INSPEC

UKAS TESTING 0316

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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

Issued: 31 October 2006

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^{-1})	-0.01	-0.01	-0.02	± 0.06
Right	(m^{-1})	-0.01	-0.01	-0.01	

Astigmatic refractive power

Sample		01	02	03	Limit
Left	(m^{-1})	0.05	0.03	0.03	≤ 0.06
Right	(m^{-1})	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.

9.2.1 Scale number

The scale number was included. Manufacturer to certify compliance. **NAs**

9.2.2 Identification of the manufacturer

A manufacturer's identification mark was not included. **Fail**

The characters 'DM' (distributors mark) were inserted in the correct position for the manufacturer's identification mark.

9.2.3 Optical class

The symbol for optical class 1 was included.

9.2.4 Mechanical strength

The symbol for low energy impact was included.

9.2.5 Resistance to short circuit electric arc

The eye-protector was a spectacle. **NAp**

9.2.6 Non-adherence of molten metal & resistance to penetrations of hot solids

The eye-protector was a spectacle. **NAp**

9.2.7 Resistance to surface damage by fine particles

The symbol "K" was included. Manufacturer to certify compliance. **NAs**

9.2.8 Resistance to fogging of oculars

Not claimed. **NAp**

9.2.9 Original/replacement oculars

The marking did not include a symbol to identify the ocular as an original/replacement.

9.2.10 Resistance to high speed particles at extremes of temperature

Not claimed. **NAp**

9.2.11 Marking of laminated oculars

Not a laminated ocular. **NAp**

9.3 Frame marking

The following proposed markings were present and have been interpreted against the requirements of the Standard as follows:-

"DM EN 166 F"

Identification of the manufacturer -	"DM"
The number of this standard -	"EN 166"
Level of impact -	"F"

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

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

9.3.1 Identification of the manufacturer

A manufacturer's identification mark was not included. **Fail**

The characters 'DM' (distributors mark) were inserted in the correct position for the manufacturer's identification mark.

9.3.2 The number of this standard

The number of the Standard was included.

9.3.3 Field of use

No field of use symbols were included in the frame marking. **NAp**

9.3.4 Increased robustness and resistance to high speed particles

The symbol for low energy impact was included.

9.3.5 Resistance to high speed particles at extremes of temperature

Not claimed. **NAp**

9.3.6 Frames designed to fit a small head

The frame was not designed to fit a small head. **NAp**

9.3.7 Highest ocular scale number

The product was a spectacle. **NAp**

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	**Range (%)**	-
		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	**Range (%)**	-
		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.