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ACCREDITED
Test Laboratory
Certificate: 1722.01

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Date: 30 September 2015
Report: T10163-01-1
Issue: 1
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Objective:

Contract testing to ISO 12312-2:2015(E) "Eye and face protection — Sunglasses and related eyewear — Part 2: Filters for direct observation of the sun".

Samples:

Paper Eclipse Glasses, Viewers, and Filters

Frame	Quantity	Sample ID
Paper Full Frame	6	3A
3" x 5" Paper Viewer	6	3B
70mm Solar Filter	2	3C

Date submitted: 18 August 2015 (samples), 29 August 2015 (artwork)

Procedures:

Testing protocols in accord with good laboratory practice were employed for all tests.

All tests were conducted in a standard laboratory atmosphere unless otherwise specified.

Samples were randomly selected from the quantity provided and tested in the as-received condition unless otherwise stated.

All Frames utilize the same lenses therefore clause 4.1.1 only assessed on one variant.

Assessment Summary:

Dates tested: 9, 10 and 30 August 2015

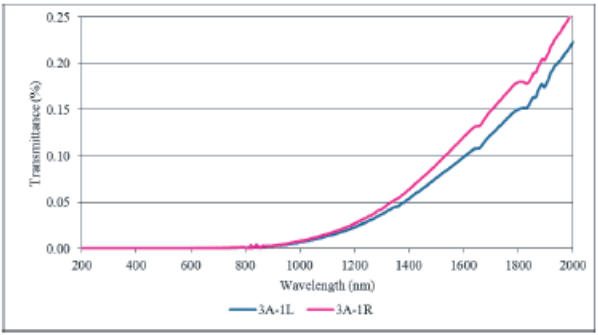
ISO 12312-2:2015(E) Requirements	Compliant	Non-Compliant
4 Requirements and associated test methods		
4.1 Transmittance		
4.1.1 General	X	
4.1.2 Uniformity of luminous transmittance	X	
4.2 Material and surface quality		
4.2.1 Requirements	X	
4.2.2 Test method		
4.3 Mounting		
4.3.1 General	X	
4.3.2 Dimensions	X	
4.3.3 Material quality	X	
5 Labelling	X	

Samples as assessed meet the requirements of ISO 12312-2:2015(E).

Results:

4.1.1 Transmittance - General

Sample ID:	3A-1L	3A-1R	Requirement
Luminous (τ_V) (%)	0.0000743	0.0000859	0.000061 to 0.0032
280 to 315nm (τ_{SUVB}) (%)	0.0000100	0.0000152	$\leq \tau_V$
315 to 380nm (τ_{SUVA}) (%)	0.0000289	0.0000202	$\leq \tau_V$
780 to 2000nm (τ_{SIR}) (%)	0.0246	0.0293	≤ 3
Pass/Fail:	Pass		



4.2.1 Filter material and surface quality; Result: Pass
Requirement: Except in a marginal area 5 mm wide, filters shall be free from defects likely to impair vision in use, such as bubbles, scratches, inclusions, dull spots, pitting, scouring, pocking, scaling, and undulations. Metal coated filter materials shall not exhibit more than one pinhole defect not greater than 200 µm in average diameter within any 5 mm diameter circular zone.

4.3.1 Filter mounting; Result: Pass
Requirement: If mounted, a filter shall be held securely so that it cannot be dislodged by normal handling or by gusts of wind.

4.3.2 Dimensions; Result: Pass
Requirement: The filter or filters and mounting assembly shall be of a size sufficient to cover both eyes of the user simultaneously and in no case shall have overall dimensions less than 115 mm in width and 35 mm in depth in the plane parallel to the facial plane. Spectacle shaped mountings may have a triangular cut-away area to accommodate the crest of the nose, not to exceed 15 mm in apical height and 35 mm width at the base and may have separate filters, one for each eye, provided that the overall dimensions are satisfied.[1]

[1]Not applicable to 70mm Solar Filter.

4.3.3 Material quality; Result: Pass
Requirement: The filter and mounting shall be free from roughness, sharp edges, projections, or other defects which could cause discomfort or injury during use. No part of the filter or mounting which is in contact with the wearer shall be made of materials which are known to cause any skin irritation.

5 Labelling; Result: Pass (artwork provided)
The filter and/or its packaging shall show the following information in the language(s) of the country where the product is to be offered for sale:

a) name and address of manufacturer of the product

b) instructions for use in looking at the sun or a solar eclipse

c) warnings that viewing the sun without an appropriate filter can result in permanent eye injury

d) warnings that filters that are damaged or separated from their mountings should be discarded

e) advice on storage, cleaning, and maintenance, as appropriate

f) obsolescence deadline or period of obsolescence, as appropriate

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Sample Photograph(s):

Full Frame

3" x 5" Viewer

70mm Filter

Estimates of Uncertainties:

ISO 12311:2013(E) Test Method	Estimated Uncertainty
7.1.1 Measurement of spectral transmittance	
0.0032% to 0.000061%	0.98% Relative

Estimated uncertainties have been calculate in accordance with the principles of ISO/IEC Guide 98-3:2008, Uncertainty of measurement-Part 3: Guide to the expression of uncertainty in measurement (GUM:1995).
Estimated uncertainties have a 95% confidence level.
A coverage factor (k) of 2.0 was used.