
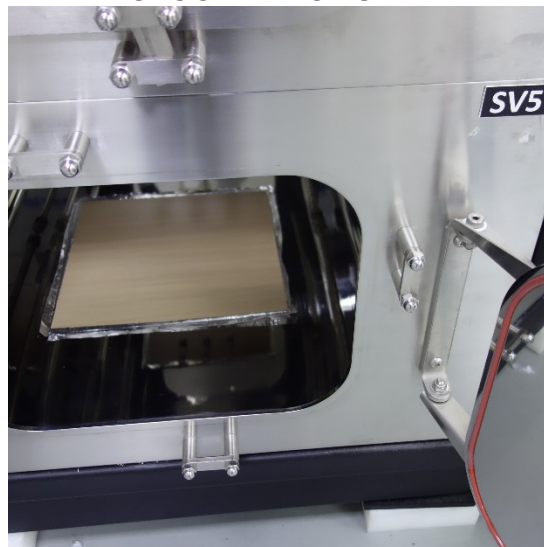




GREENGUARD CERTIFICATION TEST REPORT					
Customer Information	Dongguan Windeco Limited Thomas Au Ruihua Road, Tiankeng Village Hengli Town Dongguan Guangdong 523460 China				
Product Description	0.8mm Wood Grain Series HPL				
Test Group	Laminate Surfacing Product - 01				
Category	Surfacing Materials				
Test Type	Certification		Year 4 Retest		
Test Method	UL 2821 "GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers"				
GREENGUARD	TVOC	Formaldehyde	Total Aldehydes	TLV	
	✓	✓	✓	✓	
GREENGUARD Gold	TVOC	Formaldehyde	Total Aldehydes	CREL/TLV	NMP
	✓	✓	✓	✓	✓
✓ - meets criteria; X - over criteria					
Authorized by	 Ring Zhong Laboratory Testing Supervisor				

MODELING PREDICTED CONCENTRATION PARAMETERS						
Certification Program	Environment Basis	Product Usage	Surface Area (m ²)	Room Volume (m ³)	ACH (1/hr)	Air Flow Rate (m ³ /hr)
GREENGUARD and GREENGUARD Gold	Open Plan Configuration	furniture components	11.08	16.3	0.92	15.0

PHOTOGRAPH OF SAMPLE



GREENGUARD RESULTS SUMMARY

Product Description		0.8mm Wood Grain Series HPL	
GREENGUARD Acceptable IAQ Criteria		168 Hour Product Measurement	Product Compliance for IAQ
TVOC ^a	≤ 0.5 mg/m ³	< 0.001 mg/m ³	Yes
Formaldehyde	≤ 0.05 ppm	0.019 ppm	Yes
Total Aldehydes ^b	≤ 0.1 ppm	0.019 ppm	Yes
4-Phenylcyclohexene	≤ 0.0065 mg/m ³	< 0.001 mg/m ³	Yes
Individual VOCs	all ≤ 1/10 TLV	----- ^c	Yes

^a "TVOC" is the sum of all VOCs measured via TD/GC/MS which elute between n-hexane (C₆) and n-hexadecane (C₁₆) quantified using calibration to a toluene surrogate.
^b "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.
^c 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	Environmental Chamber Study Parameters
Table 2	Emission Factors and Predicted Air Concentrations
Table 3	Emission Factors of Identified VOCs
Table 4	Emission Factor of Target List Aldehydes
Table 5	Supplemental Emissions Information
Chain of Custody	Chain of Custody
Appendix 1	GREENGUARD Gold Results Summary

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

ENVIRONMENTAL CHAMBER STUDY PARAMETERS			
Product Description	0.8mm Wood Grain Series HPL		
Product Manufacture Date	July 5, 2021		
Product Collection Date	Not Provided		
Product Shipping Date	Not Provided		
Date Received	July 15, 2021		
Test Description	The product was received by ULE Guangzhou Laboratory 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 Period	July 26, 2021 - August 2, 2021**		
Area	one-sided area = 0.0873 m ²		
Environmental Chamber ID and Volume	SV5 - 0.0866 m ³		
Product Loading	1.01 m ² /m ³		
Test Conditions	1.00 ± 0.05 ACH 50% RH ± 5% RH 21.7°C - 23.7°C		
*Accredited Laboratory Locations	Testing Laboratory	Analytical Laboratory	Technical Reporting Location
	ULE - Guangzhou	ULE - Guangzhou	ULE - Guangzhou

**Unable to confirm product meets all GREENGUARD sampling requirements. Date(s) not provided on the Chain of Custody. 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.

