ALSEAL MARKETING SDN. BHD. Co.No.: 200301022720 (625140-D)
No. 86, Jalan Industri 3/3, Rawang Integrated Industrial Park, 48000 Rawang, Selangor.
**Tel:** +603-6094 2088 **Fax:** +603-6099 2930 **Email:** info@alsealmarketing.com
**Website:** www.alsealmarketing.com
*A member of* NIPPON PAINT

Our reference: 10/K22/LTR/Y498

10th November 2022

**Dear Valued Customer / Business Partners,**

**RE: AS-5001 Green Nails Statement of Product Compliance**

This letter is to elaborate on AS-5001 Green Nails contributing to Leadership in Energy and Environmental Design (LEED) v4.1 credit. The EQ Credit: Low-Emitting Materials requires 75 % of adhesives and sealants to meet the volatile organic compound (VOC) emissions evaluation and 100 % of adhesives and sealants to meet the VOC content evaluation.

For VOC emissions, the product is to be tested as per the California Department of Public Health (CDPH) Standard Method v1.2-2017. The product must comply with the VOC allowable concentration listed in Table 4-1 of the standard method. The total VOC (TVOC) after 14 days is required to be reported in ranges as specified in the standard method.

The parameters for the modelling scenario are as follows:

| **Parameter** | **Value** | |
|---|---|---|
| | **Standard School Classroom** | **Standard Private Office** |
| Volume | 231 $m^3$ | 30.6 $m^3$ |
| Air change rate | 0.82 $hr^{-1}$ | 0.68 $hr^{-1}$ |
| Estimated exposed area | 1.62 $m^2$ | 0.21 $m^2$ |

The TVOC of AS-5001 Green Nails after 14 days is as follow:

| **Elapsed exposure hour after 10 days conditioning** | **Predicted Air Concentration** | |
|---|---|---|
| | **Standard School Classroom** | **Standard Private Office** |
| 96 | 0.5 $mg/m^3$ or less | Between 0.5 and 5 $mg/m^3$ |

Formaldehyde content was not detected for all results (refer to Table 2 and Table 3 of test report 7191274108-CHM22-04-LS-AD2.

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For VOC content, the product is to be tested as per the South Coast Air Quality Management District (SCAQMD) Rule 1168. The VOC content of AS-5001 Green Nails is 18.06g/L (refer to certificate CCN18070056H03-0). This is below the current (70g/L) under "Multi-Purpose Construction Adhesives" category.

Based on the test result of VOC emission (test report 7191274108-CHM22-04-LS-AD2) and VOC content (certificate CCN18070056H03-0), AS-5001 Green Nails complies to requirements of LEED v4.1 EQ Credit: Low-Emitting Materials.

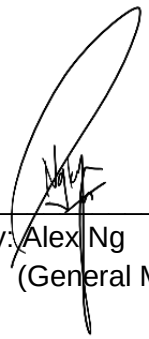
Should you require any additional information, please do not hesitate to contact us.

Thank you.

Yours sincerely,

For Alseal Marketing Sdn. Bhd.

Prepared by: Yap Wai Hoong
(R&D Chemist)



Verified by: Alex Ng
(General Manager (Technical))

# TEST REPORT: 7191274108-CHM22-04-LS-AD2

Date: 07 NOV 2022 Tel: +65 6973 6176

Client's Ref: Email: Sihai.Li@tuvsud.com



PSB Singapore

Add value.
Inspire trust.

## SUBJECT

Evaluation of "AS-5001" product sample in accordance with CDPH/EHLB/Standard Method Version 1.2

## CLIENT

Alseal Marketing Sdn. Bhd.
No. 86, Jalan Industri 3/3,
Rawang Integrated Industrial Park,
48000 Rawang, Selangor DE
Malaysia

## DESCRIPTION OF SAMPLE

Two tubes of sample labelled as followed were received on 18 Jul 2022

| | |
|---|---|
| **Product Name** | Green Nails |
| **Model / Series** | AS-5001 |
| **Product Type** | Adhesive |

## DATE OF ANALYSIS

18 July 2022 – 17 October 2022

PSB Singapore

Note:

1. No physical test sample was submitted for testing for the specific product which is the subject of this additional test report.

