Architectural Testing

BREAK and ENTRY PERFORMANCE TEST REPORT

Report No.: C7770.01-201-44

Rendered to:

3M COMPANY
St. Paul, Minnesota

PRODUCT TYPE: Safety and Security Window Film

Test Date: 04/26/13
Report Date: 07/17/13

1.0 Report Issued To: 3M Company
Renewable Energy Division
St. Paul, Minnesota 55114

2.0 Test Laboratory: Architectural Testing, Inc.
849 Western Avenue North
St. Paul, Minnesota 55114
651-636-3835

3.0 Project Summary:

3.1 Product Type: Safety and Security Window Film
3.1.1 3M Ultra S600, 6 mil Microlayered Safety and Security Film
3.1.2 3M Safety S140, 14 mil Safety and Security Film
3.1.3 3M Safety S80, 8 mil Safety and Security Film

3.2 Scope: Testing involved methodical attacks by an adult male to an entry door system including sidelites. Objective of the testing was to simulate an attack by an intruder with a firearm as the primary device to gain access through a door entryway. Testing was performed per the direction of 3M personnel.

3.3 Test Dates: 04/26/2013

3.4 Test Record Retention End Date: All test records for this report will be retained until April 26, 2017.

3.5 Test Location: Architectural Testing, Inc. test facility in St. Paul, Minnesota.

3.6 Test Sample Source: The test specimens were provided by the client.

3.7 List of Official Observers:

Name	Company
Paul Neumann	3M Company
Billy Pettit	3M Company
Karl A. Lips-Eakins	Architectural Testing, Inc.
Eric J. Schoenthaler	Architectural Testing, Inc.

4.0 Test Specimen Description:

4.1 Test Specimen Description: The glazing that was tested was installed within a storefront entry system including two sidelites. The mockup consisted of a fully glazed outswing aluminum entry door with deadbolt and two fully glazed sidelites. The door size was 36" x 84" and the sidelites were 18" x 84". The glass remains consistent with 1/4" tempered glass with applied film as noted in the testing section.

5.0 Test #1: Handgun attack, baseball bat attack

5.1 Product Type: Safety and Security Window Film

5.2 Series/Model: 3M Safety S140, 14 mil Safety and Security Window Film

5.3 Film Attachment: 3M Impact Protection Profile flexible-mechanical attachment

5.4 Area of Attack: Sidelite

5.5 Conditioning Temperature: 21°C (70°F)

5.6 Result: A total of 2 minutes and 2 seconds elapsed before the attacker was able to gain access through door entryway system

Method of Attack	Number of Impacts/Shots	Time Elapsed (Seconds)	Note
Gunshots	4	0:00:03	1, 2
Upper Body Attack	3	0:00:01	3
Kicking	25	0:00:34	
Upper Body Attack	9	0:00:07	3
Kicking	3	0:00:05	
Upper Body Attack	7	0:00:04	3
Kicking	4	0:00:10	
Upper Body Attack	5	0:00:04	3
Kicking	7	0:00:13	
Upper Body Attack	11	0:00:09	3
Baseball bat	24	0:00:27	
Totals from above:			
Gunshots	4	0:00:08	1
Upper Body Attack	35	0:00:25	3
Kicking	39	0:01:02	
Baseball bat	24	0:00:27	
Total:	**102**	**0:02:02**	

Note 1: The handgun utilized was a Glock Model 23 in .40 S&W. The ammunition utilized was full metal jacket.

Note 2: Attempted attack with upper body after first shot.

Note 3: Upper body attack defined as a discrete attempt to push, pull, punch, rip or tear the glazing with hands, fists, or elbow.

6.0 Test #2: Handgun attack, no security film

6.1 Product Type: None

6.2 Series/Model: None

6.3 Film Attachment: No film was utilized

6.4 Area of Attack: Sidelite

6.5 Conditioning Temperature: 21°C (70°F)

6.6 Result: A total of 3 seconds elapsed before the attacker was able to gain access through door entryway system

Method of Attack	Number of Impacts/Shots	Time Elapsed (Seconds)	Note
Gunshots	1	**0:00:03**	1

Note 1: The handgun utilized was a Glock Model 23 in .40 S&W. The ammunition utilized was full metal jacketed.

7.0 Test #3: Handgun attack

7.1 Product Type: Safety and Security Window Film

7.2 Series/Model: 3M – 6 mil Microlayered Safety and Security Window Film

7.3 Film Attachment: 3M Impact Protection Profile flexible-mechanical attachment

7.4 Area of Attack: Sidelite

7.5 Conditioning Temperature: 21°C (70°F)

7.6 Result: A total of 30 seconds elapsed before the attacker was able to gain access through door entryway system

Method of Attack	Number of Impacts/Shots	Time Elapsed (Seconds)	Note
Gunshots	4	0:00:06	1, 2
Upper Body Attack	1	0:00:02	3
Kicking	8	0:00:09	
Upper Body Attack	5	0:00:04	3
Kicking	5	0:00:07	
Upper Body Attack	1	0:00:02	3, 4
Totals from above:			
Gunshots	4	0:00:06	1
Upper Body Attack	7	0:00:08	3
Kicking	13	0:00:16	
Total:	**24**	**0:00:30**	

Note 1: The handgun utilized was a Glock Model 23 in .40 S&W. The ammunition utilized was full metal jacket.

Note 2: Attempted attack with upper body after first shot.

Note 3: Upper body attack defined as a discrete attempt to push, pull, punch, rip or tear the glazing with hands, fists, or elbow.

Note 4: Attachment system failure. Not enough time allowed for attachment system adhesive bond to cure.

8.0 Test #4: Handgun attack

8.1 Product Type: Safety and Security Window Film

8.2 Series/Model: 3M – 6 mil Microlayered Safety and Security Window Film

8.3 Film Attachment: 3M Impact Protection Profile flexible-mechanical attachment

8.4 Area of Attack: Sidelite

8.5 Conditioning Temperature: 21°C (70°F)

8.6 Result: A total of 58 seconds elapsed before the attacker was able to gain access through door entryway system

Method of Attack	Number of Impacts/Shots	Time Elapsed (Seconds)	Note
Gunshots	4	0:00:05	1, 2
Kicking	9	0:00:13	
Upper Body Attack	1	0:00:07	3
Kicking	4	0:00:04	
Upper Body Attack	1	0:00:02	3
Kicking	2	0:00:04	
Upper Body Attack	8	0:00:04	3
Kicking	8	0:00:19	
Totals from above:			
Gunshots	4	0:00:05	1
Upper Body Attacks	11	0:00:13	3
Kicking	23	0:00:40	
Total:	**38**	**0:00:58**	

Note 1: The handgun utilized was a Glock Model 23 in .40 S&W. The ammunition utilized was full metal jacket.

Note 2: Attempted attack with upper body after first shot.

Note 3: Upper body attack defined as a discrete attempt to push, pull, punch, rip or tear the glazing with hands, fists, or elbow.

9.0 Test #5: Semi-automatic rifle attack

9.1 Product Type: Safety and Security Film

9.2 Series/Model: 3M – 14 mil Safety and Security Window Film

9.3 Film Attachment: Flexible-mechanical attachment

9.4 Area of Attack: Door

9.5 Conditioning Temperature: 21°C (70°F)

9.6 Result: A total of 1 minute, 46 seconds elapsed before the attacker was able to gain access through door entryway system

Method of Attack	Number of Impacts/Shots	Time Elapsed (Seconds)	Note
Gunshots	4	0:00:06	1, 2
Upper Body Attack	8	0:00:08	3
Kicking	42	0:00:59	
Simulated rifle attack	24	0:00:27	4
Upper Body Attack	3	0:00:06	3
Totals from above:			
Gunshots	4	0:00:06	1
Upper Body Attack	11	0:00:14	3
Kicking	42	0:00:59	
Simulated rifle attack	24	0:00:27	4
Total:	**81**	**0:01:46**	

Note 1: The rifle utilized was a Rock River Arms AR-15 in .223 caliber. The ammunition utilized was ballistic tipped.

Note 2: Attempted pushing glazing after first shot.

Note 3: Upper body attack defined as a discrete attempt to push, pull, punch, rip or tear the glazing with hands, fists, or elbow.

Note 4: Simulated rifle attack consisted of direct impact with a nine pound galvanized steel pipe in the shape of a rifle.