*Accredited Laboratory Locations	
Location	Address
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
Servaco	Servaco Product Testing N.V. Boertang 200 2400 MOL Belgium

This test is accredited under the laboratory's ISO/IEC 17025 accreditation issued by International Accreditation Service. Refer to certificate and scope of accreditation TL-441.

This test report is for intended use in certification programs.

TABLE 2

Product Description		0.8mm Wood Grain Series HPL	
TVOC EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS			
Elapsed Exposure Hour*	Emission Factor µg/m²•hr	Predicted Air Concentration** µg/m³	
6	BQL	< 1	
24	BQL	< 1	
48	BQL	< 1	
72	BQL	< 1	
96	BQL	< 1	
168	BQL	< 1	
FORMALDEHYDE EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS			
Elapsed Exposure Hour*	Emission Factor µg/m² • hr	Predicted Air Concentration**	
		µg/m³	ppm
6	44.0	32	0.026
24	35.1	26	0.021
48	32.6	26	0.021
72	35.7	25	0.020
96	34.2	25	0.020
168	30.8	23	0.019
1 st Order Exponential Decay Constant = k _F = 0.001			
TOTAL ALDEHYDE EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS			
Elapsed Exposure Hour*	Emission Factor µg/m² • hr	Predicted Air Concentration**	
		µg/m³	ppm
6	44.0	32	0.026
24	35.1	26	0.021
48	32.6	26	0.021
72	35.7	25	0.020
96	34.2	25	0.020
168	30.8	23	0.019
1 st Order Exponential Decay Constant = k _A = 0.001			

*Exposure hours are nominal (± 1 hour).

BQL = Below quantifiable level of 0.04 µg based on a standard 18 L air collection volume for VOCs and 0.1 µg 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

Product Description		0.8mm Wood Grain Series HPL					
EMISSION FACTORS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS							
CAS Number	Compound	Elapsed Exposure Hour ($\mu\text{g}/\text{m}^2\cdot\text{hr}$)					
		6	24	48	72	96	168
---	none	---	---	---	---	---	---

*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 4

Product Description		0.8mm Wood Grain Series HPL					
EMISSION FACTORS OF TARGET LIST ALDEHYDES							
CAS Number	Compound	Elapsed Exposure Hour ($\mu\text{g}/\text{m}^2\cdot\text{hr}$)					
		6	24	48	72	96	168
4170-30-3	2-Butenal	BQL	BQL	BQL	BQL	BQL	BQL
75-07-0	Acetaldehyde	BQL	BQL	BQL	BQL	BQL	BQL
100-52-7	Benzaldehyde	BQL	BQL	BQL	BQL	BQL	BQL
5779-94-2	Benzaldehyde, 2,5-dimethyl	BQL	BQL	BQL	BQL	BQL	BQL
529-20-4	Benzaldehyde, 2-methyl	BQL	BQL	BQL	BQL	BQL	BQL
620-23-5 /104-87-0	Benzaldehyde, 3- and/or 4-methyl	BQL	BQL	BQL	BQL	BQL	BQL
123-72-8	Butanal	BQL	BQL	BQL	BQL	BQL	BQL
590-86-3	Butanal, 3-methyl	BQL	BQL	BQL	BQL	BQL	BQL
50-00-0	Formaldehyde	44.0	35.1	32.6	35.7	34.2	30.8
66-25-1	Hexanal	BQL	BQL	BQL	BQL	BQL	BQL
110-62-3	Pentanal	BQL	BQL	BQL	BQL	BQL	BQL
123-38-6	Propanal	BQL	BQL	BQL	BQL	BQL	BQL

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

TABLE 5

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		0.8mm Wood Grain Series HPL					
CAS Number	Compound	✓() = FOUND IN LISTING (CLASS)					
		CAL PROP. 65	NTP	IARC	CAL AIR TOXICS	CREL	TLV
50-00-0	Formaldehyde	✓(1)	✓(2A)	✓(1)	✓(IIA)	✓	✓

