
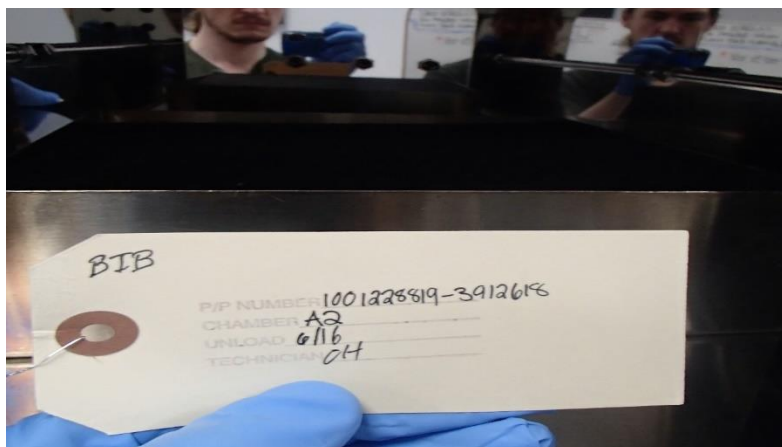




INDOOR AIR QUALITY EVALUATION FOLLOWING THE REQUIREMENTS OF CDPH/EHLB/STANDARD METHOD	
Product Description	2" Black FSorb Polyester Panel
Customer Information	NUT SHELL LLC ROBERT WEDLAW 15125 NE 90TH STREET REDMOND WA 98052
Testing Laboratory	UL Environment - Marietta, 2211 Newmarket Parkway, Marietta, GA 30067-9399 USA
Product Category	Building Products
Date Received	May 24, 2021
Test Description	The product was received by UL Environment as packaged and shipped by the customer. The package was visually inspected and stored in a controlled environment immediately following sample check-in. Just prior to loading, the product was unpackaged and prepared for the required loading to expose the finished surfaces only. The sample was placed inside the environmental chamber and tested according to the specified protocol.
Test Date	June 2, 2021 - June 16, 2021
Product Area Exposed	one-sided area = 0.0853 m ²
Environmental Chamber ID and Volume	SA2 - 0.0903 m ³
Product Loading Ratio	0.94 m ² /m ³
Test Chamber Conditions	Air change rate: 1.00 ± 0.05 1/h Inlet air flow rate: 0.0903 ± 0.004 m ³ /h Temperature: 22.5°C - 23.4°C Relative Humidity: 50% RH ± 5% RH
Test Method	CDPH - CA Section 01350 <i>Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers</i> Version 1.2.
Authorized by	 Allyson M. McFry Chemistry Laboratory Director
<p>*The temperature range specification is 23°C ± 1°. The actual temperature range listed above may vary slightly. If the range is outside this specification, data was reviewed to ensure a negative impact did not occur.</p> <p>This test is accredited and meets the requirements of ISO/IEC 17025 as verified by ANSI National Accreditation Board. Refer to certificate and scope of accreditation AT-1297.</p>	

PHOTOGRAPH OF SAMPLE



RESULTS SUMMARY

Product Description		2" Black FSorb Polyester Panel			
Environment	Product Usage	Product Surface Area	Room Volume	Ventilation Rate (ACH)	Product Compliance?
Classroom	wall	94.6 m ²	231 m ³	0.82	Yes
Office	wall	33.4 m ²	30.6 m ³	0.68	Yes

PROJECT DESCRIPTION

The product was monitored for emissions of TVOC, individual VOCs, formaldehyde and other aldehydes over the 96-hour test period. Measurements were made and predicted exposures were calculated according to the CA Section 01350 protocol. As specified in this protocol, the results at 96 hours, after 10 days of conditioning, were compared to ½ (one-half) the current Chronic Reference Exposure Levels (CRELs), as adopted from the California OEHHA list. All identified VOCs were also compared to the California-EPA OEHHA Proposition 65 list and the California-EPA Air Resource Board list of Toxic Air Contaminants (TACs).

Report Outline:

Table 1	Comparison of Data To Method Requirements
Table 2	Chamber Concentrations and Emission Factors
Table 3	Most Abundant Compounds
Table 4	VOC Predicted Air Concentrations And Regulatory Information
Chain of Custody	Chain of Custody

Download more information regarding UL's technical references and resources, product evaluation methodologies information, quality control program, and environmental chamber evaluations from our website [click here](#) or <https://www.ul.com/offerings/greenguard-certification>

For RSD, Quality Assurance Report or other quality documents, [Request](#) here or contact ULE.