10.0 Test #6: Semi-automatic rifle attack

10.1 Product Type: Safety and Security Film

10.2 Series/Model: 3M – 6 mil Microlayered Safety and Security Window Film

10.3 Film Attachment: 3M Impact Protection Profile flexible-mechanical attachment

10.4 Area of Attack: Sidelite

10.5 Conditioning Temperature: 21°C (70°F)

10.6 Result: A total of 44 seconds elapsed before the attacker was able to gain access through door entryway system.

Method of Attack	Number of Impacts/Shots	Time Elapsed (Seconds)	Note
Gunshots	4	0:00:09	1, 2
Kicking	9	0:00:11	
Upper Body Attack	4	0:00:03	3
Kicking	4	0:00:06	
Upper Body Attack	8	0:00:08	3
Kicking	1	0:00:07	
Totals from above:			
Gunshots	4	0:00:09	1
Upper Body Attack	12	0:00:11	3
Kicking	14	0:00:24	
Total:	**30**	**0:00:44**	

Note 1: The rifle utilized was a Rock River Arms AR-15 in .223 caliber. The ammunition utilized was ballistic tipped.

Note 2: Attempted pushing glazing after first shot.

Note 3: Upper body attack defined as a discrete attempt to push, pull, punch, rip or tear the glazing with hands, fists, or elbow.

11.0 Test #7: Baseball bat attack

11.1 Product Type: Safety and Security Film

11.2 Series/Model: 3M – 6 mil Microlayered Safety and Security Window Film

11.3 Film Attachment: 3M Impact Protection Profile flexible-mechanical attachment

11.4 Area of Attack: Sidelite

11.5 Conditioning Temperature: 21°C (70°F)

11.6 Result: A total of 28 seconds elapsed before the attacker was able to gain access through door entryway system

Method of Attack	Number of Impacts	Time Elapsed (Seconds)	Note
Baseball bat	**28**	**0:00:36**	

12.0 Test #8: Semi-automatic rifle attack, no film attachment system

12.1 Product Type: Safety and Security Film

12.2 Series/Model: 3M – 8 mil Safety and Security Window Film

12.3 Film Attachment: NONE

12.4 Area of Attack: Sidelite

12.5 Conditioning Temperature: 21°C (70°F)

12.6 Result: A total of 5 seconds elapsed before the attacker was able to gain access through door entryway system

Method of Attack	Number of Impacts/Shots	Time Elapsed (Seconds)	Note
Gunshots	1	0:00:01	1
Kicking	1	0:00:02	
Upper Body Attack	1	0:00:02	2
Total:	**3**	**0:00:05**	

Note 1: The rifle utilized was a Rock River Arms AR-15 in .223 caliber. The ammunition utilized was ballistic tipped.

Note 2: Upper body attack defined as a discrete attempt to push, pull, punch, rip or tear the glazing with hands, fists, or elbow.

13.0 Test #9: Claw hammer attack

13.1 Product Type: Safety and Security Film

13.2 Series/Model: 3M – 6 mil Microlayered Safety and Security Window Film

13.3 Film Attachment: Flexible-mechanical attachment

13.4 Area of Attack: Door

13.5 Conditioning Temperature: 21°C (70°F)

13.6 Result: A total of 11 seconds elapsed before the attacker was able to unlock door; and an additional 22 seconds elapsed before the attacker was able walk through the security glazing.

Method of Attack	Number of Impacts	Time Elapsed (Seconds)	Note
Hammer	5	0:00:11	1
Hammer	12	0:00:12	
Upper Body Attack	4	0:00:03	2
Hammer	3	0:00:02	
Kicking	1	0:00:05	3
Totals from above:			
Hammer	20	0:00:09	
Upper Body Attack	4	0:00:11	
Kicking	1	0:00:24	
Total:	**25**	**0:00:33**	

Note 1: Able to unlock door and gain entry.

Note 2: Upper body attack defined as a discrete attempt to push, pull, punch, rip or tear the glazing with hands, fists, or elbow

Note 3: Able to walk through opening created.

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period.

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For ARCHITECTURAL TESTING, Inc.

Digitally Signed by: Eric Schoenthaler

Eric J. Schoenthaler
Project Manager

Digitally Signed for: Daniel A Johnson by Jan Brustad

Daniel A. Johnson
Director – Regional Operations

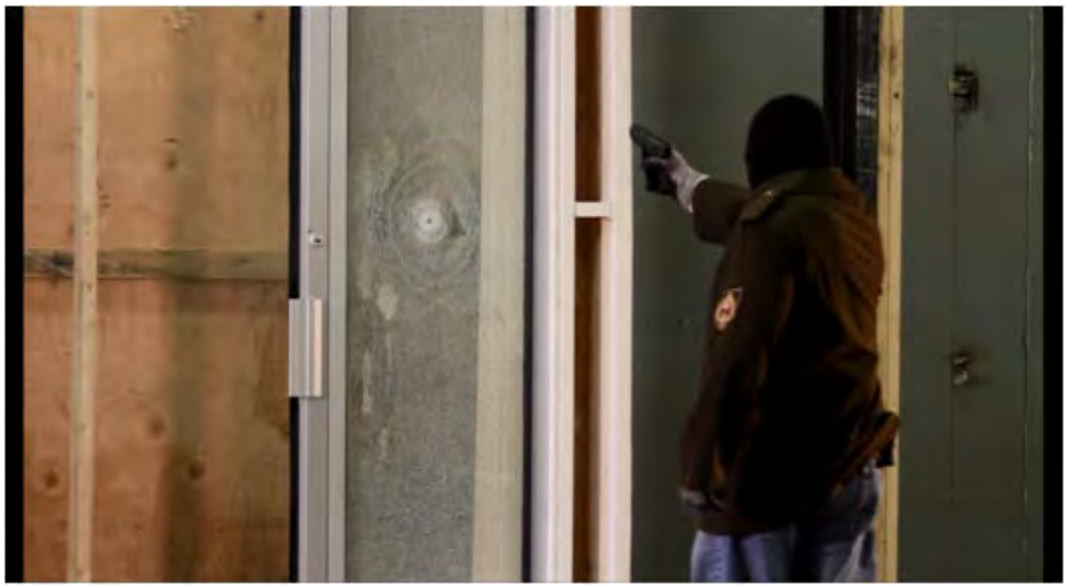
EJS/jb

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Photographs (15 pages)

Appendix A

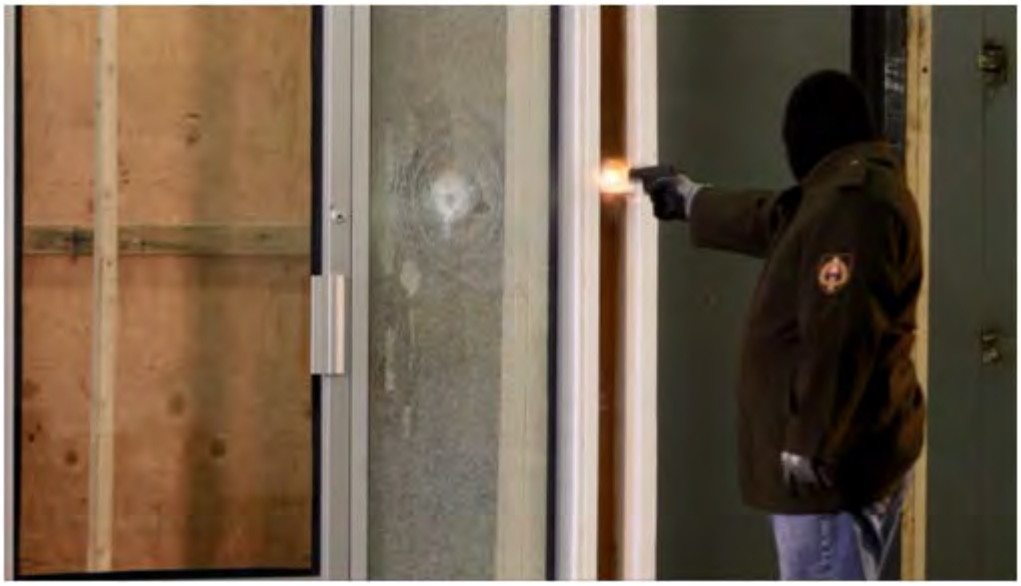
Photographs

Photo No. 1



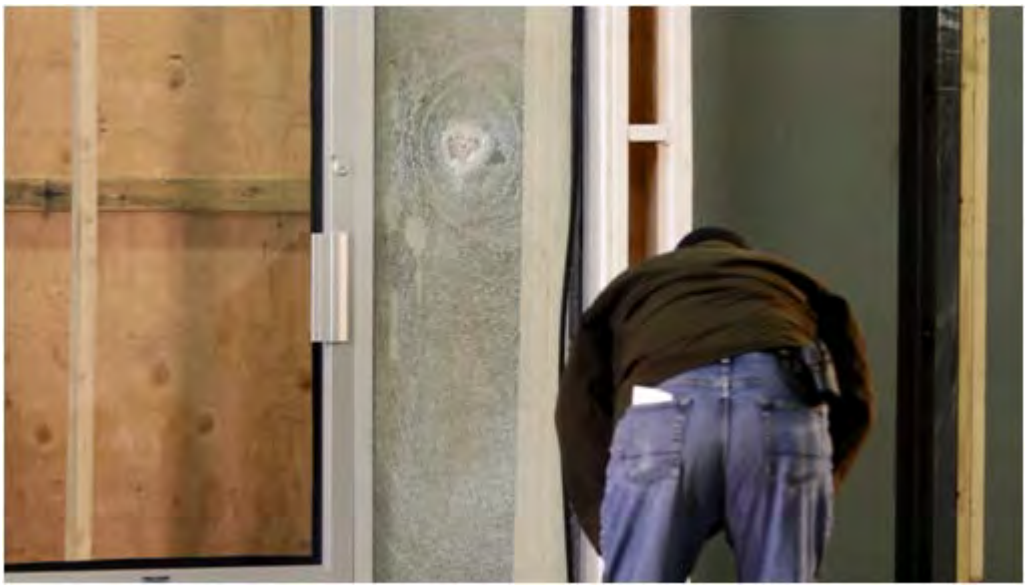
Test #1: Handgun attack, 3M Safety S140 (14-mil Security Film).

