

PERFORMANCE TEST REPORT

Rendered to:

WAYNE-DALTON CORPORATION
Door and Systems Division

Model DS-350 Square
12'x 8'

Report No:	01-46385.02
Test Date:	09/15/03
Report Date:	11/13/03
Expiration Date:	09/08/07

PERFORMANCE TEST REPORT

Rendered to:

WAYNE-DALTON CORPORATION
Door and Systems Division
1 Door Drive
Mount Hope, Ohio 44660

Report No: 01-46385.02
Test Date: 09/15/03
Report Date: 11/13/03

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Wayne-Dalton Corporation to perform wind load testing per ASTM E 330-97. The test was performed upon a Model DS-350 Square commercial roll-up sheet door. The door was 12' wide by 8' high. The door was tested to a +/-40.0 psf design pressure. This report includes test data and drawings.

Test Procedure: The test specimen was evaluated in accordance with ASTM E 330-97, *Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference*. Testing was conducted at positive and negative loads as listed in the test results.

General Description: The steel test chamber provided a clear opening measuring 12' 0" wide by 8' 0" high. Two jamb conditions were provided. Steel tube with a 5/16" wall thickness was utilized on the left jamb and a 3,000 psi grout filled concrete block column for the right jamb. The head was comprised of two 12" steel channels that were stacked and welded.

Test Specimen:**Product:** Model DS-350 Square commercial roll-up sheet door**Door Opening:** 12' 0" wide by 8' 0" high

Assembly Details: "G" guides were utilized for both the steel and the grout filled concrete block jambs. The guide anchor spacing was 6" from the bottom and 12" on center thereafter for the steel and the grout filled concrete block jambs. The curtain was fabricated with .018" sheet steel with windlocks on alternating beads. The windlocks were fastened with two rivets per lock. Reference Wayne-Dalton Drawing # 035-0010 and 035-0012 for these details.

Test Results: The following results have been recorded:

ASTM E 330-97: *"Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference."*

Note: Polyethylene film and tape were used in a manner that did not influence the test results. Deflection was measured at the midspan and ends of the door with linear transducers.

Test Pressure	Duration	Maximum Deflection (Inch)			Permanent Set (Inch)		
		Transducer Number #1	Transducer Number #2	Transducer Number #3	Transducer Number #1	Transducer Number #2	Transducer Number #3
+17.0 psf (1/2 Design)	10 sec	Remove Slack					
+34.0 psf (Design)	10 sec	0.540	7.700	0.500	0.040	0.220	0.100
+51.0 psf (Overload)	10 sec	0.670	9.100	0.640	0.080	0.580	0.120
-17.0 psf (1/2 Design)	10 sec	Remove Slack					
-34.0 psf (Design)	10 sec	0.850	9.640	0.920	0.020	0.180	0.020
-51.0 psf (Overload)	10 sec	1.010	10.340	1.190	0.050	0.400	0.080
-56.0 psf (Overload)	10 sec	1.060	10.560	1.260	0.070	0.480	0.100
+28.0 psf (1/2 Test)	10 sec	Remove Slack					
+56.0 psf (Overload)	10 sec	0.740	10.200	0.630	0.030	0.440	0.020
+60.0 psf (Overload)	10 sec	0.720	10.420	0.710	0.040	0.640	0.050
-30.0 psf (1/2 Test)	10 sec	Remove Slack					
-60.0 psf (Overload)	10 sec	1.140	10.940	1.300	0.060	0.260	0.050

There was no visible damage and the door was operational at the conclusion of testing.

List of Official Observers:

Mark Daus	Wayne-Dalton Corporation
Michael Mendez	Wayne-Dalton Corporation
Scott Kramer	Architectural Testing, Inc.

ASTM E8-01

Test Method: The test specimens were evaluated in accordance with ASTM E8-01, *Standard Test Methods for Tensile Testing of Metallic Materials*. The test specimens were machined and sized in compliance with section 6.0 of the standard. The specimens were tested using a Satec 50UD Universal Machine with a cross head speed of 0.2 in/min

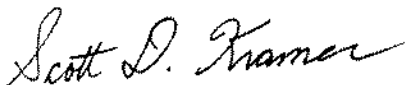
Test Results: The test results are shown on test logs 18876 through 18881 (attached) and summarized in the following table.

