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Customer reference	:	6100
ORLAB reference	:	18329.1
ORLAB method	:	ORLAB 2.52
Date of issue	:	19 November 2018
Date tested	:	19 November 2018

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EVALUATION TESTS TO AS/NZS 1337.1:2010
Part 1: Eye and face protectors for occupational applications

Submitted for test by	:	Protective Industrial Products Hong Kong Limited
Supplier	:	Protective Industrial Products Hong Kong Limited
Manufacturer	:	Not supplied
Identifier	:	18329-1-(1-3)

DESCRIPTION OF SAMPLES

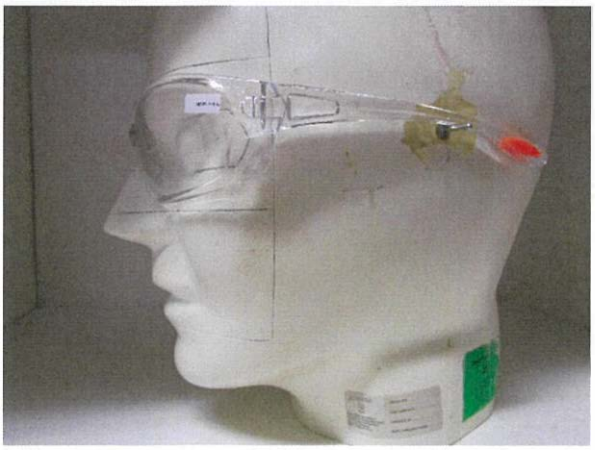
	Material	Colour(s)			
Frame front	Plastic	Clear			
Sides	Plastic	Clear			
Side ends	Rubber	Orange inserts			

	Material	Colour(s)	Tint	Type	Coating
Filters / Oculars	Plastic	Clear	Uniform	Non-polarising	None

Markings	**Front**	None			
	Filters / Oculars (left)	None			
	Right side	**Inside**	[Date stamp]	**Outside**	None
	Left side	**Inside**	None	**Outside**	None

Packaging	None
Stick on label	None
Swing-tag	None



SECTION 2 REQUIREMENTS FOR OCULARS

2.2	**GENERAL REQUIREMENTS FOR OCULARS**	
2.2.1	**Finish**	Pass
2.2.2	**Materials**	Pass
2.2.3	**Dimensions of oculars and visors**	Pass
2.3	**MATERIAL REQUIREMENTS**	
2.3.1	**Visual quality**	Pass
2.3.2	**Viewing area**	Pass
2.4	**OPTICAL PROPERTIES OF OCULARS**	
2.4.1	**Position of measurement**	As per the Standard
2.4.2	**Direction of measurement**	As per the Standard
2.4.3	**Transmittance properties**	See Clause 2.4.4

2.4.4 Transmittance requirements

2.4.4.1 *General*

Luminous transmittance (3 pairs of oculars / filters) — See table below

Category 0	*over 80%*	*to*	*100%*
Category 1	*over 43%*	*to*	*80%*
Category 2	*over 18%*	*to*	*43%*
Category 3	*over 8%*	*to*	*18%*
Outdoor untinted	*over 80%*	*to*	*100%*

Minimum spectral transmittance for wavelengths 470nm – 650nm $\geq 0.20\tau_v$

Minimum relative visual attenuation for signal light detection (Q)

Incandescent source ≥0.80
LED source ≥0.80

UV spectral range

		280-315nm	315-350nm	315-380nm
Maximum	*Category 0 – 2*	*0.05* τ_v	τ_v	τ_v
	Category 3	*0.01* τ_v	*0.50* τ_v	*0.50* τ_v
	Outdoor untinted	*0.01* τ_v	*0.25* τ_v	*0.25* τ_v

Sample No.	18329-1-1-R	18329-1-1-L	18329-1-2-R	18329-1-2-L	18329-1-3-R	18329-1-3-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	0.98	0.98	0.98	0.98	0.98	0.99	Pass
τ_v (%)	92.0	92.3	92.1	92.3	91.9	92.2	
Category	0	0	0	0	0	0	Category 0
Q_{Red}	1.01	1.01	1.01	1.01	1.01	1.00	Pass
Q_{Yellow}	1.00	1.00	1.00	1.00	1.00	1.00	Pass
Q_{Green}	1.00	1.00	1.00	1.00	1.00	1.00	Pass
Q_{Blue}	1.00	1.00	1.01	1.00	1.00	1.00	Pass
(informative purposes only)							
Q_{Red}(LED)	1.01	1.01	1.01	1.00	1.01	1.00	
Q_{Yellow}(LED)	0.99	0.99	1.00	1.01	0.99	0.99	
Q_{Green}(LED)	1.01	1.00	1.01	1.01	1.00	1.00	
Q_{Blue}(LED)	1.00	1.01	1.01	1.00	1.01	1.00	

2.4.4.2 Claims of luminous transmittance — No claims made

2.4.5 Other transmittance requirements

2.4.5.1 Uniformity of luminous transmittance of uniformly tinted filters — Pass

2.4.5.2 Transmittance matching for pairs of filters of all types — See table below

Transmittance matching *Maximum* *≤15%*

Sample No.	Right Eye	Left Eye	Matching	Compliance
18329-1-1	92.0%	92.3%	0.3%	Pass
18329-1-2	92.1%	92.3%	0.2%	Pass
18329-1-3	91.9%	92.2%	0.3%	Pass

