

Ballistic Testing Services

Report Number: BTR-12-06-2019-Sample 2

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

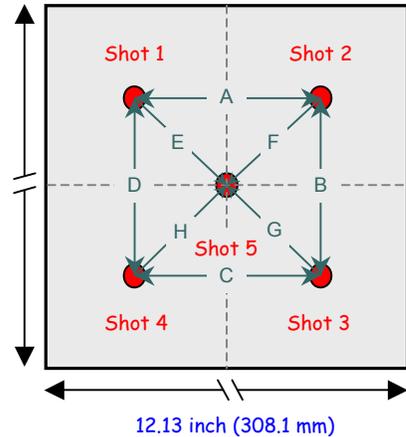
Project Summary
 Type of Products to be tested: **Bullet Resistant Glazings**
 Test Specimen Sample size(s): **12 x 12 inch**
 Number of test specimens: **23 Samples**
 Weight of all samples: **321.7 lbs**
 Are Materials a Health Hazard: **No**
 Need the Tests performed by: **within 7 to 10 days**
 Need 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: **National Institute of Justice 0108.01**
 Particular Test: **NIJ I Part 2 (.38 Special RNL)**
 Velocity Range: **800 to 900 ft/s**
 Shots: **5 shots**
 Shot Pattern: **> 2 inch**

Test Results

Test Sample: **Sample 2**
 Part Number / D.O.M.: **MWGF-NIJ1 / November 14, 2019**
 Reference ID: **CFR NIJ I**
 Description: **Security Glazing**
 Sample Size: **12.13 x 12.13 inch (308.1 x 308.1 mm)**
 Thickness: **0.440 inch (11.18 mm)**
 Weight: **4.49 lbs (2.04 kg)**
 Weapon Type: **.38 Special**
 Cartridge / Projectile Type: **.38 Special RNL**
 Projectile Weight: **158 grains**
 Target Distance: **16.4 feet**
 Number of Shots: **5 shots**

12.13 inch
(308.1 mm)



Shot Sequence:	Shot 1	Shot 2	Shot 3	Shot 4	Shot 5
Impact Velocity (ft/sec) *:	880	883	879	867	871
Impact Energy (ft-lbs):	272	273	271	264	266
Impact Momentum (lb-sec.):	0.62	0.62	0.62	0.61	0.61
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	5.75	Average 6.03
B	6.00	
C	6.38	
D	6.00	Average 4.13
E	3.75	
F	4.25	
G	4.25	
H	4.25	

Witness Plate & Spall Result:

Witness plate material: **0.020 in. type 2024-T4 Aluminum foil alloy**
 Spall catch box: **Not required**
 Witness / Box Distance: **6.0 inches**
 Spall Occurrence: **No spall occurred**
 Test Temperature: **70 ° F**
 Test Date: **December 06, 2019**
 Pass / Fail Results: **Passed the Test**
 Comments: **CFR Reference for NIJ Level 1 Parts 1 & 2 (.22LR and .38 Special)**

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

Footnotes

* Velocity measurements were taken at a distance of 6.6 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 2 passed the National Institute of Justice 0108.01 NIJ I Part 2 (.38 Special RNL) Ballistic test. There was no complete penetration of the test sample from any of the .38 Special RNL caliber projectiles.

Witness Plate and Spall Effects:

No spall occurred or damage to the 0.020 in. type 2024-T4 Aluminum foil alloy witness plate was observed.

Photographs

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

Sample 2: MWGF-NIJ1 - D.O.M. November 14, 2019 - CFR NIJ I - NIJ I Part 2 - 12.13 x 12.13 x 0.440 in.



Sample 2 Post Test Impact Side



Sample 2 Post Test Rear Side

Test and Report Engineers

Tested and Reported by: **Sam Raheb**

Signature: *Sam Raheb*

Date: **December 6, 2019**