

FLAMEOFF TEST REPORT

SCOPE OF WORK

CDPH 01350 Standard Method Version 1.2 on FR Clear

REPORT NUMBER

106204072GRR-002

ISSUE DATE

16-June-2025

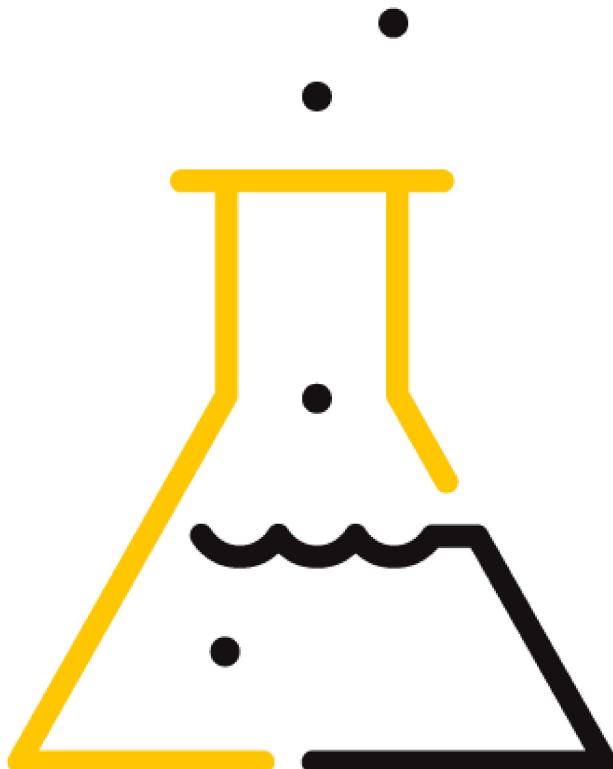
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TEST REPORT FOR FLAMEOFF COATINGS., INC.

Report No.: 106204072GRR-002

Date: 16-June-2025

P.O.: 8320

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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) and single family residence (R)

CLIENT PROVIDED SAMPLE INFORMATION

Manufacturer / Location	DimaChem / Ontario Canada
Product Name	FR Clear
Product Number	17012
Product Description	Fire inhibitor
Date of Manufacture	06-January-2025
Date of Collection	Not Specified
Date of Shipment	09-May-2025

DESCRIPTION OF SAMPLES

Date Received by Lab	13-May-2025
As Received Sample Condition	Good Condition
Lab Sample ID	GRR2505130009-1
Material Submitted	One (1) 32 Oz. Bottle

WORK REQUESTED/APPLICABLE DOCUMENTS

VOC Emissions Analysis:	CDPH Standard Method v1.2
Intertek Quote:	Qu-01541723

TEST RESULTS**CDPH Standard Method v1.2, Table 4.1**

MODELING SCENARIO	RESULT (PASS/FAIL)
Private Office (PO)	PASS
School Classroom (SC)	PASS
Single Family Residence (R)*	PASS

*Note: The single family residence scenario is not yet a CDPH requirement. It is provided for informational purposes only.

LEED v4 Total Volatile Organic Compounds (TVOC)

MODELING SCENARIO	TVOC (mg m ⁻³)
Private Office (PO)	< 0.1
School Classroom (SC)	< 0.1
Single Family Residence (R)*	< 0.1

*Note: The single family residence scenario is not yet a CDPH requirement. It is provided for informational purposes only.

SAMPLE DISPOSITION

At the completion of testing, samples were disposed of in a routine manner.

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

Date Received: 13-May-2025

Dates Tested: 22-May-2025 to 05-June-2025

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 sample was prepared four months and sixteen days from production.

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 in 2 coats to a wood panel and placed into the test chamber with the top surface exposed. The sample was conditioned outside of the test chamber at $23 \pm 2^\circ\text{C}$ and $50 \pm 10\%$ RH. Air samples were collected prior to the sample being placed in the test chamber (0 hours) and at 264, 288, and 336 hours after preparation. 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-dinitrophenylhydrazine (DNPH). Low molecular weight aldehydes were analyzed using high performance liquid chromatography, HPLC.

