

## Test Report

### EN 166 : 2001

**Report no:** 06.10.76  
**Client:** INSPEC Certification Services  
Upper Wingbury Courtyard  
Wingrave  
Aylesbury  
Buckinghamshire  
HP22 4LW  
**Client order:** TS06/3216 and Diane Brooks  
**Order(s) received:** 19 April to 18 October 2006  
**Manufacturer:** Elvex Corporation  
**Model:** SG-12  
**Date(s) tested:** 2 to 7 May 2006



**Conditions:**

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Opinions, comments and interpretations expressed herein are outside the scope of UKAS accreditation and shown in italics in this report.

Tests marked  are not included in the UKAS accreditation schedule for INSPEC.

Samples have been destroyed.

Checked:  ..... Approved:  .....  
S. J. WRIGHT A. NELSON

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**Product characteristics**

Product type: Spectacle

Property	Clause	Claimed characteristic (relevant to testing performed)
Optical class	7.1.2.1	1 (proposed marking)
Scale number	7.1.2.2	-
Protection against high speed particles	7.2.2	Low energy (proposed marking)
Protection against high speed particles (extreme temps.)	7.3.4	-

**Sample details**

Product	Quantity	Received	INSPEC no. (R258+)
SG-12 spectacle	27	11 Apr. 06	01 to 03, 07 to 30

Samples were selected by INSPEC from the submission detailed above, randomly where possible.

**Procedures**

Testing was performed in accordance with EN166 : 2001.

**Summary of assessment\***

Clause		Samples	Result
6.1	General construction	All	Pass
6.2	Materials		
6.3	Headbands		
7.1.1	Field of vision	01 to 03	Pass
7.1.2.1	Spherical, astigmatic & prismatic refractive powers	01 to 03	Pass
7.1.2.2	Transmittance – non-filtering oculars		
7.1.2.2	Transmittance – filtering oculars		
	Transmittance – housings		
7.1.2.2	Transmittance – variations in transmittance		
7.1.2.3	Diffusion of light		
7.1.3	Quality of material and surface	01 to 03	Pass
7.1.4.1	Minimum robustness		
7.1.4.2	Increased robustness	07 to 18	Pass
7.1.5.1	Stability at elevated temperature	01 to 03	Pass
7.1.5.2	Resistance to ultraviolet radiation (oculars only)		
7.1.6	Resistance to corrosion	07 to 09	Pass
7.1.7	Resistance to ignition	10 to 12	Pass
7.2.2	Protection against high speed particles	19 to 30	Pass
7.2.3	Protection against molten metals & hot solids		
7.2.4	Protection against droplets and splashes of liquids		
7.2.5	Protection against large dust particles		
7.2.6	Protection against gases and fine dust particles		
7.2.7	Protection against short circuit electric arc		
7.2.8	Lateral protection	01 to 03	Pass
7.3.1	Resistance to surface damage by fine particles		
7.3.2	Resistance to fogging of oculars ☒		
7.3.3	Oculars with enhanced reflectance in the infra-red ☒		
7.3.4	Protection against high speed particles at extremes of temperature		
9	Marking	All	Fail
10	Information supplied by the manufacturer		

**Key**

	Highlighting shows clauses requested for each model. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing was insufficient to completely verify compliance with clause. See "Procedures" / "Result detail".
Fail	Requirement not satisfied. See "Result detail".
NAs	Assessment not carried out. See "Result detail".
NAp	Requirement not applicable.
NT	Requested but not tested due to early termination following failure.
☒	These tests were not included in the UKAS accreditation schedule for INSPEC.

\* Assessment relates only to those items tested in this report.



**Result detail****7.1.2.1 Spherical, astigmatic & prismatic refractive powers****Spherical refractive power**

Sample		01	02	03	Maximum Limit
Left	(m <sup>-1</sup> )	-0.01	-0.01	-0.02	± 0.06
Right	(m <sup>-1</sup> )	-0.01	-0.01	-0.01	

**Astigmatic refractive power**

Sample		01	02	03	Limit
Left	(m <sup>-1</sup> )	0.05	0.03	0.03	≤ 0.06
Right	(m <sup>-1</sup> )	0.04	0.05	0.05	

**Difference in prismatic refractive power**

Sample		01	02	03	Limit
Horizontal	(cm/m)	0.08	0.10	0.08	≤ 0.75
Vertical	(cm/m)	0.03	0.05	0.03	≤ 0.25
Base in or out		out	out	out	-

**9 Marking**

All samples were assessed.

**9.1 General**

The samples were not marked.

**Fail**

A document entitled 'Proposed marking on products' was submitted against which assessment was performed.

Assessment that the marking was clear and permanent, visible when the complete eye-protector was assembled, did not encroach into the specified minimum field of vision and did not impede vision when worn could not be performed.

**NAs**

The number of the Standard was proposed to be included in the marking of the frames.

**9.2 Ocular marking**

*The following proposed markings were present (lens with hard coating) and have been interpreted against the requirements of the Standard as follows:-*

"2-1.2 DM 1 F K" / "2C-1.2 DM 1 F K"

Scale number -

"2-1.2" / "2C-1.2"

Identification of the manufacturer -

"DM"

Optical class -

"1"

Mechanical strength -

"F"

Resistance to surface damage by fine particles -

"K"

**Note**

"DM" was stated by the manufacturer to represent the distributor's mark.

