# NANTONG OFISOLUTION NEW MATERIAL CO., LTD

# TEST REPORT

**SCOPE OF WORK**
PET ACOUSTIC PANEL

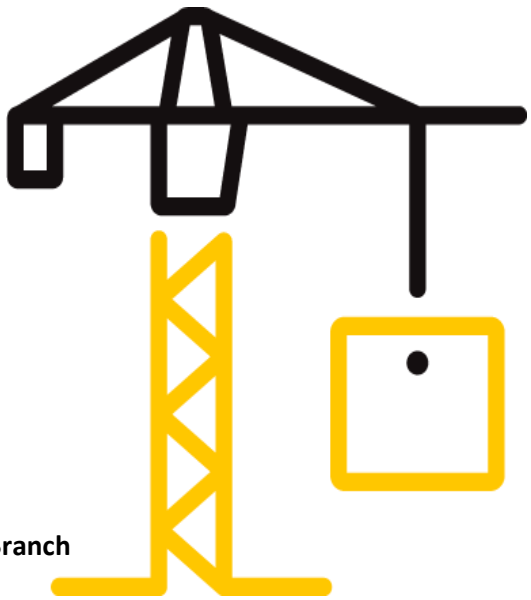
**REPORT NUMBER**
191206003SHF-001

**TEST DATE(S)**
2019-12-06 - 2020-01-06

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2020-01-06

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11

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LFT-APAC-SHF-OP-10k(May 1, 2019)
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**Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch**

## Test Report

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# Test Report

Issue Date: 2020-01-06 Intertek Report No. 191206003SHF-001
Applicant: NANTONG OFISOLUTION NEW MATERIAL CO., LTD
Address: 198 GONGNONG ROAD, NANTONG, JIANGSU, P.R.CHINA
Attn: Wenwen Wang
Test Type： Performance test, samples provided by the applicant.

**Product Information**

| | | | |
|---|---|---|---|
| **Product Name** | PET ACOUSTIC PANEL | **Brand** | / |
| **Sample Description** | Good Condition | **Sample Amount** | 1 piece |
| | | **Received Date** | 2019-12-06 |

| **Sample ID** | **Model** | **Specification** |
|---|---|---|
| S191206003SHF.001 | Light Grey | 1000x1000x9mm |
| | | |

**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 relates specifically to the sample(s) that were drawn and provided by the applicant or their nominated third party. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and/or shipment and only relate to the sample(s) as received and tested.

**Report Authorized**

Name: Flora Fan
Title: Reviewer

Name: Milo Liu
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 $m^3$

Exposed sample surface area: 0.06 $m^2$

Loading factor: 1.0 $m^2/m^3$

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 ($\mu g/m^3$) | | | Emission Factor ($\mu g/m^2 \cdot h$) | | |
|---|---|---|---|---|---|---|---|
| | | 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 ($\mu g/m^3$) | Emission Factor ($\mu g/m^2 \cdot h$) |
|---|---|---|---|---|
| 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<br>95-47-6<br>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) |
|---|---|---|---|---|---|---|---|
| Not Detected | / | / | / | / | / | / | / |

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

| Compound Name | CAS No. | SURROGATE[1] | CREL ($\mu g/m^3$)[2] | CARB TAC[3] | PROP 65 LIST[4] | Chamber Concentration ($\mu g/m^3$) | Emission Factor ($\mu g/m^2 \cdot h$) |
|---|---|---|---|---|---|---|---|
| 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 Contaminate (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., $C_5$-$C_{17}$) as measured by the GC/MS TIC method and expressed as a toluene equivalent value.

7. Detection limit of individual compound = 2 $\mu g/m^3$

Detection limit of TVOC = 10 $\mu g/m^3$

8. Test location: Central Chemical Lab of Intertek Testing Services Ltd., Wuxi
Address: No. 8, Fubei road, Xishan Economic Development Zone, Wuxi, Jiangsu, 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<br>95-47-6<br>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 | Not Detected | / | / | / | / |

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**Test Photo:**

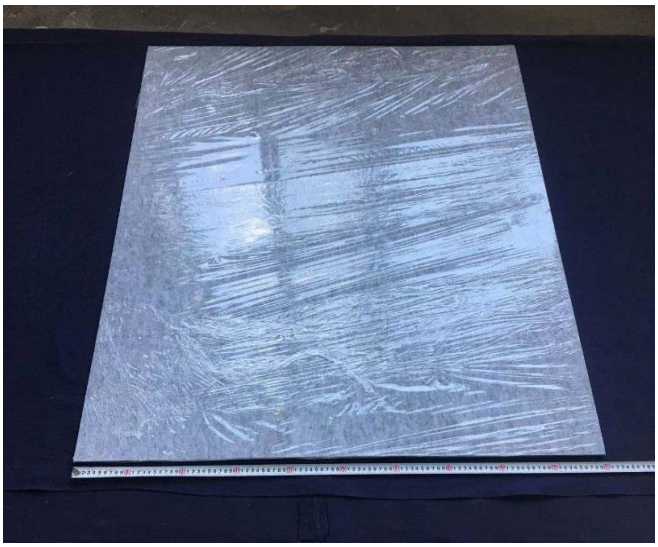




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**Appendix A: Sample Received Photo**



**Revision:**

| NO. | Date | Changes | Author | Reviewer |
|---|---|---|---|---|
| 191206003SHF-001 | 2020-01-06 | First issue | Milo Liu | Flora Fan |