

Ballistic Testing Services

Report Number: BTR-12-06-2019-Sample 17

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

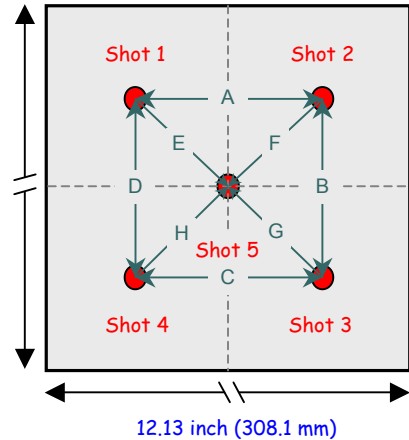
Project Summary
 Type of Products to be tested: **Bullet Resistant Glazings**
 Test Specimen Sample size(s): **12 x 12 inch**
 Number of test specimens: **23 Samples**
 Weight of all samples: **321.7 lbs**
 Are Materials a Health Hazard: **No**
 Need the Tests performed by: **within 7 to 10 days**
 Need 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 6 (9 mm Parabellum FMJ)**
 Velocity Range: **1,400 to 1,540 ft/s**
 Shots: **5 shots**
 Shot Pattern: **4.5 inch ± 0.5 inch square**

Test Results

Test Sample: **Sample 17**
 Part Number / D.O.M.: **MWGF-UL6 / November 14, 2019**
 Reference ID: **CFR UL Level 6**
 Description: **Security Glazing**
 Sample Size: **12.01 x 12.13 inch (305.1 x 308.1 mm)**
 Thickness: **1.094 inch (27.79 mm)**
 Weight: **11.23 lbs (5.09 kg)**
 Weapon Type: **9 mm Parabellum**
 Cartridge / Projectile Type: **9 mm Parabellum FMJ**
 Projectile Weight: **124 grains**
 Target Distance: **15 feet**
 Number of Shots: **5 shots**

12.01 inch
(305.1 mm)



Shot Sequence:	Shot 1	Shot 2	Shot 3	Shot 4	Shot 5
Impact Velocity (ft/sec) *:	1,445	1,443	1,451	1,452	1,448
Impact Energy (ft-lbs):	575	573	580	580	577
Impact Momentum (lb-sec.):	0.80	0.79	0.80	0.80	0.80
Impact Angle (degrees):	0°	0°	0°	0°	0°
Sample Penetration:	NP	NP	NP	NP	NP
Witness Plate Penetration:	NP	NP	NP	NP	NP

Impact Spacing	(inches)	
A	4.00	Average 4.24
B	4.25	
C	4.00	
D	4.70	Average 3.05
E	3.00	
F	3.00	
G	3.50	
H	2.70	

Witness Plate & Spall Result:

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 6 (9 mm HV)**

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 17 passed the Underwriters Laboratory UL752 UL Level 6 (9 mm Parabellum FMJ) Ballistic test. There was no complete penetration of the test sample from any of the 9 mm Parabellum FMJ caliber projectiles.

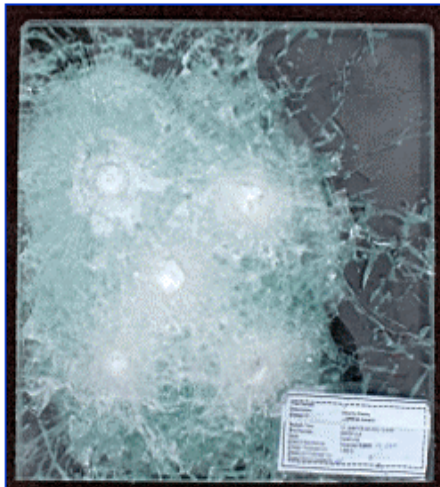
Witness Plate and Spall Effects:

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

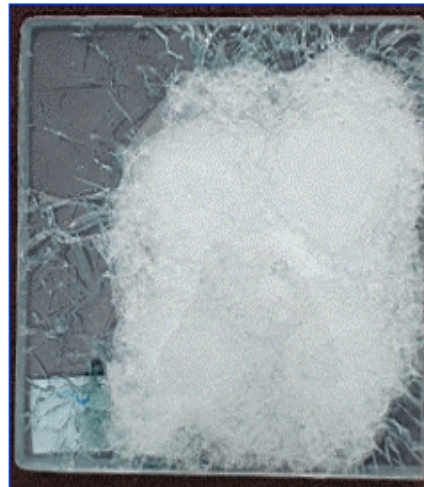
Photographs

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

Sample 17: MWGF-UL6 - D.O.M. November 14, 2019 - CFR UL Level 6 - UL Level 6 - 12.01 x 12.13 x 1.094 in.



Sample 17 Post Test Impact Side



Sample 17 Post Test Rear Side

Test and Report Engineers

Tested and Reported by: **Sam Raheb**

Signature: *Sam Raheb*

Date: **December 6, 2019**