Table 1: Conditioning and test timing

EXPERIMENT PHASE	START DATE	DURATION
Conditioning	22-May-2025	10 Days
Chamber Testing	01-June-2025	4 Days

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RESULTS:**Table 2: Sample and Chamber Conditions during Test Period**

PARAMETER		SYMBOL	VALUE	UNITS
Sample Dimensions	Length	-	0.276	m
	Width	-	0.258	m
	Thickness	-	-	m
Spreading Ratio Applied		-	20.8	m^2/L
Wet Sample Mass		-	8.6	g
Exposed Sample Surface Area		A	0.071	m^2
Chamber Volume		V	0.116	m^3
Chamber Loading Factor		L	0.61	$m^2 m^{-3}$
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	1.63	$m h^{-1}$
Chamber Pressure (Range)		P	17.4 (16.0-22.1)	Pa
Average Temperature (Range)		T	23.3 (23.1-23.4)	°C
Average Humidity (Range)		RH	50.0 (47.1-51.8)	% RH
Testing Duration		t	336	h

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

COMPOUND	CAS No.	C_{i0}
Formaldehyde	50-00-0	0.6
TVOC	-	< 20

Table 4: 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	0.5	0.5	0.6
TVOC	-	22.4	25.4	< 20

Table 5: Test chamber TVOC and formaldehyde emission factors in $\mu\text{g m}^{-2} h^{-1}$.

COMPOUND	CAS No.	264 H	288 H	336 H
Formaldehyde	50-00-0	< 0.5	< 0.5	< 0.5
TVOC	-	34.5	39.4	< 31

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Individual emitted VOCs identified above the lower limits of quantitation are listed in Table 6; 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 7.

In Tables 5, 7 and 8, emission factors were calculated using equation 3.1 in CDPH Standard Method V1.2:

$$EF_{Ai} = \frac{Q \times (C_{it} - C_{i0})}{A_C}$$

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_{i0} ($\mu\text{g m}^{-3}$), 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 6: 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
Acetic Acid*	64-19-7	Yes	-	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 Contaminate (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).

*Substance is suspected to be emitting from the wood substrate

Table 7: 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	0.6	< 0.5
Acetaldehyde	75-07-0	< 3.7	< 5.9
Vinyl acetate	108-05-4	< 0.5	< 0.8
Epichlorohydrin	106-89-8	< 0.4	< 0.7
Ethanol, 2-methoxy-, acetate	110-49-6	< 0.8	< 1.4
Isopropyl Alcohol	67-63-0	< 0.8	< 1.2
Ethene, 1,1-dichloro-	75-35-4	< 0.2	< 0.4
Methylene chloride	75-09-2	< 5.0	< 8.1
Carbon disulfide	75-15-0	< 0.4	< 0.7
Methyl tert-butyl ether	1634-04-4	< 1.2	< 2.0
n-Hexane	110-54-3	< 0.5	< 0.8
Trichloromethane (Chloroform)	67-66-3	< 0.3	< 0.5
Ethanol, 2-methoxy-	109-86-4	< 5.0	< 8.1
Ethane, 1,1,1-trichloro-	71-55-6	< 0.3	< 0.5
Benzene	71-43-2	< 0.4	< 0.7
Carbon Tetrachloride	56-23-5	< 0.3	< 0.5
2-Propanol, 1-methoxy-	107-98-2	< 2.2	< 3.6
Ethylene glycol	107-21-1	< 50	< 81.3
Trichloroethylene	79-01-6	< 0.3	< 0.5
1,4-Dioxane	123-91-1	< 0.4	< 0.7
Ethanol, 2-ethoxy-	110-80-5	< 5.0	< 8.1
Toluene	108-88-3	< 0.3	< 0.4
Formamide, N,N-dimethyl-	68-12-2	< 5.0	< 8.1
Tetrachloroethylene	127-18-4	< 0.3	< 0.6
Benzene, chloro-	108-90-7	< 0.2	< 0.4
Ethylbenzene	100-41-4	< 0.4	< 0.6
Xylene (-m, -p, & -o)	108-38-3, 95-47-6, 106-42-3	< 0.8	< 1.3
Styrene	100-42-5	< 0.3	< 0.5
2-Ethoxyethyl acetate	111-15-9	< 2.4	< 3.8
Phenol	108-95-2	< 1.6	< 2.6
Benzene, 1,4-dichloro-	106-46-7	< 0.3	< 0.5
Isophorone	78-59-1	< 1.8	< 3.0
Naphthalene	91-20-3	< 0.5	< 0.8

Table 8: Measured chamber concentrations and corresponding emission factors of identified non-listed individual VOCs and TVOC at 336 hours.

