



**Farabaugh Engineering and Testing Inc.**

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Project No. T347-11

Report Date: December 16, 2011

Total Pages (inclusive): 10

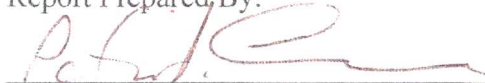
**ASTM E330  
STRUCTURAL PERFORMANCE TESTING**

**16" SIDING PANEL WITH CLIP  
0.040" ALUMINUM**

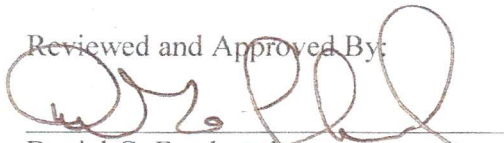
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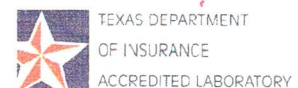
PETERSEN ALUMINUM CORP.  
1005 TONNE RD.  
ELK GROVE VILLAGE, IL 60007

Report Prepared By:

  
Patrick J. Farabaugh

Reviewed and Approved By:

  
Daniel G. Farabaugh



Project No. T347-11

**Purpose**

This test method covers the evaluation of structural performance of the referenced test specimen per ASTM E330-02, "Standard Test Method of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference" and as provided herein.

**Test Dates**

12-4-11 to 12-8-11

**Test Specimen**

*Manufacturer:* Petersen Aluminum Corp.  
1005 Tonne Rd.  
Elk Grove Village, IL 60007

*Panel:* 16" Siding Panel with Clip, 0.040" Aluminum (nominal)

**Testing Apparatus**

A vacuum test chamber was used with two static pressure taps located at diagonally opposite corners. A controlled blower provided a vacuum to uniformly load the specimen mock-up. Calibrated manometers were used to measure the pressure at each pressure tap. The uniform load pressure was performed in the negative direction to monitor wind uplift on the panel specimen mock-up. Calibrated deflectometers were attached to monitor panel deformation as shown.

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### **Installation**

- The panels were installed on to 16 ga supports using a fixed clip with #10-16 X 1" long pancake head self drill fasteners (2 screws per clip). The panel side-joints were a tongue and groove type as shown on the attached detail.
- Plastic (4 mil thick) was employed loosely between the panels and subgirts and in the side joints to create a vacuum seal.

### **Procedure**

- The test assembly was subjected to negative pressures to form an outward pressure at the values and time duration as shown in the attached table.
- Each pressure increment was held for at least 1 minute.
- Deflection movement of the assembly during the tests was recorded.
- Successive increments were achieved as above until failure or ultimate load was reached.

## TEST "A"

Specimen: 16" Siding Panel with Clip, 0.040" Aluminum

Clip Spacing: 4 ft o/c

### NEGATIVE LOAD TEST

LOAD (PSF)	DEFLECTION READINGS (INCHES)							
	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8
0.8	0	0	0	0	0	0	0	0
6.0	0.067	0.203	0.079	0.184	0.025	0.164	0.041	0.237
0.8	0.003	0.002	0	0	0	0	0	0.001
11.2	0.169	0.475	0.206	0.446	0.083	0.432	0.095	0.519
0.8	-0.003	0.002	0.002	0.006	0.006	0.001	-0.003	-0.009
16.4	0.28	0.734	0.367	0.741	0.181	0.701	0.147	0.736
0.8	0.013	0.003	0.02	0.017	0.038	0.002	0.001	-0.003
21.6	0.404	0.937	0.511	1.002	0.277	0.93	0.201	0.927
0.8	0.034	0.015	0.06	0.055	0.078	0.016	0.008	0.022
26.8	0.534	1.168	0.677	1.294	0.355	1.161	0.28	1.154
0.8	0.075	0.072	0.137	0.176	0.105	0.067	0.025	0.08
32.0	0.656	1.382	0.842	1.561	0.413	1.367	0.35	1.337
0.8	0.107	0.142	0.218	0.302	0.131	0.139	0.045	0.146
42.4	0.867	1.756	1.125	1.99	0.545	1.756	0.461	1.706
0.8	0.203	0.349	0.398	0.56	0.194	0.377	0.106	0.338
52.8	1.083	2.124	1.403	2.379	0.665	2.13	0.573	2.028
0.8	0.33	0.598	0.586	0.853	0.276	0.667	0.182	0.572
63.2	1.243	2.644	2.149	2.938	0.744	2.83	0.666	2.304
0.8	0.461	1.088	1.161	1.287	0.348	1.06	0.251	0.889

