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## TEST REPORT:

**AS/NZS 1337.1:2010**

**Personal eye protection**

**Part 1: Eye and face protectors for occupational applications**

**Product:** Full Face Mask  
**Report No:** 2023 (W) – 114  
**Client:** Shanghai Huguard Protection Technology Co., Ltd.  
**Model (s):** 9800  
**Date of sample receive:** 2023.08.29  
**Date(s) of tests:** 2023.08.30 - 2023.09.26

## DESCRIPTION OF SAMPLES

General Information	Model	Type
	9800	High impact
<b>Manufacturer</b>	Shanghai Huguard Protection Technology Co., Ltd.	
<b>Manufacturer Address</b>	Room 301 A, Building 1, No. 168 Xutang Road, Songjiang District, Shanghai, P. R. China	
<b>Numbers of Samples</b>	21	

Signed:

**Issued: 2023.09.26**

陈倬为 Chen Zhuowei

Authorized Signatory, Lab Director

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## Test Results

### Section 3 Requirements for assembled eye and face protectors

#### 3.2 General Requirements

##### 3.2.3 Optical properties of oculars

Pass<sup>1</sup>

Oculars of assembled eye and face protectors shall comply with Clauses 2.1 to 2.4 inclusive.

Note1. Refer to Annex A for testing results.

#### 2.2 GENERAL REQUIREMENTS FOR OCULARS

##### 2.2.1 Finish

Pass<sup>2</sup>

Oculars shall be free from projections, sharp edges or other features likely to cause discomfort or injury during use.

Note2. Refer to Annex A for testing results.

##### 2.2.2 Materials

Pass<sup>3</sup>

Oculars shall be made of organic materials (plastics), inorganic materials (glass), or any suitable combination of these materials.

Oculars shall not include any substance in such quantities or in such a manner that would be hazardous to the health of the wearer when the ocular is subject to normal use and reasonably foreseeable abuse.

NOTE: The purpose of this requirement is to prevent the use of substances with properties not specifically covered by this Standard but which would nonetheless be injurious to the health of the wearer.

Note3. Refer to Annex A for testing results.

##### 2.3.1 Visual quality

Pass<sup>4</sup>

On visual inspection of the viewing area(see Clause 2.3.2), oculars shall be reasonably free of pits, scratches, greyness, watermarks, bubbles, striae, local aberrations and inclusions which could impair vision or prevent the use of the oculars for their intended purpose. Lighting conditions for inspection of oculars are set out in Appendix J. Other visual inspection shall be carried out under good illumination against a suitable background with the unaided eye, although spectacles may be worn if required.

Note4. Refer to Annex A for testing results.

##### 2.3.2 Viewing area

Pass<sup>5</sup>

The viewing area of oculars is determined as follows:

(a)For spectacles and goggle with separate oculars for each eye the area contained to within 3 mm from the edge.

(b)For visors the area contained in a rectangle 120 mm horizontally and 50 mm vertically, except for visors specified in Clause 2.2.4, symmetrically located about the vertical centre-line. and in the horizontal plane of the ocular in the as-worn position.

(c)For single ocular wide-vision goggles the area contained to within 10 mm of the edge excluding markings and an area 10 mm either side of this vertical centre-line, on the horizontal plane of the ocular and in the as-worn position. For visors meeting the requirements of Clause 2.2.4 the area contained in are rectangle 100 mm horizontally and 42 mm vertically, symmetrically located about the vertical centre-line. and in the horizontal plane of the ocular in the as-worn position.

Note5. Refer to Annex A for testing results.

#### 2.4.4 Transmittance requirement

##### 2.4.4.1 General

Pass<sup>6</sup>

Filters in a given ocular category shall meet the requirements set out in Table 1 when measured at the reference points of the oculars. The requirements of Table 1 apply to all filters including untinted, uniformly tinted, gradient density, polarizing and photochromic.

Photochromic filters shall meet the requirements in both the faded and darkened states.

