

# Dynamic Small-Scale Chamber Emissions Testing

Compliance Report per  
California Dept. of Public Health  
Standard Method Version 1.1  
and FloorScore®

Selit® Bloc Underlayment



Prepared for:



550 Old Peachtree Road  
Suwanee, GA 30024

Submitted by:

Materials Analytical Services, LLC  
3945 Lakefield Court  
Suwanee, Georgia 30024



Testing Cert. #2925.01

September 30, 2014

MAS Project No.: 1401210



September 30, 2014



Mr. Paul Dooley  
Pak-Lite, Inc.  
550 Old Peachtree Road  
Suwanee, GA 30024

**Subject:           Dynamic Small-Scale Chamber Emissions Testing  
                      Compliance Report per California Department of Public Health Standard Method  
                      Version 1.1 and FloorScore®  
                      Pak-Lite, Inc. Selit® Bloc Underlayment  
                      MAS Project No.: 1401210**

Dear Mr. Voss:

Materials Analytical Services, LLC (MAS) is pleased to submit this report for emissions testing relative to potential VOC off-gassing from an application of Pak-Lite, Inc.'s Selit® Bloc Underlayment submitted in September 2014. This report summarizes our testing procedures and the results of our analytical measurements.

This project was conducted in general accordance with the emission testing guidelines specified under ASTM D 5116-10. Specific testing parameters and VOC emission limits were based on the California Department of Public Health (CDPH) *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Test Chambers Version 1.1* (Section 01350) and FloorScore® testing criteria.

MAS is pleased to have been of service to you. If you have any questions or comments, or if we can be of further assistance to you, please do not hesitate to contact us.

Sincerely,

**MATERIALS ANALYTICAL SERVICES, LLC**

A handwritten signature in black ink, appearing to read "Robert D. Schmitter".

Robert D. Schmitter  
Manager, Emissions Group

A handwritten signature in black ink, appearing to read "William R. Stapleton".

William R. Stapleton  
Senior Chemist

Appendices:       Appendix A – Chain-of-Custody  
                      Appendix B – Testing Parameters and Data



## COMPLIANCE EMISSIONS TEST

By California Dept. of Public Health Standard Method Version 1.1 and  
 FloorScore®

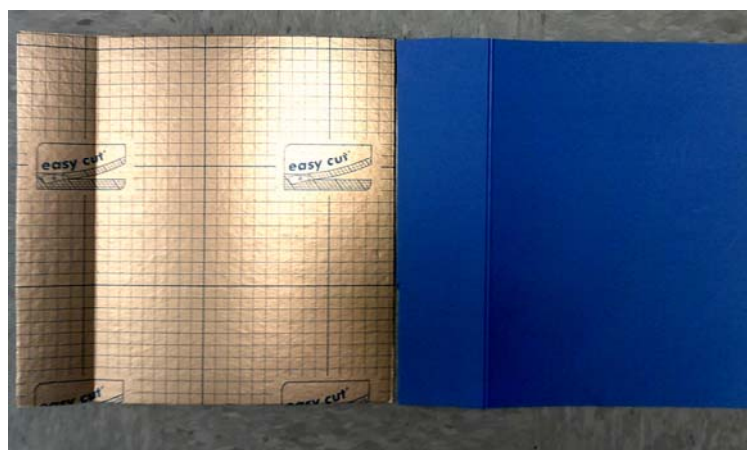
Flooring Evaluation

MAS Project No.: 1401210

### SAMPLE DESCRIPTION & TESTING PARAMETERS

Sample specifics as described in the accompanying chain-of custody (Appendix A) and a timeline of milestone dates relative to sampling and analysis are summarized below:

<b>Product Name:</b> Selit® Bloc Underlayment	<b>MAS Assigned ID:</b> 1401210
<b>Manufacturer:</b> Pak-Lite, Inc. 550 Old Peachtree Road Suwanee, GA 30024	<b>Product Description:</b> Foam underlayment Approx. 6” x 6” tested
<b>Manufacture Date:</b> Not Provided	<b>Testing Period:</b> September 12-26, 2014
<b>Collection Date:</b> September 12, 2014	<b>In-Chamber Sampling Dates:</b> September 23 @ 24 hours; September 24 @48 hours; September 26@ 96 hrs
<b>Shipping Date:</b> September 12, 2014	<b>Date of Sample Analysis:</b> Sept. 29-30, 2014
<b>Laboratory Arrival Date:</b> September 12, 2014	



