

VIETNAM SENTAI ENVIRONMENTAL PROTECTION NEW MATERIALS TECHNOLOGY COMPANY LIMITED

TEST REPORT

SCOPE OF WORK

SPC FLOORING

REPORT NUMBER

231007177GZU-002

TEST DATE(S)

2023-10-07 ~ 2023-10-24

ISSUE DATE

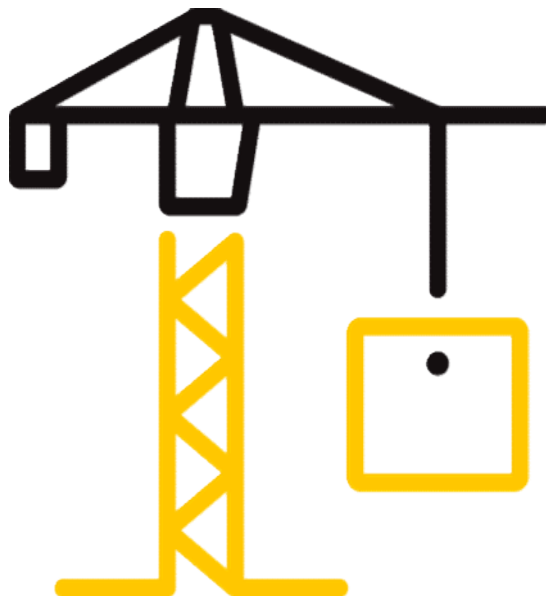
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Intertek Testing Services Shenzhen Ltd. Guangzhou Branch

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- 5.All the tests results give the statement of conformity refer to the decision rule of "Procedure 2 "Accuracy Method" as stated in the IEC Guide 115:2007.

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Client Information:

Applicant Name:	VIETNAM SENTAI ENVIRONMENTAL PROTECTION NEW MATERIALS TECHNOLOGY COMPANY LIMITED
Address:	FACTORY 1B+2B+6B+6C- PHASE 2, LOT CN18, YEN BINH INDUSTRIAL PARK, DONG TIEN WARD, PHO YEN CITY, THAINGUYEN, VIETNAM
Attn:	/

Product Information:

Product Name	SPC FLOORING	Sample Description	Good Condition
Model and/or type reference	0.5 WL +4.5 SPC CORE +1.5 IXPE	Received Date	2023-09-22
Specification	1220*183*6.5	Brand	/
Sample ID.	S231007177GZU.001	Sample Amount	1 pack
Manufacturer	/		
Address	/		
Test Type	Performance test, samples provided by the applicant		

Test Methods And Standards:

Test Standard	Please refer to next following pages.
Specification Standard	Please refer to next following pages.
Test Conclusion	Please refer to next following pages.

Laboratory information:

Testing Laboratory	Intertek testing services Shenzhen Ltd. Guangzhou Branch
Test location	No. 8, East BaoYing Road, Huangpu District, Guangzhou, China

Report Authorized :

Approved By:

Jin Liang

Jin Liang
Reviewer

Checked By:

Andy Guo

Andy Guo
Project Engineer

Noted: If you have any questions for the report, please contact: lillian.lf.he@intertek.com

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Test Items, Method and Results:

Test Items, Method and Results:

1. Test Standard:

CDPH/EHLB/Standard Method V1.2, 2017

Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers Version 1.2 - Emission testing method for California Specification 01350

2. Test Method:

With reference to ASTM D5197-16 Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology);

ASTM D6196-15^{e1} Standard Practice for Choosing Sorbents, Sampling Parameters and Thermal Desorption Analytical Conditions for Monitoring Volatile Organic Chemicals in Air;

U.S. EPA. Method TO-17. 1997. Determination of Volatile Organic Compounds in Ambient Air Using Active Sampling Onto Sorbent Tubes;

ISO 16000-9:2006/Cor 1:2007 - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method;

ISO 16000-11:2006 Indoor air - Part 11: Determination of the emission of volatile organic compounds from building products and furnishing - Sampling, storage of samples and preparation of test specimens.