Photo No. 2



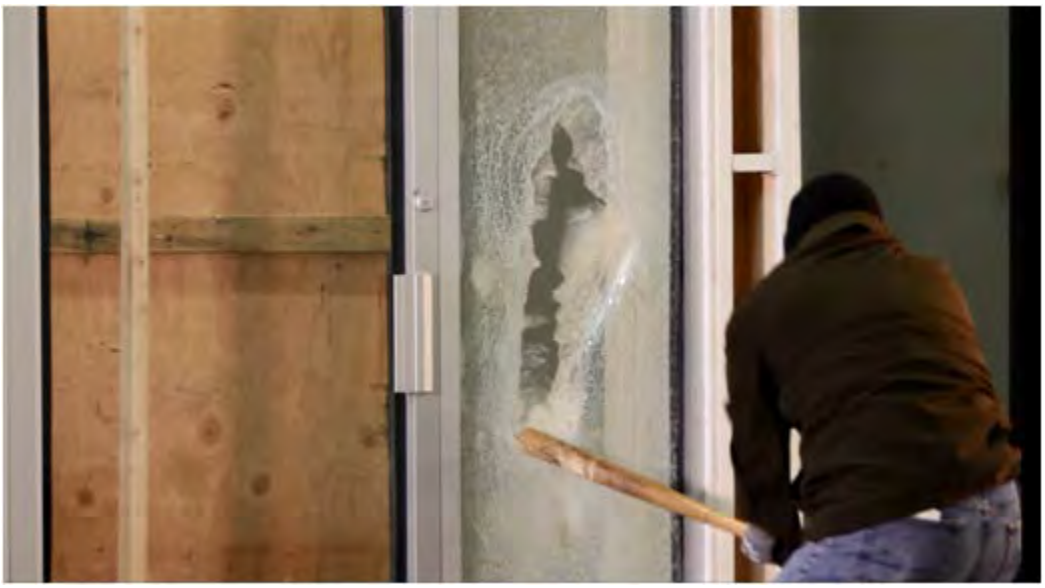
Test #1: Handgun attack, 3M Safety S140 (14-mil Security Film). After 4 gun shots.

Photo No. 3



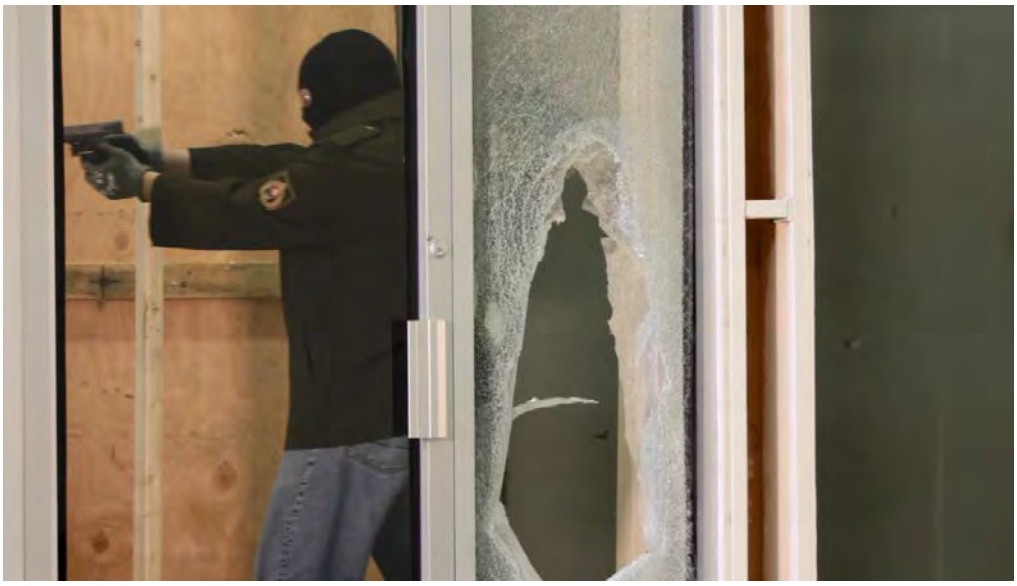
Test #1: Handgun attack, 3M Safety S140 (14-mil Security Film). After 4 gun shots, 35 upper body attacks, 39 kicking attempts. Total time elapsed was 95 seconds.

Photo No. 4



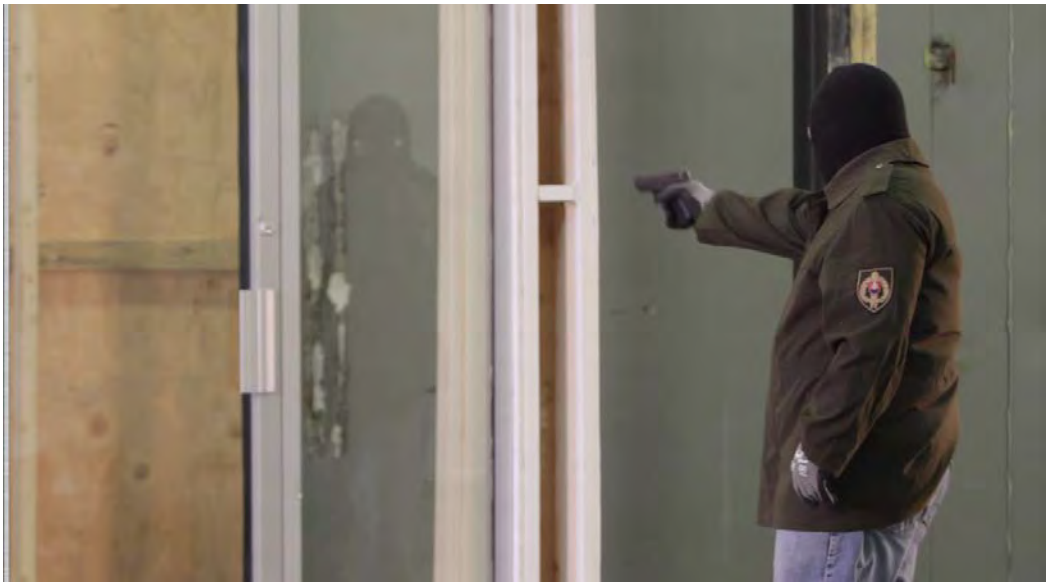
Test #1: Handgun attack, 3M Safety S140 (14-mil Security Film). Attack with baseball bat.

Photo No. 5



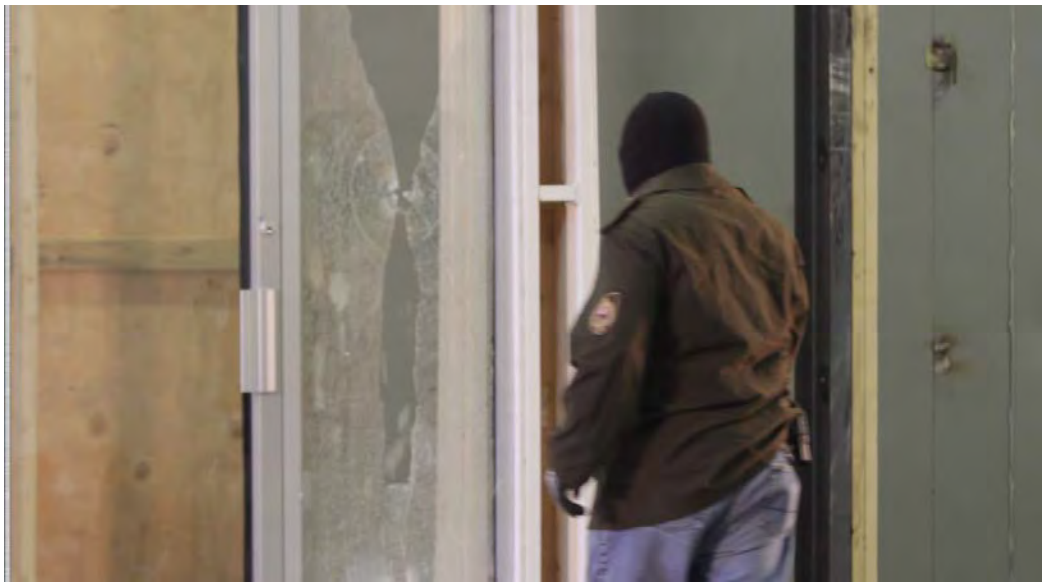
Test #1: Handgun attack, 3M Safety S140 (14-mil Security Film). Access after 4 gun shots, 35 upper body attacks, 39 kicking attempts, 24 impacts with baseball bat. Total time elapsed was 122 seconds.

