Shenzhen Precision Eyewear
Testing & Inspection Services Co., Ltd.

中国认可
国际互认
检测
TESTING
CNAS L2210

Test Report

Report No.: PL20041055 Page 1 of 11

Applicant:

Address of Applicant:

Date of Receiving Samples: Apr 29, 2020

Testing Period: Apr 29, 2020 to May 27, 2020

Description of Samples
The submitted sample and sample information was/were submitted and identified by/on behalf of client.

Sample Name:	Face Shield
Device Type:	☐ Spectacles ☐ Goggles ☒ Face Shields
Model No.:	ZD-04
Quantity:	21 Pairs
Material:	PET
Scale No.:	Not provided
Frame Color:	Not provided
Lenses Color:	Transparent
P.O. No.:	Not provided
Supplier / Brand:	Not provided
Buyer:	Not provided
Goods exported to:	Not provided
Country of Origin:	China

Tests Conducted: As requested by the applicant, refer to attached page(s) for details.

Issued by stamp

Date of Issued: May 27, 2020
For and on behalf of:
Shenzhen Precision Eyewear
Testing & Inspection Services Co., Ltd.

Manager: WenHua Li

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Sample Photo:

Conclusion:

Tested Samples	Required Standard(s)	Results
Submitted Samples	EN 166: 2001 Personal eye - protection – Specifications, only test the related parameters, please refer to "Tests Conducted Summary" for details.	☒Pass ☐Fail

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Tests Conducted Summary

1. Test standards

EN 166: 2001 Personal eye - protection – Specifications
EN 167: 2001 Personal eye - protection – Optical test methods
EN 168: 2001 Personal eye - protection - Non-optical test methods

Note: The applicant's attention was drawn that the manufacturer should not use the frame materials which are known to cause irritation, allergic or toxic reaction during wear in a normal state of health against significant proportion of users.

Requirement				Testing		Results[1]
Test Items		According to		According to		
		EN	Clause	EN	Clause	
General construction		166	6.1	--	--	P
Materials (Nickel release)		166	6.2	--	--	NA
Headbands		166	6.3	--	--	P
Field of vision		166	7.1.1	168	18	P
Refractive powers (Unmounted oculars covering one eye)	Spherical refractive powers	166	7.1.2.1.1	167	3.1	NA
	Astigmatic refractive powers					
	Prismatic refractive powers					
Refractive powers (Mounted oculars and covering both eyes)	Spherical refractive powers	166	7.1.2.1.2	167	3.2	Optical Class 1
	Astigmatic refractive powers					
	Prismatic refractive powers					
Transmittance	Oculars without filtering action	166	7.1.2.2.1	167	6	P
	Oculars with filtering action	166	7.1.2.2.2	167	6	NA
	Ultraviolet Filter	170	4	167	6	NA
	Sunglare Filter for Industrial Use	172	4.1	167	6	NA
Variations in transmittance (Exempt oculars without filtering action)	Oculars without corrective effect	166	7.1.2.2.3.1	167	7	NA
	Oculars with corrective effect	166	7.1.2.2.3.2	167	7	NA

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Tests Conducted Summary

Requirement				Testing		Results
Test Items		According to Clause		According to		
		EN	Clause	EN	Clause	
Diffusion of light		166	7.1.2.3	167	4	P
Quality of material and surface		166	7.1.3	167	5	P
Minimum robustness[2]		166	7.1.4.1	168	4	NA
Increased robustness	Unmounted oculars	166	7.1.4.2.1	168	3.1	NA
	Complete eye-protectors and frame	166	7.1.4.2.2	168	3.2	P
Stability at an elevated temperature		166	7.1.5.1	168	5	P
Resistance to ultraviolet radiation (oculars only)		166	7.1.5.2	168	6	P
Resistance to corrosion (All metal parts only)		166	7.1.6	168	8	NA
Resistance to ignition		166	7.1.7	168	7	P
Protection against high-speed particles		166	7.2.2	168	9	NA
Protection against chemical droplets of liquids	For Goggles	166	7.2.4	168	12	NA
	For face-shields			168	10.2, 12	P
Lateral protection		166	7.2.8	168	19	P
Resistance to fogging of oculars		166	7.3.2	168	16	P
Information supplied by the manufacturer		166	10	--	--	P

Remarks: 1. P = Pass; F = Fail; NA = Not Applicable; NR= Not require; X=Checked.

2. This requirement relates only to cover plates and oculars with filtering effect and not be assessed if these items are intended to meet the requirements for increased robustness or resistance to high speed particles, in which case the requirements of 7.1.4.2 or 7.2.2 shall be met.

