Document: Technical Construction File

File No: TCF(20)-018-PPE

Revision: A1

Revision Date: 2020-02-21

Product: Safety Goggles

MODEL: HB-S03,

HB-S03A,HB-S06,HB-S06K,HB-S09,HB-S12,HB-S19,HB-S29,

HB-S33,HB-S40,HB-S42, HB-S43,HB-S52,HB-S58,JL-08

According to

Personal protective equipment 2016/425

presented by

GUANGZHOU JULONG SPORTS PRODUCTS CO.,LTD

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Technical File No.	Issue Date	Prepared by	Approved by
TCF(20)-018-PPE	2020-02-20		

Test Property	Test Method	Test Principle / Requirements	Test Result
Function of eye-protectors	EN 166:2001 Clause 4.1	The function of eye-protectors is to provide protection against: -impacts of different severities; - optical radiations; - molten metals and hot solids; - droplets and splashes; - dust; - gases; - short circuit electric arc; or any combination of these.	Pass. Impacts of different severities; optical radiations
Types of eye-protectors	EN 166:2001 Clause 4.2	-Spectacles with or without lateral protection -Goggles -Face-shields	Pass. Spectacles without lateral protection
Types of ocular	EN 166:2001 Clause 4.3	-Mineral oculars (glass): 1)Untoughened mineral oculars 2)Toughened mineral oculars -Organic oculars (plastic) -Laminated oculars	Pass. Organic oculars (plastic):PC
Designation of filters	EN 166:2001 Clause 5	The transmittance characteristics of a filter are represented by a scale number. The scale number is a combination of the code number and the shade number of the filter, joined together by a dash. The scale number for welding filters does not include a code number, it comprises the shade number only. Table 1 gives the designation of the various types of filters specified in this European Standard.	Not applicable.
General construction	EN 166:2001 Clause 6.1	Eye-protectors shall be free from projections, sharp edges or other defects which are likely to cause discomfort orinjury during use.	Pass. No sharp edges and projections.
Materials	EN 166:2001 Clause 6.2	No parts of the eye-protector which are in contact with the wearer shall be made of materials which are known to cause any skin irritation.	Pass. PC . Not cause any skin irritation.
Headbands	EN 166:2001 Clause 6.3	Headbands, when used as the principal means of retention, shall be at least 10 mm wide over any portion which may come into contact with the wearer’s head. Headbands shall be adjustable or self-adjusting.	Pass.
Field of vision	EN 166:2001 Clause 7.1.1 &EN 168	Eye-protectors shall exhibit a minimum field of vision defined by the two ellipses in Figure 1 when placed and centered at a distance of 25 mm from the surface of the eyes of the appropriate head-form. The horizontal axis shall be parallel to and 0,7 mm below the height of the line connecting the centres of the two eyes. The horizontal length of the ellipses shall be of	Pass.