2. Test results stated in this additional test report was based exclusively on the test results of a past submitted and tested sample reported in Test report No. 7191274108-CHM22-04-LS dated 20 OCT 2022.

3. This additional test report was issued on the basis of the declaration by the Customer that the specific product which is the subject of this additional test report is exactly the same as the original sample provided for Test report No. 7191274108-CHM22-04-LS dated 20 OCT 2022 in terms of technical specification and performance.

4. Details of the product, including name, brand, article number and any technical specification are solely provided by the Customer. No verification has been done by TUV SUD PSB Pte Ltd whether such details are true and correct.

5. Details of Customer's declaration are as follows :

| | |
|---|---|
| Company Name : | Vital Technical Sdn. Bhd. |
| Address : | No. 93, Jalan Industri 3/3, Rawang Integrated Industrial Park, 48000 Rawang, Selangor DE, Malaysia |
| Name of Authorised person : | Mr Cheong Chee Leong |
| Contact Telephone / Email address : | +603-60942088 / cl.cheong@vitaltechnical.com |

## METHOD OF TEST

### 1. Emission Test

The following emission tests were conducted according to CDPH/EHLB/Standard Method Version 1.2 – *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers*

1) Total Volatile Organic Compounds (TVOC) Emission Rate
2) Formaldehyde Emission Rate

**Emission Test Condition**

| | | |
|---|---|---|
| 1) | Chamber Volume: | about 1$m^3$ |
| 2) | Temperature: | 23°C |
| 3) | Relative Humidity: | 50% |
| 4) | Air Exchange Rate: | n=1 (air change rate per hour in the chamber) |
| 5) | Chamber Loading Ratio: | 0.3-1.0 $m^2/m^3$ (total exposed surface area of the test specimen divided by the net air volume of the emission test chamber) |
| 6) | Air Velocity: | 0.1 m/s to 0.3 m/s (over the surface of the test specimen) |

Note: Chamber Loading ratio for the tested sample: 0.007 $m^2/m^3$

### 2. Sampling, Desoprtion, Analysis

1) For analysis, the air was sampled using constant flow rate pumps, equipped with absorbent containing Tenax TA to trap VOCs. (sampling and assay carried out according to ISO 16000-6 / ASTM D5116).
2) In addition, the air was sampled using constant flow rate pumps, provided with absorbent containing di-nitrophenylhydrazine (DNPH) grafted silica cartridge to trap aldehydes. (sampling and assay performed according to ISO 16000-3)
3) The Tenax samples were then desorbed by Automated Thermal Desorber System and then analyzed by Gas Chromatography coupled with Mass Spectrometry (ATD-GCMS).
4) The samples on DNPH cartridge were then desorbed to form the stable compound hydrazone, which was then assayed by Liquid Chromatography (HPLC) with UV / Diode Array Detector.

**METHOD OF TEST** *(cont')*

**3. Calculation of Results**

**Air Concentration Determinations**

Emission Factor Calculations

*EF = C X (N/L)*

EF = emission factor (µg/m$^2$·hr) or (µg/unit·hr)
C = chamber concentration (µg/m$^3$)
N = chamber air exchange rate (hr $^{-1}$)
L = product loading (m$^2$/m$^3$)

The model measurements were made with the following assumptions: air within open office areas of the building is well-mixed at the breathing level zone of the occupied space; environmental conditions are maintained at 50 % relative humidity and 23°C (73°F); there are no additional sources of these pollutants; and there are no sinks or potential re-emitting sources within the space for these pollutants.

The predicted exposure concentrations ($C_{P,t}$) (µg/m$^3$) are calculated from the modelled emission factors as:

$$C_{P,t} = EF_{m,t}\left(\frac{A}{V}\right)\left(\frac{1}{N}\right)$$

where,

$C_{P,t}$ = predicted exposure concentration at time t (µg/m$^3$)
$EF_{m,t}$ = modelled emission factor at time t (µg/m$^2$·hr) or (µg/unit·hr)
A = product area exposed in room (m$^2$ or unit)
V = room volume (m$^3$)
N = room air change per hour (hr $^{-1}$)

The model was set as Private Office and/or Standard Classroom scenario as defined in Table 4-4 and Table 4-5 with reference to California Department of Public Health (CDPH) *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers* V 1.2 (2017). The following parameters are used for estimating VOC air concentrations at 336 hours for the modelling scenarios.

