

Report No	255/7948029 Issue 2	This Report consists of 14 pages
Licence/Certificate No	CE 595924	
Client	Long Dar Plastic Co Limited No 140 Wu Gong Road New Taipei Industrial Park New Taipei City 248 Taiwan	
Authority & date	Service Management Order No 7948029 dated 30 January 2013 Equipment Record No 10139980	
Items tested	Personal eye-protectors Model: SG2610 Twenty-One (21) clear lens samples submitted Four (4) grey lens samples submitted	
Specification	Type testing to BS EN 166:2002 Personal eye-protection – Specifications See Assessment Summary for details Issue 2 of this report supersedes all previous issues. The amendments on all pages giving rise to this issue can be ascertained by contacting the authorising signatory	
Results	See Summary of results on Pages 3 - 5	
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Authorized by	D J Newton <i>D.J. Newton</i>	Senior Engineer
Issue Date	13 June 2013	
Conditions of issue	<p>This Test Report is issued subject to the conditions stated in current issue of CP0322 'Conditions of contract for testing'. The results contained herein apply only to the particular sample/s tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Managing Director, BSI, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.</p>	



SPECIFICATION: Type testing to BS EN 166:2002 Personal eye-protection – Specifications
(See Assessment Summary for details)

CLIENT: Long Dar Plastic Co Limited

MODEL: SG2610 with clear and grey

STYLE: Goggles

ER NO: 10139980

DATE RECEIVED: 12 April 2013

DATE STARTED: 14 May 2013

BS EN 166 TYPE/OPTIONS CLASSIFICATIONS:-

Optical Class: 1 (1)

Impact Grade: F (1)

Other Options: 5-3.1 (1)

(1) These details are obtained from this test programme.

INTRODUCTION

The samples were submitted by the Client for a type test programme.

This Report should be read in conjunction with the Specification referenced above.

Testing to clauses 7.1.2.2.2, 7.1.2.2.3 and 7.1.5.2 (Relative change in luminous transmittance) was externally subcontracted.

ASSESSMENT SUMMARY

EN 166 Particular Requirements	Testing Requirements	BSI Sample Nos	Assessment
CLAUSE 6 Design and Manufacturing requirements			
6.1 General construction	Visual Inspection	1-21	Pass
6.2 Materials	Manufacturer's Certificates	-	N/As (1)
6.3 Headbands	EN 166:2001 Clause 6.3	-	N/Ap (2)
CLAUSE 7 Basic, particular and optional requirements			
7.1 Basic requirements	EN 168:2001 Clause 17		
7.1.1 Field of vision		1-3	Pass
7.1.2 Optical requirements			
7.1.2.1 Spherical, astigmatic and prismatic refractive powers	EN 167:2001 Clause 3.1		
7.1.2.1.1 Unmounted oculars covering one eye		-	N/Ap (2)
7.1.2.1.2 Mounted oculars and unmounted oculars covering both eyes	EN 167:2001 Clause 3.2	1-3	Pass
7.1.2.1.3 Cover plates	EN 166:2001 Tables 2 & 3	-	N/Ap (2)
7.1.2.2 Transmittance			
7.1.2.2.1 Oculars without filtering action	EN 167:2001 Clause 6	4-6	Pass
7.1.2.2.2 Oculars with filtering action (filters) and housings for oculars with filtering action	EN 167:2001 Clause 6	26-28	Pass
7.1.2.2.3 Variations in transmittance (Oculars without filtering action are exempt from this requirement)			
7.1.2.2.3.1 Oculars without corrective effect	EN 167:2001 Clause 7	26-28	Pass
7.1.2.2.3.2 Oculars with corrective effect (prescription oculars)	Deviation Factor 2.68 max (one shade number)	-	N/Ap (2)

N/Ap: Not Applicable

N/As: Not Assessed

- (1) Manufacturer's responsibility to use materials not known to cause skin irritation when in contact with the wearer of the eye-protector.
- (2) Not applicable to style of eye-protector.
- (3) Assessment not required by BSI Certification.