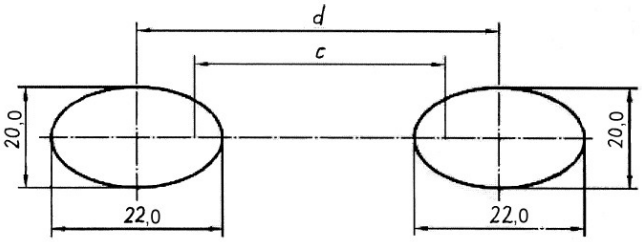
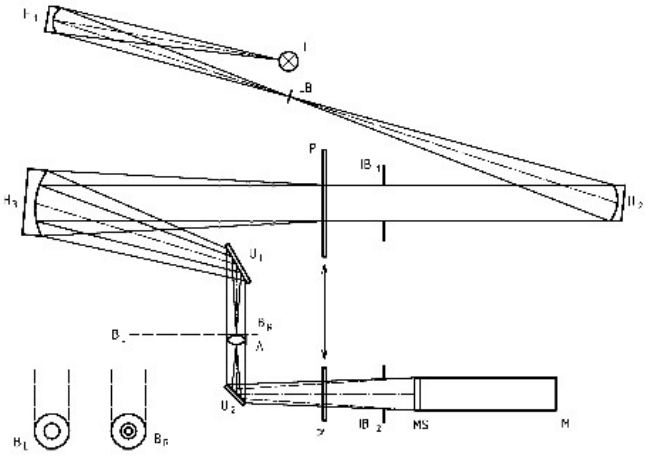
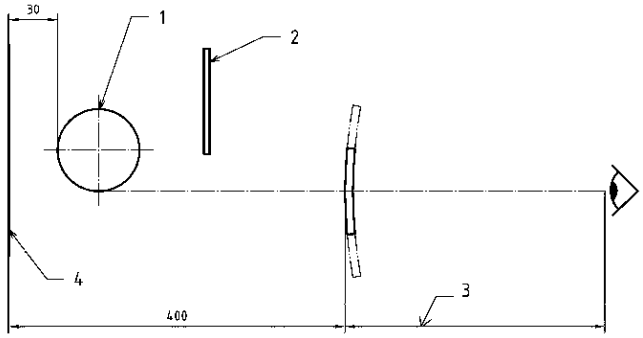
<table>
<tr><th>Test Property</th><th>Test Method</th><th>Test Principle / Requirements</th><th>Test Result</th></tr>
<tr><td></td><td></td><td>22,0 mm, the vertical width of the ellipses shall be 20,0 mm. The centre distance of the two ellipses shall be d = c + 6 mm, where c is the pupillary distance. The pupillary distance is 64 mm for the medium head-form and 54 mm for the small head-form, if not specified differently by the manufacture.
The test shall be carried out in accordance with clause 18 of EN 168:2001.
 

Figure 1 — Definition of the field of vision</td><td></td></tr>
<tr><td>Spherical, astigmatic and prismatic refractive powers</td><td>EN 166:2001 Clause 7.1.2.1 &EN 167</td><td>The refractive power characteristics of mounted oculars or unmounted oculars covering both eyes shall be measured by the method specified in 3.2 of EN 167:2001 at the visual centre of the ocular.
The permissible tolerances for oculars without corrective effect are given in Table 3.
The permissible deviations for vertex powers of oculars with corrective effect are as defined in 7.1.2.1.1. Deviations that would correspond to class 3 shall not be permitted.
Table 3 — Permissible tolerances for refractive powers of mounted oculars without corrective effect and unmounted oculars without corrective effect covering both eyes
<table>
<tr><th rowspan="3">Optical class</th><th rowspan="3">Spherical refractive power $(D_1 + D_2)/2$ m^{-1}</th><th rowspan="3">Astigmatic refractive power $\lvert D_1 - D_2 \rvert$ m^{-1}</th><th colspan="3">Difference in prismatic refractive power cm/m</th></tr>
<tr><th colspan="2">Horizontal</th><th rowspan="2">Vertical</th></tr>
<tr><th>Base out</th><th>Base in</th></tr>
<tr><td>1</td><td>± 0,06</td><td>0,06</td><td>0,75</td><td>0,25</td><td>0,25</td></tr>
<tr><td>2</td><td>± 0,12</td><td>0,12</td><td>1,00</td><td>0,25</td><td>0,25</td></tr>
<tr><td>3</td><td>+ 0,12
− 0,25</td><td>0,25</td><td>1,00</td><td>0,25</td><td>0,25</td></tr>
<tr><td colspan="6">NOTE D_1 and D_2 are the refractive powers in the two principal meridians. For optical class 3 the axes of the principal meridians shall be parallel within ± 10°.</td></tr>
</table></td><td>Optical class 2. See the Report Annex I for the details data of test.</td></tr>
<tr><td>Transmittance</td><td>EN 166:2001 Clause 7.1.2.2 & EN 167</td><td>Oculars intended to protect the eyes against mechanical or chemical hazards only, and cover plates, shall have a luminous transmittance greater than 74,4 % when measured as given in clause 6 of EN 167:2001 (based on CIE ource A (2856 K)).
Transmittance is measured with incident radiation falling normally on the ocular and the surface of the portion of the frame to be tested.
Test methods shall be used which have relative uncertainties less than or equal to those given in Table 1.</td><td>Optical class 2. See the Report Annex II for the details data of test.</td></tr>
</table>

