INTERTEK TEST REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

TEST REPORT NO.: G100148523CRT-004

ANSI Z87.1-2003
"AMERICAN NATIONAL STANDARD, OCCUPATIONAL AND EDUCATIONAL PERSONAL EYE AND FACE PROTECTION DEVICES"

TESTING OF
CLEMCO INDUSTRIES- CLEMCO
MODEL NUMBER(S):
APL 20 (#25214) HELMET ASSEMBLY
(LENS # 21044 CLEMCO Z87)

RENDERED TO:
CLEMCO INDUSTRIES
ONE CABLE CAR DRIVE
WASHINGTON, MO 63090

Abstract

The protective faceshields (Clemco lens # 21044), (attached to Clemco SAR Helmet, Assembly # 25214, green in color) identified as a Clemco Industries APL 20, submitted by the manufacturer, was received in the pristine condition on 06/04/10 and 09/17/10 and was evaluated in accordance with the requirements of ANSI Z87.1-2003 entitled "American National Standard, Occupational and Educational Personal Eye and Face Protection Devices", Section 9-"Faceshields", between 07/08/10 and 09/17/10.

Details of the instrument calibration are maintained in laboratory records.

Introduction

This report describes the results of the test program conducted in accordance with ANSI Z87.1-2003 entitled "American National Standard, Occupational and Educational Personal Eye and Face Protection Devices", Section 9-"Faceshields", performed on specimens submitted by the manufacturer. The test evaluations were conducted by Intertek located in Cortland, NY.

Product Description

Intertek received 20 production protective helmets. The test samples were identified as specimens 1-20. Individual lenses marked "Z87+" were also provided for the evaluation.

Authorization

The test was authorized by quote number 500240394, signed by Mr. Tom Enger.

Photos:

Performance Test Results:

9.2: Impact Testing Requirements

9.2.1: Faceshield Frame/Crown Tests

9.2.1.1: High Mass Impact, (ref. section 14.1)

Testing is performed concurrently with Section 9.3.1.1 (See that test section for test results)

9.2.1.2: High Velocity Impact, (ref. section 14.2)

Testing is performed concurrently with Section 9.3.1.2 (See that test section for test results)

9.2.2: "BASIC" (Z87) Impact Window Tests

9.2.2.1: Drop Ball Impact, (ref. section 14.4)

Sample Description: **Lens/window only # 04493**

Sample #	Impact Location	Compliant
6	Apex in line with eyes	Yes
3	Apex in line with eyes	Yes
8	Apex in line with eyes	Yes
4	Apex in line with eyes	Yes

9.2.2.2: Minimum Thickness

Sample Description: **Lens/window only # 04493**

Sample #	Thickness, mm, (in.)	Compliant
4	2.90	Yes

9.2.2.3: Plastic Window Penetration Test, (ref. section 14.5)

The test is identical to Section 9.3.1.3 (high Impact), see that section for the test results.

9.3: "HIGH IMPACT" (Z87+) Testing Requirements

9.3.1.1: High Mass Impact Test, (ref. section 14.1)

Sample Description: **Lens/window only (# 21044)**

Sample #	Impact Location	Compliant
1	Left Eye	Yes
2	Left Eye	Yes
3	Right Eye	Yes
4	Right Eye	Yes

Sample Description: **Lens/window Frame**

Sample #	Impact Location	Compliant
1	Left Eye	Yes
2	Left Eye	Yes
3	Right Eye	Yes
4	Right Eye	Yes

9.3.1.2: High Velocity Impact Test, (ref. section 14.2)

Sample Description:	**Lens/window only (#21044)**		**Right Side Impacts**
Sample #	Impact Location	Impact Velocity (ft/s)	Compliant
5	15° Nasal Lt. Eye	301.8	Yes
5	0° Lt. Eye	301.2	Yes
5	15° Lt. Eye	301.4	Yes
5	30° Lt. Eye	301.2	Yes
5	45° Lt. Eye	301.4	Yes
5	60° Lt. Eye	302.8	Yes
5	75° Lt. Eye	301.4	Yes
5	90° Lt. Eye	303.4	Yes
5	*90° Lt. Eye (above)	298.5	Yes
5	*90° Lt. Eye (below)	302.3	Yes

