

Ballistic Testing Services

Report Number: BTR-12-06-2019-Sample 18

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CloseFocusResearch.com

Name: Midwest Glass Fabricators  
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Report Date: December 6, 2019  
 Contact: Paul Mouton  
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**Ballistic Results**

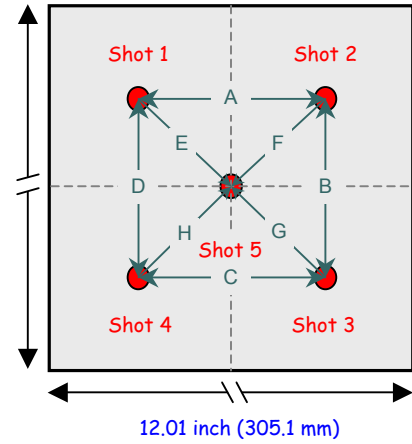
**Project Summary**  
 Type of Products to be tested: **Bullet Resistant Glazings**  
 Test Specimen Sample size(s): **12 x 12 inch**  
 Number of test specimens: **23 Samples**  
 Weight of all samples: **321.7 lbs**  
 Are Materials a Health Hazard: **No**  
 Need the Tests performed by: **within 7 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 7 (.223 cal. 5.56 NATO FMJ)**  
 Velocity Range: **3,080 to 3,388 ft/s**  
 Shots: **5 shots**  
 Shot Pattern: **4.5 inch ± 0.5 inch square**

**Test Results**

Test Sample: **Sample 18**  
 Part Number / D.O.M.: **MWGF-UL7 / November 14, 2019**  
 Reference ID: **CFR UL Level 7**  
 Description: **Security Glazing**  
 Sample Size: **12.01 x 12.01 inch (305.1 x 305.1 mm)**  
 Thickness: **1.595 inch (40.51 mm)**  
 Weight: **17.88 lbs (8.11 kg)**  
 Weapon Type: **.223 caliber / 5.56 NATO**  
 Cartridge / Projectile Type: **5.56 NATO / M193 FMJ**  
 Projectile Weight: **55 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) *:	3,194	3,196	3,207	3,182	3,197
Impact Energy (ft-lbs):	1,246	1,247	1,256	1,236	1,248
Impact Momentum (lb-sec.):	0.78	0.78	0.78	0.78	0.78
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	4.50	Average 4.49
B	4.70	
C	4.50	
D	4.25	
E	3.60	Average 3.15
F	3.20	
G	2.80	
H	3.00	

**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 7 (.223 Rem. M193)**

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 18 passed the Underwriters Laboratory UL752 UL Level 7 (.223 cal. 5.56 NATO FMJ) Ballistic test. There was no complete penetration of the test sample from any of the 5.56 NATO / M193 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.

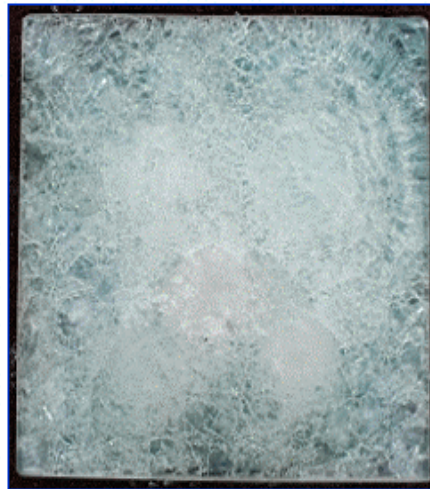
**Photographs**

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

**Sample 18: MWGF-UL7 - D.O.M. November 14, 2019 - CFR UL Level 7 - UL Level 7 - 12.01 x 12.01 x 1.595 in.**



Sample 18 Post Test Impact Side



Sample 18 Post Test Rear Side

**Test and Report Engineers**

Tested and Reported by: **Sam Raheb**

Signature: *Sam Raheb*

Date: **December 6, 2019**