



**Farabaugh Engineering and Testing Inc.**

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Project No. T175-08

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Total Pages (inclusive): 18

**ASTM E1592**  
STANDARD TEST METHOD FOR  
STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING  
SYSTEMS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE

**R-36 ROOF PANEL**

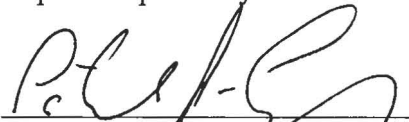
**36" WIDE X 24 GA**

FOR

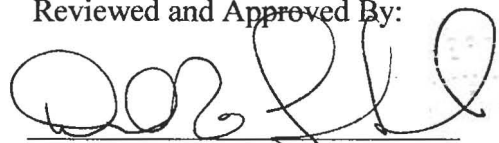
PETERSEN ALUMINUM CORP.  
1005 TONNE RD.  
ELK GROVE VILLAGE, IL 60007

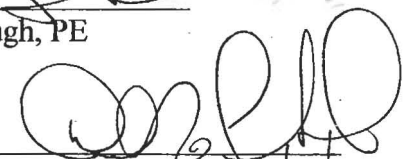
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5/13/08



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Project No. T175-08

**ASTM E1592-01**  
**STANDARD TEST METHOD FOR**  
**STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING**  
**SYSTEMS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE**

**Purpose**

This test method covers the evaluation of the structural performance of Sheet Metal Panels and Anchor to Panel Attachments for roof or siding systems under uniform static air pressure difference.

**Test Dates**

4/15/08 to 4/30/08

**Test Specimen**

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

*Panel:* R-36 Roof Panel, 36" wide (coverage), 24 ga steel

*Panel Length:* as shown

**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 test 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.

### **Installation**

- The panels were installed on to 16 ga supports with #12-14 X 1" self drill fasteners w/ 0.55" dia. seal washer head spaced as shown on the attached detail drawings. Panel sidejoints were overlapping using #12-14 X 3/4" self drill lap fasteners w/ 0.55" dia. seal washer head located at 12" oc.
- Plastic (4 mil thick) was employed loosely between the panels and subgirts and in the side joints to create a vacuum seal.

### **Procedure**

- The specimen was checked for proper adjustment and all vents closed in the pressure measuring lines.
- The required deflection measuring apparatus' were installed at their specified locations.
- A nominal initial pressure was applied equal to at least four times but not more than ten times the dead weight of the specimen. This nominal pressure was used as the reference zero and initial deflection readings were recorded.
- At each load increment, pressure was maintained for a period of not less than 60 seconds and until the deflection gages indicated no further increase in deflections.
- Successive increments were achieved as above until failure or ultimate load was reached.

The test was conducted according to the procedure in ASTM E1592-01 and as noted herein. In our opinion the tape and plastic had no influence on the results of the test.