Photo No. 6



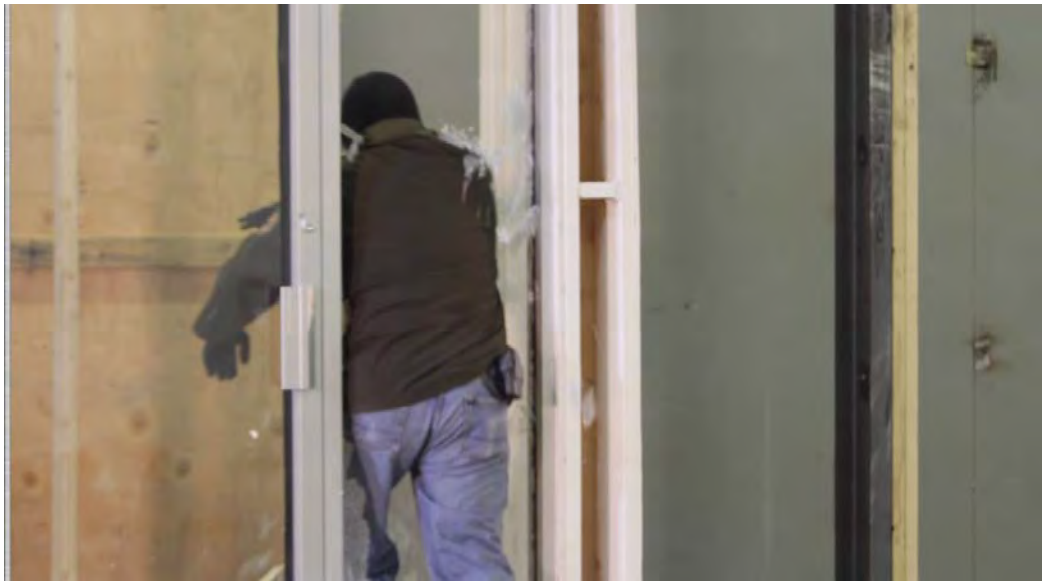
Test #2: Handgun attack, no security film.

Photo No. 7



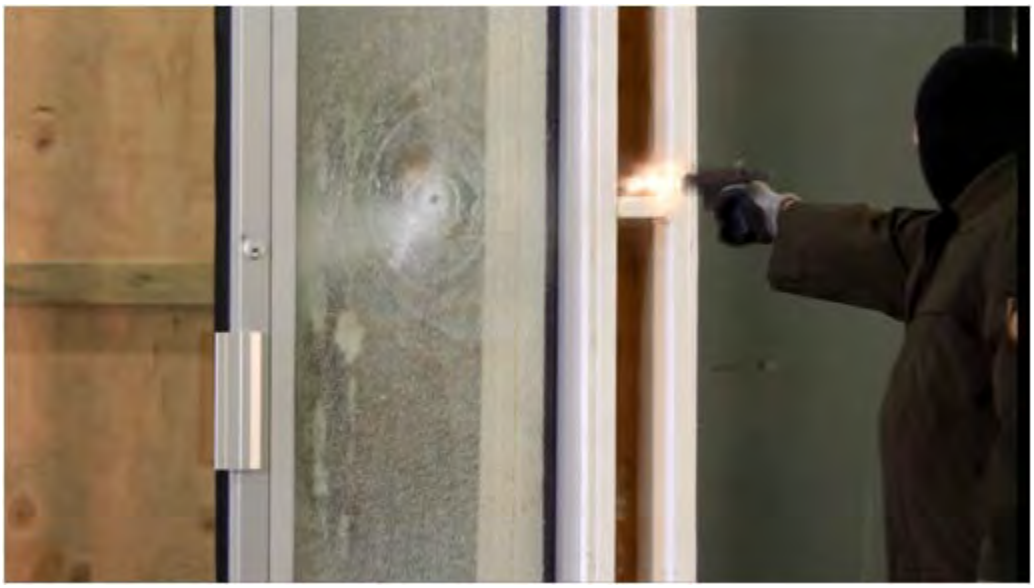
Test #2: Handgun attack, no security film. After 1 gun shot.

Photo No. 8



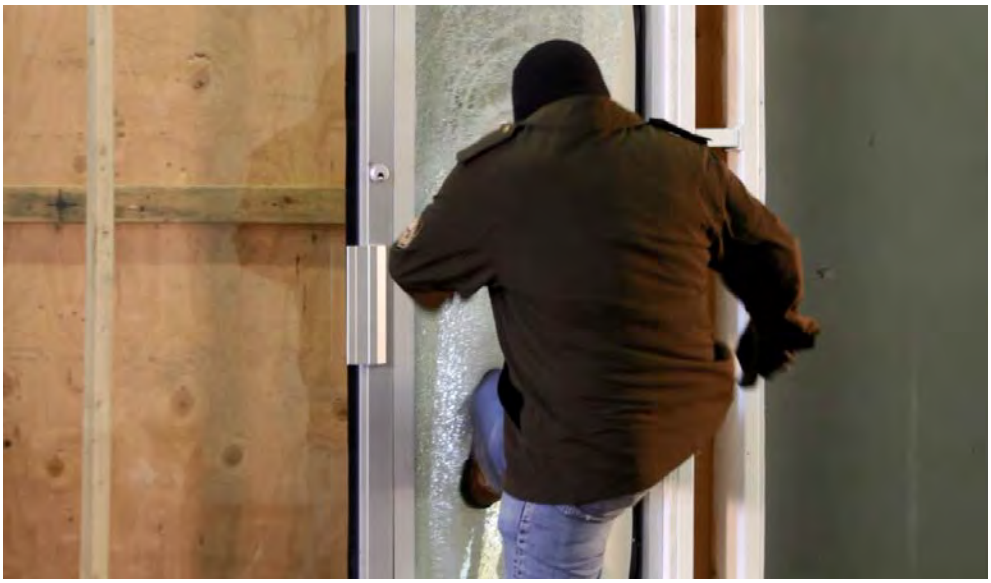
Test #2: Handgun attack, no security film. Access after 3 seconds.

Photo No. 9



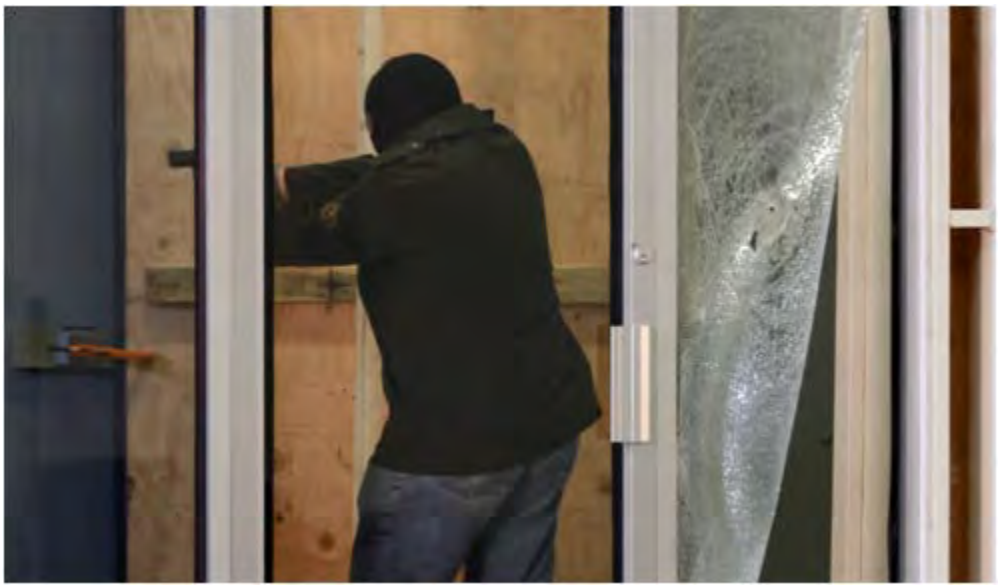
Test #3: Handgun attack, 3M Ultra S600.

