voltage

Unless otherwise specified, the tests are carried out at a specific voltage within a voltage range (e.g. 100 V to 240 V) or at the rated voltage or voltages (e.g. 120 V, or 120 V and 240 V).

4.7 Test frequency

Hair clippers or trimmers are tested at the rated frequency or within a rated frequency range (e.g. rated as 50 Hz and 60 Hz, or 50 Hz to 60 Hz).

4.8 Test electrical supply system

Total harmonic distortion of the test electrical supply system shall be less than 5 %.

5 Testing procedures

5.1 General

Oil the cutting system according to the instructions for use before each test, unless otherwise specified. During the oiling, the clipper blades shall be in a horizontal position.

5.2 Preconditioning run

5.2.1 For rechargeable hair clipper or trimmers, the following preconditioning run is required.

a) Fully charge the device according to its instructions for use.

b) Let the device reach the cool state.

c) Oil the cutting system according to its instructions for use.

d) Lay the device horizontally on a soft surface with the teeth of the cutting element pointing upwards.

e) Continuously run (discharge) the device under no-load test condition until it stops.

f) Let the device reach the cool state.

g) Repeat the procedures a) to f) three times.

5.2.2 For hair clippers or trimmers other than rechargeable type, the following preconditioning run is required.

a) Oil the cutting system according to its instructions for use.

b) Lay the device horizontally on a soft surface with the teeth of the cutting element pointing upwards.

c) Continuously run the device under no-load test conditions for 20 min.

d) Let the device reach the cool state.

5.3 Test condition for no-load operation

Lay the device horizontally on a soft surface with the teeth of the cutting element pointing upwards and without any load on the cutters. If possible, there shall be no combs attached. The device shall operate in normal mode (e.g. no turbo) with only the main cutting system in operation.

The cutting head mounted during the tests shall be recorded.

5.4 Measurement of supply cord length

The length of the supply cord is measured between the point where the cord or the cord sheath enters into the enclosure and the entry to the plug (see Figure 2). The cord is stretched to its full length. For coiled cords, a 10 N force is applied to stretch.

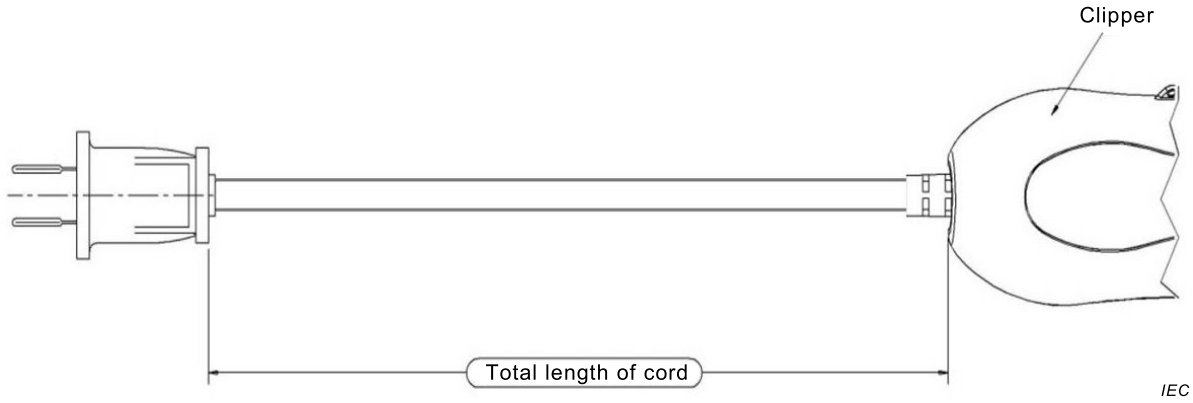


Figure 2 – Measurement of supply cord length

5.5 Starting ability test

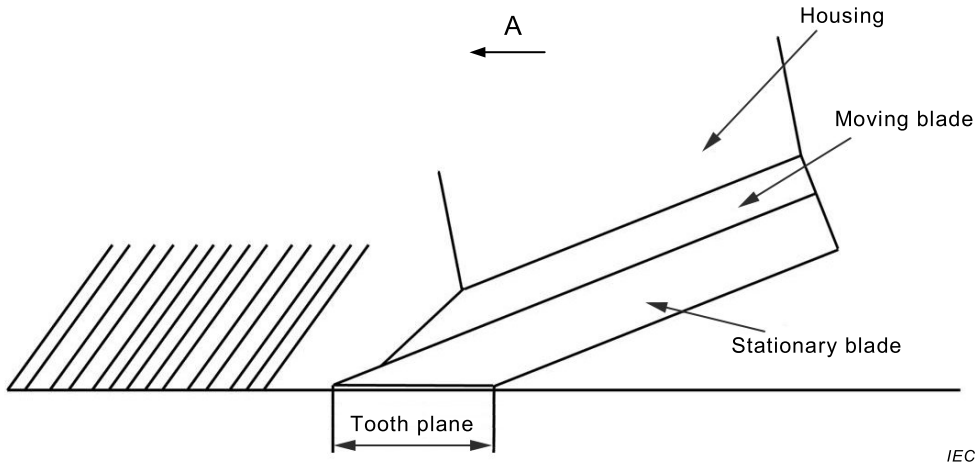
Oil the cutting system of the corded hair clipper or trimmer according to the instructions for use. The corded hair clipper or trimmer is started three times at 0,9 times the rated voltage. The hair clipper or trimmer shall come to a complete stop before it is restarted. The outcome of starting for each time shall be recorded.

