



PRI Construction Materials Technologies LLC

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Laboratory Test Report

Report for: Kelly Allore
Dow Silicones Corporation
2200 West Salzburg Road
Midland, Michigan 48686

Product Name: DOWSIL Contractors Paintable Sealant

Project No.: 2107T0019

Dates Tested: Apr. 1, 2022 - May 13, 2022

Test Methods: CDPH v1.2

Results Summary: Meets requirements of Section 4 for School Classroom and Private Office Scenarios
Meets requirements of informative Appendix B for Single-family Residence Scenario

Purpose: Evaluate DOWSIL Contractors Paintable Sealant in accordance with CDPH v1.2: *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers*.

DOWSIL Contractors Paintable Sealant was tested and modeled as a window sealant with application to the perimeter of windows.

Test Methods: Testing was completed in accordance with Section 3 Laboratory Sample Preparation, testing, Chemical Analysis and Calculations of CDPH v1.2: *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers*, Version 1.2 (January 2017) (Emission testing method for California Specification 01350) Volatile Organic Content was measured using small-scale Environmental Chamber approximately 0.0751m³ in volume per ASTM D5116-06: *Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products* and/or ISO 16000-9:2006: *Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing — Emission test chamber method* guidelines. The chamber maintained a temperature of 23±1°C and relative humidity of 50±5% through the duration of test with an air exchange rate of 1.00±0.05/hr and an inlet flow rate of 0.0751 ± 0.004m³/hr.

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Test Methods (cont'd): VOC sampling media for individual VOCs and TVOC consisted of Markes sorbent tubes. Samples were desorbed using a Markes Unity and analyzed using a ThermoFisher Trace 3100 GC mated to an ISQ7000 Mass Spectrometer operated in scanning mode over a mass range of 35-350m/z. Testing and analysis was based off of ASTM D6196-03: *Standard Practice for Choosing Sorbents, Sampling Parameters and Thermal Desorption Analytical Conditions for Monitoring Volatile Organic Chemicals in Air*; EPA Method TO-1: *Method for the Determination of Volatile Organic Compounds in Ambient Air using Tenax® Adsorption and Gas Chromatography/Mass Spectrometry (GC/MS)*; and EPA Method TO-17: *Volatile Organic Compounds*.

VOC sampling media for formaldehyde, acetaldehyde, and other low molecular weight aldehydes through butanol consisted of cartridges treated with 2,4-dinitrophenylhydrazine (DNPH). DNPH cartridges were analyzed in accordance with ASTM D5197-03: *Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)* utilizing ultra-high-performance liquid chromatography with a ThermoFisher UltiMate 3000 equipped with a UV detector.

Calculations: Calculations were performed per section 3 utilizing modeling parameters outlined in Section 4. The area specific emission rate, emissions factor EF_{Ai} , was determined in accordance with CDPH v1.2 Equation 3.1:

$$EF_{Ai} = Q \cdot \frac{(C_{it} - C_{i0})}{A_c}$$

Where, the inlet flow rate, Q (m³/h) is the measured flow rate of air into the chamber; the chamber concentration, C_{it} (µg/m³), is the concentration of a target VOC_i, formaldehyde, and other carbonyl compounds measured at time, t ; the background concentration, C_{i0} (µg/m³), is the corresponding concentration measured with the chamber operating without a test specimen or with an appropriate substrate; and the exposed projected surface area of the test specimen in the chamber A_c (m²) is determined by calculating the exposed area of the specimen. Emissions Factor Results are reported in units of (results are reported in units of µg/(m·h)).

The estimated building concentration, C_{Bi} (µg/m³), of a target VOC_i was calculated using CDPH v1.2 Equation 3.2a:

$$C_{Bi} = \frac{EF_{Ai}}{q_A} \quad \text{where: } q_A = \frac{Q_B}{A_B}$$

The area specific emission rate EF_A at 336 hours (14 days) total exposure time is divided by the area specific flow rate q_A (m/h); the area specific flow rate q_A is calculated as the ratio of the flow rate of outside ventilation air Q_B (m³/h), to the exposed surface area of the installed material in the building A_B (m²).