Photo No. 10



Test #3: Handgun attack, 3M Ultra S600. Attachment System failure in lower right corner at 28 seconds.

Photo No. 11

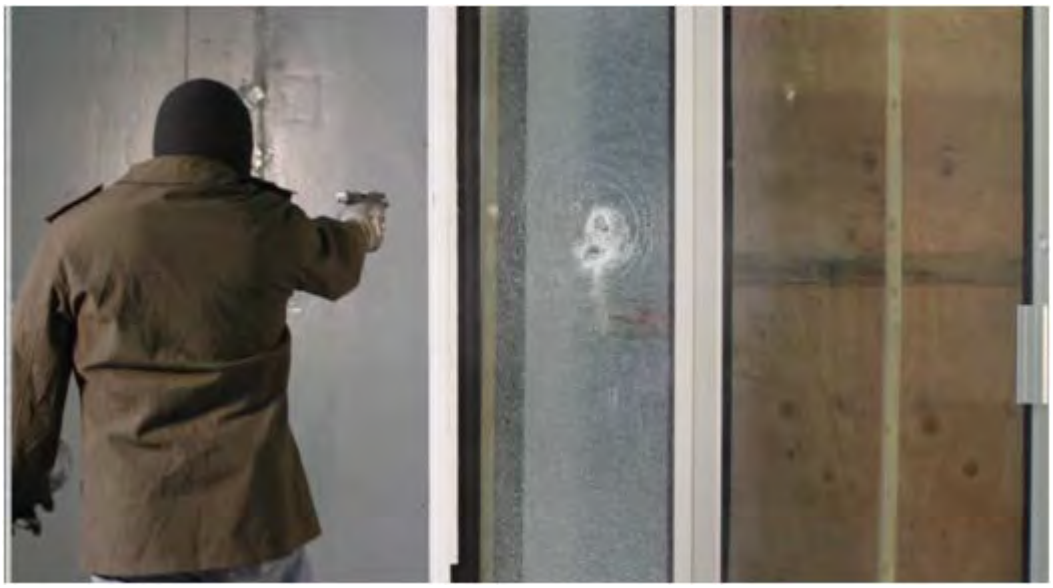


Test #3: Handgun attack, 3M Ultra S600. Access after 30 seconds.

Photo No. 12

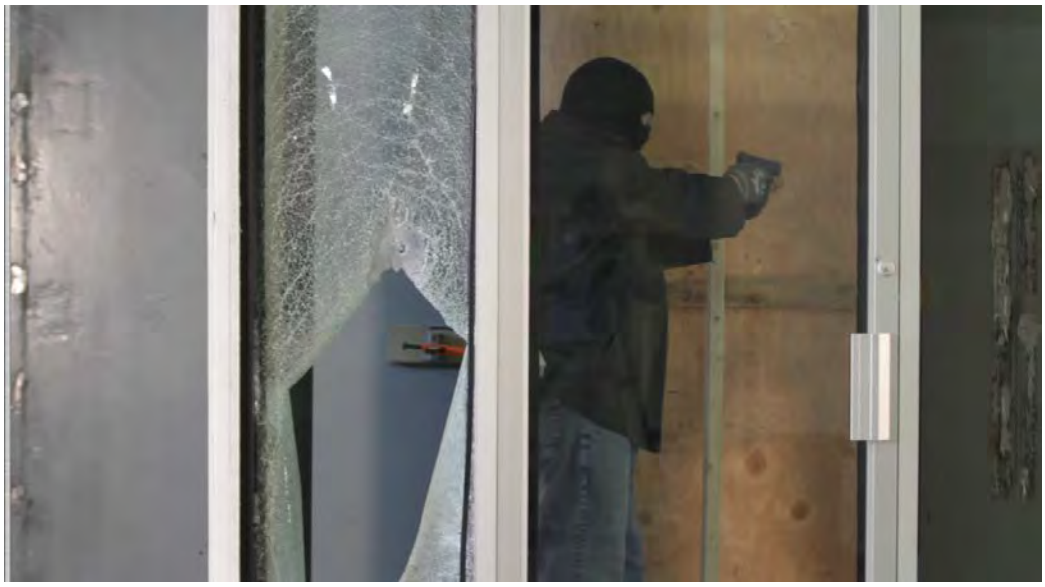
Test #4: Handgun attack, 3M 6-mil microlayered film.

Photo No. 13



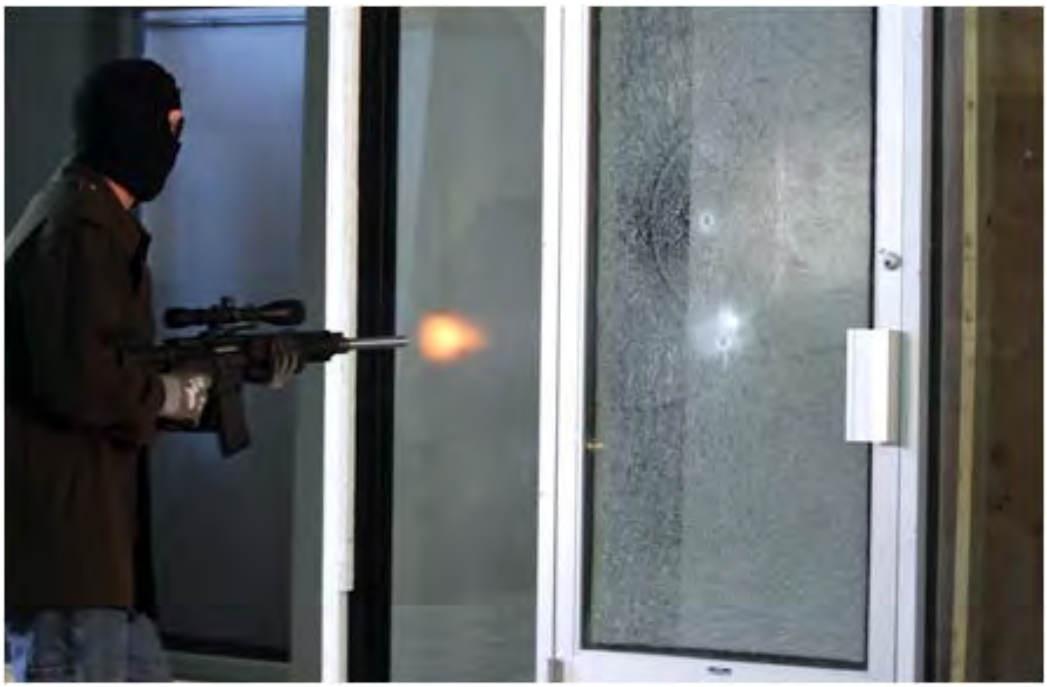
Test #4: Handgun attack, 3M 6-mil microlayered film. After 4 gun shots.

Photo No. 14



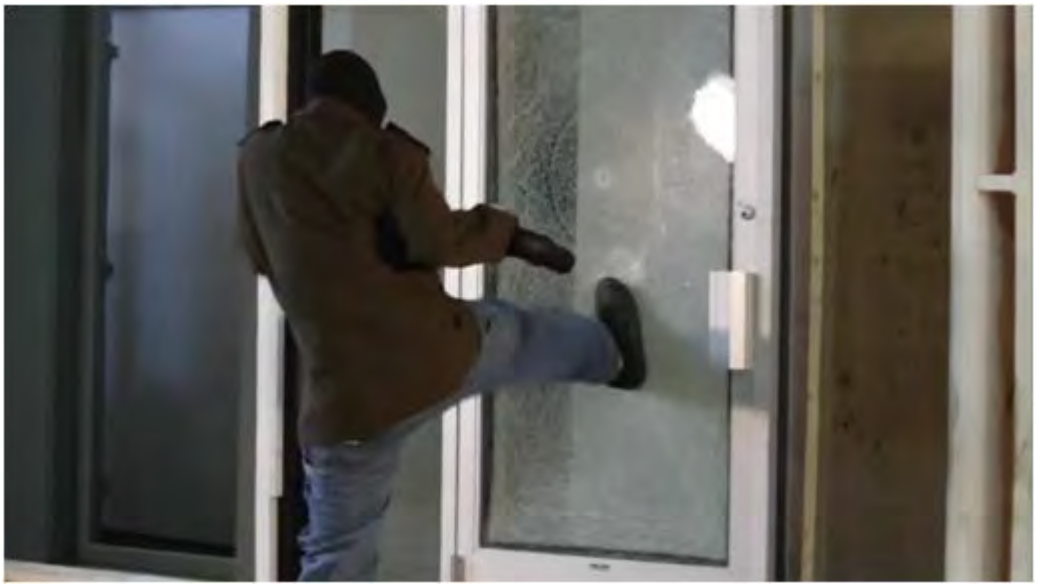
Test #4: Handgun attack, 3M 6-mil microlayered film. Access after 4 gun shots, 11 upper body attacks, 23 kick attempts. Total time elapsed was 58 seconds.

