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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 23132-2024

Replacing GB/T 23132-2008

Electric shaver

电动剃须刀

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3 Terms and definitions

3.1 electric shaver: an appliance that uses electric power to drive a shaving head for shaving.

3.2 mains connected shaver: an electric shaver supplied directly from the mains. The English term is printed in the original as mains connceted shaver.

3.3 rechargeable battery operated shaver: an electric shaver supplied from a rechargeable battery. The class takes in shavers that cannot work normally while charging and shavers that can.

3.4 primary battery operated shaver: an electric shaver supplied from dry cells.

3.5 shaving head: the shaving assembly made up of structural parts, the foil and the blades.

3.6 trimmer: an attachment of an electric shaver for trimming particular facial hair, such as the moustache and the side whiskers.

4 Classification

4.1 By the way they are supplied, shavers are divided into primary battery operated shavers, rechargeable battery operated shavers and mains connected shavers.

4.2 By the motion of the blades, shavers are divided into rotary shavers, whose blades move by rotation, and reciprocating shavers, whose blades move by reciprocation.

5 Technical requirements

5.1 The general service temperature is 0 °C to 40 °C.

5.2 The safety requirements conform to GB/T 4706.9-2024.

5.3 The shaver shall start smoothly at 0.9 times the rated voltage.

5.4 Tested by the method of 6.4, the temperature rise of the foil shall not exceed 30 K. A note explains that a foil whose temperature rise goes beyond 30 K is generally held to give a burning sensation on contact with the skin.

5.5 Tested by the method of 6.5, the hardness of foil and blades shall meet Table 1. For carbon steel the Vickers hardness is at least 543 for the foil of the shaving head, at least 664 for the blades of the shaving head and at least 664 for the blades of the trimmer; for stainless steel and electroformed alloy it is at least 400 for all three.

5.6 Tested by the method of 6.6, the roughness of the outer surface of the foil shall not exceed Ra 0.40. The clause does not apply to foils whose surface is designed with closely arranged raised and hollow shapes. The original gives no unit for the roughness value.

5.7 Tested by the method of 6.7, the nylon filaments shall be cut through without the shaver stalling, and the proportion of curled filaments shall be less than 15%.

5.8 Tested by the method of 6.8, the sound power level of the shaver shall not exceed 75 dB.

5.9 Tested by the methods of 6.9, a supply pin that has been pushed out shall not retract when a force of 60 N is applied to its end; and after 2 000 push-out and retraction operations the pins shall show nothing abnormal, shall conduct fully, and shall still meet the force requirement.

5.10 Tested by the method of 6.10, the fault-free running time shall be not less than 60 h, and no fault shall appear before the cumulative running time reaches 60 h.

5.11 Tested by the methods of 6.11, the cumulative running time of a rechargeable shaver after one full charge shall be not less than 25 min, and the cumulative running time of a primary battery shaver using two LR06 cells after a change of cells shall be not less than 60 min.

5.12 The surface of plastic and moulded resin parts shall be free of obvious defects and of sharp burrs. Apart from the shaving head, metal that needs protection against corrosion shall be corrosion resistant, and where it is plated the plating shall be smooth and fine and free of spots, pitting, pinholes, blisters, flaking and bare patches. Coatings shall not lift, peel or crack.

5.13 The shaver shall have a protective cap or a similar structure to protect the foil. Its construction shall be such that in normal running the foil and the blades bear evenly on each other with an even friction, the sound is smooth, and no knocking or irregular noise is produced.

6 Test methods

6.1 Unless otherwise stated, tests are made where there is no forced convection of air and the ambient temperature is 20 °C plus or minus 5 °C. Electrical measuring instruments are of accuracy class 0.5 or better for type testing and 1.0 or better for delivery inspection. The regulated d.c. supply used for the tests has a rated current of not less than 1 A and a regulation accuracy of not worse than +/-2%. The sample is tested in the condition of use laid down in the instruction manual, and unless otherwise stated the test supply matches the supply specified for the product. Before and during the test a few drops of light oil are put on the cutting edges and worked in.

6.2 The safety tests are made by the methods of GB/T 4706.9-2024.

6.3 The shaver is started three times at the voltage of 5.3, each start being made after the motor has come completely to rest.

