



Test Report T18671-01-3 Issue 1
ISO 12312-2:2015(E)
Absolute Eclipse/Gravitis Enterprise Limited
Absolute Eclipse Paper Solar Eclipse Glasses
04 January 2024



Approved by:

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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:

Absolute Eclipse Paper Solar Eclipse Glasses

Description	Quantity	Sample ID
Paper Frame with Silver/Black Filters	4	1C

Date(s) submitted: 27 December 2023

Procedures:

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: 28 through 29 December 2023

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	X	
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).

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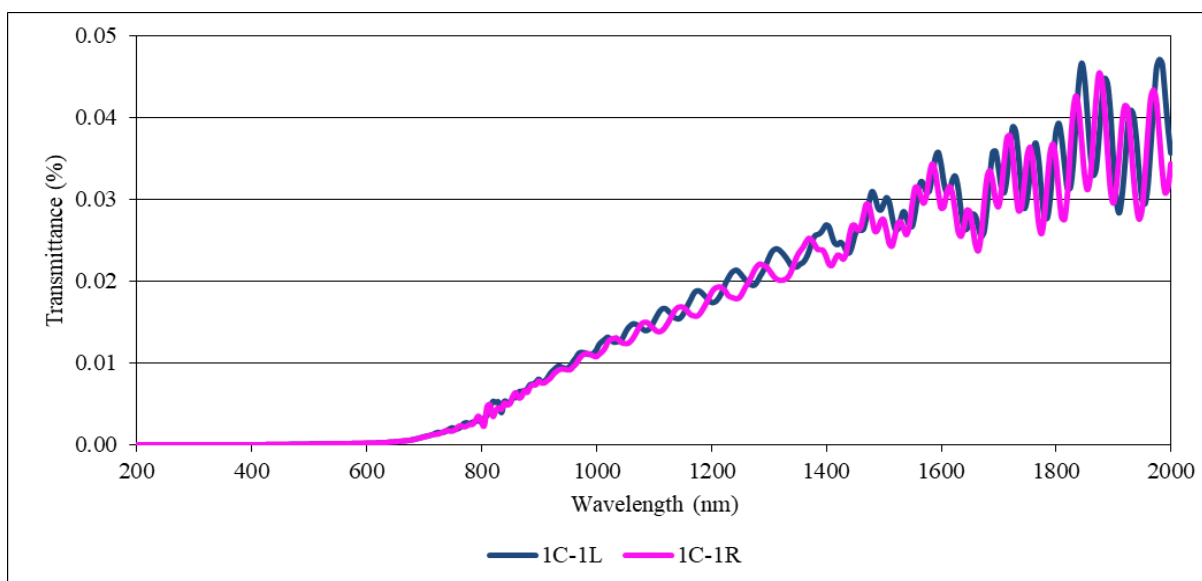
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Results:

4.1.1 Transmittance-General

Sample ID:	1C-1L	1C-1R	Requirement	Pass	Fail
Luminous-D65 (τ_v) (%)	0.000167	0.000166	0.000061 to 0.0032	X	
Solar UVB-280 to 315nm (τ_{SUVB}) (%)	<0.00001	<0.00001	$\leq \tau_v$	X	
Solar UVA-315 to 380nm (τ_{SUA}) (%)	<0.00001	<0.00001	$\leq \tau_v$	X	
Solar Infrared-780 to 2000nm (τ_{SIR}) (%)	0.014	0.014	≤ 3	X	

Measured with a double beam, ratio recording, double monochromator spectrophotometer followed by the appropriate calculation as described in ISO 12311:2013, 7.1.1, 7.1.2, 7.3.2, 7.3.3 and 7.5.



4.1.2 Transmittance-Uniformity of luminous transmittance

Sample ID:	1C-1L	1C-1R	Requirement
Luminous-D65 (τ_v) (%)			
Maximum:	0.000233	0.000225	
Center:	0.000219	0.000216	
Minimum:	0.000213	0.000214	
Relative Difference (%):	8.58	4.89	$\leq 10\%$
Pass/Fail:	Pass		

Measured with a broadband collimated light source tuned for D65 and photodetector with the spectral response corresponding to CIE 2° standard observer.

4.2 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 μ m in average diameter within any 5 mm diameter circular zone.

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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 Mounting-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.

Note: Triangular cut-away only applies to cardboard spectacle shaped mountings.

4.3.3 Mounting-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

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):



Estimates of Uncertainties:

ISO 12311:2013(E) Test Method	Estimated Uncertainty
7.1.1 Measurement of spectral transmittance	10% Relative

Estimated uncertainties have been calculated 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.

Estimated Uncertainties were not taken into consideration for determination of pass/fail.

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14. Client agrees to pay any and all additional costs associated with unexpected or above-standard communications and/or consultations with Client or third parties as designated by Client.
15. 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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19. It is agreed that if ICS should be found liable for any losses or damages attributable to the services hereunder in any respect, its liability shall not exceed the amount of the fee paid by Client for services rendered and Client's sole remedy at law or in equity shall be the right to recover that sum.
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21. ICS hereby objects to any conflicting terms contained in any order, acceptance or other subsequent correspondence submitted by Client.
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.
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