



Test Report T15245-01-1 Issue 1
ANSI/ISEA Z87.1-2020

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1190TC Automatic Darkening Welding Filter
19 October 2020



Approved by:

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Objective:

Contract testing to ANSI/ISEA Z87.1-2020 “American National Standard for Occupational and Educational Personal Eye and Face Protection Devices”.

- Clause(s): 5. Fundamental Design Requirements for All Protectors
-excluding Markings
7. Optional Hazard-Specific Protector Requirements

Requirements as applicable to Automatic-Darkening Welding Filter Only.

Samples:

1190TC Automatic Darkening Welding Filter

Description	Quantity	Sample ID
Shades 4/9-13 Two Sensors, One Solar Cell Non-Removable Batteries. Potentiometer Control of Shade, Sensitivity, Delay and Grind Mode Cartridge 111x90x11mm, Viewing Area 91x41x6mm	4	5A

Date(s) submitted: 11 September 202

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.

Testing procedures as specified within Section 9 of ANSI/ISEA Z87.1-2020 were followed unless noted in results.

When applicable, samples were assessed on medium headform (64mm PD).

Grind Mode and Power Off Mode are equivalent to Light State.

Assessment Summary:

Date(s) tested: 24 through 30 September 2020

Samples as assessed meet the requirements of ANSI/ISEA Z87.1-2020 for Automatic Darkening Welding Filters.

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Assessment Summary (Continued):

ANSI/ISEA Z87.1-2020 Requirements	Compliant	Non-Compliant
5. Fundamental Design Requirements for All Protectors		
5.1 Optical Requirements		
5.1.1 Optical Quality	X	
5.1.2 Luminous Transmission (Clear Lenses)		Not applicable
5.1.3 Haze - Clear Lenses Only		Not applicable
5.1.4 Refractive Power, Astigmatism, Resolving Power, Prism and Prism Imbalance for Plano Protectors	X	
5.1.5 Refractive Power, Astigmatism, Prism and Prism Imbalance for Prescription Protectors and Magnifiers		Not applicable
5.2 Physical Requirements	X	
5.2.1 Drop Ball Impact Resistance		Not applicable
5.2.2 Ignition	X	
5.2.3 Corrosion Resistance of Metal Components		Not applicable
5.2.4 Minimum Coverage Area		Not applicable
5.3 Markings		Excluded
7. Optional Hazard-Specific Protector Requirements		
7.2 Optical Radiation Protector Requirements		
7.2.1 Protectors with Clear Lenses		Not applicable
7.2.2 Protectors providing Filtration of Optical Radiation		
7.2.2.1 Filter Lenses		
7.2.2.1.1 Transmission Requirements		Not applicable
7.2.2.1.2 Visible Light Filters (ANSI Z80.3-2018)		Not applicable
7.2.2.1.3 Variations in Luminous Transmittance	X	
7.2.2.2 Transmittance of Non-Lens Components-Light Tightness		Not applicable
7.2.3 Automatic Darkening Welding Filter Lenses		
7.2.3.1 Luminous Transmittance	X	
7.2.3.2 UV/IR Transmittance	X	
-Non Removable UV/IR Filter	X	
7.2.3.3 Switching Index	X	
7.2.3.4 Occlusion	X	
7.2.3.5 Angular Dependence of Luminous Transmittance	X	

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Results:

5.1.1 Optical Quality; Result: Pass

Filters are free of striae, bubbles, waves and other visible defects which would impair the wearer's vision.

5.1.4 Refractive Power, Astigmatism, Resolving Power, Prism and Prism Imbalance for Plano Protectors

Refractive Power & Astigmatism

Sample ID	Left (m ⁻¹)		Right (m ⁻¹)		Pass	Fail
	Refractive Power	Astigmatism	Refractive Power	Astigmatism		
5A-1	0.01	0.03	0.00	0.04	X	
Requirement:	+/- 0.06	≤ 0.06	+/- 0.06	≤ 0.06		

Tested in a simulated as worn position using a 19mm aperture.

Resolving Power

Sample ID	Pattern Resolved (Yes/No)		Pass	Fail
	Left	Right		
5A-1	Yes	Yes	X	
Requirement:	Resolve Pattern 20			

Tested in a simulated as worn position using a 19mm aperture.

Prism and Prism Imbalance

Sample ID	Prismatic Power (cm/m)		Vertical Imbalance(cm/m)	Horizontal Imbalance(cm/m)	Pass	Fail
	Left	Right				
5A-1	0.10	0.08	0.06	0.06 Base In	X	
Requirement:	≤ 0.50		≤ 0.25	Base Out ≤ 0.75 Base In ≤ 0.25		

5.2 Physical Requirements; Results: Pass

Protectors are free from projections, sharp edges or other defects which are likely to cause discomfort or injury during use.

5.2.2 Ignition; Results: Pass

Components tested (Shade Knob, Housing, Sensitivity/Delay knob, Shade Dial, Wire) did not ignite or continue to glow once the rod is removed.