Sample Description:	**Lens/window only (#21044)**		**Left Side Impacts**
Sample #	Impact Location	Impact Velocity (ft/s)	Compliant
6	15° Nasal Lt. Eye	301.2	Yes
6	0° Lt. Eye	301.4	Yes
6	15° Lt. Eye	301.4	Yes
6	30° Lt. Eye	301.6	Yes
6	45° Lt. Eye	302.1	Yes
6	60° Lt. Eye	302.1	Yes
6	75° Lt. Eye	302.3	Yes
6	90° Lt. Eye	301.4	Yes
6	*90° Lt. Eye (above)	300.9	Yes
6	*90° Lt. Eye (below)	301.4	Yes

Sample Description:	**Frame**		**Right Side Impacts**
Sample #	Impact Location	Impact Velocity (ft/s)	Compliant
7	15° Nasal Lt. Eye	301.8	Yes
7	0° Lt. Eye	301.8	Yes
7	15° Lt. Eye	300.5	Yes
7	30° Lt. Eye	301.8	Yes
7	45° Lt. Eye	300.9	Yes
7	60° Lt. Eye	301.8	Yes
7	75° Lt. Eye	301.8	Yes
7	90° Lt. Eye	301.8	Yes
7	*90° Lt. Eye (above)	302.2	Yes
7	*90° Lt. Eye (below)	302.8	Yes

Sample Description:	**Frame**		**Left Side Impacts**
Sample #	Impact Location	Impact Velocity (ft/s)	Compliant
7	15° Nasal Lt. Eye	303.2	Yes
7	0° Lt. Eye	303.2	Yes
7	15° Lt. Eye	302.5	Yes
7	30° Lt. Eye	296.5	Yes
7	45° Lt. Eye	302.3	Yes
7	60° Lt. Eye	303.0	Yes
7	75° Lt. Eye	301.6	Yes
7	90° Lt. Eye	302.8	Yes
7	*90° Lt. Eye (above)	303.4	Yes
7	*90° Lt. Eye (below)	303.2	Yes

9.3.1.3: Penetration Test, (ref. section 14.5)

Sample #	Impact Location	Compliant
8	Apex in line with eyes	Yes
3	Apex in line with eyes	Yes
6	Apex in line with eyes	Yes
7	Apex in line with eyes	Yes

9.4: Optical Requirements for Plano Faceshield Windows

9.4.1: Optical Qualities

Sample #	Note Any Imperfections (visually inspection only)	Compliant
20	none	Yes

9.4.2: Prismatic Power Test, (ref. section 14.9)

Sample #	Left Side Diopters	Right Side Diopters	Compliant
20	0	0	Yes
	Prism Imbalance- Vertical Diopters		----------
	0		Yes
	Horizontal Prism Imbalance Diopters		----------
	0 bo		Yes

9.4.3: Resolving Power, (ref. section 14.10)

Sample #	Compliant
20	Yes

9.4.4: Haze Test, (ref. section 14.11)

Sample #	Percent Haze		Compliant
20	Left =0.5	Right = 0.5	Yes

9.4.5: Transmittance, (ref. section 14.12)

Sample #	Shade	Percent Transmittance		Compliant
20	clear	Left = 86.6	Right = 86.7	Yes

9.5: Wire Screen Windows

Sample #	Condition of Exposed Borders	Compliant
NA	Not this type	NA

9.6: Flammability Test, (ref. section 14.6)

Requirements: The test sample shall not burn at a rate greater than 75mm/min.