Test Result

General construction — Clause 6.1/ Headbands – Clause 6.3

Sample No.	General construction		Headbands				Comment	Result(s)
	Defects		Width		Adjustable			
	Observed	Absent	Pass	Fail	Yes	No		
20041055-(01~03)		X	X		X		--	P

Requirements:
1. General construction: Eye-Protectors shall be free of projections, sharp edges or other defects which are likely to cause discomfort or injury during use.
2. Headbands: shall be at least 10mm wide over any portion which may come into contact with the wearer's head ,and shall be adjustable or self-adjusting;

Field of vision — Clause 7.1.1 / EN 168:2001 Clause 18

Sample No.	Head-form		Exhibit minimum field of vision defined in the standard		Comment	Result(s)
	Medium	Small	Yes	No		
20041055-(01~03)	X		X		--	P

Requirements:
Eye-Protectors shall be exhibit field of vision an area of not less than 22 mm in the horizontal length and 20mm in the vertical width in front of each eye.

Refractive powers— Clause 7.1.2.1 .2 / EN 167:2001 Clause 3.2

Sample No.	Refractive powers				Difference in prismatic refractive powers (cm/m)			Result(s)
	Spherical (m^{-1})		Astigmatic (m^{-1})		Horizontal		Vertical	
	Left	Right	Left	Right	Base Out	Base In		
20041055-01	0.00	0.00	0.00	0.00	0.10	--	0.00	
20041055-02	0.00	0.00	0.00	0.00	0.09	--	0.02	Optical class 1
20041055-03	0.00	0.00	0.00	0.00	0.10	--	0.02	
Requirement: Permissible tolerances for refractive powers :								
Optical class 1	±0.06		0.06		0.75	0.25	0.25	
Optical class 2	±0.12		0.12		1.00	0.25	0.25	
Optical class 3	+0.12~ -0.25		0.25		1.00	0.25	0.25	

Measurement Uncertainty (if necessary):

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Test Result

Transmittance (without filtering action) — Clause 7.1.2.2/ EN 167:2001 Clause 6

Sample No.	Requirements	Luminous Transmittance τ_v (%)		Result(s)
		Left	Right	
20041055-01	$\tau_v > 74.4\%$	89.4	88.9	P
20041055-02		89.3	89.1	P
20041055-03		89.3	89.1	P

Measurement Uncertainty (if necessary):

Diffusion of light — Clause 7.1.2.3 / EN 167:2001 Clause 4

Sample No.	Samples type	Diffusion of light (cd/m²) / lx		Result(s)
		Left	Right	
20041055-19	III	0.31	0.30	P
20041055-20		0.31	0.28	P
20041055-21		0.30	0.33	P

Requirements:
The maximum value of the reduced luminance factor shall be :
I 1.00(cd/m²) / lx for welding filter;
II 0.75(cd/m²) / lx for oculars used in eye-protectors against high speed particles;
III 0.50 (cd/m²) / lx for all other oculars;

Measurement Uncertainty (if necessary):

Remark:*=Failed data, the same as below

Test Result

Quality of material and surface — Clause 7.1.3 / EN 167:2001 Clause 5

Sample No.	Defects		Comment	Result(s)
	Observed	Absent		
20041055-(01~03)		X	--	P

Requirements:
Except in 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.

Increased robustness — Clause 7.1.4.2 / EN 168:2001 Clause 3.2

Sample No.	Test temperature (℃)	Test position	Defects		Comment	Result(s)
			Observed	Absent		
20041055-(04~05)	55	Left Frontal		X	--	P
20041055-06		Left Lateral		X		P
20041055-(07~08)	-5	Left Frontal		X		P
20041055-09		Left Lateral		X		P
20041055-(04~05)	55	Right Frontal		X		P
20041055-06		Right Lateral		X		P
20041055-(07~08)	-5	Right Frontal		X		P
20041055-09		Right Lateral		X		P

Requirements:
The following defects shall not occur:
1. Ocular fracture;
2. Ocular deformation;

Stability at an elevated temperature — Clause 7.1.5.1 / EN 168:2001 Clause 5

Sample No.	Apparent deformation		Comment	Result(s)
	Observed	Absent		
20041055-(04~06)		X	--	P

Requirements:
Assembled eye-protectors shall show no apparent deformation;

Test Results

Resistance to ultraviolet radiation (oculars only) — Clause 7.1.5.2 / EN 168:2001 Clause 6

Samples type		Sample No.					
Other oculars		20041055-19		20041055-20		20041055-21	
Test Items		Left	Right	Left	Right	Left	Right
89.1The relative change of luminous transmittance (%)	Before Expose	89.4	88.9	89.3	89.1	89.3	89.1
	After Expose	89.5	89.2	89.2	89.2	89.0	89.1
	Difference	0.1	0.3	-0.1	-0.1	-0.2	0.0
Reduced scattered light coefficient (cd/m²) / lx	Before Expose	0.31	0.30	0.31	0.28	0.30	0.33
	After Expose	0.33	0.28	0.33	0.28	0.35	0.33
Result(s)		P		P		P	