Test Property	Test Method	Test Principle / Requirements	Test Result
		Table 1 — Relative uncertainty of measured transmittance Transmittance value: Less than % / To % — Relative uncertainty % 100 / 17,8 — ± 5 17,8 / 0,44 — ± 10 0,44 / 0,023 — ± 15 0,023 / 0,0012 — ± 20 0,0012 / 0,000023 — ± 30 Measurements or transmittance of oculars shall be taken at the visual centre of the ocular. If the visual centre is not known then the geometric centre shall be used.	
Diffusion of light	EN 166:2001 Clause 7.1.2.3 &EN 167	The diffusion of light shall be measured in accordance with one of the reference methods specified in clause 4 of EN 167:2001. The luminance(Ls) of an illuminated ocular is a measure of its diffusion and is proportional to the illuminance(E). The proportionality factor is the luminance factor l=Ls/E, which is expressed in candelas per square metre per $\frac{cd/m^2}{lx}$. The ocular is placed in the parallel beam at position P, then diaphragm B_L is put in place. The flux Φ_{1L} falling onto the photodetector corresponds to the undiffused light transmitted by the sample. Diaphragm B_L is then replaced by annular diaphragm B_R; flux Φ_{1R} falling onto the photodetector corresponds to the total diffused light originating from the filter ad from the apparatus. The test sample is then placed at position P'. The flux Φ_{2R} which then falls onto the photodetector corresponds to the diffused light coming from the apparatus only.  The difference Φ_{1R}-Φ_{2R}corresponds to the light diffused by the filter. The mean reduced luminance factor l^* for the solid angle ω is calculated from the preceding fluxes by means of the formula:	Pass. Lower than 0.5 $\frac{cd/m^2}{lx}$.

Test Property	Test Method	Test Principle / Requirements	Test Result
		$l^* = \frac{l}{\omega} \cdot \frac{\Phi_{1R} - \Phi_{2R}}{\Phi_{1L}}$ The maximum value of the reduced luminance factor shall be: 1.00 $\frac{cd/m^2}{lx}$ for welding filters; 0.75 $\frac{cd/m^2}{lx}$ for oculars used in eye-protectors against high speed particles; 0.50 $\frac{cd/m^2}{lx}$ for all other oculars.	
Quality of material and surface	EN 166:2001 Clause 7.1.3 &EN 167	Except for a marginal area 5 mm wide, oculars shall be free from any significant defects likely to impair vision in use, such as bubbles, scratches, inclusions, dull spots, pitting, mould marks, scouring, grains, pocking, scaling and undulation. The assessment shall be carried out in accordance with the method specified in clause 5 of EN 167:2001. The assessment of the quality of material and surface is conducted by visual inspection with the aid of a "light box" or illuminated grid. One method is inspection in current use consists of an illuminated grid as a background to be viewed through the ocular which is held at various distances from the eye. Another method is to illuminate the ocular by means of a fluorescent lamp mounted within a dull black chamber and with the amount of illumination adjusted by ,means of an adjustable opaque black mask. A suitable arrangement is shown in Figure 6.  If there is any doubt concerning the acceptability of the quality of the material and surface then this may be resolved by examining the areas in question with a light beam of 5mm nominal diameter using the objective tests for transmittance, light diffusion an d the method for determining optical refractive powers .	Pass. No material or machining defects.
Robustness	EN 166:2001 Clause 7.1.4	The complete eye-protector or frame shall withstand the lateral and frontal impacts of a steel	Pass. No cracks and

