



**INTERTEK TEST REPORT  
3933 US ROUTE 11 CORTLAND, NEW YORK 13045**

**TEST REPORT NO.: G100210541CRT-002A**

**ANSI/ISEA Z87.1-2010  
“AMERICAN NATIONAL STANDARD FOR OCCUPATIONAL AND EDUCATIONAL  
PERSONAL EYE AND FACE PROTECTION DEVICES”  
INITIAL TESTING OF  
ACETOGEN GAS CHILE S.A.  
IMPACT RATED PLANO PROTECTIVE SPECTACLES  
MODEL: BLACKBULL  
NUMBER: B200  
SHADE: GRAY**

**RENDERED TO:  
ACETOGEN GAS CHILE S.A.  
AV. DEL PARQUE 4160 PISO 6  
CIUDAD EMPRESARIAL HUECHURABA  
ZIP CODE 8580644  
SANTIAGO, CHILE**

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**Abstract**

The impact rated plano protective gray spectacles identified as a Acetogen Gas Chile S.A. model BLACKBULL No. B200, submitted by the manufacturer, was received in pristine condition on 09/07/2010, and was evaluated in accordance with the requirements of ANSI/ISEA Z87.1-2010 entitled "American National Standard For Occupational and Educational Personal Eye and Face Protection Devices", between 10/14/2010 and 11/12/2010.

Details of the instrument calibration are maintained in laboratory records.  
The measurement of uncertainty is available upon request.

**Introduction**

This report describes the results of the test program conducted in accordance with ANSI/ISEA Z87.1-2010 entitled "American National Standard For Occupational and Educational Personal Eye and Face Protection Devices", performed on specimens submitted by the manufacturer. Intertek Testing Services, located in Cortland NY, conducted the test evaluations.

**Product Description**

Intertek received 25 production model BLACKBULL No. B200, impact rated plano protective gray spectacles. The test samples were identified as specimens BBG1 – BBG25.

**Authorization**

The tests were authorized by Intertek Proposal (Quote) number 500250149 submitted by Steven Nierenberg, Personal Protective Equipment Account Manager, Intertek Testing Services NA, Inc. on 08/05/2010, signed by Roberto Valdivia, Acetogen Gas Chile S.A. on 09/30/2010 and Intertek Proposal (Quote) number 500469884 signed by Marcelo Lara, Acetogen Gas Chile S.A. on 07/31/2013.

<b>Eye/Face Protection Requirements</b>	<b>Compliant</b>	<b>Non-Compliant</b>
Section 5.1.1 Optical Quality	<b>X</b>	
Section 5.1.2 Luminous Transmittance	<b>N/A</b>	
Section 5.1.3 Haze	<b>N/A</b>	
Section 5.1.4 Refractive Power, Astigmatism, Resolving Power	<b>X</b>	
Prism and Prism Imbalance for Plano Protectors	<b>X</b>	
Section 5.2 Physical Requirements	<b>X</b>	
Section 5.2.1 Drop-Ball Impact Resistance	<b>X</b>	
Section 5.2.3 Ignition	<b>X</b>	
Section 5.2.4 Corrosion Resistance of Metal Components	<b>X</b>	
Section 5.2.5 Minimum Coverage Area	<b>X</b>	
Section 5.3 Minimum Lens Thickness	<b>N/A</b>	
Section 5.4 Marking	<b>X</b>	
Section 6.1.3 Lateral (Side) Coverage	<b>X</b>	
Section 6.2.2 High Mass Impact	<b>X</b>	
Section 6.2.3 High Velocity Impact	<b>X</b>	
Section 6.2.4 Penetration	<b>X</b>	

**Section 5.1 Optical Requirements**  
**Section 9.1 Optical Quality**

**Requirement: Section 5.1.1** – When tested in accordance with Section 9.1, lenses shall be free of striae, bubbles, waves and other visible defects which would impair their optical quality.