TABLE 1

Product Description		2" Black FSorb Polyester Panel					
COMPARISON OF DATA TO METHOD REQUIREMENTS AT 96 HOURS FOLLOWING 10 DAYS OF CONDITIONING							
Compound	CAS Number	1/2 CREL (µg/m³)	Chamber Concentration (µg/m³)	Emission Factor ^{††} (µg/m²·hr)	Classroom Predicted Concentration (µg/m³) ^{**}	Office Predicted Concentration (µg/m³) ^{**}	Meets 1/2 CREL? (Classroom/Office)
Acetaldehyde	75-07-0	70	BQL	BQL	BQL	BQL	Yes
Benzene	71-43-2	1.5	BQL	BQL	BQL	BQL	Yes
Carbon disulfide*	75-15-0	400	BQL	BQL	BQL	BQL	Yes
Carbon tetrachloride*	56-23-5	20	BQL	BQL	BQL	BQL	Yes
Chlorobenzene	108-90-7	500	BQL	BQL	BQL	BQL	Yes
Chloroform*	67-66-3	150	BQL	BQL	BQL	BQL	Yes
Dichlorobenzene (1,4-)	106-46-7	400	BQL	BQL	BQL	BQL	Yes
Dichloroethylene (1,1)*	75-35-4	35	BQL	BQL	BQL	BQL	Yes
Dimethylformamide (N,N-)*	68-12-2	40	BQL	BQL	BQL	BQL	Yes
Dioxane (1,4-)	123-91-1	1,500	BQL	BQL	BQL	BQL	Yes
Epichlorohydrin	106-89-8	1.5	BQL	BQL	BQL	BQL	Yes
Ethylbenzene	100-41-4	1,000	BQL	BQL	BQL	BQL	Yes
Ethylene glycol	107-21-1	200	BQL	BQL	BQL	BQL	Yes
Ethylene glycol monoethyl ether acetate*	111-15-9	150	BQL	BQL	BQL	BQL	Yes
Ethylene glycol monoethyl ether*	110-80-5	35	BQL	BQL	BQL	BQL	Yes
Ethylene glycol monomethyl ether acetate*	110-49-6	45	BQL	BQL	BQL	BQL	Yes
Ethylene glycol monomethyl ether*	109-86-4	30	BQL	BQL	BQL	BQL	Yes
Formaldehyde	50-00-0	9.0***	BQL	BQL	BQL	BQL	Yes

Product Description		2" Black FSorb Polyester Panel					
COMPARISON OF DATA TO METHOD REQUIREMENTS AT 96 HOURS FOLLOWING 10 DAYS OF CONDITIONING							
Compound	CAS Number	½ CREL (µg/m³)	Chamber Concentration (µg/m³)	Emission Factor ^{††} (µg/m²·hr)	Classroom Predicted Concentration (µg/m³) ^{**}	Office Predicted Concentration (µg/m³) ^{**}	Meets ½ CREL? (Classroom/Office)
Hexane (n-)	110-54-3	3,500	BQL	BQL	BQL	BQL	Yes
Isophorone*	78-59-1	1,000	BQL	BQL	BQL	BQL	Yes
Isopropanol	67-63-0	3,500	BQL	BQL	BQL	BQL	Yes
Methyl chloroform*	71-55-6	500	BQL	BQL	BQL	BQL	Yes
Methyl t-butyl ether	1634-04-4	4,000	BQL	BQL	BQL	BQL	Yes
Methylene chloride*	75-09-2	200	BQL	BQL	BQL	BQL	Yes
Naphthalene	91-20-3	4.5	BQL	BQL	BQL	BQL	Yes
Phenol	108-95-2	100	BQL	BQL	BQL	BQL	Yes
Propylene glycol monomethyl ether*	107-98-2	3,500	BQL	BQL	BQL	BQL	Yes
Styrene	100-42-5	450	BQL	BQL	BQL	BQL	Yes
Tetrachloroethylene (perchloroethylene)	127-18-4	17.5	BQL	BQL	BQL	BQL	Yes
Toluene	108-88-3	150	BQL	BQL	BQL	BQL	Yes
Trichloroethylene	79-01-6	300	BQL	BQL	BQL	BQL	Yes
Vinyl acetate	108-05-4	100	BQL	BQL	BQL	BQL	Yes
Xylenes (m-, o-, p-)	1330-20-7	350	BQL	BQL	BQL	BQL	Yes

BQL denotes below quantifiable level of 0.04 µg for individual VOCs, with the exceptions benzene and epichlorohydrin which have a QL of 0.02 µg, based on a standard 18 L air collection volume.

