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INC. LABORATORIES

Test Report T9127-03-1 Issue 1
ISO 12312-2:2015
American Paper Optics, LLC
Paper Eclipsor Safe Solar Viewers
18 November 2015



Approved by:

A handwritten signature in blue ink, appearing to read 'Keith E. Whitten', written over a horizontal line.

Keith E. Whitten
Laboratory Manager

Prepared by:

A handwritten signature in blue ink, appearing to read 'Cathy Woloszyn', written over a horizontal line.

Cathy Woloszyn
Lab Administrator

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ICS Laboratories, Inc. • 1072 Industrial Parkway North • Brunswick, Ohio 44212 USA
Phone: 330.220.0515 Fax: 330.220.0516

Client: American Paper Optics, LLC
 2995 Appling Road, Suite 106
 Bartlett, TN 38133
 USA

Date: 18 November 2015
 Report: T9127-03-1
 Issue: 1
 Page: 1 of 4

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 Eclipsers Safe Solar Viewers

Part Number	Frame Color	Quantity	Sample ID
ECLIPBPPW	White	5	7B-3xx
ECLIPBPGENST	Yellow and Black	5	

Date(s) submitted: 30 October 2015

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.

Assessment Summary:

Date(s) tested: 04 through 17 November 2015

ISO 12312-2:2015(E) Requirements	Compliant	Non-Compliant
4 Requirements and associated test methods		
4.1 Transmittance		
4.1.1 General ¹	X	
4.1.2 Uniformity of luminous transmittance	X	
4.2 Material and surface quality - filters	X	
4.3 Mounting		
4.3.1 General ²	X	
4.3.2 Dimensions ²	X	
4.3.3 Material quality - frames ¹	X	
5 Labelling ²	X	

¹Assessed in ICS Report T10330-01, ² Assessed in ICS Report T9127-02-1.

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

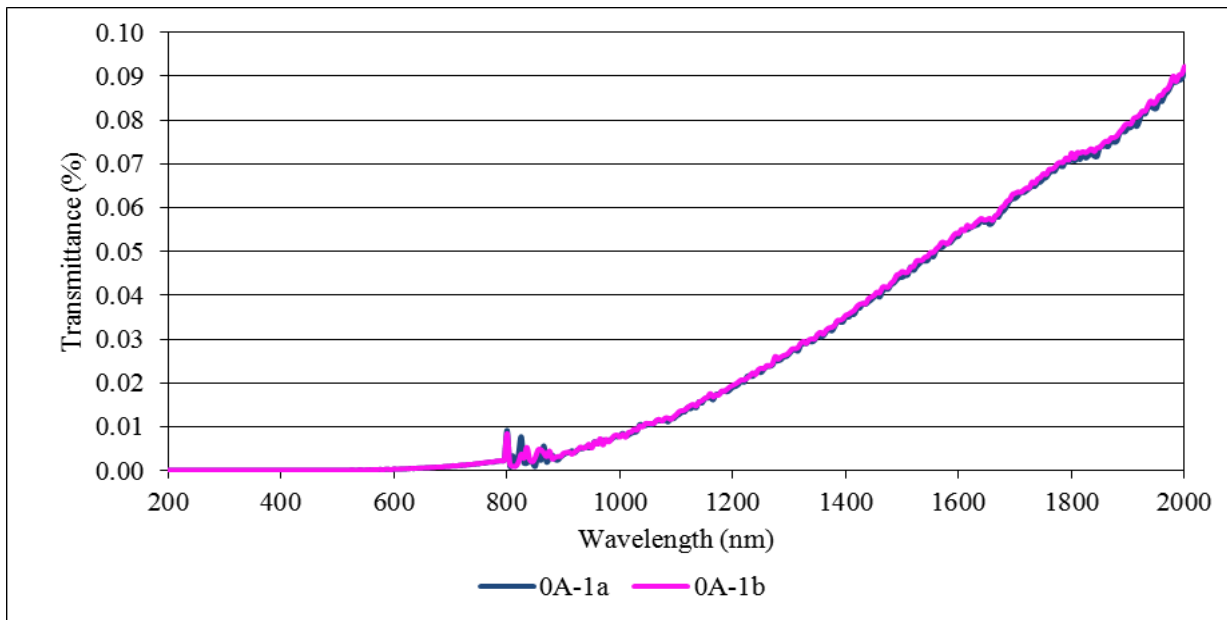
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Date: 18 November 2015
 Report: T9127-03-1
 Issue: 1
 Page: 2 of 4

Results:

4.1.1 Transmittance-General

Sample ID:	0A-1a	0A-1b	Requirement
Luminous (τ_V) (%)	0.00021	0.00021	0.000061 to 0.0032
280 to 315nm (τ_{SUVB}) (%)	< 0.0001	< 0.0001	$\leq \tau_V$
315 to 380nm ($\tau_{SUV A}$) (%)	< 0.0001	< 0.0001	$\leq \tau_V$
780 to 2000nm (τ_{SIR}) (%)	0.016	0.017	≤ 3
Pass/Fail:	Pass		



Note: Noise between 800 and 900nm is due to the detector changeover of the instrument and not a feature of the samples measured.

4.1.2 Uniformity of luminous transmittance

Sample ID:	7B-301L	7B-301R	Requirement
Transmittance (%)			
Maximum:	0.00018	0.00019	
Center:	0.00017	0.00019	
Minimum:	0.00017	0.00019	
Variation (%)	5.14	3.61	$\leq 10\%$
Pass/Fail:	Pass		

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Date: 18 November 2015
Report: T9127-03-1
Issue: 1
Page: 3 of 4

4.2 Material and surface quality - filters; 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 Mounting-General; 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.

4.3.3 Material quality - frames; 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

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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 Report: T9127-03-1
 Issue: 1
 Page: 4 of 4

Sample Photograph(s):



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.

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17. Client agrees to pay any and all additional costs for work additional to the original scope of work as agreed to by Client.
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22. In the event that payment is not received within 15 days of invoice date, Client agrees to pay a late payment charge on the unpaid balance equal to 1-1/2% per month or the maximum charge allowed by law, whichever is less, and all costs and expenses, including attorney's fees where recovery of the same is not prohibited by law, incurred by ICS in collecting such invoices.
23. All costs associated with compliance with any subpoena (s) for documents, testimony in a court of law, or for any other purpose relating to work performed by ICS in connection with work performed for that Client, shall be paid by Client. Client shall also pay ICS's then existing standard fee for consulting, deposition and trial testimony and all expenses related thereto.
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