



TEST #21

AAMA 1503-98 THERMAL PERFORMANCE TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39431.03
Test Date: 05/24/01
Report Date: 09/17/01

Test Sample Identification:

Series/Model: F500HD

Type: Swinging FRP Door with Aluminum Frame

Test Procedure: The condensation resistance factor (CRF) and thermal transmittance (U) were determined in accordance with AAMA 1503-98, *Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections*.

- | | |
|---|--------|
| 1. Average warm side ambient temperature | 70.0 F |
| 2. Average cold side ambient temperature | 0.0 F |
| 3. 15 mph dynamic wind applied to test specimen exterior. | |
| 4. 0.0" \pm 0.04" static pressure drop across specimen. | |

Test Results Summary:

- | | |
|---|------|
| 1. Thermal transmittance due to conduction (Uc)
(U-factors expressed in Btu/hr-ft ² -F) | 0.70 |
| 2. Thermal resistance
(R-value expressed in hr-ft ² -F/Btu) | 1.43 |

Test Sample Description:

CONSTRUCTION	Frame	Door Slab
Size (in.)	39.50 x 85.75	35.50 x 83.50
Thickness (in.)	0.125 Wall Thickness	1.75
CORNERS	Butt Joint	Mortise & Tenon
Fasteners	Screws	Tie Rods two top & one bottom
Sealant	None	None
MATERIAL	AL	0.120" Textured fiberglass skin with AL closures and urethane core
Color Exterior	Satin Aluminum	Gray
Finish Exterior	Anodized (head, jambs) Mill (threshold)	Fiberglass coloring
Color Interior	Gray	Gray
Finish Interior	Anodized (head, jambs) Mill (threshold)	Fiberglass coloring
GLAZING METHOD	NA	NA

GLAZING: NA

** -- Stated per Client/Manufacturer*

NA --Non-Applicable

See Appendix A for Description Codes



TEST #22

AAMA 1503-98 THERMAL PERFORMANCE TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39425.03
Test Date: 05/22/01
Report Date: 09/17/01

Test Sample Identification:

Series/Model: F200G

Type: Swinging FRP Door with Aluminum Frame

Test Procedure: The condensation resistance factor (CRF) and thermal transmittance (U) were determined in accordance with AAMA 1503-98, *Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections*.

- | | |
|---|--------|
| 1. Average warm side ambient temperature | 70.0 F |
| 2. Average cold side ambient temperature | 0.0 F |
| 3. 15 mph dynamic wind applied to test specimen exterior. | |
| 4. 0.0" \pm 0.04" static pressure drop across specimen. | |

Test Results Summary:

- | | |
|---|------|
| 1. Thermal transmittance due to conduction (Uc)
(U-factors expressed in Btu/hr-ft ² -F) | 0.57 |
| 2. Thermal resistance
(R-value expressed in hr-ft ² -F/Btu) | 1.76 |



Test Sample Description:

TEST #22

CONSTRUCTION	Frame	Door Slab
Size (in.)	39.50 x 85.75	35.50 x 83.50
Thickness (in.)	0.125 Wall Thickness	1.75
CORNERS	Butt Joint	Mortise & Tenon
Fasteners	Screws	Tie Rod Top & Bottom
Sealant	None	None
MATERIAL	AL	0.120" Textured fiberglass with AL closures and 5 lb
Color Exterior	Satin Aluminum	Gray
Finish Exterior	Anodized (head, jambs) Mill (threshold)	Fiberglass coloring
Color Interior	Gray	Gray
Finish Interior	Anodized (head, jambs) Mill (threshold)	Fiberglass coloring
GLAZING METHOD	NA	NA

GLAZING: NA

* -- Stated per Client/Manufacturer

NA --Non-Applicable

See Appendix A for Description Codes



TEST #23

AAMA 1503-98 THERMAL PERFORMANCE TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39424.03
Test Date: 05/19/01
Report Date: 09/17/01

Test Sample Identification:

Series/Model: F200

Type: Swinging FRP Door with Aluminum Frame

Test Procedure: The condensation resistance factor (CRF) and thermal transmittance (U) were determined in accordance with AAMA 1503-98, *Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections*.

