

Ballistic Testing Services

Report Number: BTR-03-13-2008-TBD-Sample 4

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Report Date: March 13, 2008
 Contact: Bob Gray
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Ballistic Results

Project Summary

Type of Products to be tested: Laminated Polycarbonate
 Test Specimen Sample size(s): 12 x 12 inch
 Number of test specimens: 6 Sample(s)
 Weight of all samples: 37 lbs
 Are Materials a Health Hazard: No
 Need the Tests performed by: March 15, 2008
 Need products shipped back: Yes
 Purchase Order Number: TBD

International Ballistic Standards / Specifications Testing

ASTM Brunswick FRA NIJ CFR Pass All
 Australian Canadian Germ DIN State Dept CFR SYA
 British EN 1063 MIL-SAMIT UL 752 Other
 Test Standard: UL 752
 Particular Test: UL Level 3 Part 1 (.44 Magnum SWC)
 Velocity Range: 1,350 to 1,485 ft/s
 Number of Shots: 3 shots
 Spacing / Pattern: within a 4.5 inch triangle

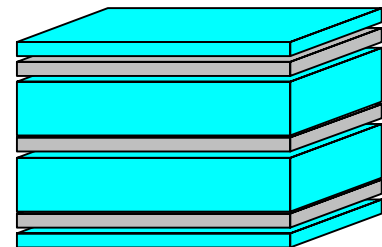
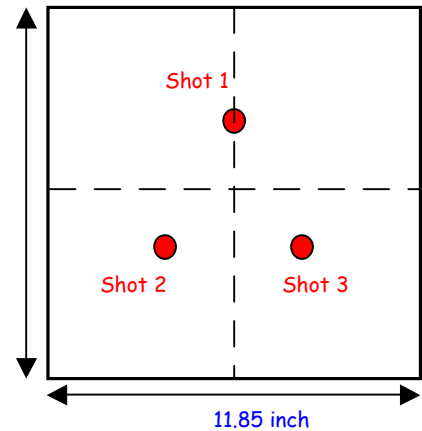
Test Results

Product Number: Sample 4
 Sample Type: Laminated Polycarbonate
 Sample Size: 11.80 x 11.85 inch
 Thickness: 1.250 inch
 Weight: 7.44 lbs
 Weapon Type: .44 Magnum
 Cartridge / Projectile Type: .44 Magnum SWC
 Projectile Weight: 240 gr
 Target Distance: 15 ft
 Number of Shots: 3 shots

Shot Sequence:	Shot 1	Shot 2	Shot 3
Impact Velocity (ft/sec) *:	<u>1,451</u>	<u>1,423</u>	<u>1,507</u>
Impact Energy (ft-lbs):	<u>1,122</u>	<u>1,079</u>	<u>1,210</u>
Impact Momentum (lb-sec):	<u>1.55</u>	<u>1.52</u>	<u>1.61</u>
Impact Spacing (inches) **::	<u>3.7</u>	<u>3.6</u>	<u>4.2</u>
Impact Angle (degrees):	<u>0 °</u>	<u>0 °</u>	<u>0 °</u>
Penetration Effect:	<u>NP</u>	<u>NP</u>	<u>NP</u>
Bulge Height (inches) ***:	<u>0.295</u>	<u>0.225</u>	<u>0.362</u>

Impact Spacing / Pattern: 3.83 inch (average)
 Witness plate material: 0.125 in. thick corrugated cardboard
 Witness Plate Distance: 18 inches
 Spall Occurrence: None
 Test Temperature: 73 °F
 Test Date: March 13, 2008
 Comments: Passed the Test

NP = No Penetration
 CP = Complete Penetration



Comments and Test Descriptions

- * Velocity measurements were taken at a distance of 6.6 ft from muzzle
- ** Impact Spacing is the distance between shots. (shot 1= 3 to 1, shot 2 = 1 to 2, shot 3 = 2 to 3)
- *** The post impact Bulge Height is the distance between the apex of the extruded deformation bulge to the tangent plane of the flat surface. This measurement is taken from the side opposite to the impacts.

Test and Report Engineers

Tested and Reported by: Sam Raheb

Signature: Sam Raheb

Date: March 13, 2008

Name: **Regal Plastic Supply Company**

Report Date: **March 13, 2008**

Ballistic Test Results and Photographs

Ballistic Test Results:

The Transparent Laminated Polycarbonate test sample passed the UL 752 Level 3 Part 1 (.44 Magnum SWC) Ballistic test. Shot #3 was 22 ft/sec over the standard's maximum velocity, but is considered a valid shot according to the standard's guidelines since it did not penetrate the test sample.

Projectile Penetration Effects:

There was no partial or complete projectile penetration of the Transparent Laminated Polycarbonate sample for all 3 shots.

Witness Plate and Spall Effects:

No spall was observed. The 0.125 in. thick corrugated cardboard witness plate remained undamaged.

Photographs

The following photographs show the post-test Transparent Laminated Polycarbonate sample. Additional larger sized photographs are included with this report.

Sample 4 - UL 752 Level 3 Part 1 (44 Magnum SWC) - 11.80 x 11.85 x 1.250 inch



Post Test Impact Side



Post Test Impact Side



Post Test Rear Side



Post Test Rear Side

Test and Report Engineers

Tested and Reported by: **Sam Raheb**

Signature: *Sam Raheb*

Date: **March 13, 2008**