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**Table 1 TRANSMITTANCE REQUIREMENTS FOR UNTINTED AND SUNGLARE OCULARS FOR EYE PROTECTOR**

Ocular category	Range of luminous transmittance ( $\tau_v$ )		Minimum spectral transmittance for wave-lengths 470 nm to 650 nm
	From over	to	
0	80.0	100.0	0.20 $\tau_v$
1	43.0	80.0	
2	18.0	43.0	
3	8.0	18.0	
Outdoor untinted	80.0	100.0	

Note6. Refer to Annex A for testing results.

## 2.4.7 Refractive power of oculars

### 2.4.7.1 Spherical and astigmatic power

Pass<sup>7</sup>

When tested in accordance with Appendix E, the spherical and astigmatic powers shall not exceed those set out in Table 2. The values shall not be exceeded for all positions of the measuring field specified in the method.

**Table 2 SPHERICAL AND ASTIGMATIC POWERVALUES OF OCULARS**

Spherical power Mean value of the optical power values in the two principal meridians, $m^{-1}$	Cylindrical power Absolute difference of the optical power values in the two principal meridians, $m^{-1}$
$(D_1 + D_2)/2$ $\pm 0.09$	$ D_1 - D_2 $ $\pm 0.09$

Note7. Refer to Annex A for testing results.

### 2.4.7.3 Prismatic power Individual oculars

Pass<sup>8</sup>

When tested in accordance with Appendix E, the prismatic power shall not exceed that set out in Table 3, Column 1.

Note8. Refer to Annex A for testing results.

### 2.4.7.4 Prismatic power difference Pairs of oculars

Pass<sup>9</sup>

When tested in accordance with Appendix G, the prismatic power difference shall not exceed those set out in Table 3, Columns 2-4.

**Table 3 PRISMATIC POWERS OF INDIVIDUAL OCULARS ANDASSEMBLED EYE PROTECTORS**

Prismatic power in Individual unmounted oculars (edged or uncut) at the reference point $cm/m$	Difference in prismatic powers at the reference points in assembled eye protectors $cm/m$		
	Horizontal		Vertical
	Base out	Base in	
0.25	1.00	0.25	0.25

Note9. Refer to Annex A for testing results.

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**2.4.8 Scattered light****Pass<sup>10</sup>**

When tested for scattered light at the reference point as specified in Appendix H, the scattered light measured in the ocular shall not exceed 3%.

**Note10. Refer to Annex A for testing results.**

**2.4.9 Material and surface quality****Pass<sup>11</sup>**

When inspected by the naked eye in accordance with the method specified in Appendix J, oculars shall have no material or machining defects within an area of 28 mm diameter centred on the reference point of the ocular that could impair vision, e.g. bubbles, scratches, inclusions, dull spots, pitting, mould marks, notches, reinforced points, specks, beads, water specks, pocking, gas inclusions, splintering, cracks, polishing defects or undulations. Single defects outside this area and within 5 mm of frame edges are permissible.

**Note11. Refer to Annex A for testing results.**

**3.2.8 Penetration resistance****3.2.8.1 General****Pass<sup>12</sup>**

Plastic oculars shall be capable of withstanding the test described in Appendix P.3.2.8.2 Performance criteria. When eye protectors and clip-ons are tested in accordance with Appendix P, they shall be considered to have failed

- (a) if the ocular or clip-on cracks through its entire thickness into two or more pieces;
- (b) if the projectile pierces the surface of the ocular or clip-on remote from that surface struck by the projectile;
- (c) if contact is made with either eye of the test headform by the projectile, ocular or a part or fragment of these.

**Note12. The test described in Appendix P.3.2.8.2 Performance criteria. Refer to Annex A for testing results.**

**3.2.9 Resistance to ignition****3.2.9.1 General****Pass<sup>13</sup>**

Spectacle eye protector, headbands (textile or foam), and edgings of goggle type eye protectors, which do not extend more than 10 mm from the edge of the goggle are exempted from this requirement. Materials used in the construction of eye protectors shall be capable of withstanding the test described in Appendix O.