- | | |
|---|--------|
| 1. Average warm side ambient temperature | 70.0 F |
| 2. Average cold side ambient temperature | -0.4 F |
| 3. 15 mph dynamic wind applied to test specimen exterior. | |
| 4. 0.0" \pm 0.04" static pressure drop across specimen. | |

Test Results Summary:

- | | |
|---|------|
| 1. Thermal transmittance due to conduction (Uc)
(U-factors expressed in Btu/hr-ft ² -F) | 0.58 |
| 2. Thermal resistance
(R-value expressed in hr-ft ² -F/Btu) | 1.73 |

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com

Test Sample Description:

CONSTRUCTION	Frame	Door Slab
Size (in.)	39.50 x 85.75	35.50 x 83.50
Thickness (in.)	0.125 Wall Thickness	1.75
CORNERS	Butt Joint	Mortise & Tenon
Fasteners	Screws	Screws
Sealant	None	None
MATERIAL	AL (1.75" x 4.50" tubular reinforcement)	0.120" Textured FRP skin with AL closures and polystyrene core*
Color Exterior	Satin Aluminum	Gray
Finish Exterior	Anodized (head, jambs) Mill (threshold)	Fiberglass coloring
Color Interior	Gray	Gray
Finish Interior	Anodized (head, jambs) Mill (threshold)	Fiberglass coloring
GLAZING METHOD	NA	NA

**Reinforced with 1.50" x 2.50" tubular steel in stiles and bottom rail, 1.50" x 6.00" in the top rail.*

GLAZING: NA

** -- Stated per Client/Manufacturer*

NA --Non-Applicable

See Appendix A for Description Codes



Architectural Testing

STRUCTURAL PERFORMANCE TEST REPORT

TEST #31

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39570.01
Test Date: 06/14/01
Report Date: 08/03/01

Specimen Type: F500HD FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc., (ATI) was contracted by Commercial Door Systems to conduct Air Infiltration, Water Penetration, and Uniform Load Structural tests on a Commercial Door Systems series F500HD FRP door system.

Test Procedures: The test specimen was evaluated in accordance with the following:

ASTM E 283, Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

ASTM E 331, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

ASTM E 330, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high

Door Size: 2' 11-1/2" wide by 6' 11-3/4" high

Core Material: 25 psi Polystyrene

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. Each doorjamb was anchored to the test frame approximately 2", 34", 50", and 82" from the sill.

Door Mainframe Construction: The stiles were 5-1/2" by 1-1/2" by 1/8" thick tubular aluminum. The top and bottom rail were 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using one full-length 3/8" tie rod through the bottom rail, and two full-length 3/8" tie rods through the top rail. Tie rods were secured at each end with "KEPS" lock nuts.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com



Architectural Testing

Test Specimen Description: (Continued)

TEST #31

Hardware:

Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

Test Results:

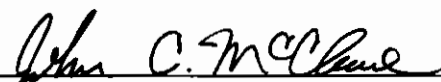
The results are tabulated as follows:

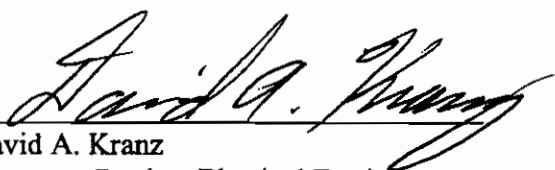
<u>Test Method</u>	<u>Title of Test</u>	<u>Results</u>	<u>Allowed</u>
ASTM E 283	Air Infiltration		
	@ 1.57 psf (25 mph)	0.31 cfm/ft ²	1.25 cfm/ft ²
	@ 6.24 psf (50 mph)	.97 cfm/ft ²	N/A
ASTM E 331	Water Resistance		
	Test Duration - One 15 minute Cycle WTP = 0.0 psf	No entry	No entry
ASTM E 330	Uniform Load Structural		
	Load Duration - 10 seconds		
	@ +82.5 psf	No damage	No damage
	@ -82.5 psf	No damage	No damage

At a negative pressure of 84.3 psf, the latch released allowing the panel to swing open. The remedial repair consisted of adjusting the latch to its original position.

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


 John McClane
 Technician


 David A. Kranz
 Director - Product/Physical Testing



Architectural Testing

STRUCTURAL PERFORMANCE TEST REPORT

Rendered to:

TEST #32

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39569.01
Test Date: 06/14/01
Report Date: 08/03/01

Specimen Type: F200G FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to conduct Air Infiltration, Water Penetration, and Uniform Load Structural tests on a Commercial Door Systems series F200G FRP door system.

Test Procedures:

ASTM E 283, Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

ASTM E 331, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

ASTM E 330, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high

Door Size: 2' 11-1/2" wide by 6' 11-3/4" high

Core Material: Injected Polyurethane

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. Each door jamb was anchored to the test frame approximately 2", 24", 50", and 80" from the sill.

