


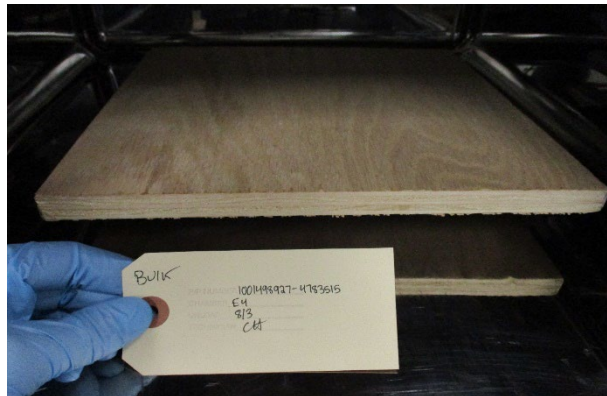


GREENGUARD CERTIFICATION TEST REPORT					
<b>Customer Information</b>	ROSEBURG FOREST PRODUCTS SOUTH L P JOHN BIEDERMANN 3660 GATEWAY ST SPRINGFIELD OR 97477				
<b>Product Description</b>	Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels				
<b>Test Group</b>	Plywood Products - 01				
<b>Category</b>	General Construction Materials				
<b>Test Type</b>	Certification		Year 7		
<b>Test Method</b>	UL 2821 "GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers"				
	<b>Environment</b>	<b>TVOC</b>	<b>Formaldehyde</b>	<b>Total Aldehydes</b>	<b>CREL/TLV</b>
<b>GREENGUARD</b>	Office	✓	✓	✓	✓
✓ - meets criteria; X - over criteria					
<b>Authorized by</b>	 Allyson M. McFry Chemistry Laboratory Director				

MODELING FOR PREDICTED AIR CONCENTRATION					
<b>Certification Program</b>	<b>Environment Basis</b>	<b>Modeling Basis</b>	<b>Surface Area (m<sup>2</sup>)</b>	<b>Room Volume (m<sup>3</sup>)</b>	<b>ACH (1/hr)</b>
<b>GREENGUARD</b>	CDPH/EHLB/Standard Method	wall	33.4	30.6	0.68

Note that certain environments and/or modeling scenarios may prevent assessment of low level CREL and TLV analytes due to the emissions being below the lower LOQ (0.04 µg). For example, benzene ½ CREL is 1.5 µg/m<sup>3</sup>.

**PHOTOGRAPH OF SAMPLE**



## GREENGUARD RESULTS SUMMARY

Product Description		Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels	
GREENGUARD Acceptable IAQ Criteria		168 Hour Product Measurement	Product Compliance for IAQ
TVOC <sup>a</sup>	≤ 0.5 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>	Yes
Formaldehyde	≤ 0.05 ppm	0.011 ppm	Yes
Total Aldehydes <sup>b</sup>	≤ 0.10 ppm	0.021 ppm	Yes
Individual VOCs	all ≤ 1/10 TLV	----- <sup>c</sup>	Yes

<sup>a</sup>“TVOC” is the sum of all VOCs measured via TD/GC/MS which elute between n-hexane (C<sub>6</sub>) and n-hexadecane (C<sub>16</sub>) quantified using calibration to a toluene surrogate.

<sup>b</sup>“Total Aldehydes” is the sum of all measured normal aldehydes from formaldehyde to nonanal, plus benzaldehyde. Heptanal through nonanal are analyzed using TD/GC/MS. The remaining aldehydes are analyzed using HPL/UV methodology. All aldehydes are quantified to authentic standards.

<sup>c</sup>All individual VOCs detected met the criteria of less than 1/10 the ACGIH established threshold limit values (TLVs).

## PROJECT DESCRIPTION

This study was conducted using a UL Environment’s GREENGUARD test method following the requirements of GREENGUARD Certification program. The product was monitored for emissions of total volatile organic compounds (TVOC), formaldehyde, target list aldehydes, and other individual volatile organic compounds (VOCs) over a 168-hour exposure period. These emissions were measured, and the resultant air concentrations were determined for each of the potential pollutants. Determination of compliance is based on predicted air concentrations modeled using the GREENGUARD program room loading.

