Project No. T131-09

Report Date: February 24, 2009

No. Pages: 7 (inclusive)

ASTM E-1680-95 AIR LEAKAGE TEST
ASTM E-1646-95 WATER PENETRATION TEST

7/8\textquotedbl{} CORRUGATED ROOF PANEL
37.33\textquotedbl{} COVERAGE X 24 GA STEEL

FOR

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

Prepared by:

Paul G. Farabaugh

Approved by:

Daniel G. Farabaugh, PE
AIR LEAKAGE AND WATER PENETRATION TESTING

**Purpose**

The purpose of this test is to establish air and water infiltration rates on 7/8” corrugated roof panels that are 37.33” wide coverage X 24 ga steel.

**Test Date**

2/23/09 & 2/24/09

**Test Specimen**

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

Panel: 7/8” Corrugated Roof Panel, 37.33” wide coverage X 24 ga steel

Side joint Sealant 3/16” thick X 1/4” wide Butyl Tape Sealer

**Test Apparatus**

Test Chamber: Vacuum chamber.

Manometer: Inclined manometer from Dwyer Instruments, 6” capacity.

Air Flow Meter: Laminar Flow Element

**Installation**

The panels were installed on the chamber frame and intermediate support. The panels were attached to each support using 1/4”-14 X 1-1/4” long hex head self drill fasteners with 5/8” seal washer located at every other low cell of the panel. The panel side-joints were overlapping using butyl tape sealer with #12-14 X 1” long hex head self drill fasteners with 5/8” seal washer located at 12” oc. The panels were sealed to the perimeter frame with silicone sealant. Test was done with panels in horizontal position.
Theory of Procedure

The tests were conducted in accordance with ASTM E-1680-95 "Rate of Air Leakage Through Exterior Metal Roof Panel System", and ASTM E-1646-95, "Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference" and as provided here-in.

Air Leakage Test Procedure

The test procedure is as per ASTM 1680-95 and as provided herein.

The intermediate support was not traversed since this system does not accommodate thermal movement parallel to the panel.

A positive preload pressure of 15 psf was applied for 10 seconds. Panels were allowed to recover for a period of 2 minutes. A negative preload pressure of 15 psf was applied for 10 seconds. Panels were allowed to recover for a period of 2 minutes. The positive and negative preload cycle was repeated two additional times for a total of 3 cycles.

Air leakage rates were determined at the specified test pressures.

Water Penetration Test Procedure

The test procedure is as per ASTM 1646-95 and as provided herein.

The intermediate support was not traversed since this system does not accommodate thermal movement parallel to the panel.

Due to the panels being preloaded during the Air Leakage Test, no additional preload was performed for the Water Penetration Test.

Overflow devices were attached to provide a minimum of ½" of water ponding during the test.

A calibrated water spray and uniform pressure loads were applied at the specified rates.
Test Date 2/23/09  
Ambient Temp. = 50deg.F  
Barometric Pressure = 30.3" Hg.

ASTM E-1680-95  
AIR LEAKAGE TEST  
Summary

POSITIVE PRESSURE  
(INFILTRATION)

<table>
<thead>
<tr>
<th>Test Specimen</th>
<th>Static Pressure Differential (psf)</th>
<th>Air Leakage Rate (cfm/sf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC</td>
<td>+1.57</td>
<td>0.014</td>
</tr>
<tr>
<td>7/8&quot; Corrugated Roof Panel</td>
<td>+6.24</td>
<td>0.024</td>
</tr>
</tbody>
</table>

NEGATIVE PRESSURE  
(EXFILTRATION)

<table>
<thead>
<tr>
<th>Test Specimen</th>
<th>Static Pressure Differential (psf)</th>
<th>Air Leakage Rate (cfm/sf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC</td>
<td>-1.57</td>
<td>0.003</td>
</tr>
<tr>
<td>7/8&quot; Corrugated Roof Panel</td>
<td>-6.24</td>
<td>0.007</td>
</tr>
</tbody>
</table>
Test Date 2/24/09
Panel Surface Temperature PRIOR to test = 62.2 deg F
Panel Surface Temperature PRIOR to test = 49.9 deg F

ASTM E-1646-95
WATER PENETRATION TEST
Summary

POSITIVE PRESSURE
(INFILTRATION)

<table>
<thead>
<tr>
<th>Test Specimen</th>
<th>Static Pressure Differential (psf)</th>
<th>Rate</th>
<th>Test Duration</th>
<th>Water Infiltration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC 7/8&quot; Corrugated Roof Panel 37.33&quot; coverage X 24 ga</td>
<td>+6.24</td>
<td>5 gal./hr/sq.ft.</td>
<td>15 min</td>
<td>No Leakage</td>
</tr>
<tr>
<td></td>
<td>+15.0</td>
<td>5 gal./hr/sq.ft.</td>
<td>15 min</td>
<td>No Leakage</td>
</tr>
</tbody>
</table>
2.67" X 7/8" CORRUGATED

PANEL PROFILE

FASTENER PATTERN

APPLICATION  -------
PREVAILING WIND  ----
INTERMEDIATE SUPPORT

PANEL COVERAGE

37.33"

CHAMBER FRAME

PLAN VIEW