

June 1, 2007

Revised October 28, 2008

Revised September 28, 2009

Revised February 22, 2012

EVALUATION REPORT No.:

ER-07-0005-R3

Reference No.: 27013_28064_29031_32010

Product: Exterior Doors – Roll-Up Doors

Slat Models 300 Series (flat):	324, 322, 320
Slat Models 400F Series (flat):	424F, 422F, 420F, 418F
Slat Models 400C Series (curved):	424C, 422C, 420C, 418C
Insulated Slat Models 600 Series:	622, 620, 618
Sheet Models 200 Series:	233, 203

Manufacturer: Asta Door Corporation
4255 McEver Industrial Drive, NW
Acworth, GA 30101

Statement of Compliance:

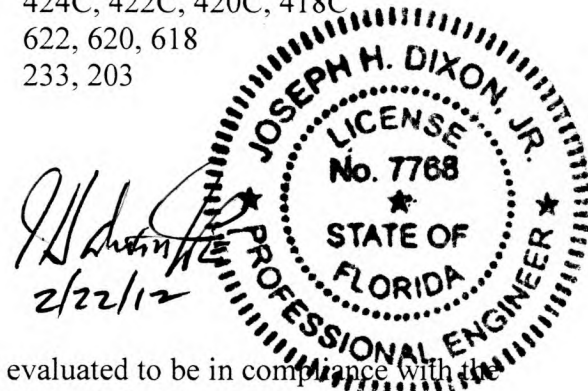
The Rolling Overhead Doors described in this report were evaluated to be in compliance with the 2010 Florida Building Code. The doors are, for the purpose intended, at least equivalent to that required by the Code when manufactured and installed as described below.

Description of the Product

General – Slat Doors and Insulated Doors

The curtain on all models is suspended from a rotating shaft about which the curtain is coiled as the curtain is raised. In the closed position, the sides of the curtain are constrained from lateral movement along their vertical edges by steel guides that are attached to the door jambs. This constraint provides resistance to lateral wind forces. Various guide configurations are used for the different door styles included in this report. The lateral wind forces are transferred from the curtain to the guides and then through the attachment elements to the door jamb. Windlocks are attached to each end of alternate slats. These windlocks engage the guides and help restrain the curtain under wind load. The door jambs are part of the main wind frame resisting system and usually are constructed of steel, concrete, or concrete masonry units.

Guides are made using three angles configured as E-Guides or Z-Guides with a windlock bar welded to the middle angle. The test door qualified the door for attachment to either steel or concrete jambs.



Slats are made of Hot-Dip Galvanized (G90) steel sheet, ASTM A653 structural steel grade 50 with a full coat of primer and baked polyester finish coat. Slat gage number is identified by the last two digits of the model number: 24 gage (0.022"), 22 gage (0.029"), 20 gage (0.036") and 18 gage (0.045"). Style variations may include door width, slat gage, and wind load rating, or any combination. Maximum door height is limited to 3 times the test door height. Each of these models is described in detail on a drawing for the size door tested.

Slat Doors – 300 Series (flat slat)

Models 324, 322, and 320 doors consist of a steel curtain constructed of individual interlocking flat slats. The curtain is suspended from a light-duty coiling system. The bottom bar is a single angle. An alternative bottom bar is shown in this revision. This bottom bar consists of the same angle as was tested plus an aluminum extrusion that has been added to provide a better connection to the curtain. The strength and stiffness of the alternate bottom bar is higher than the original tested bottom bar.

A comparative analysis was made on each model to determine the maximum pressure that could be applied for various width doors based on using the same guides and anchors used in the test doors. Maximum door heights were extended to 3 times the test door height. The pressures shown in Table 1 are these maximum design load values. These design pressures will exert forces on the guides and anchors equal to or less than those calculated for the test door.

Slat Doors – 400 Series (flat slat)

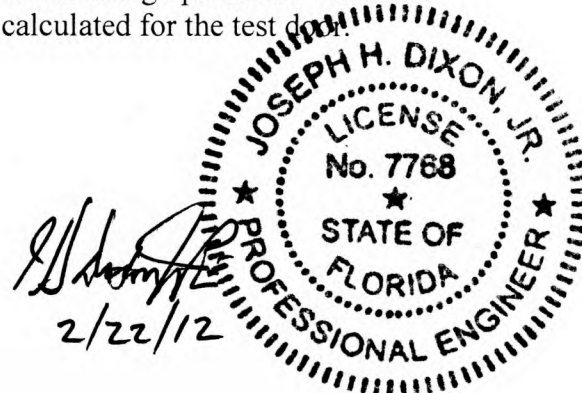
Model 424F, 422F, 420F and 418F doors consist of a steel curtain constructed of individual interlocking flat slats. The bottom bar consists of two angles.