### Report Outline:

Table 1	<a href="#">Environmental Chamber Study Parameters</a>
Table 2	<a href="#">Emission Factors and Predicted Air Concentrations</a>
Table 3	<a href="#">Chamber Concentrations of Identified VOCs</a>
Table 4	<a href="#">Emission Factors of Identified VOCs</a>
Table 5	<a href="#">Chamber Concentrations of Target List Aldehydes</a>
Table 6	<a href="#">Emission Factor of Target List Aldehydes</a>
Table 7	<a href="#">Supplemental Emissions Information</a>
Chain of Custody	<a href="#">Chain of Custody</a>

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**

<b>ENVIRONMENTAL CHAMBER STUDY PARAMETERS</b>			
<b>Product Description</b>	Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels		
<b>Product Manufacture Date</b>	July 12, 2022		
<b>Product Collection Date</b>	July 14, 2022		
<b>Product Shipping Date</b>	July 14, 2022		
<b>Date Received</b>	July 21, 2022		
<b>Test Description</b>	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.		
<b>Test Period</b>	July 27, 2022 – August 3, 2022		
<b>Area</b>	two-sided area = 0.1928 m <sup>2</sup>		
<b>Environmental Chamber ID and Volume</b>	SE4 - 0.0861 m <sup>3</sup>		
<b>Product Loading</b>	2.24 m <sup>2</sup> /m <sup>3</sup>		
<b>Test Conditions</b>	1.00 ± 0.05 ACH 50% RH ± 5% RH 22.4°C - 24.0°C		
<b>*Accredited Laboratory Locations</b>	<b>Testing Laboratory</b>	<b>Analytical Laboratory</b>	<b>Technical Reporting Location</b>
	ULE - Marietta	ULE - Marietta	ULE - Marietta

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.

<b>*Accredited Laboratory Locations</b>	
<b>Location</b>	<b>Address</b>
ULE - Marietta	UL Environment 2211 Newmarket Parkway, Marietta, GA 30067-9399 USA
ULE - Guangzhou	UL Verification Services (Guangzhou) 1-3F & Room 501, Building 2 (R&D Center A1), No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China
ULE - Cabiato	UL International Italia S.r.l ATTN: IAQ Laboratory Via Europa, 9, I – 22060 – Cabiato (Como), Italia
ULE - Vietnam	UL VS (VIET NAM) CO. LTD., Lot C5, Conurbation 2, Street K1, Cat Lai Industrial Zone, Thanh My Loi Ward, District 2, Ho Chi Minh City, Vietnam
UL - Shimadzu	Shimadzu Techno-Research, Inc. 1, Nishinokyo-Shimoaicho Nakagyo-ku, Kyoto 604-8436 Japan
KCL	Korea Conformity Laboratories #805, I-Valley, 149 Gongdan-ro Gunpo-si, Gyeonggi-do, 15849 Korea
Normec	Normec Product Testing N.V. Honderdweg 13, 9320 Wetteren Belgium

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.

