

EVALUATION REPORT

Title: Commercial Sectional Steel Doors – Series 430/432, 424/426, 420/422, 416/418

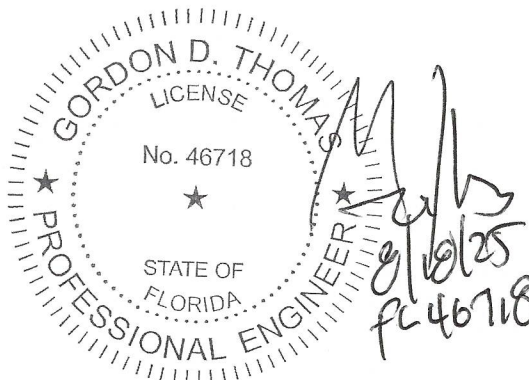
Report #: OHD2025-001

Manufacturer: Overhead Door Corporation
2501 South State Hwy 121
Lewisville, Texas 75067

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Engineering Manager

Prepared by: Gordon Thomas, P.E.
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Date: August 18, 2025



I. Introduction/ Scope

At the request of Overhead Door Corporation, I have completed an evaluation report for the stated products. The products listed in this report are currently listed under FL 11734 and approved for the 7th Edition (2022) Florida Building Code. This report will approve additional strut designs. The pressures listed on the wind load specification drawings are direct result of tests or engineering comparative analysis from actual tests. I have concluded that the construction shown on these drawings comply with the structural requirements of the 8th Edition (2023) Florida Building Code. I certify that I meet the requirements of "independence" as detailed in Florida Statutes.

This report is based on wind load tests of the Overhead Door Corporation 400 series style sectional steel doors. The following report will review the wind load requirements for a variety of doors sizes and design pressures. Since every door size cannot be tested, engineering analysis using a comparative analysis were used to analyze the doors and the specified wind load design pressures.

All testing from Overhead Door Corporation were conducted per ANSI/DASMA 108 & ANSI DASMA 115. The Overhead Door Corporation TREQ facility Dallas Texas and the Wayne Dalton, a Division of Overhead Door Corporation Pensacola, Florida facility are accredited by IAS, TL368.

II. Reference Documents

The following documents were referenced in the evaluation report.

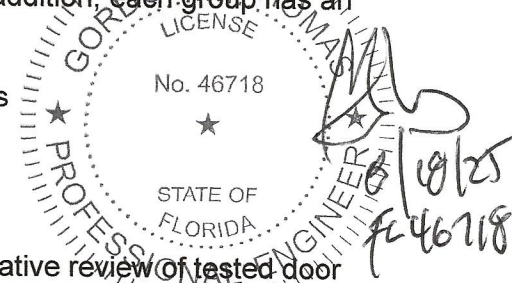
- a. Overhead Door Corporation Wind Load Test Reports: #918, #920, #021420A, #022820A, ETR05128
- b. Intertek Test Report J 1626.03-801-18-R0, J 1626.03-801-18-R1
- c. Architectural Testing Reports, ATI 82057.01-801-33
- d. Construction Consulting Laboratory Report, CCLI-O3-145
- e. Miami-Dade reports, NOA 07-0905.01, NOA 06-0331.04
- f. Wayne Dalton Test Reports, 0811204, 081320A,
- g. Overhead Door Corporation AETR-00179, AETR-00180, AETR-00958
- h. LeRoy Krupke Evaluation Report# 090120-1, revised October 18, 2023.
- i. Overhead Door Corporation hardware drawing 408717
- j. Overhead Door Corporation Wind Load Specification Drawings. All drawings are based on the latest revision dated 7/14/2025:
410153, 410154, 410155, 410156, 410157, 410158, 410159, 410160, 410161, 410162,
410163, 410164, 410165, 410166, 410167, 410168, 410169, 410170, 410171, 410172,
410126, 410217, 400218.

III. Product Configuration Overview

The Overhead Door Series 400 style Commercial Sectional Steel Door is comprised of the following door series 430/432, 424/426, 420/422, 416/418. This family of door series are based on a common section profile or cross section. The primary difference being gauge of material used to create the section: 430/432 Series 25-gauge, 424/426 Series 24-gauge, 420/422 Series 20-gauge, 416/418 Series 16-gauge. Each group is offered as an uninsulated pan door or as a steel backed EPS insulated pan door. In addition, each group has an optional full view aluminum glazed section.

