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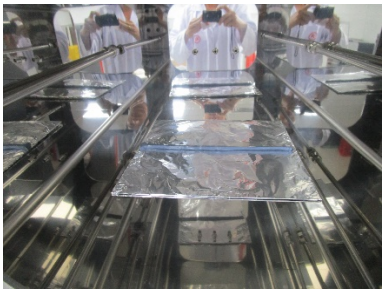
INDOOR AIR QUALITY EVALUATION FOLLOWING THE REQUIREMENTS OF CDPH/EHLB/STANDARD METHOD		
Product Description	DOWSIL™ 983 Structural Glazing Sealant	
Customer Information	DOW CHEMICAL PACIFIC (SINGAPORE) PRIVATE LIMITED JAYROLD BAUTISTA 260 ORCHARD ROAD #18-01 THE HEEREN SINGAPORE 238855	
Testing Laboratory Location	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	
Product Category	Adhesives/Sealants	
Date Received	July 27, 2020	
Analytical Laboratory Location	UL Verification Services (Guangzhou), 1-3F & Room 501, Building 2 (R&D Center A1), No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China	
Test Description	The product was received by ULE Vietnam 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 Date	August 23, 2020 - August 27, 2020	
Product Area Exposed	length = 0.2900 m	
Environmental Chamber ID and Volume	SAS - 0.0900 m³	
Product Loading Ratio	3.22 m/m³	
Test Chamber Conditions	Air change rate: 1.00 ± 0.05 1/h Inlet air flow rate: 0.09 ± 0.004 m³/h	Temperature: 22.0 ºC Relative Humidity: 50% RH ± 5% RH
Test Method	CDPH - CA Section 01350 *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers* Version 1.2.	
Authorized by	Ring Zhong Laboratory Testing Supervisor	

*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.

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 only published to and used by the applicant, and it is not for evidence purpose in China.

PHOTOGRAPH OF SAMPLE



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RESULTS SUMMARY

Product Description	DOWSIL™ 983 Structural Glazing Sealant				
Environment	**Product Usage**	**Product Surface Area**	**Room Volume**	**Ventilation Rate (ACH)**	**Product Compliance?**
Classroom	Adhesives/Sealants	39.0 m	231 m³	0.82	Yes
Office	Adhesives/Sealants	14.6 m	30.6 m³	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:

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.

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TABLE 1

Product Description	DOWSIL™ 983 Structural Glazing Sealant

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/m•hr)	Classroom Predicted Concentration (µg/m³)**	Office Predicted Concentration (µg/m³)**	Meets ½ 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

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Product Description	DOWSIL™ 983 Structural Glazing Sealant

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/m•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: $EF = (CC*V_C*N_C)/A_C$.

**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: $BC = (EF*A_B)/(V_B*N_B)$. For more information on Predicted Concentration modeling parameters, click here.

***Guidance value per CA Standard Method

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TABLE 2

Product Description	DOWSIL™ 983 Structural Glazing Sealant

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/m³)**	**Emission Factor†† (µg/m•hr)**
TVOC†		
24	297	92.0
48	291	90.2
96	265	82.4
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 (C_6) and n-hexadecane (C_{16}) 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: $EF = (CC*V_C*N_C)/A_C$.

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TABLE 3

Product Description	DOWSIL™ 983 Structural Glazing Sealant

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/m•hr)	Calculated Predicted Exposure Concentration** (µg/m³)	
				Classroom	Office
---	**TVOC‡‡**	**265**	**82.4**	**17.0**	**57.8**
541-02-6	Cyclopentasiloxane, decamethyl	110	34.2	7.0	24.0
540-97-6	Cyclohexasiloxane, dodecamethyl	86.3	26.8	5.5	18.8
556-67-2	Cyclotetrasiloxane, octamethyl	34.7	10.8	2.2	7.6
541-05-9	Cyclotrisiloxane, hexamethyl	18.4	5.7	1.2	4.0
107-50-6	Cycloheptasiloxane, tetradecamethyl-	15.7	4.9	1.0	3.4
78-78-4	Butane, 2-methyl (Isopentane)	5.9	1.8	0.4	1.3

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: $EF = (CC*V_C*N_C)/A_C$.
‡‡Defined as the sum of those VOCs that elute between the retention times of n-hexane (C_6) and n-hexadecane (C_{16}) 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: $BC = (EF*A_B)/(V_B*N_B)$. For more information on Predicted Concentration modeling parameters, click here.