Door Mainframe Construction: The stiles and bottom rail were 2-1/2" by 1-1/2" tubular aluminum, comprised of 1/16" thick face walls and 1/8" thick end walls. The top rail was 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using full-length 3/8" tie rod (one per rail), secured at each end with "KEPS" lock nuts.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com

Test Specimen Description: (Continued)

Hardware:

Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

TEST #32

Test Results:

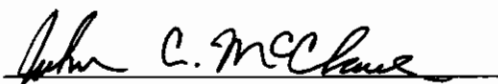
The results are tabulated as follows:

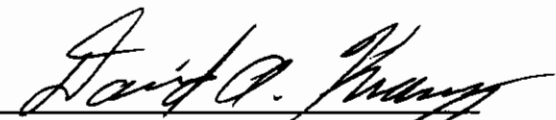
<u>Test Method</u>	<u>Title of Test</u>	<u>Results</u>	<u>Allowed</u>
ASTM E 283	Air Infiltration @ 1.57 psf (25 mph) @ 6.24 psf (50 mph)	0.47 cfm/ft ² 1.02 cfm/ft ²	1.25 cfm/ft ² N/A
ASTM E 331	Water Resistance Test Duration - One 15 minute Cycle WTP = 0.0 psf	No entry	No entry
ASTM E 330	Uniform Load Structural Load Duration - 10 seconds @ +75.0 psf @ -75.0 psf	No damage No damage	No damage No damage

At a negative pressure of 78.2 psf, the latch released allowing the panel to swing open. The remedial repair consisted of adjusting the latch to its original position.

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


 John McClane
 Technician


 David A. Kranz
 Director - Product/Physical Testing

DAK:nlb
01-39569.01

130 Derry Court
 York, PA 17402-9405
 phone: 717.764.7700
 fax: 717.764.4129
 www.testati.com



Architectural Testing

STRUCTURAL PERFORMANCE TEST REPORT

Rendered to:

TEST #33

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39567.01
Test Date: 06/14/01
Report Date: 08/03/01

Specimen Type: F200 FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc., (ATI) was contracted by Commercial Door Systems to conduct Air Infiltration, Water Penetration, and Uniform Load Structural tests on their F200 FRP door system.

Test Procedures: The test specimen was evaluated in accordance with the following:

ASTM E 283, Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

ASTM E 331, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

ASTM E 330, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high by 4-1/2" deep with 1/8" wall

Door Size: 2' 11-1/2" wide by 6' 11-3/4" high by 1-3/4" thick

Core Material: 25 psi Polystyrene

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. The door jambs were anchored to the frame approximately 2", 24", 50", and 80" from the sill.

Door Mainframe Construction: The stiles and bottom rail were 2-1/2" by 1-1/2" tubular aluminum comprised of 1/16" thick face walls and 1/8" thick end walls. The top rail was 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using full-length 3/8" tie rod (one per rail), secured at each end with "KEPS" lock nuts.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com

Test Specimen Description: (Continued)

Hardware:

TEST #33

Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

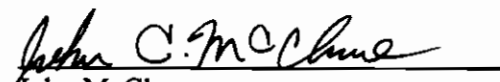
Test Results:

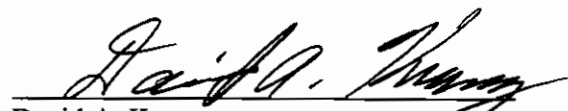
The results are tabulated as follows:

<u>Test Method</u>	<u>Title of Test</u>	<u>Results</u>	<u>Allowed</u>
ASTM E 283	Air Infiltration		
	@ 1.57 psf (25 mph)	0.41 cfm/ft ²	1.25 cfm/ft ²
	@ 6.24 psf (50 mph)	1.06 cfm/ft ²	N/A
ASTM E 331	Water Resistance		
	Test Duration - One 15 minute Cycle		
	WTP = 0.0 psf	No entry	No entry
	WTP = 1.57 psf	No entry	No entry
ASTM E 330	Uniform Load Structural		
	Load Duration - 10 seconds		
	@ +75 psf	No damage	No damage
	@ -75 psf	No damage	No damage

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


 John McClane
 Technician


 David A. Kranz
 Director - Product/Physical Testing

DAK:nlb
01-39567.01

130 Derry Court
 York, PA 17402-9405
 phone: 717.764.7700
 fax: 717.764.4129
 www.testati.com



Architectural Testing

TEST #41

CONCENTRATED LOAD TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-40114.03
Test Date: 06/14/01
Report Date: 09/12/01

Specimen Type: F500HD FRP Door

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to conduct concentrated load testing on a door identified by Commercial Door Systems as F500HD FRP door system.

