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Your reference : Jager Clear
Our reference : 13227.1
ORLAB method: ORLAB 2.53
Date of issue : 3 December 2013
Date tested : 26 November 2013

Mr Dean Bennell
Blueye Eyewear
6 Carlow Crescent
Killarney Heights NSW 2087

EVALUATION TESTS TO BS EN 166:2002
Personal eye-protection – Specifications
High Speed Particles – Low Energy Impact

Submitted for test by : Blueye Eyewear

Supplier : Blueye Eyewear

Manufacturer : Not supplied

Identifier : 13227-1-(1-30)

DESCRIPTION OF SAMPLE

	Material	**Colour(s)**
Frame front	Plastic (semi-rimless)	Matte black with a black rubber saddle nose pad
Temples	Plastic *13227-1-(1-18)*	Matte black with a circular hole at both temple tips and a shiny silver plate attached to the outside
	Plastic *13227-1-(19-24)*	Matte black with a circular hole at both temple tips and a matte dark grey plate attached to the outside
Temple ends	None	None

	Material	**Colour(s)**	**Tint**	**Type**	**Coating**
Filters / Oculars	Plastic one piece	Clear	Uniform	Non-polarising	Unknown

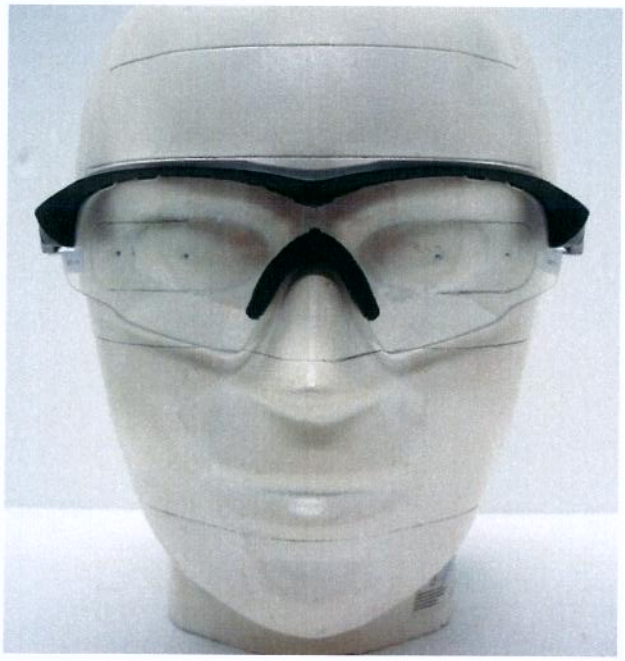
Accredited for compliance with ISO/IEC 17025.

The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Markings	**Frame front**	None			
	Filter *13227-1-(1-18)*	None			
	Filter (left side) *13227-1-(19-24)*	09/12 Z87+ CE BLU			
	Right temple	**Inside** *13227-1-(1-18)*	None	**Outside**	(logo)
		Inside *13227-1-(19-24)*	JAGER	**Outside**	(logo)
	Left temple	**Inside** *13227-1-(1-18)*	None	**Outside**	(logo)
		Inside *13227-1-(19-24)*	Z87+ 09/12 CAT.3 CE	**Outside**	(logo)

Packaging	None



Section 6 DESIGN AND MANUFACTURING REQUIREMENTS

6.1	General Construction	Pass
6.2	Materials	Pass
6.3	Headbands (where applicable must be greater than 10mm)	N/A

Section 7 BASIC, PARTICULAR AND OPTIONAL REQUIREMENTS

7.1 Basic requirements

7.1.1	Field of view	13227-1-(1-3)	Pass
7.1.2.1	Spherical, astigmatic and prismatic refractive powers		Optical class 1

Refractive power *Maximum* *±0.06 D*

Sample No.	Right Eye	Compliance	Left Eye	Compliance
13227-1-1	-0.001	Pass	-0.013	Pass
13227-1-2	-0.004	Pass	-0.007	Pass
13227-1-3	0.000	Pass	-0.007	Pass

Astigmatism power *Maximum* *≤0.06 D*

Sample No.	Right Eye	Compliance	Left Eye	Compliance
13227-1-1	0.068	Pass	0.049	Pass
13227-1-2	0.062	Pass	0.057	Pass
13227-1-3	0.060	Pass	0.047	Pass