<table>
<tr><th>Test Property</th><th>Test Method</th><th>Test Principle / Requirements</th><th>Test Result</th></tr>
<tr><td></td><td>&EN 168</td><td>ball striking at a specified speed.
The diameter of the steel ball and the corresponding impact speed are given in Table 5.
Table 5 — Requirements relating to increased robustness of complete eye-protectors
<table>
<tr><th rowspan="2">Size, mass and speed of steel ball</th><th colspan="2">Spectacles</th><th colspan="2">Goggles</th><th>Face-shields</th></tr>
<tr><th>Frontal impact</th><th>Lateral impact</th><th>Frontal impact</th><th>Lateral impact</th><th></th></tr>
<tr><td>22 mm nominal diameter steel ball, of 43 g minimum mass, at a speed of approximately 5,1 m/s</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
</table>
The test shall be in accordance with the method specified in 3.2 of EN 168:2001.
The eye-protector to be tested shall be placed on the appropriate head-form in the position corresponding to normal use.
A sheet of carbon paper on top of a sheet of white paper os attached to the head-form behind the eye-protector. The head-form and eye-protector assembly is positioned in the test apparatus.
The ball is projected at the points of impact.
On so testing the following defects shall not occur:
a) ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the one struck by the ball, or if the ball passes through the ocular;
b) ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white paper on the opposite side to that struck by the ball;
c) ocular housing or frame fracture : an ocular housing or frame shall be considered to have failed if it separates into two or more pieces, or if it is no longer capable of holding an ocular in position, or if an unbroken ocular detaches from the frame, or if the ball passes through the housing or frame;
d) lateral protection failure : the lateral protection shall be considered to have failed if it fractures through its entire thickness into two or more separate pieces, or if one or more particles become detached from the surface remote from the impact point, or if it allows the ball to penetrate completely, or if it partially or totally detaches from the eye-protector, or if its component parts become separated.</td><td>deformation are present.
Report Annex III for the details data of test.</td></tr>
<tr><td>Resistance to ageing</td><td>EN 166:2001 Clause 7.1.5</td><td>Assembled eye-protectors shall show no apparent deformation when tested by the method specified in clause 5 of EN 168:2001.
Oculars shall be subjected to the test for resistance</td><td>Pass.
No apparent deformation when tested.</td></tr>
</table>

<table>
<tr><th>Test Property</th><th>Test Method</th><th>Test Principle / Requirements</th><th>Test Result</th></tr>
<tr><td></td><td></td><td>to ultraviolet radiation in accordance with the method specified in clause 6 of EN 168:2001.
At the end of the test, oculars shall meet the following requirements.
a) The relative change of luminous transmittance shall not be greater than the values specified in Table 6.
If for welding filters the relative change of the luminous transmittance is larger than the values specified in Table 6 but the actual value of luminous transmittance remains within the range specified by its shade number, a second irradiation is performed in accordance with clause 6 of EN 168:2001 on the same sample. The relative change of luminous transmittance due to the second irradiation shall not be greater than the values specified in Table 6 and the actual value of luminous transmittance shall remain within the range specified by its shade number;
b) The value of the reduced luminance factor shall not exceed the permissible limits given in 7.1.2.3.
<table>
<tr><th colspan="2">Luminous transmittance</th><th rowspan="2">Permissible relative change</th></tr>
<tr><th>less than
%</th><th>up to
%</th></tr>
<tr><td>100</td><td>17,8</td><td>± 5</td></tr>
<tr><td>17,8</td><td>0,44</td><td>± 10</td></tr>
<tr><td>0,44</td><td>0,023</td><td>± 15</td></tr>
<tr><td>0,023</td><td>0,0012</td><td>± 20</td></tr>
<tr><td>0,0012</td><td>0,000023</td><td>± 30</td></tr>
</table>
</td><td>The value of the reduced luminance factor does not exceed the permissible limits.</td></tr>
<tr><td>Resistance to corrosion</td><td>EN 166:2001 Clause 7.1.6</td><td>Remove all contamination, particularly oil and grease from the metal parts of the specimen.
Immerse the specimen for (15±1)min in a boiling, aqueous, (10.0±0.5)% by mass solution of sodium chloride.
Remove the specimen from this solution and immerse immediately in a (10.0±0.5)% by mass aqueous solution of sodium chloride at room temperature for (15±1)min.
Remove from this solution and without wiping off the adhering liquid, leave to dry for (24±1)h at (23±5)℃. Rinse in lukewarm water and leave to dry before inspecting.
After having undergone the test for resistance to corrosion specified in clause 8 of EN 168:2001, all metal parts of the eye-protector shall display smooth surfaces, free from corrosion, when they are examined by a trained observer.</td><td>Pass. All metal parts of the eye-protector display smooth surfaces, free from corrosion.</td></tr>
</table>