Photo No. 15



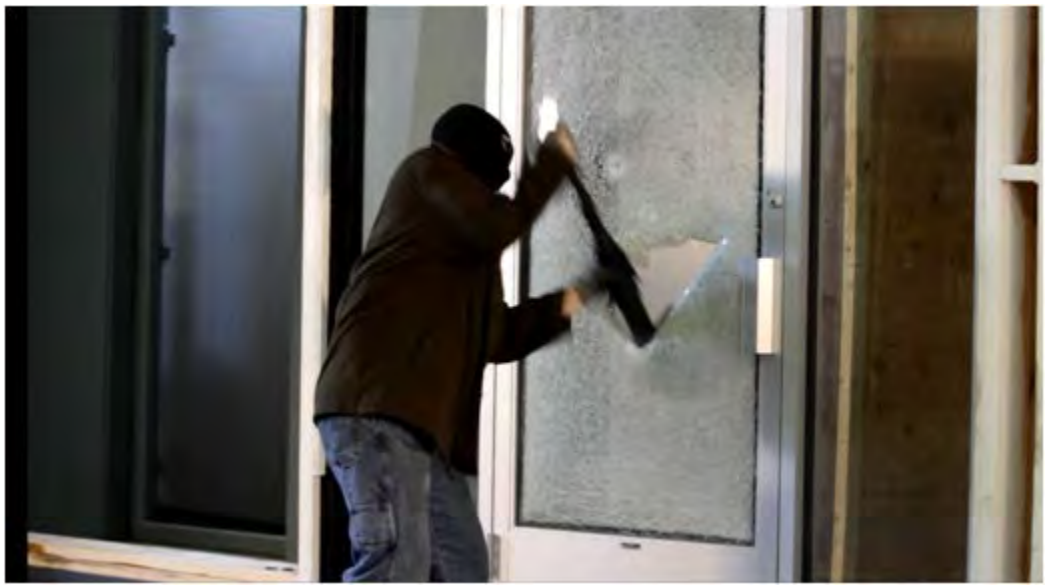
Test #5: Semi-automatic rifle attack, 3M Safety S140 (14-mil Security Film). After 4 gunshots.

Photo No. 16



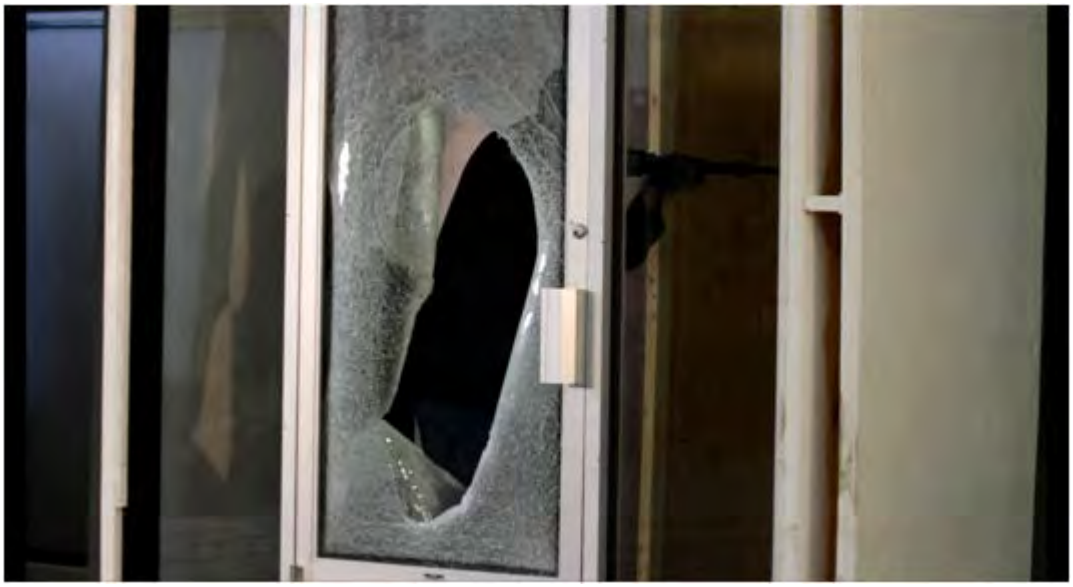
Test #5: Semi-automatic rifle attack, 3M Safety S140 (14-mil Security Film). Kick attempts after 4 gunshots.

Photo No. 17



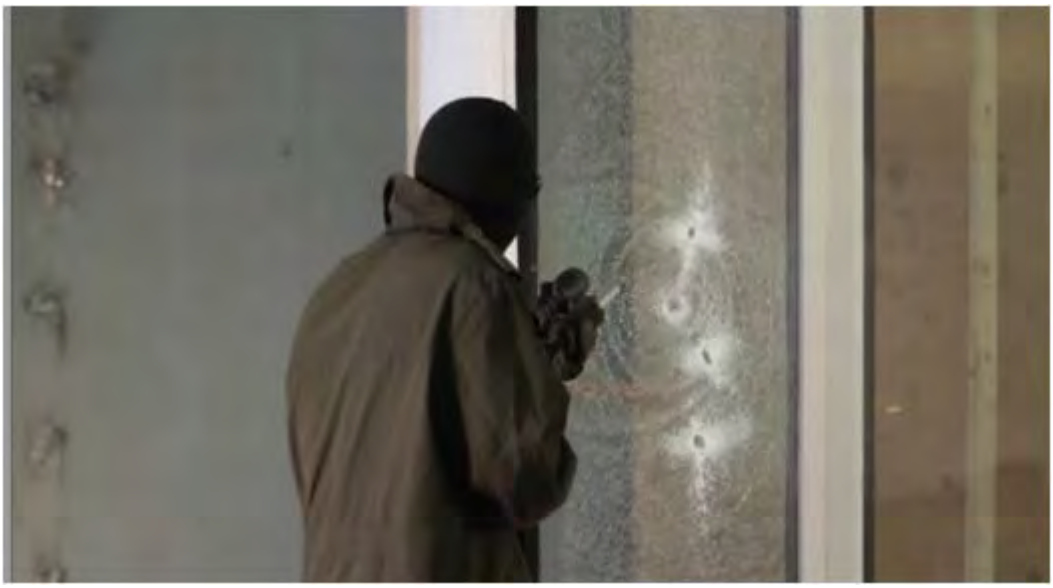
Test #5: Semi-automatic rifle attack, 3M Safety S140 (14-mil Security Film). Simulated rifle attack, using 9-lb steel pipe.

Photo No. 18



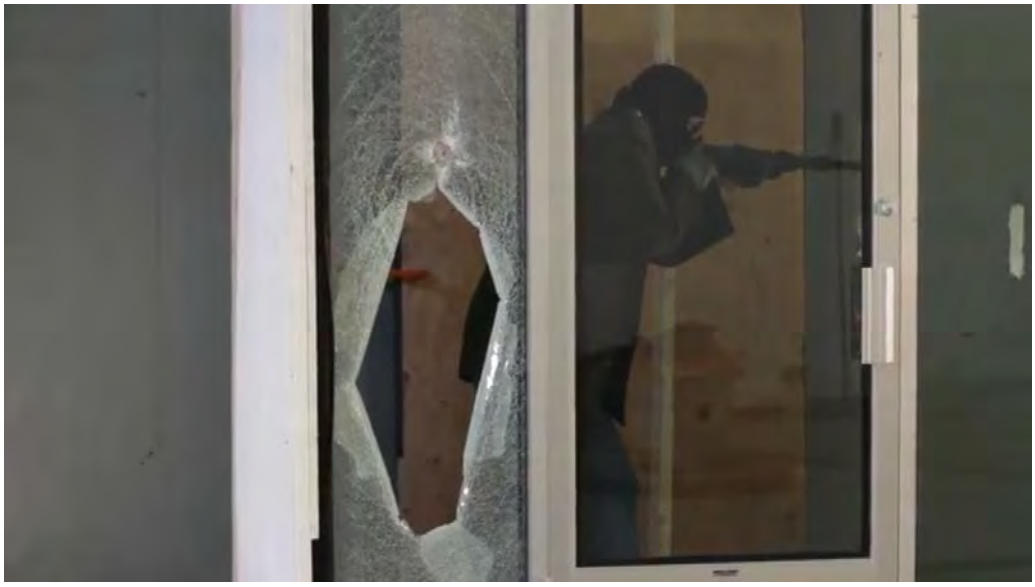
Test #5: Semi-automatic rifle, 3M Safety S140 (14-mil Security Film). Access after 4 gun shots, 11 upper body attacks, 42 kicking attempts, 24 impacts with 9-lb steel pipe. Total time elapsed was 106 seconds.

