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General technical specification for eye and face protector

眼面防护具通用技术规范

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General technical specification for eye and face protector

1 Scope

This document specifies the classification, general requirements, geometrical optical performance requirements, physical optical performance requirements, physical and mechanical performance requirements, marking and information provided by manufacturers, etc. of eye and face protection products.

This document applies to protection products or components used to protect the eyes or face in production and life.

This document does not apply to welding protectors, auto-darkening welding filters, goggles for protection against strong light sources, goggles for protection against lasers, sunglasses and sun lenses.

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 version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 2410-2008, Determination of the luminous transmittance and haze of transparent plastics

GB 10810.4-2012, Uncut finished spectacle lenses - Part 4: Specifications and test methods for anti-reflective coatings

GB 13511.1-2011, Assembled spectacles - Part 1: Single-vision and multifocal

GB 13511.2-2011, Assembled spectacles - Part 2: Progressive power

GB/T 30042, Personal Protective Equipment - Eye and Face Protection - Vocabulary

GB/T 32166.2, Personal protective equipment - Eye and face protection - Occupational eye and face protectors - Part 2: Test methods

3 Terms and definitions

Terms and definitions determined by GB/T 30042, as well as the following, are applicable to this document.

5 General requirements and test methods

5.1 Biocompatibility

Eye and face protection products shall meet the requirements of the intended use and use environment, and shall not contain any factors that affect the health or safety of the wearer.

Manufacturers shall ensure that material precipitation will not cause harm to the wearer's skin. Manufacturers can confirm the safety of materials by requesting material safety test reports from material suppliers.

5.2 Structure and adjustment

Eye and face protection products shall not have protrusions, sharp edges, or other parts that may cause discomfort or injury during use.

For structures or accessories on eye and face protection products that can be disassembled, adjusted, and replaced, manufacturers shall ensure the convenience of disassembly, adjustment, and replacement, and simplify the operation process as much as possible. The operation process shall comply with ergonomic requirements. Products shall be inspected by visual inspection, touch and other methods.

5.3 Cleaning and disinfection

The manufacturer shall provide the materials, methods and steps for cleaning, disinfection and maintenance of eye and face protection products in the instructions for use. After cleaning, disinfection and maintenance according to the methods provided by the manufacturer, the performance of the eye and face protection products shall neither change nor affect the health of the wearer. This can be confirmed through performance testing and requesting material safety test reports from material suppliers.

6 Geometric optical performance requirements and testing methods

6.1 Field of view

6.1.1 Eye and face protection products not applicable to road driving

For eye and face protection products that are not suitable for road driving, the horizontal bitamporal field of view of each eye in the wearing position shall not be less than 30°, the horizontal nasal field of view shall not be less than 30°, and the vertical field of view shall not be less than 30° in both the upper and lower directions of the line of sight. See Figure 6 for a schematic diagram.

7.3 Scattered light

The wide angle scattering value shall not be greater than 2%. When the visible light transmittance of eye and face protection products is not less than 15%, the test shall be carried out according to the method given in 7.1 of GB/T 2410-2008. When the visible light transmittance of eye and face protection products is less than 15%, the test shall be carried out according to the method given in 7.2 of GB/T 2410-2008.

7.4 Reflectance

For eye and face protection products coated with an anti-reflection coating, the visible light reflectance shall be less than 2.5%. Test according to the method given in 5.3 of GB 10810.4-2011.

7.5 Driving transmittance requirements and traffic light identification

7.5.1 Transmittance requirements

The visible light transmittance of eye and face protection products suitable for driving shall not be less than 8%. Test according to the method given in GB/T 32166.2.

7.5.2 Traffic light identification

Its spectral transmittance at 475 nm ~ 650 nm shall not be less than $0.2\tau_v$, and the relative visual attenuation factor Q for red, yellow, green and blue signal lights shall not be less than 0.8. GB/T 30042 gives the calculation method of the relative visual attenuation factor Q.