Prismatic difference *Maximum*

Vertical *≤0.25 Δ*
Horizontal (in) *≤0.25 Δ*
Horizontal (out) *≤0.75 Δ*

Sample No.	Base In / Out	Horizontal	Compliance	Vertical	Compliance
13227-1-1	In	0.10	Pass	0.01	Pass
13227-1-2	In	0.10	Pass	0.01	Pass
13227-1-3	In	0.10	Pass	0.02	Pass

7.1.2.2 Transmittance

7.1.2.2.1 Oculars without filtering action — See below

Luminous Transmission *Minimum* *74.4%*

Sample No.	(%T)	Compliance
13227-1-4-R	88.7	Pass
13227-1-4-L	89.3	Pass
13227-1-5-R	90.3	Pass
13227-1-5-L	87.6	Pass
13227-1-6-R	88.0	Pass
13227-1-6-L	87.8	Pass

7.1.2.2.2 Oculars with filtering action — N/A

7.1.2.2.3 Variations in transmittance — See below

Relative difference *Maximum* *20.0%*

Sample No.	Right Eye	Left Eye	Matching	Compliance
13227-1-1	88.7%	89.3%	0.7%	Pass
13227-1-2	90.3%	87.6%	3.0%	Pass
13227-1-3	88.0%	87.8%	0.2%	Pass

7.1.2.3 Diffusion of light — See below

Maximum *0.75 $cd.m^{-2}.lx^{-1}$*

Sample No.	Right Eye	Left Eye	Compliance
13227-1-1	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass
13227-1-2	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass
13227-1-3	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass

7.1.3 Quality of material and surface — 13227-1-(1-3) — Pass

7.1.4 Robustness

7.1.4.1 Minimum robustness — N/A

7.1.4.2 Increased robustness — See below

Impact speed @ 5.1m/s *(22mm, 43g steel ball)*

Sample No.	55°C	Compliance	Sample No.	-5°C	Compliance
13227-1-7	Left eye frontal	Pass	13227-1-13	Left eye frontal	Pass
13227-1-8	Left eye frontal	Pass	13227-1-14	Left eye frontal	Pass
13227-1-9	Right eye frontal	Pass	13227-1-15	Right eye frontal	Pass
13227-1-10	Right eye frontal	Pass	13227-1-16	Right eye frontal	Pass
13227-1-11	Left eye side	Pass	13227-1-17	Left eye side	Pass
13227-1-12	Right eye side	Pass	13227-1-18	Right eye side	Pass

7.1.5 Resistance to aging

7.1.5.1 Stability at an elevated temperature — 13227-1-(1-3) — Pass

7.1.5.2 Resistance to ultraviolet radiation — See below

Permissible relative change *Maximum* *± 5%*

Sample No.	Before (%T)	After (%T)	Relative Change (%)	Compliance
13227-1-4-R	88.7	89.8	1.2	Pass
13227-1-4-L	89.3	88.8	0.6	Pass
13227-1-5-R	90.3	90.0	0.3	Pass
13227-1-5-L	87.6	88.5	1.0	Pass
13227-1-6-R	88.0	87.8	0.2	Pass
13227-1-6-L	87.8	87.8	0	Pass

7.1.6 Resistance to corrosion — N/A

7.1.7 Resistance to ignition — 13227-1-(10-12) — Pass

7.2 Particular requirements

7.2.1 Protection against optical radiation — N/A

7.2.2 Protection against high speed particles — See below

Low energy impact (F) @ 45m/s (6mm,0.86g steel ball)

Sample No.	23°C	Compliance	Sample No.	23°C	Compliance
13227-1-19	Left eye frontal	Pass	13227-2-1	Right eye frontal	Pass
13227-1-20	Left eye frontal	Pass	13227-2-2	Right eye frontal	Pass
13227-1-21	Left eye frontal	Pass	13227-2-3	Left eye side	Pass
13227-1-22	Left eye frontal	Pass	13227-3-1	Left eye side	Pass
13227-1-23	Right eye frontal	Pass	13227-3-2	Right eye side	Pass
13227-1-24	Right eye frontal	Pass	13227-3-3	Right eye side	Pass