| Parameter | Units | Value | |
|---|---|---|---|
| | | Standard Classroom | Private Office |
| Volume | m$^3$ | 231 | 30.6 |
| Air Change Rate | 1/h | 0.82 | 0.68 |
| Loading Factor * | m$^2$/m$^3$ | 0.007 | 0.007 |
| Estimated Exposed Area | m$^2$ | 1.62 | 0.21 |

* Based on Clause 4.2.2 of EN16516 - Construction products: Assessment of release of dangerous substances – Determination of emissions into indoor air. Loading factor for very small surfaces, e.g. sealants.

## RESULTS

**Table 1. Summary of TVOC Chamber Concentrations, Emission Factors and Predicted Air Concentrations for "AS-5001"**

| Elapsed Exposure Hour after 10 Days Conditioning * | Chamber Concentrations ($\mu g/m^3$) | Emission Factor ($\mu g/m^2 \cdot hr$) | Predicted Air Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|
| | | | Standard Classroom | Private Office |
| 0 (Background) | BQL | BQL | - | - |
| 24 | 854.76 | 113968.32 | 964.85 | 1179.32 |
| 48 | 797.01 | 106267.50 | 899.66 | 1099.64 |
| 96 | 369.02 | 49203.13 | 416.55 | 509.15 |

* Exposure hours are nominal (± 1 hour)
BQL = Below quantifiable level of 0.02 µg based on a standard 12 L air collection volume

**Table 2. Summary of Formaldehyde Chamber Concentrations, Emission Factors and Predicted Air Concentrations for "AS-5001"**

| Elapsed Exposure Hour after 10 Days Conditioning * | Chamber Concentrations ($\mu g/m^3$) | Emission Factor ($\mu g/m^2 \cdot hr$) | Predicted Air Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|
| | | | Standard Classroom | Private Office |
| 0 (Background) | BQL | BQL | -- | -- |
| 24 | BQL | BQL | -- | -- |
| 48 | BQL | BQL | -- | -- |

* Exposure hours are nominal (± 1 hour)
BQL = Below quantifiable level of 0.05 µg based on a standard 30 L air collection volume

**RESULTS** *(cont'd)*

**Table 3. Chamber Concentrations, Emission Factors and Predicted Air Concentrations of Target CRELs Compounds for "AS-5001" at 96 Hours Following 10 Day of Conditioning.**

| Cas Number | Target CRELs Compound Name | Chamber Concentrations ($\mu g/m^3$) | Emission Factor ($\mu g/m^2 \cdot hr$) | Predicted Air Concentration ($\mu g/m^3$) | | Half CREL ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| | | | | Standard Classroom | Private Office | |
| 75-07-0 | Acetaldehyde | BQL | BQL | -- | -- | 70 |
| 71-43-2 | Benzene† | BQL | BQL | -- | -- | 1.5 |
| 75-15-0 | Carbon Disulfide | BQL | BQL | -- | -- | 400 |
| 56-23-5 | Carbon Tetrachloride | BQL | BQL | -- | -- | 20 |
| 108-90-7 | Chlorobenzene† | BQL | BQL | -- | -- | 500 |
| 67-66-3 | Chloroform | BQL | BQL | -- | -- | 150 |
| 106-46-7 | Dichlorobenzene (1,4-)† | BQL | BQL | -- | -- | 400 |
| 75-35-4 | Dichloroethylene (1,1) | BQL | BQL | -- | -- | 35 |
| 68-12-2 | Dimethylformamide (N,N)† | BQL | BQL | -- | -- | 40 |
| 123-91-1 | Dioxane (1,4-)† | BQL | BQL | -- | -- | 1500 |
| 106-89-8 | Epichlorohydrin† | BQL | BQL | -- | -- | 1.5 |
| 100-41-4 | Ethylbenzene† | BQL | BQL | -- | -- | 1000 |
| 107-21-1 | Ethylene Glycol | BQL | BQL | -- | -- | 200 |
| 110-80-5 | Ethylene Glycol Monoethyl Ether | BQL | BQL | -- | -- | 35 |
| 111-15-9 | Ethylene Glycol Monoethyl Ether Acetate | BQL | BQL | -- | -- | 150 |
| 109-86-4 | Ethylene Glycol Monomethyl Ether | BQL | BQL | -- | -- | 30 |
| 110-49-6 | Ethylene Glycol Monomethyl Ether Acetate | BQL | BQL | -- | -- | 45 |
| 50-00-0 | Formaldehyde | BQL | BQL | -- | -- | 9 |
| 110-54-3 | Hexane (n-)† | BQL | BQL | -- | -- | 3500 |
| 78-59-1 | Isophorone | BQL | BQL | -- | -- | 1000 |
| 67-63-0 | Isopropanol† | BQL | BQL | -- | -- | 3500 |
| 71-55-6 | Methyl Chloroform | BQL | BQL | -- | -- | 500 |
| 75-09-2 | Methylene Chloride | BQL | BQL | -- | -- | 200 |
| 1634-04-4 | Methyl t-Butyl Ether† | BQL | BQL | -- | -- | 4000 |
| 91-20-3 | Naphthalene† | BQL | BQL | -- | -- | 4.5 |
| 108-95-2 | Phenol† | BQL | BQL | -- | -- | 100 |
| 107-98-2 | Propylene Glycol Monomethyl Ether | BQL | BQL | -- | -- | 3500 |
| 100-42-5 | Styrene† | BQL | BQL | -- | -- | 450 |
| 127-18-4 | Tetrachloroethylene† | BQL | BQL | -- | -- | 17.5 |
| 108-88-3 | Toluene† | BQL | BQL | -- | -- | 150 |
| 79-01-6 | Trichloroethylene† | BQL | BQL | -- | -- | 300 |
| 108-05-4 | Vinl Acetate | BQL | BQL | -- | -- | 100 |
| 108-38-3 /95-47-6 /106-42-3 | Xylenes† | 3.3 | 439.0 | 3.7 | 4.5 | 350 |

