Exterior Research & Design, L.L.C.
Building Science and Envelope Consultants

Laboratory Report K0810.12.05

Long Term Aging & Tensile Adhesion Testing

of

PolyPro® AH160

with

Sharkskin Ultra™

in accordance with

ASTM D1623 and the FRSA Recommendations for the Use of Underlayments Applied Under Pitched Roofing Components

Prepared for:
Kirsch Building Products, LLC
1464 Madera Road
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Client Information: Kirsch Building Products, LLC
1464 Madera Road, Suite 387
Simi Valley, CA 93065
c/o Mark Strait

Client Reference: Long Term Aging / Tensile Adhesion – Composite Assembly

ERD Reference: Project #2005.K0810LAB

Samples: PolyPro® AH160 is a dual-component polyurethane foam adhesive designed for use as a roof tile adhesive.

Sharkskin Ultra™ is a polypropylene scrim / coated roof underlayment.

Sample Delivery: The named client shipped samples of said materials to Exterior Research & Design's Seattle Washington Laboratory for testing.

Test Date(s): August - December 2005

M-D Notification: ERD05013

ERD Technicians: Charles Phillips, Jonas Hawk

Properties:

Comparative Tensile Adhesion	ASTM D1623
Long Term Aging	FRSA Recommendations

Standards: ASTM D1623-03, *Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics,* © 2003, ASTM.

FRSA Recommendations for the Use of Underlayments Applied Under Pitched Roofing Components

Equipment:

Conditioning:	Thermotron
Tensile Adhesion:	Satec T-5000

Specimens: Specimens consist of the following composite assembly:

15/32-inch thick CDX plywood
Sharkskin Ultra™
PolyPro® AH160
SharkSkin Ultra™
15/32-inch thick CDX plywood

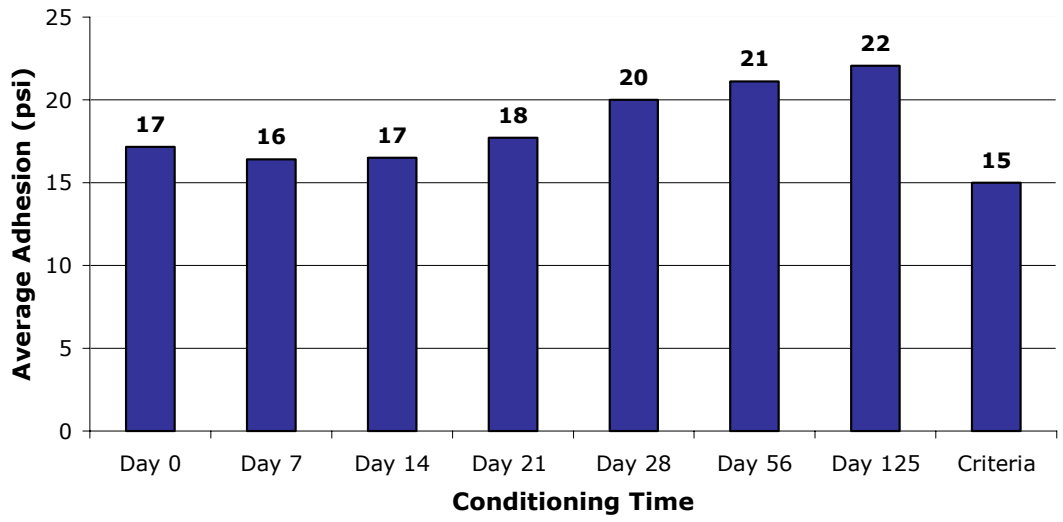
24" x 24" sections of the composite assembly are constructed and allowed to cure for 24 hours at 75 ± 2°F and 50% relative humidity. After curing, the composite panels are cut into 2" x 2" squares and conditioned for testing

Conditioning: Control samples are conditioned at 75 ± 2°F and 50% relative humidity. Long Term Aging specimens were conditioned at 180 ± 2°F and 65% relative humidity for 7, 14, 28, 56, and 125 days. Specimens were then allowed to equilibrate at 75 ± 2°F and 50% relative humidity prior to testing.

Results:

Table 1: Tensile Adhesion Performance (psi), ASTM D1623						
Specimen No.	Condition					
	Control (Day-0)	Day-7	Day-14	Day-28	Day-56	Day-125
1	19	18	17	17	20	20
2	17	15	17	24	20	26
3	20	18	18	22	19	18
4	14	16	15	12	26	23
5	15	14	16	13	16	18
Average:	**17**	**16**	**17**	**18**	**20**	**21**
Std. Dev.:	3	2	1	6	4	3
Failure Mode:	Cohesive Failure of Foam	Cohesive Failure of Foam	Cohesive Failure of Foam	Cohesive Failure of Foam	Cohesive Failure of Foam	Cohesive Failure of Foam

Figure 1: Comparative Adhesion Performance, FRSA Std.



Conclusions:

ERD has tested Sharkskin Ultra™ for long term aging and tensile adhesion performance when used in conjunction with PolyPro® AH160 tile adhesive. Test results indicate compliance with the minimum 15 psi requirement set forth in the referenced FRSA standard.

Polyfoam Products, Inc. has reported that meeting this minimum 15 psi standard results in allowance for use of the underlayment product beneath tile roof systems bonded with PolyPro® AH160, and use of the static uplift data owned by Polyfoam Products, Inc. in documenting the system's resistance to wind loads and overturning moment.

Please contact our offices with any questions.

Sincerely,
EXTERIOR RESEARCH & DESIGN, LLC.

Charles Phillips
Laboratory Systems Manager

Robert Nieminen, P.E.
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Laboratory Technical Manager

Note: This engineer is registered in the states of Washington, Florida, Connecticut and Texas.