7.2.3 Protection against molten metals and hot solids — N/A

7.2.4 Protection against droplets ad splashes of liquids — N/A

7.2.5 Protection against large dust particles — N/A

7.2.6 Protection against gases and fine dust particles — N/A

7.2.7 Protection against short circuit electric arc — N/A

7.2.8 Lateral protection — 13227-1-(1-3) — Pass

7.3 Optional requirements

7.3.1 Resistance to surface damage by fine particles — N/A

7.3.2 Resistance to fogging of oculars — N/A

7.3.3 Oculars with enhanced reflectance in the infrared — N/A

7.3.4 Protection against high speed particles at extremes of temperature — N/A

Section 9	**MARKING**	
9.1	**General**	Not present
9.2	**Ocular marking**	
9.2.1	Scale number	Not present
9.2.2	Identification of the manufacturer	Not present
9.2.3	Optical class	Not present
9.2.4	Mechanical strength	Not present
9.2.5	Resistance to short circuit electric arc	
9.2.6	Non-adherence of molten metal and resistance to penetration of hot solids	Not present
9.2.7	Resistance to surface damage by fine particles	Not present
9.2.8	Resistance to fogging of oculars	Not present
9.2.9	Original/replacement oculars	Not present
9.2.10	Resistance to high speed particles at extremes of temperature	Not present
9.2.11	Marking of laminated oculars	Not present
9.3	**Frame marking**	
9.3.1	Identification of the manufacturer	Not present
9.3.2	The number of this standard	Not present
9.3.3	Field of use	Not present
9.3.4	Increased robustness and resistance to high speed particles	Not present
9.3.5	Resistance to high speed particles at extremes of temperatures	Not present
9.3.6	Frames designed to fit a small head	Not present
9.3.7	Highest ocular scale number	Not present
Section 10	**INFORMATION SUPPLIED BY THE MANUFACTURER**	Not present

These eye-protectors DO meet the above requirements of BS EN 166:2002.

These eye-protectors need to be marked as follows:

Optical Class:	Class 1,2 or 3 could be claimed
Mechanical strength	"F" may be etched to indicate low energy impact

In addition, the manufacturer shall provide the following:

1. Frame and oculars must be marked with the manufacturers ID and this standard number.
2. Information to be supplied as required in Section 10.

NB: The inside of the left temple of samples 13227-1-(19-24) are incorrectly labelled as 'CAT.3' eye protectors.

The oculars of samples 13227-1-(19-24) are labelled 'B'. Wide-vision spectacles cannot be marked 'B' for medium energy impact.

Brian Cheng
Authorised Signatory

Thao Ngo
Authorised Signatory

Notes: The uncertainties stated in this report have been calculated in accordance with principles in the ISO Guide to the Expression of Uncertainty in measurement, and give intervals estimated to have a level of confidence of 95%. A coverage factor (k) of 2.0 was used.

The following least uncertainties for the measurements reported have been taken into account when assessing compliance:

Luminous transmittance	±0.1%	Q factors	±0.01
Refractive power	±0.005D	Prismatic power	±0.01D
Scattered light	±0.1%	UV transmittance uncertainties comply with EN 168	

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Your reference : Jager Smoke
Our reference : 13227.2
ORLAB method : ORLAB 2.53
Date of issue : 3 December 2013
Date tested : 26 November 2013

Mr Dean Bennell
Blueye Eyewear
6 Carlow Crescent
Killarney Heights NSW 2087

EVALUATION TESTS TO BS EN 166:2002
Personal eye-protection – Specifications
Filter Assessment Only

Submitted for test by : Blueye Eyewear

Supplier : Blueye Eyewear

Manufacturer : Not supplied

Identifier : 13227-2-(1-3)

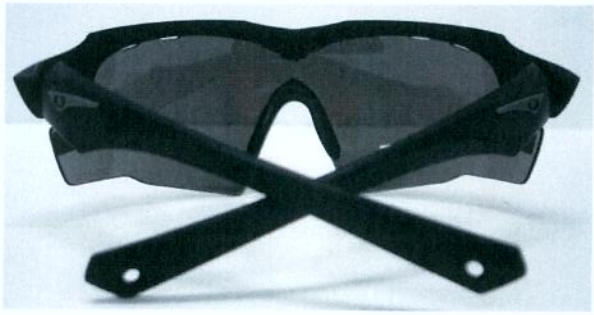
DESCRIPTION OF SAMPLE

	Material	**Colour(s)**
Frame front	Plastic (semi-rimless)	Matte black with a black rubber saddle nose pad
Temples	Plastic	Matte black with a circular hole at both temple tips and a matte dark grey plate attached to the outside
Temple ends	None	None

