

FRÄSCH! TEST REPORT

SCOPE OF WORK

CDPH 01350 Standard Method Version 1.2 on 9 mm PET

REPORT NUMBER

104624813GRR-001a

ISSUE DATE

22-April-2021

PAGES

12

DOCUMENT CONTROL NUMBER

Per GFT-OP-10 (6-March-2017)

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TEST REPORT FOR FRÄSCH!

Report No.: 104624813GRR-001a

Date: 22-April-2021

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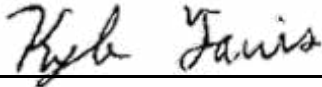
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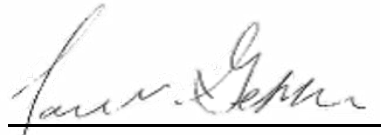
SECTION 1

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) and single family residence (R)

DESCRIPTION OF SAMPLES

Manufacturer / Location Fräsch! / Arlington, TX USA
 Product Name 9 mm PET
 Product Number Not Specified
 Date of Manufacture 09-March-2021
 Date of Collection 09-March-2021
 Date of Shipment 09-March-2021
 Date Received by Lab 12-March-2021
 Date of Test Start 19-March-2021
 As Received Sample Condition Good
 Lab Sample ID GRR2103120013

WORK REQUESTED/APPLICABLE DOCUMENTS

VOC Emissions Analysis: CDPH Standard Method v1.2
 Intertek Quote: Qu-01153163

TEST RESULTS

MODELING SCENARIO	RESULT (PASS/FAIL)	TVOC (mg m ⁻³)
Private Office (PO)	PASS	0.2
School Classroom (SC)	PASS	0.1
Single Family Residence (R)*	PASS	0.5

*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: 12-March-2021
Dates Tested: 19-March-2021 to 02-April-2021

DESCRIPTION OF SAMPLES:

Product Description: 9 mm panel – 100% Polyethylene Terephthalate
Material Submitted: One (1) panel

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 temperature was above 24 °C for approximately 7% of the testing period. This was not expected to have an impact on the final test result.

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. Three edges of the sample were sealed with aluminized tape prior to placing the sample into the test chamber. 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	-	0.294	m
	Width	-	0.299	m
	Thickness	-	0.010	m
Exposed Sample Surface Area		<i>A</i>	0.088	m ²
Chamber Volume		<i>V</i>	0.116	m ³
Chamber Loading Factor		<i>L</i>	0.76	m ² m ⁻³
Inlet Air Flow Rate		<i>Q</i>	0.116	m ³ h ⁻¹
Air Change Rate		<i>N_{ACH}</i>	1.00	h ⁻¹
Area Specific Flow Rate		<i>q_A</i>	1.32	m h ⁻¹
Chamber Pressure (Range)		<i>P</i>	16.0 (13.8-18.1)	Pa
Average Temperature (Range)		<i>T</i>	23.3 (21.6-24.3)	°C
Average Humidity (Range)		RH	50.0 (47.3-52.1)	% RH
Testing Duration		<i>T</i>	336	h

Table 2: Test chamber background VOC concentrations in µg m⁻³.

COMPOUND	CAS No.	<i>C₁₀</i>
Formaldehyde	50-00-0	0.9
TVOC	-	12.0

Table 3: Test chamber TVOC and formaldehyde concentrations in µg m⁻³.

COMPOUND	CAS No.	264 H	288 H	336 H
Formaldehyde	50-00-0	< 2.0	< 2.0	< 2.0
TVOC	-	95.3	87.5	70.2

Table 4: Test chamber TVOC and formaldehyde emission factors in µg m⁻² h⁻¹.

COMPOUND	CAS No.	264 H	288 H	336 H
Formaldehyde	50-00-0	< 1.4	< 1.4	< 1.4
TVOC	-	110	99.5	76.7

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:

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

The inlet flow rate, Q ($m^3 h^{-1}$), is the measured flow rate of air into the chamber. The chamber concentration, C_{it} ($\mu g m^{-3}$), is the concentration of a target VOC_i, formaldehyde and other carbonyl compounds measured at time t . The chamber background concentration, C_{i0} ($\mu g m^{-3}$), 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 ($\mu g m^{-3}$)	CARB TAC ³	PROP 65 LIST ⁴
Acetaldehyde	75-07-0	No	140	Yes	Yes
Methylene chloride	75-09-2	No	400	Yes	Yes
Acetic acid	64-19-7	Yes	N/A	No	No
Butylated hydroxytoluene*	128-37-0	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).