Overhead Door Corporation 400 series doors:

Panel Thickness
1 3/4



IV. Evaluation

Since every door size cannot be tested, engineering analysis using a comparative review of tested door configurations were used in this analysis to determine design wind loads specified on the wind load specification drawings listed in this report. Based on comparative analysis from maximum bending moments ($M=wL^2/8$) on the critical design members. The design pressure can be compared to changes in door width with the equation below:

$$L_1^2 / L_2^2 = w_2 / w_1$$

Where,

L_1 width of door 1 and L_2 width of door 2

w_1 wind load pressure door 1 and w_2 wind load pressure door 2

Since the cross sections have the same geometry a comparison of section bending strength can also be made between door series by comparing the I/c value of each section cross section. The calculated I/c values for each of the door configurations is listed in the table below:

Section Strutting	Door Series	None	1 HS-1	1 HS-2	1 HS-3 (1)	1 HS-3(2)	2 HS-3	1 C (16 ga)	1 Z (16 ga)
I/C Value	430	0.0858	0.2664	0.3983	0.6524	0.6524	1.0956	1.1013	1.6556
	424	0.0986	0.2762	0.4143	0.6763	0.6763	1.1358	1.1269	1.6876
	420	0.1504	0.3083	0.4647	0.7515	0.7515	1.2715	1.2087	1.7913
	416	0.2388	0.3515	0.5263	0.8379	0.8379	1.4400	1.3039	1.9119

The allowable moments for each configuration were generated from the actual tests (see limitations item 1 below) and the comparative strength of each configuration as illustrated in the I/C table above. Utilizing this method of analysis maintains a consistent constant stress for each section configuration. Maintaining a constant stress and assuming the sections respond as a simply supported beam we can utilize the basic stress equation, $\text{Stress} = MC / I$ or $\text{Moment} = \text{Stress} \times I/C$. The moments are therefore proportional to the ratio of the I/C's for each configuration. The allowable Design Moment for each strut configuration is listed in the table below:

Section Strutting	Door Series	None	1 HS-1	1 HS-2	1 HS-3 (1)	1 HS-3(2)	2 HS-3	1 C (16 ga)	1 Z (16 ga)
Moment	430	1971	5787	*10781	12038	17781	31219	31219	37542
	424	2266	*6000	*11213	*12479	*18432	*32718	*31944	38269
	420	*3456	6699	*12578	13867	20482	34262	34262	40620
	416	6271	8728	*16279	17670	26100	42241	42241	49548

The moments marked with an * were determined by actual test. Note the moments listed for the 2-HS3 configuration are limited by the C-Channel values. The drawings allow for both alternate configurations for the same design load.

Additional testing was completed under AETR-00958 (dated 7/14/2025) along with supporting calculations and comparative analysis. The results are as follows:

Strut	Thickness, T (in)	Height	Material	Yield Strength (psi)	Moment of Inertia Iy (in ⁴)	Max Bending Moment (in-lbs)
2" 20 GA	0.034 min	2.000	SS Grade 80	80,000	0.1014	6709
3" 20 GA	0.034 min	3.000	SS Grade 80	80,000	0.296	13394

Conclusions from the testing and comparative analysis are as follows:

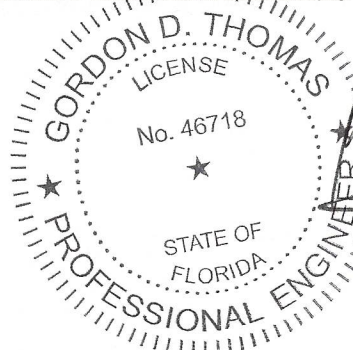
1. 2" 20GA strut may replace and/or be substituted for current HS-1.
2. 3" 20GA strut may replace and/or be substituted for current HS-2.

In addition to the above comparative analysis, door testing also established load limits for the following items:

Track Rollers	Roller Load = Lx w, assuming 24" tall sections
End Hinge	End Hinge Load = Roller Load
Panel End Stiles	End Stile Load = Roller Load
Track Jamb Brackets	Jamb Bracket Load (lbs./ft) = Roller Load / 2 assuming 24" tall sections
Panel Glazing Width	Glazing Width = L / Center Stile spacing @ tested design pressure
Track Gage	Track gage was determined by track roller load and jamb bracket spacing

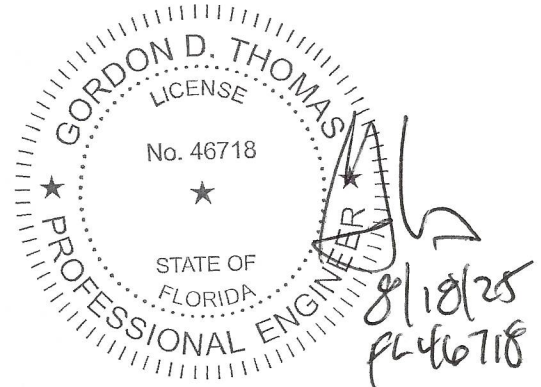
The Limitations and allowable loads were determined from the physical door testing referenced above. This analysis was used to create the door configurations detailed on the wind load specification drawings listed in this report.