The marking was presented in the order required by the Standard.

<b>9.2.1</b>	<b>Scale number</b>	The scale number was included. Manufacturer to certify compliance.	<b>NAs</b>
<b>9.2.2</b>	<b>Identification of the manufacturer</b>	A manufacturer's identification mark was not included. The characters 'DM' (distributors mark) were inserted in the correct position for the manufacturer's identification mark.	<b>Fail</b>
<b>9.2.3</b>	<b>Optical class</b>	The symbol for optical class 1 was included.	
<b>9.2.4</b>	<b>Mechanical strength</b>	The symbol for low energy impact was included.	
<b>9.2.5</b>	<b>Resistance to short circuit electric arc</b>	The eye-protector was a spectacle.	<b>NAP</b>
<b>9.2.6</b>	<b>Non-adherence of molten metal &amp; resistance to penetrations of hot solids</b>	The eye-protector was a spectacle.	<b>NAP</b>
<b>9.2.7</b>	<b>Resistance to surface damage by fine particles</b>	The symbol "K" was included. Manufacturer to certify compliance.	<b>NAs</b>
<b>9.2.8</b>	<b>Resistance to fogging of oculars</b>	Not claimed.	<b>NAP</b>
<b>9.2.9</b>	<b>Original/replacement oculars</b>	The marking did not include a symbol to identify the ocular as an original/replacement.	
<b>9.2.10</b>	<b>Resistance to high speed particles at extremes of temperature</b>	Not claimed.	<b>NAP</b>
<b>9.2.11</b>	<b>Marking of laminated oculars</b>	Not a laminated ocular.	<b>NAP</b>
<b>9.3</b>	<b>Frame marking</b>	<i>The following proposed markings were present and have been interpreted against the requirements of the Standard as follows:-</i> "DM EN 166 F" <i>Identification of the manufacturer -</i> "DM" <i>The number of this standard -</i> "EN 166" <i>Level of impact -</i> "F"	
<b>Note</b>		"DM" was stated by the manufacturer to represent the distributor's mark. The marking was presented in the order required by the Standard.	
<b>9.3.1</b>	<b>Identification of the manufacturer</b>	A manufacturer's identification mark was not included. The characters 'DM' (distributors mark) were inserted in the correct position for the manufacturer's identification mark.	<b>Fail</b>
<b>9.3.2</b>	<b>The number of this standard</b>	The number of the Standard was included.	

9.3.3	<b>Field of use</b> No field of use symbols were included in the frame marking.	<b>NAP</b>
9.3.4	<b>Increased robustness and resistance to high speed particles</b> The symbol for low energy impact was included.	
9.3.5	<b>Resistance to high speed particles at extremes of temperature</b> Not claimed.	<b>NAP</b>
9.3.6	<b>Frames designed to fit a small head</b> <i>The frame was not designed to fit a small head.</i>	<b>NAP</b>
9.3.7	<b>Highest ocular scale number</b> The product was a spectacle.	<b>NAP</b>

## **ANNEX**

This Annex comprises one section.

1. Estimates of the uncertainty of measurement - 1 page.

**EN 166 : 2001****Estimates of the uncertainty of measurement**

Clause	Test	Uncertainty	
6.3	Headband width	0.86%	
7.1.2.1	Spherical and astigmatic refractive powers	0.01D (max)	
7.1.2.1	Prismatic refractive power	0.01cm/m (max)	
7.1.2.2.1	Transmittance - non-filtering	0.19%	
7.1.2.2.2	Transmittance - filters	<b>Range (%)</b>	-
		100 to 17.8	0.26%
		17.8 to 0.44	0.51%
		0.44 to 0.023	2.9%
		0.023 to 0.0012	5.0%
		0.0012 to 0.000023	5.8%
7.1.2.2.2	Transmittance - housing/frame	See 7.1.2.2.2	
7.1.2.2.3	Variations in transmittance	0.23%	
7.1.2.3	Reduced luminance factor	9.8%	
7.1.5.2	Relative change in luminous transmittance	<b>Range (%)</b>	-
		Non-filtering	0.27%
		100 to 17.8	0.37%
		17.8 to 0.44	0.72%
		0.44 to 0.023	4.1%
		0.023 to 0.0012	7.0%
		0.0012 to 0.000023	8.1%
7.1.5.2	Diffusion of light	9.8%	
7.2.1.4	Polarizing filters	1° (max)	
7.2.3 b)	Vertical centre-line depth	0.99%	
7.2.3 f) & g)	Penetration time	4.8%	
7.2.4	Vertical centre-line depth	0.99%	
7.2.5	Reflectance	5.6%	
7.2.7	Thickness	(0.49%+0.02mm)	
	Transmittance - filters	See 7.1.2.2	
	Vertical centre-line depth	0.99%	
7.3.1	Resistance to damage by fine particles	8.7%	

Values expressed as a percentage (%) are relative.

It should be noted that the above values have not been taken into account when making assessment to the pass/fail criteria.