

*The test is repeated with the heat setting switch placed in each position. The voltage to the heating element is maintained at the value that gives 1,15 times **rated power input** with the switch at the highest heat setting position.*

19.102 Portable hair dryers are operated under **normal operation** at 1,15 times **rated power input**.

A sheet of polyethylene approximately 200 mm × 200 mm and having a thickness of 50 µm is placed against the air-inlet and moved in any direction in order to reduce the airflow so that the most unfavourable conditions are established.

The test is carried out for 30 min.

The test is repeated with the airflow directed horizontally.

NOTE The most unfavourable conditions are usually obtained by positioning the polyethylene sheet so that the **thermal cut-out** is prevented from operating.

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** without a charging stand, intended to be used on a surface such as the floor or a table, shall have adequate stability. **Hand-held appliances** with an integral rest shall have adequate stability when placed on the integral rest.

*Compliance is checked by the following test, appliances incorporating an appliance inlet being fitted with an appropriate connector and flexible cord. **Hand-held appliances** are subjected to the test while placed on their charging stand or integral rest.*

*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°.*

NOTE 101 The test on the horizontal support can 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 which overturns complies with all of the following:

- *It only contains circuits operating at SELV according to 8.1.4;*
- *It only contains low power circuits according to 19.11.1;*
- *It is dropped from a height of 700 mm on a rigidly supported hard wood board 5 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.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 Addition:

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

*Water filled **foot care appliances** are loaded as specified for **normal operation** but with the mass increased to 90 kg. The mass is applied for 30 s.*

21.101 ~~The appliance is operated under the conditions of Clause 11. It is then placed on a horizontal surface positioned 700 mm above a rigidly supported hardwood board.~~

~~It is pulled from the surface by its **supply cord** and allowed to drop freely. The test is carried out five times, the appliance being placed on the horizontal surface in different positions likely to occur.~~

~~The appliance shall not be damaged to such an extent that compliance with this standard is impaired. In particular, the appliance shall not emit flames or molten material and the requirements of Clauses 8 and 29 shall be fulfilled.~~

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 similar 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 appliance 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.

22.13 Addition:

To avoid accidental contact with hot surfaces, the handle of curling irons and hair straighteners shall be clearly identified by tactile means, or colour or other visual means.

22.24 Addition:

The heating element shall also be unlikely to come into contact with the skin or hair if it ruptures.

22.32 *Addition:*

Supplementary insulation and **reinforced insulation** in **class II curling irons** and hair straighteners shall be resistant to aging.

Insulation mentioned in Table 3 is considered to be resistant to aging.

For insulation not mentioned in Table 3 compliance is checked by the following test.

Samples of insulation not mentioned in Table 3 are suspended in a heating cabinet so that there is at least 10 mm between the samples, and between the samples and the top and bottom of the cabinet. The samples shall be at least 50 mm from the walls of the cabinet. The volume of the samples is not to exceed one-tenth of the capacity of the cabinet.

The cabinet is ventilated by natural convection, with at least three air changes per hour. The temperature of the cabinet is maintained at $30\text{ K} \pm 1\text{ K}$ in excess of the temperature rise of the part determined during the tests of Clause 19 or at $70\text{ °C} \pm 2\text{ °C}$, whichever is higher.

The samples are kept in the cabinet for 240 h and then at ambient temperature for at least 16 h.

*The samples shall show no cracks and shall withstand the electric strength test of 16.3 for **supplementary insulation**.*

22.36 *Addition:*

For **class I appliances**, other than hand dryers and face dryers, metal parts that could be in contact with skin or hair in normal use shall be separated from **live parts** by **double insulation** or **reinforced insulation** and shall not be earthed.

22.40 *Addition:*

The switch in the **off-position** shall disconnect **electronic circuits**, unless compliance with Clause 19 does not depend on the operation of a **self-resetting thermal cut-out**.

22.101 Appliances having steam-producing or spray-producing devices shall be constructed so that there is no spillage or unintentional burst of steam or water that is likely to cause a hazard.

Compliance is checked during the test of Clause 11.

22.102 Curling rollers of permanent-wave appliances having integral heating elements shall be supplied with **safety extra-low voltage** not exceeding 24 V.

Compliance is checked by inspection and by the relevant tests.

22.103 Hairdryers shall be fitted with a grid or similar protection means to limit the risk of hair being sucked into the air intake.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.3 *Addition:*

The number of flexings for conductors that are only flexed when the appliance is stored is 5 000.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 Addition:

Switches incorporated in hand dryers are subjected to 50 000 cycles of operation.

