PROJECT NO. T113-17

REPORT DATE: January 23, 2017

NO. PAGES: 8 (inclusive)

ASTM E-283 AIR LEAKAGE TEST
ASTM E331 WATER PENETRATION TEST
ASTM E330 UNIFORM LOAD STRUCTURAL TEST
AAMA 501.1 DYNAMIC WATER PENETRATION TEST

ON

PRECISION DIAMOND TILE PANEL
7-1/4" WIDE X 0.032" ALUMINUM

FOR

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

Prepared by:
Paul G. Farabaugh

Approved by:
Daniel G. Farabaugh
Project No. T113-17

Purpose

The purpose of this test is to establish the air, water and dynamic water infiltration rates and structural loading on the test specimen mock-up in accordance with the referenced test standards and as provided herein.

Referenced Test Standards


2. ASTM E 331-00 “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference”


Test Completion Date

1/16/17

Manufacturer: Petersen Aluminum
10551 PAC Rd.
Tyler, TX. 75707

Product Identification

Specimen: Precision Diamond Tile Panel, 7-1/4” wide, 0.032” aluminum

Substrate: 5/8” plywood decking / W. R. Grace Ice & Water Shield roof underlayment membrane
Test Specimen Assembly

The test mock-up was a 8’ wide X 8’ high (nominal) Precision Diamond Tile System mock-up. The mock-up frame was a wood frame comprised of 2 x 10 perimeter supports with intermediate 2 x 10 supports at 2'-0" o.c. 5/8” plywood was then attached to 2 x 10 wood structural framing supports using 8d x 2-1/2” long ring shank nails. The nail pattern is 6" o.c. in the field and 6" o.c. around the perimeter. A layer of Self Adhering Waterproof Membrane was on top of the plywood sheathing substrate and wrapped around the perimeter sides of the wood buck. The Precision Diamond Tile Panels were attached thru the top layer of underlayment membrane and into the plywood substrate using (2) #10 -13 x 1" long GP Concealer screws. Fasteners were located at the pre-punched fasteners holes spaced at 6-3/8" o.c. on the top nail flange for each panel. Additional screws were added around perimeter of the mock-up at top and bottom of panel when needed to secure perimeter panels to plywood. Specimen was built and tested with the panels running on a 45 degree angle. All fasteners for the panel were the #10-13 x 1" long GP Concealer screws.

- NOTE: For Structural Test only - A plastic barrier was located between the panels and the underlying substrate.

Test Procedure

The tests were conducted using the test procedures per the referenced test standards. Tests were performed at the given test pressures and test data was recorded as shown on the attached data sheets.
TEST RESULTS

Date: 1/16/17

Ambient Temperature = 60 deg. F  Barometric Pressure = 30.30"Hg

ASTM E-283
AIR INFILTRATION LEAKAGE TEST

<table>
<thead>
<tr>
<th>TEST PRESSURE (PSF)</th>
<th>TOTAL AIR LEAKAGE RATE (CFM)</th>
<th>AIR INFILTRATION RATE (CFM/SF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.82</td>
<td>0.013</td>
</tr>
<tr>
<td>12</td>
<td>0.82</td>
<td>0.013</td>
</tr>
<tr>
<td>6.24</td>
<td>0.68</td>
<td>0.011</td>
</tr>
</tbody>
</table>

Based on 64 sq.ft.

ASTM E-331
WATER PENETRATION TEST

<table>
<thead>
<tr>
<th>TEST PRESSURE (PSF)</th>
<th>WATER SPRAY RATE GAL/SF/HR</th>
<th>TEST DURATION (MIN)</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.00</td>
<td>5</td>
<td>15</td>
<td>PASS - NO VISIBLE LEAKAGE</td>
</tr>
</tbody>
</table>

AAMA 501.1
DYNAMIC WATER TEST

POSITIVE PRESSURE (INFILTRATION)

<table>
<thead>
<tr>
<th>Test Pressure (psf)</th>
<th>Water Spray Rate (gal/sf/hr)</th>
<th>Time Duration (min)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>5</td>
<td>15</td>
<td>No Leakage</td>
</tr>
</tbody>
</table>

Results:
As a result of the test pressure and water spray for the specified time duration, there was no water leakage on the interior side of the specimen assembly.
ASTM E330 UNIFORM LOAD TEST

Specimen: Precision Diamond Tile Panel, 7-1/4" wide, 0.032" aluminum

Panel Fastener Spacing on Nail flange: 6.375" o.c

### NEGATIVE PRESSURE

<table>
<thead>
<tr>
<th>PRESSURE (PSF)</th>
<th>NET DEFLECTION (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.000</td>
</tr>
<tr>
<td>25</td>
<td>0.094</td>
</tr>
<tr>
<td>0</td>
<td>0.000</td>
</tr>
<tr>
<td>50</td>
<td>0.156</td>
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<tr>
<td>0</td>
<td>0.000</td>
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<tr>
<td>75</td>
<td>0.219</td>
</tr>
<tr>
<td>0</td>
<td>0.031</td>
</tr>
<tr>
<td>112.6</td>
<td>0.281</td>
</tr>
<tr>
<td>0</td>
<td>0.031</td>
</tr>
</tbody>
</table>

Maximum Net Deflection is $D_2 - (D_1 + D_3)/2 = \text{Net Deflection of Panel}$

**RESULTS**
Upon completion of the testing at the negative pressures noted above there were no noticeable failures of the specimen
TEST SETUP

WOOD CHAMBER FRAME

2'-0" (TYP.)

SUPPORT

(2X10 TYP.)

SUPPORT

SUPPORT

SUPPORT

PANEL SPECIMEN OVER ADHESIVE MEMBRANE & 5/8" PLYWOOD
(NOTE: PLASTIC BETWEEN PANEL AND MEMBRANE FOR STRUCTURAL TEST ONLY)

TOP

8'-0"

BOTTOM

8'-0"

X# - DEFLECTION POINTS FOR STRUCTURAL TEST ONLY

PLAN VIEW OF PANELS
TENSILE TEST REPORT

Client: Petersen Aluminum
10551 PAC Rd.
Tyler, TX. 75707

Test Date: January 16, 2017

Test Method: ASTM B557-10

Material Description: Precision Diamond Tile Panel, 7-1/4" wide, 0.032" aluminum

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Width (in)</th>
<th>Thickness (in)</th>
<th>Yield Load (lb)</th>
<th>Max. Load (lb)</th>
<th>0.2% Offset Yield Strength (psi)</th>
<th>Tensile Strength (psi)</th>
<th>Elongation (% in 2 inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0002-17</td>
<td>0.503</td>
<td>0.029</td>
<td>347.9</td>
<td>351.5</td>
<td>23,851</td>
<td>24,097</td>
<td>4.02</td>
</tr>
</tbody>
</table>

Equipment Used: Tensile Machine #QT7-061196-020
Caliper #1074379
Extensometer #10311744D
Micrometer #110596927