Specimen	Yield Strength (psi)	Yield Strain (in/in)	Tensile Load (lbf)	Tensile Strength (psi)	Elongation (%)	Area Reduction (%)
1	39,729	0.0037	511	45,648	32.00	46.40
2	41,512	0.0035	509	47,536	34.00	38.30
3	38,347	0.0037	499	46,677	33.80	41.10
4	36,496	0.0035	509	47,541	35.30	23.40
5	41,393	0.0034	515	48,548	36.00	37.70
6	38,981	0.0035	511	45,604	35.00	30.40
Average	39,410	0.0036	509	46,925	34.40	36.20

The average Tangent Modulus for the tested specimens was 24.6×10^6 psi.

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 samples tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory. This report may not be reproduced except in full without the approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC.:



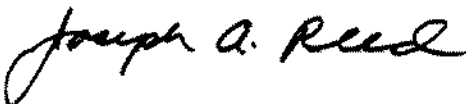
Digitally Signed by: Scott D. Kramer

Scott D. Kramer
Technician



Digitally Signed by: Connie L. Owad

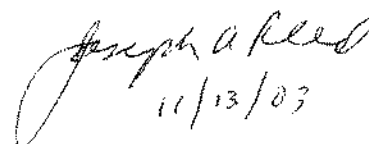
Connie Owad
Technician



Digitally Signed by: Joseph A. Reed

Joseph A. Reed, P.E.
Director - Engineering and Product Testing

SDK:baw
01-46385.02



DOCUMENT CONTROL ADDENDUM #01-46385.00

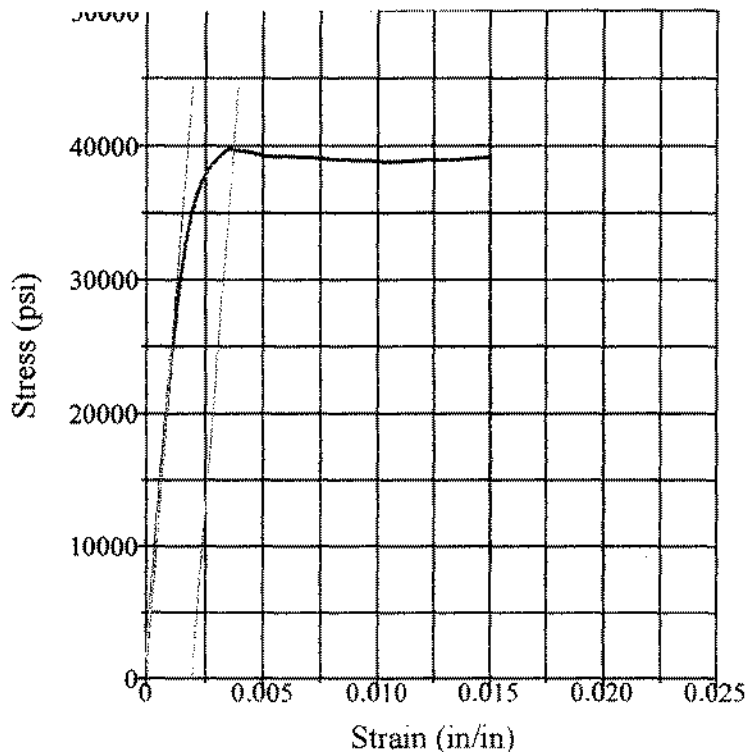
Current Issue Date: 11/13/03

Report No.: 01-46385.01

Requested by: Mark Daus, Wayne Dalton Corporation
Purpose: ASTM E 330 testing of Series/Model DS-350, 10' x 8'.
Issued Date: 11/13/03
Comments: Florida P.E. seal required on report.

Report No.: 01-46385.02

Requested by: Mark Daus, Wayne Dalton Corporation
Purpose: ASTM E 330 testing of Series/Model DS-350, 12' x 8'.
Issued Date: 11/13/03
Comments: Florida P.E. seal required on report.