**Sample #:** BBG25

Note Any Imperfections	Compliant
None	YES

**Section 9.4 Refractive Power, Astigmatism, Resolving Power for Plano Protectors**

**Requirement: Section 5.1.4** – When tested in accordance with Section 9.4, the tolerance on refractive power, astigmatism and resolving power shall be as indicated in Table 1.

<b>Table 1: Tolerance on Refractive Power, Astigmatism and Resolving Power</b>			
Protector	Refractive Power	Astigmatism	Resolving Power
Spectacle	$\pm 0.06$ D	$\leq 0.06$ D	Pattern 20

**Sample #:** BBG25

Test	Left Diopters	Right Diopters	Compliant
Refractive Power	-0.04	-0.03	YES
Astigmatism	0.03	0.06	YES
Resolving Power	Pattern 20	Pattern 20	YES

**Section 9.5 Prism and Prism Imbalance for Plano Protectors**

**Requirement: Section 5.1.4** – When tested in accordance with Section 9.5, the tolerance on Prism and Prism Imbalance shall be as indicated in Table 2.

<b>Table 2: Tolerance on Prism and Prism Imbalance</b>				
<b>Protector</b>	<b>Prism</b>	<b>Vertical Imbalance</b>	<b>Base In Imbalance</b>	<b>Base Out Imbalance</b>
Spectacle	$\leq 0.50 \Delta$	$\leq 0.25 \Delta$	$\leq 0.25 \Delta$	$\leq 0.50 \Delta$

**Sample #: BBG25**

<b>Left</b>		<b>Right</b>		<b>Compliant</b>
<b>Vertical</b>	<b>Horizontal</b>	<b>Vertical</b>	<b>Horizontal</b>	
-0.12 $\Delta$	0.16 $\Delta$	-0.12 $\Delta$	0.18 $\Delta$	YES

**Sample #: BBG25**

<b>Prism</b>		<b>Vertical Imbalance</b>	<b>Horizontal Imbalance</b>
<b>Left</b>	<b>Right</b>		
0.20 $\Delta$	0.22 $\Delta$		
<b>Compliant:</b>	YES	0.00 $\Delta$	0.34 $\Delta$ Base Out

**Section 5.2 Physical Requirements**

**Requirement: Section 5.2** – Protectors shall be free from projections, sharp edges or other defects which are likely to cause discomfort or injury during use.

**Sample #:** BBG1

Physical Defects	Compliant
None	YES

**Section 9.6 Drop-Ball Impact Resistance**

**Requirement: Section 5.2.1** – When tested in accordance with Section 9.6, protector lenses shall not fracture when impacted by a 25.4 mm (1 in) diameter steel ball when dropped from a height of 127 cm (50.0 in). **Section 5.2.2** – When each type test is conducted as indicated above, a complete device shall fail if any of the following occurs:

--piece fully detached from inner surface

--fracture

--penetration of the rear surface

--lens not retained

Drop-Ball Weight: 68 g

Drop Height: 127 cm (50.0 in.)

Drop-Ball Diameter 25.4 mm

Sample #	Impact Location	Compliant
BBG1	Left Eye	YES
BBG2	Left Eye	YES
BBG3	Right Eye	YES
BBG4	Right Eye	YES

**Section 9.7 Ignition**

**Requirement: Section 5.2.3** – When tested in accordance with section 9.7, protectors shall not ignite or continue to glow once the rod is removed. Each externally exposed material (exclusive of textiles or elastic bands) shall be tested.

**Sample #:** BBG15

Sample Type	Ignition	Afterglow	Compliant
Lens	NO	NO	YES
Frame	N/A	N/A	N/A
Temple	NO	NO	YES

### Section 9.8 Corrosion Resistance of Metal Components

**Requirement: Section 5.2.4** – When tested in accordance with Section 9.8, metal components used in protectors shall be corrosion resistant to the degree that the function of the protector shall not be impaired by the corrosion. Lenses and electrical components are excluded from these requirements.