^{††}The emission factor (EF) is calculated from the chamber concentration (CC), the chamber air change rate (N_C), the chamber volume (V_C), and the product area exposed in the chamber (A_C) as: $EF = (CC \cdot V_C \cdot N_C) / A_C$.

^{**}The predicted building exposure concentration (BC) is calculated from the emission factor (EF), the building air change rate (N_B), the building room volume (V_B), and the product area exposed in the building room (A_B) as: $BC = (EF \cdot A_B) / (V_B \cdot N_B)$. For more information on Predicted Concentration modeling parameters, [click here](#).

^{***}Guidance value per CA Standard Method

TABLE 2

Product Description		2" Black FSorb Polyester Panel	
CHAMBER CONCENTRATIONS AND EMISSION FACTORS FOR TVOC AND FORMALDEHYDE AT 24, 48, AND 96 HOURS FOLLOWING 10 DAYS OF CONDITIONING			
Elapsed Exposure Hour After 10 Days Conditioning	Chamber Concentration (µg/m ³)	Emission Factor ^{††} (µg/m ² •hr)	
TVOC[†]			
24	BQL	BQL	
48	BQL	BQL	
96	BQL	BQL	
Formaldehyde[‡]			
24	BQL	BQL	
48	BQL	BQL	
96	BQL	BQL	

BQL denotes below quantifiable level of 2 µg/m³.

Exposure hours are nominal (± 1 hour).

[†]Defined as the sum of those VOCs that elute between the retention times of n-hexane (C₆) and n-hexadecane (C₁₆) on a non-polar capillary GC column quantified based on a toluene response factor.

[‡]Compound identified and quantified by DNPH derivitization and HPLC/UV analysis.

^{††}The emission factor (EF) is calculated from the chamber concentration (CC), the chamber air change rate (N_c), the chamber volume (V_c), and the product area exposed in the chamber (A_c) as: $EF = (CC \cdot V_c \cdot N_c) / A_c$.

TABLE 3

Product Description		2" Black FSorb Polyester Panel			
TEN MOST ABUNDANT IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS (VOCs) AND/OR ALDEHYDES AT 96 HOURS FOLLOWING 10 DAYS OF CONDITIONING					
CAS Number	Compound	Chamber Concentration (µg/m³)	Emission Factor ^{††} (µg/m²·hr)	Calculated Predicted Exposure Concentration ^{**} (µg/m³)	
				Classroom	Office
---	TVOC ^{‡‡}	BQL	BQL	---	---

Exposure hours are nominal (± 1 hour).

VOC data obtained by scanning GC/MS; identification of compound made by retention time and mass spectral characteristics.

[†]Quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.

*Identification based on NIST mass spectral database only.

[‡]Compound identified and quantified by DNPH derivitization and HPLC/UV analysis.

^{††}The emission factor (EF) is calculated from the chamber concentration (CC), the chamber air change rate (N_c), the chamber volume (V_c), and the product area exposed in the chamber (A_c) as: $EF = (CC \cdot V_c \cdot N_c) / A_c$.

^{‡‡}Defined as the sum of those VOCs that elute between the retention times of n-hexane (C₆) and n-hexadecane (C₁₆) on a non-polar capillary GC column quantified based on a toluene response factor.

^{**}The predicted building exposure concentration (BC) is calculated from the emission factor (EF), the building air change rate (N_B), the building room volume (V_B), and the product area exposed in the building room (A_B) as: $BC = (EF \cdot A_B) / (V_B \cdot N_B)$. For more information on Predicted Concentration modeling parameters, [click here](#).

TABLE 4

Product Description		2" Black FSorb Polyester Panel						
VOC PREDICTED AIR CONCENTRATIONS AND REGULATORY INFORMATION AT 96 HOURS FOLLOWING 10 DAYS OF CONDITIONING								
CAS Number	Compound	Chamber Concentration (µg/m ³)	Emission Factor ^{††} (µg/m ² ·hr)	Predicted Exposure Concentration ^{**} (µg/m ³)		✓ Indicates Presence On List		
				Classroom	Office	CA PROP 65	CA AIR TOXIC	CREL
---	none	---	---	---	---	---	---	---

[†]Quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.

