

# Laboratory Report K45450.05.13

**Air Permeance Testing** 

of

### Sharkskin Ultra SA<sup>™</sup> Roof Underlayment

in accordance with

### **ASTM E2178**

## Prepared for:

## **Kirsch Building Products**

1464 Madera Street, #387 Simi Valley, CA 93065

## Date of Issuance: May 29, 2013

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CLIENT INFORMATION:	Kirsch Building Products 1464 Madera Street, #387 Simi Valley, CA 93065 Attn.: Mark Strait	7				
TRINITY ERD PROJECT:	2013.K45450SC					
SAMPLES:	<u>Product</u>	Published Description				
	Sharkskin Ultra SA™	Polypropylene self-stick ice and water roof underlayment, for use under tile, metal and asphalt composition shingles				
SAMPLE DELIVERY:	The named client arranged for shipping of the sample, received at Trinity ERD's South Carolin facility on 05/08/2013.					
Test Date(s):	05/13/2013 - 05/14/2013					
M-D NOTIFICATION:	None					
TECHNICIANS:	Charles Phillips, Tim Cook					
PROPERTIES:	Air Permeance					
STANDARDS:	ASTM E2178 – Standard Test Method for Air Permeance of Building Materials, © 2003, ASTM. AC 38 – Acceptance Criteria for Water-Resistive Barriers, © 2011, ICC.					
EQUIPMENT:	Air Permeance:	ERD Air Permeance apparatus, CME Laminar Flow elements				

#### I. AIR PERMEANCE:

(ASTM E2178)

- I.I Specimen Preparation:
- 1.1.1 Five specimens are tested. A  $4 \times 4$  ft (1.2  $\times$  1.2 m) specimen is conditioned in 21°C (68.8°F) and 40% relative humidity for a minimum of seven days. The specimen thicknesses are given in Table 1A.
- 1.1.2 The specimen is placed in the test apparatus, with gaskets used to create air-tight seals. A polyethylene film is placed over the test specimen and secured with gaskets.
- I.2 Procedure:
- 1.2.1 A pressure differential is created across the specimen assembly with a vacuum motor. The pressure difference is increased and the air flow rate recorded.
- 1.2.2 The top section of the polyethylene film is cut, and the testing repeated.
- 1.2.3 The flow rate equation is established through linear fitting of data by method of least squares for the mean air flow. The coefficient of determination  $(r^2)$  is calculated, and a regression line based on mean air leakage data is reported.

TABLE 1A: SPECIMEN THICKNESS, SHARKSKIN ULTRA SA™							
Matarial	Test Data (mils)					Results	
Wateria	1	2	3	4	5	Average	St. Dev.
Sharkskin Ultra SA™	23.8	24.7	24.4	24.6	24.1	24.3	0.37





#### I.3 Results:

TABLE 1B: AIR PERMEANCE, SHARKSKIN ULTRA SA™										
Material	Pressure Measured Air Flow (L/s·m <sup>2</sup> )				Average		46.39	D /E-1		
	Pa (psf)	1	2	3	4	5	L/s∙m²	cfm/ft²	AC 38	Pass/Fail
	25 (0.52)		0.00157	0.00087	0.00087	0.00087	0.00105	0.00021	Air Permeance at 75 Pa: ≤ 0.02 (L/s·m²) or	Pass
	50 (1.04)	0.00026	0.00000	0.00026	0.00043	0.00009	0.00021	0.00004		Pass
	75 (1.57)	0.00069	0.00011	0.00040	0.00023	0.00011	0.00031	0.00006		Pass
Sharkskin	100 (2.09)	0.00030	0.00013	0.00017	0.00034	0.00017	0.00022	0.00004		Pass
Ultra SA™	150 (3.13)	0.00011	0.00014	0.00006	0.00031	0.00009	0.00014	0.00003		Pass
	300 (6.27)	0.00038	0.00020	0.00017	0.00007	0.00001	0.00017	0.00003		Pass
		Average:					0.00033	0.00007	$\leq 0.004$	Pass
		Air Flow @ 75 Pa:				w @ 75 Pa:	0.00033	0.00007		Pass



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1.3.1 Compliance with ASTM E2178, Section 8.2.8 was evaluated, whereby re-measurement of air leakage at 100, 75, and 50 Pa must be within 10% of the original measurements.

TABLE 1C: TESTING EFFECT UPON AIR LEAKAGE MEASUREMENT						
Material	$\Delta$ P (Pa)	% difference	E2178	Pass/Fail		
	100	15				
Sharkskin Ultra SA™	75	15	<u>&lt;</u> 10%	See Section 1.3.2		
	50	25				

- 1.3.2 Review of data in Table IC show movements measured to the nearest 0.0001 L/s·m<sup>2</sup>. Since the amount of air movement is nearly zero, the difference between the extremely low flow rates is magnified as an artifact, and is not significant.
- I.4 Error Analysis:
- 1.4.1 Reporting the 95% confidence interval is required for each test as outlined in ASTM E2178 Appendix A1. These intervals are omitted as they could not be calculated due to undefined values of natural log.

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#### 2. CONCLUSIONS:

- 2.1 Trinity|ERD has tested the Sharkskin Ultra SA® underlayment product detailed on Page 2, as supplied by the named client, for air permeance in accordance with ASTM E2178. Sharkskin Ultra SA® passed the testing, the results are outlined in Tables IA through IC of this report.
- 2.1.1 Review of results indicates Sharkskin Ultra SA<sup>™</sup> has an air permeance of 0.00033 L/s-m<sup>2</sup> (0.0000 cfm/ft<sup>2</sup>) @ 75 Pa.

Please contact our office with any questions.

Sincerely, Trinity|ERD

Charles Phillips Laboratory Manager

<u>Event</u> Draft Report Issued Final Issued Robert Nieminen, P.E. Vice President

> Notes For client review After client review

Authorized By: RN RN

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