	Material	**Colour(s)**	**Tint**	**Type**	**Coating**
Filters / Oculars	Plastic one piece	Grey	Uniform	Non-polarising	Unknown

Markings	**Frame front**	None			
	Filter (leftside)	10/12 Z87+ CE BLU			
	Right temple	**Inside**	JAGER	**Outside**	(logo)
	Left temple	**Inside**	Z87+ 10/12 CAT.3 CE	**Outside**	(logo)

Packaging	None



Section 6 DESIGN AND MANUFACTURING REQUIREMENTS

6.1	General Construction	Pass
6.2	Materials	Pass
6.3	Headbands (where applicable must be greater than 10mm)	Pass

Section 7 BASIC, PARTICULAR AND OPTIONAL REQUIREMENTS

7.1 Basic requirements

7.1.1	Field of view	13227-2-(1-3)	Pass
7.1.2.1	Spherical, astigmatic and prismatic refractive powers		Optical class 2

Refractive power *Maximum* *±0.06 D* *Class 1*
±0.12 D *Class 2*

Sample No.	Right Eye	Compliance	Left Eye	Compliance
13227-2-1	-0.008	Pass	0.003	Pass
13227-2-2	-0.014	Pass	-0.008	Pass
13227-2-3	-0.008	Pass	0.006	Pass

Astigmatism power *Maximum* *≤0.06 D* *Class 1*
≤0.12 D *Class 2*

Sample No.	Right Eye	Compliance	Left Eye	Compliance
13227-2-1	0.044	Pass	0.065	Pass
13227-2-2	0.056	Pass	0.049	Pass
13227-2-3	0.049	Pass	0.076	Pass

Prismatic difference *Maximum* *Vertical* *≤0.25 Δ*
Horizontal (in) *≤0.25 Δ*
Horizontal (out) *≤1.00 Δ*

Sample No.	Base In / Out	Horizontal	Compliance	Vertical	Compliance
13227-2-1	In	0.10	Pass	0.01	Pass
13227-2-2	In	0.06	Pass	0.01	Pass
13227-2-3	In	0.10	Pass	0.01	Pass

7.1.2.2 Transmittance

7.1.2.2.1 Oculars without filtering action N/A

7.1.2.2.2 Oculars with filtering action Refer to clause 7.2.1.4

7.1.2.2.3 Variations in transmittance See below

Relative difference *Maximum* *20.0%*

Sample No.	Right Eye	Left Eye	Matching	Compliance
13227-2-1	14.0%	14.6%	4.1%	Pass
13227-2-2	13.9%	14.5%	4.1%	Pass
13227-2-3	14.0%	14.2%	1.4%	Pass

7.1.2.3 Diffusion of light See below

Maximum *0.75 $cd.m^{-2}.lx^{-1}$*

Sample No.	Right Eye	Left Eye	Compliance
13227-2-1	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass
13227-2-2	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass
13227-2-3	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass

7.1.3 Quality of material and surface 13227-2-(1-3) Pass

7.1.4 Robustness

7.1.4.1 Minimum robustness Refer to report 13227.1

7.1.4.2 Increased robustness Refer to report 13227.1

7.1.5 Resistance to aging

7.1.5.1 Stability at an elevated temperature — Refer to report 13227.1

7.1.5.2 Resistance to ultraviolet radiation — See below

Permissible relative change *Maximum* ± 5%

Sample No.	Before (%T)	After (%T)	Relative Change (%)	Compliance
13227-2-1-R	14.0	14.0	0	Pass
13227-2-1-L	14.6	14.6	0	Pass
13227-2-2-R	13.9	13.9	0	Pass
13227-2-2-L	14.5	14.5	0	Pass
13227-2-3-R	14.0	14.0	0	Pass
13227-2-3-L	14.2	14.2	0	Pass

