

Ballistic Testing Services

Report Number: BTR-12-06-2019-Sample 16

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Report Date: December 6, 2019
 Contact: Paul Mouton
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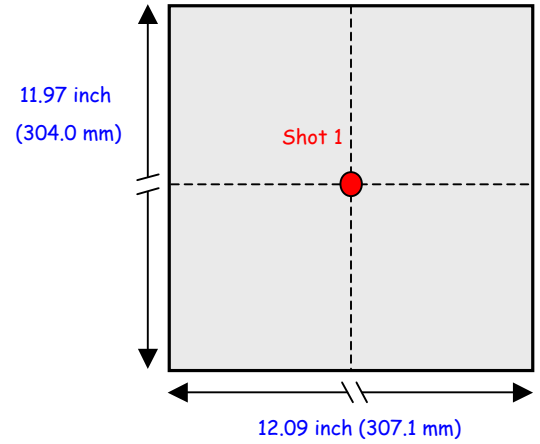
Ballistic Results

Project Summary
 Type of Products to be tested: **Bullet Resistant Glazings**
 Test Specimen Sample size(s): **12 x 12 inch**
 Number of test specimens: **23 Samples**
 Weight of all samples: **321.7 lbs**
 Are Materials a Health Hazard: **No**
 Need the Tests performed by: **within 7 to 10 days**
 Need products shipped back: **No**
 Purchase Order Number: **Not Applicable**

International Ballistic Standards / Specifications Testing
 ASTM Canadian FRA NIJ CFR Pass All
 Australian EN1063 Germ DIN State Dept CFR SYA
 British EN1522/23 MIL-SAMIT UL 752 Other
 Test Standard: **Underwriters Laboratory UL752 (Ambient Temp. Only)**
 Particular Test: **UL Level 5 Part 1 (.30 cal. 7.62 NATO FMJ)**
 Velocity Range: **2,750 to 3,025 ft/s**
 Shots: **1 shot**
 Shot Pattern: **Center shot**

Test Results

Test Sample: **Sample 16**
 Part Number / D.O.M.: **MWGF-UL4-5 / November 20, 2019**
 Reference ID: **CFR UL Levels 4 and 5**
 Description: **Security Glazing**
 Sample Size: **11.97 x 12.09 inch (304.0 x 307.1 mm)**
 Thickness: **1.280 inch (32.51 mm)**
 Weight: **13.72 lbs (6.22 kg)**
 Weapon Type: **7.62 NATO**
 Cartridge / Projectile Type: **7.62 NATO / M80 FMJ**
 Projectile Weight: **150 grains**
 Target Distance: **15 feet**
 Number of Shots: **1 shot**
 Shot Sequence: **Shot 1**
 Impact Velocity (ft/sec)*: **2,802**
 Impact Energy (ft-lbs): **2,615**
 Impact Momentum (lb-sec.): **1.87**
 Impact Angle (degrees): **0°**
 Sample Penetration: **NP**
 Witness Plate Penetration: **NP**
 Impact Spacing (inches)**: **N/A**
 Impact Spacing / Pattern: **N/A**
 Witness plate material: **0.125 in. thick corrugated cardboard**
 Spall catch box: **Not required**
 Witness / Box Distance: **18.0 inches**
 Spall Occurrence: **No spall occurred**
 Test Temperature: **72 ° F**
 Test Date: **December 06, 2019**
 Pass / Fail Results: **Passed the Test**
 Comments: **CFR Reference for UL Level 4 and 5 (.30-06 and 7.62 NATO)**



NP = No Penetration
 PP = Partial Penetration
 CP = Complete Penetration
 N/A = Not Applicable

Footnotes

* Velocity measurements were taken at a distance of 6 feet from muzzle.

Test and Report Engineers

Tested and Reported by: **Sam Raheb**

Signature: *Sam Raheb*

Date: **December 6, 2019**

Name: **Midwest Glass Fabricators**

Report Date: **December 6, 2019**

Ballistic Test Results and Photographs

Ballistic Test Results:

Test Sample 16 passed the Underwriters Laboratory UL752 UL Level 5 Part 1 (.30 cal. 7.62 NATO FMJ) Ballistic test. There was no complete penetration of the test sample from the 7.62 NATO / M80 FMJ caliber projectile.

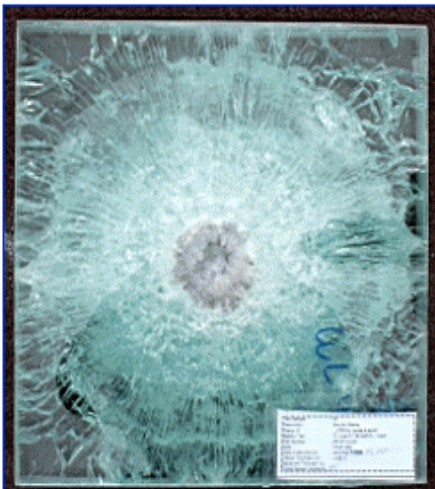
Witness Plate and Spall Effects:

No spall occurred or damage to the 0.125 in. thick corrugated cardboard witness plate was observed.

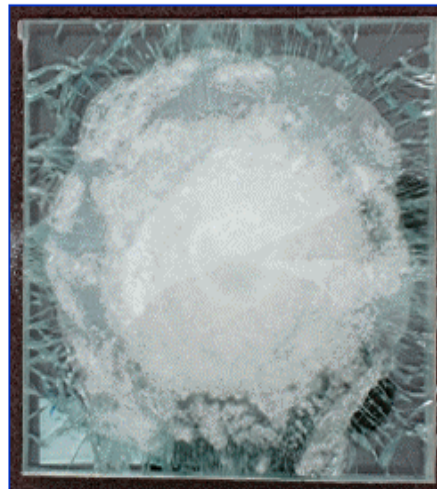
Photographs

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

Sample 16: MWGF-UL4-5 - D.O.M. November 20, 2019 - CFR UL Levels 4 and 5 - UL Level 5 Part 1 - 11.97 x 12.09 x 1.280 in.



Sample 16 Post Test Impact Side



Sample 16 Post Test Rear Side

Test and Report Engineers

Tested and Reported by: **Sam Raheb**

Signature: *Sam Raheb*

Date: **December 6, 2019**