**Sample #:** BBG12

Metal Component(s)	Compliant
2 Hinge Screws	YES

### Section 5.2.5 Minimum Coverage Area

**Requirement: Section 5.2.5** – The eyewear and lens shall cover in plain view an area of not less than 40 mm (1.57 in.) in width and 33 mm (1.30 in.) in height (elliptical) in front of each eye, centered on the geometrical center of the lens.

Frames designed for small head sizes shall cover in plain view an area of not less than 34 mm (1.34 in.) in width and 28 mm (1.10 in.) in height (elliptical), centered on the geometrical center of the lens.

Frames designed for small head sizes shall be tested on the 54 mm (2.13 in.) PD headform and are permitted to have an eye size, including eyewear thickness, as small as 34 x 28 mm (1.34 x 1.10 in.). Frames that are tested using the small headform shall be marked on the frame with the letter “H”.

**Sample #:** BBG13

Compliant	YES

### Section 5.3 Minimum Lens Thickness

**Requirement: Section 5.3** – The minimum lens thickness for specified protector shall be those indicated in Table 3.

Table 3 Minimum Lens Thickness	
Protector	Minimum Thickness
Spectacle, Plano, Impact Rated	No Minimum Thickness Requirement

**Sample #:** BBG13

Protector Type	Compliant
Spectacle, Plano, Impact Rated	N/A

## Section 5.4 Marking

**Requirement: Section 5.4** – All protectors shall bear the permanent markings in specified locations as shown in Table 4a. Markings shall follow the sequence shown in Table 4b. Marking for lens type and use applications shall be required only when claims for protection against the hazard or indicated use are made by the manufacturer.

In addition, the components of frames that are intended for prescription protector use shall be marked for size in accordance with the system described in ANSI Z80.5-2004. Fronts shall be marked with the A-dimension (eye size) and DBL (distance between lenses). Temples shall be marked with their overall length.

<b>Table 4a. Marking Requirements</b>		
<b>Type of Mark</b>	<b>Frame<sup>1</sup></b>	<b>Marking for Complete Device (No replaceable parts)<sup>2</sup></b>
<b>All protectors shall bear the markings below.</b>		
<b>Manufacturer's Mark or Logo</b>	Yes	Yes
<b>Standard</b> Plano	<b>Z87</b>	<b>Z87</b>
The following shall be required only when claims of impact rating, a specific lens type and/or use are made by the manufacturer.		
<b>Impact Mark</b>	Yes	Yes
Impact Rated Plano	<b>Z87+</b>	<b>Z87+</b>

- Frame components subject to marking vary by type of protector.*
  - Spectacles: Front and at least one temple. Both detachable sideshields are marked Z87+, if impact rated.*
- A complete device (no replaceable components) shall have at least one set of markings. The markings may be on the lens or the frames or both the lens and the frame.*

**Sample #: BBG1**

<b>Marked Location</b>	<b>Marking</b>	<b>Compliant</b>
Inside Surface Rt. Temple	ACE Z87.1+	YES

**Section 6 Impact Protector Requirements**  
**Section 9.10 Lateral Protection Test**

**Requirements: Section 6.1.3** – When tested in accordance with Section 9.10, impact rated protectors shall provide continuous lateral coverage (i.e. no openings greater than 1.5 mm (.06 in.) in diameter) from the vertical plane of the lenses tangential to a point not less than 10 mm (0.394 in.) posterior to the corneal plane and not less than 10 mm (0.394 in.) in height above and not less than 10 mm (0.394 in.) in height below the horizontal plane centered on the eyes of the headform. The probe shall not contact the headform within the defined coverage area. (See Annex D).