**3.2.9.2 Performance criteria**

When tested in accordance with Appendix Q, no part of the eye-protector shall ignite or continue to glow after removal of the steel rod.

**Note13. Refer to Annex A for testing results.**

**3.2.10 Thermal stability****Pass<sup>14</sup>**

Assembled eye and face protectors shall be stable at elevated temperatures, and when tested in accordance with Appendix T shall show no physical distortion. On completion of the 30 minute heating period of Paragraph T4-

- (a) their optical properties shall not have deteriorated beyond the limits specified in Clause 2.4.7; and
- (b) their strength and resistance to penetration shall not have fallen below that required to pass the relevant tests described in Appendix K, L, M, N or O and P, as appropriate. This strength requirement is also applicable if the test method in Appendix L is used.

**Note14. Refer to Annex A for testing results.**

**3.2.11 Protection against corrosion****Pass<sup>15</sup>**

When tested in accordance with Appendix U, the metal components of eye and face protectors shall have a smooth surface free from corrosion that can be observed by inspection under conditions of adequate lighting.

NOTES: Changes in colour of the components after testing should not be regarded as corrosion.

Suitable lighting conditions for inspection purposes are recommended in AS/NZS 1680.1.

**Note15. Refer to Annex A for testing results.**

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### 3.3.2 High impact protectors

Pass<sup>16</sup>

#### 3.3.2.1 General

High impact protectors shall be face-shields, hoods, welding hand-shields or welding helmets, fitted with oculars complying with the requirements of Clause 2.7. They shall be capable of withstanding the test described in Appendix N.

#### 3.3.2.2 Performance criteria

When the ocular, oculars, ocular housing and frame are tested in accordance with Appendices K and L, they shall be considered to have failed-

(a) if the ocular, frame, housing or mounting or side shield cracks through its entire thickness into two or more pieces;

(b) if more than 5 mg of ocular material becomes detached from the ocular surface remote from the surface struck by the ball;

(c) if the ball passes through the ocular, frame, housing, mounting, or side shield;

(d) if the ocular dislodges from the normal position with respect to the frame; or

(e) if any contact is made with either eye of the test headform by the ball, frame, side shield ocular or any part or fragment of these.

**Note16. Refer to Annex A for testing results.**

### 3.3.7 Protection against molten metal and hot solids

Pass<sup>17</sup>

#### 3.3.7.1 General

Eye and face protectors for protection against molten metal and hot solids shall be face shields or wire-mesh screens complying with the requirements for medium impact protectors and the performance criteria set out in Clauses 3.3.2.2.

#### 3.3.7.2 Performance criteria for molten metal test

When the eye and face protector is tested in accordance with Appendix R, there shall be no adherence of molten metal to the ocular and the integrity of the ocular shall be maintained

Where applicable, the woven gauze of a wire-mesh screen shall show no penetration of metal fragments.

**Note17. Refer to Annex A for testing results.**

#### 3.3.7.3 Performance criteria for hot solids test

Pass<sup>18</sup>

When the eye and face protector is tested in accordance with Appendix S, complete penetration of the ocular shall not occur within a period of 5 s.

**Note18. Refer to Annex A for testing results.**

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## End of Test Results

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**Annex A: Summarization of Test Data****2.2.1 Finish**

Sample No	Test results
1#	Free from projections, sharp edges or other features likely to cause discomfort or injury during use
2#	Free from projections, sharp edges or other features likely to cause discomfort or injury during use
3#	Free from projections, sharp edges or other features likely to cause discomfort or injury during use

**2.2.2 Materials**

Sample No	Test results
1#	Made of organic materials (plastics),meet requirement
2#	Made of organic materials (plastics),meet requirement
3#	Made of organic materials (plastics),meet requirement

**2.3.1 Visual quality**

Sample No	Test results
1#	No defects likely to impair vision
2#	No defects likely to impair vision
3#	No defects likely to impair vision

