

STRUCTURAL SOLUTIONS, P.A.*

Structural Engineering ■ Investigations ■ Consulting

GARAGE DOOR STATIC PRESSURE TEST REPORT

Garage Door No.:	IBC-2509-140-15-A		Test Date:	7/25/2017		Project No.:	17-063			
Design Pressures:	+28.1 psf, -33 psf		Report Date:	10/28/2020		Model #	2500/3550			
Test Pressures:	+42.2 psf, -49.5 psf		Test Location:	Entrematic, Winston-Salem, NC						
ASCE 7-16 Criteria:	Up to 5 Feet of Door Width in Zone 5; Roof Slope ≤ 10°; Enclosed Building									
	Exp. B, 30' MRH		Exp. C, 15' MRH		Exp. C, 25' MRH		Exp. D, 15' MRH		Exp. D, 25' MRH	
	181 mph		164 mph		156 mph		149 mph		143 mph	
Witnessed By:	Robert Richardson - Entrematic / Amarr; Thomas L. Shelmerdine, PE - Structural Solutions, P.A.									

Description of Test Specimen:

A 9'-2" wide x 8'-0" high sectional garage door, one section wide by four sections high. The top, bottom and 2nd sections were 25 gauge galvanized steel sheet, the 3rd section was aluminum with 1/8" annealed DSB glass. The bottom and intermediate steel sections were reinforced with one 2" 20 gauge and one 3" 20 gauge galvanized steel strut, the top section was reinforced with one 2" 20 gauge galvanized steel strut. The door sections were connected together with one 14 gauge galvanized steel end hinge at each end stile and one 14 gauge galvanized steel center hinge at one interior stile as shown on the drawing. Model 2500/3550 manufactured by Entrematic was used in the test. The test unit is further described on Drawing IBC-2509-140-15-A.

Manner of Testing:

This test was conducted at Entrematic, 165 Carriage Ct., Winston-Salem, NC, which is accredited by the American Association for Laboratory Accreditation, Certificate #2595.01. The specimen was tested for static pressure structural performance in substantial conformance with the procedures described in DASMA 108-12 and ASTM E330-14. Both positive and negative pressures were tested. The specimen was installed in an enclosure framed with welded structural steel and covered with 3/4" thick plywood. The door was covered with 2 mil plastic sheeting to prevent leakage of air pressure. One pressure blower was attached to the enclosure with flexible ducting to provide the positive and negative pressures. Pressure transducers connected to a computer were used to measure and record the pressures in the enclosure.

Test Procedure:

The specimen was subjected to the above pressures for the following durations. Positive pressure was applied on the exterior face of the door first, and then negative pressure was applied.

- Step 1: Preload the door to 50% of the Design Pressure and hold for 10 seconds. Step 2: Unload the door for 1 to 5 minutes.
Step 3: Load the door to 100% of the Design Pressure and hold for 60 seconds. Step 4: Unload the door for 1 to 5 minutes.
Step 5: Load the door to 150% of the Design Pressure (which equals 100% of the Test Pressure) and hold for 10 seconds.
Step 6: Repeat 1 through 5 above for negative pressure.

Observations:

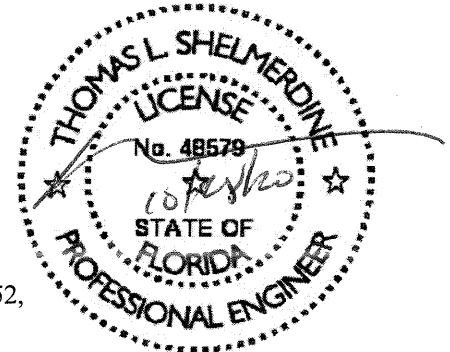
No failures occurred as a result of the noted loadings. The door remained operable after both positive and negative tests.

Summary:

The 9'-2"x8'-0" Model 2500/3550 as described on drawing IBC-2509-140-15-A meets or exceeds the testing criteria as described above. By comparison to the construction of the 9'-2"x8'-0" Model 2500/3550, the following doors also meet or exceed the above testing criteria, when constructed in accordance with drawing IBC-2509-140-15-A:

- 9'-2" x 8'-0" Model 2400/3550 and Model 2000/3550 doors (which are constructed of thicker 24 ga and 20 ga [respectively] steel sections in lieu of 25 ga steel sections)
- 9'-2" x 8'-0" Amarr Model # 2502/3552, 2402/3552 and 2002/3552 doors, which are alternate model numbers for the 2500/3550, 2400/3550 and 2000/3550 doors
- 9'-2" x 8'-0" Amarr Model # 2512/3552, 2412/3552 and 2012/3552 doors, which are Model 2500/3550, 2400/3550 and 2000/3550 doors with drop-in insulation
- 9'-2" x 8'-0" Amarr Model # 2422/3552 and 2022/3552 doors, which are Model 2400/3550 and 2000/3550 doors with drop-in insulation and backer panels
- Model 2500/3550, 2400/3550 and 2000/3550 doors, and Amarr Model # 2502/3552, 2512/3552, 2402/3552, 2412/3552, 2422/3552, 2002/3552, 2012/3552, and 2022/3552 doors, with widths up to 9'-2" and heights up to 24'-0"

Submitted By:



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