7.1.6 Resistance to corrosion — N/A

7.1.7 Resistance to ignition — Refer to report 13227.1

7.2 Particular requirements

7.2.1 Protection against optical radiation

7.2.1.1 Welding filters — N/A

7.2.1.2 Ultraviolet filters — N/A

7.2.1.3 Infrared filters — N/A

7.2.1.4 Sunglare filters for industrial use — See below

As per EN 172:1995 clause 4

4.1.1 Permissible transmittance for filters without a requirement for infra-red protection

Scale No.	*From*	*To Over*	*Scale No.*	*From*	*To Over*
5-1,1	*100%*	*80.0%*	*5-2,5*	*29,1%*	*17,8%*
5-1,4	*80,0%*	*58,1%*	*5-3,1*	*17,8%*	*8,0%*
5-1,7	*58,1%*	*43,2%*	*5-4,1*	*8,0*	*3,0*
5-2	*43,2%*	*29,1%*			

Minimum spectral transmittance for wavelengths 500nm – 650nm		*≥0.20 τ_v*		
Minimum relative visual attenuation for signal light detection (Q)		*≥0.80*		
UV spectral range (maximum)		*280-315nm*	*315-350nm*	*315-380nm*
	Scale No. 5-1 – 5-2	*0.1 τ_v*	*τ_v*	*τ_v*
	5-3 – 5-4	*0.01 τ_v*	*0.50 τ_v*	*0.50 τ_v*

Sample No.	13227-2-1-R	13227-2-1-L	13227-2-2-R	13227-2-2-L	13227-2-3-R	13227-2-3-L	
280-315nm (%)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Pass
315-350nm (%)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Pass
315-380nm (%)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Pass
Min Spect Trans	0.90	0.90	0.91	0.90	0.90	0.90	Pass
Tv%	14.6	14.0	14.5	13.9	14.2	14.0	
Scale No.	5-3,1	5-3,1	5-3,1	5-3,1	5-3,1	5-3,1	5-3,1
Q_{red}	1.12	1.12	1.12	1.11	1.12	1.12	Pass
Q_{Yellow}	1.01	1.01	1.01	1.01	1.01	1.01	Pass
Q_{Green}	1.00	1.00	1.00	1.00	1.00	1.00	Pass
Q_{Blue}	1.05	1.06	1.05	1.06	1.05	1.05	Pass

4.1.2 Permissible transmittance for filters with a requirement for infra-red protection — N/A

4.3 Special transmittance requirements

4.3.1 Photochromic filters — N/A

4.3.2 Polarising filters — N/A

4.3.3 Gradient filters — N/A

7.2.2	Protection against high speed particles	Refer to report 13227.1
7.2.3	Protection against molten metals and hot solids	N/A
7.2.4	Protection against droplets ad splashes of liquids	N/A
7.2.5	Protection against large dust particles	N/A
7.2.6	Protection against gases and fine dust particles	N/A
7.2.7	Protection against short circuit electric arc	N/A
7.2.8	Lateral protection	Refer to report 13227.1
7.3	**Optional requirements**	
7.3.1	Resistance to surface damage by fine particles	N/A
7.3.2	Resistance to fogging of oculars	N/A
7.3.3	Oculars with enhanced reflectance in the infrared	N/A
7.3.4	Protection against high speed particles at extremes of temperature	N/A
Section 9	**MARKING**	
9.1	**General**	Not present
9.2	**Ocular marking**	
9.2.1	Scale number	Not present
9.2.2	Identification of the manufacturer	Not present
9.2.3	Optical class	Not present
9.2.4	Mechanical strength	Not present
9.2.5	Resistance to short circuit electric arc	Not present
9.2.6	Non-adherence of molten metal and resistance to penetration of hot solids	Not present
9.2.7	Resistance to surface damage by fine particles	Not present
9.2.8	Resistance to fogging of oculars	Not present
9.2.9	Original/replacement oculars	Not present
9.2.10	Resistance to high speed particles at extremes of temperature	Not present
9.2.11	Marking of laminated oculars	Not present
9.3	**Frame marking**	
9.3.1	Identification of the manufacturer	Not present
9.3.2	The number of this standard	Not present
9.3.3	Field of use	Not present
9.3.4	Increased robustness and resistance to high speed particles	Not present
9.3.5	Resistance to high speed particles at extremes of temperatures	Not present
9.3.6	Frames designed to fit a small head	Not present
9.3.7	Highest ocular scale number	Not present
Section 10	**INFORMATION SUPPLIED BY THE MANUFACTURER**	Not present

These eye-protectors DO meet the above requirements of BS EN 166:2002.