Test Procedure: Supportive fulcrums were positioned along the top and bottom edges of the door panel at the same plane of the door. A steel pulling fixture was positioned across the entire mid-span of the door panel. The pulling fixture was attached to a loading device with a calibrated force gauge located between the loading device and the pulling fixture. A deflection measuring device was attached to the center of the panel. Various concentrated loads were applied across the mid-span of the door and the deflection was recorded at the center of the door in 100 lb. increments with each load being maintained for 10 seconds prior to recording readings.

Test Specimen Description:

Door Size: 2' 11-1/2" wide by 6' 11-3/8" high by 1-3/4" thick

Core Material: 25 psi Polystyrene

Door Mainframe Construction: The stiles were 5-1/2" by 1-1/2" by 1/8" thick tubular aluminum. The top and bottom rail were 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using one full-length 3/8" tie rod through the bottom rail, and two full-length 3/8" tie rods through the top rail. Tie rods were secured at each end with "KEPS" lock nuts. 7 gauge by 16" by 5-1/2" steel reinforcement plates were utilized in the top rail at the closer.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com

Test Results:

The results are tabulated as follows:

Load Applied (pounds)	Deflection Under Load (inches)	Load Applied (pounds)	Deflection Under Load (inches)
100	0.02	1700	0.44
200	0.04	1800	0.47
300	0.07	1900	0.50
400	0.10	2000	0.52
500	0.12	2100	0.55
600	0.14	2200	0.57
700	0.17	2300	0.60
800	0.20	2400	0.63
900	0.21	2500	0.66
1000	0.24	2600	0.69
1100	0.27	2700	0.71
1200	0.31	2800	0.74
1300	0.34	2900	0.77
1400	0.37	3000	0.79
1500	0.39	3100	0.84
1600	0.42	3200	0.87

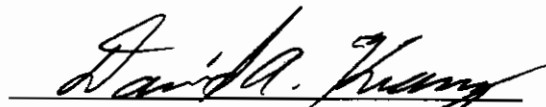
Results: Upon completion of the 3200 lb load, the deflection measuring device was removed and the concentrated load was gradually increased up to 4200 lbs. The load was released and the panel was inspected. There was no apparent damage to the door and there appeared to be no permanent deformation. Testing was terminated due to the limitations of the test fixtures and loading device utilized.

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:



John C. McClane
Technician



David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-40114.03

CONCENTRATED LOAD TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-40113.03
Test Date: 06/14/01
Report Date: 09/12/01

Specimen Type: F200G FRP Door

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to conduct concentrated load testing on a Commercial Door Systems F200G FRP door system.

Test Procedure: Supportive fulcrums were positioned along the top and bottom edges of the door panel at the same plane of the door. A steel pulling fixture was positioned across the entire mid-span of the door panel. The pulling fixture was attached to a loading device with a calibrated force gauge located between the loading device and the pulling fixture. A deflection measuring device was attached to the center of the panel. Various concentrated loads were applied across the mid-span of the door and the deflection was recorded at the center of the door in 100 lb increments with each load being maintained for 10 seconds prior to recording readings.

Test Specimen Description:

Door Size: 2' 11-1/2" wide by 6' 11-3/8" high by 1-3/4" thick

Core Material: Injected Polyurethane

Door Mainframe Construction: The stiles and bottom rail were 2-1/2" by 1-1/2" tubular aluminum, comprised of 1/16" thick face walls and 1/8" thick end walls. The top rail was 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using full-length 3/8" tie rod (one per rail), secured at each end with "KEPS" lock nuts. The hinge stile and lock stile were reinforced with 2-1/2" by 1-1/2" by 1/8" thick aluminum channel.

Test Results:


The results are tabulated as follows:

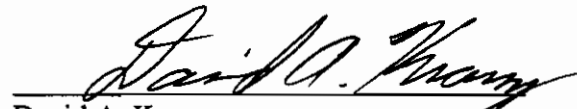
Load Applied (pounds)	Deflection Under Load (inches)	Load Applied (pounds)	Deflection Under Load (inches)
100	0.05	1600	0.74
200	0.13	1700	0.78
300	0.18	1800	0.84
400	0.24	1900	0.89
500	0.28	2000	0.94
600	0.33	2100	1.00
700	0.40	2200	1.06
800	0.43	2300	1.14
900	0.48	2400	1.21
1000	0.52	2500	1.29
1100	0.55	2600	1.36
1200	0.59	2700	1.46
1300	0.63	2800	0.57
1400	0.66	2900	1.86
1500	0.71	3000	2.29

Results: Deflection device was removed and load was gradually increased until the door yielded under a concentrated load of 3400 lbs.