A comparative analysis was made on each model to determine the maximum pressure that could be applied for various width doors based on using the same guides and anchors used in the test doors. Maximum door heights were extended to 3 times the test door height. The pressures shown in Table 2 show these maximum design load values. These design pressures will exert forces on the guides and anchors equal to or less than those calculated for the test door.

Slat Doors – 400 Series (curved slat)

Model 424C, 422C, 420C and 418C doors consist of a steel curtain constructed of individual interlocking curved slats. The bottom bar consists of two angles.

A comparative analysis was made on each model to determine the maximum pressure that could be applied for various width doors based on using the same guides and anchors used in the test doors. Maximum door heights were extended to 3 times the test door height. The pressures shown in Table 3 show these maximum design load values. These design pressures will exert forces on the guides and anchors equal to or less than those calculated for the test door.



Slat Doors – 600 Series (Insulated double slat)

Model 622, 620, and 618 doors consist of a steel curtain constructed of a double slat with insulation between the outside flat slat and the inner slat.

A comparative analysis was made on each model to determine the maximum pressure that could be applied for various width doors based on using the same guides and anchors used in the test doors. Maximum door heights were extended to 3 times the test door height. The pressures shown in Table 4 show these maximum design load values. These design pressures will exert forces on the guides and anchors equal to or less than those calculated for the test door.

General – Sheet Doors

The curtain on all models is suspended from a light-duty coiling system about which the curtain is coiled as the curtain is raised. In the closed position, the sides of the curtain are constrained from lateral movement along their vertical edges by steel guides that are attached to the door jambs. This constraint provides resistance to lateral wind forces. The same guide configuration is used for both sheet door models included in this report. The lateral wind forces are transferred from the curtain to the guides and then through the attachment elements to the door jamb. Windlocks are attached to each side of the curtain. These windlocks engage the guides to help restrain the curtain under wind load. The door jambs are part of the main wind frame resisting system and usually are constructed of steel, concrete, or concrete masonry units.

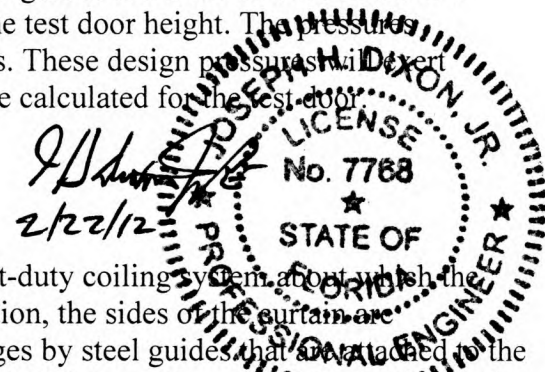
The bottom bar is a single angle. An alternative bottom bar is shown in this revision. This bottom bar consists of the same angle as was tested plus an aluminum extrusion that has been added to provide a better connection to the curtain. The strength and stiffness of the alternate bottom bar is higher than the original tested bottom bar.

Guides are made using a cold-formed shape with a separate cold-formed windlock bar attached to the guide. Attachment to steel jambs is made directly through the guide. Attachment to concrete jambs is made through steel brackets attached to the guide. The test door qualified the door for attachment to either steel or concrete jambs.

The curtain is made of Hot-Dip Galvanized (G60) steel sheet with a full coat of primer and baked polyester finish coat. The sheet is cold-formed into a corrugated shape. Style variations may include door width, height, and wind load rating, or any combination. Maximum door height is limited to 3 times the test door height. Each of these models is described in detail on a drawing for the size door tested.

Sheet Doors – Model 233 (narrow rib)

Model 233 doors have a corrugated-type steel sheet curtain with narrow ribs spaced at approximately 2.90 inches. The height of the formed cross section is approximately 11/16". The steel is ASTM A653 structural steel, grade 50, 26 gage (0.019"). Standard sheets installed in the door have a net height of approximately 26" and are mechanically seamed at every 9th corrugation. Windlocks are attached to alternate corrugations on both sides of the curtain.