Photo No. 19



Test #6: Semi-automatic rifle attack, 3M 6-mil microlayered film. After 4 gunshots.

Photo No. 20

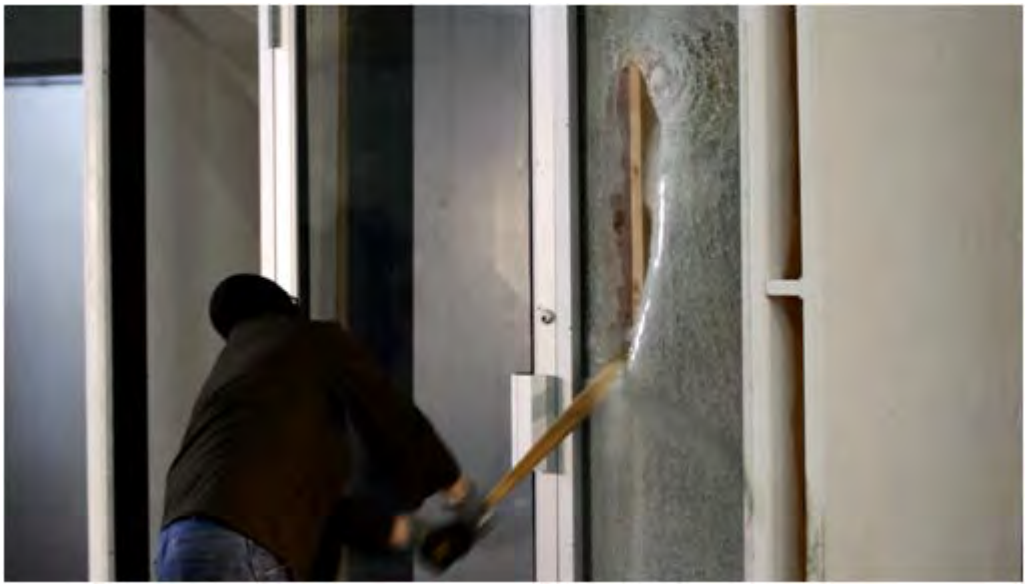


Test #6: Semi-automatic rifle attack, 3M 6-mil microlayered film. Access after 4 gun shots, 12 upper body attacks, 14 kick attempts. Total time elapsed was 44 seconds.

Photo No. 21

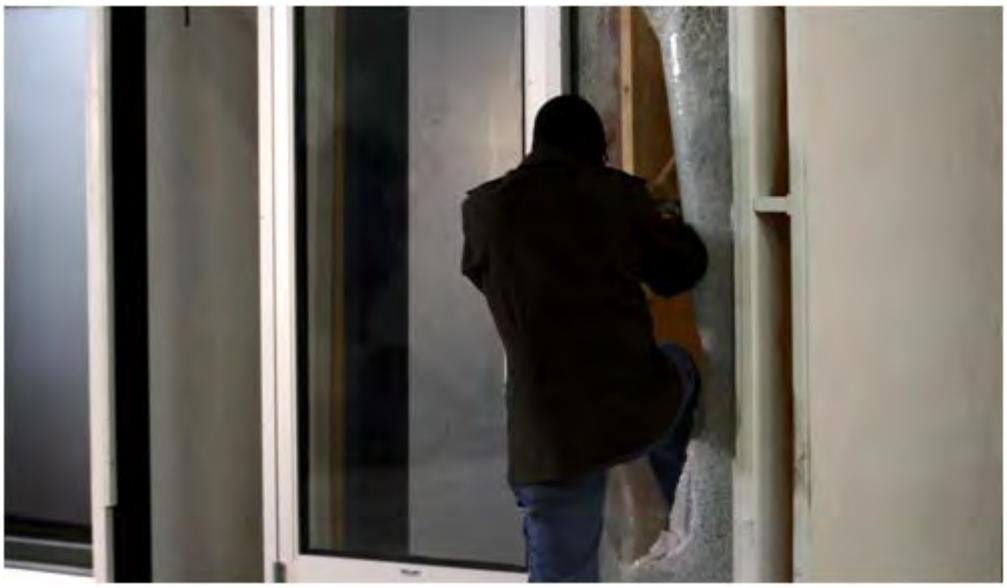
Test #7: Baseball bat attack, 3M 6-mil microlayered film.

Photo No. 22



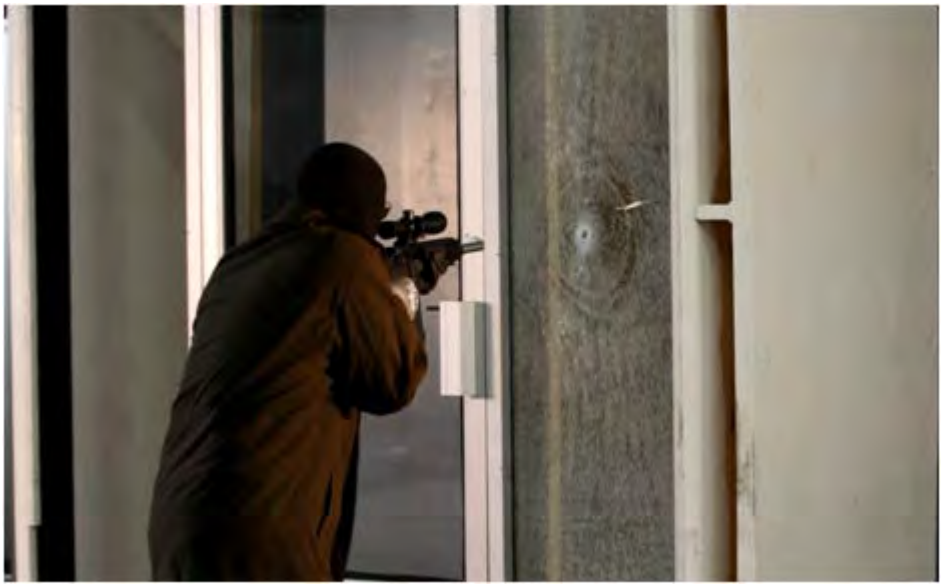
Test #7: Baseball bat attack, 3M 6-mil microlayered film.

Photo No. 23



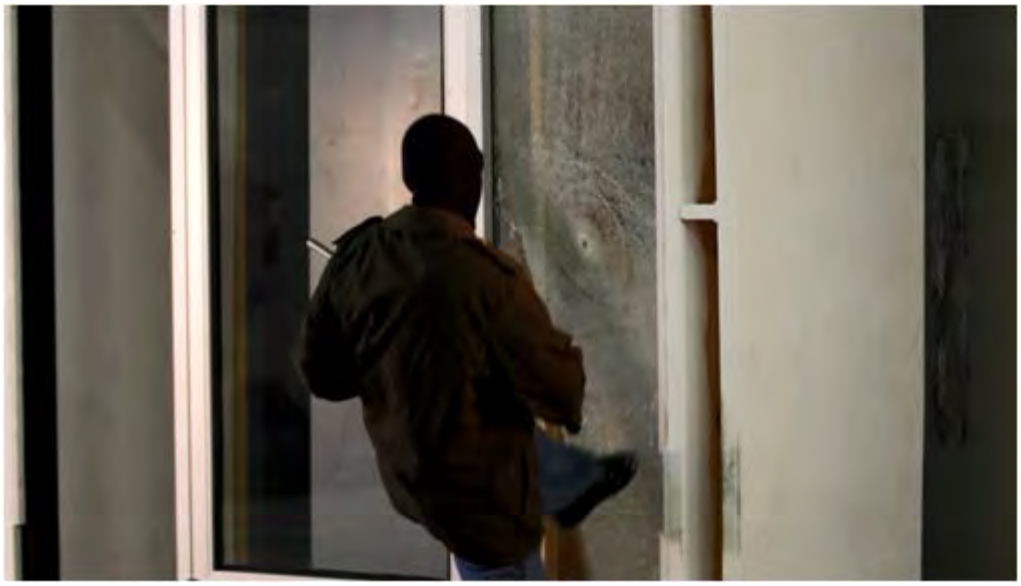
Test #7: Baseball bat attack, 3M 6-mil microlayered film. Access after 28 impacts. Total time elapsed was 28 seconds.