Requirements:

1. The relative change of luminous transmittance

Luminous transmittance		Permissible relative Change (%)
Less than (%)	Up to (%)	
100	17.8	±5
17.8	0.44	±10

2. Reduced scattered light coefficient
The maximum value of the reduced luminance factor shall be:
- 1.00(cd/m²) / lx for welding filter;
- 0.75(cd/m²) / lx for oculars used in eye-protectors against high speed particles;
- 0.50 (cd/m²) / lx for all other oculars;

Measurement Uncertainty (if necessary):

Resistance to ignition — Clause 7.1.7 / EN 168:2001 Clause 7

Sample No.	Continued combustion		Comment	Result(s)
	Yes	No		
20041055-(04~06)		X	--	P

Requirements:
Eye-protectors shall be considered to be satisfactory if no parts ignites or continues to glow after removal of the steel rod.

Test Results

Lateral Protection — Clause 7.2.8 / EN 168:2001 Clause 19

Sample No.	Lateral region coverage		Comment	Result(s)
	Pass	Fail		
20041055-(01~03)	X		---	P

Requirements:

Eye-protectors claimed to lateral protection shall pass the lateral region coverage. These region being a 20mm wide with 10 mm radial ends struck from the front and side impact points (See figure 1)

Figure 1:

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Test Results

Protection against chemical droplets of liquids — Clause 7.2.4 / EN 168:2001 Clause 12& 10.2
(for face shield)

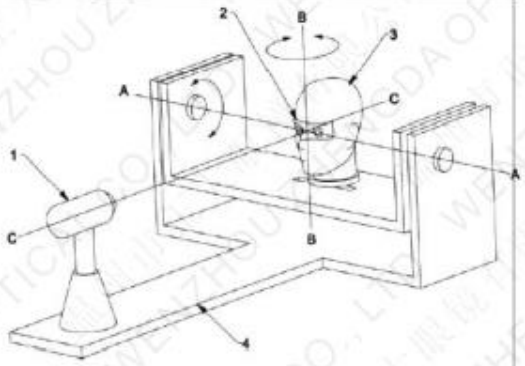
Sample No.	The rectangle without first intercepting			Minimum vertical centre-line depth		Comment	Results
	*Test Point	Contact		≥150mm	<150mm		
		Yes	No	Yes	No		
20041055-(12~14)	a, b, c, d, e, f		X	X		--	P

Requirements:

1. As a failure any location where laser beam contacts the rectangle without first intercepting the face shield.
2. Additionally, for face-shields, shall have a viewing area with a minimum vertical centre-line depth of 150mm when mounted in the appropriate housing.

*Test Point:

a. Facing forwards and rotated (45±1)° forwards about horizontal axis A
b. Facing forwards and rotated (45±1)° backwards about horizontal axis A
c. Rotated (90±1) °to the left about vertical axis B and rotated (45±1)° forwards about horizontal axis A
d. Rotated (90±1) °to the left about vertical axis B and rotated (45±1)° backwards about horizontal axis A
e. Rotated (90±1) °to the right about vertical axis B and rotated (45±1)° forwards about horizontal axis A
f. Rotated (90±1) °to the right about vertical axis B and rotated (45±1)° backwards about horizontal axis A



Key
1 laser beam or cylindrical rube fitted with cross wires
2 rectangle enclosing the eye region
3 headform
4 support frame

Test Report

Test Results

*** Resistant to Fogging of Oculars —Clause 7.3.2/ EN 168:2001 Clause 16**

Sample No.	Position	After Fogging Test Evaluation		Comment	Result
		Fogging	Free Fogging		
20041055-(10~11)	Left		X	--	P
	Right		X		P
Requirements: If oculars are described as resistant to fogging they shall remain free from fogging for a minimum of 8s.					

Remark: * Non-accredited items

Information supplied by the manufacturer — Clause 10

Sample No.	Result of observed		Comment	Results
	Pass	Fail		
20041055-01	X		--	P
Requirement:				
1. Name and address of the manufacturer				
2. The number of this standards				
3. The eye-protector model identification				
4. Instructions for storage, use and maintenance				
5. Specific instructions for cleaning and disinfection				
6. Details of the filed of use, protection capabilities and performance characteristics				
7. The significance of making on the fame and the ocular				
8. A warning concerning the compatibility of marking				
11. A warning that materials which may come into contact with the wearer's skin could cause allergic reactions to susceptible individuals				
12. A warning that scratched or damaged oculars should be replaced				
13. A warning that eye-protection against high speed worn over standard ophthalmic spectacles may transmit impacts, thus creating a hazard to the wearer.				

-----Report End-----