A comparative analysis was made to determine the maximum pressure that could be applied for various width doors based on using the same guides and anchors used in the test doors. The pressures shown in Table 1 are these maximum design load values. These design pressures will exert forces on the guides and anchors equal to or less than those calculated for the test door.

Sheet Doors – Model 203 (symmetrical rib)

Model 203 doors have a corrugated-type steel sheet curtain with symmetrical ribs spaced at approximately 3.57 inches. The height of the formed cross section is approximately 5/8". The steel is ASTM A653 structural steel, grade 80, 26 gage (0.017"). Standard sheets installed in the door have a net height of approximately 25" and are mechanically seamed at every 7th corrugation. Four windocks are attached to each 25" high sheet on both sides of the curtain.

A comparative analysis was made to determine the maximum pressure that could be applied for various width doors based on using the same guides and anchors used in the test doors. The pressures shown in Table 1 are these maximum design load values. These design pressures will exert forces on the guides and anchors equal to or less than those calculated for the test door.

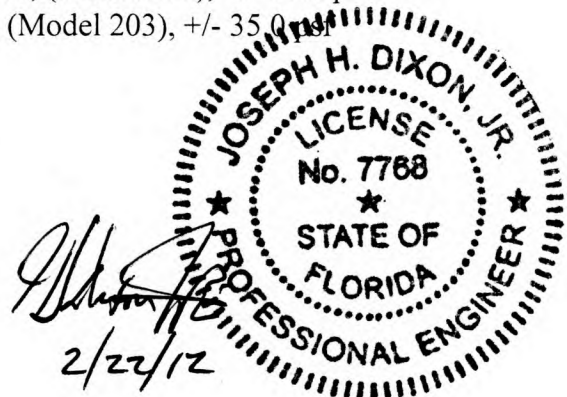
The following models covered by this report are described in detail on the following ASTA Door Corp. drawings:

300 Series, Drawing No. 607-3-300F, sheets 1 and 2 of 2, revised 09/02/09
400 Series, Drawing No. 607-4-400F, sheets 1 and 2 of 2, dated 05/15/07
400 Series, Drawing No. 607-5-400C, sheets 1 and 2 of 2, dated 05/15/07
600 Series, Drawing No. 607-6-600, sheets 1 and 2 of 2, dated 05/15/07
Model 233, Drawing No. 607-2-233, sheet 1 of 1, revised 09/02/09
Model 203, Drawing No. 607-1-203, sheet 1 of 1, revised 09/02/09

Technical Documentation:

The tested models were tested at Certified Testing Laboratories, Orlando, Florida. These tests were conducted following the procedures of ASTM E330-02 or equivalent, Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference. The following test reports, signed and sealed by R. Patel, P.E. cover the tested door models contained in this report:

- Test Report No.: CTLA 689W, date: March 23, 2001, (Model 324), +40 / -37 psf
- Test Report No.: CTLA 783W-2, date: December 12, 2001, (Model 424C), +/- 31 psf
- Test Report No.: CTLA 783W-1, date: December 12, 2001, (Model 424F), +/- 45 psf
- Test Report No.: CTLA 1253W-1, date: August 8, 2004, (Model 622), +/- 50.0 psf
- Test Report No.: CTLA 783W, date: December 12, 2001, (Model 233), +/- 37.5 psf
- Test Report No.: CTLA 1253W, date: August 2, 2004, (Model 203), +/- 35.0 psf



Confirmation of compliance with ANSI/DASMA 108-02 acceptance criteria

Test Report No. CTLA-689W dated 03/23/01 was reviewed to determine if appropriate data were recorded and if so, did the data indicate the test met the acceptance criteria of ANSI/DASMA 108-02. The following data is contained in the test report:

Positive Design Pressure: +40.0 psf
Deflection at Positive Design Pressure: 15.188 in.
Set after release of pressure: 0.500 in.
Recovery: 96.7%
Minimum recovery permitted: 75%

Negative Design Pressure: -37.0 psf
Deflection at Negative Design Pressure: 15.625 in.
Set after release of pressure: 0.125 in.
Recovery: 99.2%
Minimum recovery permitted: 75%
The door met all the Pass/Fail criteria of ANSI/DASMA 108-02

Test Report No. CTLA-783W-2 dated 12/12/01 was reviewed to determine if appropriate data were recorded and if so, did the data indicate the test met the acceptance criteria of ANSI/DASMA 108-02. The following data is contained in the test report:

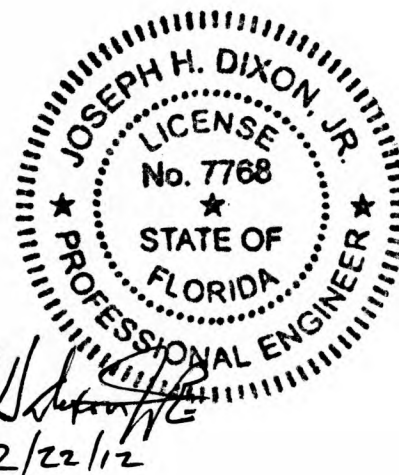
Positive Design Pressure: +31.0 psf
Deflection at Positive Design Pressure: 11.313 in.
Set after release of pressure: 0.063 in.
Recovery: 99.4%
Minimum recovery permitted: 75%

Negative Design Pressure: -31.0 psf
Deflection at Negative Design Pressure: 13.500 in.
Set after release of pressure: 1.750 in.
Recovery: 87.0%
Minimum recovery permitted: 75%
The door met all the Pass/Fail criteria of ANSI/DASMA 108-02

Test Report No. CTLA-783W-1 dated 12/12/01 was reviewed to determine if appropriate data were recorded and if so, did the data indicate the test met the acceptance criteria of ANSI/DASMA 108-02. The following data is contained in the test report:

Positive Design Pressure: +45.0 psf
Deflection at Positive Design Pressure: 11.500 in.
Set after release of pressure: 0.250 in.
Recovery: 97.8%
Minimum recovery permitted: 75%

Negative Design Pressure: -45.0 psf
Deflection at Negative Design Pressure: 13.750 in.
Set after release of pressure: 0.188 in.
Recovery: 98.6%
Minimum recovery permitted: 75%
The door met all the Pass/Fail criteria of ANSI/DASMA 108-02



Test Report No. CTLA-1253W-1 dated 08/08/04 was reviewed to determine if appropriate data were recorded and if so, did the data indicate the test met the acceptance criteria of ANSI/DASMA 108-02. The following data is contained in the test report:

Positive Design Pressure: +50.0 psf
Deflection at Positive Design Pressure: 12.000 in.
Set after release of pressure: 0.125 in.
Recovery: 98.9%
Minimum recovery permitted: 75%

Negative Design Pressure: -50.0 psf
Deflection at Negative Design Pressure: 14.875 in.
Set after release of pressure: 0.063 in.
Recovery: 99.6%
Minimum recovery permitted: 75%
The door met all the Pass/Fail criteria of ANSI/DASMA 108-02

Test Report No. CTLA-783W dated 12/12/01 was reviewed to determine if appropriate data were recorded and if so, did the data indicate the test met the acceptance criteria of ANSI/DASMA 108-02. The following data is contained in the test report:

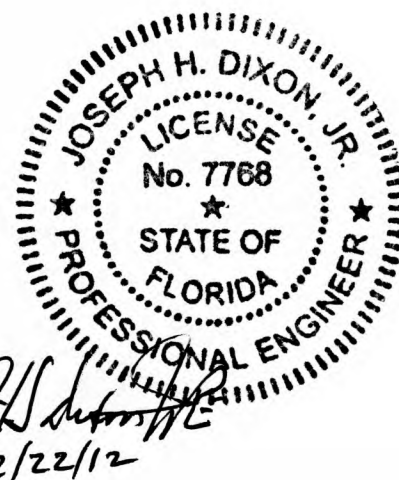
Positive Design Pressure: +37.5 psf
Deflection at Positive Design Pressure: 9.500 in.
Set after release of pressure: 0.125 in.
Recovery: 98.6%
Minimum recovery permitted: 75%

Negative Design Pressure: -37.5 psf
Deflection at Negative Design Pressure: 13.750 in.
Set after release of pressure: 0.188 in.
Recovery: 98.6%
Minimum recovery permitted: 75%
The door met all the Pass/Fail criteria of ANSI/DASMA 108-02

Test Report No. CTLA-1253W dated 08/02/04 was reviewed to determine if appropriate data were recorded and if so, did the data indicate the test met the acceptance criteria of ANSI/DASMA 108-02. The following data is contained in the test report:

Positive Design Pressure: +35.0 psf
Deflection at Positive Design Pressure: 13.250 in.
Set after release of pressure: 0.000 in.
Recovery: 100%
Minimum recovery permitted: 75%