**TABLE 2**

<b>Product Description</b>		Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels		
<b>TVOC CHAMBER CONCENTRATIONS, EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS</b>				
<b>Elapsed Exposure Hour*</b>	<b>Chamber Concentration <math>\mu\text{g}/\text{m}^3</math></b>	<b>Emission Factor <math>\mu\text{g}/\text{m}^2\cdot\text{hr}</math></b>	<b>Predicted Air Concentration** <math>\mu\text{g}/\text{m}^3</math></b>	
0 (Background)	BQL	BQL	---	
<b>6</b>	32.3	14.5	23	
<b>24</b>	16.1	7.2	12	
<b>48</b>	12.5	5.6	8	
<b>72</b>	6.2	2.8	6	
<b>96</b>	6.1	2.7	5	
<b>168</b>	5.7	2.5	3	
Power Law Decay Constant = $k_T = 0.645$				
<b>FORMALDEHYDE CHAMBER CONCENTRATIONS, EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS</b>				
<b>Elapsed Exposure Hour*</b>	<b>Chamber Concentration <math>\mu\text{g}/\text{m}^3</math></b>	<b>Emission Factor <math>\mu\text{g}/\text{m}^2\cdot\text{hr}</math></b>	<b>Predicted Air Concentration**</b>	
			<b><math>\mu\text{g}/\text{m}^3</math></b>	<b>ppm</b>
0 (Background)	BQL	BQL	---	---
<b>6</b>	38.5	17.2	28	0.022
<b>24</b>	30.0	13.4	21	0.017
<b>48</b>	25.7	11.5	18	0.015
<b>72</b>	21.1	9.4	16	0.013
<b>96</b>	21.7	9.7	15	0.013
<b>168</b>	19.8	8.8	14	0.011
Power Law Decay Constant = $k_F = 0.232$				
<b>TARGET LIST ALDEHYDES CHAMBER CONCENTRATIONS, EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS</b>				
<b>Elapsed Exposure Hour*</b>	<b>Chamber Concentration <math>\mu\text{g}/\text{m}^3</math></b>	<b>Emission Factor <math>\mu\text{g}/\text{m}^2\cdot\text{hr}</math></b>	<b>Predicted Air Concentration**</b>	
			<b><math>\mu\text{g}/\text{m}^3</math></b>	<b>ppm</b>
0 (Background)	BQL	BQL	---	---
<b>6</b>	118	52.8	85	0.052
<b>24</b>	90.2	40.3	64	0.039
<b>48</b>	72.7	32.4	51	0.031
<b>72</b>	58.0	25.9	45	0.028
<b>96</b>	58.1	25.9	41	0.025
<b>168</b>	49.4	22.1	34	0.021
Power Law Decay Constant = $k_A = 0.326$				

\*Exposure hours are nominal ( $\pm 1$  hour).

BQL = Below quantifiable level of 0.04  $\mu\text{g}$  based on a standard 18 L air collection volume for VOCs and 0.1  $\mu\text{g}$  based on a standard 45 L air collection volume for aldehydes.

\*\*Predicted Air Concentrations are based on GREENGUARD modeling predicted concentration parameters. For more information [click here](#).

**TABLE 3**

<b>Product Description</b>		Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels						
<b>CHAMBER CONCENTRATIONS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS</b>								
<b>CAS Number</b>	<b>Compound</b>	<b>Elapsed Exposure Hour (µg/m³)</b>						
		<b>0 (BG)</b>	<b>6</b>	<b>24</b>	<b>48</b>	<b>72</b>	<b>96</b>	<b>168</b>
64-19-7	Acetic acid	BQL	67.4	41.3	33.4	21.7	24.0	15.1
104-76-7	1-Hexanol, 2-ethyl†	BQL	11.4	5.4	3.6	2.6	2.2	2.0
98-01-1	Furfural (2-Furaldehyde)	BQL	10.0	5.3	4.1	3.1	3.0	2.7
103-11-7	2-Propenoic acid, 2-ethylhexyl ester (2-Ethylhexyl acrylate)	BQL	5.9	2.7	2.1			
66-25-1	Hexanal	BQL	5.6	4.1	3.6	3.1	3.1	3.0
3333-52-6	Tetramethylbutanedinitrile**†	BQL	2.8					
45019-28-1	4-Methylnonanoic acid*	BQL	2.4					

**TABLE 4**

<b>Product Description</b>		Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels					
<b>EMISSION FACTORS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS</b>							
<b>CAS Number</b>	<b>Compound</b>	<b>Elapsed Exposure Hour (µg/m²·hr)</b>					
		<b>6</b>	<b>24</b>	<b>48</b>	<b>72</b>	<b>96</b>	<b>168</b>
64-19-7	Acetic acid	30.1	18.4	14.9	9.7	10.7	6.7
104-76-7	1-Hexanol, 2-ethyl†	5.1	2.4	1.6	1.2	1.0	0.9
98-01-1	Furfural (2-Furaldehyde)	4.5	2.4	1.8	1.4	1.3	1.2
103-11-7	2-Propenoic acid, 2-ethylhexyl ester (2-Ethylhexyl acrylate)	2.6	1.2	1.0			
66-25-1	Hexanal	2.5	1.8	1.6	1.4	1.4	1.3
3333-52-6	Tetramethylbutanedinitrile**†	1.2					
45019-28-1	4-Methylnonanoic acid*	1.1					

\*Indicates NIST/EPA/NIH best library match only based on retention time and mass spectral characteristics.

