



Test Report T5072-01-2 Issue 1  
ANSI Z87.1-2003  
Microaxis Corp.  
G015 Spectacles  
11 November 2009



Certificate 1722.01

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**Objective:**

Contract testing to ANSI Z87.1-2003 “Practice for Occupational and Educational Eye and Face Protection.”  
Section 7 Spectacles.

**Samples:**

G015 Spectacles

Ocular Variant	Qty	Sample ID
Gray	60	2A-x
Clear	60	2B-x
Yellow	60	2C-x

Date submitted: 27 October 2009

**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.

Testing procedures as specified within Section 14 of ANSI Z87.1-2003 were followed.

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

**Assessment Summary:**

Dates tested: 28 October through 10 November 2009

7. Spectacle Requirements	Compliant	Non-Compliant
7.1 Introduction		
7.2 Spectacle Frame Test		
7.3 Basic Impact Lens Requirements	Not applicable, assessed to 7.4.2	
7.4 Plano Spectacle Lens Requirements		
7.4.1 Basic Impact Testing Requirements		
7.4.2 High Impact Testing Requirements		
7.4.2.1 Spectacle Product Test		
7.4.2.1.1 High Mass Impact	X	
7.4.2.1.2 High Velocity Impact	X	
7.4.2.1.3 Penetration Test	X	
7.4.2.2 Thickness (Non-Plano Frames Only)	Not applicable	
7.4.3 Optical Requirements		
7.4.3.1 Optical Qualities	X	
7.4.3.2 Prismatic Power	X	
7.4.3.3 Refractive Power	X	
7.4.3.4 Resolving Power	X	
7.4.3.5 Haze	X	
7.4.3.6 Transmittance	X	
7.5 Non-Plano Spectacle Lens Requirements	Not applicable	
7.6 Flammability	X	
7.7 Corrosion Resistance	Not applicable	
7.8 Cleanability	X	
7.9 Replacement Spectacle Lenses	Not applicable	
7.10 Marking	Not assessed	

Samples as assessed meet the requirements of ANSI Z87.1-2003 for spectacles with side protection.

**Results:**

*Gray*

**7.4.2.1.1 High Mass Impact**

Sample ID	Location	Pass	Fail
2A-1	Right Ocular	X	
2A-2	Left Ocular	X	
2A-3	Right Ocular	X	
2A-4	Left Ocular	X	

**7.4.2.1.2 High Velocity Impact**

Sample ID	Location	Velocity (ft/sec)	Pass	Fail
2A-5	Right Ocular 15° Nasal	151	X	
2A-6	Right Ocular 0°	151	X	
2A-7	Right Ocular 15° Temporal	151	X	
2A-8	Right Ocular 30° Temporal	151	X	
2A-9	Right Ocular 45° Temporal	151	X	
2A-10	Right Ocular 60° Temporal	152	X	
2A-11	Right Ocular 75° Temporal	153	X	
2A-12	Right Ocular 90° Temporal	153	X	
2A-13	Right Ocular 90° Temporal +10 mm	153	X	
2A-14	Right Ocular 90° Temporal -10 mm	152	X	
2A-15	Left Ocular 15° Nasal	151	X	
2A-16	Left Ocular 0°	151	X	
2A-17	Left Ocular 15° Temporal	151	X	
2A-18	Left Ocular 30° Temporal	153	X	
2A-19	Left Ocular 45° Temporal	152	X	
2A-20	Left Ocular 60° Temporal	152	X	
2A-21	Left Ocular 75° Temporal	152	X	
2A-22	Left Ocular 90° Temporal	152	X	
2A-23	Left Ocular 90° Temporal +10 mm	152	X	
2A-24	Left Ocular 90° Temporal -10 mm	153	X	

**Side Protection Coverage**

Sample ID	Above Center (mm)	Below Center (mm)	Provides Side Protection
2A-1	22	15	Yes
Specification:	≥ 10		

Note: "The function and coverage of side protection are defined by the high velocity impact test (Section 14.2)". Due to asymmetries of the Alderson 50<sup>th</sup> percentile headform the left eye is used for this assessment as it provides better correlation to published specifications and the standard fitting practices.