*Suspected to be an artifact from the aluminized tape used for sample preparation.

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	< 2.0	< 1.4
Acetaldehyde	75-07-0	3.6	0.8
Vinyl acetate	108-05-4	< 0.6	< 0.8
Epichlorohydrin	106-89-8	< 0.3	< 0.3
Ethanol, 2-methoxy-, acetate	110-49-6	< 0.3	< 0.4
Isopropyl Alcohol	67-63-0	< 0.5	< 0.6
Ethene, 1,1-dichloro-	75-35-4	< 0.3	< 0.3
Methylene chloride	75-09-2	10.4	13.7
Carbon disulfide	75-15-0	< 0.5	< 0.7
Methyl tert-butyl ether	1634-04-4	< 1.0	< 1.3
n-Hexane	110-54-3	< 0.3	< 0.4
Trichloromethane (Chloroform)	67-66-3	< 0.3	< 0.3
Ethanol, 2-methoxy-	109-86-4	< 0.8	< 1.0
Ethane, 1,1,1-trichloro-	71-55-6	< 0.3	< 0.3
Benzene	71-43-2	< 0.3	< 0.3
Carbon Tetrachloride	56-23-5	< 0.3	< 0.3
2-Propanol, 1-methoxy-	107-98-2	< 0.7	< 0.9
Ethylene glycol	107-21-1	< 20	< 26
Trichloroethylene	79-01-6	< 0.3	< 0.3
1,4-Dioxane	123-91-1	< 0.3	< 0.3
Ethanol, 2-ethoxy-	110-80-5	< 0.4	< 0.5
Toluene	108-88-3	< 0.3	< 0.4
Formamide, N,N-dimethyl-	68-12-2	< 1.0	< 1.3
Tetrachloroethylene	127-18-4	< 0.4	< 0.5
Benzene, chloro-	108-90-7	< 0.4	< 0.5
Ethylbenzene	100-41-4	< 0.3	< 0.3
Xylene (-m, -p, & -o)	108-38-3, 95-47-6, 106-42-3	< 0.6	< 0.8
Styrene	100-42-5	< 0.4	< 0.6
2-Ethoxyethyl acetate	111-15-9	< 0.9	< 1.1
Phenol	108-95-2	< 0.3	< 0.3
Benzene, 1,4-dichloro-	106-46-7	< 0.4	< 0.5
Isophorone	78-59-1	< 0.3	< 0.3
Naphthalene	91-20-3	< 0.4	< 0.5

Table 7: 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	2.3	3.0
Butylated hydroxytoluene	128-37-0	40.3	53.1
TVOC	-	70.2	76.7

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 Wall & Ceiling Acoustical Panels.

PARAMETER	SYMBOL	VALUE	UNITS
Exposed Surface Area Installed in <i>Private Office (PO)</i>	A_B	44.5	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	184	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	779	m^2
Air flow rate of <i>Residence (R)</i>	Q_B	127	$\text{m}^3 \text{h}^{-1}$

