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Testing Laboratory 3579

Test Report

EN 166:2001
Personal Eye Protection

Report no./報告號碼:	AL-200210(H)-01
Client /客戶名稱:	Bullard Asia Pacific Pte Ltd
Client Order(s) /客戶訂單/委託案號:	2718/ 200210(H)
Test Criteria /依據標準:	EN 166:2001
Order Received /收件日期:	2020/2/4
Model(s) /型號:	SG1CAF
Sample Group Description /產品說明:	Clear lens, T-Smoke frame
Specimen quantity/ no. /樣本數量/編號:	30 pcs/ (H)-1 to (H)-30
Date(s) of Tests /測試日期:	2020/2/5
Assessment /最終結論:	The test results are summarized on page 3.

Approved by:

Kant Wu
Laboratory Manager

Prepared by:

Shung Chang
Lab Senior Technician

TERMS AND CONDITION

1. Client acknowledges All-Logic Int'l Laboratory performs testing services only as specified by the client. All-Logic Laboratory does not design. Warrant, supervise or monitor compliance of products or services except as specifically agreed in writing by their very nature. Testing, analysis and other All-Logic Int'l Laboratory services are limited in scope and subject to expected measurement variability.
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4. The results contained in this report apply only to the samples tested and not to lots from which they were taken.
5. All-Logic Int'l Laboratory shall retain copies of testing job file for a period of at least 10 years.
6. Specimens will be disposed of 2 months from the date of this report, unless otherwise instructed.
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10. Reporting is required when information on uncertainty is relevant to the validity or application of the test results, when the client requires it or when the uncertainty affects compliance with a specification limit.
11. All-Logic Int'l Laboratory tested these samples in accordance with EN166 as requested by the client.

Summary of assessment

Clause	Requirement	Assessment
6.1	Construction☒	PASS
6.3	Head bands☒	PASS
7.1.1	Field of vision☒	PASS
7.1.2.1	Spherical	PASS
	Astigmatism	PASS
	Prismatic Refractive Power	PASS
7.1.2.2.2	Oculars with filtering action and housings for oculars with filter action	PASS
7.1.2.2.3	Variations in transmittance	PASS
7.1.2.3	Diffusion of light☒	PASS
7.1.3	Quality of material and surface☒	PASS
7.1.4.2	Increased robustness	PASS
7.1.5.1	Stability at elevated temperature☒	PASS
7.1.5.2	Resistance to ultraviolet radiation (oculars only)☒	PASS
7.1.7	Resistance to ignition☒	PASS
7.2.2	Protection against high speed particles	See 7.3.4
7.2.8	Lateral Protection☒	PASS
7.3.4	Protection against high speed particles at extremes of temperature	PASS

Paragraph Test / Property

6.1 General construction

All samples were assessed.

The sample was free from sharp edges and defect to cause discomfort or injury during use. Pass

6.3 Head bands

Sample ID	Headband width (mm)	Pass	Fail
(H)-1	25	V	
(H)-2	25	V	
(H)-3	25	V	
Limit	≧ 10		

7.1.1 Field of vision

Sample ID (H)-1, (H)-2, (H)-3

The sample exhibited at least the minimum field of vision. Pass

7.1.2.1 Spherical Refractive Power

The specimens satisfied the requirements for optical **class 1**.

Requirements	≦ ±0.06 D			
Sample ID	Left Ocular (D)	Right Ocular (D)	Pass	Fail
(H)-1	0.00	0.00	V	
(H)-2	0.00	0.00	V	
(H)-3	0.00	0.00	V	

Astigmatism Refractive Power

Requirements	≦ 0.06 D			
Sample ID	Left Ocular (D)	Right Ocular(D)	Pass	Fail
(H)-1	0.00	0.00	V	
(H)-2	0.00	0.00	V	
(H)-3	0.00	0.00	V	

Difference Prismatic Refractive Power

Requirements	Difference Prismatic (cm/m) V ≦ 0.25 H Base in ≦ 0.25 Base out ≦ 0.75			
Sample ID	Vertical	Horizontal	Pass	Fail
(H)-1	0.00	0.05 out	V	
(H)-2	0.00	0.05 out	V	
(H)-3	0.00	0.05 out	V	

7.1.2.2 Transmittance

7.1.2.2.2 Oculars with filtering action (filters) and housings for oculars with filtering action

Ocular transmittance: EN 170:2002

Sample ID	Scale number	Luminous Transmittance (%)	Relative visual attenuation quotient (Q)				Pass	Fail
			Red	**Yellow**	**Green**	**Blue**		
(H)-4 L	2C-1,2	92.76	1.00	1.00	1.00	1.00	V	
(H)-4 R	2C-1,2	92.14	1.00	1.00	1.00	1.00	V	
(H)-5 L	2C-1,2	92.25	1.00	1.00	1.00	1.00	V	
(H)-5 R	2C-1,2	92.34	1.00	1.00	1.00	1.00	V	
(H)-6 L	2C-1,2	92.28	1.00	1.00	1.00	1.00	V	
(H)-6 R	2C-1,2	92.62	1.00	1.00	1.00	1.00	V	
Limit	2C-1,2	74.4~100	≧ 0.8	≧ 0.8	≧ 0.8	≧ 0.8		

The Sample complied with the additional requirements of Clause 5.2 of EN 170:2002. Pass

The Sample complied with the spectral transmittance requirements for the range 500nm to 650nm. Pass