ASSESSMENT SUMMARY (CONTINUED)

EN 166 Particular Requirements	Testing Requirements	BSI Sample Nos	Assessment
CLAUSE 7 Basic, particular and optional requirements (Continued) 7.1.2.3 Diffusion of light	EN 167:2001 Clause 4	4-6	Pass
7.1.3 Quality of material and surface	EN 167:2001 Clause 5	1-21	Pass
7.1.4 Robustness 7.1.4.1 Minimum robustness	EN 168:2001 Clause 4	-	N/Ap (1)
7.1.4.2 Increased robustness 7.1.4.2.1 Unmounted oculars	EN 168:2001 Clause 3.1	-	N/Ap (1)
7.1.4.2.2 Complete eye-protectors and frames	EN 168:2001 Clause 3.2	7-10	Pass
7.1.5 Resistance to ageing 7.1.5.1 Stability at an elevated temperature	EN 168:2001 Clause 5	1-3	Pass
7.1.5.2 Resistance to ultraviolet radiation (oculars only)	EN 168:2001 Clause 6	4-6 26-28	Pass Pass
7.1.6 Resistance to corrosion	EN 168:2001 Clause 8	-	N/Ap (1)
7.1.7 Resistance to ignition	EN 168:2001 Clause 7	7-9	Pass
7.2 Particular requirements 7.2.1 Protection against optical radiation			
7.2.1.1 Welding filters	EN 169	-	N/Ap (1)
7.2.1.2 Ultraviolet filters	EN 170	-	N/Ap (1)
7.2.1.3 Infra-red filters	EN 171	-	N/Ap (1)
7.2.1.4 Sunglare filters for industrial use	EN 172	-	N/Ap (1)
7.2.1.5 Welding filters with switchable or dual luminous transmittance	EN 379	-	N/Ap (1)

N/Ap: Not Applicable

N/As: Not Assessed

- (1) Not applicable to style of eye-protector.
(2) Assessment not required by BSI Certification.

ASSESSMENT SUMMARY (CONTINUED)

EN 166 Particular Requirements	Testing Requirements	BSI Sample Nos	Assessment
CLAUSE 7 Basic, particular and optional requirements (Continued)			
7.2.2 Protection against high-speed particles	EN 168:2001 Clause 9 & Table 7	11-14 (Clear) 22-25 (Grey)	Pass
7.2.3 Protection against molten metals and hot solids	EN 168:2001 Clauses 10 & 11	-	N/Ap (1)
7.2.4 Protection against droplets and splashes of liquids	EN 168:2001 Clauses 10.2 & 12	-	N/Ap (1)
7.2.5 Protection against large dust particles	EN 168:2001 Clause 13	-	N/Ap (1)
7.2.6 Protection against gases and fine dust particles	EN 168:2001 Clause 14	-	N/Ap (1)
7.2.7 Protection against short circuit electric arc	EN 166:2001 Clause 7.2.7	-	N/Ap (1)
7.2.8 Lateral Protection	EN 168:2001 Clause 19	1-3	Pass
7.3 Optional requirements			
7.3.1 Resistance to surface damage by fine particles	EN 168:2001 Clause 15	-	N/Ap (1)
7.3.2 Resistance to fogging of oculars	EN 168:2001 Clause 16	-	N/Ap (1)
7.3.3 Oculars with enhanced reflectance in the infra-red	EN 167:2001 Clause 8	-	N/Ap (1)
7.3.4 Protection against high-speed particles at extremes of temperature	EN 168:2001 Clause 9	-	N/Ap (1)
9. Marking	EN 166:2001 Clause 9	1-21	Pass
10. Information supplied by the manufacturer	EN 166:2001 Clause 10	1-21	Pass

N/Ap: Not Applicable

- (1) Not applicable to style of eye-protector.
(2) Assessment not required by BSI Certification.

BSI
BS EN 166:2002

CLAUSE 7.1.2.1.2 OPTICAL REQUIREMENTS (Oculars Without Corrective Effect)
Mounted and unmounted oculars covering both eyes
Requirements

Optical Class	Spherical Refractive Power (1)	Astigmatic Refractive Power (1)	Difference in Prismatic Refractive Power (2)		
			Horizontal Base Out	Vertical Base In	Vertical
1	± 0.06	0.06	0.75	0.25	0.25
2	± 0.12	0.12	1.00	0.25	0.25
3	+ 0.12	0.25	1.00	0.25	0.25
	- 0.25	0.25	1.00	0.25	0.25

Measurements of Spherical and Astigmatic Power and Difference in Prismatic Refractive Power

Measurements made by the method specified in EN 167:2001 Clause 3.2

Sample Left (L) Right (R)	Spherical and Astigmatic Power (1)		Resultant Spherical (1) $\frac{D_1 + D_2}{2}$	Resultant Astigmatic (1) ($D_1 - D_2$)	Difference in Prismatic Refractive Power (2)			
	D_1	D_2			Horizontal Base Power	Vertical Power	Vertical Power	
1	L	-0.02	-0.01	-0.015	0.01	OUT	0.050	0.000
	R	-0.01	+0.01	0.000	0.02			
2	L	0.00	+0.01	+0.005	0.01	OUT	0.050	0.000
	R	-0.01	+0.01	0.000	0.02			
3	L	+0.01	+0.01	+0.010	0.00	OUT	0.050	0.000
	R	-0.01	-0.01	-0.010	0.00			

D_1 = horizontal bars readings

D_2 = vertical bars readings

Optical Class: 1

Overall Assessment: Pass

(1) Dioptres per metre.

