

ALLFASTENERS TEST REPORT

SCOPE OF WORK

Standard Method Version 1.2 for CDPH 01350 on AF607 Duct Sealant

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TEST REPORT FOR ALLFASTENERS USA LLC

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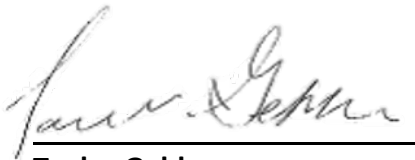
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SECTION 1

CLIENT INFORMATION

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SECTION 2**SUMMARY AND CONCLUSION**

Test Method: Standard Method Version 1.2 for CDPH 01350
Modeling Scenario: Private office (PO), school classroom (SC)

DESCRIPTION OF SAMPLES

Manufacturer / Location Monongahela, PA USA
Product Name AF607 Duct Sealant
Product Number 12DS10
Date of Manufacture 09-June-2020
Date of Collection 09-June-2020
Date of Shipment 16-June-2020
Date Received by Lab 18-June-2020
Date of Test Start 25-June-2020
As Received Sample Condition Good
Lab Sample ID GRR2006180003

WORK REQUESTED/APPLICABLE DOCUMENTS

VOC Emissions Analysis: CDPH Standard Method v1.2
Intertek Quote: Qu-01296275-4

TEST RESULTS

MODELING SCENARIO	RESULT (PASS/FAIL)	TVOC (mg m ⁻³)
Private Office (PO)	PASS	< 0.01
School Classroom (SC)	PASS	< 0.01

SAMPLE DISPOSITION

At the completion of testing, samples were returned to the client.

SECTION 3**CDPH STANDARD METHOD V1.2**

Date Received: 18-June-2020
Dates Tested: 25-June-2020 to 09-July-2020

DESCRIPTION OF SAMPLES:

Part Description: Water based HVAC duct sealant
Material Submitted: One (1) quart can

ACCEPTANCE CRITERIA:

Referencing: CDPH Standard Method v1.2, Table 4.1
LEED v4 - Low Emitting Materials
LEED v4 - TVOC Ranges: $\leq 0.5 \text{ mg m}^{-3}$
 $0.5 \text{ to } 5.0 \text{ mg m}^{-3}$
 $\geq 5.0 \text{ mg m}^{-3}$

TEST NOTES OR DEVIATIONS:

The chamber blank for acetaldehyde was above $2.0 \text{ } \mu\text{g/m}^3$, and the chamber blank for TVOC was above $25 \text{ } \mu\text{g/m}^3$. There is not expected to be an effect on testing.

TEST SUMMARY:

The emissions testing was performed according to "Standard Method for the Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers Version 1.2". A photograph of the tested sample is included herein. The sample was applied to a stainless steel plate and placed into the test chamber with top surface exposed. Air samples were collected prior to the sample being placed in the test chamber (0 hours) and at 264, 288, and 336 hours after being placed in the test chamber. Samples analyzed for individual VOCs and TVOC were collected on multi-sorbent tubes containing glass wool, Tenax TA 35/60 and Carbograph 5 TD 40/60. These VOC samples were analyzed by thermal desorption-gas chromatography/mass-spectrometry, TD-GC/MS. TVOC was calculated through integration of the chromatogram from n-pentane through n-heptadecane using toluene as a surrogate. Individual VOCs were calculated using calibration curves based on pure standards unless otherwise noted. Samples analyzed for low molecular weight aldehydes were collected on cartridges treated with 2,4-di-nitrophenylhydrazine (DNPH). Low molecular weight aldehydes were analyzed using high performance liquid chromatography, HPLC.

RESULTS:**Table 1: Sample and Chamber Conditions during Test Period**

PARAMETER		SYMBOL	VALUE	UNITS
Sample Dimensions	Length	-	0.075	m
	Width	-	0.076	m
	Thickness	-	-	m
Applied sample mass		-	17.6	g
Exposed Sample Surface Area		A	0.006	m ²
Chamber Volume		V	0.116	m ³
Chamber Loading Factor		L	0.05	m ² m ⁻³
Inlet Air Flow Rate		Q	0.116	m ³ h ⁻¹
Air Change Rate		N_{ACH}	1.00	h ⁻¹
Area Specific Flow Rate		q_A	20.3	m h ⁻¹
Chamber Pressure (Range)		P	18.7 (12.1-20.9)	Pa
Average Temperature (Range)		T	23.5 (22.9-24.1)	°C
Average Humidity (Range)		RH	49.6 (44.8-53.7)	% RH
Testing Duration		t	336	h

Table 2: Test chamber background VOC concentrations in $\mu\text{g m}^{-3}$.