**2.3.2 Viewing area**

Sample No	Test results
1#	Meet requirement
2#	Meet requirement
3#	Meet requirement

**2.4.4 Transmittance requirement**

Sample No	Range of luminous transmittance ( $\tau_v$ )	Minimum spectral transmittance for wave-lengths 470 nm to 650 nm
1#	89.2	43.6
2#	88.8	43.5
3#	89.3	44.0

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**2.4.7.1 Spherical and astigmatic power**

Sample No	Spherical power Mean value of the optical power values in the two principal meridians, m <sup>-1</sup> (D <sub>1</sub> + D <sub>2</sub> )/2	Cylindrical power Absolute difference of the optical power values in the two principal meridians, m <sup>-1</sup>  D <sub>1</sub> - D <sub>2</sub>
1#	0.04	0.03
2#	0.04	0.02
3#	0.04	0.03

**2.4.7.3 Prismatic power Individual oculars****2.4.7.4 Prismatic power difference Pairs of oculars**

Sample No	Prismatic power in Individual unmounted oculars (edged or uncut) at the reference point cm/m	Difference in prismatic powers at the reference points in assembled eye protectors cm/m		
		Horizontal		Vertical
		Base out	Base in	
1#	0.11	0.23	/	0.07
2#	0.12	0.23	/	0.06
3#	0.11	0.24	/	0.06

**2.4.8 Scattered light**

Sample No	Test results
1#	1.7%
2#	1.6%
3#	1.7%

**2.4.9 Material and surface quality**

Sample No	Test results
1#	No defects likely to impair vision
2#	No defects likely to impair vision
3#	No defects likely to impair vision

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**3.2.8 Penetration resistance**

Sample No	Test results
4#	√
5#	√
6#	√

**3.2.9 Resistance to ignition**

Sample No	Test results
7#	No physical distortion. Optical properties no deteriorated. Strength and resistance to penetration no fallen.
8#	No physical distortion. Optical properties no deteriorated. Strength and resistance to penetration no fallen.
9#	No physical distortion. Optical properties no deteriorated. Strength and resistance to penetration no fallen.

**3.2.10 Thermal stability**

Sample No	Test results
10#	No physical distortion. Optical properties no deteriorated. Strength and resistance to penetration no fallen.
11#	No physical distortion. Optical properties no deteriorated. Strength and resistance to penetration no fallen.
12#	No physical distortion. Optical properties no deteriorated. Strength and resistance to penetration no fallen.

**3.2.11 Protection against corrosion**

Sample No	Test results
1#	smooth surface free from corrosion
2#	smooth surface free from corrosion
3#	smooth surface free from corrosion

**3.3.2 High impact protectors**

Sample No.	steel ball	Test Results	Speed m/s
13#	6mm diameter	No cracking, separates into two or more pieces, dislodged from its normal position, material becomes detached from the surface opposite to that impacted, the ball passes through the protector, contact of the ball or the protector with the eye of the test headfor.	122.3
14#		No cracking, separates into two or more pieces, dislodged from its normal position, material becomes detached from the surface opposite to that impacted, the ball passes through the protector, contact of the ball or the protector with the eye of the test headfor.	120.9
15#		No cracking, separates into two or more pieces, dislodged from its normal position, material becomes detached from the surface opposite to that impacted, the ball passes through the protector, contact of the ball or the protector with the eye of the test headfor.	120.8

**3.3.7.1 General****3.3.7.2 Performance criteria for molten metal test**

Sample No	Test results
16#	No molten metal to the ocular and the integrity of the ocular
17#	No molten metal to the ocular and the integrity of the ocular
18#	No molten metal to the ocular and the integrity of the ocular

**3.3.7.3 Performance criteria for hot solids test**

Sample No	Test results
19#	No penetration of the ocular within a period of 5 s
20#	No penetration of the ocular within a period of 5 s
21#	No penetration of the ocular within a period of 5 s

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**End of Annex A**

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**ANNEX B PHOTOS OF SAMPLES**



**End of Annex B**

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