## TEST #1

TEST DATA FOR R-36 PANEL 24 GA (SPECIMEN A) 3 SPANS @ 5'-0" oc									
DEFLECTION DIAL READINGS (INCHES)									
LOAD (PSF)	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	REMARKS
1.1	0	0	0	0	0	0	0	0	0 PANEL WT.
11.5	0.078	0.195	0.077	0.178	0.006	0.024	0.005	0.051	
1.1	0.005	-0.003	-0.004	0.012	0.004	0	0.009	0.006	PANEL WT.
16.8	0.125	0.328	0.135	0.319	0.019	0.043	0.026	0.089	
1.1	-0.001	0	0.013	0.004	0.01	0.003	0.004	0.016	PANEL WT.
22.0	0.182	0.462	0.189	0.451	0.026	0.056	0.034	0.138	
1.1	0.016	0.034	0.006	0.003	0.008	0.006	-0.004	-0.003	PANEL WT.
27.2	0.249	0.593	0.242	0.566	0.035	0.069	0.049	0.183	
1.1	0.001	0.002	0.014	0.019	0.011	0.004	-0.006	-0.001	PANEL WT.
32.4	0.296	0.716	0.296	0.681	0.045	0.084	0.061	0.223	
1.1	0.015	0.025	0.027	0.02	0.006	0.009	0.017	0.016	PANEL WT.
42.8	0.412	0.929	0.411	0.875	0.068	0.11	0.103	0.299	
1.1	0.02	0.032	0.03	0.038	0.009	0.011	0	0.011	PANEL WT.
53.2	0.528	1.112	0.531	1.063	0.091	0.14	0.123	0.383	
1.1	0.023	0.049	0.049	0.045	0.014	0.016	0.007	0.007	PANEL WT.
63.6	0.665	1.324	0.663	1.239	0.12	0.174	0.183	0.474	
1.1	0.056	0.091	0.073	0.071	0.027	0.032	0.04	0.046	PANEL WT.
74.0	0.798	1.524	0.791	1.412	0.145	0.2	0.233	0.542	
1.1	0.096	0.15	0.112	0.12	0.044	0.044	0.058	0.053	PANEL WT.
84.4	0.915	1.676	0.933	1.586	0.166	0.236	0.294	0.59	
1.1	0.137	0.217	0.156	0.176	0.064	0.068	0.056	0.08	PANEL WT.

RESULTS:

MAXIMUM TEST LOAD (HELD FOR 1 MIN.) = 99.9 PSF

MAXIMUM TEST LOAD (FAILURE) = 102.0 PSF  
(PANEL BUCKLING AT END SPAN )

## TEST #2

TEST DATA FOR R-36 PANEL 24 GA (SPECIMEN B) 5 SPANS @ 2'-0" oc									
DEFLECTION DIAL READINGS (INCHES)									
LOAD (PSF)	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	REMARKS
1.1	0	0	0	0	0	0	0	0	PANEL WT.
27.2	0.029	0.134	0.041	0.109	0.002	0.064	0.008	0.082	
1.1	0.012	0.006	0.007	0.001	0	0.001	-0.002	0.002	PANEL WT.
53.2	0.078	0.265	0.095	0.224	0.008	0.114	0.026	0.16	
1.1	0.021	0.056	0.014	0.009	0.001	0.01	0	0.006	PANEL WT.
79.2	0.116	0.344	0.14	0.314	0.02	0.157	0.046	0.226	
1.1	0.017	0.017	0.021	0.018	0.001	0.018	0.003	0.012	PANEL WT.
105.2	0.16	0.425	0.191	0.403	0.031	0.202	0.065	0.279	
1.1	0.022	0.03	0.034	0.032	0	0.03	0.005	0.014	PANEL WT.
131.2	0.211	0.513	0.244	0.474	0.043	0.231	0.083	0.324	
1.1	0.037	0.046	0.042	0.048	0.002	0.043	0.01	0.018	PANEL WT.
157.3	0.259	0.595	0.298	0.553	0.053	0.271	0.1	0.367	
1.1	0.052	0.072	0.059	0.073	0.005	0.064	0.015	0.027	PANEL WT.
183.3	0.313	0.677	0.349	0.629	0.06	0.313	0.124	0.415	
1.1	0.069	0.105	0.079	0.103	0.015	0.096	0.027	0.043	PANEL WT.
209.3	0.369	0.763	0.411	0.692	0.067	0.353	0.147	0.458	
1.1	0.095	0.139	0.104	0.131	0.026	0.125	0.039	0.056	PANEL WT.
235.3	0.419	0.844	0.467	0.772	0.07	0.389	0.173	0.504	
1.1	0.121	0.167	0.127	0.158	0.04	0.157	0.053	0.072	PANEL WT.

**RESULTS:**

MAXIMUM TEST LOAD (HELD FOR 1 MIN.) = 318.3 PSF

MAXIMUM TEST LOAD (FAILURE) = 323.5 PSF  
(SUPPORT FASTENER PULLOUT)