8 Physical and mechanical performance requirements and testing methods

8.1 Protection area

8.1.1 Eye protection area

Figure 8 and Table 4 show the basic eye protection area. All eye and face protection products applicable to this document shall be able to cover this area and ensure the safety of the wearer. For eye and face protection products with side protection, the side protection area in Figure 8 shall also be covered.

Figure 9 and Table 5 show the eye protection areas of eyeglasses-type protector with high-speed particle impact protection performance. Figure 10 and Table 6 show the eye protection areas of eye shield-type protector with high-speed particle impact protection performance.

9.3 Marking arrangement methods and requirements

The markings of eye and face protection products consist of basic marking, size marking, driving and traffic light identification marking, and high-speed particle impact protection performance marking. Eye and face protection products shall be marked according to the above requirements and ordering.

The basic marking is “GB 14866”, which means that eye and face protection products meet the basic requirements of serial number 1 in Table 10.

The size marking refers to the corresponding size of the head model for eye and face protection products in Appendix A of eye and face protection products, that is, small, medium, and large, which shall be marked according to serial number 2 in Table 10.

The driving and traffic light identification marking shall be marked in accordance with the requirements of serial number 3 in Table 10.

The high-speed particle impact protection performance marking shall be marked according to serial number 4 in Table 10.

Example 1: GB 14866 S, this marking indicates that the eye and face protection product meets the basic requirements of serial number 1 in Table 10 and the size is small.

Example 2: GB 14866 M Driving, this marking indicates that the eye and face protection product meets the basic requirements of serial number 1 in Table 10, the size is medium, and it is suitable for driving.

Example 3: GB 14866 L+, this marking indicates that the eye and face protection product meets the basic requirements of serial number 1 in Table 10, the size is large, and it has high-speed particle impact protection performance.

10 Information that is provided by the manufacturer

10.1 General requirements

The manufacturer shall provide product instructions in clear fonts, and the contents of the instructions shall at least include the contents specified in 10.2.

10.2 Necessary information

The necessary information is as follows:

a) Manufacturer information: name, address, contact information;

b) Size, storage, use, maintenance methods, and attached parts of the eye and face protection product;

c) Model, functions and usage scenarios of the eye and face protection product;

Appendix B

(Normative)

Visual field measurement methods

B.1 Measuring devices

B.1.1 Goniometer, the uncertainty of which shall not be greater than 1°.

B.1.2 Head model, which shall comply with the provisions of Appendix A.

B.1.3 Continuous laser, where the beam diameter is 2 mm ± 1 mm.

B.1.4 Photoelectric detector, which is placed at the vertex of the cornea of the head model. The positions of the photoelectric detector and the continuous laser can be interchanged.

B.2 Measurement steps

B.2.1 According to the instructions, put the sample on the head model and put it in the wearing position.

B.2.2 Set the goniometer to 0 ° and adjust the continuous laser so that the beam can vertically illuminate the photodetector at the corneal vertex of the right eye of the head model. The angle when the head model is rotated toward the nasal direction around the vertical rotation axis passing through the corneal vertex until the edge of the lens or the frame blocks half of the beam is the horizontal bitamporal visual field.

B.2.3 Repeat the above steps to rotate the head model toward the bitamporal side and measure the horizontal nasal visual field.

B.2.4 Set the measuring instrument to 0 ° and adjust the continuous laser so that the light beam can vertically illuminate the photoelectric detector at the corneal vertex of the right eye of the head model. Rotate the head model up and down around the horizontal rotation axis passing through the line connecting the corneal vertices of the two eyes. The angle when the edge of the lens or the frame blocks half of the light beam is the vertical upper and lower visual field.

B.2.5 For products that cover both eyes, the horizontal bitamporal visual field of the right eye shall be measured on the right eye, and the horizontal bitamporal visual field of the left eye shall be measured on the left eye.

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