

Enclosed is a report entitled *Report of Water Vapor Permeation Testing of Construction Vapor Barrier Materials* by Dr. Kay Cooksey Ph.D of Clemson University's Packaging Science Department. Any conclusions or opinions rendered by non-Stego Industries employees regarding Dr. Cooksey's report do not necessarily reflect the conclusions or opinions of Stego Industries. Stego Industries does not have an official public position on the information contained in the report, but will certainly discuss the facts of the study and the report.



Report of Water Vapor Permeation Testing of Construction Vapor Barrier Materials
Prepared by Kay Cooksey, Ph.D., Clemson University, Department of Packaging Science
kcookse@clemson.edu

The purpose of this report is to discuss how the project started, procurement process and results. I was contacted via email on July 15, 2009 by Mike Joseph Smith. His initial email and all subsequent emails have not had affiliations such as company name or email included in the messages. This was done to provide complete anonymity which could bias the results. Furthermore, phone calls indicated “unknown” on the call screen of both my cell and office phone. All payments were received from a third party and were paid by cashier’s check from S. Cox and K. Delgado. At the time of writing this report, I do not know the real identity of Mike Joseph Smith or his affiliation.

I am a professor at Clemson University in the Department of Packaging Science. One of my main areas of expertise is permeation of materials and my Ph.D. graduate student is the technician that supervises and performs permeation testing. Materials were procured directly from the vendors or from a local distributor. It was important that materials were procured without indicating that testing would be performed, therefore, I used the name of a family friend’s business, Sierra Builders, when materials were ordered. At the time the study started, I was using Sierra Builders to construct a barn and renovate a tack room at my residence and I used this scenario when vendors asked how the material would be used. In addition, it was important to obtain production roll materials, not sample sheets. That is why the scenario was used when necessary. In some cases, vendors just wanted to know what I wanted to order but in other cases I spoke to people that genuinely wanted to help me procure the best product for my application. In one case, I was forced to buy the sealing tape in order to prevent revealing that the product was actually part of a test.

When the rolls were shipped direct from the vendor to the University, the name of the University was not included on the shipping address. The address used was 109 Newman, Clemson, SC 29634, which allowed us to use the loading dock for delivery of the rolls. When the rolls were ordered from a local distributor, I picked them up in my pickup truck and students helped me unload them at the University. Samples were obtained by unrolling at least one full revolution to remove the outside layer of material that could have been damaged during handling. Next, the end of the roll was cut down lengthwise and duplicate samples of 8 x 10” were removed from the center of the roll. These flat sheets were mailed to Mocon in Minneapolis, MN and tested per ASTM F1249 under the following conditions: 23°C, 50% relative humidity. Samples were sent with a numerical code to prevent identification of the materials during testing at Mocon.

In October of 2010 Mike Joseph Smith asked me to do a second round of testing with select materials. The second round was done exactly the same way as the first. The results for both rounds follow.

Report of Water Vapor Permeation Testing of Construction Vapor Barrier Materials

Results

Material Identity	Sample Code	Permeance (grn/ft ² /hr/inHg)	Procurement Date (mo/year)	Material Supplier
Insulation Solutions Viper Vapor Check 6.5	100A	0.0622	Sep-09	Insulation Materials.com ²
	100B	0.0571		
	Avg.	0.0597		
Insulation Solutions Viper Vapor Check 10	101A	0.0383	Sep-09	Insulation Materials.com ²
	101B	0.0399		
	Avg.	0.0391		
Insulation Solutions Viper Vapor Check 16	102A	0.0308	Sep-09	Insulation Materials.com ²
	102B	0.0378		
	Avg.	0.0343		
Insulation Solutions Viper Vapor Check II 15 mil	103A	0.0131	Sep-09	Insulation Materials.com ²
	103B	0.0143		
	Avg.	0.0137		
Barrier Bac VB 350	104A	0.0406	Oct-09	Inteplast Group ¹
	104B	0.0397		
	Avg.	0.0402		
Epro Services Eco-Shield E 15	105A	0.0159	Nov-09	Epro Waterproofing Systems, Kansas City, MO ¹
	105B	0.0151		
	Avg.	0.0155		
Raven Industries Vapor Block 15	106A	0.0156	Dec-09	Whitecap, Greenville, SC ²
	106B	0.0156		
	Avg.	0.0156		
Fortifiber Moistop Ultra 15	107A	0.0163	Dec-09	Whitecap, Greenville, SC ²
	107B	0.0167		
	Avg.	0.0165		
Stego Industries Stego Wrap Vapor Barrier	108A	0.0082	Dec-09	Whitecap, Greenville, SC ²
	108B	0.0082		
	Avg.	0.0082		
Raven Industries Vapor Block 10 mil	109A	0.0247	Dec-09	Whitecap, Greenville, SC ²
	109B	0.0237		
	Avg.	0.0242		
W.R. Meadows Perminator 10 mil	110A	0.0206	Feb-10	Cemex Anderson, SC ²
	110B	0.0195		
	Avg.	0.0201		
W.R. Meadows Perminator 15 mil	111A	0.0144	Feb-10	Cemex Anderson, SC ²
	111B	0.0144		
	Avg.	0.0144		