**Sample #:** BBG13

<b>Contact</b>	<b>Contact Location</b>	<b>Penetration</b>	<b>Compliant</b>
<b>#1</b>	0° Right Eye at Horizontal Plane	NO	YES
<b>#2</b>	*90° Temporal Right Eye (10 mm above Horizontal Plane)	NO	YES
<b>#3</b>	*90° Temporal Right Eye (10 mm below Horizontal Plane)	NO	YES
<b>#4</b>	0° Left Eye at Horizontal Plane	NO	YES
<b>#5</b>	*90° Temporal Left Eye (10 mm above Horizontal Plane)	NO	YES
<b>#6</b>	*90° Temporal Left Eye (10 mm below Horizontal Plane)	NO	YES



**Section 6.2 Impact Requirements**

**Requirements: Section 6.2.1** - When each type test is conducted as indicated in Sections 6.2.2, 6.2.3 and 6.2.4 and, as applicable Section 6.2.6, a complete device shall fail if any of the following occurs:

- piece fully detached from inner surface
- fracture
- penetration of the rear surface
- lens not retained
- for the high-velocity test, the unaided eye observes any piece adhering to the contact paste, or observes contact paste on the projectile or complete device

**Section 9.11 High Mass Impact**

**Requirement: Section 6.2.2** – When tested in accordance with Section 9.11, the complete device shall be capable of resisting an impact from a pointed projectile weighing 500 g (17.6 oz) dropped from a height of 127 cm (50.0 in).

Projectile Weight: 500 g (17.6 oz)

Drop Height: 127 cm (50.0 in.)

<b>Sample #</b>	<b>Impact Location</b>	<b>Compliant</b>
BBG1	Right Eye	YES
BBG2	Right Eye	YES
BBG3	Left Eye	YES
BBG4	Left Eye	YES

**Section 9.12.2 High Velocity Verification**

**Requirement:** The velocity of the steel ball shall be determined at a distance not greater than 25 cm (9.8 in.) from the eye of the headform and shall have a standard deviation not exceeding 2% of the specified test velocity over a test series of 30 shots within  $\pm 2\%$  of the specified test velocity.

<b>Table 5 High Velocity Impact Testing</b>		
<b>Device Type</b>	<b>Velocity</b>	<b>Velocity Range (<math>\pm 2\%</math>)</b>
Spectacles	45.72 m/s (150 ft/s)	45.72 $\pm$ 0.91 m/s (150 $\pm$ 3 ft/s)

<b>Shot #</b>	<b>Velocity (ft/s)</b>	<b>Shot #</b>	<b>Velocity (ft/s)</b>	<b>Shot #</b>	<b>Velocity (ft/s)</b>
<b>1</b>	152.4	<b>11</b>	152.4	<b>21</b>	152.6
<b>2</b>	151.0	<b>12</b>	151.9	<b>22</b>	150.8
<b>3</b>	152.0	<b>13</b>	152.0	<b>23</b>	152.4
<b>4</b>	152.4	<b>14</b>	151.6	<b>24</b>	152.5
<b>5</b>	151.4	<b>15</b>	152.4	<b>25</b>	152.5
<b>6</b>	152.2	<b>16</b>	152.2	<b>26</b>	152.4
<b>7</b>	152.4	<b>17</b>	152.5	<b>27</b>	152.4
<b>8</b>	151.9	<b>18</b>	151.9	<b>28</b>	152.6
<b>9</b>	152.9	<b>19</b>	152.3	<b>29</b>	152.8
<b>10</b>	152.7	<b>20</b>	152.8	<b>30</b>	152.6
<b>Standard Deviation of 30 shots</b>			0.49 ft/s (0.33% of specified test velocity)		
<b>Compliant</b>			YES		

### Section 9.12 High Velocity Impact

**Requirement: Section 6.2.3** – When tested in accordance with Section 9.12, the complete device shall be capable of resisting impact from a 6.35 mm (0.25 in) diameter steel ball traveling at the velocity specified in Table 5. No contact with the eye of the headform is permitted as a result of the impact.