Negative Design Pressure: -35.0 psf
Deflection at Negative Design Pressure: 14.000 in.
Set after release of pressure: 0.000 in.
Recovery: 100%
Minimum recovery permitted: 75%
The door met all the Pass/Fail criteria of ANSI/DASMA 108-02



Design pressures for variations in door width and curtain thickness were determined by comparative analysis with test results. The following calculations were prepared by Joseph H. Dixon, Jr. P.E.:

- Calculations for Maximum Design Windload for Model 324, 8' to 20' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 322, 8' to 20' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 320, 8' to 20' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 424F, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 422F, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 420F, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 418F, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 424C, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 422C, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 420C, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 418C, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 622, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 620, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 618, 8' to 24' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 233, 8' to 20' wide, May 5, 2007
- Calculations for Maximum Design Windload for Model 203, 8' to 20' wide, May 5, 2007

TABLE 1
Allowable Transverse Design Wind Loads (psf)

Max. Door Width (ft)	Max. Door Height (ft)	Model 203	Model 233	Model 324	Model 322	Model 320
8	21	+/- 113.1	+/- 95.9	+118.1 / -111.1	+128.5 / -121.5	+138.3 / -131.3
9	21	+/- 91.4	+/- 95.9	+118.1 / -111.1	+128.5 / -121.5	+138.3 / -131.3
10	21	+/- 76.0	+/- 80.1	+95.3 / -89.3	+102.5 / -96.5	+109.3 / -103.3
11	21	+/- 64.6	+/- 68.4	+79.0 / -73.8	+84.2 / -79.0	+89.1 / -83.9
12	21	+/- 55.8	+/- 59.3	+67.0 / -62.4	+70.8 / -66.2	+74.4 / -69.8
13	21	+/- 48.9	+/- 52.1	+57.8 / -53.7	+60.7 / -56.6	+63.4 / -59.3
14	21	+/- 43.3	+/- 46.3	+50.5 / -46.9	+52.8 / -49.1	+54.8 / -51.2
15	21	+/- 38.8	+/- 41.5	+44.7 / -41.4	+46.5 / -43.2	+48.1 / -44.8
16	21	+/- 35.0	+/- 37.5	+40.0 / -37.0	+41.4 / -38.4	+42.7 / -39.7
17	21	+/- 31.8	+/- 34.1	+36.1 / -33.3	+37.2 / -34.5	+38.3 / -35.5
18	21	+/- 29.1	+/- 31.2	+32.7 / -30.2	+33.7 / -31.2	+34.5 / -32.0
19	21	+/- 26.7	+/- 28.7	+29.9 / -27.6	+30.7 / -28.4	+31.4 / -29.1
20	21	+/- 24.6	+/- 26.5	+27.5 / -25.3	+28.1 / -26.0	+28.7 / -26.5

Design values used for the tests are shown in the box at 16 ft. width.

Maximum test load was 150% of design load.

All widths for any model have the same guides and anchorage as the 16' wide test door of that model.

Models 322 and 320 have the same guides and anchorage as the 16' wide Model 324.

All doors shown have a design slip of 1/4" each side.

TABLE 2
Allowable Transverse Design Wind Loads (psf)

Max. Door Width (ft)	Max. Door Height (ft)	Model 424F	Model 422F	Model 420F	Model 418F
8	21	+/- 105.3	+/- 112.5	+/- 119.3	+/- 127.6
9	21	+/- 105.3	+/- 112.5	+/- 119.3	+/- 127.6
10	21	+/- 105.3	+/- 112.5	+/- 119.3	+/- 127.6
11	21	+/- 87.7	+/- 92.9	+/- 97.8	+/- 103.7
12	21	+/- 74.6	+/- 78.5	+/- 82.0	+/- 86.4
13	21	+/- 64.6	+/- 67.5	+/- 70.2	+/- 73.5
14	21	+/- 56.6	+/- 58.9	+/- 60.9	+/- 64.5
15	21	+/- 50.2	+/- 52.0	+/- 53.6	+/- 55.6
16	21	+/- 45.0	+/- 46.4	+/- 47.7	+/- 49.3
17	21	+/- 40.7	+/- 41.8	+/- 42.8	+/- 44.1
18	21	+/- 36.9	+/- 37.9	+/- 38.7	+/- 39.8
19	21	+/- 33.8	+/- 34.6	+/- 35.3	+/- 36.1
20	21	+/- 31.1	+/- 31.7	+/- 32.3	+/- 33.0
21	21	+/- 28.7	+/- 29.2	+/- 29.7	+/- 30.3
22	21	+/- 26.6	+/- 27.1	+/- 27.5	+/- 28.0
23	21	+/- 24.8	+/- 25.2	+/- 25.5	+/- 26.0
24	21	+/- 23.2	+/- 23.5	+/- 23.8	+/- 24.2

Design values used for the test are shown in the box at 16 ft. width.

