



Test Report T8779-01-1 Issue 1
EN 166:2001
Taizhou City Jixing Safety Protection Products Co., Ltd.
KS 101 Spectacles
11 February 2014



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Objective:

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

Clauses: 6 Design and manufacture
7.1 Basic requirements
7.2.1.2 Protection against optical radiation, Ultraviolet filters (EN 170:2002)
7.2.2 Protection against high-speed particles – Low energy impact (F)

Samples:

KS 101 Spectacles

Ocular Variant	Quantity	Sample ID
Clear	30	9A

Date submitted: 22 January 2014

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).

Variation in luminous transmittance- P1 and P2, The actual variation is compared to the requirement. If the actual variation does not meet the requirement, then the corrected variation is used. The corrected variation is calculated from the difference between the theoretical and actual variation. The theoretical values are determined by applying Beer-Lambert’s Law to the known thickness variation of the lens.

Spherical, astigmatic, and prismatic refractive powers are a function of lens geometry, not tint, therefore they were only performed on one tint variant of each lens type.

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Assessment summary:

Dates tested: 30 January through 03 February 2014

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 Basic, particular and option requirements		
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 1	
7.1.2.2 Transmittance		
7.1.2.2.1 Oculars without filtering action		Not applicable
7.1.2.2.2 Oculars with filtering action		See 7.2.1
7.1.2.2.3 Variations in transmittance	X	
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		
7.2.1.2 Ultraviolet filters (EN170)	X	
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	Ultraviolet	2-1.2 or 2C-1.2	CE 'filter scale' 'mfg' 1 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)	
9A-1	-0.03	0.01	-0.03	0.03	1
9A-2	-0.03	0.01	-0.02	0.02	1
9A-3	-0.03	0.01	-0.01	0.02	1
Requirement					
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
9A-1	0.04	0.11 Base Out	1
9A-2	0.04	0.10 Base Out	1
9A-3	0.03	0.10 Base Out	1
Requirement			
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	

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7.1.2.2.3 Variations in transmittance [filtering]

Sample ID:	9A-4		9A-5		9A-6		Requirement
Ocular:	Left	Right	Left	Right	Left	Right	
Maximum %T:	90.1	90.0	90.1	89.9	90.0	89.8	
Center %T:	90.0	90.0	90.0	89.9	89.8	89.7	
Minimum %T:	90.0	90.0	89.8	89.8	89.8	89.5	
Actual P1 & P2:	0.1	0.0	0.2	0.1	0.2	0.2	± 5%
P3:	0.0		0.1		0.1		± 20%
Pass/Fail:	Pas						

7.1.2.3 Diffusion of light

Sample ID	cd/(m ² ·lx)	Pass	Fail
9A-4R	0.05	X	
9A-5L	0.05	X	
9A-6R	0.07	X	
Requirement:	≤ 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
9A-7	Left Frontal (1)	55°C	5.1m/s 22mm 43g Drop Ball 1.3m	X	
9A-8				X	
9A-9	Right Frontal (2)			X	
9A-10				X	
9A-11	Left Lateral (3)	X			
9A-12	Right Lateral (4)	X			
9A-13	Left Frontal (1)	-5°C		X	
9A-14				X	
9A-15	Right Frontal (2)			X	
9A-16				X	
9A-17	Left Lateral (3)			X	
9A-18	Right Lateral (4)			X	

7.1.5.1 Stability at elevated temperatures; Result: Pass

Samples assessed had no visible deformation.

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7.1.5.2 Resistance to ultraviolet radiation - Transmittance

Sample ID	Before (%)	After (%)	Relative Change (%)	Pass	Fail
9A-4R	90.0	89.9	-0.111	X	
9A-5L	90.0	89.9	-0.111	X	
9A-6R	89.7	89.8	-0.111	X	
Requirement:			±5		

7.1.5.2 Resistance to ultraviolet radiation - Diffusion of Light

Sample ID	cd/(m ² ·lx)	Pass	Fail
9A-4R	0.06	X	
9A-5L	0.09	X	
9A-6R	0.07	X	
Requirement:	≤ 0.75		