The U.S. Green Building Council Leadership in Energy and Environmental Design defines Equivalency Credit requirements for adhesives and sealants using volume or surface area. Emission rates were calculated using surface area. Exposure area is calculated to be the perimeter of the window area for each scenario as permitted in CDPH Section 4.3.6.

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Sampling: DOWSIL Contractors Paintable Sealant was sampled by Dow Silicones Corporation on Mar. 23, 2022, and received by PRI CMT on Mar. 25, 2022, from the following contact:

Tammy Bailey
Dow Silicones Corporation
2200 W. Salzburg Rd,
Auburn, MI 48611

<u>Product</u>	<u>Batch/Lot</u>	<u>Sampling</u>	<u>PRI Sample</u>
DOWSIL Contractors Paintable Sealant	YY00M1H002	Dow Silicones Corporation	22-20129488

Sample Preparation: Samples were retained at 23±2°C & 50±10%RH for 24h prior to test. Specimens were prepared in accordance with Section 3.4 of CDPH v1.2: Preparation of Caulking Product Test Specimens. An aluminum channel of 3/8in. (9.525mm) in width and 10in (254mm) in length for a total exposed are of 3.75in² (2,418mm³) to achieve a loading factor of 0.31 m²/m³. Specimen were loaded in the test chamber within 5 minutes of dispersion time on Mar. 26, 2021.

Test Results: The specimen 10-day conditioning period occurred Apr. 1, 2022 - Apr. 11, 2022. Air sampling occurred Apr. 12, 13, and 15, 2022.

CDPH v1.2

Property				Result			Requirement ₁
Standardized Building Scenarios							
Scenario	Standard school classroom	Private office	Single-family residence ₂	Standard school classroom	Private office	Single-family residence ₂	
Usage Area, A_B (m ²)	0.12	0.05	1.09	Pass	Pass	Pass	Pass
Room Volume (m ³)	231	30.6	547	Pass	Pass	Pass	Pass
Ventilation Rate, Q_B (m ³ /h)	191	20.7	127	Pass	Pass	Pass	Pass
Area specific flow rate q_A (m/h)	1,645	445.6	117.0	Pass	Pass	Pass	Pass
Estimated Concentrations for Building Scenarios							
Concentration of compound (µg/m ³) Cond 10d @ 23±1°C & 50±5% RH in chamber followed by; Sample 96±2h @ 23±1°C & 50±5% RH				Standard school classroom	Private office	Single-family residence ₂	
Compound Name		CAS. No(s)					
“D4” Cyclotetrasiloxane, octamethyl-		556-67-2 ₄	0.01	0.02	0.08	Report	
“D5” Cyclopentasiloxane, decamethyl-		541-02-6 ₄	0.11	0.04	0.15	Report	
“D6” Cyclohexasiloxane, dodecamethyl-		540-97-6 ₄	0.00	0.01	0.06	Report	
TVOC			0.02	0.07	0.27	Report	