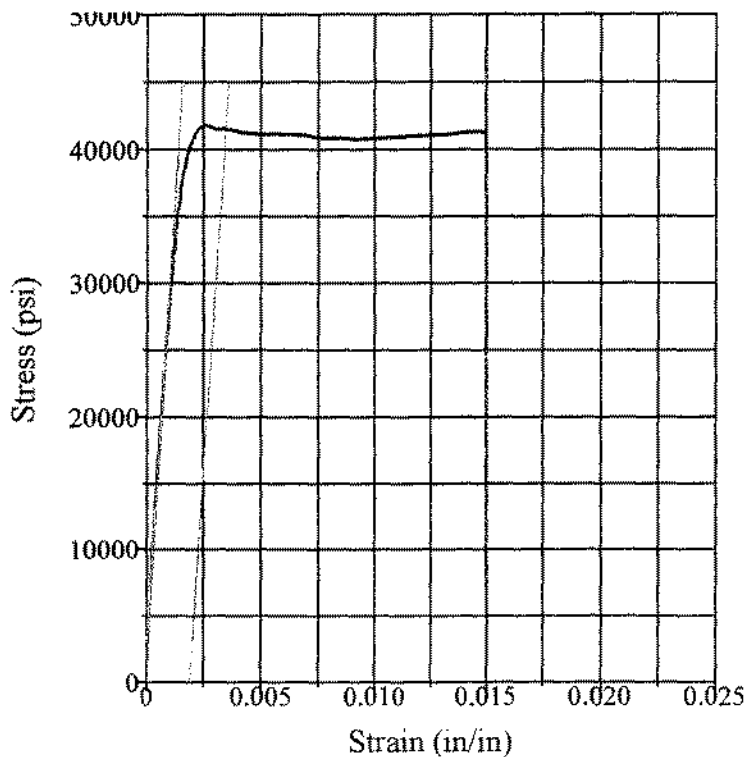


Test Results

Width: 0.5070 in
 After Test Width: 0.4000 in
 Thickness: 0.0220 in
 After Test Thickness: 0.0150 in
 Area: 0.0112 in²
 After Test Area: 0.0060 in²
 Tensile Strength: 45648 psi
 Peak Load: 511 lbf
 Load at Yield: 444.9626 lbf
 Position at Yield: 0.0700 in
 Time at Yield: 0.3534 min
 Strain at Yield: 0.0037 in/in
 Stress at Yield: 39728.8100 psi
 Elongation at Yield: 0.0074 in
 Reduction of Area: 46.4 %
 Total Elongation: 32.0000 %
 Pretest Punch Length: 2.000 in
 Posttest Punch Length: 2.64 in
 Modulus of Elasticity: 21962700 psi

Test Summary

Counter: 18876
 Elapsed Time: 00:04:17
 ATI #: 01-46385
 Client: Wayne Dalton Corporation
 Material Type: Steel Door
 Sample #: 1
 Comments: 12 x 8 Square 120-32
 Procedure Name: ASTM E 8-01, Tensile Testing of
 Start Date: 10/17/03
 Start Time: 8:08:54 AM
 End Date: 10/17/03
 End Time: 8:13:11 AM
 Workstation: Architectural Testing Inc.
 Tested By: Connie

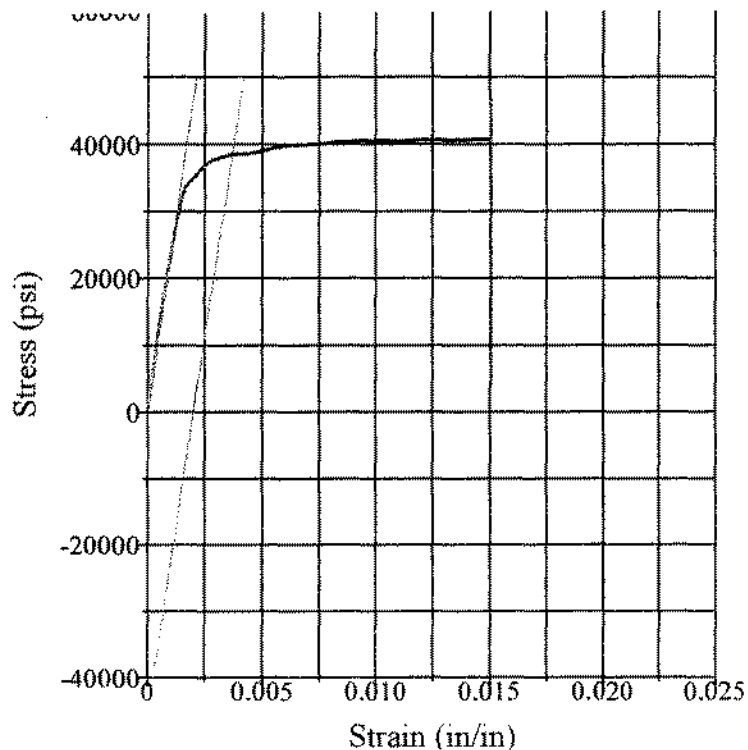


Test Results

Width:	0.5085 in
After Test Width:	0.4155 in
Thickness:	0.0210 in
After Test Thickness:	0.0160 in
Area:	0.0107 in ²
After Test Area:	0.0066 in ²
Tensile Strength:	47536 psi
Peak Load:	509 lbf
Load at Yield:	444.1808 lbf
Position at Yield:	0.0717 in
Time at Yield:	0.3618 min
Strain at Yield:	0.0035 in/in
Stress at Yield:	41512.2300 psi
Elongation at Yield:	0.0069 in
Reduction of Area:	38.3 %
Total Elongation:	34.0000 %
Pretest Punch Length:	2.000 in
Posttest Punch Length:	2.68 in
Modulus of Elasticity:	26646900 psi