3. Test Procedure:

The sample was tested in the emission test chamber. After defined times, chamber air samples were collected. Samples analyzed for individual VOCs and TVOC were collected on sorbent tubes Tenax TA, and were detected by Automatic Thermal Desorption-Gas Chromatography/Mass Spectrometric (ATD-GC/MS). Samples analyzed for aldehydes were collected on DNPH cartridge, and were detected by High Performance Liquid Chromatography (HPLC).

4. Conditioning of the sample until testing date:

23°C±2°C, 50%±5%, 10days

5. Test condition:

Test chamber	:	0.06	m ³
Exposed sample surface area	:	0.06	m ²
Loading factor	:	1	m ² /m ³
Supply air temperature	:	23±1	°C
Supply air humidity	:	50±5	% R.H
Air exchange rate	:	1.0	h ⁻¹
Area specific flow rate	:	1.000	m/h
Sampling	:	Tenax TA & DNPH cartridge	

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6. Test result:

Table 1 Evaluation for different scenarios

Modeling scenario	Verdict(Pass/Fail)
Standard school classroom (SC)	Pass
Private office (PO)	Pass
Single family residence (R) ^{&}	Pass

Remark: &The single family residence modeling scenario is not yet a requirement and is for informational purposes only.

Table 2 Chamber Concentration and Emission Factor of Formaldehyde and TVOC

Parameter	CAS number	Chamber Concentration ($\mu\text{g}/\text{m}^3$)			Emission Factor ($\mu\text{g}/\text{m}^2\cdot\text{h}$)		
		264h	288h	336h	264h	288h	336h
Formaldehyde [#]	50-00-0	<2	<2	<2	<2	<2	<2
TVOC	/	<10	<10	<10	<10	<10	<10

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Table 3 336h Chamber concentration and Emission Factor of all Target VOCs

No.	Compound Name	CAS Number	Chamber Concentration ($\mu\text{g}/\text{m}^3$)	Emission Factor ($\mu\text{g}/\text{m}^2\cdot\text{h}$)
1	Acetaldehyde#	75-07-0	<2	<2
2	Benzene	71-43-2	<1	<1
3	Carbon disulfide	75-15-0	<2	<2
4	Carbon tetrachloride	56-23-5	<2	<2
5	Chlorobenzene	108-90-7	<2	<2
6	Chloroform	67-66-3	<2	<2
7	Dichlorobenzene (1,4-)	106-46-7	<2	<2
8	Dichloroethylene (1,1)	75-35-4	<2	<2
9	Dimethylformamide (N,N-)	68-12-2	<2	<2
10	Dioxane (1,4-)	123-91-1	<2	<2
11	Epichlorohydrin	106-89-8	<1	<1
12	Ethylbenzene	100-41-4	<2	<2
13	Ethylene glycol	107-21-1	<2	<2
14	Ethylene glycol monoethyl ether	110-80-5	<2	<2
15	Ethylene glycol monoethyl ether acetate	111-15-9	<2	<2
16	Ethylene glycol monomethyl ether	109-86-4	<2	<2
17	Ethylene glycol monomethyl ether acetate	110-49-6	<2	<2
18	Formaldehyde#	50-00-0	<2	<2
19	Hexane (n-)	110-54-3	<2	<2
20	Isophorone	78-59-1	<2	<2
21	Isopropanol	67-63-0	<2	<2
22	Methyl chloroform	71-55-6	<2	<2
23	Methylene chloride	75-09-2	<2	<2
24	Methyl t-butyl ether	1634-04-4	<2	<2
25	Naphthalene	91-20-3	<2	<2
26	Phenol	108-95-2	<2	<2
27	Propylene glycol monomethyl ether	107-98-2	<2	<2
28	Styrene	100-42-5	<2	<2
29	Tetrachloroethylene	127-18-4	<2	<2
30	Toluene	108-88-3	<2	<2
31	Trichloroethylene	79-01-6	<2	<2
32	Vinyl acetate	108-05-4	<2	<2
33~35	Xylenes, technical mixture (m-, o-, p-xylene combined)	108-38-3 95-47-6 106-42-3	<2	<2

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Table 4 336h non-Listed VOCs detected above lower limits of semi-quantitation.