(2) Prism dioptres cm per metre.

**CLAUSE 7.1.2.2.1 TRANSMITTANCE (Oculars Without Filtering Action) AND
CLAUSE 7.1.5.2 RESISTANCE TO ULTRAVIOLET RADIATION (1)**

Measurements made by the method specified in EN 167:2001 Clause 6

Sample No	PERCENTAGE TRANSMISSIONS					
	Prior to UV ageing (>74.4%)	LEFT Post UV ageing	Relative Difference $\pm 5\%$ max	Prior to UV ageing (>74.4%)	RIGHT Post UV ageing	Relative Difference $\pm 5\%$ max
4	88.2	88.9	+0.8	88.5	88.0	-0.6
5	89.1	88.4	-0.8	87.6	88.4	+0.9
6	88.9	88.1	-0.9	88.4	87.8	-0.7

Overall Assessment: Pass

(1) Assessment of oculars only.

CLAUSE 7.1.2.2.2 TRANSMITTANCE**(Oculars With Filtering Action (filters) and housings for oculars with filtering action)****Ocular transmittance: EN 172:1994**

Specimen	Scale number	Transmittance (%)		Relative visual attenuation quotient (Q)			
		Mean spectral 315 to 380nm	Luminous (LT)	Red	Yellow	Green	Blue
26L	5-3.1	0	8.99	1.09	1.02	0.99	1.04
26R	5-3.1	0	9.36	1.08	1.02	1.00	1.04
27L	5-3.1	0	9.36	1.12	1.04	0.99	1.03
27R	5-3.1	0	9.44	1.12	1.04	0.99	1.03
28L	5-3.1	0	9.33	1.12	1.04	0.99	1.03
28R	5-3.1	0	9.12	1.10	1.03	0.99	1.04
Limit	5-3.1	0.5LT	8.0 to 17.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8

Overall Assessment: Pass

280nm to 315nm: Maximum value of spectral transmittance did not exceed 0.01LT Pass

316nm to 350nm: Maximum value of spectral transmittance did not exceed 0.5LT Pass

500nm to 650nm: The spectral transmittance was not less than 0.2LT Pass

CLAUSE 7.1.2.2.3 VARIATIONS IN TRANSMITTANCE

Specimen	P1 (%)	P2 (%)	P3 (%)
26	6.5	4.0	4.0
27	3.5	4.8	0.8
28	5.0	5.9	2.3
Limit	≤ ± 10		≤ 20

Overall Assessment: Pass**CLAUSE 7.1.5.2 RESISTANCE TO ULTRAVIOLET RADIATION****(Relative change in luminous transmittance)**

Specimen	Relative change (%)	
	Left	Right
26	-0.4	-
27	-	-1.1
28	+2.6	-
Max Limit	±10	

Overall Assessment: Pass

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CLAUSE 7.1.2.3 DIFFUSION OF LIGHT

Measurements made by the method specified in EN 167:2001 Clause 4.2.2.1

Results

		Diffusion (1) (cd/m².lx)
Sample 1	Left	0.273
	Right	0.237
Sample 2	Left	0.205
	Right	0.172
Sample 3	Left	0.232
	Right	0.399

Overall Assessment: Pass

- (1) Maximum permitted values:
- a) Welding filters: 1.00
 - b) High-speed particle protection oculars: 0.75
 - c) Minimum and increased robustness oculars: 0.50

CLAUSE 7.1.4.2.2 INCREASED ROBUSTNESS - COMPLETE EYE-PROTECTORS

Tested in accordance with the requirements of EN 168:2001 Clause 3.2

Sample No BSI / Client	Impact site (1)				Conditioning (°C)	Assessment
	1	2	3	4		
7	√	√	√	√	+55	Pass
8	√	√	√	√	-5	Pass
9	√	√	√	√	+55	Pass
10	√	√	√	√	-5	Pass

The following comments are applicable:-

(1) Impact sites above correspond to the following:-

1 Left eye frontal 2 Right eye frontal 3 Left eye side 4 Right eye side

Additionally it was observed during testing samples, that all impact points on the headform were covered by the eye protector.