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TABLE 4

Product Description	DOWSIL™ 983 Structural Glazing Sealant

VOC PREDICTED AIR CONCENTRATIONS AND REGULATORY INFORMATION AT 96 HOURS FOLLOWING 10 DAYS OF CONDITIONING

CAS Number	Compound	Chamber Concentration (µg/m³)	Emission Factor†† (µg/m•hr)	Predicted Exposure Concentration** (µg/m³)		✓ 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: $EF = (CC*V_C*N_C)/A_C$.
**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: $BC = (EF*A_B)/(V_B*N_B)$. 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

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Product Description	DOWSIL™ 983 Structural Glazing Sealant

CHAIN OF CUSTODY

3219040

3219040

Description
[illegible]

Customer: Dow Chemical Pacific (Singapor
Received Date: 2020-JUL-07 04:38:16 PM
Aurora Project No.: 1000995571
Order No.: [illegible]
Oracle Project No.: [illegible]

1 of 1

INTERNAL Use Only		
Project #	1000995571	
Product #	3219040	
Order #	13305563	
Task Line	1.1	UL_BU
_____ of _____		

☐ *Rush Request – Subject to upcharge. Customer must confirm with ULE prior to submitting product.*

Product Emissions Test Information

Test Type (These options have specific protocols)	☒CA01350 CDPH/EHLB	☐Office	☐Classroom	☐Residential
	☐Other Evaluation	☐ MBT UL 2824	☐ GLP (24 hour)	☐ GLP (336 hour)
	☐ GREENGUARD Screening (24 hr TVOC, VOCs, & aldehydes w/ modeling)			Modeling:
Comments	Specify test method, nonstandard sample preparation, modeling parameters, application rate for wet products, etc.			

Product Category		**Subcategory**			
Application	☐Floor/Ceiling	☐Panel	☐Wall	☐Work Surface	☐Other:
Wet Products Only	Coverage Rate		Density		Specific Gravity

Product and Company Information

Product Description	DOWSIL™ 983 Structural Glazing Sealant		
Company Name	DOW	**Date Manufactured**	[illegible]
		Contact Name	983 base [illegible]
Address	1 Fusionopolis Walk	**Job Title**	983 Catalyst [illegible]
	#07-11 Solaris North Tower	**Contact Phone**	
	Singapore 138628	**Contact Email**	

Collection Information

Collector Name		**Date Collected**	7/14/2020
Collector Phone		**Time Collected**	
Collector Signature		**Collection Location**	

Shipping Information

Carrier			
Shipper Name		**Date Shipped**	7/15/2020
Shipper Phone		**Time Shipped**	
Shipper Signature		**Air Bill #**	

Sample Submitted to

☐ UL Environment (Marietta) 2211 Newmarket Pkwy Suite 106 Marietta, GA 30067 USA	☐ UL Verification Services (Guangzhou) [illegible]	☐ UL International Italia S.r.l ATTN: IAQ Laboratory Via Europa 8 I - 22060 – Cabiate (Como), Italia	☐ Other

Post Testing Information
(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	[illegible]		Receiver Signature	[signature]
Condition Upon Arrival	☒ Acceptable	☐ Not Acceptable	Receive Date	[illegible]
Condition Notes			Receive Time	[illegible]
Completed By		Based On		Date

00-EN-F0052 – Issue 3.0

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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	Dow Chemical Pacific (Singapore) Private Limited
Product Description	DOWSIL™ 983 Structural Glazing Sealant
Product Type	Adhesives/Sealants
UL Sample Identification	1000995571-3219040
Manufactured Date	October 1, 2019
Test Completed Date	August 27, 2020
UL Report #	1000995571-3219040
Report Date	September 8, 2020

TEST RESULTS COMPARISON TO STANDARD CRITERIA

Environment	**Classroom**		**Office**	
Surface Area	39.0 m		14.6 m	
	Criterion	**Meets?**	**Criterion**	**Meets?**
Individual VOC	≤ ½ CREL	Yes	≤ ½ CREL	Yes
Formaldehyde	≤ 9.0 µg/m³	Yes	≤ 9.0 µg/m³	Yes

Environment	**Classroom**	**Office**
Surface Area	39.0 m	14.6 m
TVOC	0.5 mg/m³ or less	0.5 mg/m³ 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	Ring Zhong Laboratory Testing Supervisor

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.