Test Summary

Counter:	18877
Elapsed Time:	00:04:29
ATI #:	01-46385
Client:	Wayne Dalton Corporation
Material Type:	Steel Door
Sample #:	2
Comments:	12 x 8 Square 120-32
Procedure Name:	ASTM E 8-01, Tensile Testing of
Start Date:	10/17/03
Start Time:	8:18:13 AM
End Date:	10/17/03
End Time:	8:22:42 AM
Workstation:	Architectural Testing Inc.
Tested By:	Connie

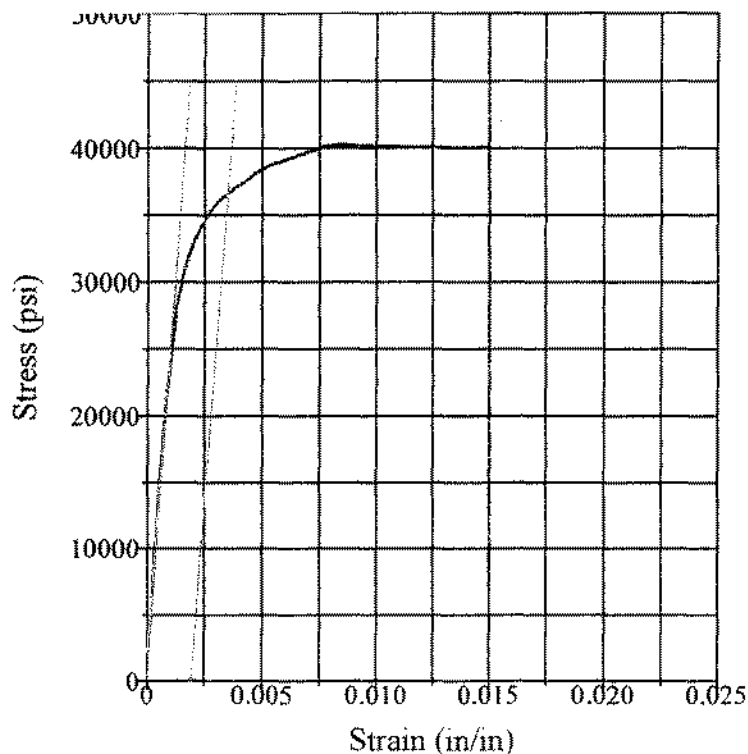


Test Results

Width: 0.5085 in
 After Test Width: 0.3965 in
 Thickness: 0.0210 in
 After Test Thickness: 0.0160 in
 Area: 0.0107 in²
 After Test Area: 0.0063 in²
 Tensile Strength: 46677 psi
 Peak Load: 499 lbf
 Load at Yield: 410.3168 lbf
 Position at Yield: 0.0697 in
 Time at Yield: 0.3520 min
 Strain at Yield: 0.0037 in/in
 Stress at Yield: 38347.3600 psi
 Elongation at Yield: 0.0073 in
 Reduction of Area: 41.1 %
 Total Elongation: 33.8000 %
 Pretest Punch Length: 2.000 in
 Posttest Punch Length: 2.676 in
 Modulus of Elasticity: 22855000 psi

Test Summary

Counter: 18878
 Elapsed Time: 00:04:28
 ATI #: 01-46385
 Client: Wayne Dalton Corporation
 Material Type: Steel Door
 Sample #: 3
 Comments: 12 x 8 Square 120-32
 Procedure Name: ASTM E 8-01, Tensile Testing of
 Start Date: 10/17/03
 Start Time: 8:25:34 AM
 End Date: 10/17/03
 End Time: 8:30:02 AM
 Workstation: Architectural Testing Inc.
 Tested By: Connie

