

**LABORATORY TEST REPORT**

**FEDERAL RAILROAD ADMINISTRATION  
CERTIFICATION OF GLAZING MATERIALS  
FRA 49 CFR PART 223 (A) - BALLISTIC**

Document Revision 3 - April 2015 - Issued by H.Bui

**CLIENT DETAILS**

Glassform Pty Ltd  
148-152 Bernard St  
Cheltenham, VIC 3192  
Australia

Date Received 14/06/2017  
Courier Swift  
Sample Designation Glass  
Purchase Order 7441

Job No. 5507/17  
Test Date 3/07/2017  
Report No. 5507.1/17  
Page No. 1 of 2

**SAMPLE DETAILS**

Sample No./ID See Results  
Manufacturer Glassform Pty Ltd  
Model No. Drawing #48512  
Serial No. Not Applicable  
Batch No. 17/06/04 B3  
Size (mm) 1715x960mm  
Protection Level Type 2  
Material Type Glass  
Date of Manufacture 29/06/2017

**BALLISTIC THREAT**

Calibre .22 LR  
Projectile Weight 40 grain  
Projectile Type Lead Solid  
Cannister Markings 196926-7023  
Production Factory Federal  
Head Stamp Details Target Gold Medal  
Barrel Length 6 Inch  
Barrel Serial No. R0708-2  
Obliquity Zero Degrees  
Specification Type 2  
Required Velocity **960 ft/s minimum**

**RANGE**

Muzzle to Target 5 metres  
No. of Screens 3  
Screen Spacing 5.0 ft  
Midpoint to Target 2.0 metres  
Chronograph Model Sabre Iris  
Screen Type Skyscreen408  
Screen Light Source DC LED

**TEST CONDITIONS**

Temperature 18.6 °C  
Relative Humidity 47.5 %  
Conditioning Ambient

**APPLICABLE STANDARDS OR PROCEDURES**

- |   |                        |                         |
|---|------------------------|-------------------------|
| 1 | CFR Title 49, Part 223 |                         |
| 2 | Witness Material       | 0.006" 1100 Al Temper O |
| 3 | Witness to Target      | 6 Inches                |
| 4 | Examination Light      | 60 Watt Light Bulb      |

**TEST PERSONNEL**

Data Recorder H.Bui  
Gunner B.Kelaart  
Witness Nil

| Sample Number          | Sample Thickness (mm) | Yaw | Shot No. | Velocity (ft/s) Chrono. 1 | Velocity (ft/s) Chrono. 2 | Average Velocity (ft/s) | Notes | Panel Pen. | Spalling | Witness Penetration | Pass/Fail |
|------------------------|-----------------------|-----|----------|---------------------------|---------------------------|-------------------------|-------|------------|----------|---------------------|-----------|
| GLASSFORM 5507.1/17-9  | 9.72                  | Nil | 1        | 995.0                     | 991.3                     | 993.1                   |       | Nil        | Yes      | No                  | Pass      |
| GLASSFORM 5507.1/17-10 | 9.71                  | Nil | 2        | 970.3                     | 966.6                     | 968.5                   |       | Nil        | No       | No                  | Pass      |
| GLASSFORM 5507.1/17-11 | 9.66                  | Nil | 3        | 992.3                     | 988.1                     | 990.2                   |       | Nil        | No       | No                  | Pass      |

**Footnotes:**

- a. Insufficient velocity
- b. Not a fair hit
- c. Test Terminated

**Comments:**

- 1. No Spall film applied to samples.

**Deviations from Standard:**

- 1. Nil



B. Eu  
(Approved signatory)

Model Compliance  
Passed: **Yes**

**LABORATORY TEST REPORT**

FEDERAL RAILROAD ADMINISTRATION  
CERTIFICATION OF GLAZING MATERIALS  
FRA 49 CFR PART 223 (A) - LARGE OBJECT IMPACT  
Document Revision 3 - April 2015 - Issued by H.Bui

**CLIENT DETAILS**

Glassform Pty Ltd  
148-152 Bernard St  
Cheltenham, VIC 3192  
Australia

Date Received 14/06/2017  
Courier Swift  
Sample Designation Glass  
Purchase Order 7441

Job No. 5507/17  
Test Date 16/06/2017  
Report No. 5507.1/17  
Page No. 2 of 2

**SAMPLE DETAILS**

Sample No./ID See Results  
Manufacturer Glassform Pty Ltd  
Model No. Drawing #48512  
Serial No. Not Applicable  
Batch No. 17/06/04 B  
Size (mm) 1715x960mm  
Protection Level Type 2  
Material Type Glass  
Date of Manufacture 14/06/2017

**LARGE OBJECT THREAT**

Size/dimensions 8x8x16 Inch  
Projectile Weight Min. 24lbs  
Material Type Cinder Block  
Compliance Std ASTM C90  
Manufactured CALIF USA  
Specification Type 2

**RANGE**

Sensors to Target 250mm  
Speed Sensors 2  
Speed Sensor Type Digital  
Sensor Spacing 52mm

**TEST CONDITIONS**

Temperature 14.6 °C  
Relative Humidity 47.3 %  
Conditioning Ambient

**WITNESS MATERIAL SPECIFICATIONS**

Witness Material Used Alloy 1100 Temper O  
Distance from Witness to Target 6 Inches  
Witness Material Thickness 0.006 Inch

**TEST PERSONNEL**

Data Recorder James Sutherland  
Gunner Ben Kelaart  
Witness Nil

| Sample Number         | Sample Thickness (mm) | Required Velocity (ft/s) | Brick Weight (lbs) | Measured Velocity (ft/s) | Impacting Energy (J) | Notes | Panel Pen. | Spalling | Witness Penetration | Pass/Fail |
|-----------------------|-----------------------|--------------------------|--------------------|--------------------------|----------------------|-------|------------|----------|---------------------|-----------|
| GLASSFORM 5507.1/17-4 | 9.63                  | 12                       | 28.030             | 12.2                     | 112.13               |       | Nil        | Nil      | Nil                 | Pass      |
| GLASSFORM 5507.1/17-5 | 9.64                  | 12                       | 28.025             | 12.2                     | 112.11               |       | Nil        | Nil      | Nil                 | Pass      |
|                       |                       |                          |                    |                          |                      |       |            |          |                     |           |

**Footnotes:**

- a. Insufficient velocity
- b. Not a fair hit
- c. Test Terminated

**Comments:**

- 1. Cinder Blocks manufactured in accordance with ASTM Standard C90 Certified by the Concrete Masonry Association of California & Nevada

**Deviations from Standard:**

- 1. Nil



B. Eu  
(Approved signatory)

Model Compliance  
Passed: **Yes**