[‡]Compound identified and quantified by DNPH derivitization and HPLC/UV analysis.

^{††}The emission factor (EF) is calculated from the chamber concentration (CC), the chamber air change rate (N_c), the chamber volume (V_c), and the product area exposed in the chamber (A_c) as: $EF = (CC \cdot V_c \cdot N_c) / A_c$.

^{**}The predicted building exposure concentration (BC) is calculated from the emission factor (EF), the building air change rate (N_B), the building room volume (V_B), and the product area exposed in the building room (A_B) as: $BC = (EF \cdot A_B) / (V_B \cdot N_B)$. For more information on Predicted Concentration modeling parameters, [click here](#).

CAL Prop. 65: California Health and Welfare Agency, Proposition 65 Chemicals

1 = known to cause cancer

2 = known to cause reproductive toxicity

CAL Toxic Air Contaminant:



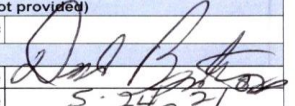
- I) Substances identified as Toxic Air Contaminants, known to be emitted in California, with a full set of health values reviewed by the Scientific Review Panel.
- IIA) Substances identified as Toxic Air Contaminants, known to be emitted in California, with one or more health values under development by the Office of Environmental Health Hazard Assessment for review by the Scientific Review Panel.
- IIB) Substances NOT identified as Toxic Air Contaminants, known to be emitted in California, with one or more health values under development by the Office of Environmental Health Hazard Assessment for review by the Scientific Review Panel.
- III) Substances known to be emitted in California, and are NOMINATED for development of health values or additional health values.
- IVA) Substance identified as Toxic Air Contaminants, known to be emitted in California, and are TO BE EVALUATED for entry into Category III.
- IVB) Substance NOT identified as Toxic Air Contaminants, known to be emitted in California, and are TO BE EVALUATED for entry into Category III.
- V) Substance identified as Toxic Air Contaminants, and NOT KNOWN TO BE EMITTED from stationary source facilities in California based on information from the AB 2588 Air Toxic "Hot Spots" Program and the California Toxic Release Inventory.
- VI) Substances identified as Toxic Air Contaminants, NOT KNOWN TO BE EMITTED from stationary source facilities in California, and are active ingredients in pesticides in California.

Chronic REL: California Office of Environmental Health Hazard Assessment (OEHHA), Chronic Reference Exposure Levels

✓ = Found in Listing

Date Issued: June 22, 2021
 Product ID #: 1001228819-3912618
 Test Report #: 1001228819-3912618
 ©2021 UL
 CDPH2

Product Description	2" Black FSorb Polyester Panel
CHAIN OF CUSTODY	

INTERNAL Use Only		  <small>CUVDBI474</small>
Project #	1001228819	
Product #	3912618	
Order #	13817331	
Task Line	1.1	UL BU
___1___ of ___1___ 180031823		
<input type="checkbox"/> Rush Request – Subject to upcharge. Customer must confirm with ULE prior to submitting product.		
Product Emissions Test Information		
Test Type Request <small>(These options have specific protocol)</small>	<input type="checkbox"/> CA01350 CDPH/EHLB <input type="checkbox"/> Office <input type="checkbox"/> Classroom <input type="checkbox"/> Residential <input type="checkbox"/> Odor Evaluation <input type="checkbox"/> MRT UL 2824 <input type="checkbox"/> GLP (24 hour) <input type="checkbox"/> GLP (336 hour)	
	<input checked="" type="checkbox"/> GREENGUARD Screening (24 hr TVOC, VOCs, & aldehydes w/ modeling) Modeling:	
Other Test Type Request		
Comments	Specify test method, non-standard sample preparation, modeling parameters, etc.	
Product Category		Subcategory
Application <input type="checkbox"/> Floor/Ceiling <input checked="" type="checkbox"/> Panel <input type="checkbox"/> Wall <input type="checkbox"/> Work Surface <input type="checkbox"/> Other:		
Wet Products Only Coverage Rate Density Specific Gravity		
Product and Company Information		
Product Description		Product Commercial Name
2" Black FSorb Polyester Panel		FSorb
Manufacture ID#		Date Manufactured
		N/A
Company Name		Contact Name
NutShell		Robert Wedlaw
Address		Job Title
15135 NE 90 th St		Sales
Suite 200		Contact Phone
Redmond, WA 98052		(425) 81-0888
		Contact Email
		Robert.w@FSorb.com
Collection Information		
Collector Name	Date Collected	mm/dd/yyyy
Collector Phone	Time Collected	
Collector Signature	Collection Location	
Shipping Information		
Carrier	UPS	
Shipper Name	Date Shipped	mm/dd, 5-18-21
Shipper Phone	Time Shipped	
Shipper Signature	Air Bill #	1Z78E08039389
Sample Submitted to		
<input checked="" type="checkbox"/> UL Environment (Marietta) <small>2211 Newmarket Pkwy Suite 106 Marietta, GA 30067, USA</small>	<input type="checkbox"/> UL Verification Services (Guangzhou) <small>Building A1, 3F, Nansha Science and Technology Innovation Ctr. No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China</small>	<input type="checkbox"/> UL International Italia S.r.l <small>ATTN: IAQ Laboratory Via Europa, 9 I - 22060 - Cabiato (Como), Italia</small>
<input type="checkbox"/> Other		
Post Testing Sample Disposition		
<small>(Sample will be disposed of 30 days after report is issued if information below is not provided)</small>		
Return Shipping Co.	Customer Shipping Acct #	
Internal Use Only – Receiving Information		
Receiver Name	Receiver Signature	
		