COMPOUND	CAS No.	C_{i0}
Formaldehyde	50-00-0	0.7
TVOC	-	37.1

Table 3: Test chamber TVOC and formaldehyde concentrations in $\mu\text{g m}^{-3}$.

COMPOUND	CAS No.	264 H	288 H	336 H
Formaldehyde	50-00-0	2.9	3.1	2.4
TVOC	-	97.9	104	94.4

Table 4: Test chamber TVOC and formaldehyde emission factors in $\mu\text{g m}^{-2} \text{h}^{-1}$.

COMPOUND	CAS No.	264 H	288 H	336 H
Formaldehyde	50-00-0	45.8	50.0	34.3
TVOC	-	1240	1360	1170

Individual emitted VOCs identified above the lower limits of quantitation are listed in Table 5; VOCs which are listed on chemical of concern lists or have CRELs are indicated.

The measured chamber concentrations and corresponding emission factors of identified individual VOCs and TVOCs are listed in Table 6.

In Tables 4, 6 and 7, emission factors were calculated using equation 3.1 in CDPH Standard Method V1.2:

$$EF_{Ai} = \frac{Q \times (C_{it} - C_{io})}{A_c}$$

The inlet flow rate, Q ($\text{m}^3 \text{h}^{-1}$), is the measured flow rate of air into the chamber. The chamber concentration, C_{it} ($\mu\text{g m}^{-3}$), is the concentration of a target VOC_i, formaldehyde and other carbonyl compounds measured at time t . The chamber background concentration, C_{io} ($\mu\text{g m}^{-3}$), is the corresponding concentration measured with the chamber operating without a test specimen. The exposed surface area of the test specimen in the chamber, A_c (m^2), is determined from the measurements made at the time of specimen preparation.

Table 5: VOCs detected above lower limits of quantitation in air samples at 336 hours.

VOC	CAS No.	SURROGATE ¹	CREL ² ($\mu\text{g m}^{-3}$)	CARB TAC ³	PROP 65 LIST ⁴
Formaldehyde	50-00-0	No	9	Yes	Yes
Acetaldehyde	75-07-0	No	140	Yes	Yes
Styrene	100-42-5	No	900	Yes	Yes
Propylene Glycol	57-55-6	Yes	N/A	No	No
1,1'-Biphenyl, 4-methyl-	644-08-6	Yes	N/A	No	No

¹Indicates which non-listed VOCs were quantified using surrogate compounds, all other compounds were quantified using pure compounds.

²Chronic Reference Exposure Level (CREL) as defined by California Office of Environmental Health Hazard Assessment.

³Substance is listed on California Air Resource Board's (CARB) Toxic Air Contaminant (TAC) identification list.

⁴Substance known to the state of California to cause cancer or reproductive toxicity according to California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).

Table 6: Measured chamber concentrations and corresponding emission factors of individual VOCs listed in Table 4-1 of CDPH 01350 V1.2. at 336 hours.

