



Test Report T6790-03-1 Issue 1
EN 166:2001
Rayman Speco Co., Ltd.
S-10 Spectacles
27 February 2012



Certificate 1722.01

Approved by:

A handwritten signature in blue ink, appearing to read "Keith E. Whitten".

Keith E. Whitten
Laboratory Manager

Prepared by:

A handwritten signature in blue ink, appearing to read "Cathy Woloszyn".

Cathy Woloszyn
Laboratory Assistant

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Issued to: Rayman Speco Co., Ltd.
189 Jang Kang Road, Sec. 2
Tainan city, 70249
Taiwan, R.O.C.

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Objective:

Contract testing to EN 166:2001, "Personal Eye Protection - Specifications".

Clauses: 7.1 Basic requirements
7.2.2 Protection against high-speed particles – Low energy impact (F)

Samples:

S-10 Spectacles

Lens Color	Temple Color	Quantity	Date Received	Sample ID
Clear	Clear	50	03 October 2011	0A-xx
		12	12 January 2012	0A-3xx

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 were followed as specified within:

EN 167:2001 "Personal eye-protection - Optical test methods"

EN 168:2001 "Personal eye-protection - Non-optical test methods"

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

When applicable, samples were assessed on medium headform (64mm PD).

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Assessment summary:

Dates tested: 07 through 17 October 2011, and 21 through 24 February 2012

EN 166:2001 Requirements	Compliant	Non Compliant
6 Design and manufacture		
6.1 General construction	X	
6.2 Materials	Not assessed	
6.3 Headbands	Not applicable	
7.1 Basic requirements		
7.1.1 Field of vision	X	
7.1.2 Optical requirements		
7.1.2.1 Spherical, astigmatic, and prismatic refractive powers	Optical Class 2	
7.1.2.2 Transmittance		
7.1.2.2.1 Oculars without filtering action	X	
7.1.2.2.2 Oculars with filtering action	Not applicable	
7.1.2.2.3 Variations in transmittance	Not applicable	
7.1.2.3 Diffusion of light	X	
7.1.3 Quality of material and surface	X	
7.1.4 Robustness		
7.1.4.1 Minimum robustness	Not applicable	
7.1.4.2 Increased robustness	X	
7.1.5 Resistance to Ageing		
7.1.5.1 Stability at elevated temperatures	X	
7.1.5.2 Resistance to ultraviolet radiation (oculars only)	X	
7.1.6 Resistance to corrosion	Not applicable	
7.1.7 Resistance to ignition	X	
7.2 Particular requirements (Optional)		
7.2.1 Protection against optical radiation		
7.2.2 Protection against high speed particles (F)	X	
7.2.8 Lateral Protection	X	
7.3 Optional requirements	None claimed	
9 Marking	Not assessed	
10 Information supplied by the manufacturer	Not assessed	

Samples as assessed meet the requirements of EN166:2001 and as a result of this assessment the following markings are suggested for a product in which the frame and ocular form a single unit:

Ocular Variant	Filter Type	Filter Scale	Frame or Ocular Marking
Clear	Not a filter	N/A	CE 'mfg' 2 F - EN 166 F

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Results:

6.1 General construction; Result: Pass

Samples were assessed and found to be free from projections, sharp edges or other defects that are likely to cause discomfort or injury.

7.1.1 Field of view; Result: Pass

Samples assessed and a 22mm(W) x 20mm(H) ellipse could be described in full for each eye (64mm pupil distance)

7.1.2.1 Refractive powers

Spherical and astigmatic powers

Sample ID	Left Ocular		Right Ocular		Optical Class Met
	Spherical Power (m ⁻¹)	Astigmatic Power (m ⁻¹)	Spherical Power (m ⁻¹)	Astigmatic Power (m ⁻¹)	
0A-301	0.02	0.02	0.02	0.07	2
0A-302	0.04	0.02	-0.01	0.05	1
0A-303	0.05	0.07	0.02	0.07	2
Specification					
Optical Class 1:	+/- 0.06	≤ 0.06	+/- 0.06	≤ 0.06	
Optical Class 2:	+/- 0.12	≤ 0.12	+/- 0.12	≤ 0.12	
Optical Class 3:	+ 0.12 /- 0.25	≤ 0.25	+ 0.12 /- 0.25	≤ 0.25	