**RESULTS:**

Maximum Test Load = 70.4 psf (Panel disengaged from clip)

$R_{(UIT)} = [70.4 \text{ \#/ft}^2 \times 4 \text{ ft}] = 281.60 \text{ \#/ft}$ $F.S. = 2.0$ $R_{(ALLOW)} = \underline{140.8 \text{ \#/ft}}$	$R_{(UIT)} = [70.4 \text{ \#/ft}^2 \times 4 \text{ ft}] = 281.60 \text{ \#/ft}$ $F.S. = 1.65$ $R_{(ALLOW)} = \underline{170.7 \text{ \#/ft}}$
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## TEST "B"

Specimen: 16" Siding Panel with Clip, 0.040" Aluminum

Clip Spacing: 1 ft o/c

### NEGATIVE LOAD TEST

LOAD (PSF)	DEFLECTION READINGS (INCHES)							
	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8
0.8	0	0	0	0	0	0	0	0
16.4	0.03	0.295	0.046	0.42	0.045	0.239	0.019	0.243
0.8	0.007	0.114	0.015	-0.016	0	0.077	0	0.026
32.0	0.092	0.585	0.126	0.73	0.116	0.595	0.071	0.6
0.8	0.009	0.035	0.021	-0.003	0.009	0.004	0	0.02
47.6	0.174	0.934	0.195	1.023	0.208	0.913	0.137	0.93
0.8	0.02	0.046	0.052	0.066	0.013	0.032	0.007	0.032
63.2	0.306	1.286	0.261	1.265	0.388	1.276	0.236	1.27
0.8	0.071	0.178	0.1	0.207	0.105	0.155	0.046	0.162
78.8	0.425	1.604	0.433	1.552	0.577	1.581	0.357	1.6
0.8	0.16	0.486	0.196	0.431	0.189	0.438	0.106	0.435
94.4	0.523	1.786	0.474	1.693	0.682	1.833	0.471	1.834
0.8	0.245	0.679	0.238	0.595	0.314	0.648	0.22	0.637
110.0	0.73	2.151	0.613	2.022	0.854	2.171	0.598	2.21
0.8	0.407	1.142	0.32	0.988	0.386	1.108	0.312	1.145
136.1	0.952	2.606	0.848	2.41	1.1	2.67	0.892	2.686
0.8	0.56	1.644	0.521	1.446	0.725	1.621	0.427	1.664
162.1	1.116	3.018	1.023	2.782	1.242	3.092	1.011	3.124
0.8	0.7	2.091	0.749	1.886	0.879	2.132	0.516	2.14
188.1	1.289	3.353	1.116	3.089	1.417	3.388	1.072	3.458
0.8	0.913	2.431	0.851	2.156	1.003	2.443	0.748	2.895
214.1	1.419	3.686	1.256	3.37	1.575	3.736	1.332	3.786
0.8	0.981	2.811	0.932	2.515	1.1	2.801	1.022	2.963

**RESULTS:**

Maximum Test Load = 312.7 psf (Panel disengaged from clip)