VOC	CAS No.	CHAMBER CONCENTRATION ($\mu\text{g m}^{-3}$)	EMISSION FACTOR ($\mu\text{g m}^{-2} \text{h}^{-1}$)
Formaldehyde	50-00-0	2.4	34.3
Acetaldehyde	75-07-0	5.4	58.7
Vinyl acetate	108-05-4	< 0.7	< 15.2
Epichlorohydrin	106-89-8	< 0.3	< 5.5
Ethanol, 2-methoxy-, acetate	110-49-6	< 0.4	< 7.7
Isopropyl Alcohol	67-63-0	< 0.4	< 8.7
Ethene, 1,1-dichloro-	75-35-4	< 6.4	< 130
Methylene chloride	75-09-2	< 0.6	< 12.6
Carbon disulfide	75-15-0	< 0.8	< 15.9
Methyl tert-butyl ether	1634-04-4	< 1.7	< 35.1
n-Hexane	110-54-3	< 0.3	< 5.1
Trichloromethane (Chloroform)	67-66-3	< 0.3	< 5.1
Ethanol, 2-methoxy-	109-86-4	< 0.4	< 7.3
Ethane, 1,1,1-trichloro-	71-55-6	< 0.6	< 11.5
Benzene	71-43-2	< 0.3	< 5.1
Carbon Tetrachloride	56-23-5	< 0.4	< 8.7
2-Propanol, 1-methoxy-	107-98-2	< 0.3	< 5.9
Ethylene glycol	107-21-1	< 6.4	< 130
Trichloroethylene	79-01-6	< 0.3	< 5.1
1,4-Dioxane	123-91-1	< 0.3	< 5.1
Ethanol, 2-ethoxy-	110-80-5	< 0.4	< 8
Toluene	108-88-3	< 0.5	< 9.9
Formamide, N,N-dimethyl-	68-12-2	< 0.3	< 6.0
Tetrachloroethylene	127-18-4	< 0.3	< 5.1
Benzene, chloro-	108-90-7	< 0.3	< 5.9
Ethylbenzene	100-41-4	< 0.4	< 7.8
Xylene (-m, -p, & -o)	108-38-3, 95-47-6, 106-42-3	< 1.2	< 24.1
Styrene	100-42-5	1.4	27.9
2-Ethoxyethyl acetate	111-15-9	< 0.3	< 5.2
Phenol	108-95-2	< 0.3	< 6.9
Benzene, 1,4-dichloro-	106-46-7	< 0.3	< 6.2
Isophorone	78-59-1	< 0.3	< 5.1
Naphthalene	91-20-3	< 0.3	< 5.2

Table 7: Measured chamber concentrations and corresponding emission factors of identified individual VOCs and TVOC at 336 hours.

VOC	CAS No.	CHAMBER CONCENTRATION ($\mu\text{g m}^{-3}$)	EMISSION FACTOR ($\mu\text{g m}^{-2} \text{h}^{-1}$)
Propylene Glycol	57-55-6	62.7	1270
1,1'-Biphenyl, 4-methyl-	644-08-6	2.3	45.9
TVOC	-	94.4	1170

Exposure Scenario Modeling and Evaluation:

Estimated building concentrations for the listed scenarios were calculated using equation 3.2a of CDPH Standard Method V1.2:

$$C_{Bi} = \frac{EF_{Ai} \times A_B}{Q_B}$$

The area specific emission rate EF_A at 336 hours (14 days) total exposure time is multiplied by the ratio of the exposed surface area of the installed material in the building, A_B (m^2), to the flow rate of outside ventilation air, Q_B ($\text{m}^3 \text{h}^{-1}$).

The modeling parameters used for the given scenarios are listed in Table 8. The modeled concentrations of identified individual VOCs are listed in Tables 9 & 10. Whether the modeled concentrations meet the maximum allowable concentration requirements specified in Table 4.1 of CDPH Standard Method V1.2 are also indicated.

Table 8: Standard modeling parameters for HVAC duct sealant.

PARAMETER	SYMBOL	VALUE	UNITS
Exposed Surface Area Installed in <i>Private Office (PO)</i>	A_B	0.34	m^2
Air flow rate of <i>Private Office (PO)</i>	Q_B	20.7	$\text{m}^3 \text{h}^{-1}$
Exposed Surface Area Installed in <i>Classroom (SC)</i>	A_B	0.91	m^2
Air flow rate of <i>Classroom (SC)</i>	Q_B	191	$\text{m}^3 \text{h}^{-1}$

Table 9: Modeled concentrations of individual VOCs specified in Table 4-1 of CDPH 01350 V1.2.

