



PRI Construction Materials Technologies LLC

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Laboratory Test Report

Report for: Matt Ashley
A&E Metal Roofing Supply South & Echols Metal LLC
230 Lee Road 430
Smith Station, AL 36877

Product Name: R-PANEL

Project No.: 2264T0003

Dates Tested: Apr. 8th – May 4th, 2020

Test Methods: UL 580-06
UL 1897-12

Results Summary: Specimen No. 1: 26ga.; 24" o.c. (12"-12"-12"); 60psf; Class 30
Specimen No. 2: 26ga.; 24" o.c. (3"-9"-3"-9"-3"-9"); 105psf; Class 90

Purpose: Determine the uplift resistance in accordance with **UL 580-06 Test for Uplift Resistance of Roof Assemblies** and **UL 1897-12 Uplift Tests for Roof Covering Systems**.

Test Methods: Testing was completed as described in UL 580-06 *Test for Uplift Resistance of Roof Assemblies* and UL 1897-12 *Uplift Tests for Roof Covering Systems*. Specimens were tested to the loading schedule as described in UL 580, and where applicable, incrementally loaded in accordance with UL 1897 until failure.

Sampling: The following materials were received by PRI.

<u>Product</u>	<u>Source</u>	<u>Date</u>	<u>Sampling</u>
26ga. R-PANEL panel	Smith Station, AL	Mar. 6, 2020	A&E Metal
#10-16 x 1.5" HWH screws	Smith Station, AL	Mar. 6, 2020	A&E Metal
#14-14 x 7/8" HWH:	Smith Station, AL	Mar. 6, 2020	A&E Metal

All other roofing components were procured by PRI Construction Materials Technologies LLC through local distribution.

Product Description:

R-PANEL: 26ga., ASTM A 792 AZ55, Grade 80 steel, through fastened rib panel; 1.15" rib; 36" coverage; Panel drawing shown in Appendix B.

#10-16 x 1.5" HWH: #10-16 x 1" HWH wood screws with 0.5" O.D. sealing washers

#14-14 x 7/8" HWH: #10-16 x 1" HWH wood screws with 0.6" O.D. sealing washers

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Deck Description: Underlayment: ASTM D 226 Type II felt installed with minimum 4" side-lap and 6" end-laps and fastened using 12 ga., 1-1/4" ring shank nails and 32 ga., 1-5/8" tin caps spaced 6" o.c. along the laps and two staggered rows 12" o.c. in the field of the roll.

Deck: CAT 15/32 PS 1-09 APA span rated, CDX plywood sheathing installed over No. 2 lumber supports spaced 24" o.c. Decking attached with 0.113" x 2-3/8" ring shank nails spaced 6" o.c. along the perimeter and intermediate supports.

Specimen Sealing: Polyethylene film placed under the metal roof panels; tape¹

¹It is the judgment of the test engineer that the film and tape used to seal the specimen against air leakage did not influence the results of the test.

Results:

Test data are contained in Appendix A. Photographs after testing are shown in Appendix C.

Table 1. Summary of Test Results

Specimen No.	Panel	Attachment	Passing Uplift Pressure (psf)	Failure Mode
1	26ga. R-Panel	#10-16 x1.5" HWH wood screws with sealing washers installed 24" o.c. using a 12"-12"-12" screw pattern across the width of the panel. The perimeter of the deck was attached using the a 3"-9"-3"-9"-3"-9" pattern at each of the panel ends, and 6" o.c. along the panel length. Panel side laps with stitched 24" o.c. with #14-14 x 7/8" HWH screws with sealing washers.	60	Fastener withdrawal
2	26ga. R-Panel	#10-16 x1.5" HWH wood screws with sealing washers installed 24" o.c. using a 3"-9"-3"-9"-3"-9" screw pattern across the width of the panel. The perimeter of the deck was attached using the a 3"-4.5"-4.5"-3"-4.5"-4.5"-3"-4.5"-4.5" pattern at each of the panel ends, and 4" o.c. along the panel length. Panel side laps with stitched 24" o.c. with #14-14 x 7/8" HWH screws with sealing washers.	105	Fastener withdrawal

Classification:

Specimen No. 1 installed as described herein meets **Class 30**.

Specimen No. 2 installed as described herein meets **Class 90**.

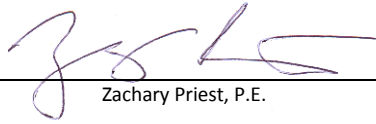
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Statement of Attestation:

Testing was conducted in accordance with **UL 580-06 Test for Uplift Resistance of Roof Assemblies** and **UL 1897-12 Uplift Tests for Roof Covering Systems**. The test results and interpretations presented herein are representative of the materials supplied by the client.

Signed: _____



Zachary Priest, P.E.

