



Test Report T11763-01-3 Issue 1
MIL-PRF-32432 (GL) (9 January 2013)
Ballistic Fragmentation Protection, Class 1 (Spectacles)
3M
Securefit 600 SGAF Spectacles
14 July 2017



Approved by:

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Prepared by:

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Date: 14 July 2017
Report: T11763-01-3
Issue: 1
Page: 1 of 4

Objective:

Contract testing to MIL-PRF-32432 (GL) "Performance Specification Military Combat Eye Protection (MCEP) System"; 9 January 2013.

Clause(s): 3.6.3.1 Ballistic Fragmentation Protection, Class 1 and Class 1a (Spectacles)

Samples:

Securefit 600 SGAF Spectacles

Part Numbers	Lot #	Lens	Quantity	Sample ID
SF601SGAF, SF601SGAF-TAC, SF601SGAF-EU	17069	Clear	40	3A
SF602SGAF, SF602SGAF-TAC, SF602SGAF-EU	17048	Gray	40	3B
SF603SGAF, SF603SGAF-TAC, SF603SGAF-EU	17069	Amber	40	3C

Date(s) submitted: 14 June 2017

Summary:

Date(s) tested: 23 June 2017

The samples as assessed meet the Ballistic Fragmentation Protection requirements for Class 1 Spectacles.

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Report: T11763-01-3
Issue: 1
Page: 2 of 4

Equipment:

1. Pneumatic Air Gun.
2. Propellant, Nitrogen.
3. Fragment Simulating Projectiles (FSP), 0.15 caliber, 5.8grain, 4340 steel, Hardness 30 +/- 2 Rockwell C.
4. Oehler Research Precision Ballistic Chronographs, two sets of screens with 1' spacing between start and stop. (Set 1: stop screen ~16.0" from sample, Set 2: stop screen ~ 12.5" from sample)
5. EN Medium Headform with modified eye sockets and two elliptical 0.002 inch witness sheets over each eye socket.

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 mounted on headform and impacted with a 0.15 caliber projectile a velocity of 640 to 660 ft/s. One impact per sample, normal to the front curve, coincident with either the right or left eye. Left and right impact locations were to the visual centers (a point centered on the horizontal center line and 32mm from the vertical center line).

Strike velocities were calculated using ITOP 4-2-805 (20 September 2005) Appendix D-Part 1 and TEDT-AT-FPP (5 October 2009) Equation 5.

$$\Delta V = (X_{pid}^2 G) / W$$

$$V_{\text{strike}} = V_{\text{measured}} - \Delta V$$

Test considered a failure if one or more of the following occur:

- 1) if the witness sheet is perforated or if there is a complete penetration of the test item,
- 2) if the primary lens is cracked, fractured, or shattered,
- 3) if one or more fragments become dislodged on the inside of the eyewear (to include coatings)
- 4) if an eyewear component needed to retain the eyewear on the head becomes completely separated from the eyewear
- 5) if the primary lens becomes completely separated from the eyewear
- 6) if the eyewear falls off the head form
- 7) if the inside laminate is cracked and results in a loose flap of material larger than the diameter of the projectile (for laminated lens structures only)

A lens crack is defined as a fissure that propagates beyond the impact site from one surface of the lens to the other. Petalling is not considered a crack.

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Date: 14 July 2017
 Report: T11763-01-3
 Issue: 1
 Page: 3 of 4

Results:

Sample ID	Location	Velocity (ft/s)				Observations	Pass	Fail
		Measured		Calculated Strike				
		Chrono 1	Chrono 2	Chrono 1	Chrono 2			
<i>Clear</i>								
3A-1	Left	662	660	657	656	1, 2	X	
3A-2	Left	660	658	655	654	1, 2	X	
3A-3	Left	658	656	653	652	1, 2	X	
3A-4	Left	660	658	655	654	1, 2	X	
3A-5	Left	661	660	656	656	1, 2	X	
3A-6	Right	661	660	656	656	1, 2	X	
3A-7	Right	659	658	654	654	1, 2	X	
3A-8	Right	662	661	657	657	1, 2	X	
3A-9	Right	660	659	655	655	1, 2	X	
3A-10	Right	660	658	655	654	1, 2	X	
<i>Gray</i>								
3B-1	Left	662	660	657	656	1, 2	X	
3B-2	Left	658	656	653	652	1, 2	X	
3B-3	Left	661	658	656	654	1, 2	X	
3B-4	Left	654	653	650	649	1, 2	X	
3B-5	Left	660	656	655	652	1, 2	X	
3B-6	Right	659	658	654	654	1, 2	X	
3B-7	Right	661	659	656	655	1, 2	X	
3B-8	Right	660	659	655	655	1, 2	X	
3B-9	Right	659	658	654	654	1, 2	X	
3B-10	Right	661	660	656	656	1, 2	X	
<i>Amber</i>								
3C-1	Left	663	661	658	657	1, 2	X	
3C-2	Left	660	659	655	655	1, 2	X	
3C-3	Left	662	661	657	657	1, 2	X	
3C-4	Left	661	660	656	656	1, 2	X	
3C-5	Left	661	660	656	656	1, 2	X	
3C-6	Right	662	661	657	657	1, 2	X	
3C-7	Right	660	659	655	655	1, 2	X	
3C-8	Right	660	660	655	656	1, 2	X	
3C-9	Right	660	659	655	655	1, 2	X	
3C-10	Right	663	662	658	658	1, 2	X	

(1) Spectacle partially dislodged from headform, (2) Lens partially dislodged from frame

Unless otherwise noted all observations pertain to side impacted.

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Report: T11763-01-3
Issue: 1
Page: 4 of 4

Sample Photographs:



Observation Photographs:



Examples of spectacle partially dislodged from headform



Examples of lens partially dislodged from frame

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