VOC	CAS NO.	MODELED CONCENTRATION ($\mu\text{g m}^{-3}$)		CONC. LIMIT ($\mu\text{g m}^{-3}$)	RESULT Pass (P) /Fail (F)	
		PO	SC		PO	SC
Formaldehyde	50-00-0	0.6	0.2	9	P	P
Acetaldehyde	75-07-0	1.0	0.3	70	P	P
Vinyl acetate	108-05-4	< 0.2	< 0.1	100	P	P
Epichlorohydrin	106-89-8	< 0.1	< 0.1	1.5	P	P
Ethanol, 2-methoxy-, acetate	110-49-6	< 0.1	< 0.1	45	P	P
Isopropyl Alcohol	67-63-0	< 0.1	< 0.1	3,500	P	P
Ethene, 1,1-dichloro-	75-35-4	< 2.1	< 0.6	35	P	P
Methylene chloride	75-09-2	< 0.2	< 0.1	200	P	P
Carbon disulfide	75-15-0	< 0.3	< 0.1	400	P	P
Methyl tert-butyl ether	1634-04-4	< 0.6	< 0.2	4,000	P	P
n-Hexane	110-54-3	< 0.1	< 0.1	3,500	P	P
Trichloromethane (Chloroform)	67-66-3	< 0.1	< 0.1	150	P	P
Ethanol, 2-methoxy-	109-86-4	< 0.1	< 0.1	30	P	P
Ethane, 1,1,1-trichloro-	71-55-6	< 0.2	< 0.1	500	P	P
Benzene	71-43-2	< 0.1	< 0.1	1.5	P	P
Carbon Tetrachloride	56-23-5	< 0.1	< 0.1	20	P	P
2-Propanol, 1-methoxy-	107-98-2	< 0.1	< 0.1	3,500	P	P
Ethylene glycol	107-21-1	< 2.1	< 0.6	200	P	P
Trichloroethylene	79-01-6	< 0.1	< 0.1	300	P	P
1,4-Dioxane	123-91-1	< 0.1	< 0.1	1,500	P	P
Ethanol, 2-ethoxy-	110-80-5	< 0.1	< 0.1	35	P	P
Toluene	108-88-3	< 0.2	< 0.1	150	P	P
Formamide, N,N-dimethyl-	68-12-2	< 0.1	< 0.1	40	P	P
Tetrachloroethylene	127-18-4	< 0.1	< 0.1	17.5	P	P
Benzene, chloro-	108-90-7	< 0.1	< 0.1	500	P	P
Ethylbenzene	100-41-4	< 0.1	< 0.1	1,000	P	P
Xylene (-m, -p, & -o)	108-38-3, 95-47-6, 106-42-3	< 0.4	< 0.1	350	P	P
Styrene	100-42-5	0.5	0.1	450	P	P
2-Ethoxyethyl acetate	111-15-9	< 0.1	< 0.1	150	P	P
Phenol	108-95-2	< 0.1	< 0.1	100	P	P
Benzene, 1,4-dichloro-	106-46-7	< 0.1	< 0.1	400	P	P
Isophorone	78-59-1	< 0.1	< 0.1	1,000	P	P
Naphthalene	91-20-3	< 0.1	< 0.1	4.5	P	P

Table 10: Modeled concentrations of identified non-listed individual VOCs.

VOC	CAS NO.	MODELED CONCENTRATION ($\mu\text{g m}^{-3}$)		CONC. LIMIT ($\mu\text{g m}^{-3}$)	RESULT Pass (P) /Fail (F)	
		PO	SC		PO	SC
Propylene Glycol	57-55-6	20.9	6.1	-	-	-
1,1'-Biphenyl, 4-methyl-	644-08-6	0.8	0.2	-	-	-
TVOC _{Toluene}	-	19.1	5.6	-	-	-

PHOTOGRAPHS:

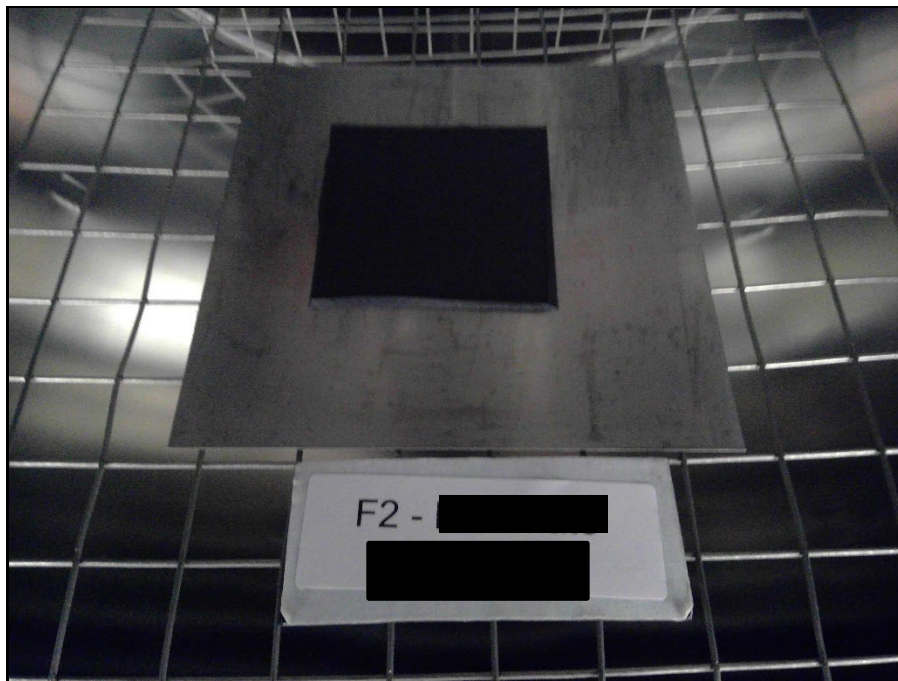


Figure 1: Photograph of sample in test chamber

SECTION 4**FACILITIES AND EQUIPMENT:****GCMS**


INSTRUMENTATION USED:	Markes TD-100 Thermal
	Desorption
	Agilent 7890A GC
COLUMN USED:	Agilent 5975C MS
	Agilent HP-Ultra 2 (GC)

HPLC

INSTRUMENTATION USED:	Agilent 1260 Infinity Series
COLUMN USED:	Poroshell 120 EC-C18

SECTION 5

CHAIN OF CUSTODY

	Ship To:		Chain of Custody for Chemical Testing	
	Attn: VOC Laboratory		Intertek Quotation Number: [REDACTED]	
	4700 Broadmoor Ave SE		Purchase Order (enter Company and Number): [REDACTED]	
	Suite 200 Kentwood, MI 49512 Phone: 616-656-7401			
Customer Information				
Company: [REDACTED]				
Street Address: [REDACTED]				
City/State/Postal code: Monongahela, PA 15063				
Country: USA				
Contact Name & Title (for reporting): [REDACTED]				
Contact Phone/Fax Numbers: [REDACTED]				
Contact E-mail Address: [REDACTED]				
Financially Responsible Co.: [REDACTED]				
Shipping Details				
Packed & Shipped By: [REDACTED]				
Shipping Date: [REDACTED]				
Carrier/Airbill Number: [REDACTED]				
Requested Testing				
Test to be performed: CDPH 013.50 v1.3				
Customer Request for Certification				
Clean Air Silver™ Certification: <input type="checkbox"/> YES				
Clean Air Gold™ Certification: <input type="checkbox"/> YES				
Manufacturer Information (If Different)				
Company: [REDACTED]				
City/State/Country: [REDACTED]				
Contact Name/Title: [REDACTED]				
Phone Number/E-mail Address: [REDACTED]				
Special Customer Instructions				
Customer Authorizes Laboratory to Submit Copies of Test Reports To:				
Contact: [REDACTED]				
Email Address: [REDACTED]				
Organization: [REDACTED]				
Contact: [REDACTED]				
Email Address: [REDACTED]				
Organization: [REDACTED]				
Sample Details				
Product Commercial Name*: [REDACTED]				
Product Commercial Part No. (if not part of the name)*: [REDACTED]				
Manufacturer Sample Tracking ID: [REDACTED]				
Date Manufactured*: 6/9/2020				
Product Category & Use*: water based sealant/building & construction				
Sample Construction Materials*: HVAC duct work				
Plant Name & Location*: [REDACTED] Monongahela, PA				
Collection Location within Plant: [REDACTED]				
Date & Time Collected*: 6/9/2020 1:30 pm				
Number of Sample Pieces*: 1				
Sample Collected by*: [REDACTED]				
Phone/Fax Numbers*: [REDACTED]				
E-mail Address*: [REDACTED]				
Intertek Use Only				
Condition of Shipping Package: Good				
Condition of Sample: Good				
Sample ID: GRR200618003				
GIN: G104367893				
*Indicates required field				
Sample Handling*				
Relinquished By:	Printed Name*	Signature*	Date*	Company*
Received by:	Taylor Gebben	[Signature]	7/17/2020	Intertek