INSPEC

UKAS TESTING 0316

56 LESLIE HOUGH WAY • SALFORD • GREATER MANCHESTER • M6 6AJ • UNITED KINGDOM
Email: testing@inspec-international.com
Website: www.inspec-international.com
Tel: +44 (0) 16 17 37 06 99
Fax: +44 (0) 16 17 36 01 01

Test Report

EN 166 : 2001

Report no:	08.09.12
Client:	INSPEC Certification Services 56 Leslie Hough Way Salford Greater Manchester M6 6AJ
Client order(s):	TS08/4061 and TS08/4080
Order(s) received:	22 July and 27 August 2008
Manufacturer:	Elvex Corporation
Model:	SG-18
Date(s) tested:	1 to 6 August 2008

Conditions:

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

Samples will be disposed of four weeks from the date of this report unless alternative instructions are received.

Checked: ..... Approved: .....

T. D. SEDDON S. J. WRIGHT

Issued: 12 September 2008

Summary of assessment*

Clause		Assessment
6.1	General construction	Pass
6.2	Materials	
6.3	Headbands	
7.1.1	Field of vision	Pass
7.1.2.1	Spherical, astigmatic & prismatic refractive powers	Pass
7.1.2.2.1	Non-filtering oculars	
7.1.2.2.2	Oculars with filtering action (filters) and housings for oculars with filtering action	
7.1.2.2.3	Variations in transmittance	
7.1.2.3	Diffusion of light	
7.1.3	Quality of material and surface	Pass
7.1.4.1	Minimum robustness	
7.1.4.2	Increased robustness	Pass
7.1.5.1	Stability at elevated temperature	Pass
7.1.5.2	Resistance to ultraviolet radiation (oculars only)	
7.1.6	Resistance to corrosion	Pass
7.1.7	Resistance to ignition	Pass
7.2.2	Protection against high speed particles	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	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	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.

Product characteristics

Product type: Spectacle

Property	Clause	Claimed characteristic (relevant to testing requested)
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
Protection against high speed particles (extreme temps.)	7.3.4	-

Sample details

Product	Quantity	Received	INSPEC no. (T598+)
SG-18 spectacle	27	18 Aug. 08	01 to 03 and 07 to 30

Samples were selected by INSPEC from the submission detailed above.

Procedures

Testing was performed in accordance with EN166 : 2001.

Result detail

6.1 General construction

All samples were assessed

The samples were free from projections, sharp edges and other defects which are likely to cause discomfort or injury during use.

7.1.1 Field of vision

Samples 01 to 03 were assessed.

The samples exhibited at least the minimum field of vision as defined by the Standard.

7.1.2.1 Spherical, astigmatic & prismatic refractive powers

Spherical refractive power

Sample	Spherical power (m^{-1})	
	Left	Right
01	-0.01	0
02	-0.01	-0.01
03	-0.01	-0.01
Max limit	± 0.06	

Astigmatic refractive power

Sample	Astigmatic power (m^{-1})	
	Left	Right
01	0.04	0.03
02	0.03	0.03
03	0.03	0.02
Limit	≤ 0.06	

Difference in prismatic refractive power

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

7.1.3 Quality of material and surface

Samples 01 to 03 were assessed.

For each of the samples tested, there were none of the ocular defects listed in the Standard.

7.1.4.2 Increased robustness

7.1.4.2.2 Complete eye protectors

Samples 07 to 18 were assessed.

None of the samples tested exhibited any of the impact defects listed in the Standard.

7.1.5.1 Stability at an elevated temperature

Samples 01 to 03 were assessed.

The samples tested showed no apparent deformation following removal from conditioning.

7.1.6 Resistance to corrosion

Samples 07 to 09 were assessed.

Following testing, all metal parts of the samples displayed smooth surfaces and were free from corrosion.

7.1.7 Resistance to ignition

Samples 10 to 12 were assessed.

No part of the samples tested ignited or continued to glow after removal of the steel rod.

7.2.2 Protection against high speed particles

Samples 19 to 30 were assessed against the low energy impact requirements.

See Clause 7.1.4.2 for details of the assessment to the requirements for "Increased robustness".

None of the samples tested exhibited any of the impact defects listed in the Standard.

7.2.8 Lateral protection

Samples 01 to 03 were assessed.

The samples tested covered the specified lateral region.

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 frame.

9.2 Ocular marking

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

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

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

A 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 penetration 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 CE"

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

The eye-protector was a spectacle. **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 eye-protector 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		0.9mm (max)
7.1.2.1	Spherical and astigmatic refractive powers		0.01D (max)
	Prismatic refractive power difference		0.01cm/m (max)
	Prismatic refractive power (unmounted oculars)		0.012cm/m
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%
	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%
	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.