- 1) Individual sections react like a simply supported beam. Each reinforcement configuration has a maximum allowable moment that cannot be exceeded.
 - a. Series 420 Door with No struts. Maximum allowable moment 3456 in-lbs.
 - b. Aluminum Full View Glazed section with no struts, Maximum allowable moment 7296 in-lbs. Report #920.
 - c. Optional glazing with 1/8" DSB glazing may be used for listed pressures. Glazing shall have a maximum height of 7" and a maximum length of 24". Maximum tested design pressure +/- 50 psf. Report CCLI-03-145.
 - d. Series 424 Door with one HS1 strut per section. Maximum allowable moment 6000 in-lbs. Report ATI 82057.01-801-33.
 - e. Series 424 Door with one HS2 strut per section. Maximum allowable moment 11213 in-lbs. Report CCLI 03-145.
 - f. Series 424 Door with one HS3 strut per section with wide stile spacing. Maximum allowable moment 12749 in-lbs. Report CCLI 03-145.
 - g. Series 424 Door with one HS3 strut per section with narrow stile spacing. Maximum allowable moment 18432 in-lbs. Report CCL|03-145.
 - h. Series 424 Door with two HS3 struts per section with narrow spacing. Maximum allowable moment 32718 in-lbs. Report AETR-00179.
 - i. Series 424 Door with one C (16 ga) strut per section. Maximum allowable moment 31944 in-lbs. Report ETR 05128.



- 2) The basic strength of the aluminum full view glazed section is stronger than all the unstructured 400 series steel doors. In addition, the equivalent I/C values are higher for each of the strut configurations. Therefore, the individual door strutting for full view glazed sections should follow the strutting of the steel section. The only additional limitation on the aluminum sections will be maximum door width. The maximum width allowed for Full View Aluminum Sections will be limited to the same widths as the Aluminum Doors detailed in FL 32012. The no-fin aluminum doors detailed in the report have the same cross section as the aluminum full glazed section used with the 400 series steel doors. The full view aluminum sections are not to be used for the top or bottom sections. The width limitation for full view glazed sections are given in the table below:

Design PSF	Max Width
18	22
22	20
26	18
31	16
37	14
50	10

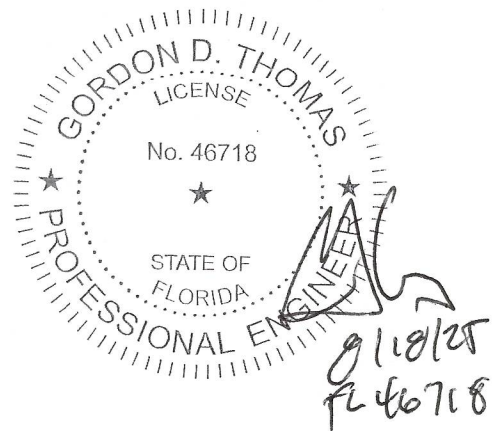


- 3) Maximum Roller Loads for each roller type, steel 2" or 3" - 10 ball roller.
- a. 7/16 roller stem diameter, maximum load 432 lbs. Report #918
 - b. 7/16 high tensile stem diameter, maximum load 828 lbs. Report #J 1626.03-801- 18-R1
 - c. 7/16 stem 2" Nylon rollers are equivalent in strength and an acceptable substitution for the steel 2" - 10 ball rollers. Report # J 1626.03-801-18-R0
- 4) Maximum End Hinge Load
- a. 12 gage end hinges, maximum load 780lbs, Report # NOA 07-0905.01, #022820A.
- 5) Panel End Stile Configuration load limit.
- a. Single end stile maximum load 340lbs. Report# CCLI 03-145.
 - b. Double end stile load 780 lbs. Report # NOA 07-0905.01, #022820A.
- 6) Track Jamb Bracket Spacing load limit and Track Gage load limit
- a. 0.049" track thickness with 24" jamb bracket spacing, maximum load 132 lbs./ft. Report #CCLI 03-145.
 - b. 0.068/.072" track thickness with 12" jamb bracket spacing, maximum load 350 lbs./ft. Report #CCLI 03-145.
 - c. 0.085/.090" track thickness with 12" jamb bracket spacing, maximum load 414 lbs./ft. Report #J 1626.03-801-18-R1.
- 7) Full view aluminum glazed section width limit @ maximum design pressure
- a. 1/8" DSB glass, 1/4" DSB glass, 1/4" Polycarbonate, maximum center stile spacing 54" @ 50 psf. Report #081120A.
- 8) Door Tracks
- a. All door assemblies listed in this report have both vertical and horizontal tracks from a minimum 33 ksi steel and finished with an ASTM A525 G-40 galvanized coating. The vertical tracks are attached to the supporting structure with jamb brackets as specified on the Wind Load Specification drawings.

V. Evaluation Summary

Using comparative analysis, the following table summarizes the door configurations that have been evaluated. All doors detailed on the specified wind load drawings have not exceeded the maximum allowable loads and moments defined above for this model door.