<table>
<tr><th>Test Property</th><th>Test Method</th><th>Test Principle / Requirements</th><th>Test Result</th></tr>
<tr><td>Resistance to ignition</td><td>EN 166:2001
Clause 7.1.7</td><td>Heat one end of the steel rod over a length of at least 50 mm to a temperature of (650±20)℃. Measure the temperature of the rod by means of the thermocouple attached at a distance of (20±1) mm from the heated end of the rod. Press the heated face of the rod (long axis vertically) against the surface of the test sample for a period of (5.0±0.5)s, and then remove it.
Carry out the test on all externally exposed parts of the eye-protector, except elastic headbands and textile edging.
Carry out a visual inspection during the test in order to establish whether the test samples ignite or continue glow.
Eye-protectors shall be tested in accordance with the method specified in clause 7 of EN 168:2001 and shall be considered to be satisfactory if no part of the eye-protector ignites or continues to glow after removal of the steel rod.</td><td>Pass.
No part of the eye-protector ignites.</td></tr>
<tr><td>Protection against high-speed particles</td><td>EN 166:2001
Clause 7.2.2</td><td>Eye-protectors intended to provide protection against high-speed particles shall withstand the impact of a 6 mm nominal diameter steel ball of 0,86 g minimum mass, striking the oculars and the lateral protection at one of the speeds given in Table 7.
Eye-protectors for protection against high-speed particles shall also meet the requirements for increased robustness given in 7.1.4.2.
Table 7 — Requirements relating to protection against high-speed particles
<table><tr><th rowspan="2">Type of eye-protector</th><th colspan="3">Impact speed of ball</th></tr><tr><th>Low energy impact (F)
$45^{+1,5}_{-0}$ m/s</th><th>Medium energy impact (B)
120^{+3}_{-0} m/s</th><th>High energy impact(A)
190^{+5}_{-0} m/s</th></tr><tr><td>Spectacles</td><td>+</td><td>Not applicable</td><td>Not applicable</td></tr><tr><td>Goggles</td><td>+</td><td>+</td><td>Not applicable</td></tr><tr><td>Face-shields</td><td>+</td><td>+</td><td>+</td></tr></table>The test shall be in accordance with the method specified in clause 9 of EN 168:2001.
It shall not be possible for the ball to strike the lateral impact point without first striking the lateral protection.
On so testing the following defects shall not occur:
a) ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the one struck by the ball, or if the ball passes through the ocular;
b) ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white paper on the opposite side to</td><td>Pass.
Low energy impact (F).
Report Annex III for the details data of test.</td></tr>
</table>