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-40113.03



Architectural Testing

TEST #44

DOOR PANEL TORSION TWIST TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-40114.02
Test Date: 06/14/01
Report Date: 09/12/01

Specimen Type: F500HD FRP Door

Project Summary: Architectural Testing, Inc., (ATI) was contracted by Commercial Door Systems to conduct door panel torsion twist testing on a door identified by Commercial Door Systems F500HD FRP door system

Test Procedure: Supportive fulcrums were positioned in the same plane and diagonally opposite corners of the door. The other bottom rail corner was secured in the plane of the door and clamped firmly in place. Various concentrated loads were applied to the fourth unrestrained top rail corner and the deflection was recorded at the unrestrained corner in 50 lb increments with each load being maintained for 10 seconds prior to recording readings. The final load (300 lbs) was maintained for 60 seconds. 60 seconds after the final load, permanent set was recorded.

Test Specimen Description:

Door Size: 2' 11-1/2" wide by 6' 11-3/48" high by 1-3/4" thick

Core Material: 25 psi Polystyrene

Door Mainframe Construction: The stiles were 5-1/2" by 1-1/2" by 1/8" thick tubular aluminum. The top and bottom rail were 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using one full-length 3/8" tie rod through the bottom rail, and two full-length 3/8" tie rods through the top rail. Tie rods were secured at each end with "KEPS" lock nuts. 7 gauge by 16" by 5-1/2" steel reinforcement plates were utilized in the top rail at the closer.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com


Test Results:

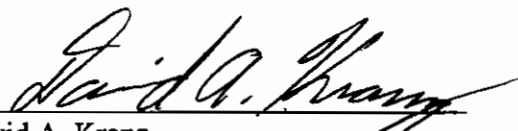
The results are tabulated as follows:

Perpendicular Load Applied (lbs)	Deflection Under Load (inches)
100	0.375
150	0.750
200	1.000
250	1.438
300	1.750
Permanent Set at one minute after load	<0.001

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John C. McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-40114.02



TEST #45

DOOR PANEL TORSION TWIST TEST REPORT

Rendered to:

**COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020**

Report No: 01-40113.02
Test Date: 06/14/01
Report Date: 09/12/01

Specimen Type: F200G FRP Door

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to conduct door panel torsion twist testing on a Commercial Door Systems F200G FRP door system.

Test Procedure: Supportive fulcrums were positioned in the same plane and diagonally opposite corners of the door. The other bottom rail corner was secured in the plane of the door and clamped firmly in place. Various concentrated loads were applied to the fourth unrestrained top rail corner and the deflection was recorded at the unrestrained corner in 50 lb increments with each load being maintained for 10 seconds prior to recording readings. The final load (300 lbs) was maintained for 60 seconds. 60 seconds after the final load, permanent set was recorded.

Test Specimen Description:

Door Size: 2' 11-1/2" wide by 6' 11-3/8" high by 1-3/4" thick

Core Material: Injected Polyurethane

Door Mainframe Construction: The stiles and bottom rail were 2-1/2" by 1-1/2" tubular aluminum, comprised of 1/16" thick face walls and 1/8" thick end walls. The top rail was 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using full-length 3/8" tie rod (one per rail), secured at each end with "KEPS" lock nuts. The hinge stile and lock stile were reinforced with 2-1/2" by 1-1/2" by 1/8" thick aluminum channel.



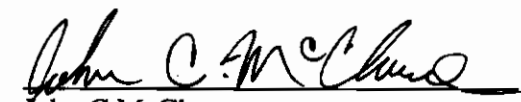
Test Results:

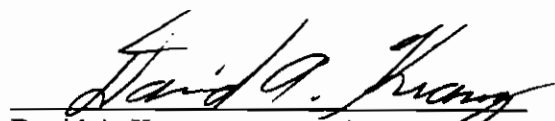
The results are tabulated as follows:

Perpendicular Load Applied (lbs)	Deflection Under Load (inches)
100	0.938
150	1.500
200	2.188
250	2.938
300	3.625
Permanent Set at one minute after load	0.188

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John C. McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-40113.02



Architectural Testing

TEST #47

HARDWARE PULL-OFF TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-40114.01
Test Date: 06/14/01
Report Date: 09/12/01

Specimen Type: F500HD FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to evaluate the closer and exit bar door attachment fasteners on a door identified by Commercial Door Systems F500HD FRP door system.

