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Non Destructive Testing Product Evaluation  
Metallurgical Analysis Materials Testing Welder Qualification

**Report of CPSC Tests on  
1/4inch and 1/8inch annealed glass with film applied**

**Prepared for:  
3M COMPANY  
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**Client Purchase Order Number: Verbal**

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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.**

**PROJECT NUMBER:** MCO002-04-11-75443**PAGE:** 1 of 7**DATE:** April 17, 2006**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 April 7, 2006 with the work conducted from April 11, 2006 to April 14, 2006.

**TEST RESULTS SUMMARY:**

54 of 56 samples comply with CPSC Part 1201 when applied to nominal 1/4inch and 1/8inch – See page

**DESCRIPTION OF SAMPLES:**

56 specimens of 34x76inch dimension were supplied for testing impact resistance. The samples consisted of nominal 1/4inch and 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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**RESULTS:**

On 1/4" Glass – 03/14/06 S35 NEAR 400 6057 05 AIE GREEN				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
1 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
2 (CPSC)	Glass	0.228	48	Stayed in frame 21" tear, ball went through <b>FAILURE</b>
3 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
4 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
5 (CPSC)	Film	0.227	48	Removed from frame No rips or tears
6 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
7 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
8 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
9 (CPSC)	Film	0.227	48	Removed from frame No rips or tears
10 (CPSC)	Glass	0.229	48	Removed from frame No rips or tears
11 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
12 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears

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**RESULTS:**

On 1/4" Glass – 03/14/06 S35 NEAR 400 6057 05 AIE <b>BLUE</b>				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
13 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
14 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears
15 (CPSC)	Film	0.227	48	Removed from frame No rips or tears
16 (CPSC)	Glass	0.229	48	Removed from frame No rips or tears
17 (CPSC)	Film	0.226	48	Removed from frame No rips or tears
18 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears
19 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
20 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears
21 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
22 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears
23 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
24 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears

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**RESULTS:**

On 1/4" Glass – 2/27/06 S70 HP 5363 002				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
25 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
26 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears
27 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
28 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
29 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
30 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
31 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
32 (CPSC)	Glass	0.227	48	Removed from frame 8" tear ball did not go through
33 (CPSC)	Film	0.226	48	Removed from frame No rips or tears
34 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
35 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
36 (CPSC)	Glass	0.229	48	Removed from frame No rips or tears

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**RESULTS:**

On 1/4" Glass – 2/27/06 S50 HP 5363 001				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
37 (CPSC)	Film	0.227	48	Removed from frame No rips or tears
38 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
39 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
40 (CPSC)	Glass	0.229	48	Removed from frame No rips or tears
41 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
42 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears
43 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
44 (CPSC)	Glass	0.227	48	Removed from frame No rips or tears
45 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
46 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
47 (CPSC)	Film	0.227	48	Removed from frame No rips or tears
48 (CPSC)	Glass	0.229	48	Removed from frame No rips or tears

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**RESULTS:**

On 1/4" Glass – 03/13/06 S35 NEAR 400 6057 05 AIE <b>RED</b>				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
49 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
50 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears
51 (CPSC)	Film	0.228	48	Removed from frame No rips or tears
52 (CPSC)	Glass	0.227	48	Stayed in frame 23" tear, ball went through <b>FAILURE</b>
53 (CPSC)	Film	0.229	48	Removed from frame No rips or tears
54 (CPSC)	Glass	0.228	48	Removed from frame No rips or tears

On 1/8" Glass – 03/13/06 S35 NEAR 400 6057 05 AIE <b>RED</b>				
Sample Number	Impact Side	Total Thickness Inches	Drop Height Inches	Results/Size of Opening
55 (CPSC)	Film	0.128	48	Removed from frame No rips or tears
56 (CPSC)	Glass	0.128	48	Removed from frame No rips or tears

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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.

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