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Test Report

EN 166: 2001

Report no:	1.12.04.26
Client:	INSPEC Certification Services 56 Leslie Hough Way Salford Greater Manchester M6 6AJ
Client order(s):	TS11/4783 and TS12/4906
Order(s) received:	31 October 2011 and 2 April 2012
Manufacturer:	Elvex Corporation
Model(s):	GG-45 (Go-Specs II)
Date(s) of tests:	11 to 18 November 2011

Signed: 

Stuart Wright, Senior Technician

Issued: 13 April 2012

TESTING AND CERTIFICATION OF PERSONAL PROTECTIVE EQUIPMENT AND QUALITY MANAGEMENT SYSTEMS
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Specimens have been destroyed.

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Summary of assessment*

Clause	Requirement	Assessment (See Key)
6.1	General construction	Pass
6.2	Materials	NAs
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	
10	Information supplied by the manufacturer	

Key

	Shading shows the clauses requested. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing requested was insufficient completely to verify compliance with the clause. Refer to the "Result details" section for more information.
Fail	Requirement not satisfied. Refer to the "Result details" section for more information.
NAs	Assessment not carried out.
NAp	Requirement not applicable.
NT	Requested but not tested due to early termination following failure.

* Assessment relates only to those specimens which were tested and are the subject of this report.

Product characteristics

Product type: Spectacle

Property	Clause	Claimed characteristic (relevant to testing requested)
Optical class	7.1.2.1	1
Scale number	7.1.2.2.2	-
Diffusion of light limit	7.1.2.3, 7.1.5.2 b)	-
Protection against high speed particles	7.2.2	Low energy
Protection against high speed particles (extreme temps.)	7.3.4	-

Submission details

Product	Quantity	Date Received	INSPEC specimen no. (1X0803+)
GG-45 (Go-Specs II) safety spectacle	27	28 Oct. 11	01 to 03 and 07 to 30

Procedures

The specimens detailed within the submission above were used for the tests covered by this report.

Testing was performed in accordance with EN166:2001 unless otherwise specified below. Reference should be made to the standard when reading this report.

Unless stated otherwise, specimens were tested in the condition as received by INSPEC.

General Unless required otherwise by the standard, testing was performed under ambient conditions.

Result details

6.1 General construction

All specimens were assessed.

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

6.2 Materials

Manufacturer to certify whether the parts of the eye-protector which are in contact with the wearer are made of materials which are not known to cause skin irritation. **NAs**

7.1.1 Field of vision

Specimens 01 to 03 were assessed.

The specimens exhibited at least the minimum field of vision as defined by the Standard. **Pass**

7.1.2.1 Spherical, astigmatic & prismatic refractive powers

Spherical refractive power

Specimen	Spherical power (m^{-1})		
	Left	**Right**	
01	0	-0.02	**Pass**
02	-0.01	0	**Pass**
03	-0.02	-0.01	**Pass**
Max limit	**± 0.06**		

Astigmatic refractive power

Specimen	Astigmatic power (m^{-1})		
	Left	**Right**	
01	0.05	0.03	**Pass**
02	0.03	0.04	**Pass**
03	0.05	0.05	**Pass**
Limit	**≤ 0.06**		

Difference in prismatic refractive power

Specimen	Horizontal difference (cm/m)	Base	Vertical difference (cm/m)	
01	0.25	out	0.03	**Pass**
02	0.23	out	0.03	**Pass**
03	0.23	out	0	**Pass**
Limit	**≤ 0.75**	-	**≤ 0.25**	

7.1.3 Quality of material and surface

Specimens 01 to 03 were assessed.

For each of the specimens tested, there were none of the ocular defects listed in the Standard. **Pass**

7.1.4.2 Increased robustness

7.1.4.2.2 Complete eye protectors

Impact details

Specimen	Impact position	Conditioning (°C)	
07	1 (left eye frontal)	+55	**Pass**
08			**Pass**
09		-5	**Pass**
10			**Pass**
11	2 (right eye frontal)	+55	**Pass**
12			**Pass**
13		-5	**Pass**
14			**Pass**
15	3 (left eye side)	+55	**Pass**
16		-5	**Pass**
17	4 (right eye side)	+55	**Pass**
18		-5	**Pass**

7.1.5.1 Stability at an elevated temperature

Specimens 01 to 03 were assessed.

The specimens tested showed no apparent deformation following removal from conditioning. **Pass**

7.1.6 Resistance to corrosion

Specimens 07 to 09 were assessed.

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

7.1.7 Resistance to ignition

Specimens 10 to 12 were assessed.

No part of the specimens tested ignited or continued to glow after removal of the steel rod. **Pass**

7.2.2 Protection against high speed particles

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

Impact details - low energy

Specimen	Impact position	
19	1 (left eye frontal)	**Pass**
20		**Pass**
21		**Pass**
22		**Pass**
23	2 (right eye frontal)	**Pass**
24		**Pass**
25		**Pass**
26		**Pass**
27	3 (left eye side)	**Pass**
28		**Pass**
29	4 (right eye side)	**Pass**
30		**Pass**

7.2.8 Lateral protection

Specimens 01 to 03 were assessed.

The specimens tested covered the specified lateral region. **Pass**

Estimates of the uncertainty of measurement

Clause	Test		Uncertainty
6.1	General construction		-
6.2	Materials		-
6.3	Headband width		± 0.9mm (max)
7.1.1	Field of vision		*
7.1.2.1	Spherical, astigmatic and prismatic refractive powers		-
	Spherical and astigmatic refractive powers		± 0.01D (max)
Plano	Prismatic refractive power difference		± 0.01cm/m (max)
	Prismatic refractive power (unmounted oculars)		± 0.012cm/m
	Spherical power		± 0.05D
Prescription	Astigmatic power		± 0.04D
	Prismatic power		± 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%
7.1.3	Quality of material and surface		-
7.1.4.1	Minimum robustness		*
7.1.4.2	Increased robustness		*
7.1.5.1	Stability at elevated temperature		*
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%
7.1.6	Resistance to corrosion		*

Clause	Test	Uncertainty
7.1.7	Resistance to ignition	*
7.2.1.4	Polarizing filters	± 1° (max)
7.2.2	Protection against high speed particles	*
7.2.3	Protection against molten metals & hot solids	-
	a) Product type	-
	b) Vertical centre-line depth	± 0.99%
	c) Coverage	*
	d) High speed particles	*
	e) Metal splash	*
	f) & g) Penetration time	± 4.8%
7.2.4	Vertical centre-line depth	± 0.99%
7.2.5	Reflectance	± 5.6%
7.2.6	Protection against gases and fine dust particles	*
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%
7.3.2	Resistance to fogging of oculars	See sub-contract report
7.3.3	Oculars with enhanced reflectance in the infra-red	See sub-contract report
7.3.4	Protection against high speed particles at extremes of temperature	*

* The acceptance criterion for this test is a straightforward “Pass/Fail”, rather than a numerical value. Consequently, as there is no value to be reported, uncertainty has not been reported either.

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.