Test Procedure: The F500HD FRP door panel was secured in a suitable test fixture and a steel cable was attached to the hardware device being evaluated. A concentrated load was applied to each individual hardware device in a direction perpendicular to the plane of the panel in a direction that would tend to separate the hardware from the panel. The load was gradually increased in the attempt to disengage the hardware from the panel. The force required to induce failure was recorded.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high by 4-1/2" deep with 1/8" wall

Door Size: 2' 11-1/2" wide by 6' 11-3/8" high by 1-3/4" thick

Core Material: 25 psi Polystyrene

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. Each doorjamb was anchored to the test frame approximately 2", 30", 52", and 82" from the sill.

Door Mainframe Construction: The stiles were 5-1/2" by 1-1/2" by 1/8" thick tubular aluminum. The top and bottom rail were 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using one full-length 3/8" tie rod through the bottom rail, and two full-length 3/8" tie rods through the top rail. Tie rods were secured at each end with "KEPS" lock nuts. 7 gauge by 16" by 5-1/2" steel reinforcement plates were utilized in the top rail at the closer.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com

Test Specimen Description: (Continued)

TEST #47

Hardware:

Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

Hardware Fastener Description:

Closer: The closer was fastened to the top rail using four (4) 1/4-20 by 2-1/2" screws.

Exit Bar: The exit bar was fastened to the door using four (4) #10 by 1-1/4" screws.

Test Results:

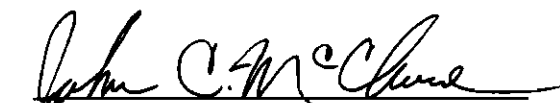
The results are tabulated as follows:

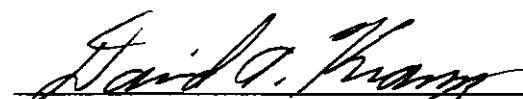
Closer: A concentrated load of 7338 lbs was applied to the closer. There was no disengagement from the door and no apparent damage to the closer or door.

Exit Bar: A concentrated load of 2400 lbs was applied to the exit bar. There was no disengagement from the door and no apparent damage to the exit bar or door.

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John C. McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-40114.01



Architectural Testing

TEST #48

HARDWARE PULL-OFF TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-40113.01
Test Date: 06/14/01
Report Date: 09/12/01

Specimen Type: F200G FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to evaluate the closer and exit bar door attachment fasteners on the Commercial Door Systems F200G FRP door system.

Test Procedure: The F200G FRP door panel was secured in a suitable test fixture and a steel cable was attached to the hardware device being evaluated. A concentrated load was applied to each individual hardware device in a direction perpendicular to the plane of the panel in a direction that would tend to separate the hardware from the panel. The load was gradually increased in the attempt to disengage the hardware from the panel. The force required to induce failure was recorded.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high by 4-1/2" deep with 1/8" wall

Door Size: 2' 11-1/2" wide by 6' 11-3/8" high by 1-3/4" thick

Core Material: Injected Polyurethane

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. Each doorjamb was anchored to the test frame approximately 2", 30", 52", and 82" from the sill.

Door Mainframe Construction: The stiles and bottom rail were 2-1/2" by 1-1/2" tubular aluminum, comprised of 1/16" thick face walls and 1/8" thick end walls. The top rail was 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using full-length 3/8" tie rod (one per rail), secured at each end with "KEPS" lock nuts. The hinge stile and lock stile were reinforced with 2-1/2" by 1-1/2" by 1/8" thick aluminum channel.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com

Test Specimen Description: (Continued)

TEST #48

Hardware:

Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

Hardware Fastener Description:

Closer: The closer was fastened to the top rail using four (4) 1/4-20 by 2-1/2" screws.

Exit Bar: The exit bar was fastened to the door using four (4) #10 by 1-1/4" screws.

Test Results:

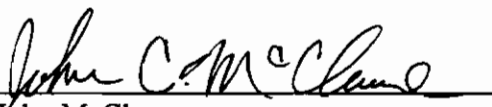
The results are tabulated as follows:

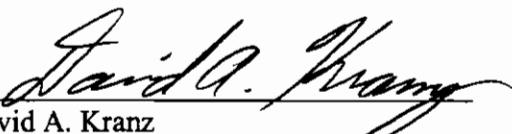
Closer: At a concentrated load of 1638 lbs, the closer disengaged from the panel.