These eye-protectors need to be marked as follows:

Scale Number	5-3,1
Optical Class	Class 2 or 3 could be claimed
Mechanical strength	Please refer to report # 13227.1 for the appropriate use of the ocular marking "F" to indicate low energy impact

In addition, the manufacturer shall provide the following:

1. Frame and oculars must be marked with the manufacturers ID and this standard number.
2. Information to be supplied as required in Section 10.

NB: The inside of the left temples are incorrectly labelled as 'CAT.3' eye protectors.

The oculars are marked 'B'. Wide-vision spectacles cannot be marked 'B' for medium energy impact.

Brian Cheng
Authorised Signatory

Thao Ngo
Authorised Signatory

Notes: The uncertainties stated in this report have been calculated in accordance with principles in the ISO Guide to the Expression of Uncertainty in measurement, and give intervals estimated to have a level of confidence of 95%. A coverage factor (k) of 2.0 was used.

The following least uncertainties for the measurements reported have been taken into account when assessing compliance:

Luminous transmittance	±0.1%	Q factors	±0.01
Refractive power	±0.005D	Prismatic power	±0.01D
Scattered light	±0.1%	UV transmittance uncertainties comply with EN 168	

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Your reference : Jager Orange
Our reference : 13227.3
ORLAB method : ORLAB 2.53
Date of issue : 3 December 2013
Date tested : 26 November 2013

Mr Dean Bennell
Blueye Eyewear
6 Carlow Crescent
Killarney Heights NSW 2087

EVALUATION TESTS TO BS EN 166:2002
Personal eye-protection – Specifications
Filter Assessment Only

Submitted for test by : Blueye Eyewear

Supplier : Blueye Eyewear

Manufacturer : Not supplied

Identifier : 13227-3-(1-3)

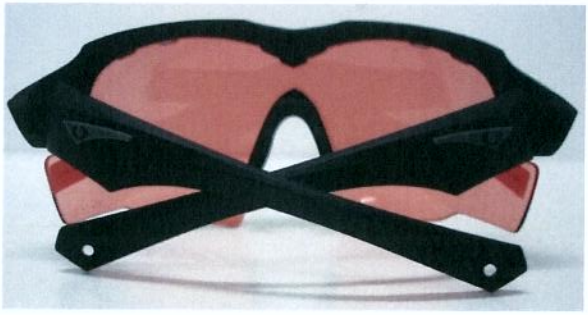
DESCRIPTION OF SAMPLE

	Material	**Colour(s)**
Frame front	Plastic (semi-rimless)	Matte black with a black rubber saddle nose pad
Temples	Plastic	Matte black with a circular hole at both temple tips and a matte dark grey plate attached to the outside
Temple ends	None	None

	Material	**Colour(s)**	**Tint**	**Type**	**Coating**
Filters / Oculars	Plastic one piece	Orange	Uniform	Non-polarising	Unknown

Markings	**Frame front**	None			
	Filter (left side)	10/12 Z87+ CE BLU			
	Right temple	**Inside**	JAGER	**Outside**	(logo)
	Left temple	**Inside**	Z87+ 10/12 CAT.3 CE	**Outside**	(logo)

Packaging	None



Section 6 DESIGN AND MANUFACTURING REQUIREMENTS

6.1	General Construction	Pass
6.2	Materials	Pass
6.3	Headbands (where applicable must be greater than 10mm)	Pass

Section 7 BASIC, PARTICULAR AND OPTIONAL REQUIREMENTS

7.1 Basic requirements

7.1.1	Field of view	13227-2-(1-3)	Pass
7.1.2.1	Spherical, astigmatic and prismatic refractive powers		Optical class 2

Refractive power *Maximum* *±0.06 D* *Class 1*
±0.12 D *Class 2*

Sample No.	Right Eye	Compliance	Left Eye	Compliance
13227-3-1	-0.004	Pass	0.000	Pass
13227-3-2	-0.002	Pass	-0.002	Pass
13227-3-3	-0.007	Pass	0.012	Pass