VOC	CAS No.	CHAMBER CONCENTRATION ($\mu\text{g m}^{-3}$)	EMISSION FACTOR ($\mu\text{g m}^{-2} \text{h}^{-1}$)
Acetic Acid*	64-19-7	11.1	18.0
TVOC	-	< 20	< 31

*Substance is suspected to be emitting from the wood substrate

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 9. The modeled concentrations of identified individual VOCs are listed in Tables 10 & 11. 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 9: Standard modeling parameters for wallcoverings.

PARAMETER	SYMBOL	VALUE	UNITS
Exposed Surface Area Installed in <i>Private Office (PO)</i>	A_B	33.4	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	94.6	m^2
Air flow rate of <i>Classroom (SC)</i>	Q_B	191	$\text{m}^3 \text{h}^{-1}$
Exposed Surface Area Installed in <i>Residence (R)</i>	A_B	562	m^2
Air flow rate of <i>Residence (R)</i>	Q_B	127	$\text{m}^3 \text{h}^{-1}$

Table 10: 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	R		PO	SC	R
Formaldehyde	50-00-0	< 0.8	< 0.2	< 2.1	9	P	P	P
Acetaldehyde	75-07-0	< 9.6	< 2.9	< 26	70	P	P	P
Vinyl acetate	108-05-4	< 1.2	< 0.4	< 3.3	100	P	P	P
Epichlorohydrin	106-89-8	< 1.1	< 0.3	< 3.0*	1.5	P	P	P
Ethanol, 2-methoxy-, acetate	110-49-6	< 2.2	< 0.7	< 6.1	45	P	P	P
Isopropyl Alcohol	67-63-0	< 2.0	< 0.6	< 5.5	3,500	P	P	P
Ethene, 1,1-dichloro-	75-35-4	< 0.6	< 0.2	< 1.7	35	P	P	P
Methylene chloride	75-09-2	< 13	< 4.0	< 36	200	P	P	P
Carbon disulfide	75-15-0	< 1.1	< 0.3	< 3.0	400	P	P	P
Methyl tert-butyl ether	1634-04-4	< 3.2	< 1.0	< 8.8	4,000	P	P	P
n-Hexane	110-54-3	< 1.3	< 0.4	< 3.5	3,500	P	P	P
Trichloromethane (Chloroform)	67-66-3	< 0.8	< 0.2	< 2.1	150	P	P	P
Ethanol, 2-methoxy-	109-86-4	< 13	< 4.0	< 36	30	P	P	P
Ethane, 1,1,1-trichloro-	71-55-6	< 0.7	< 0.2	< 2.0	500	P	P	P
Benzene	71-43-2	< 1.1	< 0.3	< 3.1*	1.5	P	P	P
Carbon Tetrachloride	56-23-5	< 0.8	< 0.2	< 2.1	20	P	P	P
2-Propanol, 1-methoxy-	107-98-2	< 5.8	< 1.8	< 16	3,500	P	P	P
Ethylene glycol	107-21-1	< 131	< 40	< 360	200	P	P	P
Trichloroethylene	79-01-6	< 0.8	< 0.2	< 2.2	300	P	P	P
1,4-Dioxane	123-91-1	< 1.1	< 0.3	< 3.1	1,500	P	P	P
Ethanol, 2-ethoxy-	110-80-5	< 13	< 4.0	< 36	35	P	P	P
Toluene	108-88-3	< 0.7	< 0.2	< 2.0	150	P	P	P
Formamide, N,N-dimethyl-	68-12-2	< 13	< 4.0	< 36	40	P	P	P
Tetrachloroethylene	127-18-4	< 0.9	< 0.3	< 2.4	17.5	P	P	P
Benzene, chloro-	108-90-7	< 0.6	< 0.2	< 1.6	500	P	P	P
Ethylbenzene	100-41-4	< 1.0	< 0.3	< 2.8	1,000	P	P	P
Xylene (-m, -p, & -o)	108-38-3, 95-47-6, 106-42-3	< 2.1	< 0.6	< 5.7	350	P	P	P
Styrene	100-42-5	< 0.9	< 0.3	< 2.4	450	P	P	P
2-Ethoxyethyl acetate	111-15-9	< 6.2	< 1.9	< 17	150	P	P	P
Phenol	108-95-2	< 4.1	< 1.3	< 11	100	P	P	P
Benzene, 1,4-dichloro-	106-46-7	< 0.9	< 0.3	< 2.4	400	P	P	P
Isophorone	78-59-1	< 4.8	< 1.5	< 13	1,000	P	P	P
Naphthalene	91-20-3	< 1.3	< 0.4	< 3.5	4.5	P	P	P

*Individual VOC of concern is below lower LOQ for modeled scenario.