For battery-operated hair clippers or trimmers and rechargeable hair clippers or trimmers, the starting ability test is not carried out.

5.6 Ability-to-cut test

All attachments are removed.

The clipper is fed into a specified hair strip with the stationary blade tooth plane being less than 5 mm from, and parallel to, the hair strip surface (see Figure 3) at a maximum uniform stroke speed so that 100 % of the hair across the blade's cutting width is cut. Try to find the fastest time where the clipper is still able to cut 100 %.



Key

A: direction of trimmer/clipper movement

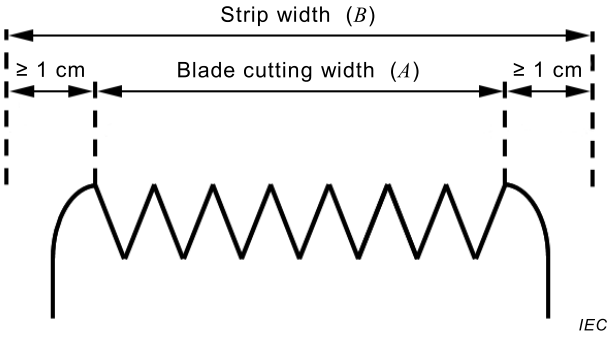
Figure 3 – Stationary blade tooth plane parallel to the hair strip surface

At least 2 units are tested and at least 3 cutting times are measured for each unit. The time to cut the hair strip in seconds for each test is recorded.

The cutting distance is 20 cm (from the start point to the end point). In addition, 5 cm of blank distance is reserved on the hair strip to facilitate the cutting operation (see Figure 5).

The cutting width of the blade is shown in Figure 4 where

$B = A + (\geq 2\ \text{cm})$



Key

A: blade width

B: strip width

Figure 4 – Hair strip width

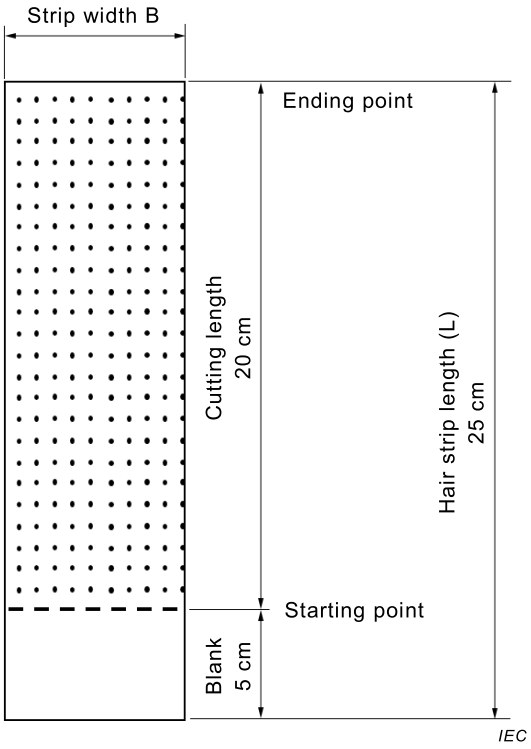
The hair strip width is equal to B with the following characteristics:

– a hair stitch density of approximately 25 stitches/cm^2 and approximately (15 ± 3) hairs per stitch (see Figure 5);

– a hair orientation angle of approximately 45° to 65° (angle α in Figure 6).

The length of the hair is approximately 20 mm.

The material of the strip hair can be artificial and the hair diameter is 70 µm to 110 µm.