Photo No. 24



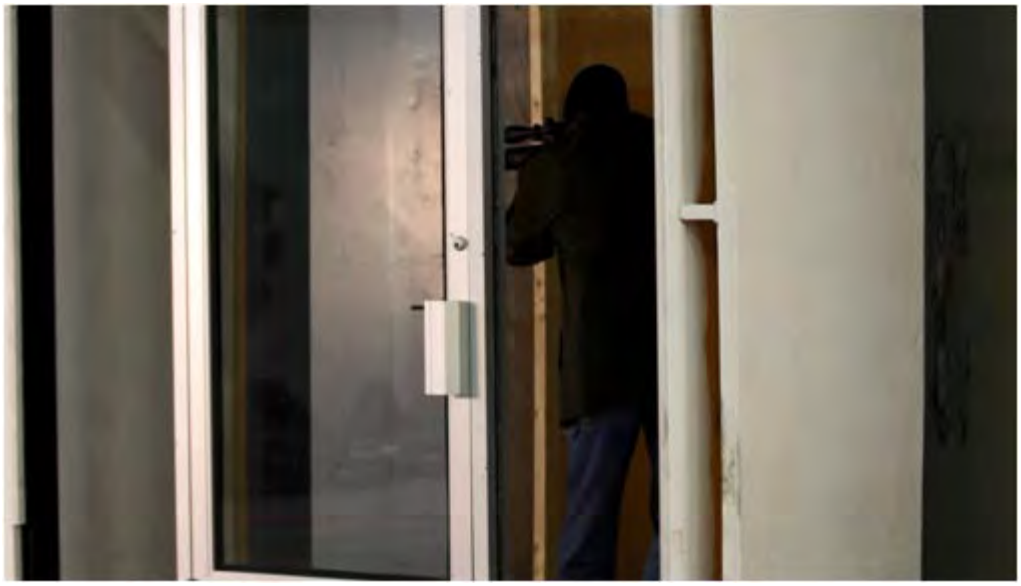
Test #8: Semi-automatic rifle attack, 3M 6-mil microlayered film.

Photo No. 25



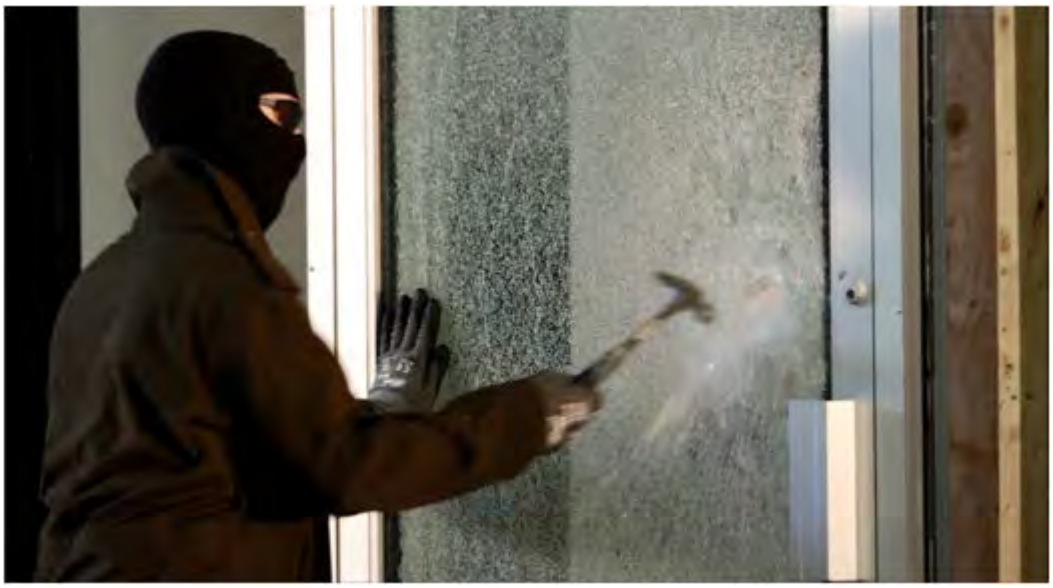
Test #8: Semi-automatic rifle attack, 3M 8 mil Safety Film, NO ATTACHMENT. Glazing pulled away from frame after 1 shot and 1 kick attempt. Total time elapsed was 2 seconds.

Photo No. 26



Test #8: Semi-automatic rifle attack, 3M 8 mil Safety Film, NO ATTACHMENT. Complete opening in sidelight window and access after 5 seconds.

Photo No. 27

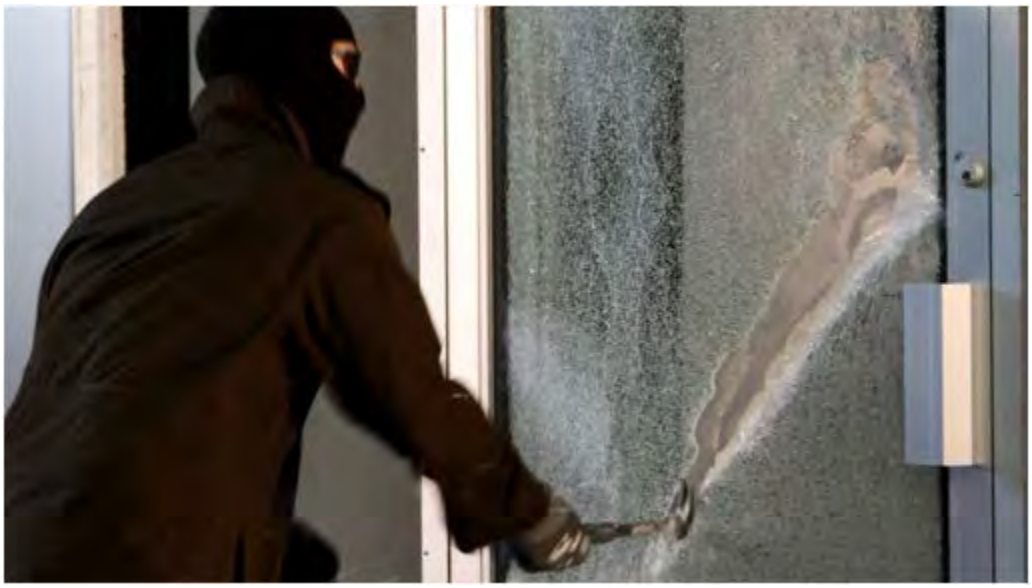


Test #9: Claw hammer attack, 3M 6-mil microlayered film.

Photo No. 28

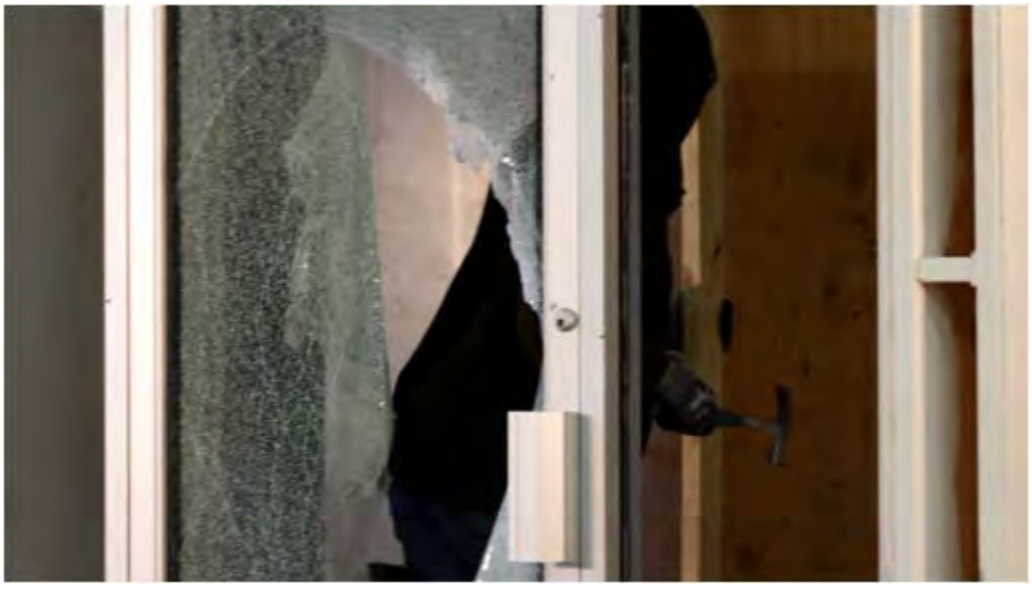
Test #9: Claw hammer attack, 3M 6-mil microlayered film. Able to unlock door after 11 seconds.

Photo No. 29



Test #9: Claw hammer attack, 3M 6-mil microlayered film. Continued attack after unsuccessful attempt to unlock door.

Photo No. 30



Test #9: Claw hammer attack, 3M 6-mil microlayered film. Continued attack after unsuccessful attempt to unlock door. Access after 33 seconds.