CLAUSE 7.1.5.1 STABILITY AT AN ELEVATED TEMPERATURE

Conditioning in accordance with Clause 5 of EN168:2001 was conducted. There was no apparent deformation present after conditioning.

Assessment: Pass

CLAUSE 7.1.5.2 RESISTANCE TO ULTRAVIOLET RADIATION

Conditioning was conducted in accordance with Clause 6 of EN 168:2001

CLAUSE 7.1.2.3 DIFFUSION OF LIGHT (Post U.V. Ageing)

Measurements made by the method specified in EN 167:2001 Clause 4.2.2.1

Results

		Diffusion (1) (cd/m².lx)
Sample 1	Left	0.352
	Right	0.683
Sample 2	Left	0.299
	Right	0.320
Sample 3	Left	0.212
	Right	0.388

Overall Assessment: Pass

- (1) Maximum permitted values:
- a) Welding filters: 1.00
 - b) High-speed particle protection oculars: 0.75
 - c) Minimum and increased robustness oculars: 0.50

CLAUSE 7.2.2 PROTECTION AGAINST HIGH-SPEED PARTICLES

Tested in accordance with the requirements of EN 168:2001 Clause 9

Sample No BSI / Client	Impact site (1)				Impact velocity m/sec	Assessment
	1	2	3	4		
11	√	√	√	√	45	Pass
12	√	√	√	√	45	Pass
13	√	√	√	√	45	Pass
14	√	√	√	√	45	Pass
22	√	√	√	√	45	Pass
23	√	√	√	√	45	Pass
24	√	√	√	√	45	Pass
25	√	√	√	√	45	Pass

The following comments are applicable:-

(1) Impact sites above correspond to the following:-

1 Left eye frontal 2 Right eye frontal 3 Left eye side 4 Right eye side

Additionally it was observed during testing samples, that all impact points on the headform were covered by the eye protector.

CLAUSE 7.2.8 LATERAL PROTECTION

Requirement	Assessment
Sample Nos: 1-3 (1) When assessed, the eye protector covered the lateral protection region on the headform in accordance with Clause 19 of EN 168:2001.	Pass

(1) Adjusted by BSI as required to provide best fit on headform.

CLAUSE 9 MARKING (1)

Clause	Marking Present	Sample No	Assessment
9 Marking	SG2610 Taiwan 'Trademark' ANSI z87 + 1F EN 166 F CE	1-21	Pass

(1) Assessed as a single unit.

CLAUSE 10 INFORMATION FOR USERS (2)

Requirement	Assessment
The manufacturer shall provide with each eye-protector, replacement ocular and replacement frame at least the following information:	
a) Name and address of the manufacturer	Pass
b) The number of this European Standard	Pass
c) The eye-protector model identification number	Pass
d) Instructions for storage, use and maintenance	Pass
e) i) Specific instructions for cleaning ii) Specific instructions for disinfecting	Pass Pass
f) Details of the field of use, protection capabilities and performance characteristics	Pass
g) Details of suitable accessories and spare parts and instructions for fitting	N/Ap (1)
h) The obsolescence deadline or period of obsolescence, if applicable, for the complete eye-protector and/or component parts	Pass
i) The type of packaging suitable for transport, if applicable	N/Ap (1)
j) The significance of the marking on the frame and the ocular	Pass
k) A warning that optical class 3 oculars are not intended for long term use	N/Ap (1)
l) A warning concerning the compatibility of marking	Pass
m) A warning that materials which may come into contact with the wearer's skin could cause allergic reactions to susceptible individuals	Pass
n) A warning that scratched or damaged oculars should be replaced	Pass
o) A warning that eye-protectors against high-speed particles worn over standard ophthalmic spectacles may transmit impacts, thus creating a hazard to the wearer.	Pass
p) A note to instruct that if protection against high-speed particles at extremes of temperature is required then the selected eye-protector should be marked with the letter T immediately after the impact letter, i.e. FT, BT or AT. ;If the impact letter is not followed by the letter T then the eye-protector shall only be used against high-speed particles at room temperature.	N/Ap (1)

N/Ap: Not Applicable

(1) Not applicable to style of eye-protector.

(2) Manufacturer submitted a revised information for users sheets

End of Report.