24.2 Modification:

Helmet-type hairdryers and permanent-wave appliances may incorporate a switch in a flexible cord.

24.101 Protective devices incorporated in **fixed hand dryers** in order to comply with 19.2 and 19.3 shall not be self-resetting.

Compliance is checked by inspection during the tests of 19.2 and 19.3.

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 if the **supply cord** is fitted with a warning flag tag.

Type Z attachment is allowed for

- **hand-held appliances**;
- hairdryers with a flexible hood attachment;
- **heaters for detachable curlers** having not more than 10 curlers.

25.7 Modification:

Light polyvinyl chloride sheathed cords (code designation 60227 IEC 52) are allowed regardless of the mass of the appliance.

The temperature rise limit of 75 K is increased to 130 K provided that the temperature rise decreases to 75 K within 5 min of the appliance being switched off.

25.14 Addition:

*The force applied to the **supply cord** of appliances provided with a **swivel connection** is*

- 20 N, for cords having a nominal cross-sectional area exceeding 0,75 mm²;
- 10 N, for other cords.

*The appliance is mounted so that the direction of flexing corresponds to that most likely to occur when the **supply cord** is wound around the appliance for storage.*

*Unless incorporating a **swivel connection**, **hand-held appliances** are additionally tested while mounted on an apparatus similar to that of Figure 8 with the **supply cord** hanging*

vertically and loaded with a force of 10 N. The oscillating part of the apparatus is moved through an angle of 180° and back to the original position. The number of flexings is 10 000, the rate of flexing being 6 per min.

25.15 Addition:

The **swivel connection** is not locked during the tests.

Modification:

For appliances with a **swivel connection**, the value of 30 N in Table 12 is increased to 60 N.

25.101 Swivel connections shall be adequate for normal use of the appliance.

Compliance is checked by the following test.

The appliance is operated under the conditions specified in 11.101, the number of revolutions being increased to 20 000.

*After this test, the **swivel connection** and the **supply cord** shall be fit for further use. **Live parts** shall not have become accessible and the appliance shall withstand the electric strength test of 16.3.*

26 Terminals for external conductors

This clause of Part 1 is applicable except as follows.

26.10 Addition:

Terminals with screw clamping and screwless terminals shall not be used for **type X attachments** in appliances incorporating a **swivel connection**.

27 Provision for earthing

This clause of Part 1 is 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 except as follows.

29.3 Addition:

For curling irons and hair straighteners the distance through insulation between metal parts separated by **supplementary insulation** may be reduced to 0,6 mm, provided that the distance through **basic insulation** is at least 1 mm.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.1 Addition:

For hand dryers and hairdryers, the temperature rises occurring during the tests of Clause 19 are not taken into account.

30.2 Addition:

For **heaters for detachable curlers**, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.

30.101 Helmet-type hairdryers shall be resistant to fire.

Compliance is checked by inspection and by applying the needle-flame test of Annex E to

- parts of non-metallic material enclosing the heating element and other electrical components;*
- non-metallic parts within the enclosure.*

The needle-flame test is not carried out on material classified as V-0 or V-1 according to IEC 60695-11-10, provided that the test sample was no thicker than the relevant part.