**Pak-Lite, Inc. Selit® Bloc underlayment as submitted (left) and tested (right)**

The underlayment was prepared for testing by cutting a 6” x 6” piece from the submitted samples. The cut piece was placed on a stainless steel plate, and the edges were then taped with ¼” aluminum tape. The sample was then inside MAS’s small-scale (53 liter) stainless steel emissions chamber on the chamber floor beneath a fan to facilitate even air circulation around the sample.

Emissions from the sample were sampled and analyzed in general accordance with ASTM D 5116 *Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products*. The specific parameters for sample conditioning, collection of samples and analysis of compounds of interest were conducted in accordance with the California Department of Public Health (CDPH) *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from*



Indoor Sources Using Environmental Chambers Version 1.1, for comparison to the CDPH target CREL VOCs maximum allowable concentrations and FloorScore® testing protocol. Details of testing protocols and parameters are presented in Appendix B.

## TESTING RESULTS

In order to compare the chamber derived data to the standards established under CDPH Standard Method Version 1.1 and the FloorScore® criteria for low emitting materials an emission factor for the tested sample is calculated based on the 96 hour data following ten days of in-chamber conditioning. This emission factor is then applied to the defined parameters of that product in typical school classroom and private office environments accounting for the CDPH-specified room sizes and ventilation rates.

CDPH modeling parameters define a typical classroom as having a total floor area of 89.2 square meters, and a typical private office having a total floor area of 11.1 square meters. For purposes of this report, a typical application was assumed to be the total floor area for classrooms and offices. The results of the modeled data are presented below in Table I.

**Table I**  
**Emission Factors and Predicted 96-Hour Airborne Concentrations for the Pak-Lite, Inc. Selit® Bloc Underlayment in Typical Building Environments**

VOC Name	Calculated Emission Factor ( $\mu\text{g}/\text{m}^2/\text{hr}$ )	Predicted Airborne Concentration ( $\mu\text{g}/\text{m}^3$ )		Reference OEHHA ½ CREL Values ( $\mu\text{g}/\text{m}^3$ )	Testing Comment
	96 <sup>th</sup> hour (4 days)	Classroom*	Private Office**		
Total VOCs (TVOC)	<3.1	<1.5	<1.7	NA	NA
formaldehyde	<3.6	<1.7	<1.9	9	Compliant
acetaldehyde	4.4	2.1	2.4	70	Compliant
isopropanol	<3.1	<1.5	<1.7	3500	Compliant
1,1-dichloroethylene	<3.1	<1.5	<1.7	35	Compliant
methylene chloride	<3.1	<1.5	<1.7	200	Compliant
carbon disulfide	<3.1	<1.5	<1.7	400	Compliant
MTBE	<3.1	<1.5	<1.7	4000	Compliant
vinyl acetate	<3.1	<1.5	<1.7	100	Compliant
hexane	<3.1	<1.5	<1.7	3500	Compliant
chloroform	<3.1	<1.5	<1.7	150	Compliant
2-methoxyethanol	<3.1	<1.5	<1.7	30	Compliant
1,1,1-trichloroethane	<3.1	<1.5	<1.7	500	Compliant
benzene	<3.1	<1.5	<1.7	30	Compliant
1-methoxy-2-propanol	<3.1	<1.5	<1.7	3500	Compliant
carbon tetrachloride	<3.1	<1.5	<1.7	20	Compliant
1,4-dioxane	<3.1	<1.5	<1.7	1500	Compliant



trichloroethylene	<3.1	<1.5	<1.7	300	Compliant
epichlorohydrin	<1.6	<0.76	<0.86	1.5	Compliant
2-ethoxyethanol	<3.1	<1.5	<1.7	35	Compliant
n,n-dimethylformamide	<3.1	<1.5	<1.7	40	Compliant
toluene	<3.1	<1.5	<1.7	150	Compliant
2-methoxyethanol acetate	<3.1	<1.5	<1.7	45	Compliant
tetrachloroethylene	<3.1	<1.5	<1.7	17.5	Compliant
chlorobenzene	<3.1	<1.5	<1.7	500	Compliant
ethylbenzene	<3.1	<1.5	<1.7	1000	Compliant
m & p-xylene	<3.1	<1.5	<1.7	350	Compliant
styrene	<3.1	<1.5	<1.7	450	Compliant
o-xylene	<3.1	<1.5	<1.7	350	Compliant
phenol	<3.1	<1.5	<1.7	100	Compliant
1,4-dichlorobenzene	<3.1	<1.5	<1.7	400	Compliant
isophorone	<3.1	<1.5	<1.7	1000	Compliant
naphthalene	<1.6	<0.76	<0.86	4.5	Compliant