Director

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	05/04/2020	9	NA

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Specimen No. 1 (UL 580 Load Schedule)

Class 30 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	16.2	0.021	0.119	0.006	0.083	Pass
5	13.8	16.2	0.072	0.247	0.036	0.181	Pass
60	13.8	8.1-27.7 ¹	0.120	0.278	0.071	0.220	Pass
5	0.0	24.2	0.116	0.274	0.067	0.215	Pass
5	20.8	24.2	0.173	0.394	0.101	0.311	Pass
Permanent Set			0.031	0.097	0.023	0.053	Pass

Class 60 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	32.3	0.128	0.321	0.107	0.238	Pass
5	27.7	32.3	0.226	0.478	0.136	0.353	Pass
60	27.7	16.2-55.4 ¹	-	-	-	-	Failed at 53s
5	0.0	40.4					
5	34.6	40.4					
Permanent Set							

Notes: 1) Oscillation frequency is 10±2 sec per cycle

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Specimen No. 2 (UL 1897 Load Schedule)

Class 30 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	16.2	0.141	0.022	0.009	0.028	Pass
5	13.8	16.2	0.237	0.053	0.030	0.071	Pass
60	13.8	8.1-27.7 ¹	0.242	0.056	0.036	0.078	Pass
5	0.0	24.2	0.256	0.061	0.055	0.090	Pass
5	20.8	24.2	0.346	0.096	0.084	0.123	Pass
Permanent Set			0.095	0.020	0.017	0.013	Pass

Class 60 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	32.3	0.280	0.070	0.078	0.109	Pass
5	27.7	32.3	0.421	0.134	0.111	0.176	Pass
60	27.7	16.2-55.4 ¹	0.454	0.160	0.143	0.211	Pass
5	0.0	40.4	0.429	0.151	0.182	0.267	Pass
5	34.6	40.4	0.556	0.216	0.245	0.314	Pass
Permanent Set			0.157	0.064	0.055	0.069	Pass

Class 90 Loading Sequence (UL 580)							
Duration (min)	Positive Pressure (psf)	Negative Pressure (psf)	Max Deflection Under Load (in.)				Result
			1	2	3	4	
5	0.0	48.5	0.442	0.157	0.199	0.273	Pass
5	41.5	48.5	0.626	0.272	0.266	0.389	Pass
60	41.5	24.2-48.5 ¹	0.546	0.225	0.240	0.357	Pass
5	0.0	56.5	0.545	0.224	0.232	0.355	Pass
5	48.5	56.5	0.704	0.489	0.443	0.576	Pass
Permanent Set			0.314	0.214	0.150	0.179	Pass

Notes: 1) Oscillation frequency is 10±2 sec per cycle

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Specimen No. 2 (UL 1897 Load Schedule)

Ultimate Loading Sequence (UL 1897)						
Duration (min)	Combine Test Pressure (psf)	Max Deflection Under Load (in.)				Result
		1	2	3	4	
1	120	-	-	-	-	Failed @ 5s

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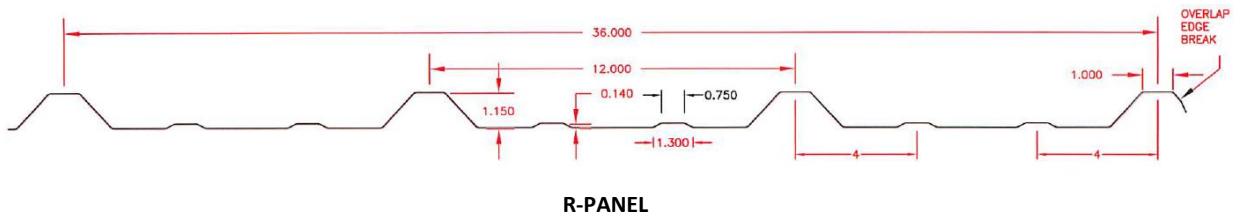
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ASTM E 8 Tensile Properties of 26 ga. steel

Specimen	Width (in)	Thickness (in)	Gage Length (in)	Yield Strength (ksi)	Tensile Strength (ksi)	Elongation at Break (%)
1	0.444	0.015	2.0	129.2	129.9	4.4
2	0.446	0.014	2.0	139.0	140.3	4.7
3	0.444	0.015	2.0	134.1	136.2	4.2
4	0.436	0.015	2.0	132.3	132.3	4.1
5	0.479	0.017	2.0	117.2	117.2	4.5
Average	0.450	0.015	2.0	130.4	131.2	4.4
St.Dev.	0.017	0.001	0.0	8.2	8.8	0.2

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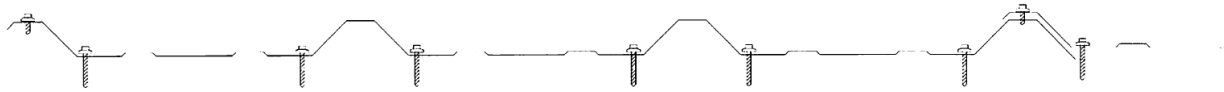
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R-PANEL



Specimen No. 1 Fastening (12"-12"-12")



Specimen No. 2 Fastening (3"-9"-3"-9"-3"-9")

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Specimen No. 1 After Testing



Specimen No. 2 After Testing

END OF REPORT

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