Compound Name	CAS No.	SURROGATE ¹	CREL (µg/m ³) ²	CARB TAC ³	PROP 65 LIST ⁴	Chamber Concentration (µg/m ³)	Emission Factor (µg/m ² ·h)
Not Detected	/	/	/	/	/	/	/

Table 5 Top Ten VOCs having the highest emission factors in 336h.

Compound Name	CAS No.	SURROGATE ¹	CREL (µg/m ³) ²	CARB TAC ³	PROP 65 LIST ⁴	Chamber Concentration (µg/m ³)	Emission Factor (µg/m ² ·h)
Not Detected	/	/	/	/	/	/	/

Remark:

1. Indicates which non-listed VOCs were quantified using surrogate compounds, all other compounds were quantified using pure compounds.
2. Chronic Reference Exposure Level (CREL) as defined by California Office of Environmental Health Hazard Assessment.
3. Substance is listed on California Air Resource Board's (CARB) Toxic Air Contaminant (TAC) identification list.
4. Substance 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)
5. # = indicates aldehydes identified and quantified by DNPH derivatization and HPLC/DAD analysis.
6. TVOC means sum of the concentrations of all identified and unidentified VOCs between and including n-pentane through n-heptadecane (i.e., C₅-C₁₇) as measured by the GC/MS TIC method and expressed as a toluene equivalent value.
7. Detection limit of individual compound = 1 µg/m³ for Benzene and Epichlorohydrin, 2 µg/m³ for others
Detection limit of TVOC = 10 µg/m³
8. Emission Factor (µg/m²·h) = Chamber Concentration (µg/m³) x Area Specific Flow rate (m/h)

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7. Estimated Concentration for different scenarios and evaluation of the requirement.

Table 6 Parameters to be used for estimation of VOC concentrations for Flooring

Scenario	Room Size(m ³)	Exposed Surface Area (m ²)	Effective outdoor air change rate (h ⁻¹)	Air Flow Rate (m ³ /h)
Standard school classroom	231	89.2	0.82	191
Private office	30.6	11.1	0.68	20.7
Single family residence	547	211	0.23	127

Remark:

The above parameters are cited from section 01350 table 4-2, 4-3, for Standard school classroom, and table 4-4, 4-5 for Private office, and table B-1, B-2 for single family residence.

Table 7 Estimated Concentration of all Target VOCs for different scenarios and evaluation of the requirement

No.	Compound Name	CAS No.	Estimated concentration (µg/m ³)			Allowable Concentration (µg/m ³)	Verdict (Pass/Fail)		
			SC	PO	R		SC	PO	R
1	Acetaldehyde [#]	75-07-0	<0.9	<1.1	<3.3	70	Pass	Pass	Pass
2	Benzene	71-43-2	<0.5	<0.5	<1.7 [^]	1.5	Pass	Pass	Pass
3	Carbon disulfide	75-15-0	<0.9	<1.1	<3.3	400	Pass	Pass	Pass
4	Carbon tetrachloride	56-23-5	<0.9	<1.1	<3.3	20	Pass	Pass	Pass
5	Chlorobenzene	108-90-7	<0.9	<1.1	<3.3	500	Pass	Pass	Pass
6	Chloroform	67-66-3	<0.9	<1.1	<3.3	150	Pass	Pass	Pass
7	Dichlorobenzene (1,4-)	106-46-7	<0.9	<1.1	<3.3	400	Pass	Pass	Pass
8	Dichloroethylene (1,1)	75-35-4	<0.9	<1.1	<3.3	35	Pass	Pass	Pass
9	Dimethylformamide (N,N-)	68-12-2	<0.9	<1.1	<3.3	40	Pass	Pass	Pass
10	Dioxane (1,4-)	123-91-1	<0.9	<1.1	<3.3	1500	Pass	Pass	Pass
11	Epichlorohydrin	106-89-8	<0.5	<0.5	<1.7 [^]	1.5	Pass	Pass	Pass
12	Ethylbenzene	100-41-4	<0.9	<1.1	<3.3	1000	Pass	Pass	Pass
13	Ethylene glycol	107-21-1	<0.9	<1.1	<3.3	200	Pass	Pass	Pass
14	Ethylene glycol monoethyl ether	110-80-5	<0.9	<1.1	<3.3	35	Pass	Pass	Pass
15	Ethylene glycol monoethyl ether acetate	111-15-9	<0.9	<1.1	<3.3	150	Pass	Pass	Pass
16	Ethylene glycol monomethyl ether	109-86-4	<0.9	<1.1	<3.3	30	Pass	Pass	Pass