[†]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

✓ = 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

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90931



Place UL barcode here

INTERNAL Use Only		
Project #	1001276476	
Product #	4078075	
Order #		
Task Line	UL BU	UK CS
____ of ____		

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 4 <input type="checkbox"/> Quarterly Test - Year Quarter	<input type="checkbox"/> Out-of-Scope Test <input type="checkbox"/> Profile Study Test	
Service Line	<input checked="" type="checkbox"/> GREENGUARD <input checked="" type="checkbox"/> GREENGUARD GOLD <input type="checkbox"/> Other		
Test Group	Laminate Surfacing Product - 01		
Product Category	Surfacing Materials	Subcategory	Laminata
Application	<input type="checkbox"/> Floor/Ceiling <input 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	0.8mm Wood Grain Series HPL		
Manufacture ID#		Date Manufactured	07/20/21
Company Name	Dongguan Windeco Limited	Contact Name	Thomas Au
Address	Rui Huan Road, Hengli Town Dongguan	Job Title	Manager
	City, Guangdong Province, China	Contact Phone	
		Contact Email	thomas.au@windeco.com.cn
Collection Information			
Collector Name		Date Collected	mm/dd/yyyy
Collector Phone		Time Collected	
Collector Signature		Collection Location	
Shipping Information			
Carrier		Date Shipped	mm/dd/yyyy
Shipper Name		Time Shipped	
Shipper Phone		Air Bill #	
Shipper Signature			
Sample Submitted to			
<input type="checkbox"/> UL Environment (Marietta) 2311 Newmarket Pkwy Suite 100 Marietta, GA 30067 USA	<input type="checkbox"/> UL Verification Services (Guangzhou) Building A1, 2F, Nansha Science and Technology Innovation Ctr. No. 29 South Hushang Avenue Nansha District, Guangzhou 511438, China	<input type="checkbox"/> UL International (Rte 6, r) ATTN: IQO Laboratory Via Europa 9 I-22090 - Calate (Como) Italy	<input type="checkbox"/> UL VS (Vietnam) Co., Ltd. Lot C5, Condat on 7, Street K1, Chi Loi Industrial Zone Thuan My Loi Ward, District 2 Ho Chi Minh City, Vietnam
Post Testing Sample Disposition			
Sample will be disposed of 30 days after test unless other information below is not provided			
Return Shipping Co.		Customer Shipping Acct #	
Internal Use Only - Receiving Information			
Receiver Name		Receiver Signature	U
Condition Upon Arrival	<input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Not Acceptable	Receive Date	2021.7.15
Condition Notes		Receive Time	15:30
Completed By	ULE	Based On	Program Testing Schedule
		Date	07/21/2020

00-EN-P0053 Issue 6.0

APPENDIX 1

GREENGUARD GOLD RESULTS SUMMARY

Product Description	0.8mm Wood Grain Series HPL		
COMPLIANCE WITH GREENGUARD GOLD STANDARD			
	GREENGUARD Gold Acceptable IAQ Criteria	168 Hour Product Measurement	Product Compliance for IAQ
TVOC	≤ 0.22 mg/m ³	< 0.001 mg/m ³	Yes
Formaldehyde	≤ 0.0073 ppm/7.3 ppb	0.0019 ppm/ 1.9 ppb	Yes
Total Aldehydes	≤ 0.043 ppm/43 ppb	0.0019 ppm/ 1.9 ppb	Yes
1-Methyl-2-Pyrrolidinone	≤ 0.16 mg/m ³	< 0.001 mg/m ³	Yes
Individual VOCs	≤ 1/100 TLV and ≤ ½ chronic REL	See Below	

[Click here](#) for GREENGUARD Gold modeling parameters.

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/m³.

CHEMICALS FOUND WITH EXISTING TLV AND CHRONIC REL					
CAS Number	Compound	1/100 TLV ^a (µg/m ³)	½ Chronic REL ^b (µg/m ³)	Product Measurement (µg/m ³)	Product Compliance for IAQ
---	none	---	---	---	---

^aAmerican Conference of Governmental Industrial Hygienists. Threshold Limit Values for Chemical Substances and Physical Agents. Cincinnati, OH: ACGIH.

^bChronic Reference Exposure Levels (CRELs) adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA).