"Formaldehyde remover with BACTAKLEEN ANTI VOC"

Removal rate test

Test Report

Sponsor： EXCELSIA TECHNOLOGIES SDN BHD
Testing Institution： SGS Taiwan Ltd.
Report No.： UG/2018/20829

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STUDY SCHEDULE

Protocol No.:	UG/2018/20829
Test Article Received Date:	2018.02.26
Expected experimental starting date:	2018.04.24
Expected experimental completion date:	2018.04.25
Study completion date:	See Study Director's signature date in the report

ADDRESS INFORMATION

Testing Facility/Test Site

Name: SGS TAIWAN LTD.
Address: No. 38, Wu Chyuan 7th Rd., New Taipei Industrial Park, Wu Ku Dist., New Taipei City, 24890, Taiwan

Study Director
Name: Shinjyh, Chen
Address: No. 38, Wu Chyuan 7th Rd., New Taipei Industrial Park, Wu Ku Dist., New Taipei City, 24890, Taiwan

Sponsor

Name: EXCELSIA TECHNOLOGIES SDN BHD
Address: UNIT 103, 1ST FLOOR, LIFT 2, BLOCK C, DAMANSARA INTAN, 47400, PETALING JAYA, SELANGOR, MALAYSIA

SGS

SIGNATURE OF STUDY PERSONNEL

Removal rate test

Study Director:

Chun-Ching Wu / SGS Taiwan Ltd. 2018-04-30 Date Completed

Facility Manager:

Shin-Jyh CHEN / SGS Taiwan Ltd. 2018-05-03 Date Completed

Objective

This test procedure is based on the in house mehotd. Determine the Formaldehyde(HCHO) gas compound removal rate of the product" BACTAKLEEN ANTI VOC" which provide by the client" EXCELSIA TECHNOLOGIES SDN BHD " In this test, the dry product was set up in the environmental chamber. After injecting gas standard chemical, sampling the air sample in the chamber, analysis was performed by the equipment. Determine the removal rate by comparing the result of control and experiement group.

Experimental Design

1. Instrument

Name	Brand/Lot.	Purpose
Sampling pump	GASTEC	Gas sampling
Detector tube	GASTEC/91L,91LL	Formaldehyde testing
Heating plate	-	Chemical Vaporization
$1m^3$ environmental chamber	-	Testing environment

2. Reagent

Compound	Brand	Purpose
Formaldehyde	Sigma-Aldrich	Standard chemical

3. Product/instrument preparation

I. Production preparation

(1) Shake bottle then pour anti voc solution to spray gun or sprayer.

(2) Adequately cover the surface.

(3) Allow 10 mins to dry then spray second layer.

(4) Repeat until 4 layers have been sprayed.

(5) Place a light source to point at the coated surface (the surface must be exposed to light).

II. Parameter of instrument

(1) Before testing, check the detector is leaking or not according to the operation manual.

(2) Sampling volume: 100 mL air sample in the chamber.

III. Testing procedure

Formaldehyde removal rate testing

(1) Take 35μL Formaldehyde standard by auto-pipette and transfer to 10 mL glassware bottle.

(2) Prepare the Formaldehyde standard gas from liquid (vaporize formaldehyde solution by heating plat).

(3) Turn on the test box fan, that airflow evenly in the box cycle.

(4) Sampling the gas in the chamber at time 0 and 24hrs after experiment starting.

(5) The concentration of formaldehyde in the chamber was determined by detector.

4. Quality control

Carry out the same procedure of procedure III but excluding the product as control group.

Data calculation

The removal rate(γ_t) and Natural attenuation rate(R_t) can be calculated according formula

$$R_t = \frac{(N_{0-\text{control group}} - N_{t-\text{control group}})}{n_{0-\text{control group}}} * 100\%$$

R_t: Natural attenuation rate of time t (%)

$N_{0\text{-control group}}$: initial concentration of compound of control group(ppmv)

$N_{t\text{-control group}}$: time t concentration of compound of control group (ppmv)

$$\gamma_t = \frac{(n_{t-\text{control group}} - n_{t-\text{experiment group}})}{n_{t\ \text{control group}}} * 100\%$$

where:

γ_t: Removal rate of time t (%)

$n_{t\text{-control group}}$: compound concentration of control group(ppmv)

$n_{t\text{-experiment group}}$: compound concentration of experiment group (ppmv)

Sampling time t (hr)	control group (ppmv)	experiment group (ppmv)
0	10.0	10.0
24	9.50	0.25

Sampling time t (hr)	Natural attenuation rate (%)	Removal rate (%)
0	0.00	0.00
24	5.00	97.37

Test result

Removal rate (%) of Formaldehyde (HCHO)

Time period (hr)	Removal rate (%)
0	-
24	97.37

Note1: Limit of Quantification (LOQ)=0.01 ppmv
Note2: The testing result will be "N.D." for the value less than LOQ

TEST ARTICLE PHOTO

UG/2018/20829