$$R_{(ult)} = [312.7 \frac{\#}{ft^2} \times 1 ft] = 312.7 \frac{\#}{ft}$$

$$F.S. = 2.0$$

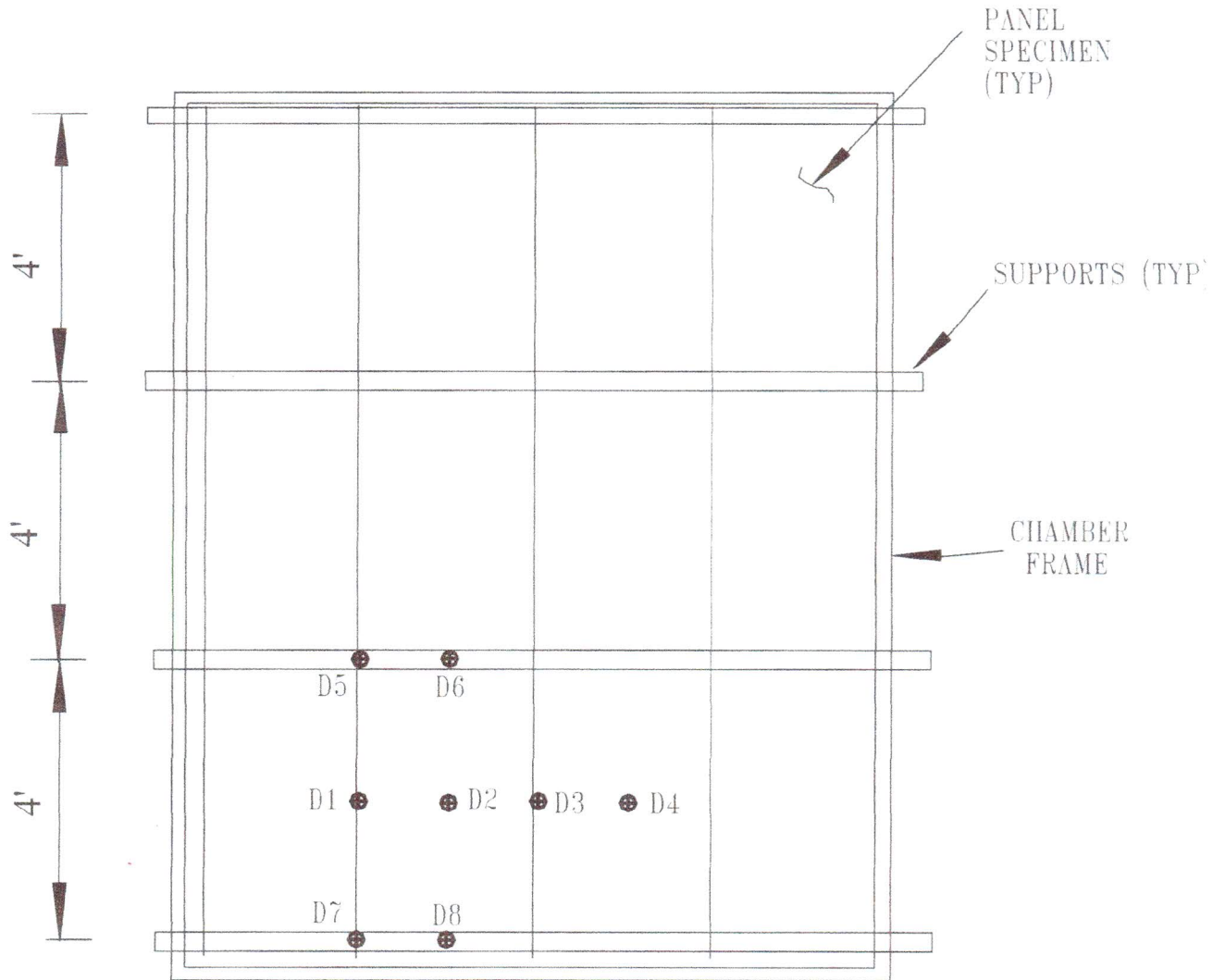
$$R_{(allow)} = \underline{156.4 \frac{\#}{ft}}$$

