

PROJECT NUMBER: 383-0088

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**PATZIG TESTING LABORATORIES**  
3922 Delaware Avenue  
Des Moines, Iowa 50313-2597

**REPORT OF CPSC TESTS ON  
Safety Glazing Material For Use In Buildings  
Various Roll Nos. On 1/4 inch and 1/8 inch Glass**

Prepared for:  
**3M COMPANY**  
Attn: Stephen Strauss  
Construction Materials Department  
Building 207-1 W-08  
St. Paul, MN 55144

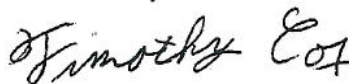
Client Purchase Order Number:

Prepared by:



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The test results contained in this report pertain only to the samples submitted for testing and not necessarily to all similar products.



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**INTRODUCTION:**

This report presents the results of impact tests conducted on an architectural glazing construction of 3M High Performance Window Film applied to annealed glass. This testing was performed in accordance with the Code of Federal Regulations 16, Chapter II, Consumer Product Safety Commission, Part 1201 - Safety Standard for Architectural Glazing Materials (January '98 Revision). This work was authorized by Steve Strauss of 3M Company. Samples were received on March 28, 2003 with the work conducted from April 3, 2003 to April 11, 2003.

**TEST RESULTS SUMMARY:**

- 39 of 52 samples comply with CPSC Part 1201 when applied to nominal 1/4inch - See pages 3-7
- 4 of 4 samples comply with CPSC Part 1201 when applied to nominal 1/8inch - See page 7

**DESCRIPTION OF SAMPLES:**

Fifty-six (56) specimens of 34x76inch dimension were supplied for testing impact resistance. The samples consisted of nominal 1/4inch and nominal 1/8inch clear glass with 3M High Performance Film professionally applied to one side and allowed to cure. All samples were prepared prior to delivery to the laboratory.

**TEST METHODS: (CPSC 1201.4)**

**Impact Test**

Specimens were kept at a temperature of 70-80°F for a minimum of four hours preceding the test. Specimens were placed alternately with the film facing the impact and opposite of the impact as shown below. Each specimen was struck once within 1/2inch of center, with a shot bag constructed in accordance with the specifications referenced, swinging in a pendulum arc, from a drop height shown below.

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DATE: April 11, 2003**RESULTS:**

On 1/4" Glass				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
1 (CPSC) 3014-011	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
2 (CPSC) 3014-15	Glass	0.227	48	Glass Broke, Bag Passed Through Glass and Film, Tore Full Width.
3 (CPSC) 1354-05	Film	0.230	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
4 (CPSC) 1354-05	Glass	0.231	48	Glass Broke, Completely Removed From Frame, No Opening In Film
5 (CPSC) 1354-05	Film	0.231	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
6 (CPSC) 1354-05	Glass	0.231	48	Glass Broke, No Opening In Film.
7 (CPSC) 3014-012	Film	0.227	48	Glass Broke, Bag Passed Completely Through Glass and Film.
8 (CPSC) 3038-07	Glass	0.227	48	Glass Broke, 5 inch Tear in Film – 4lb. Ball Would Not Pass Through
9 (CPSC) 3038-07	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
10 (CPSC) 3038-07	Glass	0.227	48	Glass Broke, No Opening In Film.
11 (CPSC) 3038-08	Film	0.228	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
12 (CPSC) 3038-08	Glass	0.226	48	Glass Broke, No Opening In Film.



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On 1/4" Glass				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
13 (CPSC) 3014-15	Film	0.227	48	Glass Broke, 9 Inch Tear In Film – 4lb. Ball Would Not Pass Through
14 (CPSC) 3014-15	Glass	0.227	48	<b>Glass Broke, Bag Passed Completely Through Glass and Film.</b>
15 (CPSC) 3014-15	Film	0.225	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
16 (CPSC) 3014-15	Glass	0.226	48	Glass Broke, No Opening In Film.
17 (CPSC) 3014-15	Film	0.226	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
18 (CPSC) 3014-15	Glass	0.227	48	<b>Glass Broke, Bag Passed Through Glass and Film, Tore Full Width.</b>
19 (CPSC) 3014-15	Film	0.225	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
20 (CPSC) 3014-15	Glass	0.226	48	<b>Glass Broke, Bag Passed Completely Through Glass and Film.</b>
21 (CPSC) 3014-15	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
22 (CPSC) 3038-08	Glass	0.227	48	<b>Glass Broke, Bag Passed Completely Through Glass and Film.</b>
23 (CPSC) 3038-08	Film	0.228	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
24 (CPSC) 3038-08	Glass	0.226	48	Glass Broke, No Opening In Film.
25 (CPSC) 3038-08	Film	0.228	48	Glass Broke, Completely Removed From Frame, No Opening In Film.