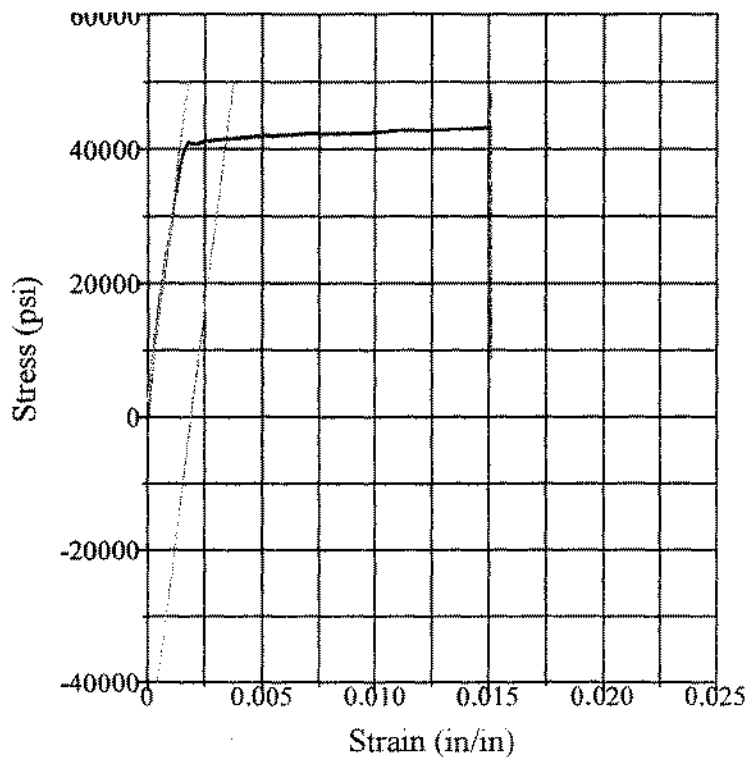


Test Results

Width: 0.5085 in
 After Test Width: 0.4080 in
 Thickness: 0.0210 in
 After Test Thickness: 0.0200 in
 Area: 0.0107 in²
 After Test Area: 0.0082 in²
 Tensile Strength: 47541 psi
 Peak Load: 509 lbf
 Load at Yield: 390.5117 lbf
 Position at Yield: 0.0749 in
 Time at Yield: 0.3777 min
 Strain at Yield: 0.0035 in/in
 Stress at Yield: 36496.4200 psi
 Elongation at Yield: 0.0070 in
 Reduction of Area: 23.4 %
 Total Elongation: 35.3250 %
 Pretest Punch Length: 2.000 in
 Posttest Punch Length: 2.7065 in
 Modulus of Elasticity: 22965700 psi

Test Summary

Counter: 18879
 Elapsed Time: 00:04:45
 ATI #: 01-46385
 Client: Wayne Dalton Corporation
 Material Type: Steel Door
 Sample #: 4
 Comments: 12 x 8 Square 120-32
 Procedure Name: ASTM E 8-01, Tensile Testing of
 Start Date: 10/17/03
 Start Time: 8:32:41 AM
 End Date: 10/17/03
 End Time: 8:37:26 AM
 Workstation: Architectural Testing Inc.
 Tested By: Connie