* Indicates Wiley ver. 8.0 best library match only based on retention time and mass spectral characteristics
† Denotes quantified using authentic standard curve. Other VOCs quantified relative to toluene
BQL = Below quantifiable level of 2.0 $\mu g/m^3$

**RESULTS** *(cont'd)*

**Table 4. Chamber Concentrations, Emission Factors and Predicted Air Concentrations of Identified Individual Organic Compounds (VOCs) for "AS-5001" at 96 Hours Following 10 Day of Conditioning for Standard Classroom and Private Office scenario.**

| Cas Number | Compound Identified | Chamber Concentrations ($\mu g/m^3$) | Emission Factor ($\mu g/m^2 \cdot hr$) | Predicted Air Concentration ($\mu g/m^3$) | | Half CREL ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| | | | | Standard Classroom | Private Office | |
| 79-20-9 | Acetic acid, methyl ester | 3.2 | 424.4 | 3.6 | 4.4 | not listed |
| 108-87-2 | Cyclohexane, methyl | 12.9 | 1717.5 | 14.5 | 17.8 | not listed |
| 1640-89-7 | Cyclopentane, ethyl | 9.0 | 1196.7 | 10.1 | 12.4 | not listed |
| 16883-48-0 | Cyclopentane, 1,2,4-trimethyl-, (1.alpha., 2.beta., 4.alpha.) | 6.3 | 843.5 | 7.1 | 8.7 | not listed |
| 142-82-5 | Heptane | 3.5 | 462.0 | 3.9 | 4.8 | not listed |
| 584-94-1 | Hexane, 2,3-dimethyl | 2.6 | 349.3 | 3.0 | 3.6 | not listed |
| 592-27-8 | Heptane, 2-methyl | 45.0 | 5994.7 | 50.8 | 62.0 | not listed |
| 921-47-1 | Hexane, 2,3,4-trimethyl | 2.9 | 383.2 | 3.2 | 4.0 | not listed |
| 589-90-2 | Cyclohexane, 1,4-dimethyl | 148.8 | 19839.1 | 168.0 | 205.3 | not listed |
| 2613-66-3 | Cyclopentane, 1-ethyl-3-methyl-, cis | 50.3 | 6701.0 | 56.7 | 69.3 | not listed |
| 111-65-9 | Octane | 36.7 | 4889.5 | 41.4 | 50.6 | not listed |
| 2213-23-2 | Heptane, 2,4- dimethyl | 80.2 | 10692.7 | 90.5 | 110.6 | not listed |
| 1678-91-7 | Cyclohexane, ethyl | 96.5 | 12865.5 | 108.9 | 133.1 | not listed |
| 7667-60-9 | Cyclohexane, 1,2,4-trimethyl-, (1.alpha., 2.beta., 4.beta.) | 29.4 | 3919.7 | 33.2 | 40.6 | not listed |
| 3221-61-2 | Octane, 2-methyl | 26.4 | 3515.9 | 29.8 | 36.4 | not listed |
| 1678-81-5 | Cyclohexane, 1,2,4-trimethyl- | 5.4 | 717.3 | 6.1 | 7.4 | not listed |
| 3728-56-1 | 1-Ethyl-4-methylcyclohexane | 3.0 | 400.9 | 3.4 | 4.1 | not listed |
| 108-67-8 | Mesitylene | 1.5 | 201.3 | 1.7 | 2.1 | not listed |
| 100-51-6 | Benzyl Alcohol | 9.3 | 1238.3 | 10.5 | 12.8 | not listed |