Maximum test load was 150% of design load.

All widths for any model have the same guides and anchorage as the 16' wide test door of that model.

Models 422F, 420F, and 418F have the same guides and anchorage as the 16' wide Model 424F.

All doors shown have a design slip of 1/4" each side.

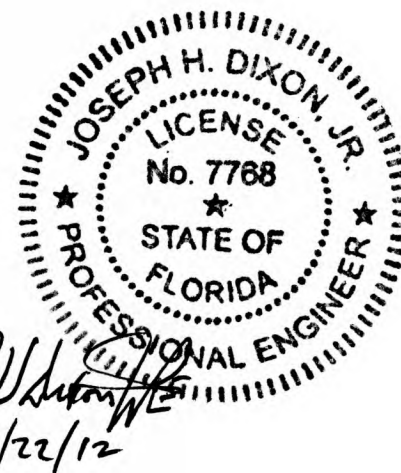


TABLE 3
Allowable Transverse Design Wind Loads (psf)

Max. Door Width (ft)	Max. Door Height (ft)	Model 424C	Model 422C	Model 420C	Model 418C
8	21	+/- 110.8	+/- 118.2	+/- 124.5	+/- 132.2
9	21	+/- 87.4	+/- 92.3	+/- 96.5	+/- 101.6
10	21	+/- 71.3	+/- 74.6	+/- 77.6	+/- 81.2
11	21	+/- 59.7	+/- 62.0	+/- 64.2	+/- 66.7
12	21	+/- 50.9	+/- 52.7	+/- 54.3	+/- 56.2
13	21	+/- 44.2	+/- 45.5	+/- 46.7	+/- 48.1
14	21	+/- 38.9	+/- 39.8	+/- 40.8	+/- 41.9
15	21	+/- 34.5	+/- 35.3	+/- 36.0	+/- 36.9
16	21	+/- 31.0	+/- 31.6	+/- 32.2	+/- 32.9
17	21	+/- 28.0	+/- 28.5	+/- 29.0	+/- 29.6
18	21	+/- 25.5	+/- 25.9	+/- 26.3	+/- 26.8
19	21	+/- 23.3	+/- 23.6	+/- 24.0	+/- 24.4
20	21	+/- 21.5	+/- 21.7	+/- 22.0	+/- 22.4
21	21	+/- 19.8	+/- 20.1	+/- 20.3	+/- 20.6
22	21	+/- 18.4	+/- 18.6	+/- 18.8	+/- 19.1
23	21	+/- 17.2	+/- 17.3	+/- 17.5	+/- 17.7
24	21	+/- 16.0	+/- 16.2	+/- 16.3	+/- 16.5

Design values used for the test are shown in the box at 16 ft. width.

Maximum test load was 150% of design load.

All widths for any model have the same guides and anchorage as the 16' wide test door of that model.

Models 422C, 420C, and 418C have the same guides and anchorage as the 16' wide Model 424C.

All doors shown have a design slip of ¼" each side.

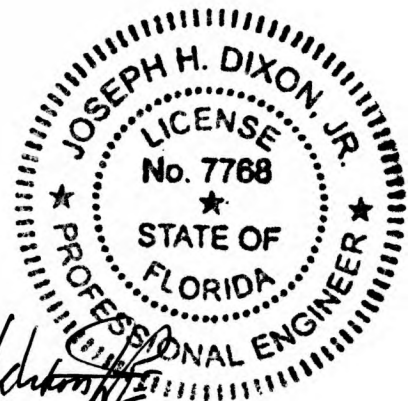


TABLE 4
Allowable Transverse Design Wind Loads (psf)