†Denotes quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.

Quantifiable level is 0.04 µg based on a standard 18 L air collection volume.

**TABLE 5**

Product Description		Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels						
CHAMBER CONCENTRATIONS OF TARGET LIST ALDEHYDES								
CAS Number	Compound	Elapsed Exposure Hour (µg/m³)						
		0 (BG)	6	24	48	72	96	168
4170-30-3	2-Butenal	BQL						
75-07-0	Acetaldehyde	BQL	70.8	47.3	36.3	28.8	28.6	22.2
100-52-7	Benzaldehyde	BQL						
5779-94-2	Benzaldehyde, 2,5-dimethyl	BQL						
529-20-4	Benzaldehyde, 2-methyl	BQL						
620-23-5 / 104-87-0	Benzaldehyde, 3- and/or 4-methyl	BQL						
123-72-8	Butanal	BQL						
590-86-3	Butanal, 3-methyl	BQL						
50-00-0	Formaldehyde	BQL	38.5	30.0	25.7	21.1	21.7	19.8
66-25-1	Hexanal	BQL	9.0	7.4	6.3	4.7	4.6	4.4
110-62-3	Pentanal	BQL						
123-38-6	Propanal	BQL		5.5	4.4	3.4	3.2	3.0

**TABLE 6**

Product Description		Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels						
EMISSION FACTORS OF TARGET LIST ALDEHYDES								
CAS Number	Compound	Elapsed Exposure Hour (µg/m²·hr)						
		6	24	48	72	96	168	
4170-30-3	2-Butenal							
75-07-0	Acetaldehyde	31.6	21.1	16.2	12.9	12.8	9.9	
100-52-7	Benzaldehyde							
5779-94-2	Benzaldehyde, 2,5-dimethyl							
529-20-4	Benzaldehyde, 2-methyl							
620-23-5 / 104-87-0	Benzaldehyde, 3- and/or 4-methyl							
123-72-8	Butanal							
590-86-3	Butanal, 3-methyl							
50-00-0	Formaldehyde	17.2	13.4	11.5	9.4	9.7	8.8	
66-25-1	Hexanal	4.0	3.3	2.8	2.1	2.1	2.0	
110-62-3	Pentanal							
123-38-6	Propanal		2.5	2.0	1.5	1.4	1.3	

Quantifiable level is 0.1 µg is based on a standard 45 L air collection volume.

## TABLE 7 SUPPLEMENTAL EMISSIONS INFORMATION

The table below represents this product's identified chemical emissions found on certain regulatory lists. This list only provides a statement regarding possible health effects associated with this compound and not the relative risks of exposure. Proper interpretation of the risks associated with exposure to a given regulated compound requires a more detailed evaluation of toxicological activity. Certain purchasing programs may require this information be submitted.

Product Description		Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels					
CAS Number	Compound	✓() = FOUND IN LISTING (CLASS)					
		CAL PROP. 65	NTP	IARC	CAL AIR TOXICS	CREL	TLV
103-11-7	2-Propenoic acid, 2-ethylhexyl ester (2-Ethylhexyl acrylate)			✓(3)			
75-07-0	Acetaldehyde	✓(1)	✓(2B)	✓(2B)	✓(IIA)	✓	✓
64-19-7	Acetic acid						✓
50-00-0	Formaldehyde	✓(1)	✓(2A)	✓(1)	✓(IIA)	✓	✓
98-01-1	Furfural (2-Furaldehyde)			✓(3)			✓
123-38-6	Propanal				✓(IVA)		✓
3333-52-6	Tetramethylbutanedinitrile <sup>†</sup>						✓

<sup>†</sup>Denotes quantified using multipoint authentic standard curve

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

1 = known to cause cancer

2 = known to cause reproductive toxicity

NTP: National Toxicology Program

2A = known to be carcinogenic to humans

2B = reasonably anticipated to be carcinogenic to humans

IARC: International Agency on Research of Cancer

1 = carcinogenic to humans

3 = unclassifiable as to carcinogenicity to humans

2A = probably carcinogenic to humans

4 = probably not carcinogenic to humans

2B = possibly carcinogenic to humans

California Air Toxics

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.

