

Nanhai Display Limited

TEST REPORT

SCOPE OF WORK

Nano Cloaking Film

REPORT NUMBER

230703002SHF-002

TEST DATE(S)

2023-07-03 - 2023-07-26

ISSUE DATE

2023-07-27

PAGES

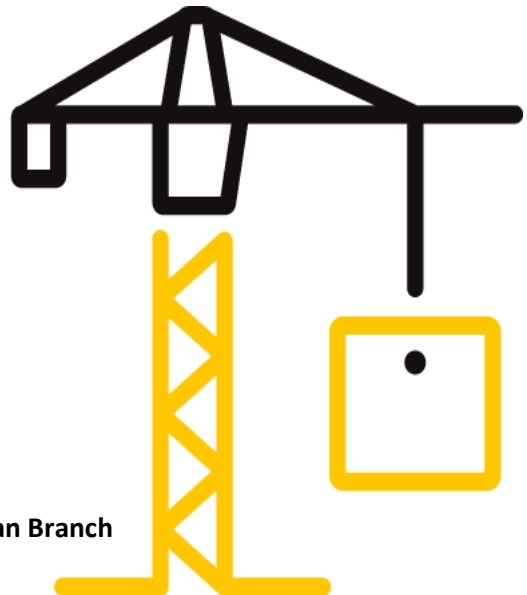
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DOCUMENT CONTROL NUMBER

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Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch



Test Report

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Test Report

Issue Date: 2023-07-27 Intertek Report No. 230703002SHF-002
 Applicant: Nanhai Display Limited
 Address: Rooms 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, HK, 999077
 Attn: Joe Son
 Manufacturer: Xiuya Technology (Shanghai) Co.,Ltd.
 Address: Room U22, Building 3, No.39 Linbao Road, Tinglin Town, Jinshan District, Shanghai
 Test Type: Performance test, samples provided by the applicant.

Product Information

Product Name	Nano Cloaking Film	Brand	/
Sample Description	Good Condition	Sample Amount	1 pcs
		Received Date	2023-06-30
Sample ID	Model	Specification	
S230703002SHF.002	T0F2	48inch*100feet	

Test Methods And Standards

Test Standard	CDPH/EHLB/Standard Method V1.2, 2017
Specification Standard	CDPH/EHLB/Standard Method V1.2, 2017
Test Conclusion	The samples were tested according to the above standards, and the results are shown in the following page.

Note:

1.This report does not involve sampling. The report only reflects conformity of the tested items of the samples provided by the testing applicant. Representativeness and authenticity of the submitted samples are responsibilities of the testing applicant.

Report Authorized


 Name: Flora Fan
 Title: Reviewer


 Name: Lu Cheng
 Title: Project Engineer



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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 Methods TO-17 Determination of Volatile Organic Compounds in Ambient Air Using Active Sampling Onto Sorbent Tubes;

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;

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 m³

Exposed sample surface area: 0.06 m²

Loading factor: 1.0 m²/m³

Supply air temper: 23°C±1°C

Supply air humidity: 50%±5% R.H.

Air exchange rate: 1.0 h⁻¹

Area specific flow rate: 1.0 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 24h, 48h and 96h Chamber Concentration and Emission Factor of Formaldehyde and TVOC

Parameter	CAS number	Chamber Concentration ($\mu\text{g}/\text{m}^3$)			Emission Factor ($\mu\text{g}/\text{m}^2\cdot\text{h}$)		
		24h	48h	96h	24h	48h	96h
Formaldehyde [#]	50-00-0	<2	<2	<2	<2	<2	<2
TVOC	/	<10	<10	<10	<10	<10	<10

Table 3 96h 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	<2	<2
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	<2	<2
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

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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

Table 4 VOCs detected above lower limits of quantitation in air samples at 96h

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)
1-butanol	71-36-3	YES	/	NO	NO	6.3	6.3

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Table 5 Top ten VOCs having the highest emission factors in 96h

Compound Name	CAS No.	SURROGATE ¹	CREL ($\mu\text{g}/\text{m}^3$) ²	CARB TAC ³	PROP 65 LIST ⁴	Chamber Concentration ($\mu\text{g}/\text{m}^3$)	Emission Factor ($\mu\text{g}/\text{m}^2\cdot\text{h}$)
1-butanol	71-36-3	YES	/	NO	NO	6.3	6.3

Note:

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 = 2 $\mu\text{g}/\text{m}^3$
Detection limit of TVOC = 10 $\mu\text{g}/\text{m}^3$
8. Test location: Central Chemical Lab of Intertek Testing Services Ltd., Wuxi
Address: No. 8, Fubei Road, Xishan Economic Development Zone, Wuxi, China

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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

Scenario	Room Size(m ³)	Wall coverings Area (m ²)	Effective outdoor air change rate (h ⁻¹)	Air Flow Rate (m ³ /h)
Standard school classroom	231	94.6	0.82	191
Private office	30.6	33.4	0.68	20.7
Single family residence	547	562	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 Number	Estimated concentration (µg/m ³)			Allowable Concentration (µg/m ³)	Verdict (Pass/Fail)		
			SC	PO	R		SC	PO	R
1	Acetaldehyde [#]	75-07-0	<1.0	<3.2	<8.9	70	Pass	Pass	Pass
2	Benzene	71-43-2	<1.0	<3.2*	<8.9*	1.5	Pass	Pass	Pass
3	Carbon disulfide	75-15-0	<1.0	<3.2	<8.9	400	Pass	Pass	Pass
4	Carbon tetrachloride	56-23-5	<1.0	<3.2	<8.9	20	Pass	Pass	Pass
5	Chlorobenzene	108-90-7	<1.0	<3.2	<8.9	500	Pass	Pass	Pass
6	Chloroform	67-66-3	<1.0	<3.2	<8.9	150	Pass	Pass	Pass
7	Dichlorobenzene (1,4-)	106-46-7	<1.0	<3.2	<8.9	400	Pass	Pass	Pass
8	Dichloroethylene (1,1)	75-35-4	<1.0	<3.2	<8.9	35	Pass	Pass	Pass
9	Dimethylformamide (N,N-)	68-12-2	<1.0	<3.2	<8.9	40	Pass	Pass	Pass
10	Dioxane (1,4-)	123-91-1	<1.0	<3.2	<8.9	1500	Pass	Pass	Pass
11	Epichlorohydrin	106-89-8	<1.0	<3.2*	<8.9*	1.5	Pass	Pass	Pass
12	Ethylbenzene	100-41-4	<1.0	<3.2	<8.9	1000	Pass	Pass	Pass
13	Ethylene glycol	107-21-1	<1.0	<3.2	<8.9	200	Pass	Pass	Pass
14	Ethylene glycol monoethyl ether	110-80-5	<1.0	<3.2	<8.9	35	Pass	Pass	Pass
15	Ethylene glycol monoethyl ether acetate	111-15-9	<1.0	<3.2	<8.9	150	Pass	Pass	Pass

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16	Ethylene glycol monomethyl ether	109-86-4	<1.0	<3.2	<8.9	30	Pass	Pass	Pass
17	Ethylene glycol monomethyl ether acetate	110-49-6	<1.0	<3.2	<8.9	45	Pass	Pass	Pass
18	Formaldehyde [#]	50-00-0	<1.0	<3.2	<8.9	9	Pass	Pass	Pass
19	Hexane (n-)	110-54-3	<1.0	<3.2	<8.9	3500	Pass	Pass	Pass
20	Isophorone	78-59-1	<1.0	<3.2	<8.9	1000	Pass	Pass	Pass
21	Isopropanol	67-63-0	<1.0	<3.2	<8.9	3500	Pass	Pass	Pass
22	Methyl chloroform	71-55-6	<1.0	<3.2	<8.9	500	Pass	Pass	Pass
23	Methylene chloride	75-09-2	<1.0	<3.2	<8.9	200	Pass	Pass	Pass
24	Methyl t-butyl ether	1634-04-4	<1.0	<3.2	<8.9	4000	Pass	Pass	Pass
25	Naphthalene	91-20-3	<1.0	<3.2	<8.9*	4.5	Pass	Pass	Pass
26	Phenol	108-95-2	<1.0	<3.2	<8.9	100	Pass	Pass	Pass
27	Propylene glycol monomethyl ether	107-98-2	<1.0	<3.2	<8.9	3500	Pass	Pass	Pass
28	Styrene	100-42-5	<1.0	<3.2	<8.9	450	Pass	Pass	Pass
29	Tetrachloroethylene	127-18-4	<1.0	<3.2	<8.9	17.5	Pass	Pass	Pass
30	Toluene	108-88-3	<1.0	<3.2	<8.9	150	Pass	Pass	Pass
31	Trichloroethylene	79-01-6	<1.0	<3.2	<8.9	300	Pass	Pass	Pass
32	Vinyl acetate	108-05-4	<1.0	<3.2	<8.9	100	Pass	Pass	Pass
33~35	Xylenes, technical mixture (m-, o-, p-xylene combined)	108-38-3 95-47-6 106-42-3	<1.0	<3.2	<8.9	350	Pass	Pass	Pass
36	TVOC	—	<5.0	<16.1	<44.3	—	—	—	—

Remark:

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

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

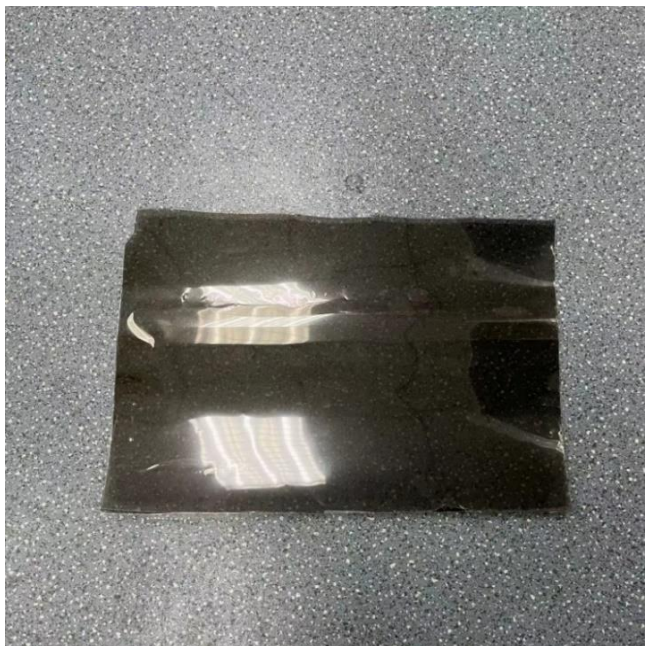
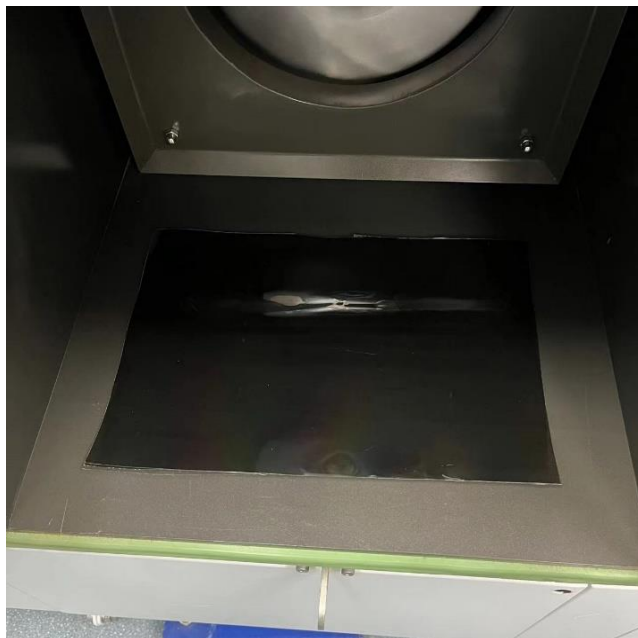
No.	Compound Name	CAS Number	Estimated concentration (µg/m ³)		
			SC	PO	R
1	1-butanol	71-36-3	3.1	10.2	27.9

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Test Photo:



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Appendix A: Sample Received Photo



Revision:

NO.	Date	Changes
230703002SHF-002	2023-07-27	First issue