Housing transmittance:

The housings displayed transmittance values that would permit use with filters up to and including scale number 2C-1,2. Pass

7.1.2.2.3 Variations in transmittance

Sample ID	**P1 (%)**	**P2 (%)**	**P3 (%)**	Pass	Fail
(H)-4	0.30	0.33	0.67	V	
(H)-5	0.33	0.30	0.10	V	
(H)-6	0.36	0.30	0.37	V	
Limit	≦ ±5		≦ ±20		

7.1.2.3 Diffusion of light

Reduced luminance factor (simplified method)

Sample ID	**Reduced luminance factor** (cd/m^{2}lx)		Pass	Fail
	Left	Right		
(H)-4	0.26	0.23	V	
(H)-5	0.22	0.27	V	
(H)-6	0.21	0.25	V	
Limit	≦ 0.75			

7.1.3 Quality of material and surface

Sample ID (H)-1, (H)-2, (H)-3

There were none of the ocular defects listed in the standard. Pass

7.1.4.2 Increase Robustness

7.1.4.2.2 Complete eye protectors and Frames

Sample ID	Impact Position	Condition(℃)	Pass	Fail
(H)-7	Left Eye Frontal	+55	V	
(H)-8			V	
(H)-13	Left Eye Frontal	-5	V	
(H)-14			V	
(H)-9	Right Eye Frontal	+55	V	
(H)-10			V	
(H)-15	Right Eye Frontal	-5	V	
(H)-16			V	
(H)-11	Left Eye Side	+55	V	
(H)-17		-5	V	
(H)-12	Right Eye Side	+55	V	
(H)-18		-5	V	

7.1.5.1 Stability at an elevated temperature

Sample ID (H)-1, (H)-2, (H)-3

The specimen tested showed no apparent deformation. Pass

7.1.5.2 Resistance to ultraviolet radiation

a) Relative change in luminous transmittance

Sample ID	**Luminous transmittance**		**Relative change (%)**	Pass	Fail
	Before (%)	After (%)			
(H)-4 L	92.76	92.51	0.27	V	
(H)-5 R	92.34	92.14	0.22	V	
(H)-6 L	92.28	92.05	0.25	V	
Max limit	±5				

b) Reduced luminance factor (simplified method), after conditioning

Sample ID	**Reduced luminance factor** (cd/m^2lx)	Pass	Fail
(H)-4 L	0.34	V	
(H)-5 R	0.35	V	
(H)-6 L	0.31	V	
limit	≦ 0.75		

7.1.7 Resistance to ignition

Sample ID (H)-10, (H)-11, (H)-12

No part of the sample tested ignited or continued glow after removal of the steel rod. Pass

7.2.8 Lateral protection

Sample ID (H)-1, (H)-2, (H)-3

The sample tested covered the specified lateral region. Pass

7.3.4 Protection against high speed particles at extremes of temperature

Sample ID	Impact Position	Condition(℃)	ft/sec	Pass	Fail
(H)-19	Left Eye Frontal	+55	401	V	
(H)-20			399	V	
(H)-25		-5	403	V	
(H)-26			403	V	
(H)-21	Right Eye Frontal	+55	402	V	
(H)-22			408	V	
(H)-27		-5	406	V	

(H)-28			400	V	
(H)-23	Left Eye Side	+55	406	V	
(H)-29		-5	399	V	
(H)-24	Right Eye Side	+55	406	V	
(H)-30		-5	398	V	

Estimates of the uncertainty of measurement

Clause	Requirement		Uncertainty
6.1	Construction☒		Not applicable
6.3	Head bands☒		See note 3
7.1.1	Field of vision☒		See note 3
7.1.2.1	Spherical		0.005D
	Astigmatism		0.005D
	Prismatic Refractive Power		0.02△
7.1.2.2.2	Transmittance: filters	Range (nm)	
		380 to 780	0.078414%
		200 to 315	0.018762%
		315 to 380	0.013442%
		400 to 700	0.095504%
		780 to 2000	0.045468%
	Transmittance: housing/frame		See 7.1.2.2.2
7.1.2.2.3	Variations in transmittance		0.044%
7.1.2.3	Diffusion of light☒		See note 3
7.1.3	Quality of material and surface☒		See note 3
7.1.4.2	Increased robustness		See note 1
7.1.5.1	Stability at elevated temperature☒		See note 3
7.1.5.2	Resistance to ultraviolet radiation (oculars only)☒		See note 3
7.1.7	Resistance to ignition☒		See note 3
7.2.2	Protection against high speed particles		See note 1
7.2.8	Lateral Protection☒		See note 3
7.3.4	Protection against high speed particles at extremes of temperature		See note 1

Note 1 The acceptance criterion for this test is a straightforward “Pass/Fail”, rather than a numerical value. Consequently, as there is no value to be reported, uncertainty has not been reported either.

Note 2 The uncertainty value is based on a standard uncertainty multiplied by a coverage factor *k*= 2, which provides for a confidence level of approximately 95%.

Note 3 The requirement is not included in ISO/IEC 17025 of TAF scope accreditation. Consequently, the estimate of the uncertainty of measurement is not provided.

ANNEX

This Annex comprises one section.

1. Photographs of the product tested. (page.11)

-----END OF REPORT-----

Bullard Asia Pacific Pte Ltd's model SG1CAF safety goggle

All-Logic Int'l Laboratory Testing Services' specimen number (H)-1