**7.4.2.1.3 Penetration**

Sample ID	Location	Pass	Fail
2A-1	Left Ocular	X	
2A-2	Right Ocular	X	
2A-3	Left Ocular	X	
2A-4	Right Ocular	X	

*Clear*

**7.4.2.1.1 High Mass Impact**

Sample ID	Location	Pass	Fail
2B-1	Right Ocular	X	
2B-2	Left Ocular	X	
2B-3	Right Ocular	X	
2B-4	Left Ocular	X	

**7.4.2.1.2 High Velocity Impact**

Sample ID	Location	Velocity (ft/sec)	Pass	Fail
2B-5	Right Ocular 15° Nasal	151	X	
2B-6	Right Ocular 0°	151	X	
2B-7	Right Ocular 15° Temporal	151	X	
2B-8	Right Ocular 30° Temporal	151	X	
2B-9	Right Ocular 45° Temporal	150	X	
2B-10	Right Ocular 60° Temporal	152	X	
2B-11	Right Ocular 75° Temporal	153	X	
2B-12	Right Ocular 90° Temporal	153	X	
2B-13	Right Ocular 90° Temporal +10 mm	152	X	
2B-14	Right Ocular 90° Temporal -10 mm	152	X	
2B-15	Left Ocular 15° Nasal	152	X	
2B-16	Left Ocular 0°	153	X	
2B-17	Left Ocular 15° Temporal	152	X	
2B-18	Left Ocular 30° Temporal	151	X	
2B-19	Left Ocular 45° Temporal	151	X	
2B-20	Left Ocular 60° Temporal	152	X	
2B-21	Left Ocular 75° Temporal	152	X	
2B-22	Left Ocular 90° Temporal	152	X	
2B-23	Left Ocular 90° Temporal +10 mm	155	X	
2B-24	Left Ocular 90° Temporal -10 mm	153	X	

**7.4.2.1.3 Penetration**

Sample ID	Location	Pass	Fail
2B-1	Left Ocular	X	
2B-2	Right Ocular	X	
2B-3	Left Ocular	X	
2B-4	Right Ocular	X	

*Yellow*

**7.4.2.1.1 High Mass Impact**

Sample ID	Location	Pass	Fail
2C-1	Right Ocular	X	
2C-2	Left Ocular	X	
2C-3	Right Ocular	X	
2C-4	Left Ocular	X	

**7.4.2.1.2 High Velocity Impact**

Sample ID	Location	Velocity (ft/sec)	Pass	Fail
2C-5	Right Ocular 15° Nasal	150	X	
2C-6	Right Ocular 0°	152	X	
2C-7	Right Ocular 15° Temporal	153	X	
2C-8	Right Ocular 30° Temporal	153	X	
2C-9	Right Ocular 45° Temporal	151	X	
2C-10	Right Ocular 60° Temporal	152	X	
2C-11	Right Ocular 75° Temporal	151	X	
2C-12	Right Ocular 90° Temporal	151	X	
2C-13	Right Ocular 90° Temporal +10 mm	151	X	
2C-14	Right Ocular 90° Temporal -10 mm	151	X	
2C-15	Left Ocular 15° Nasal	151	X	
2C-16	Left Ocular 0°	152	X	
2C-17	Left Ocular 15° Temporal	153	X	
2C-18	Left Ocular 30° Temporal	153	X	
2C-19	Left Ocular 45° Temporal	153	X	
2C-20	Left Ocular 60° Temporal	152	X	
2C-21	Left Ocular 75° Temporal	151	X	
2C-22	Left Ocular 90° Temporal	152	X	
2C-23	Left Ocular 90° Temporal +10 mm	153	X	
2C-24	Left Ocular 90° Temporal -10 mm	153	X	

**7.4.2.1.3 Penetration**

Sample ID	Location	Pass	Fail
2C-1	Left Ocular	X	
2C-2	Right Ocular	X	
2C-3	Left Ocular	X	
2C-4	Right Ocular	X	

**7.4.3.1 Optical Qualities; Result: Pass**

Samples are free of striae, bubbles, waves and other visible defects and flaws.