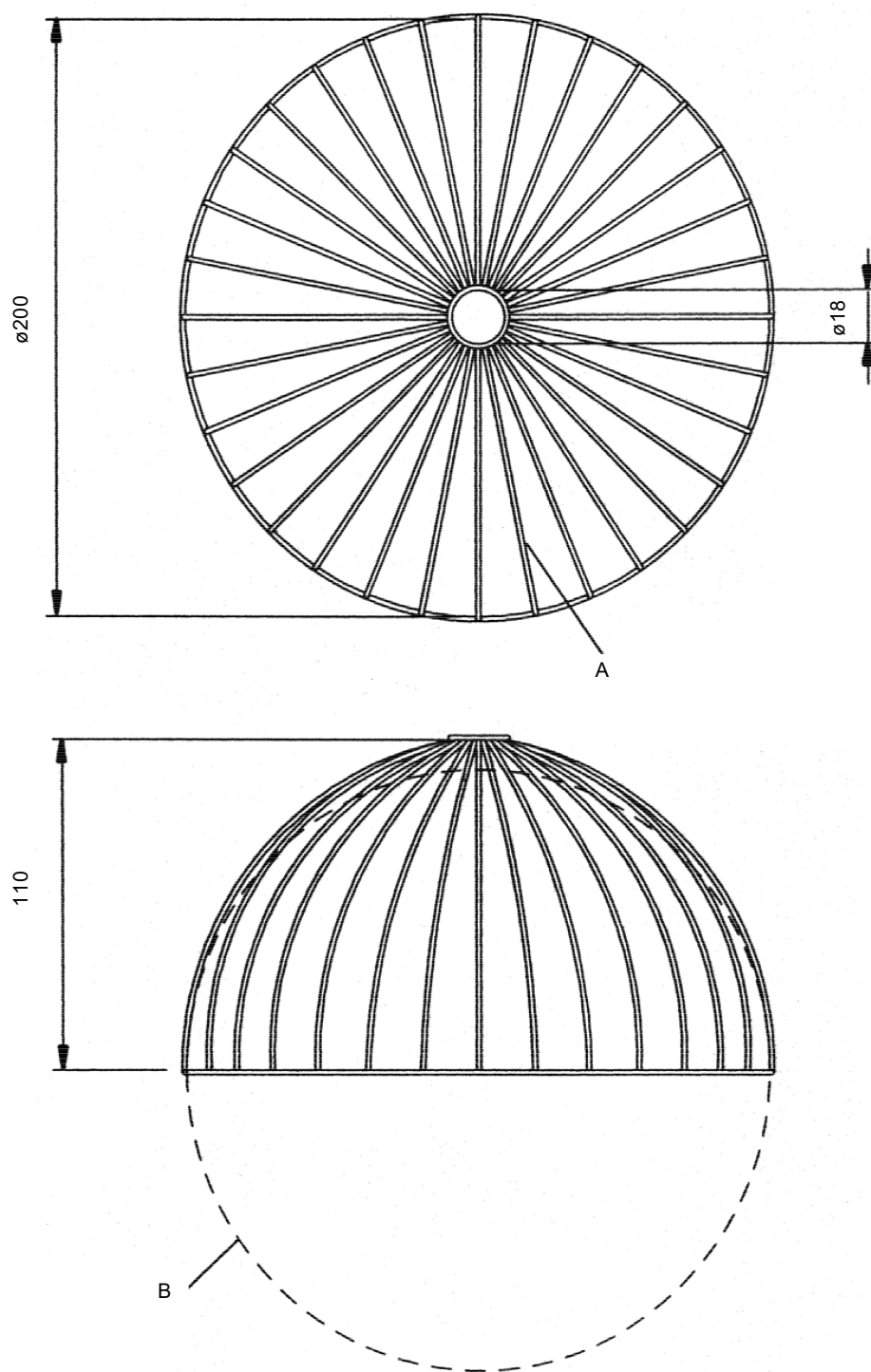
31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

Dimensions in millimetres



IEC

Key

- A frame consisting of 32 equally spaced wires $\varnothing 1,5 \text{ mm} \pm 0,5 \text{ mm}$
- B location of the wooden sphere

Figure 101 – Wire frame

Annexes

The annexes of Part 1 are applicable.

Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

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

IEC 60335-2-17, *Household and similar electrical appliances – Safety – Part 2-17: Particular requirements for blankets, pads, clothing and similar flexible heating appliances*

IEC 60335-2-27, *Household and similar electrical appliances – Safety – Part 2-27: Particular requirements for appliances for skin exposure to ultraviolet and infrared radiation*

IEC 60335-2-32, *Household and similar electrical appliances – Safety – Part 2-32: Particular requirements for massage appliances*

IEC 60335-2-53, *Household and similar electrical appliances – Safety – Part 2-53: Particular requirements for sauna heating appliances and infrared cabins*

IEC 60335-2-65, *Household and similar electrical appliances – Safety – Part 2-65: Particular requirements for air-cleaning appliances*

IEC 60335-2-113, *Household and similar electrical appliances – Safety – Part 2-113: Particular requirements for cosmetic and beauty care appliances incorporating lasers and intense light sources*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-23: Exigences particulières pour les appareils destinés aux soins de la peau ou des cheveux

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L'IEC 60335-2-23 édition 6.1 contient la sixième édition (2016-06) [documents 61/5135/FDIS et 61/5171/RVD] et son amendement 1 (2019-03) [documents 61/5757/FDIS et 61/5794/RVD].

Dans cette version Redline, une ligne verticale dans la marge indique où le contenu technique est modifié par l'amendement 1. Les ajouts sont en vert, les suppressions sont en rouge, barrées. Une version Finale avec toutes les modifications acceptées est disponible dans cette publication.