Exit Bar: At a concentrated load of 1300 lbs, the exit bar disengaged from the panel.

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-40113.01



Architectural Testing

TEST #48

HARDWARE PULL-OFF TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-40113.01
Test Date: 06/14/01
Report Date: 09/12/01

Specimen Type: F200G FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to evaluate the closer and exit bar door attachment fasteners on the Commercial Door Systems F200G FRP door system.

Test Procedure: The F200G FRP door panel was secured in a suitable test fixture and a steel cable was attached to the hardware device being evaluated. A concentrated load was applied to each individual hardware device in a direction perpendicular to the plane of the panel in a direction that would tend to separate the hardware from the panel. The load was gradually increased in the attempt to disengage the hardware from the panel. The force required to induce failure was recorded.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high by 4-1/2" deep with 1/8" wall

Door Size: 2' 11-1/2" wide by 6' 11-3/8" high by 1-3/4" thick

Core Material: Injected Polyurethane

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. Each doorjamb was anchored to the test frame approximately 2", 30", 52", and 82" from the sill.

Door Mainframe Construction: The stiles and bottom rail were 2-1/2" by 1-1/2" tubular aluminum, comprised of 1/16" thick face walls and 1/8" thick end walls. The top rail was 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using full-length 3/8" tie rod (one per rail), secured at each end with "KEPS" lock nuts. The hinge stile and lock stile were reinforced with 2-1/2" by 1-1/2" by 1/8" thick aluminum channel.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com



Test Specimen Description: (Continued)

TEST #48

Hardware:

Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

Hardware Fastener Description:

Closer: The closer was fastened to the top rail using four (4) 1/4-20 by 2-1/2" screws.

Exit Bar: The exit bar was fastened to the door using four (4) #10 by 1-1/4" screws.

Test Results:

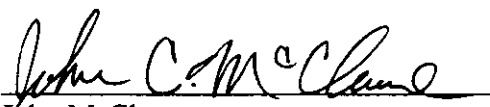
The results are tabulated as follows:

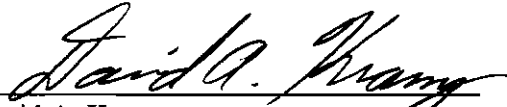
Closer: At a concentrated load of 1638 lbs, the closer disengaged from the panel.

Exit Bar: At a concentrated load of 1300 lbs, the exit bar disengaged from the panel.

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-40113.01



DOOR SLAB PERFORMANCE TEST REPORT

TEST #51

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39736.01
Test Dates: 07/12/01
Through: 07/17/01
Report Date: 08/06/01

Product: MR85 (FRP)

Type: 25 psi Expanded Polystyrene Foam Core
Total thickness measured was approximately 1-3/4"

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to perform four comprehensive performance tests of their MR85 product. The following table summarizes the average results obtained. Individual procedures and results are depicted in the report that follows.

ASTM Test Designation	ASTM Test Title	Average Result
D256	Izod Impact Resistance	15.36 ft-lb/in thickness
D790	Flexural Strength	22,680 psi (inward) 24,400 psi (outward)
D2583	Barcol Hardness	50
D5420	Gardner Impact Resistance (Drop Dart)	Mean Failure Energy 411.84 in-lb

Test Methods: The test specimens was evaluated in accordance with the following:

ASTM D256, *Standard Test Method for Determining the Izod Pendulum Impact Resistance of Plastics.*

ASTM D790, *Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.*

ASTM D2583, *Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.*

ASTM D5420, *Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).*

Test Procedures: ATI utilized the procedures as detailed in each of the four ASTM referenced documents. Details of those procedures are given with each set of results.



DOOR SLAB PERFORMANCE TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39735.01
Test Dates: 07/12/01
Through: 07/17/01
Report Date: 08/06/01

Product: MR85 (FRP)

Type: 5pcf Expanded Urethane Foam Core
Total thickness measured was approximately 1-3/4"

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to perform four comprehensive performance tests of their MR85 product. The following table summarizes the average results obtained. Individual procedures and results are depicted in the report that follows.

ASTM Test Designation	ASTM Test Title	Average Result
D256	Izod Impact Resistance	15.36 ft-lb/in thickness
D790	Flexural Strength	22,680 psi (inward) 24,400 psi (outward)
D2583	Barcol Hardness	50
D5420	Gardner Impact Resistance (Drop Dart)	Mean Failure Energy 306.9 in-lb

Test Methods: The test specimens was evaluated in accordance with the following:

ASTM D256, Standard Test Method for Determining the Izod Pendulum Impact Resistance of Plastics.