**7.4.3.2 Prismatic Power**

Sample ID	Prismatic Power ( $\Delta$ )		Vertical Imbalance ( $\Delta$ )	Horizontal Imbalance ( $\Delta$ )	Pass	Fail
	Left Ocular	Right Ocular				
<b>Gray</b>						
2A-25	0.16	0.18	0.04	0.12 Base Out	X	
2A-26	0.19	0.21	0.04	0.13 Base Out	X	
2A-27	0.18	0.20	0.03	0.12 Base Out	X	
Specification:	$\leq 0.50$		$\leq 0.25$	$\leq 0.50$ Base Out $\leq 0.25$ Base In		

**7.4.3.3 Refractive Power**

Sample ID	Left Ocular (D)			Right Ocular (D)			Pass	Fail
	Refractive Power	Astigmatism		Refractive Power	Astigmatism			
<b>Gray</b>								
2A-25	-0.01	-0.02	0.01	0.00	-0.02	0.02	X	
2A-26	-0.01	-0.03	0.02	-0.01	-0.02	0.01	X	
2A-27	-0.01	-0.02	0.01	-0.01	-0.03	0.02	X	
Specification:	+/- 0.06		$\leq 0.06$	+/- 0.06		$\leq 0.06$		

Note: Tested in a simulated as worn position.

**7.4.3.4 Resolving Power**

Sample ID	Pattern Resolved		Pass	Fail
	Left Ocular	Right Ocular		
<b>Gray</b>				
2A-25	>20	>20	X	
2A-26	>20	>20	X	
2A-27	>20	>20	X	
Specification:	$\geq$ Pattern 20			

Note: Tested in a simulated as worn position.

**7.4.3.5 Haze (Clear Lenses Only)**

Sample ID	Location	Measured Value (%)	Pass	Fail
<b>Clear</b>				
2B-28	Right Ocular	0.14	X	
2B-29	Left Ocular	0.15	X	
2B-30	Right Ocular	0.09	X	
Specification:	$\leq 3$			

**7.4.3.6 Transmittance**

Sample ID	Left (%)	Right (%)	Left/Right	Pass	Fail
<b>Gray</b>					
2A-25	14.9	14.8	1.007	X	
2A-26	15.0	14.7	1.020	X	
2A-27	15.0	14.9	1.007	X	
<b>Clear</b>					
2B-25	89.9	89.8	1.001	X	
2B-26	89.8	89.7	1.001	X	
2B-27	89.9	90.0	0.999	X	
<b>Yellow</b>					
2C-25	88.7	88.5	1.002	X	
2C-26	88.6	88.6	1.000	X	
2C-27	88.4	88.6	0.998	X	
Specification:	Clear: $100 \geq T (L) \geq 85$ Special Purpose: Tinted: $100 \geq T (L) \geq 8$ Extra Dark: $8 > T (L) \geq 0.2$		$1.10 \geq L/R \geq 0.90$		

**7.6 Flammability**

Sample ID	Component	Measured Value (mm/min)	Pass	Fail
<b>Gray</b>				
2A-1	Lens	8	X	
	Front	15	X	
	Temple	20	X	
2A-2	Lens	8	X	
	Front	15	X	
	Temple	15	X	
2A-3	Lens	0	X	
	Front	15	X	
	Temple	10	X	
<b>Clear</b>				
2B-1	Lens	10	X	
2B-2	Lens	5	X	
2B-3	Lens	0	X	
<b>Yellow</b>				
2C-1	Lens	5	X	
2C-2	Lens	5	X	
2C-3	Lens	12	X	
Specification:		$\leq 76$		

**7.8 Cleanability; Result: Pass**

The function and markings are not impaired by the cleaning procedure.



**Sample Photographs:**



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