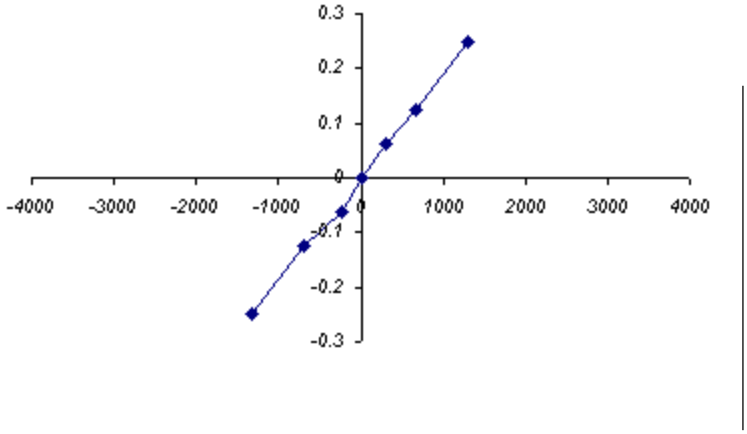
Test Property	Test Method	Test Principle / Requirements	Test Result
		that struck by the ball; c) ocular housing or frame failure : an ocular housing or frame shall be considered to have failed if it separates into two or more pieces, or if it is no longer capable of holding an ocular in position, or if an unbroken ocular detaches from the frame, or if the ball passes through the housing or frame; d) lateral protection failure : the lateral protection shall be considered to have failed if it fractures through its entire thickness into two or more separate pieces, or if one or more particles becomes detached from the surface remote from the impact point, or if it allows the ball to penetrate completely, or if it partially or totally detaches from the eye-protector, or if its component parts become separated.	
Resistance to surface damage by fine particles	EN 166:2001 Clause 7.3.1 &EN 168	After cleaning, the samples are fixed onto the revolving plate in such a way that the area of measurement of th sample does not project beyond the revolving plate. Whilst the plate is being rotated, (3.0±0.05)kg of sand is trickled onto the samples. The test is carried out at (23±5)℃. After the sand has been trickled onto them, the samples are removed from the rotary plate and then cleaned again as described. If oculars are described as resistant to surface damage by fine particles they shall have a reduced luminance factor of not more than 5 $\frac{cd/m^2}{lx}$ following the test specified in clause 15 of EN 168:2001.	Pass. Lower than 5.0 $\frac{cd/m^2}{lx}$. See the **Report Annex IV.**

Report Annex I

Optical power

Calibration

ID	Diottries	Measure
a	0.25	1295
b	0.125	681
c	0.0625	297
	0	0
d	-0.0625	-236
e	-0.125	-695
f	-0.25	-1334



Ambient condition

Temperature	22℃
Date	21-Feb-20

Time	10:21 AM

Ocular Identification

Applicant	JULONG
Model	JL-08
ID	one

Left ocular

Test			
ID	*Measure*	*Diottries*	*Notes*
D1	-401	-0.095	Meridians Resolved
D2	-39	-0.061	Parallels Resolved
Results			
Spherical power		-0.078	between -0.12and 0.12
Astigmatic power		0.034	≤0.12 diottries

Right ocular

Test			
ID	*Measure*	*Diottries*	*Notes*
D1	-385	-0.097	Meridians Resolved
D2	-71	-0.059	Parallels Resolved
Results			
Spherical power		-0.078	between -0.12 and 0.12
Astigmatic power		0.038	≤0.12 diottries