Condition Upon Arrival	Receive Date	
<input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Not Acceptable	5-24-21	
Condition Notes	Receive Time	
	12:00 PM	
Completed By	Based On	Date

00-EN-F0852 – Issue 4.0

This report shall not be reproduced, except in full, without permission from UL. Results contained within this report only apply to the actual product tested under the testing conditions documented in this report.



VOC EMISSION RESULTS COMPARISON TO STANDARD

Standard referenced: CDPH/EHLB/Standard Method V1.2 (January 2017) "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" (aka CA Section 01350).

PRODUCT SAMPLE INFORMATION

Manufacturer	Nut Shell LLC
Product Description	2" Black FSorb Polyester Panel
Product Type	Building Products
UL Sample Identification	1001228819-3912618
Manufactured Date	Not Provided
Test Completed Date	June 16, 2021
UL Report #	1001228819-3912618
Report Date	June 22, 2021

TEST RESULTS COMPARISON TO STANDARD CRITERIA

Environment	Classroom		Office	
Surface Area	94.6 m ²		33.4 m ²	
	Criterion	Meets?	Criterion	Meets?
Individual VOC	≤ ½ CREL	Yes	≤ ½ CREL	Yes
Formaldehyde	≤ 9.0 µg/m ³	Yes	≤ 9.0 µg/m ³	Yes

Environment	Classroom	Office
Surface Area	94.6 m ²	33.4 m ²
TVOC	0.5 mg/m ³ or less	0.5 mg/m ³ or less

TVOC comparison is based on LEED BD+C: New Construction v4 (LEED v4), Indoor environmental quality (EQ) category/Low-emitting materials credit/Emissions and content requirements/General emissions evaluation.

<http://www.usgbc.org/node/2614095?return=/credits/new-construction/v4/indoor-environmental-quality>

Authorized by	 Allyson McFry Chemistry Laboratory Manager
----------------------	--

Complete testing and data results are presented in UL Environment Report

Disclaimer: This Comparison affirms that: 1) the product sample was tested according to the referenced standard; 2) the measured VOC emissions were evaluated for the defined exposure scenario(s); and 3) if so indicated above that the results meet the criteria of the referenced standard(s). UL Environment did not select the samples, determine if the samples were representative of production samples, witness the production of test samples, or were we provided with information relative to the formulation or identification of component materials used in the test samples. The test results apply only to the actual samples tested. The issuance of this Comparison in no way implies Listing, Classification or Recognition by UL and does not authorize the use of UL Listing, Classification or Recognition Marks or any other reference to UL on the product or system. UL Environment authorizes the above named company to reproduce this Comparison provided it is reproduced in its entirety. The name, brand or marks of UL cannot be used in any packaging, advertising, promotion or marketing relating to the data in this Comparison, without UL's prior written permission. UL, its subsidiaries, employees and agents shall not be responsible to anyone for the use or nonuse of the information contained in this Comparison, and shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use of, or inability to use, the information contained in this Comparison.