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No.	Compound Name	CAS No.	Estimated concentration ($\mu\text{g}/\text{m}^3$)			Allowable Concentration ($\mu\text{g}/\text{m}^3$)	Verdict (Pass/Fail)		
			SC	PO	R		SC	PO	R
17	Ethylene glycol monomethyl ether acetate	110-49-6	<0.9	<1.1	<3.3	45	Pass	Pass	Pass
18	Formaldehyde [#]	50-00-0	<0.9	<1.1	<3.3	9	Pass	Pass	Pass
19	Hexane (n-)	110-54-3	<0.9	<1.1	<3.3	3500	Pass	Pass	Pass
20	Isophorone	78-59-1	<0.9	<1.1	<3.3	1000	Pass	Pass	Pass
21	Isopropanol	67-63-0	<0.9	<1.1	<3.3	3500	Pass	Pass	Pass
22	Methyl chloroform	71-55-6	<0.9	<1.1	<3.3	500	Pass	Pass	Pass
23	Methylene chloride	75-09-2	<0.9	<1.1	<3.3	200	Pass	Pass	Pass
24	Methyl t-butyl ether	1634-04-4	<0.9	<1.1	<3.3	4000	Pass	Pass	Pass
25	Naphthalene	91-20-3	<0.9	<1.1	<3.3	4.5	Pass	Pass	Pass
26	Phenol	108-95-2	<0.9	<1.1	<3.3	100	Pass	Pass	Pass
27	Propylene glycol monomethyl ether	107-98-2	<0.9	<1.1	<3.3	3500	Pass	Pass	Pass
28	Styrene	100-42-5	<0.9	<1.1	<3.3	450	Pass	Pass	Pass
29	Tetrachloroethylene	127-18-4	<0.9	<1.1	<3.3	17.5	Pass	Pass	Pass
30	Toluene	108-88-3	<0.9	<1.1	<3.3	150	Pass	Pass	Pass
31	Trichloroethylene	79-01-6	<0.9	<1.1	<3.3	300	Pass	Pass	Pass
32	Vinyl acetate	108-05-4	<0.9	<1.1	<3.3	100	Pass	Pass	Pass
33	Xylenes, technical mixture (m-, o-, p-xylene combined)	108-38-3	<0.9	<1.1	<3.3	350	Pass	Pass	Pass
34		95-47-6							
35		106-42-3							
36	TVOC	—	<4.7	<5.4	<16.6	—	—	—	—

Remark:

- The Allowable Concentration is cited from Section 01350 table 4-1, no requirement for TVOC.
- [#]Individual VOC of concern is below lower limits of quantitation for modeled scenario.

Table 8 Estimated Concentration of non-listed VOCs for different scenarios

No.	Compound Name	CAS No.	Estimated concentration ($\mu\text{g}/\text{m}^3$)		
			SC	PO	R
1	Not Detected	/	/	/	/

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Appendix A: Sample Received Photo



Revision:

Revision No.	Date	REVISION	Reviser	Reviewer
/	/	Original Report Issue	/	/

*****End of Report*****