Key
L: hair strip length = 25 cm
Cutting length = 20 cm
Blank distance = 5 cm

Figure 5 – Distribution of hairs on the hair strip

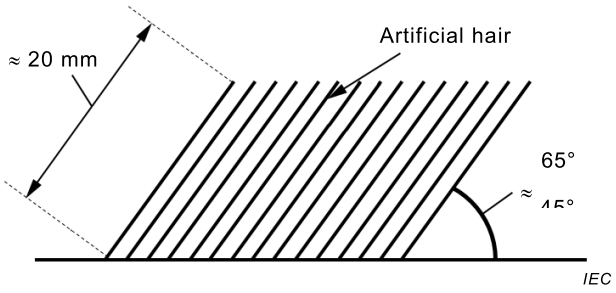


Figure 6 – Orientation and length of hair

5.7 Test of airborne acoustical noise

The test shall be carried out according to IEC 60704-2-8:1997.

NOTE The test set up is shown in Annex B.

The result of A-weighted sound power level is recorded.

5.8 Test of reliability of the mechanical /electrical connection between the adapter and the cord/cordless rechargeable hair clipper or trimmer

The axis of both the pin of the adapter and the socket of the clipper or trimmer are kept in a horizontal position and aligned with each other. The pin is inserted into the socket of the clipper or trimmer and then the plug is pulled out of the socket with the maximum pull force being measured and recorded. Then the pin is inserted into and pulled out of the socket of the clipper or trimmer with the charger plugged into the supply mains. One cycle includes one insertion and one extraction. Care should be taken not to pull on the cord.

The test is repeated and the pull force and the electrical connection shall be checked and recorded at intervals of 60 cycles. The electrical connection is checked by observing the

charging indicator, or the current/power meter if no charging indicator is present (see Figure 7). When checking the electrical connection while charging, the cord is positioned at multiple angles to verify no intermittent connection. The device shall not be switched on during the test.

When 600 cycles are reached, the test is terminated.

Figure 7 – Electrical connection diagram

5.9 Determination of the working minutes of a rechargeable hair clipper or trimmer after full charging

Fully charge the device according to the instructions for use. Oil the cutting unit according to the instructions for use. When it is fully charged, the hair clipper or trimmer shall be disconnected from the power supply. Let the device rest and the rest period shall be at least 1 h and not exceed 24h.

Run the device according to the no-load test condition specified in 5.3 for 10 min. Switch off the device for 10 min. Repeat these on-off cycles until it stops (r/min is zero). The accumulated working minutes of the device are recorded.

5.10 Determination of energy consumption of battery-operated hair clipper or trimmer

The battery-operated hair clipper or trimmer is supplied from a DC supply with the voltage equal to the battery's rated voltage as specified in the instructions for use. Run the device according to the no-load test condition specified in 5.3 for 1 min. Then start to measure the total energy consumption for 10 min. The obtained energy consumption (W·h) is recorded.

5.11 Endurance test

5.11.1 The corded hair clipper or trimmer is supplied with the rated voltage and is operated according to the no-load test condition specified in 5.3 for 10 min, then stopped and rested for 10 min. This cycle is repeated until the unit fails to operate or the predetermined accumulated working hours are reached, whichever is shorter. During this period the ability-to-cut test specified in 5.6 is performed and the ability-to-cut test intervals are done as follows:

- Ability-to-cut test is carried out once every 12 h for accumulated working time not exceeding 36 h;
- Ability-to-cut test is carried out once every 48 h for accumulated working time exceeding 36 h.

The total accumulated working hours are recorded, along with the times for the ability-to-cut test. Failure mode is also recorded.

The predetermined working hours may be agreed between the manufacturer or the client and the laboratory before the endurance test.

During the test, the hair clipper or trimmer shall be lubricated once per 12 h of accumulated working time and before the ability-to-cut test.

5.11.2 The rechargeable hair clipper or trimmer is fully charged at the rated frequency and the rated voltage and in accordance with the requirements in the instructions for use. The hair clipper or trimmer is operated according to the no-load test condition specified in 5.3 for 10 min, then stopped and rested for 10 min. The hair clipper or trimmer shall be disconnected from the charger during operation. When the battery becomes empty, it shall be recharged according to the manufacturer's instructions for use. This cycle is repeated until the unit (including the charger) fails to operate or the predetermined accumulated working hours are reached, whichever is shorter. During this period, the ability-to-cut test specified in 5.6 is performed and the ability-to-cut test intervals are done as follows:

– Ability-to-cut test is carried out once every 12 h for accumulated working time not exceeding 36 h;

– Ability-to-cut test is carried out once every 48 h for accumulated working time exceeding 36 h.

The total accumulated working hours are recorded, along with the times for the ability-to-cut test. The failure mode is also recorded.

The predetermined working hours may be agreed between the manufacturer or the client and the laboratory before the endurance test.

During the test, the hair clipper or trimmer shall be lubricated once per 12 h of accumulated working time and before the ability-to-cut test.