IVBA =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.

CREL: California Office of Environmental Health's Hazard Assessment (OEHHA), Chronic Reference Exposure Levels. The GREENGUARD program does not include all Chronic Reference Exposure Levels (CRELs) adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA). For example, caprolactam and 2-butoxyethanol.

✓ = Found in Listing

ACGIH TLV American Conference of Governmental Industrial Hygienists Threshold Limit Values for Chemical Substances and Physical Agents.

✓ = Found in Listing.

## CHAIN OF CUSTODY

INTERNAL Use Only		4783515	
Project #	1001498927	Description	4783515 Roseburg SkyPly Domestic, Engineered & Exotic Hardwood Plywood Panels
Product #	4783515	Customer	ROSEBURG FOREST PRODUCTS SOUTH
Order #	14256838	Received Date:	2022-JUL-21 13:45:24
Task Line 1.1	UL BU	Labware Project No:	1001498927
_____ of _____		Order No.:	14256838
		Oracle Project No.:	4790343169
1 of 3			
<input type="checkbox"/> Rush Request – Subject to upcharge. Customer must confirm with UL prior to submitting product.			
GREENGUARD Test Information			
Test Type	<input checked="" type="checkbox"/> Certification Test • Annual/Initial Year <u>Z</u> <input type="checkbox"/> Quarterly Test • Year <u>Quarter</u>		<input type="checkbox"/> Out-of-Scope Test <input type="checkbox"/> Profile Study Test
Service Line	<input checked="" type="checkbox"/> GREENGUARD <input type="checkbox"/> GREENGUARD GOLD <input type="checkbox"/> Other _____		
Test Group	Plywood Products - 01		
Product Category	Building Construction Materials	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	Roseburg SkyPly® Domestic, Engineered & Exotic Hardwood Plywood Panels		
Manufacture ID#	_____		
Company Name	Roseburg	Date Manufactured	7/12/2022
		Contact Name	Mike Shelton
		Job Title	Quality Coordinator
Address	10550 Old Hwy 99S, Dillard, OR, 97432	Contact Phone	541-378-7751
		Contact Email	Michael.shelton@rfpco.com
Collection Information			
Collector Name	Mike Shelton	Date Collected	7/14/2022
Collector Phone	541-378-7751	Time Collected	7am
Collector Signature		Collection Location	Dillard Plywood
Shipping Information			
Carrier	UPS		
Shipper Name	Candi Gaedecke	Date Shipped	7/14/2022
Shipper Phone	(541)679-2691	Time Shipped	_____
Shipper Signature		Air Bill #	127812910379131495
Sample Submitted to			
<input checked="" type="checkbox"/> UL Environment (Marietta) 2211 Newmarket Pkwy Suite 106 Marietta, GA 30067, USA	<input type="checkbox"/> UL Verification Services (Guangzhou) Building A1, 3F, Nansha Science and Technology Innovation Ctr. No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China	<input type="checkbox"/> UL International Italia S.r.l. ATTN: IAQ Laboratory Via Europa, 9 I - 22060 - Cabiante (Como), Italia	<input type="checkbox"/> UL VS (Vietnam) Co., Ltd. Lot C5, Conurbation 2, Street K1, Cat Lai Industrial Zone Thanh My Loi Ward, Thu Duc City Ho Chi Minh City, Vietnam
Post Testing Sample Disposition (Sample will be disposed of 30 days after report is issued if information below is not provided)			
Return Shipping Co.	_____	Customer Shipping Acct #	_____
Internal Use Only – Receiving Information			
Receiver Name	_____	Receiver Signature	
Condition Upon Arrival	<input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Not Acceptable	Receive Date	7/21/22
Condition Notes	_____	Receive Time	12:00