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Sports helmets - Safety requirements and testing methods for sports helmets for cyclists and users of skateboards and roller skates

运动头盔 自行车、滑板、轮滑运动头盔的安全要求和试验方法

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Sports helmets - Safety requirements and testing methods for sports helmets for cyclists and users of skateboards and roller skates

1 Scope

This standard specifies the terms and definitions, specifications, requirements, test methods, signs, packaging, transportation and storage, and product specifications for sports helmets for cyclists and users of skateboards and roller skates.

This standard is mainly applicable to helmets for cyclists and users of skateboards and roller skates.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 10000 Human dimensions of Chinese adults

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1

Sports helmet (hereinafter referred to as helmet)

A device used to absorb impact energy and reduce accidental injury to the wearer's head during exercise.

3.2

Shell

5 Requirements

5.1 Structure

The helmet is composed of a shell, a cushion coat, a comfort pad, a retention system, and the like.

5.1.1 Shell

It shall meet the following requirements:

a) Made of tough, water-resistant, heat-resistant and cold-resistant materials;

b) The surface shall be firm and smooth; the edges shall be rounded to prevent direct injury to the head;

c) During the test of this standard, the shell shall not rupture which will jeopardize the wearer

d) The height of the protrusion on the outer surface of the shell shall be not more than 7 mm (the easy-to-fall parts are not subject to this requirements);

e) It may have ventilation holes.

5.1.2 Cushion coat

It shall meet the following requirements:

a) Made of materials that absorb more impact energy and are not subject to variability in sweat and cosmetics;

b) The adaptive cushion of appropriate shape and size to avoid displacement;

c) The inner surface shall not have projections and sharp objects with a length greater than 2 mm;

d) It shall cover the minimum protection range of the head as specified in 3.9 and Figure 3;

e) It may have ventilation holes.

5.1.3 Comfort pad

It shall meet the following requirements:

a) Made of comfortable, sweat-absorbent, breathable, durable materials that

6 Test methods

6.1 Laboratory environmental conditions

The temperature is 20 °C ± 3 °C; the relative humidity is 25% ~ 75%.

6.2 Inspection of helmet structure, size, protection range, marking content

6.2.1 Inspection tools

The length measuring instruments which have a divisional value of not more than 0.5 mm as well as the large, medium, small, extra-small standard head model.

6.2.2 Inspection steps

a) Visually inspect the structure, appearance, marking of the helmet;

b) Use the measuring instrument to inspect the inner and outer surfaces of the helmet and the strap, etc.;

c) Measure the size and protection area of the helmet. Wear the helmet to the standard head model of the corresponding specification. It may adjust the adjustment device of the retention system and apply a 5 kg load on the top of the helmet. Measure the protection area of the helmet. Mark the test area;

d) The results shall be in accordance with the provisions of Chapters 4, 5.1 and 7.1.

6.3 Inspection of helmet mass

6.3.1 Inspection tools

Weighing instruments which have a division value of not more than 5 g.

6.3.2 Inspection steps

a) Weigh and record the mass of the helmet (including accessories), in g;

b) The results shall comply with the provisions of 5.2.1.

It consists of a single-axis accelerometer, amplifier, data processing, display and recording portion. Its main performance requirements are as follows:

a) Frequency response range $0^{+0.2}_{0}$ Hz ~ 1000 Hz, band cut-off point $-3^{+0.5}_{-1}$ dB, attenuation slope -9 dB/oct ~ -24 dB/oct;

b) Meet the acceleration value testing requirements set forth in 5.2.5;

c) Measurement uncertainty U = 5% (k = 2).

6.7.2 Pre-test processing of helmet sample

The helmet samples must be processed in accordance with Table 4 before testing. Choose one item for each helmet sample for processing.

The helmet samples after high temperature or low temperature treatment shall be tested within 3 minutes. If it exceeds 3 minutes, the helmet samples shall be returned to the incubator for more than 5 minutes before testing. The helmet samples after the water immersion shall be tested after being dried for 20 minutes.

Table 4 -- Pre-test processing conditions of helmet

Item	Temperature / °C	Time / h
High temperature	50 ± 3	4 ~ 24
Low temperature	- 15 ± 2	4 ~ 24
Water immersion	15 ~ 23	4 ~ 24

6.7.3 Test area and impact point

6.7.3.1 Test area

The test area is the portion above the ABCDEF line in Figure 3 (see Figure 3 and Table 1).

6.7.3.2 Impact point

Select any four weakest parts in the test area as the impact point. Make one impact for each impact point, wherein two impact points use flat anvil and the other two impact points use curbstone anvil (once for each along the length and width direction of the ventilation hole). The spacing between the two impact points is not less than 120 mm. The impact speed and the number of impacts are as shown in Table 5.

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