5.11.3 For battery-operated hair clippers or trimmers, use an equivalent DC supply with the voltage equal to the battery's rated voltage as specified in the instructions for use. The device is operated according to the no-load test condition specified in 5.3 for 10 min, then stopped and rested for 10 min. This cycle is repeated until the unit fails to operate or the predetermined accumulated working hours are reached, whichever is shorter. During this period, the ability-to-cut test specified in 5.6 is performed and the ability-to-cut test intervals are done as follows:

– Ability-to-cut test is carried out once every 12 h for accumulated working time not exceeding 36 h;

– Ability-to-cut test is carried out once every 48 h for accumulated working time exceeding 36 h.

The total accumulated working hours are recorded, along with the times for the ability-to-cut test. The failure mode is also recorded.

The predetermined working hours may be agreed between the manufacturer or the client and the laboratory before the endurance test.

During the test, the hair clipper or trimmer shall be lubricated once per 12 h of accumulated working time and before the ability-to-cut test.

6 Records of test information and test result

6.1 Product details

The following information shall be recorded in the test report:

– brand, model, type, and serial number or date code;

– product description, as appropriate;

– rated voltage(s) and frequency/frequencies.

In the case of products with multiple functions or with options to include additional models or attachments, the configuration of the product tested shall be noted in the report.

6.2 Test parameters

The following values shall be achieved and recorded during the test. If the values change during the test, the minimum and maximum values shall be recorded:

– ambient temperature (°C);

– test voltage(s) (V) and frequency (frequencies) (Hz);

– total harmonic distortion of the electricity supply system;

– information and documentation on the instrumentation, setup and circuits used for electrical testing.

6.3 Measured data

The following information shall be recorded in the test report:

- 5.4, measured cord length (m);
- 5.5, the outcome of starting for each of three times (started/not started);
- 5.6, ability-to-cut test (time to cut the hair strip in seconds);
- 5.7, A-weighted sound power level (dB(A));
- 5.8, test of reliability of the mechanical/electrical connection between adapter and cord/cordless rechargeable hair clipper or trimmer:
  - measured pull forces (N) and the electrical connection functionality (yes/no) at the intervals.
- 5.9, the accumulated working minutes (min);
- 5.10, determination of energy consumption of battery-operated hair clipper or trimmer:
  - electricity consumption for 10 min operation (Wh).
- 5.11, endurance test:
  - total accumulated working hours (h) and the result of the cutting ability results at the given intervals (s);
  - failure mode.

6.4 Test and laboratory details

The following information shall be recorded in the test report:

- test report number/reference;
- date of test;
- laboratory name and address;
- test officer(s).

Annex A
(informative)

Supplier information of hair strip[1]

A suitable strip of hair specified for the tests in this document can be obtained from the following supplier:

Supplier name: ZheJiang Paiter Electric Co., LTD

Address: No. 33, Hongxiang Road, National High-tech Industrial Park, Ouhai District, Wenzhou, Zhejiang Province, China.

[1] The hair strip provided by ZheJiang Paiter Electric Co.,LTD is an example of a suitable product for carrying out the tests described in this document. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

Annex B
(informative)

Positioning of the hair clipper or trimmer under test

The clipper or trimmer is positioned as follows: the clipper or trimmer is rested on the horizontal plane with the teeth of the cutting element pointing upwards and then raised up so the tips of the blade teeth are 25 cm from the floor, see Figure B.1.

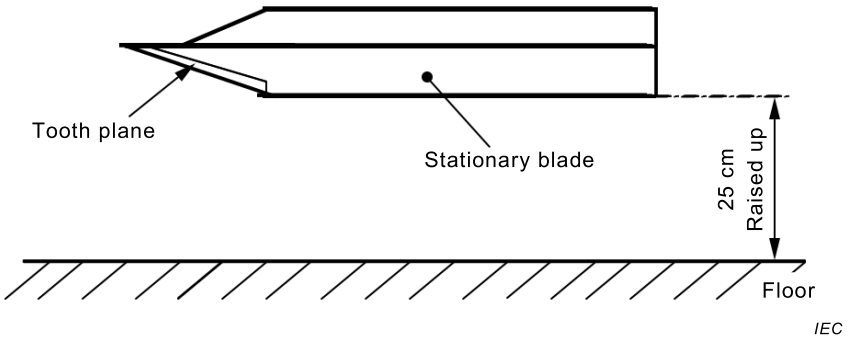


Figure B.1 – Positioning of the hair clipper or trimmer under test

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IEC 60335-2-8, *Household and similar electrical appliances – Safety – Part 2-8: Particular requirements for shavers, hair clippers and similar appliances*

IEC 61254, *Electric shavers for household use – Methods for measuring the performance*

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