Table 5 High Velocity Impact Testing		
Device Type	Velocity	Velocity Range ( $\pm 2\%$ )
Spectacles	45.72 m/s (150 ft/s)	45.72 $\pm$ 0.91 m/s (150 $\pm$ 3 ft/s)

Sample #	Impact Location	Impact Velocity (ft/s)	Compliant
BBG5	0° Right Eye	152.2	YES
BBG6	+30° Temporal Right Eye	152.6 <sup>1</sup>	YES
BBG7	*+90° Temporal Right Eye (above)	152.6	YES
BBG8	0° Left Eye	152.9 <sup>2</sup>	YES
BBG9	+30° Temporal Left Eye	152.6 <sup>3</sup>	YES
BBG10	*+90° Temporal Left Eye (below)	152.5	YES

\*10 mm above or below the plane of the eyes.

**Notes:**

1. **Spectacle Sample # BBG6:** Initial impact at +30° Temporal Right Eye had an invalid low velocity (8.4 ft/s). No Damage evident. 2nd impact performed and reported on same Spectacle at same location.
2. **Spectacle Sample # BBG8:** Initial impact at 0° Left Eye had an invalid low velocity (86.1 ft/s). No Damage evident. 2nd impact performed and reported on same Spectacle at same location.
3. **Spectacle Sample # BBG9:** Initial, 2<sup>nd</sup>, and 3<sup>rd</sup> impact at +30° Temporal Left Eye had invalid low velocities (99.5 ft/s, 53.3 ft/s, and 97.6 ft/s). No Damage evident. 4th impact performed and reported on same Spectacle at same location.

### Section 9.13 Penetration Test (Lenses Only)

**Requirement: Section 6.2.4** – When tested in accordance with Section 9.13, lenses for all complete devices shall be capable of resisting penetration by a weighted needle with a total weight of 44.2 gm (1.56 oz) dropped from a height of 127 cm (50.0 in).

Penetration Projectile Weight: 44.2 g

Drop Height: 127 cm (50.0 in.)

Sample #	Impact Location	Compliant
BBG11	Left Eye	YES
BBG12	Left Eye	YES
BBG13	Right Eye	YES
BBG14	Right Eye	YES

**Conclusion**

The impact rated plano protective gray spectacles identified as a Acetogen Gas Chile S.A. model BLACKBULL No. B200, **met** the minimum performance requirements for Impact Rated Plano Protector Testing defined in ANSI/ISEA Z87.1-2010 entitled, "American National Standard For Occupational and Educational Personal Eye and Face Protection Devices". The marking on the spectacle defined for this model as a result of the evaluations performed in this report are determined to be **Z87+**.

Report Prepared by:



Michele Reid  
Technical Writer  
Performance Group

Report Reviewed by:



Brian Bishop  
Project Engineer  
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Report Revision		
Date:	Description	By:
November 23, 2010	Original Issue (Report -002)	H. Tomasofsky
August 7, 2013	Report revision authorized by Quote 500469884 to update Address, Contact person, and Model number from 10120-020-00-0082 to B200 (Report -002A)	M. Reid



August 7, 2013

Intertek Order No.: G100210541

Mr. Marcelo Lara  
Acetogen Gas Chile S.A.  
Av. Del Parque 4160 Piso 6  
Ciudad Empresarial Huechuraba  
Zip Code 8580644  
Santiago, Chile

Dear Mr. Lara:

Enclosed please find one copy of Intertek Report No. G100210541CRT-002A, covering the test evaluations that were conducted on your Acetogen Gas Chile S.A. model BLACKBULL No. B200 impact rated plano protective gray spectacles.

The test was authorized by Intertek Proposal (Quote) No. 500250149, dated 08/05/2010, prepared by Steven Nierenberg, Personal Protective Equipment Account Manager, signed by Roberto Valdivia representing Acetogen Gas Chile S.A. on 09/30/2010 and Proposal (Quote) No 500469884 signed by Marcelo Lara representing Acetogen Gas Chile S.A.

Thank you for choosing Intertek for your testing needs. If we can be of further assistance to you please feel free to contact me at (607) 753-6711.

Sincerely,

Brian Bishop  
Project Engineer  
Performance Group



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