Sample Description: **Helmet**

Sample #	Time (sec)	Burn Length (mm)	Burn Rate (mm per min)	Compliant
7A	362	75	12.4	Yes
7B	485	75	9.3	Yes
7C	447	75	10.0	Yes
7D	Per ASTM D635, section 9.8, no further testing required			
7E				
7F				
7G				
7H				
7I				
7J				

Sample Description: **Window/lens only (# 21044)**

Sample #	Time (sec)	Burn Length (mm)	Burn Rate (mm per min)	Compliant
7A	na	Did not burn to first mark	na	Yes
7B	na	Did not burn to first mark	na	Yes
7C	na	Did not burn to first mark	na	Yes
7D	na	Did not burn to first mark	na	Yes
7E	na	Did not burn to first mark	na	Yes
7F	na	Did not burn to first mark	na	Yes
7G	na	Did not burn to first mark	na	Yes
7H	na	Did not burn to first mark	na	Yes
7I	na	Did not burn to first mark	na	Yes
7J	na	Did not burn to first mark	na	Yes

Sample Description: **Window/lens holder (frame)**

Sample #	Time (sec)	Burn Length (mm)	Burn Rate (mm per min)	Compliant
2A	548	75	8.2	Yes
2B	484	75	9.3	Yes
2C	371	75	12.1	Yes
2D	Per ASTM D635, section 9.8, no further testing required			
2E				
2F				
2G				
2H				
2I				
2J				

9.7: Corrosion Resistance, (ref. section 14.7)

Sample #	Part Description	Compliant
NA	Frame is rubber, no metal parts	NA

9.8: Cleanability, (ref. section 14.8)

Sample #	Requirements	Compliant
4	Function	Yes
	Markings	Yes

9.9: Replacement Faceshield Windows

Replacement Window Model #	Requirements	Compliant
NTT	Not replaceable	NA

9.10: Marking

Sample #	Results	Compliant
20	Permanent, legible, no interference	Yes

9.10.1: Frame/Crown Marking

Sample #	Results	Compliant
NTT	Helmet with non replaceable lens	NA

9.10.2: Window Marking

Requirement: Windows shall be marked with the manufacturer's mark and either "Z87" or "Z87+" as appropriate to the testing done.

Sample #	Results	Compliant
20	Marked "Z87 +" on lens	Yes

9.10.3: Markings for Non-removable lenses

Sample #	Results	Compliant
20	Marked "Z87 +" on lens	Yes

15.2: Warning Label

Requirement: A clearly visible, removable label or hang tag shall be affixed to any protector which does not meet the high impact requirements of this standard. The label or tag shall contain an appropriate warning indicating that the lens meets basic impact requirements, but should not be relied upon for protection from high impact exposures. The label or tag shall also state that it is to be removed only by the user.

Sample #	Results	Compliant
20	Not required, meets high impact, "Z87+" requirement	NA

Conclusion

The protective faceshields (Clemco lens # 21044), (attached to Clemco SAR Helmet, Assembly # 25214, green in color) identified as a Clemco Industries APL 20, **met** the minimum performance requirements of "Z87 +" as defined in ANSI Z87.1-2003 entitled, "American National Standard, Occupational and Educational Personal Eye and Face Protection Devices", Section 9-"Faceshields".

Testing Performed by:

Brian Bishop
Engineer
Performance Group

Report Approved by:

Sara Ensign
Technician I
Performance Group

September 17, 2010

Intertek Order No.: G100148523

Tom Enger
Clemco Industries
One Cable Car Drive
Washington, MO 63090

Dear Mr. Enger:

Enclosed please find one copy of Intertek Report No.: G100148523CRT-004, covering the test evaluations that were conducted on your protective faceshields (Clemco lens # 21044), (attached to Clemco SAR Helmet, Assembly # 25214, green in color) identified as a Clemco Industries APL 20.

The test was authorized by a signed quotation dated June 18th, 2010.

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) 758-6714.

Sincerely,

Brian Bishop
Engineer
Performance Group

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