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Table 11: Modeled concentrations of identified non-listed individual VOCs.

VOC	CAS NO.	MODELED CONCENTRATION ($\mu\text{g m}^{-3}$)		
		PO	SC	R
Acetic Acid*	64-19-7	29.1	8.9	79.7
TVOC _{Toluene}	-	< 52	< 16	< 144

*Substance is suspected to be emitting from the wood substrate

PHOTOGRAPHS:

Figure 1: Photograph of sample in test chamber.

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SECTION 4**CLIENT PROVIDED CHAIN OF CUSTODY**

 <p>Ship To: Attn: VOC Laboratory 4700 Broadmoor Ave SE Suite 200 Kentwood, MI 49512 Phone: 616-656-7401</p>	<p>Chain of Custody for Chemical Testing</p> <p>Intertek Quotation Number: Purchase Order (enter Company and Number): 8320</p>																	
	<p>Shipping Details</p> <p>Packed & Shipped By: Shipping Date: Carrier/Airbill Number:</p>																	
<p>Customer Information</p> <p>Company: FlameOFF Coatings, Inc. Street Address: 3915 Beryl Rd. Suite 130 City/State/Postal code: Raleigh NC 27607 Country: USA Contact Name & Title (for reporting): James Turner - CEO Contact Phone/Fax Numbers: 919-414-9129 Contact E-mail Address: jturner@flameoff.com Financially Responsible Co. :</p>		<p>Requested Testing</p> <p>Test to be performed: Clean Air Certification</p>																
<p>Manufacturer Information (If Different)</p> <p>Company: DimaChem City/State/Country: Windsor ON, Canada Contact Name/Title: Andrew Conway - VP Ops Phone Number/E-mail Address: 416-990-2446 - aconway@dimacheminc.com</p>		<p>Customer Request for Certification</p> <p>Clean Air™ Certification: <input checked="" type="checkbox"/> YES</p>																
<p>Sample Details</p> <p>Product Commercial Name*: FR Clear Product Commercial Part No.(if not part of the name)*: 17012 Manufacturer Sample Tracking ID: Date Manufactured*: 01/06/2025 Product Category & Use*: Fire Inhibitor Sample Construction Materials*: 32 OZ Bottle Plant Name & Location*: FlameOFF Coatings, Inc. Collection Location within Plant: Suite 130, Warehouse Date & Time Collected*: Number of Sample Pieces*: 1 32 OZ Bottle Sample Collected by*: Phone/Fax Numbers*: 919-414-9129 E-mail Address*: jturner@flameoff.com</p>		<p>Special Customer Instructions</p> <p>Customer Authorizes Laboratory to Submit Copies of Test Reports To:</p> <p>Contact: James Turner Email Address: jturner@flameoff.com Organization: FlameOFF Coatings, Inc. Contact: Email Address: Organization:</p>																
		<p>Intertek Use Only</p> <p>Condition of Shipping Package: <i>Good Condition</i> Condition of Sample: <i>Good Condition</i> Sample ID: <i>G002505130009-1</i> GIN: <i>G006204072</i></p>																
<p>*Indicates required field</p> <p>Sample Handling*</p> <table border="1"> <thead> <tr> <th></th> <th>Printed Name*</th> <th>Signature*</th> <th>Date*</th> <th>Company*</th> </tr> </thead> <tbody> <tr> <td>Relinquished By:</td> <td>James Turner</td> <td><i>James Turner</i></td> <td>5/9/2025</td> <td>FlameOFF Coatings</td> </tr> <tr> <td>Received by:</td> <td><i>Mark Lockwood</i></td> <td><i>John</i></td> <td>6/10/25</td> <td>Intertek</td> </tr> </tbody> </table>					Printed Name*	Signature*	Date*	Company*	Relinquished By:	James Turner	<i>James Turner</i>	5/9/2025	FlameOFF Coatings	Received by:	<i>Mark Lockwood</i>	<i>John</i>	6/10/25	Intertek
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