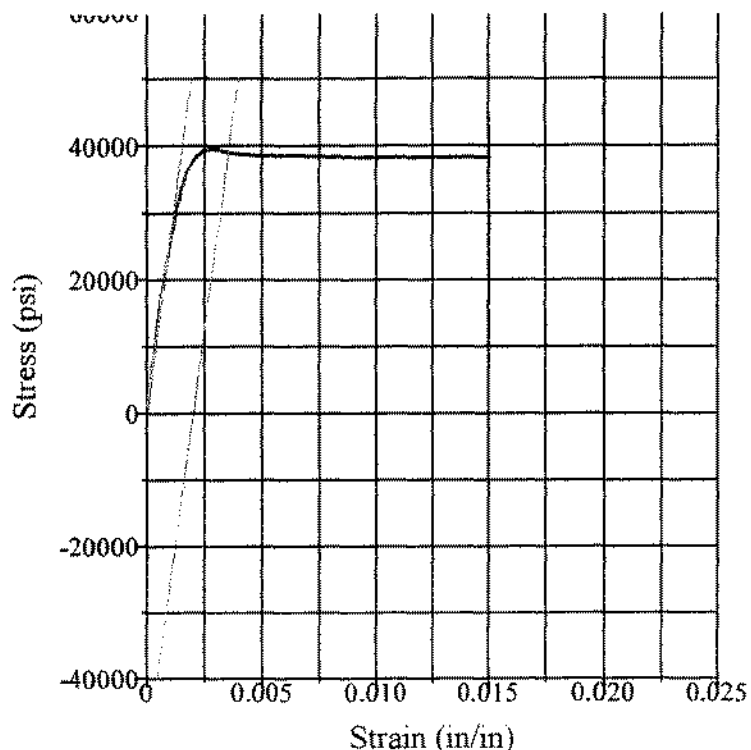


Test Results

Width: 0.5060 in
 After Test Width: 0.3975 in
 Thickness: 0.0210 in
 After Test Thickness: 0.0165 in
 Area: 0.0106 in²
 After Test Area: 0.0066 in²
 Tensile Strength: 48548 psi
 Peak Load: 515 lbf
 Load at Yield: 438.7624 lbf
 Position at Yield: 0.0767 in
 Time at Yield: 0.3867 min
 Strain at Yield: 0.0034 in/in
 Stress at Yield: 41392.6900 psi
 Elongation at Yield: 0.0068 in
 Reduction of Area: 37.7 %
 Total Elongation: 36.0000 %
 Pretest Punch Length: 2.000 in
 Posttest Punch Length: 2.72 in
 Modulus of Elasticity: 27330800 psi

Test Summary

Counter: 18880
 Elapsed Time: 00:04:31
 ATI #: 01-46385
 Client: Wayne Dalton Corporation
 Material Type: Steel Door
 Sample #: 5
 Comments: 12 x 8 Square 120-32
 Procedure Name: ASTM E 8-01, Tensile Testing of
 Start Date: 10/17/03
 Start Time: 8:47:01 AM
 End Date: 10/17/03
 End Time: 8:51:32 AM
 Workstation: Architectural Testing Inc.
 Tested By: Connie

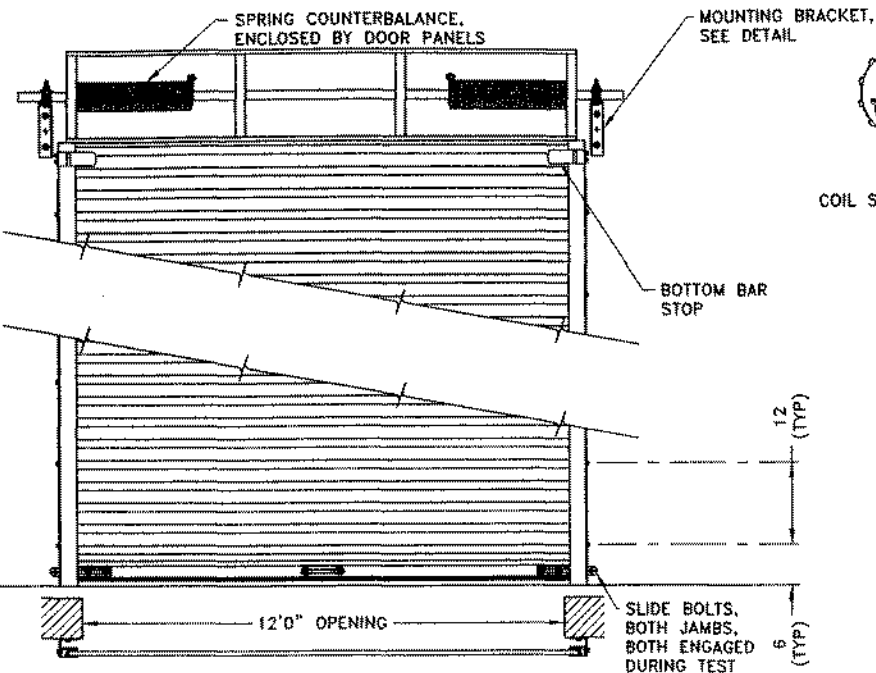


Test Results

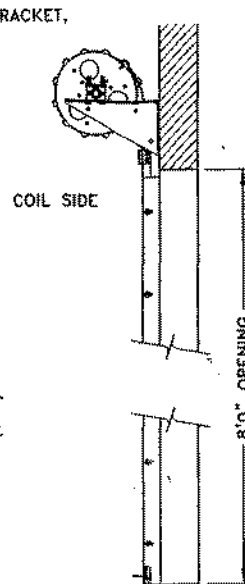
Width: 0.5070 in
After Test Width: 0.4000 in
Thickness: 0.0220 in
After Test Thickness: 0.0195 in
Area: 0.0112 in²
After Test Area: 0.0078 in²
Tensile Strength: 45604 psi
Peak Load: 511 lbf
Load at Yield: 436.5922 lbf
Position at Yield: 0.0699 in
Time at Yield: 0.3527 min
Strain at Yield: 0.0035 in/in
Stress at Yield: 38981.4500 psi
Elongation at Yield: 0.0071 in
Reduction of Area: 30.4 %
Total Elongation: 35.0000 %
Pretest Punch Length: 2.000 in
Posttest Punch Length: 2.70 in
Modulus of Elasticity: 25591700 psi