RESULTS:

On 1/4" Glass				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
26 (CPSC) 3038-08	Glass	0.228	48	Glass Broke, No Opening In Film.
27 (CPSC) 3038-08	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
28 (CPSC) 3038-08	Glass	0.229	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
29 (CPSC) 3038-07	Film	0.228	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
30 (CPSC) 3038-07	Glass	0.228	48	Glass Broke, No Opening In Film
31 (CPSC) 3038-07	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
32 (CPSC) 3038-07	Glass	0.228	48	Glass Broke, 6 Inch Tear In Film – 4lb. Ball Would Not Pass Through
33 (CPSC) 3038-07	Film	0.228	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
34 (CPSC) 3038-07	Glass	0.228	48	Glass Broke, No Opening In Film
35 (CPSC) 3014-012	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
36 (CPSC) 3014-012	Glass	0.227	48	Glass Broke, Tear In Film From Impact Point To Edge Of Glass
37 (CPSC) 3014-012	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
38 (CPSC) 3014-012	Glass	0.227	48	Glass Broke, Tear In Film, 4lb. Ball Did Pass Through



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**RESULTS:**

On 1/4" Glass				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
39 (CPSC) 3014-012	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
40 (CPSC) 3014-012	Glass	0.227	48	<b>Glass Broke, 20 x 10 1/2" Opening In Film</b>
41 (CPSC) 3014-012	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
42 (CPSC) 3014-012	Glass	0.227	48	<b>10" Tear In Film, Pulled From Mid Right And Left Side. Ball Passed Through</b>
43 (CPSC) 3014-012	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
44 (CPSC) 3014-011	Glass	0.227	48	9" Opening In Film, Completely Removed From The Frame, Ball Did Not Pass Through
45 (CPSC) 3014-011	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
46 (CPSC) 3014-011	Glass	0.227	48	8" Tear In Film, Completely Removed From The Frame, Ball Did Not Pass Through
47 (CPSC) 3014-011	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
48 (CPSC) 3014-011	Glass	0.225	48	<b>Glass Broke, Bag Passed Through Glass and Film, Tore Full Width.</b>
49 (CPSC) 3014-011	Film	0.227	48	Glass Broke, Completely Removed From Frame, No Opening In Film
50 (CPSC) 3014-011	Glass	0.228	48	<b>Glass Broke, Bag Passed Completely Through 16" Tear x 24" Tear In Film, 4lb Ball Passed Through</b>

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**RESULTS:**

On 1/4" Glass				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
51 (CPSC) 3014-011	Film	0.228	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
52 (CPSC) 3014-011	Glass	0.228	48	Glass Broke, Tore Film Full Width, Bag Passed Completely Through Glass And Film
On 1/8" Glass				
1 (CPSC) 1354-05	Film	0.126	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
2 (CPSC) 1354-05	Glass	0.126	48	Glass Broke, No Opening In Film.
3 (CPSC) 1354-05	Film	0.126	48	Glass Broke, Completely Removed From Frame, No Opening In Film.
4 (CPSC) 1354-05	Glass	0.126	48	Glass Broke, Completely Removed From Frame, No Opening In Film.

**REMARKS:**

The applicable portion of 1201.4 referenced for interpretation of results follow:

(1) A glazing material may be qualified for use in both Category I and Category II products if it meets the impact requirements for Category II. A glazing material shall be judged to pass the impact test if the specimen tested meets the criteria below.

(i) When breakage occurs (numerous cracks and fissures may occur) no opening shall develop in the test sample through which a 3 inch (76 millimeter) diameter solid steel sphere, weighing 4 pounds  $\pm$  3 oz (1.81  $\pm$  0.08 kilograms), passes when placed (not dropped) in the opening and permitted to remain for a period of one second. For this criterion, the sample after being impacted shall be placed, while remaining in the subframe, in a horizontal, impact side up position with a minimum of one foot (31 centimeters) of free space immediately beneath the specimen.

**SAMPLE DISPOSAL:**

All representative pieces of these samples will be discarded thirty days from the date on this report unless further instructed by the client.



**To: Tim Cox @ Stork Patzig Testing Des Moines**  
**FAX: 515-262-1910**

**Fr: Steve Strauss 3M CS & LM St. Paul**  
**Phone: 651-733-6205**  
**FAX: 651-733-4289**  
**Email: [ststrauss@3m.com](mailto:ststrauss@3m.com)**

**Re: Details on Impact testing of Glazings**

**Da: August 7, 2003**

**Hello Tim, I will be stopping by Friday PM – and will be trying to visit IA Sun, too.**

**Here are testing details:**

- 1. SH8CLARL Run Date 1354-05: You have three 1/4" & three 1/8" plates. Ken Smith has requested IA Sun to make more of each, so that you can place at least 4 of each type into ANSI Z97.1 accelerated aging. I will confirm with IA Sun – How many they made, and have them shipped to you to begin testing per ANSI Z97.1**
- 2. SCLARL400 Run Date 3041-15: Please begin testing all of these 1/4" panes per CPSC and videotape the testing**
- 3. S50NEAR400 Run Date 3108-01: Please begin testing all of these 1/4" panes per CPSC and videotape the testing**
- 4. SCLARL400 Run Dates 3107 – 12, 13, 14: Please begin testing all of these 1/4" panes per CPSC and videotape the testing**