Difference in prismatic refractive power

Sample ID	Vertical Imbalance (cm/m)	Horizontal Imbalance (cm/m)	Optical Class Met
0A-301	0.20	0.06 Base In	1
0A-302	0.12	<0.03 Base In	1
0A-303	0.13	0.10 Base In	1
Specification			
Optical Class 1:	≤ 0.25	≤ 0.75 Base Out, ≤ 0.25 Base In	
Optical Class 2:	≤ 0.25	≤ 1.00 Base Out, ≤ 0.25 Base In	
Optical Class 3:	≤ 0.25	≤ 1.00 Base Out, ≤ 0.25 Base In	

7.1.2.2.1 Transmittance - Oculars without filtering action

Sample ID	Left (%)	Right (%)	Pass	Fail
0A-301	88.4	88.7	X	
0A-302	88.2	88.3	X	
0A-303	88.4	88.5	X	
Specification:	≥74.4			

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7.1.2.3 Diffusion of light

Sample ID	Measured Value cd/(m ² ·lx)	Pass	Fail
0A-301R	0.09	X	
0A-302L	0.10	X	
0A-303R	0.12	X	
Specification:	≤ 0.75		

7.1.3 Quality of material and surface; Result: Pass

Samples assessed were found to be free of any optical defects that could impair vision.

7.1.4.2 Increased robustness - Complete eye-protectors

Sample ID	Location	Conditioning	Velocity (m/s)	Pass	Fail
0A-27	Left Frontal (1)	55°C	5.1m/s 22mm 43g Drop Ball 1.3m	X	
0A-28				X	
0A-29	Right Frontal (2)			X	
0A-30				X	
0A-31	Left Lateral (3)			X	
0A-32	Right Lateral (4)			X	
0A-33	Left Frontal (1)	-5°C		X	
0A-34				X	
0A-35	Right Frontal (2)			X	
0A-36				X	
0A-37	Left Lateral (3)			X	
0A-38	Right Lateral (4)			X	

7.1.5.1 Stability at elevated temperatures; Result: Pass

Samples assessed had no visible deformation.

7.1.5.2 Resistance to ultraviolet radiation

-Transmittance

Sample ID	Before (%)	After (%)	Relative Change (%)	Pass	Fail
0A-301R	88.7	87.8	-1.015	X	
0A-302L	88.2	88.2	0.000	X	
0A-303R	88.5	88.1	-0.452	X	
Specification:			±5		

- Diffusion of Light

Sample ID	cd/(m ² ·lx)	Pass	Fail
0A-301R	0.16	X	
0A-302L	0.14	X	
0A-303R	0.14	X	
Specification:	≤ 0.75		

7.1.7 Resistance to ignition; Result: Pass

Samples did not ignite or continue to glow after removal of the steel rod.

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7.2.2 Protection against high-speed particles

Sample ID	Location	Velocity (m/s)	Pass	Fail
0A-39	Left Frontal (1)	46.3	X	
0A-40		46.0	X	
0A-305		46.6	X	
0A-306		46.6	X	
0A-43	Right Frontal (2)	46.3	X	
0A-44		46.3	X	
0A-307		46.6	X	
0A-308		46.3	X	
0A-309	Left Lateral (3)	46.3	X	
0A-310		46.3	X	
0A-311	Right Lateral (4)	46.6	X	
0A-312		46.6	X	

7.2.8 Lateral protection; Result: Pass

Samples prevent the tip of a 2mm rod from touching the lateral impact regions of the headform.

Sample photographs:



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