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

MODULAR METAL PANEL
3” DEEP X 30” WIDE COVERAGE X 0.080” ALUMINUM

FOR

PETERSEN ALUMINUM CORP.
10551 PAC RD.
TYLER, TX. 75707

Prepared by:

Paul G. Farabaugh

Approved by:

Daniel G. Farabaugh
ASTM E1592-05(2012)
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 Date

10/26/21 Span @ 30" o.c.

Test Specimen

Manufacturer: Petersen Aluminum Corp.
10551 Pac Rd.
Tyler, TX. 75707

Test Specimen: ModularAL Metal Panel, - 3” Deep x 30” wide coverage x 0.080” alum.
(See Dwg A206 for actual dimension)

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.
Installation

- The panel support consisted of 16 ga. Zee supports attached to 16 ga. channel supports using #12 x 1” long wafer-head self-drilling screws. The channel supports were located at 24” o.c.

- A starter clip was attached to the Zee support using #12 x 1” lg. wafer-head, self-drilling screws. A minimum of two fasteners per starter clip or 12” o.c max. spacing per clip based on length of clip.

- The starter panel engaged into a starter clip and was top-fastened with #12 x 1” lg. Stainless Steel Cap head w/EPDM Sealing washer fasteners at the predrilled holes spaced at 12” o.c.

- The vertical edge of the panel had two (2) clips to attach that edge to the 16 ga. horizontal Zee supports using (1) #12 x 1” lg. wafer-head, self-drilling screws at each clip.

- See installation details for location of fasteners at supports and attachment of each panel.

- 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 E-1592-05(2012) and as noted herein. In our opinion the tape and plastic had no influence on the results of the test.
TEST #1

Test Specimen:
ModularAL Metal Panel - 3” Deep x 30” wide coverage x 0.080” aluminum

Support Spacing: 30” o/c

NEGATIVE (UPLIFT) PRESSURE

<table>
<thead>
<tr>
<th>Load Pressure (in-h20)</th>
<th>Load Pressure (psf)</th>
<th>Deflection #1 (in)</th>
<th>Deflection #2 (in)</th>
<th>Deflection #3 (in)</th>
<th>Deflection #4 (in)</th>
<th>Deflection #5 (in)</th>
<th>Deflection #6 (in)</th>
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<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>2</td>
<td>10.4</td>
<td>0.053</td>
<td>0.068</td>
<td>0.088</td>
<td>0.089</td>
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<td>0.046</td>
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<tr>
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<td>0.002</td>
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<td>6</td>
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<td>0.169</td>
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<td>0.515</td>
<td>0.663</td>
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<td>0</td>
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<td>0.181</td>
<td>0.180</td>
<td>0.224</td>
<td>0.194</td>
<td>0.256</td>
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</table>

RESULTS:

Load held for 1 minute = 114.5 psf

Maximum Test Load = 116.4 psf (Zee support fastener pulled out of 16 ga. lower supports)
Project No. T269-21

Deflection Point 5

Deflection Point 6
TEST #1

PLAN VIEW

E1592 Test Chamber Layout. 0.080 Metal Panel

X1 - DEFLECTION LOCATION

X2

X3

X4

X5

X6
Project No. T269-21

Visqueen by Farabaugh Engineering & Testing, Inc.
16 Ga. "Z" (typ)

#12 Waferhead Self-Drilling Screw

.080 Metal Panel

.080 Starter Clip (Attached with #12 x 1" Waferhead Self-Drilling Screw (2/Clip Min. or 12" o.c. max.)

"J" With 3/16" x 1/2" Oblong Weep Holes @ 12" o.c.

Blankoff Panel by Farabaugh Engineering & Testing, Inc.
Enlarged Detail

#12 Waferhead Self-Drilling Screw @ Each 16 Ga. Stud.

Visqueen By Farabaugh Engineering & Testing, Inc.
Blankoff Panel by Farabaugh Engineering & Testing, Inc.

#12 Stainless Steel Cap Head w/EPDM Sealing Washer @ 12" O.C.

16 Ga. "Z" (typ)

.080 Metal Panel

16 Ga. Metal Stud or Equal By Farabaugh Engineering & Testing, Inc.
16 Ga. Metal Stud or Equal By Farabaugh Engineering & Testing, Inc.

16 Ga. "Z" (typ) Visqueen By Farabaugh Engineering & Testing, Inc.

(1) #12 x 1" Waferhead Self-Drilling Screw @ Each Clip. (2 Clips Per Panel Or Determined By Engineer)

0.080 Panel Clips

0.080 Metal Panel

\( \frac{1}{2} \)" Typ Joint

Enlarged Detail C
NOTE:
Number of Panel Clips
Per Panel Will Be
Determined By Width Of
Panel Or By Lic. Engineer

1.5" x 0.79" - .080
Aluminum Extruded
Metal Panel Clip.
(Clips Are To Be Cut
Into 3" Long Pieces)

Enlarged Detail
0.080 Metal Panel

D Vertical Profile

E Horizontal Profile

Note: All Panel Dimensions are Nominal
ADDITIONAL SUPPORT AND TRIM EXTRUSIONS

0.56" +
0.50" |
2.25"

0.080" ALUM. STARTER CLIP

1" |
4.25"

16 GA. ZEE SUPPORT

1.25" |
3.25"

3.75"

0.080" ALUM. "J" TRIM
(TESTING PURPOSES ONLY)
**Report of Tensile Testing**

**Client:** Farabaugh Engineering & Testing (PO #: Verbal - Pat Farabaugh)

<table>
<thead>
<tr>
<th>PIN #</th>
<th>Dimensions (in.)</th>
<th>Area (sq.-ln.)</th>
<th>Yield Point (lb.)</th>
<th>Tensile Strength (lb.)</th>
<th>Yield Strength (psi.)</th>
<th>Tensile Strength (psi.)</th>
<th>Elongation (% in 2 in.)</th>
<th>Fracture location</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC 0.080&quot;</td>
<td>0.4955 x 0.0770</td>
<td>0.0382</td>
<td>797</td>
<td>843</td>
<td>20900</td>
<td>22100</td>
<td>7.3</td>
<td>U/4 Break</td>
</tr>
</tbody>
</table>

Test Method: Q2300.04 rev. 14 (ASTM A370-20, E8-21, or E646-16: Yld. by 0.2% offset, Elong. after fracture)

Equipment Used: Instron 5900R60HVL (s/n: 1602) w/ Extensometer (s/n: E93054)

Performed By: T. Ault

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Please send your comments and concerns to us at feedback@spectrochemicalinc.com

For more information call: 724-334-4140

Respectfully submitted,

Todd A. Ault
Laboratory Manager