Item	Door Model	Max Door Size	Design Pressure	Wind Load Specification Drawing	Drawing Revision	Note
1	430/432	20'2" x 30' 1"	+/- 18 psf	410168	7/14/2025	Static Test
2	430/432	20'2" x 30' 1"	+/- 22 psf	410169	7/14/2025	Static Test
3	430/432	20'2" x 30' 1"	+/- 26 psf	410170	7/14/2025	Static Test
4	430/432	18'2" x 30' 1"	+/- 31 psf	410171	7/14/2025	Static Test
5	430/432	16'2" x 30' 1"	+/- 37 psf	410172	7/14/2025	Static Test
6	424/426	26'2" x 30' 1"	+/- 18 psf	410163	7/14/2025	Static Test
7	424/426	24'2" x 30' 1"	+/- 22 psf	410164	7/14/2025	Static Test
8	424/426	22'2" x 30' 1"	+/- 26 psf	410165	7/14/2025	Static Test
9	424/426	20'2" x 30' 1"	+/- 31 psf	410166	7/14/2025	Static Test
10	424/426	18'2" x 30' 1"	+/- 37 psf	410167	7/14/2025	Static Test
11	424/426	14'2" x 30' 1"	+/- 50 psf	410218	7/14/2025	Static Test
12	420/422	26'2" x 30' 1"	+/- 18 psf	410158	7/14/2025	Static Test
13	420/422	24'2" x 30' 1"	+/- 22 psf	410159	7/14/2025	Static Test
14	420/422	22'2" x 30' 1"	+/- 26 psf	410160	7/14/2025	Static Test
15	420/422	20'2" x 30' 1"	+/- 31 psf	410161	7/14/2025	Static Test
16	420/422	18'2" x 30' 1"	+/- 37 psf	410162	7/14/2025	Static Test
17	420/422	14'2" x 30' 1"	+/- 50 psf	410217	7/14/2025	Static Test
18	426/418	30'2" x 30' 1"	+/- 18 psf	410153	7/14/2025	Static Test
19	426/418	26'2" x 30' 1"	+/- 22 psf	410154	7/14/2025	Static Test
20	426/418	24'2" x 30' 1"	+/- 26 psf	410155	7/14/2025	Static Test
21	426/418	22'2" x 30' 1"	+/- 31 psf	410156	7/14/2025	Static Test
22	426/418	18'2" x 30' 1"	+/- 37 psf	410157	7/14/2025	Static Test
23	426/418	14'2" x 30' 1"	+/- 50 psf	410216	7/14/2025	Static Test



VI. Limitations of Use

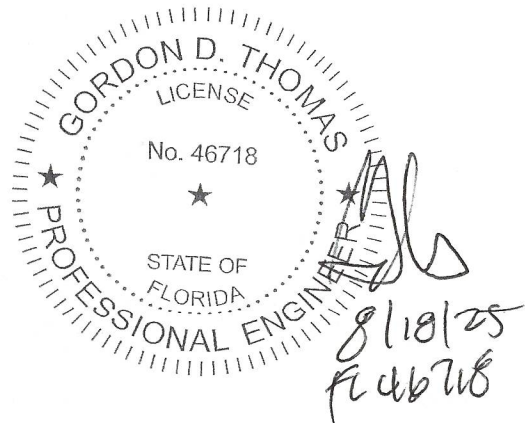
The drawings referenced above provide the primary details for limitation of use. This includes hinges, top/bottom fixture, roller stem assemblies, struts, angles, door track and brackets. The drawings cited above are an explicit part of the evaluation report. The text of this report does not attempt to address all design details but relies upon the illustration and text of these drawings and instructions as well. Each door should be chosen on the "psf" requirement determined for a specific installation or locale.

This Evaluation Report does not address design of the wall/jambs themselves. These drawings only illustrate common means to attach the door to jambs. Walls and Jambs should be designed (by others) to withstand the loads imposed by the door onto the building.

Maximum Door Width	30'2" (Series 416/418 @ +/-18psf)
Maximum Door Height	30'1"
Maximum Design Wind Load	+50/-50 psf (14'2" width)
Door Section Type	Referenced by Door Model above
Mounting	a. Angle in – steel jambs b. Angle in & bracket mount masonry jamb c. Angle out - wood jamb d. Jamb bracket mount - wood jamb

IDENTIFICATION

Each Model series covered by this report shall be labeled with the manufacturer's name and/or trademark for field identification.



Certification of Independence of Evaluation Entity

I hereby certify that (1) I have no financial interest in Overhead Door Corporation; (2) I am an independent licensed Professional Engineer in the State of Florida and; (3) I comply with the criteria of independence as stated in 9B-72.110 (3), F.A.C. and 9B-72.110(4), F.A.C.