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

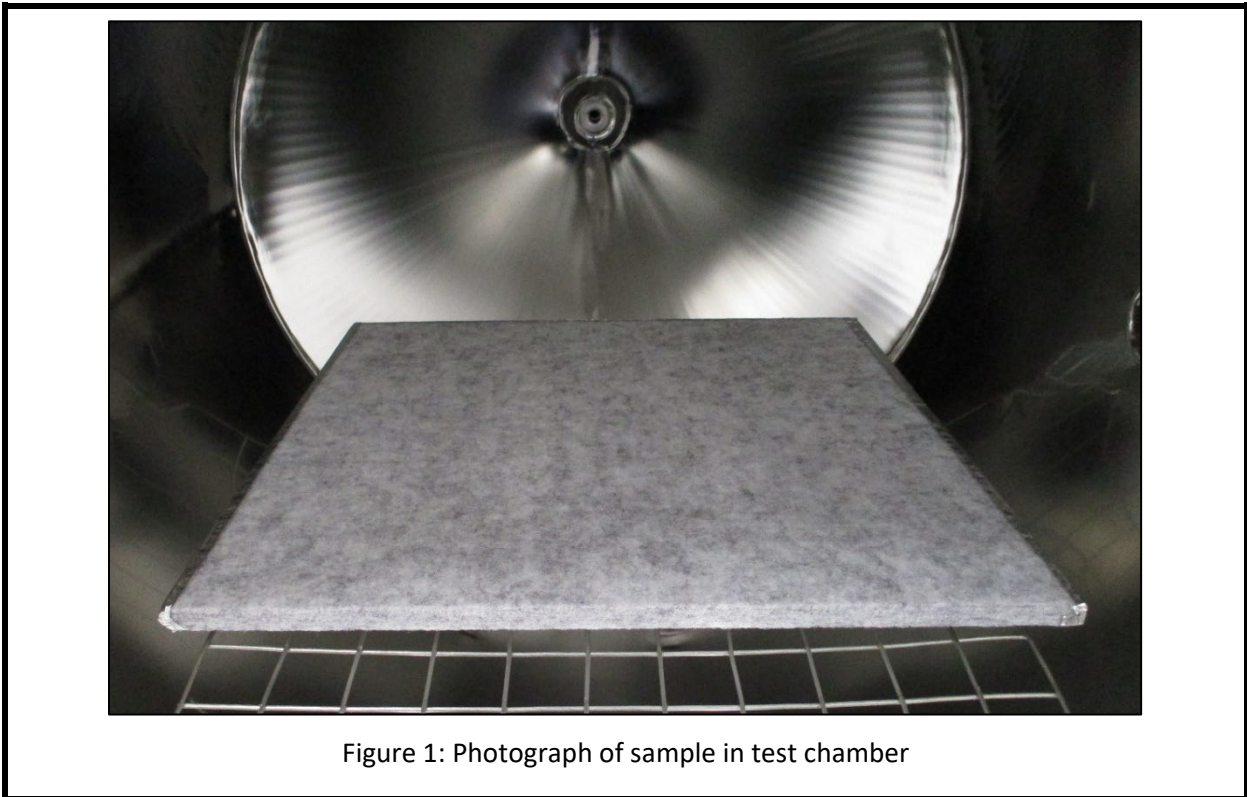
VOC	CAS NO.	MODELED CONCENTRATION ($\mu\text{g m}^{-3}$)			CONC. LIMIT ($\mu\text{g m}^{-3}$)	RESULT Pass (P) /Fail (F)		
		PO	SC	R		PO	SC	R
Formaldehyde	50-00-0	< 5.7	< 2.5	< 16.2*	9	P	P	P
Acetaldehyde	75-07-0	1.7	0.7	4.7	70	P	P	P
Vinyl acetate	108-05-4	< 1.7	< 0.8	< 4.8	100	P	P	P
Epichlorohydrin	106-89-8	< 0.7	< 0.3	< 2.0*	1.5	P	P	P
Ethanol, 2-methoxy-, acetate	110-49-6	< 0.8	< 0.4	< 2.4	45	P	P	P
Isopropyl Alcohol	67-63-0	< 1.3	< 0.6	< 3.7	3,500	P	P	P
Ethene, 1,1-dichloro-	75-35-4	< 0.7	< 0.3	< 2.1	35	P	P	P
Methylene chloride	75-09-2	29.4	13.2	83.8	200	P	P	P
Carbon disulfide	75-15-0	< 1.5	< 0.7	< 4.2	400	P	P	P
Methyl tert-butyl ether	1634-04-4	< 2.8	< 1.2	< 7.9	4,000	P	P	P
n-Hexane	110-54-3	< 0.8	< 0.4	< 2.2	3,500	P	P	P
Trichloromethane (Chloroform)	67-66-3	< 0.7	< 0.3	< 2.0	150	P	P	P
Ethanol, 2-methoxy-	109-86-4	< 2.2	< 1.0	< 6.2	30	P	P	P
Ethane, 1,1,1-trichloro-	71-55-6	< 0.7	< 0.3	< 2.0	500	P	P	P
Benzene	71-43-2	< 0.7	< 0.3	< 2.0*	1.5	P	P	P
Carbon Tetrachloride	56-23-5	< 0.7	< 0.3	< 2.0	20	P	P	P
2-Propanol, 1-methoxy-	107-98-2	< 1.9	< 0.9	< 5.4	3,500	P	P	P
Ethylene glycol	107-21-1	< 56.6	< 25.4	< 161.6	200	P	P	P
Trichloroethylene	79-01-6	< 0.7	< 0.3	< 2.0	300	P	P	P
1,4-Dioxane	123-91-1	< 0.7	< 0.3	< 2.0	1,500	P	P	P
Ethanol, 2-ethoxy-	110-80-5	< 1.1	< 0.5	< 3.2	35	P	P	P
Toluene	108-88-3	< 0.8	< 0.4	< 2.2	150	P	P	P
Formamide, N,N-dimethyl-	68-12-2	< 2.8	< 1.3	< 8.0	40	P	P	P
Tetrachloroethylene	127-18-4	< 1.1	< 0.5	< 3.1	17.5	P	P	P
Benzene, chloro-	108-90-7	< 1.2	< 0.5	< 3.3	500	P	P	P
Ethylbenzene	100-41-4	< 0.7	< 0.3	< 2.0	1,000	P	P	P
Xylene (-m, -p, & -o)	108-38-3, 95-47-6, 106-42-3	< 1.8	< 0.8	< 5.0	350	P	P	P
Styrene	100-42-5	< 1.2	< 0.6	< 3.5	450	P	P	P
2-Ethoxyethyl acetate	111-15-9	< 2.5	< 1.1	< 7.0	150	P	P	P
Phenol	108-95-2	< 0.7	< 0.3	< 2.0	100	P	P	P
Benzene, 1,4-dichloro-	106-46-7	< 1.1	< 0.5	< 3.0	400	P	P	P
Isophorone	78-59-1	< 0.7	< 0.3	< 2.0	1,000	P	P	P
Naphthalene	91-20-3	< 1.1	< 0.5	< 3.0	4.5	P	P	P