7.1.7 Resistance to ignition; Result: Pass

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

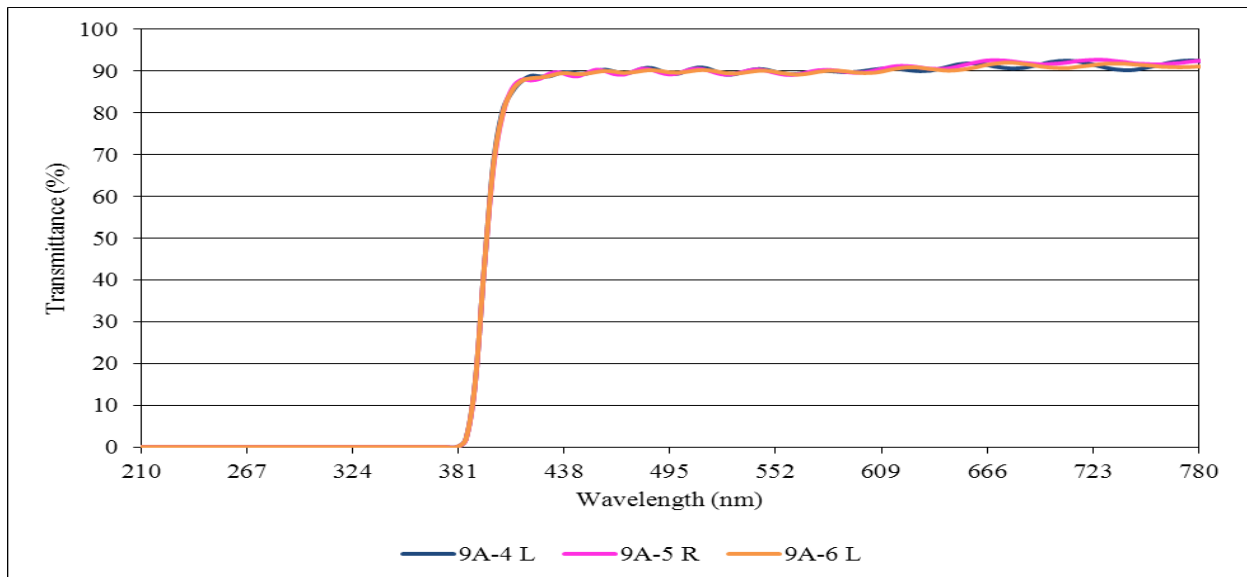
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7.2.1.2 Protection against optical radiation - Ultraviolet filters (EN 170)

Sample ID:	9A-4L	9A-5R	9A-6L	Requirement Scale Number 2-1.2 or 2C-1.2
Luminous (Tv) - ILLA	90.0	90.1	89.9	74.4 to 100%
313nm*	2.1E-4	1.7E-4	1.6E-4	≤ 0.0003%
365nm	1.7E-4	1.7E-4	1.4E-4	≤ 10%
Max. 210 to 313nm*	2.3E-4	2.3E-4	2.2E-4	≤ 0.0003%
Max. 313 to 365nm	1.0E-3	9.2E-4	9.8E-4	≤ 10%
Max. 365 to 405nm	80.7	78.8	80.1	< Tv
Optional requirements for oculars with enhanced color recognition:				
Min. 500 to 650nm	89.2	89.1	89.2	≥ 0.2 Tv
Attenuation Quotients:				
Red Signal	1.01	1.01	1.01	≥ 0.8
Yellow Signal	1.00	1.00	1.00	
Green Signal	1.00	1.00	1.00	
Blue Signal	1.00	1.00	1.00	
Scale number met	2-1.2 or 2C-1.2			

(*) Values corrected for the presence of fluorescence.



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7.2.2 Protection against high-speed particles

Sample ID	Location	Velocity (m/s)	Pass	Fail
9A-19	Left Frontal (1)	46.0	X	
9A-20		46.6	X	
9A-21		46.6	X	
9A-22		46.3	X	
9A-23	Right Frontal (2)	46.0	X	
9A-24		46.6	X	
9A-25		46.3	X	
9A-26		46.6	X	
9A-27	Left Lateral (3)	46.6	X	
9A-28		46.0	X	
9A-29	Right Lateral (4)	46.6	X	
9A-30		46.3	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 photograph:



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