



## Farabaugh Engineering and Testing Inc.

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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" CORRUGATED ROOF PANEL  
37.33" COVERAGE X 24 GA STEEL

FOR

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

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LABORATORY  
TL-186



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TEXAS DEPARTMENT  
OF INSURANCE  
ACCREDITED LABORATORY

## 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 rest 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 preformed 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)

Test Specimen	Static Pressure Differential (psf)	Air Leakage Rate (cfm/sf)
PAC		
7/8" Corrugated Roof Panel	+1.57	0.014
37.33" wide X 24 ga	+6.24	0.024

NEGATIVE PRESSURE  
 (EXFILTRATION)

Test Specimen	Static Pressure Differential (psf)	Air Leakage Rate (cfm/sf)
PAC		
7/8" Corrugated Roof Panel	-1.57	0.003
37.33" wide X 24 ga	-6.24	0.007

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)

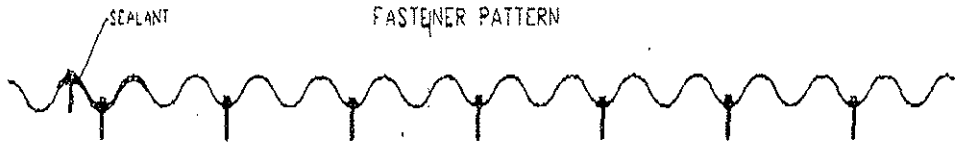
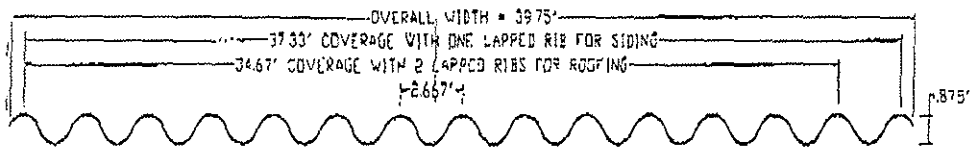
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Test Specimen	Static Pressure Differential (psf)	Rate	Test Duration	Water Infiltration
PAC	+ 6.24	5 gal./hr/sq.ft.	15 min	No Leakage
7/8" Corrugated Roof Panel				
37.33" coverage X 24 ga	+15.0	5 gal./hr/sq.ft.	15 min	No Leakage

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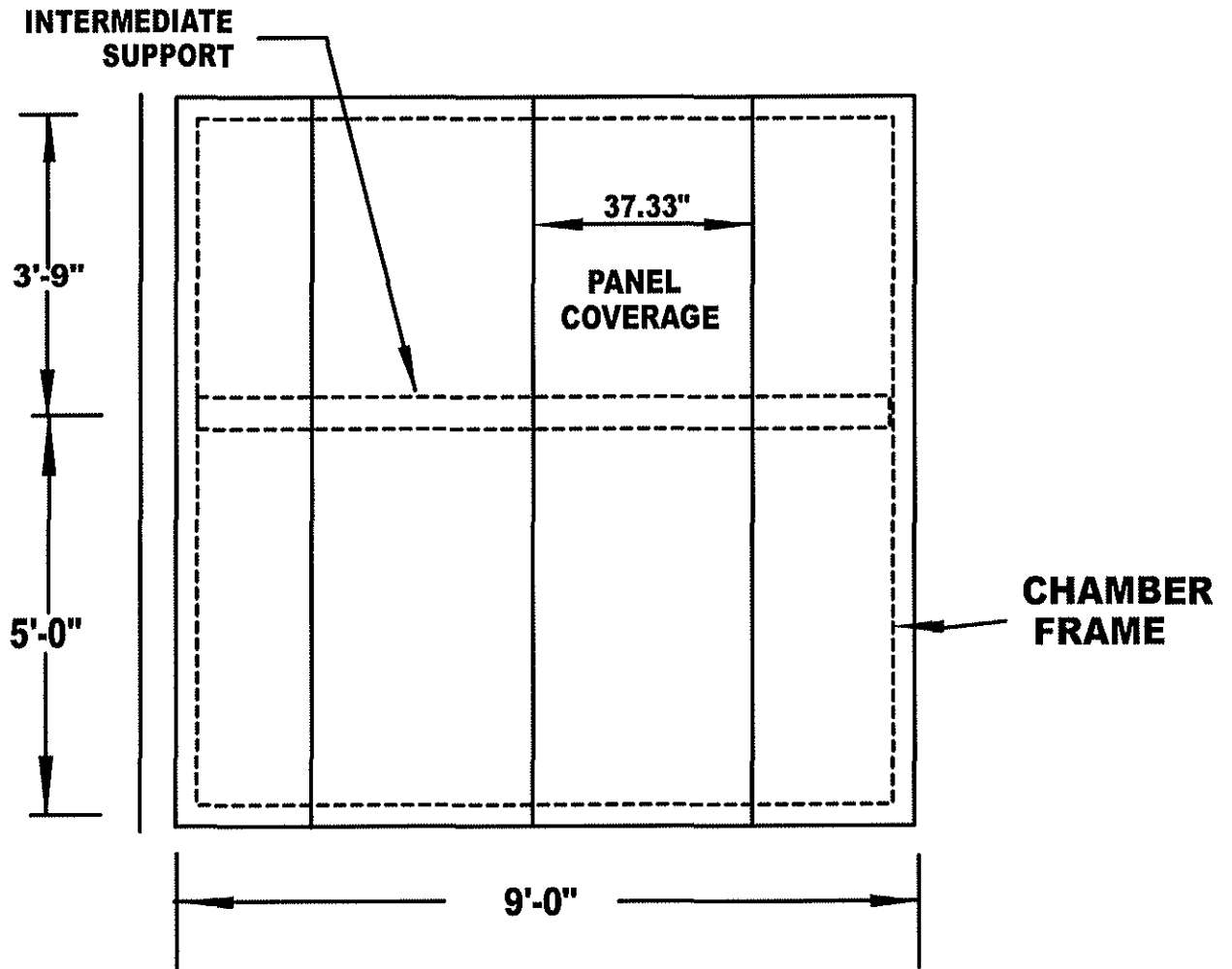
# 2.67" X 7/8" CORRUGATED

PANEL PROFILE



APPLICATION →  
PREVAILING WIND ←





**PLAN VIEW**