Test Summary

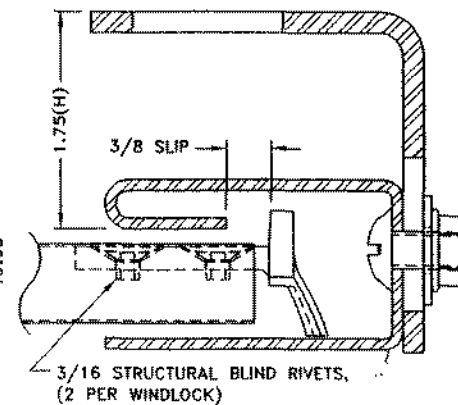
Counter: 18881
Elapsed Time: 00:04:30
ATI #: 01-46385
Client: Wayne Dalton Corporation
Material Type: Steel Door
Sample #: 6
Comments: 12 x 8 Square 120-32
Procedure Name: ASTM E 8-01, Tensile Testing of
Start Date: 10/17/03
Start Time: 8:55:53 AM
End Date: 10/17/03
End Time: 9:00:23 AM
Workstation: Architectural Testing Inc.
Tested By: Connie



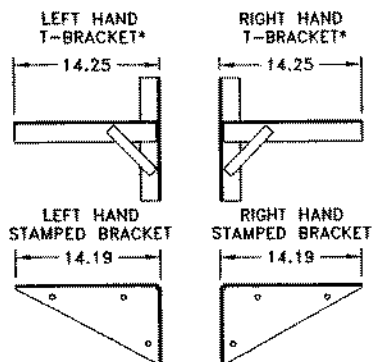
COILSIDE ELEVATION
SCALE = NONE



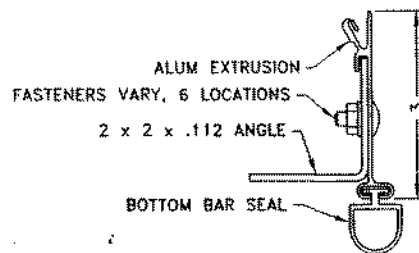
PANEL DETAIL
SCALE = 1:4



GUIDE DETAIL
SCALE = FULL



BRACKET DETAIL
SCALE = 1:12



BOTTOM BAR DETAIL
SCALE = 1:2

NOTES:

1. UNIFORM STATIC AIR PRESSURE TEST PERFORMED PER ASTM E 330
2. TENSILE TEST PERFORMED PER ASTM E 8
3. TESTED BY ARCHITECTURAL TESTING, INC.
4. CURTAIN IS .018 MIN STEEL PER ASTM A 653, GR.40
5. SEE 035-0012 FOR COMPONENT DETAILS

Architectural Testing
Test sample complies with these details.
Deviations are noted.

Report# 01-46885-02
Date 10-31-03 Tech SAK

TEST	DATE	TEST REPORT NUMBER	RESULTS
UNIFORM STATIC AIR PRESSURE			
TENSILE			

DRAWN BY M. DAUS 10/02/2003	CHECKED BY	APPVD. BY	TOLERANCES (UNLESS OTHERWISE SPECIFIED) LINEAR .X ± .060 LINEAR .XX ± .030 LINEAR .XXX ± .010 ANGULAR ± .50° DIMENSIONS IN INCHES
SCALE - WHEN THIS ORIGINAL RELEASE BOX IS .50" HIGH AS SHOWN			 Rolling Door Division 4512 Lincoln Way E. Darien, Ohio 44818

*DENOTES UNTESTED CONFIGURATIONS APPROVED BY COMPARATIVE ANALYSIS

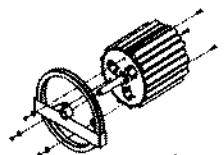
PART NUMBER	WEIGHT (LB.)	TITLE
REFERENCE		WINDLOAD TEST, DS-350, 12' x 8', SQUARE PROFILE PANEL, ±40 PSF DESIGN (±60 PSF TEST)
		MATERIAL AS SHOWN

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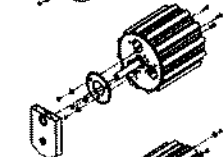
REV.	REV'D. BY	APPVD. BY	RELEASE	DESCRIPTION