Astigmatism power *Maximum* *≤0.06 D* *Class 1*
≤0.12 D *Class 2*

Sample No.	Right Eye	Compliance	Left Eye	Compliance
13227-3-1	0.052	Pass	0.054	Pass
13227-3-2	0.057	Pass	0.047	Pass
13227-3-3	0.047	Pass	0.064	Pass

Prismatic difference	*Maximum*	*Vertical*	*≤0.25 Δ*
		Horizontal (in)	*≤0.25 Δ*
		Horizontal (out)	*≤1.00 Δ*

Sample No.	Base In / Out	Horizontal	Compliance	Vertical	Compliance
13227-3-1	In	0.07	Pass	0.01	Pass
13227-3-2	In	0.07	Pass	0.01	Pass
13227-3-3	In	0.11	Pass	0.01	Pass

7.1.2.2 Transmittance

7.1.2.2.1 Oculars without filtering action — N/A

7.1.2.2.2 Oculars with filtering action — Refer to clause 7.2.1.4

7.1.2.2.3 Variations in transmittance — See below

Relative difference *Maximum* *20.0%*

Sample No.	Right Eye	Left Eye	Matching	Compliance
13227-3-1	49.5%	48.5%	2.0%	Pass
13227-3-2	49.0%	47.7%	2.8%	Pass
13227-3-3	48.3%	46.9%	2.9%	Pass

7.1.2.3 Diffusion of light — See below

Maximum *0.75 $cd.m^{-2}.lx^{-1}$*

Sample No.	Right Eye	Left Eye	Compliance
13227-3-1	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass
13227-3-2	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass
13227-3-3	<0.1 $cd.m^{-2}.lx^{-1}$	<0.1 $cd.m^{-2}.lx^{-1}$	Pass

7.1.3 Quality of material and surface — 13227-3-(1-3) — Pass

7.1.4 Robustness

7.1.4.1 Minimum robustness — Refer to report 13227.1

7.1.4.2 Increased robustness — Refer to report 13227.1

7.1.5 Resistance to aging

7.1.5.1 Stability at an elevated temperature — Refer to report 13227.1

7.1.5.2 Resistance to ultraviolet radiation — See below

Permissible relative change *Maximum* ± 5%

Sample No.	Before (%T)	After (%T)	Relative Change (%)	Compliance
13227-3-1-R	49.5	49.5	0	Pass
13227-3-1-L	48.5	48.6	0.2	Pass
13227-3-2-R	49.0	49.7	1.4	Pass
13227-3-2-L	47.7	48.7	2.1	Pass
13227-3-3-R	48.3	49.0	1.4	Pass
13227-3-3-L	46.9	49.0	4.3	Pass

7.1.6 Resistance to corrosion — N/A

7.1.7 Resistance to ignition — Refer to report 13227.1

7.2 Particular requirements

7.2.1 Protection against optical radiation

7.2.1.1 Welding filters — N/A

7.2.1.2 Ultraviolet filters — N/A

7.2.1.3 Infrared filters — N/A

7.2.1.4 Sunglare filters for industrial use — See below

As per EN 172:1995 clause 4

4.1.1 Permissible transmittance for filters without a requirement for infra-red protection

Scale No.	*From*	*To Over*	*Scale No.*	*From*	*To Over*
5-1,1	*100%*	*80.0%*	*5-2,5*	*29,1%*	*17,8%*
5-1,4	*80,0%*	*58,1%*	*5-3,1*	*17,8%*	*8,0%*
5-1,7	*58,1%*	*43,2%*	*5-4,1*	*8,0*	*3,0*
5-2	*43,2%*	*29,1%*			

Minimum spectral transmittance for wavelengths 500nm – 650nm			*≥0.20 τ_v*		
Minimum relative visual attenuation for signal light detection (Q)			*≥0.80*		
UV spectral range (maximum)			*280-315nm*	*315-350nm*	*315-380nm*
	Scale No.	*5-1 – 5-2*	*0.1 τ_v*	*τ_v*	*τ_v*
		5-3 – 5-4	*0.01 τ_v*	*0.50 τ_v*	*0.50 τ_v*