¹ Materials acquired directly from vendor

² Materials acquired from distributor

Report of Water Vapor Permeation Testing of Construction Vapor Barrier Materials

Round 2 Results

Material Identity	Sample Code	Permeance (grn/ft ² /hr/inHg)	Procurement Date (mo/year)	Material Supplier
Insulation Solutions Viper VaporCheck II 15-mil	210A	0.0171	Nov-10	Insulation Materials.com ²
	210B	0.0168		
	Avg.	0.0170		
Insulation Solutions Viper VaporCheck II 10 mil	211A	0.0248	Nov-10	Insulation Materials.com ²
	211B	0.0233		
	Avg.	0.0241		
Epro Services Eco-Shield E 15-mil	212A	0.0153	Nov-10	Epro Waterproofing Systems, Kansas City, MO ¹
	212B	0.0167		
	Avg.	0.0160		
Reef Industries Griffolyn 15 mil	213A	0.0183	Nov-10	Reef Industries, Houston, TX ¹
	213B	0.0181		
	Avg.	0.0182		
Reef Industries Vaporguard	214A	0.0011	Nov-10	Reef Industries, Houston, TX ¹
	214B	0.0011		
	Avg.	0.0011		
Layfield Vaporflex 15 mil	215A	0.0135	Nov-10	New South Supply, Greenville, SC ²
	215B	0.0131		
	Avg.	0.0133		

¹ Materials acquired directly from vendor

² Materials acquired from distributor

This page intentionally left blank to show the separation between Dr. Cooksey's report and Stego's analysis on the next page.

Explanation of The Report Entitled:

“Report of Water Vapor Permeation Testing of Construction Vapor Barrier Materials”

The above referenced report produced by Dr. Kay Cooksey of Clemson University’s Packaging Science department reveals the permeance of production samples for several below-slab vapor retarder products. To the untrained eye, interpretation of the study results might be difficult. The significance of the study becomes apparent when additional information, provided by each manufacturer, is displayed.

The table below displays the average permeance values copied from Dr. Cooksey’s report. The table also lists the permeance of the products according to each product’s published literature at the time of procurement. The fourth column shows the percent disparity between the results of the study and the manufacturer’s published data. The report results for some of the products closely match their own literature and others deviate significantly far from it. The table is sorted by this percent deviation from lowest to highest.

Manufacturer & Product Name	Study Result	Literature Claim	Percent Difference	Procurement Date
Layfield Vaporflex	0.0133	0.020	Better than Literature	Nov 2010
Fortifiber Moistop Ultra 15-mil	0.0165	0.02	Better than Literature	Dec 2009
Stego Wrap 15-mil	0.0082	0.0084	Better than Literature	Dec 2009
Reef Industries Vaporguard	0.0011	0.00	Same	Nov 2010
Reef Industries Griffolyn G15	0.0182	0.018	Same	Nov 2010
Raven Industries Vapor Block 10 mil	0.0242	0.0146	66%	Dec 2009
Epro Eco-shield E 15	0.0155	0.009	72%	Nov 2009
Raven Industries Vapor Block 15 mil	0.0156	0.009	73%	Dec 2009
Insulation Solutions Viper Vapor Check II 15 mil	0.0137	0.0067	104%	Sep 2009
Insulation Solutions Viper Vapor Check II 10 mil	0.0241	0.0073	230%	Nov 2010
Insulation Solutions Viper Vapor Check II 15 mil	0.0170	0.0043	295%	Nov 2010
Epro Eco-shield E 15	0.0160	0.0038	321%	Nov 2010
Barrier Bac VB 350	0.0402	0.009	347%	Oct 2009
W.R. Meadows Perminator 15 mil	0.0144	0.0031	365%	Feb 2010
W.R. Meadows Perminator 10 mil	0.0201	0.0043	367%	Feb 2010
Insulation Solutions Viper Vapor Check 6.5 mil	0.0597	0.0095	528%	Sep 2009
Insulation Solutions Viper Vapor Check 16 mil	0.0343	0.0015	2187%	Sep 2009
Insulation Solutions Viper Vapor Check 10 mil	0.0391	0.0016	2344%	Sep 2009