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**RESULTS** *(cont'd)*

**Table 4. Chamber Concentrations, Emission Factors and Predicted Air Concentrations of Identified Individual Organic Compounds (VOCs) for "AS-5001" at 96 Hours Following 10 Day of Conditioning for Standard Classroom and Private Office scenario.**

| Cas Number | Compound Identified | Chamber Concentrations ($\mu g/m^3$) | Emission Factor ($\mu g/m^2 \cdot hr$) | Predicted Air Concentration ($\mu g/m^3$) | | Half CREL ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| | | | | Standard Classroom | Private Office | |
| 128-37-0 | Butylated Hydroxytoluene | 18.6 | 2486.1 | 21.0 | 25.7 | not listed |

* Indicates Wiley ver. 8.0 best library match only based on retention time and mass spectral characteristics
† Denotes quantified using authentic standard curve. Other VOCs quantified relative to toluene
BQL = Below quantifiable level of 2.0 $\mu g/m^3$

**MS LOO SHIRLYN**
CHEMIST

**DR LI SIHAI**
AVP / SENIOR CHEMIST
MICROCONTAMINATION DIAGNOSIS
CHEMICAL & MATERIALS

PSB Singapore

**Please note that this Report is issued under the following terms :**

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.

2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

3. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.

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5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, 15 International Business Park TÜV SÜD @ IBP Singapore 609937.

6. The tests carried out by TÜV SÜD PSB and this report are subject to TÜV SÜD PSB's General Terms and Conditions of Business and the Testing and Certification Regulations of the TÜV SÜD Group.

Effective 26 January 2021

**ACUMEN SCIENTIFIC SDN. B BHD.** *(514926-V)*
Wisma Texchem, Lot 808 & 809, Jalan Subang 5, Taman Perindrindustrian Subang,
47610 Subang Jaya, Selangor Darul Ehsan, Malaysia.
TEL: +603-56345618 FAX: +603-56345619
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## CERTIFICATE OF ANALYSIS

ALSEAL MARKETING SDN. BHD.
Lot 2291, Jalan Kampung Baru,
Kg. Baru Sungai Buloh, 47000 Selangor DE.

Tel : +603-6157 9698 Fax :
Attn :

| | | |
|---|---|---|
| Certificate No | : | CCN18070056H03-0 |
| Sample Received Date | : | 06-Jul-2018 |
| Complete Analysis Date | : | 17-Jul-2018 |
| Date Issued | : | 17-Jul-2018 |

Sample Description : Product Name: Green Nails
Product Code: AS-5001
Brand: Alseal

Analysis Results :

| PARAMETER | ANALYSIS RESULTS | UNIT | STANDARD METHOD / TECHNIQUE / EQUIPMENT USED |
|---|---|---|---|
| VOC | 18.06 | g/L | USEPA Test method 24 and SCAQMD Method 303-91 and using equations set out in L.N. 107 of 2009 Air Pollution Control (VOC) (Amendment) Regulation 2009 |

***ND*** denotes not detected (< ***Numeric number*** ) denotes detection limits

**Remark :** -

Cheng Pui Wah
Senior Chemist
B.Sc.(Hons),
L/1828/6037/11