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

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	R		PO	SC	R
Acetic acid	64-19-7	6.5	2.9	18.5	N/A	-	-	-
Butylated hydroxytoluene	128-37-0	114	51.1	325	N/A	-	-	-
TVOC _{Toluene}	-	165	73.8	470	-	-	-	-

PHOTOGRAPHS:



SECTION 4

FACILITIES AND EQUIPMENT:

GCMS	
INSTRUMENTATION USED:	Markes TD-100 Thermal Desorption Agilent 7890A GC Agilent 5975C MS
COLUMN USED:	AGILENT HP-5MS (GC)
HPLC	
INSTRUMENTATION USED:	Agilent 1260 Infinity Series
COLUMN USED:	Poroshell 120 EC-C18

TEST REPORT FOR FRÄSCH!


Date: 22-April-2021

Report No.: 104624813GRR-001a

P.O.: CAG1009

SECTION 5

CHAIN OF CUSTODY

	Ship To:	Chain of Custody for Chemical Testing		
	Attn: VOC Laboratory 4700 Broadmoor Ave SE Suite 200 Kentwood, MI 49512 Phone: 616-656-7401	Intertek Quotation Number: Qu-01153163-3 Purchase Order (enter Company and Number):		
Customer Information		Shipping Details		
Company: Frasch Street Address: 609 112th ST STE A City/State/Postal code: Arlington, Texas 76011 Country: United States Contact Name & Title (for reporting): Ethan Lington - Partner Resource Manager Contact Phone/Fax Numbers: 682.200.3005 Contact E-mail Address: el@frasch.co Financially Responsible Co. : CAG		Packed & Shipped By: Terry Davis Shipping Date: 3/9/2021 Carrier/Airbill Number: FedEx: 773110551595		
Manufacturer Information (If Different)		Requested Testing		
Company: City/State/Country: Contact Name/Title: Phone Number/E-mail Address:		Test to be performed: CDPH 01350		
Sample Details		Customer Request for Certification		
Product Commercial Name*: 9 MM PET Product Commercial Part No.(if not part of the name)*: Manufacturer Sample Tracking ID: Date Manufactured*: 3/9/2021 Product Category & Use*: Acoustics / Sound Masking Sample Construction Materials*: 100% Polyethylene Terephthalate Plant Name & Location*: Frasch, Arlington Texas Collection Location within Plant: Date & Time Collected*: 3/9/2021 at 9:00AM Number of Sample Pieces*: 1 Sample Collected by*: Terry Davis Phone/Fax Numbers*: 682.200.3005 E-mail Address*: td@frasch.co		Clean Air Silver™ Certification: <input type="checkbox"/> YES Clean Air Gold™ Certification: <input checked="" type="checkbox"/> YES		
Special Customer Instructions		Customer Authorizes Laboratory to Submit Copies of Test Reports To:		
		Contact: Ethan Lington Email Address: el@frasch.co Organization: Frasch Contact: Jennifer Chagnon Email Address: jchagon@catalystacoustics.com Organization: CAG		
Sample Handling*		Intertek Use Only		
		Condition of Shipping Package: Good Condition of Sample: Good Sample ID: GRR2103120013 GIN: G104624813 *Indicates required field		
	Printed Name*	Signature*	Date*	Company*
Relinquished By:	Ethan Lington	<i>Ethan Lington</i>	3/15/2021	Frasch
Received by:	Kyle Tanis	<i>Kyle Tanis</i>	3/15/21	Intertek