Max. Door Width (ft)	Max. Door Height (ft)	Model 622	Model 620	Model 618
8	24	+/- 178.9	+/- 187.7	+/- 198.8
9	24	+/- 141.1	+/- 147.7	+/- 154.3
10	24	+/- 115.1	+/- 119.1	+/- 124.2
11	24	+/- 96.3	+/- 99.2	+/- 102.9
12	24	+/- 82.2	+/- 84.3	+/- 87.1
13	24	+/- 71.3	+/- 72.9	+/- 75.0
14	24	+/- 62.7	+/- 63.9	+/- 65.5
15	24	+/- 55.7	+/- 56.7	+/- 57.9
16	24	+/- 50.0	+/- 50.8	+/- 51.8
17	24	+/- 45.2	+/- 45.9	+/- 46.7
18	24	+/- 41.2	+/- 41.7	+/- 42.4
19	24	+/- 37.7	+/- 38.1	+/- 38.7
20	24	+/- 34.7	+/- 35.0	+/- 35.5
21	24	+/- 32.1	+/- 32.4	+/- 32.8
22	24	+/- 29.8	+/- 30.0	+/- 30.4
23	24	+/- 27.7	+/- 28.0	+/- 28.2
24	24	+/- 25.9	+/- 26.1	+/- 26.4

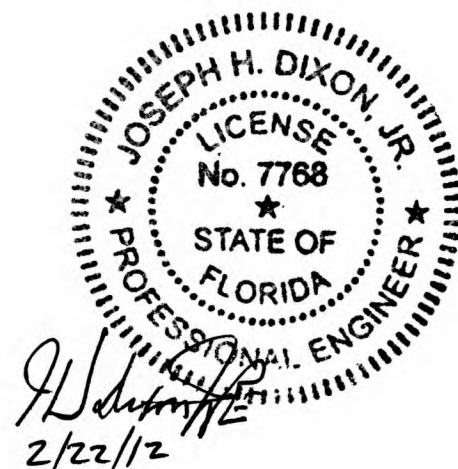
Design values used for the test are shown in the box at 16 ft. width.

Maximum test load was 150% of design load.

All widths for any model have the same guides and anchorage as the 16' wide test door of that model.

Models 620, and 618 have the same guides and anchorage as the 16' wide Model 622.

All doors shown have a design slip of 1/4" each side.



Installation Requirements:

Installation requirements are described in ASTA Door Corporation Installation Instructions as follows:

- Models: 201, 202, **203**, 204, 205, 211, 231, 232, **233**, 234, and 235, 4 pages, sealed 6/01/07
- Model: 300 (**324, 322, 320**) Commercial Slat Door, 5 pages, dated 10-1-99, sealed 6/01/07
- Model: 400/600 (**424F, 422F, 420F, 418F, 424C, 422C, 420C, 418C, 622, 620, 618**) Heavy duty Rolling Steel Service Door, 6 pages, dated 10-1-99, sealed 6/01/07

Limitations and Conditions of use:

The use of the door is limited to buildings for which the design wind loads for wall components and cladding, determined in accordance with Section 1609 of the 2010 Florida Building Code, do not exceed the rated design wind loads of the door as shown in the above Tables.

The maximum width and height limitations for each style are shown in Tables 1, 2, 3, and 4.

Door manufacturing is limited to those plants that have met the Florida Building Code 2010 Product Approval quality assurance requirements.

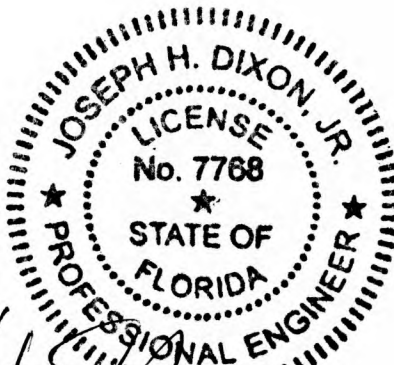
Doors are to be assembled as shown on the appropriate drawing referenced above, and the doors are to be installed in accordance with the installation instructions referenced above.

The doors covered by this report are not for use in the Florida High-Velocity Hurricane Zone.

Certification of Independence:

I, Joseph H. Dixon, Jr., certify that I am self-employed and operate as an independent contractor providing professional engineering services. I have no financial interest in nor will I acquire any financial interest in any company manufacturing or distributing products for which evaluation or validation reports have been issued by me.

Likewise, I have no financial interest in nor will I acquire any financial interest in any other entity involved in the approval process of those products for which I have issued reports.




Joseph H. Dixon, Jr. P.E.


2/22/12