REVISIONS

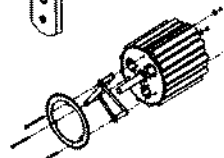
SIZE	DRAWING NO.	REVISION
B	035-0010	



DIRECT DRIVE CHAIN HOIST OPERATION



REDUCED DRIVE CHAIN HOIST OPERATION*



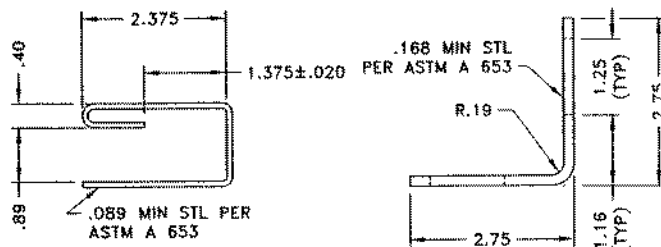
MOTOR OPERATION*



MANUAL OPERATION*

OPERATION DETAIL

SCALE = NONE

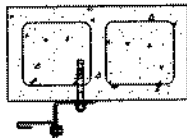


G-GUIDE DETAIL

SCALE = 1:2

WALL ANGLE DETAIL

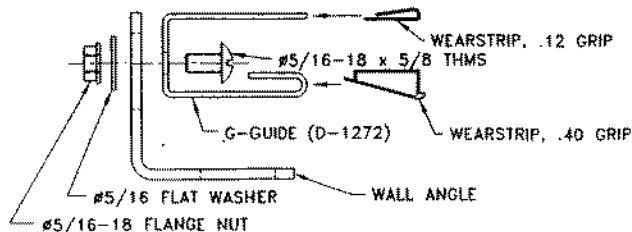
SCALE = 1:2


STEEL JAMB
#5/16-12 x 1 SELFDRILLING SCREW

MASONRY JAMB #1
GROUT FILLED BLOCK, 3000PSI MIN GROUT
#3/8 x 3 KINGPIN WEDGE ANCHOR

MASONRY JAMB #2*
CONCRETE, 3000PSI MIN
#3/8 x 3 KINGPIN WEDGE ANCHOR

JAMB DETAIL

SCALE = NONE

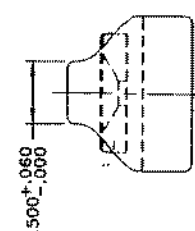
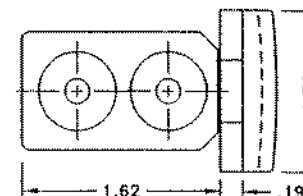
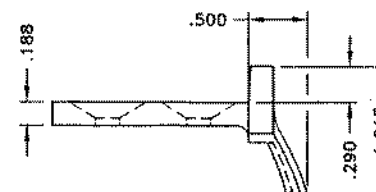


GUIDE ASSEMBLY DETAIL

SCALE = 1:2


Test sample complies with these details.
Deviations are noted.

Report# 01-46385.02

Date 10-31-03 Tech SAK


WINDLOCK DETAIL

SCALE = FULL

NOTES:

1. UNIFORM STATIC AIR PRESSURE TEST PERFORMED PER ASTM E 330
2. TENSILE TEST PERFORMED PER ASTM E 8
3. TESTED BY ARCHITECTURAL TESTING, INC.
4. SEE 035-0009, -0010, & -0011 FOR TEST DETAILS

TEST	DATE	TEST REPORT NUMBER	RESULTS
UNIFORM STATIC AIR PRESSURE	.	.	.
	.	.	.
TENSILE	.	.	.
	.	.	.

*DENOTES UNTESTED CONFIGURATIONS APPROVED BY COMPARATIVE ANALYSIS

PART NUMBER	WEIGHT (LB.)	TITLE	DRAWN BY	CHECKED BY	APPROVED BY	TOLERANCES (UNLESS OTHERWISE SPECIFIED)
REFERENCE		WINDLOAD TEST, DS-350, SQUARE PROFILE PANEL, COMPONENT DETAILS	M. DAUS			LINEAR .X ± .060
		MATERIAL AS SHOWN	10/15/2003			LINEAR .XX ± .030
			SCALE - WHEN THIS BOX IS .50" HIGH	ORIGINAL RELEASE		LINEAR .XXX ± .010
			AS SHOWN			ANGULAR ± .50°
						DIMENSIONS IN INCHES

REV.	REV'D BY	APP'D. BY	RELEASE	DESCRIPTION
				REVISIONS

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SIZE	DRAWING NO.	REVISION
B	035-0012	.

Wayne Dalton

Wayne Dalton
Rolling Door Division
14512 Lincoln Way E.
Dalton, Ohio 44818