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7.2.2.1.3 Variations in Luminous Transmittance (Welding Filters) - Darkest Dark State; Shade 13

Sample ID	Luminous (TL)-ILLA (%)		Left/Right	Pass	Fail
	Left	Right (%)			
5A-1	7.82	7.68	1.018	X	
Requirement:			1.25 ≥ L/R ≥ 0.80		

7.2.3.1 Luminous Transmittance

Sample ID	Conditioning (°C)	Luminous (TL)-ILLA (%)	Shade	Pass	Fail
Grind Mode					
5A-2	23	6.72	3.74	For reference only	
Light State; Shade 4					
5A-2	-5	7.37	3.64	For reference only	
	23	6.72	3.74		
	55	6.17	3.82		
Lightest Dark State; Shade 9					
5A-2	-5	0.0244	9.43	X	
	23	0.0410	8.90	X	
	55	0.0257	9.38	X	
Requirement:		0.0139 to 0.100	10.00 to 8.00		
Darkest Dark State; Shade 13					
5A-2	-5	0.00078	12.92	X	
	23	0.00089	12.79	X	
	55	0.00094	12.73	X	
Requirement:		0.00027 to 0.0019	14.00 to 12.00		

Measured in geometric center of the lens.

Tolerance of +/- 1 shade number is used for Dark States.

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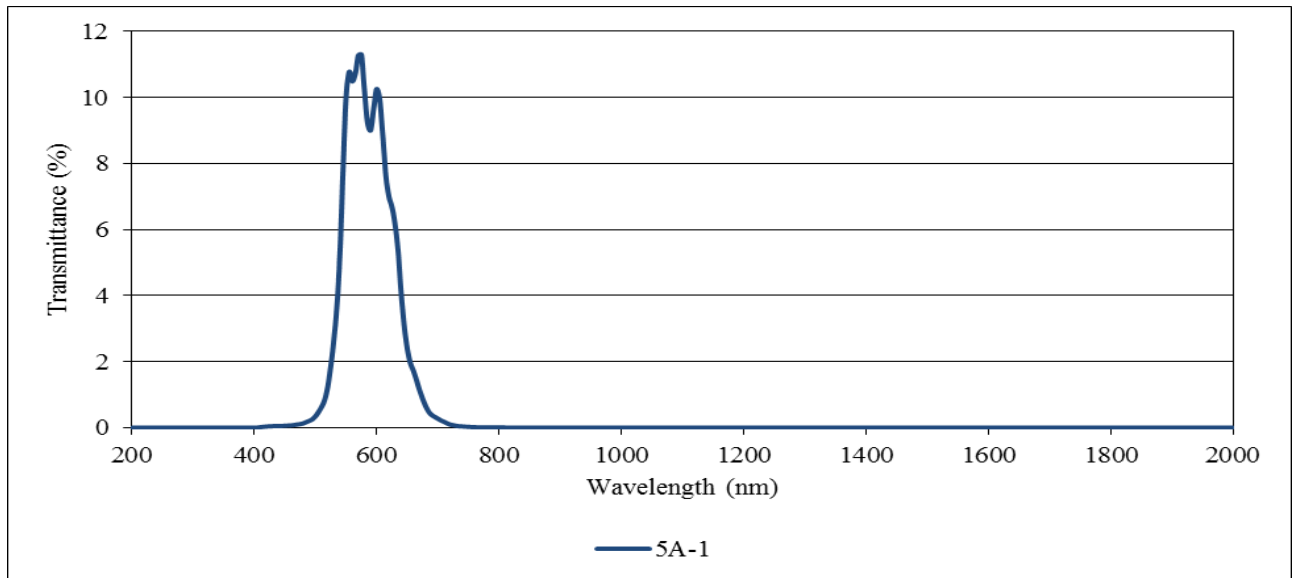
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7.2.3.2 UV/IR Transmittance - Light State; Shade 4

Sample ID:	5A-1	Requirement (Shade 13)	Pass	Fail
Luminous (T _L)-ILLA (%)	7.36			
Far-Ultraviolet; 200 to 315nm (%)*	0.000013	≤ 0.0002	X	
Near-Ultraviolet; 315 to 380nm (%)*	<0.00001	≤ 0.000044	X	
Infrared; 780 to 2000nm (%)*	0.0017	≤ 0.4	X	
Blue Light; 400 to 700nm (%)	0.15	≤ T _L	X	

Measured in Light State in geometric center of the lens

*Requirements are for the Darkest Dark State.



-Non Removable UV/IR Filter; Result: Pass
 UV/IR filter is not removable.

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7.2.3.3 Switching Index - Light State; Shade 4 to Darkest Dark State; Shade 13

Sample ID	Sensor Not Occluded	Conditioning (°C)	Switching Index (ms)	Pass	Fail
5A-2	Top Left	-5	1.50	X	
	Top Right		1.56	X	
	Top Left	23	0.71	X	
	Top Right		0.69	X	
	Top Left	55	0.47	X	
	Top Right		0.49	X	
Requirement:			≤ 4		

Measure in Darkest Dark State in geometric center of lens.
 High intensity pulsed LED used as trigger source.
 Sensor location relative to as worn (from backside).

7.2.3.4 Occlusion; Result: Pass

Samples operate properly regardless of which sensor or sensors are occluded. See 7.2.3.3

7.2.3.5 Angular Dependence of Luminous Transmittance - Darkest Dark State; Shade 13

V15

Sample ID	Luminous (T _L)-ILLA (%)			V15	Pass	Fail
	Normal	Maximum	Minimum			
5A-1	0.00093	0.0017	0.0013	1.86	X	
Requirement:				≤ 19.31		

V30

Sample ID	Luminous (T _L)-ILLA (%)		V30	Pass	Fail
	Normal	Maximum			
5A-1	0.00093	0.011	12.12	X	
Requirement:			≤ 138.95		

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Sample Photographs:



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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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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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