Sample No.	13227-3-1-R	13227-3-1-L	13227-3-2-R	13227-3-2-L	13227-3-3-R	13227-3-3-L	
280-315nm (%)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Pass
315-350nm (%)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Pass
315-380nm (%)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Pass
Min Spect Trans	0.73	0.74	0.73	0.74	0.74	0.74	Pass
Tv%	49.5	48.5	49.0	47.7	48.3	46.9	
Scale No.	5-1,7	5-1,7	5-1,7	5-1,7	5-1,7	5-1,7	5-1,7
Q_{red}	1.60	1.57	1.59	1.58	1.60	1.58	Pass
Q_{Yellow}	1.20	1.19	1.20	1.19	1.20	1.19	Pass
Q_{Green}	0.84	0.85	0.85	0.85	0.85	0.85	Pass
Q_{Blue}	0.85	0.87	0.85	0.86	0.85	0.86	Pass

4.1.2 Permissible transmittance for filters with a requirement for infra-red protection — N/A

4.3 Special transmittance requirements

4.3.1 Photochromic filters — N/A

4.3.2 Polarising filters — N/A

4.3.3 Gradient filters — N/A

7.2.2	Protection against high speed particles	Refer to report 13227.1
7.2.3	Protection against molten metals and hot solids	N/A
7.2.4	Protection against droplets ad splashes of liquids	N/A
7.2.5	Protection against large dust particles	N/A
7.2.6	Protection against gases and fine dust particles	N/A
7.2.7	Protection against short circuit electric arc	N/A
7.2.8	Lateral protection	Refer to report 13227.1
7.3	**Optional requirements**	
7.3.1	Resistance to surface damage by fine particles	N/A
7.3.2	Resistance to fogging of oculars	N/A
7.3.3	Oculars with enhanced reflectance in the infrared	N/A
7.3.4	Protection against high speed particles at extremes of temperature	N/A
Section 9	**MARKING**	
9.1	**General**	Not present
9.2	**Ocular marking**	
9.2.1	Scale number	Not present
9.2.2	Identification of the manufacturer	Not present
9.2.3	Optical class	Not present
9.2.4	Mechanical strength	Not present
9.2.5	Resistance to short circuit electric arc	Not present
9.2.6	Non-adherence of molten metal and resistance to penetration of hot solids	Not present
9.2.7	Resistance to surface damage by fine particles	Not present
9.2.8	Resistance to fogging of oculars	Not present
9.2.9	Original/replacement oculars	Not present
9.2.10	Resistance to high speed particles at extremes of temperature	Not present
9.2.11	Marking of laminated oculars	Not present
9.3	**Frame marking**	
9.3.1	Identification of the manufacturer	Not present
9.3.2	The number of this standard	Not present
9.3.3	Field of use	Not present
9.3.4	Increased robustness and resistance to high speed particles	Not present
9.3.5	Resistance to high speed particles at extremes of temperatures	Not present
9.3.6	Frames designed to fit a small head	Not present
9.3.7	Highest ocular scale number	Not present
Section 10	**INFORMATION SUPPLIED BY THE MANUFACTURER**	Not present

These eye-protectors DO meet the above requirements of BS EN 166:2002.

These eye-protectors need to be marked as follows:

Scale Number	5-1,7
Optical Class	Class 2 or 3 could be claimed
Mechanical strength	Please refer to report # 13227.1 for the appropriate use of the ocular marking "F" to indicate low energy impact

In addition, the manufacturer shall provide the following:

1. Frame and oculars must be marked with the manufacturers ID and this standard number.
2. Information to be supplied as required in Section 10.

NB: The inside of the left temples are incorrectly labelled as 'CAT.3' eye protectors.

The oculars are marked 'B'. Wide-vision spectacles cannot be marked 'B' for medium energy impact.

Brian Cheng
Authorised Signatory

Thao Ngo
Authorised Signatory

Notes: The uncertainties stated in this report have been calculated in accordance with principles in the ISO Guide to the Expression of Uncertainty in measurement, and give intervals estimated to have a level of confidence of 95%. A coverage factor (k) of 2.0 was used.

The following least uncertainties for the measurements reported have been taken into account when assessing compliance:

Luminous transmittance	±0.1%	Q factors	±0.01
Refractive power	±0.005D	Prismatic power	±0.01D
Scattered light	±0.1%	UV transmittance uncertainties comply with EN 168	