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Test Report T7811-01-2 Issue 1
CAN/CSA-Z94.3-07
Nautilus International (Cayman) Ltd.
STDY 2048 Spectacles
22 January 2013



Approved by:

A handwritten signature in blue ink, appearing to read 'Keith E. Whitten', written over a horizontal line.

Keith E. Whitten
Laboratory Manager

Prepared by:

A handwritten signature in blue ink, appearing to read 'Cathy Woloszyn', written over a horizontal line.

Cathy Woloszyn
Laboratory Assistant

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P.O. Box 30739 Camana Bay
Grand Cayman KY1-1203
Cayman Islands British West Indies

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Objective:

Contract testing to CAN/CSA Z94.3-07 (Including Updates 1, 2 and 3); “Eye and Face Protection.”

Clauses: 6 General Requirements
7 Class 1 Protectors - Spectacles

Samples:

STDY 2048 Spectacles

Lens Color	Temple Color	Quantity	Sample ID
Clear	Clear	32	1A
Smoke	Smoke	8	1B
Amber	Amber	8	1C

Date submitted: 10 December 2012

Procedures:

Testing protocols in accord with good laboratory practice were employed unless otherwise specified, for all tests.

All tests were conducted in a standard laboratory atmosphere unless otherwise specified.

Testing procedures as specified within Section 12 of CAN/CSA-Z94.3-07 were followed, unless otherwise indicated.

Samples were randomly selected from the quantity provided and tested in the as-received condition unless otherwise stated.

Residual Power, Resolving Power and Prismatic Power are a function of lens geometry, not tint, therefore these tests were performed only on one tint variant of each lens type.

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Assessment Summary:

Dates tested: 26 December 2012 through 11 January 2013

CAN/CSA Z94.3-07 Requirements	Compliant	Non Compliant
6. General Requirements		
6.1 Impact Resistance	X	
6.2 Ignition/Flammability Requirements		
6.2.1 Ignition Resistance	X	
6.2.2 Flame Resistance	X	
6.3 Replacement Components	Not assessed	
6.4 Clear Zero-Power Lenses		
6.4.1 Size	See 7.1	
6.4.2 Residual Power	X	
6.4.3 Resolving Power	X	
6.4.4 Prismatic Deviation	X	
6.4.5 Haze	X	
6.4.6 Luminous Transmittance	X	
6.5 Zero-Power Filters	Not applicable	
6.6 Zero Power Special Purpose Lenses	Not applicable	
7. Class 1 Protectors - Spectacles		
7.1 Minimal Frontal Coverage	X	
7.2 Side Protection	X	
13. Marking	Not assessed	
16. Sun protection for outdoor worker	Not applicable	

Samples as assessed meet the requirements of CAN/CSA Z94.3-07 for Class 1A Spectacles with Side Protection.

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CSA Results:

6.1 Impact Resistance

Sample ID	Location	Weight (g)		Velocity (m/s)	Pass	Fail
		Before	After			
<i>Clear</i>						
1A-17	Mid Point between pupils	35.6	35.5	46.2	X	
1A-18	Left Center 0°	35.6	35.6	46.2	X	
1A-19	Right Center 0°	35.1	35.1	46.5	X	
1A-20	Left 0°- 15mm to temple	35.2	35.2	46.5	X	
1A-21	Right 0°- 15mm to temple	35.7	35.7	46.5	X	
1A-22	Frontal 0° Left temple end piece and eyewire	35.7	35.8	46.8	X	
1A-23	Lateral 90° temple end piece and eyewire	35.1	35.2	46.4	X	
1A-24	Lateral 90° Right 10mm behind Apex	35.5	35.6	46.3	X	
1A-25	Lateral 90° Right 10mm behind Apex up 10mm	35.0	35.1	46.3	X	
1A-26	Lateral 90° Right 10mm behind Apex down 10mm	35.6	35.5	46.0	X	
<i>Smoke</i>						
1B-7	Left Center 0°	35.6	35.6	46.6	X	
1B-8	Right Center 0°	36.1	36.1	46.7	X	
<i>Amber</i>						
1C-7	Left Center 0°	34.9	34.9	46.7	X	
1C-8	Right Center 0°	34.9	34.9	46.5	X	

6.2.1 Ignition Resistance; Result: Pass

Components tested: Lens and Temple did not ignite or continue to glow or be consumed after removal of the steel rod.

6.2.2 Flame Resistance; Result: Pass

Components tested: Lens and Temple burn at a rate less than 75 mm/min.

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6.4.2 Residual Power

Sample ID	Left Ocular (D)		Right Ocular (D)		Pass	Fail	
1A-1	0.03	-0.01	0.03	-0.02	X		
Specification:	+/- 0.12						

Note: Tested on with sample mounted as worn on a headform.

6.4.3 Resolving Power

Sample ID	Pattern Resolved (seconds of arc)		Pass	Fail
	Left Ocular	Right Ocular		
1A-1	≤ 60	≤ 60	X	
Specification:	≤ 60			

Note: Tested with front surface normal to telescope.

6.4.4 Prismatic Deviation

Sample ID	Location	Vertical Imbalance (cm/m)	Horizontal Imbalance (cm/m)	Pass	Fail
1A-1	Center	<0.05	0.08 Base Out	X	
	10mm above center	<0.05	0.11 Base Out	X	
	10mm below center	<0.05	0.08 Base Out	X	
	10mm to the left of center	<0.05	0.05 Base Out	X	
	10mm to the right of center	<0.05	0.08 Base Out	X	
Specification:		≤ 0.25	≤ 0.75 Base Out ≤ 0.25 Base In		

Note: Measured using method defined in ANSI Z87.1 with sample mounted as worn on a headform.

6.4.5 Haze

Sample ID	Left (%)	Right (%)	Pass	Fail
<i>Clear</i>				
1A-2	0.17	0.21	X	
<i>Smoke</i>				
1B-2	1.75	1.89	X	
<i>Amber</i>				
1C-2	0.69	0.66	X	
Specification:	≤ 2			

6.4.6 Luminous Transmittance

Sample ID	Left (%)	Right (%)	Pass	Fail
<i>Clear</i>				
1A-2	92.5	92.5	X	
<i>Smoke</i>				
1B-2	25.9	25.9		For Reference Only
<i>Amber</i>				
1C-2	37.0	37.3		For Reference Only
Specification:	≥ 85			

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7.1 Minimal Frontal Coverage

Sample ID	Height (mm)	Width (mm)	Field of View		Pass	Fail
			Temporal (°)	Vertical (°)		
1A-1	56	77	>90	>139	X	
Specification	≥ 33	≥ 40	≥ 40	≥ 80		

7.2 Side Protection; Result: Pass

7.2.1 Side protection is incorporated as part of lens and temple.

7.2.2 Coverage

Sample ID	At Front of Eye		20mm Behind Apex		Pass	Fail
	Above Center (mm)	Below Center (mm)	Above Center (mm)	Below Center (mm)		
1A-1	30	24	32	16	X	
Specification:	≥ 16		≥ 10	≥ 7		

7.2.3 There is no vented portion, the vented portion of the temple arm does not fall in the side protection coverage area.

7.2.4 Not Applicable, not vented.

7.2.5 Samples assessed as Class 1A and side protection is not vented.

7.2.6 Not Applicable, not for protection against optical radiation.

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Sample Photographs:



Clear



Smoke



Amber

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