\* Assumes a classroom size of 24' x 40' x 8.5' with a ventilation rate of 0.82 h<sup>-1</sup> as defined by CDPH/EHLB/Standard Method V.1.1

\*\* Assumes a private office size of 10' x 12' x 9' with a ventilation rate of 0.68 h<sup>-1</sup> as defined by CDPH/EHLB/Standard Method V.1.1

## CONCLUSIONS

Based on the emissions test data, MAS offers the following findings and conclusions:

- No California Department of Public Health target CREL compounds were detected above laboratory detection limits from the Pak-Lite, Inc. Selit® Bloc Underlayment at the 14 day test end point. Predicted air concentrations of all of these compounds in both a classroom and private office environment are below the specified California Office of Environmental Health Hazard Assessment (OEHHA) ½ CREL limit.

## LIMITATIONS

This report is intended for the use of Pak-Lite, Inc. and SCS global Services only. If other parties wish to rely on this report, please have them contact us so that a mutual understanding and agreement of the terms and conditions for our services can be established prior to their use of this information. This report shall not be reproduced, except in full, without the written approval of Materials Analytical Services, LLC.

Product emissions generally decay over time, and the representativeness of the analytical data reported is directly dependant upon the age and conditions under which the tested sample was received.

# APPENDIX A

## Chain-of-Custody



### Materials Analytical Services LLC

3945 Lakefield Court  
Suwanee, Georgia 30024  
Phone: 770-866-3200  
Fax: 770-866-3259

Emission Testing  
Chain-of-Custody



Client Information
Company: Pak-Lite, Inc., (PLI) 550 Old Peachtree Rd
City/State: Suwanee, GA
Zip/Postal Code: 30024
Country: USA
Contact Name: Paul Dooley
Title:
Phone Number: 770-447-5123
Fax Number: (770) 242-5938
Email Address: Paul.Dooley@PLIUSA.com

Testing Specifications (per MAS) check appropriate test below
<input type="checkbox"/> R&D (custom): Specify Details
<input type="checkbox"/> 24-hour Comparative R&D Test
<input type="checkbox"/> 72-hour Comparative R&D Test
<input checked="" type="checkbox"/> 14-day FloorScore / CDPH Compliance Test

Manufacturer Information (if different than client)
Company:
City/State/Country:
Contact Name/Title:
Phone Number:

Construction Details (as applicable)
<b>Flooring</b> Describe Top/Wear Layer: Describe Middle & Bottom Layer(s): Describe Undelayment:
<b>Adhesives</b> Identify type: Acrylic <input type="checkbox"/> , SBR Latex <input type="checkbox"/> , Urethane/Moisture Cured <input type="checkbox"/> , Pressure Sensitive <input type="checkbox"/> , Epoxy <input type="checkbox"/> , WaterBased <input type="checkbox"/> , Powder <input type="checkbox"/> , Floating Glues <input type="checkbox"/> , Cement <input type="checkbox"/>

Sample Details
Unique Sample ID (if applicable):
Product Name & Catalog #: <u>SelitBloc</u>
Product Type: Hardwood Flooring <input type="checkbox"/> , Laminate Flooring <input type="checkbox"/> , V/C Tile <input type="checkbox"/> , Rubber Flooring <input type="checkbox"/> , Vinyl Sheet <input type="checkbox"/> , Baseboard Molding <input type="checkbox"/> , Stair Treads/Risers <input type="checkbox"/> , Adhesives <input type="checkbox"/> , Underlayments <input checked="" type="checkbox"/> , Other <input type="checkbox"/> Specify:
Date of Product Manufacturing Completion:
Collection Location: Factor Line <input type="checkbox"/> , Warehouse <input type="checkbox"/> , Production Stack/Roll <input type="checkbox"/> , Retail Package/ Container <input type="checkbox"/>
Sample Submitted by: <u>BOB CUMMINGS</u>
Date of Sample Shipment:
Number of Boxes or Pallets:

Special Notes or Comments from Manufacturer:

Shipping Details
Packed By:
Shipping Date:
Carrier/Airbill Number:

Laboratory Receipt (to be completed by Laboratory Representative)
Received By: <u>Seals</u>
Received Date: <u>9/10/14</u>
Condition of Shipping Package: <u>OK</u>
Condition of Sample: <u>OK</u>
Remarks: 

Sample Handling				
Relinquished By	Company	Received By	Company	Date/Time
		<u>A Seals</u>	<u>MAS</u>	<u>9/10/14</u>

# APPENDIX B

## GENERAL TESTING PARAMETERS AND DATA

Under the provisions of the testing method referenced in this report, testing consisted of the following procedural steps:

- Specific procedures for specimen receiving, handling, and preparation.
- Storage of test specimens in original shipping containers prior to emissions testing for up to 10 days in a ventilated and conditioned room maintained at a temperature of  $23 \pm 2^\circ\text{C}$  and a relative humidity of  $50\% \pm 15\%$ .
- For quality assurance purposes the emission chamber was purged and the interior thoroughly cleaned to remove residual compounds prior to all new product tests. Air samples were collected and analyzed from the chamber exhaust prior to loading to establish background levels.
- Collection of air samples at method-specified intervals from the chamber exhaust port utilizing mass flow controllers calibrated at 200 cc/min for VOCs and at 300 cc/min for aldehydes.
- Tenax TA® tubes (drawn in duplicate) are used for VOC analysis which is performed by thermal desorption gas chromatography/mass spectrometry (TD-GC/MS) using a modified EPA TO-17 method. Samples are also collected on DNPH tubes for aldehyde analysis which is performed using high performance liquid chromatography (HPLC) using a modified NIOSH 2016 method.
- Instrument calibration, analysis of quality control samples and quantitation of the CDPH target list of 35 chemicals of concern.
- Reporting and speciation of top 10 tentatively identified compounds.

The operational parameters for the small emission chamber utilized for this project included:

Parameter	Units	Value
Chamber Volume	$\text{m}^3$	0.053
Loading Factor	$\text{unit}/\text{m}^3$	0.425
Air Exchange Rate	$\text{h}^{-1}$	$1.0 \pm 0.05$
Area Specific Flow Rate	$\text{m h}^{-1}$	2.356
Temperature	$^\circ\text{C}$	$23 \pm 1$
Relative Humidity	%	$50 \pm 5$

The averaged results of the emission tests are summarized on the following pages in accordance with the ANSI/BIFMA M7.1-2011 guidelines for reporting.

**Table I**  
**Total Volatile Organic Compounds (TVOC) between n-C<sub>5</sub> and n-C<sub>17</sub> Measured by GC/MS\***

Sample ID#	Sample Interval in hours	Concentration in $\mu\text{g}/\text{m}^3$	Emission Factor in $\mu\text{g}/\text{m}^2 \text{ h}$
1401210	24	<1.3	<3.1
	48	<1.3	<3.1
	96	<1.3	<3.1

\*TVOC values are background corrected

The measured concentrations of formaldehyde and acetaldehyde obtained at each of the three sampling intervals are presented in Table II.

**Table II**  
**Formaldehyde and Acetaldehyde Concentrations as Measured by HPLC**

Sample ID#	Sample Interval in hours	Target Compound	Concentration ( $\mu\text{g}/\text{m}^3$ )	Emission Factor ( $\mu\text{g}/\text{m}^2 \text{ h}$ )
1401210	24	Formaldehyde	<1.5	<3.6
	48	Formaldehyde	<1.5	<3.6
	96	Formaldehyde	<1.5	<3.6
	24	Acetaldehyde	<1.4	<3.3
	48	Acetaldehyde	<1.4	<3.3
	96	Acetaldehyde	1.9	4.4

There were no individual volatile organic compounds (IVOC) identified by GC/MS after 96 hours of off-gassing from the tested flooring product.