6.4 A mains connected shaver is supplied at 1.06 times the rated voltage and run on no load for 10 min, and the highest temperature rise of the foil surface during normal running is measured. A primary battery shaver is supplied from an external d.c. source at the nominal voltage of the cells and run on no load for 10 min, and the same measurement is made. A rechargeable shaver that can work normally while charging is supplied at 1.06 times the rated voltage and run on no load for 10 min; a rechargeable shaver that cannot work while charging is fully charged, the charging circuit is then disconnected and the shaver is run on no load for 10 min.

6.5 The hardness of foil and blades is measured with a Vickers hardness tester, at any three points near the cutting edge for the foil and the blades of the shaving head and at any three points near the root of the teeth for the blades of the trimmer, and the mean of the three points is calculated.

6.6 The surface roughness of the foil is measured with a roughness tester or compared against roughness specimen blocks.

6.7 Before the sharpness test a mains connected shaver is supplied at rated voltage, a rechargeable shaver is fully charged as the instructions require, and a primary battery shaver is supplied from an external d.c. source at the nominal voltage of the cells. The shaver is set to its strongest mode as the instructions describe, started and brought to a steady state. Nylon filaments of PA612 with a nominal diameter of 0.1 mm are prepared, whose physical properties shall be a density of 1.197 g per cubic centimetre, a breaking force of 4.07 N and an elongation at break of 4.69%. A note describes how those two values are obtained: on a tensile testing machine at a drawing speed of 250 mm/min and a gauge length of 40 mm, twenty filaments are taken at random and drawn one by one; the maximum force at which each filament breaks is measured and the arithmetic mean is the breaking force, and the percentage ratio of the increase in length at the breaking force to

the initial length is measured for each filament and the arithmetic mean is the elongation at break. Ten filaments meeting these requirements are set side by side in a close row less than 1 cm wide, as shown in Figure 1, and held, with adhesive tape if wanted, 4 mm to 6 mm from the tips of the bundle. The bundle is fed slowly, at about 1 mm/s, into the test area laid down in Table 2. Timing starts when the tips touch the foil and the test ends 3 s later. A fresh bundle is then used on the next test area, and so on through the areas laid down; that completes the first test. The cut ends of the filaments are examined under a microscope at 30 times magnification against the curling assessment figure, Figure 2, whose parts a) and b) show an acceptable and an unacceptable section and which marks the curl length of the filament in millimetres, and the total number of curled filaments is established. The curling rate R is calculated from formula (1) as the total number of curled filaments K divided by the product of the number of test areas N and ten, expressed as a percentage. The test is repeated three times and the arithmetic mean of the three curling rates is the final result. A note states that a filament that has not been cut counts as not curled. Table 2 gives, for each type of shaver, how the test areas are divided and at what angle the bundle is inserted: for rotary shavers, a single-ring rotary shaver uses areas 1, 2 and 3 and a double-ring rotary shaver areas 1, 2, 3, 4 and 5; for reciprocating shavers, a single-blade reciprocating shaver uses two areas, a double-blade reciprocating shaver is divided in the same way blade by blade so that there are four areas, and a three-blade reciprocating shaver has six areas; the trimmer is divided into two areas. The insertion angle column of the extracted table did not survive and its values are not reproduced here.

6.8 Noise is tested by GB/T 4214.5-2023, with the radius of the hemispherical measurement surface in 6.5.2 of that standard taken as 1 m.

6.9 With the supply pins fully pushed out, as in Figure 3, a force of 60 N is applied for 2 s along the axis of the two pin ends. The push-out and retraction test is run at a rate of 10 to 20 operations per minute, one push-out plus one retraction counting as one operation.

6.10 A mains connected shaver is supplied at rated voltage and run in cycles of 5 min on no load and 5 min stopped. A rechargeable shaver is charged at rated frequency and rated voltage for the charging time laid down and, when charging is over, run in the same cycles of 5 min running and 5 min stopped. A primary battery shaver is fitted with the appropriate cells and run in the same cycles. A note says that the foil is lubricated with light oil each day. The cumulative running time of the shaver is its fault-free running time.

6.11 For a rechargeable shaver the battery is fully charged and discharged, then charged fully again as the instructions require; the charging connection is broken and the shaver stands for 1 h. It is set to its strongest mode and worked in cycles of 5 min running on no load and 5 min at rest until it will no longer run, when the test ends; the cumulative running time is calculated in minutes. The trimmer does not work during the test. For a primary battery shaver an external d.c. supply is used at the nominal voltage of the cells marked on the shaver or in the instructions. The shaver is set to its strongest mode and worked in the