Prismatic power

Horizontal **Type :** Base out

L	0.25	cm
R	0.15	cm

Check

0.2 <1cm/m

Test Result ***Positive***

Vertical

L	0.3	cm
R	0.1	cm

Check

0.15 <0.25 cm/m

Report Annex II

Transmittance

Test of visor spectral transmittance

Date	2020.02.21
Time	8.47
Instrument	kuang
ID	one
Model	JL-08
Color	Black

Luminous trasmittance

Test

τv= **88.3%** **Pass**

Relative visual attenuation quotient

Red signal light

Q= **1.0** **Pass**

Yellow signal light

Q= **1.0** **Pass**

Green signal light

Q= **1.0** **Pass**

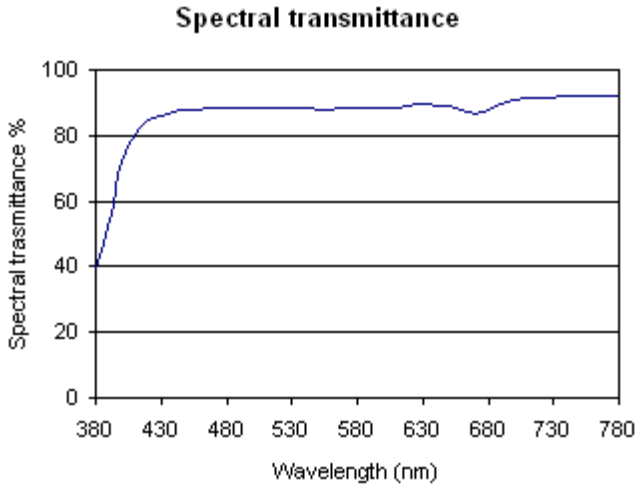
Blue signal light

Q= **1.0** **Pass**

Spectral transmittance in the range 500 nm to 650 nm

Pass

nm	transmittance>0,2τv			**Test**
500	88.4	>	17.6	**OK**
510	88.4	>	17.6	**OK**
520	88.5	>	17.6	**OK**
530	88.4	>	17.6	**OK**
540	88.1	>	17.6	**OK**
550	88.1	>	17.6	**OK**
560	88.1	>	17.6	**OK**
570	88.3	>	17.6	**OK**
580	88.3	>	17.6	**OK**
590	88.5	>	17.6	**OK**
600	88.4	>	17.6	**OK**
610	88.7	>	17.6	**OK**
620	89.3	>	17.6	**OK**
630	89.4	>	17.6	**OK**
640	89.1	>	17.6	**OK**
650	89.1	>	17.6	**OK**



Report Annex III

Impact test

Mechanical strength test	
Applicant	GUANGZHOU JULONG SPORTS PRODUCTS CO.,LTD
Model	JL-08
Conditioned Temperature	The Face shield for anti-spatter spray shall be conditioned at a temperature of (55±2)°C for at least 1 h. The Face shield for anti-spatter spray shall be conditioned at a temperature of (-5±2)°C for at least 1 h.
Test results	A steel ball of 6 mm nominal diameter and 0.86 g mass is projected at a specified point on the goggle at a speed of 45 m/s. On so testing the following defects shall not occur: a) ocular fracture : an ocular shall be considered to have fractured if it cracks through its entire thickness into two or more pieces, or if more than 5 mg of the ocular material becomes detached from the surface away from the one struck by the ball, or if the ball passes through the ocular; b) ocular deformation : an ocular shall be considered to have been deformed if a mark appears on the white paper on the opposite side to that struck by the ball; c) ocular housing or frame fracture : an ocular housing or frame shall be considered to have failed if it separates into two or more pieces, or if it is no longer capable of holding an ocular in position, or if an unbroken ocular detaches from the frame, or if the ball passes through the housing or frame; d) lateral protection failure : the lateral protection shall be considered to have failed if it fractures through its entire thickness into two or more separate pieces, or if one or more particles become detached from the surface remote from the impact point, or if it allows the ball to penetrate completely, or if it partially or totally detaches from the eye-protector, or if its component parts become separated.
Rebels set	PASS
Date	2020/02/21

Report Annex IV

Resistance to surface damage by fine particles

Sample ID

Applicant	GUANGZHOU JULONG SPORTS PRODUCTS CO.,LTD
Model	JL-08

Test Results

Apparatus Luminance	1.1540
Not Abraded Sample Luminance	1.2740
Abraded Sample Luminance	5.1421
Reduced of Not Abraded Sample Luminance	**0.1983**
Reduced of Abraded Sample Luminance	**3.7651**

Test Limits

Not Abraded Limit = 0.65	**PASS**
Abraded Limit = 5.00	**PASS**

A.1 Photo

Fig.1