2.4.5.3 Uniformity of colour for pairs of filters of all types — Pass

2.4.6 Special transmittance requirements

2.4.6.1 Photochromic filters — N/A

2.4.6.2 Polarizing filters — N/A

2.4.6.3 Gradient filters — N/A

2.4.6.4 Outdoor use, untinted filters — No claims made

2.4.7 Refractive power of oculars

2.4.7.1 Spherical and astigmatic power — See table below

Spherical Power *Limit* *± 0.09 D*
Cylindrical Power *Maximum* *0.09 D*

	Spherical Power (dioptres)				Cylindrical Power (dioptres)			
Sample No.	Right Eye	Compliance	Left Eye	Compliance	Right Eye	Compliance	Left Eye	Compliance
18329-1-1	-0.010	Pass	-0.006	Pass	0.064	Pass	0.072	Pass
18329-1-2	-0.005	Pass	-0.005	Pass	0.064	Pass	0.070	Pass
18329-1-3	-0.002	Pass	0.002	Pass	0.057	Pass	0.063	Pass

2.4.7.2 Local aberrations in spherical and astigmatic power — Not required

2.4.7.3 Prismatic power – Individual oculars — N/A

2.4.7.4 Prismatic power difference – Pairs of oculars — See table below

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
18329-1-1	Out	0.03	Pass	0.05	Pass
18329-1-2	Out	0.01	Pass	0.05	Pass
18329-1-3	Out	0.02	Pass	0.05	Pass

2.4.8 Scattered Light See table below

Haze *Maximum* *≤3.0%*

Sample No.	Right Eye	Compliance	Left Eye	Compliance
18329-1-1	0.3%	Pass	0.3%	Pass
18329-1-2	0.2%	Pass	0.3%	Pass
18329-1-3	0.3%	Pass	0.3%	Pass

2.4.9 Material and surface quality Pass

Clauses 2.5 to 2.13 see Clauses 3.2.7, 3.3.1 to 3.3.3 and 3.5

SECTION 3 REQUIREMENTS FOR ASSEMBLED EYE AND FACE PROTECTORS

3.2 GENERAL REQUIREMENTS

3.2.1 Finish Pass

3.2.2 Materials Pass

3.2.3 Optical properties of oculars See Clauses 2.2 to 2.4

3.2.4 Ventilation N/A

3.2.5 Dimensional requirements for eye-shields and face-shields N/A

3.2.6 Assessment of lateral coverage (in addition to Clause 2.2.3) Pass

3.2.7 Impact resistance (to Clause 2.5, as per Appendix K) Pass

3.2.8 Penetration resistance (to Clause 2.9, as per Appendix P) Pass

(plastic oculars only)

3.2.9 Resistance to ignition (to Clause 2.10, as per Appendix Q) N/A
(oculars for welding, wide-vision goggles, eye-shields, face-shields and hoods)

3.2.10 Thermal stability (as per Appendix T) Pass

3.2.11 Protection against corrosion (as per Appendix U) N/A
(eye and face protectors with metal components only)

3.3	**SPECIAL PERFORMANCE REQUIREMENTS**	
3.3.1	**Medium impact protectors** (to Clause 2.6, as per Appendix M)	Pass
3.3.2	**High impact protectors** (to Clause 2.7, as per Appendix N)	N/A
3.3.3	**Extra high impact protectors** (to Clause 2.8, as per Appendix O)	N/A
3.3.4	**Protection against splashes** (as per Appendix V)	N/A
3.3.5	**Protection against dust** (as per Appendix W)	N/A
3.3.6	**Protection against gas** (as per Appendix X)	N/A
3.3.7	**Protection against hot solids** (to Clause 2.11.2, as per Appendix S)	N/A
3.3.8	**Protection against high temperature** (as per Appendix Y)	N/A
3.4	**TESTING** (min 3 samples)	Pass
3.5	**MARKING OF ASSEMBLED EYE AND FACE PROTECTORS AND PACKAGING**	
3.5.1	**Eye and face protectors**	
(a)	Manufacturer's name, trade name or mark	Absent
(b)	Ocular marking as given Section 2 of this Standard	Absent
(c)	Appropriate marking as given in Table 7	See (b)
3.5.2	**Packaging**	
(a)	Type of protector as given in Table 7	Not provided
(b)	Appropriate marking as given in Table 8	Not provided
SECTION 4	**OPTIONAL TESTS AND CLAIMS**	
4.1	**CLAIMED TRANSMITTANCE PROPERTIES**	No claims made
4.2	**FLAME PROPAGATION**	No claims made

These eye protectors DO meet the medium impact, category 0 and outdoor untinted requirements of AS/NZS 1337.1, provided they are fully and correctly marked as the standard requires.

The Standard requires the following information to be etched or impressed into these eye protectors:

a) Manufacturer's name, trade name or mark on the front/ocular and on the sides.
b) Oculars may be marked "0" to indicate category 0 or "O" to indicate outdoor use, untinted.
   If these eye protectors are claimed as medium impact protection the oculars must be marked "I" or "F"
c) If these eye protectors are claimed as medium impact protection the frame must be marked "I" or "F".

The Standard requires the following information to be supplied with the packaging for these eye protectors:

a) Medium impact eye protector.
   The description Category "0" or "Outdoor use, untinted" ocular is optional.
b) If claimed as an untinted ocular "These protectors are intended for indoor use where no optical radiation hazards exist" or
   If claimed as Outdoor untinted "These protectors are intended for indoor and outdoor use where no optical radiation hazards exist other than solar radiation. They are intended to provide adequate protection against ultraviolet radiation from the sun, but are not intended to provide protection against sunglare".

Ash Matthew Ang
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	±0.005 D	Prismatic power	±0.01 Δ
Scattered light	±0.1%	Axis of polarisation	±0.5°
Spectral transmittance	±0.2%		

Uncertainties in UV transmittance comply with ISO 12311:2013, Clause 7.1.1.1 and Table 1