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Property		Result			Requirement
TVOCs					
Concentration of compound TVOC (µg/m³) Cond 10d @ 23±1°C & 50±5% RH in chamber followed by; Chamber air sample collected at time indicated @ 23±1°C & 50±5% RH		24h	48h	96h	
Total VOC Chamber Concentration		457	14	1	Report
Formaldehyde		< LD₃	< LD₃	< LD₃	Report
Area Specific Emissions Rate/Factor TVOC (µg/m·h) Cond 10d @ 23±1°C & 50±5% RH in chamber followed by; Chamber air sample collected at time indicated @ 23±1°C & 50±5% RH		24h	48h	96h	
Area Specific Emissions Rate/Factor TVOC		135	4	0	Report
Target CREL VOCs					
Concentration of compound (µg/m³) Cond 10d @ 23±1°C & 50±5% RH in chamber Loading factor 0.31m²/m³ Composite sample 96±2h @ 23±1°C & 50±5% RH					
Compound Name	CAS. No(s)				
Acetaldehyde	75-07-0	< LD₃			≤ 70
Benzene	71-43-2	< LD₃			≤ 1.5
Carbon disulfide	75-15-0	< LD₃			≤ 400
Carbon tetrachloride	56-23-5	< LD₃			≤ 20
Chlorobenzene	108-90-7	< LD₃			≤ 500
Chloroform	67-66-3	< LD₃			≤ 150
Dichlorobenzene (1,4-)	106-46-7	< LD₃			≤ 400
Dichloroethene (1,1)	75-35-4	< LD₃			≤ 35
Dimethylformamide (N,N-)	68-12-2	< LD₃			≤ 40
Dioxane (1,4-)	123-91-1	< LD₃			≤ 1,500
Epichlorohydrin	106-89-8	< LD₃			≤ 1.5
Ethylbenzene	100-41-4	< LD₃			≤ 1,000
Ethylene glycol	107-21-1	< LD₃			≤ 200
Ethylene glycol monoethyl ether	110-80-5	< LD₃			≤ 35
Ethylene glycol monoethyl ether acetate	111-15-9	< LD₃			≤ 150
Ethylene glycol monomethyl ether	109-86-4	< LD₃			≤ 30
Ethylene glycol monomethyl ether acetate	110-49-6	< LD₃			≤ 45
Formaldehyde	50-00-0	< LD₃			≤ 9
Hexane (n-)	110-54-3	< LD₃			≤ 3,500
Isophorone	48-59-1	< LD₃			≤ 1,000
Isopropanol	67-63-0	< LD₃			≤ 3,500
Methyl chloroform	71-55-6	< LD₃			≤ 500

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Property		Result	Requirement ₁
Methylene chloride	75-09-2	< LD ₃	≤ 200
Methyl t-butyl ether	1634-04-4	< LD ₃	≤ 4,000
Naphthalene	91-20-3	< LD ₃	≤ 4.5
Phenol	108-95-2	< LD ₃	≤ 100
Propylene glycol monomethyl ether	107-98-2	< LD ₃	≤ 3,500
Styrene	100-42-5	< LD ₃	≤ 450
Terachloroethylene	127-18-4	< LD ₃	≤ 17.5
Toluene	108-88-3	< LD ₃	≤ 150
Trichloroethylene	79-01-6	< LD ₃	≤ 300
Vinyl Acetate	108-05-4	< LD ₃	≤ 100
Xylenes, technical mixture (m-, o-, p-xylene combined)	108-38-3, 95-47-6, 106-42-3	< LD ₃	≤ 350

Note(s):

1. Values extracted from CDPH v1.2 Table 4-1: Target CREEL VOCs and their maximum allowable concentrations. All maximum allowable concentrations listed are one-half the corresponding CREL adopted by CAL/EPA OEHHA with the exception of formaldehyde.
2. Provided for information only. As of the January 2017 publication of CDPH v1.2, Appendix B: New Single-family residence scenario is not part of the required portion of the Standard Method. Emissions calculated based on 19 windows totaling 38m² of surface area with a presumed uniform size of 2m x 1m.
3. Compound presence within analyte below the Limit of Detection
4. Compound quantified using analytical standards

Statement of Attestation The product was tested in accordance with accordance with Section 3 of CDPH v1.2: *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers*. The laboratory test results presented in this report are representative of the material supplied.

Signed: 
Brent Barbeau
Manager

Date: May 23, 2022

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	May 23, 2022	7	NA

END OF REPORT

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Figure 1: Sample label



Figure 2: Manufacturing Information

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Figure 3: Specimen in chamber

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