$$R_{(ult)} = [312.7 \frac{\#}{ft^2} \times 1 ft] = 312.7 \frac{\#}{ft}$$

$$F.S. = 1.65$$

$$R_{(allow)} = \underline{189.5 \frac{\#}{ft}}$$

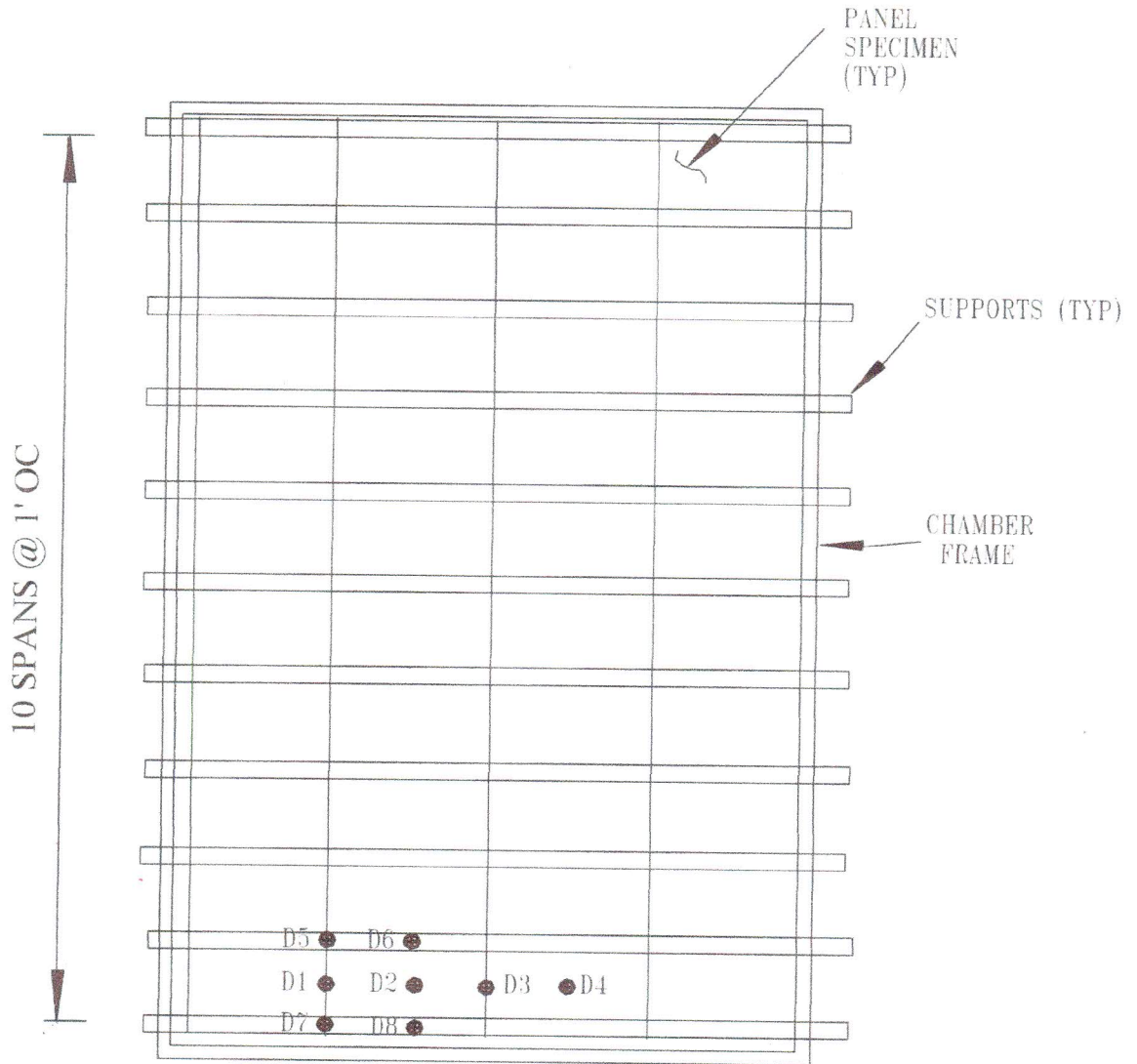
### TEST "A"



⊕ DEFLECTION POINT

### TEST ASSEMBLY

# TEST "B"



● DEFLECTION POINT

## TEST ASSEMBLY







## TENSILE TEST REPORT

Client: Petersen Aluminum Corp.  
 1005 Tonne Rd.  
 Elk Grove Village, IL 60007

Test Date: December 15, 2011

Test Method: ASTM B557-10

Material Description: 16" Siding Panel, 0.040" Aluminum

Sample No.	Width (in)	Thickness (in)	Yield Load (lb)	Max. Load (lb)	0.2% Offset Yield Strength (psi)	Tensile Strength (psi)	Elongation (% in 2 inches)
0089-11	0.509	0.039	371.7	418.7	18,742	21,094	6.81

Equipment Used: Tensile Machine #QT7-061196-020  
 Caliper #081410113-1  
 Extensometer #10311744D  
 Micrometer #52-222-001