ASTM D790, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

ASTM D2583, Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

ASTM D5420, Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).

Test Procedures: ATI utilized the procedures as detailed in each of the four ASTM referenced documents. Details of those procedures are given with each set of results.



FORCED ENTRY RESISTANCE TEST REPORT

TEST #69.1

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-39570.02
Test Date: 06/14/01
Report Date: 09/27/01

Specimen Type: F500HD FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc., (ATI) was contracted by Commercial Door Systems to conduct Security and Forced Entry Prevention testing on their F500HD FRP, door system.

Test Procedure: The test specimen was evaluated in accordance with South Florida Building code, Section 3603.2(b)(5). A 300 lb Concentrated load was applied to the center of the locking stile in the direction perpendicular to the plane of the door that would tend to open the door.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high

Door Size: 2' 11-1/2" wide by 6' 11-3/4" high

Core Material: 25 psi Polystyrene

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. Each doorjamb was anchored to the test frame approximately 2", 34", 50", and 82" from the sill.

Door Mainframe Construction: The stiles were 5-1/2" by 1-1/2" by 1/8" thick tubular aluminum. The top and bottom rail were 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using one full-length 3/8" tie rod through the bottom rail, and two full-length 3/8" tie rods through the top rail. Tie rods were secured at each end with "KEPS" lock nuts.

Test Specimen Description: (Continued)

Hardware:

TEST #69.1


Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

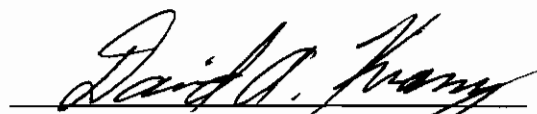
Test Results:

<u>Test Load Applied</u>	<u>Results</u>	<u>Allowed</u>
300 lb Concentrated Load (held for one minute)	No damage	No damage

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-39570.02



Architectural Testing

TEST #69.2

FORCED ENTRY RESISTANCE TEST REPORT

Rendered to:

COMMERCIAL DOOR SYSTEMS
320 Camer Drive
Bensalem, Pennsylvania 19020

Report No: 01-36569.02
Test Date: 06/14/01
Report Date: 09/27/01

Specimen Type: F200G FRP Door with Hardware and Aluminum Frame

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Commercial Door Systems to Security and Forced Entry prevention testing on their F200G FRP door system.

Test Procedure: The test specimen was evaluated in accordance with South Florida Building Code, Section 3603.2(b)(5). A 300 lb Concentrated load was applied to the center of the locking stile in the direction perpendicular to the plane of the door that would tend to open the door.

Test Specimen Description:

Frame Size: 3' 3-1/2" wide by 7' 1-3/4" high

Door Size: 2' 11-1/2" wide by 6' 11-3/4" high

Core Material: Injected Polyurethane

Installation Description: The door was installed by Commercial Door Systems personnel into a 2 x 10 wood test frame. Each doorjamb was anchored to the test frame approximately 2", 24", 50", and 80" from the sill.

Door Mainframe Construction: The stiles and bottom rail were 2-1/2" by 1-1/2" tubular aluminum, comprised of 1/16" thick face walls and 1/8" thick end walls. The top rail was 6" by 1-1/2" by 1/8" thick tubular aluminum. Corners were mortise and tenon construction, fastened using full-length 3/8" tie rod (one per rail), secured at each end with "KEPS" lock nuts.

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.testati.com

Test Specimen Description: (Continued)

TEST #69.2

Hardware:


Exit Device: Rim type - Von Duprin 99 EO
Door Closer: LCN 4041
Hinge: Continuous hinge - PEMCO CFM83SLFHD
Threshold: Reese - 2483AV x 1/4"
Sweep: Reese - 323C

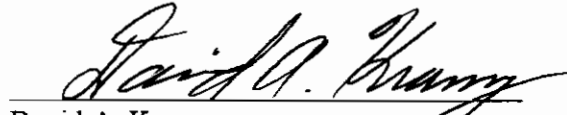
Test Results:

<u>Test Load Applied</u>	<u>Results</u>	<u>Allowed</u>
300 lb Concentrated Load (held for one minute)	No damage	No damage

A copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC:


John McClane
Technician


David A. Kranz
Director - Product/Physical Testing

DAK:nlb
01-36569.02