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Through our consultant

**Your notice of**  
03-04-2018

**Your reference**

**Date**  
24-07-2018

## Analysis Report 18.01991.01

Required tests :

**EN 16516 (2017)**

**ISO 16000-3 (2011)**

**Emission of volatile organic compounds (chamber method)  
determination of aldehydes after emission**

| Identification number | Information given by the client | Date of receipt |
|-----------------------|---------------------------------|-----------------|
| T1807975              | TONGA                           | 03-04-2018      |

Jo Wynendaele

Order responsible

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In assessing compliance with the specifications, we did not take into account the uncertainty on the test results.

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**Reference: T1807975 - TONGA**

**Emission of volatile organic compounds (chamber method)**

|  |  |
|--|--|
| Date of ending the test  | 23-07-2018   |
| Standard used  | EN 16516 (2017)  |
| Product standard   | décret Français sur les COV  |
| Preparation  | Procedure of sampling, storage of samples and preparation of test specimens as described in the standard EN 16516                  |
| Sampling and conditioning  | Emission test chamber method at 23°C and 50% RH under ½ air exchange per hour. Sampling (under continuous ventilation) on Tenax TA |
| Sampling after X days  | 28 days  |
| Analytical method  | Volatile compounds are thermally desorbed, cryo-trapped and injected into a GC-MS.   |
| Detection  | Gas chromatography with Agilent MSD detector.  |
| Quantification   | Target compounds are calibrated, non-target and unidentified compounds are quantified using toluene equivalents (TEQ)              |
| Results  |  |
| Determination limit µg/m <sup>3</sup> (emissions)                                    | 5  |
| Determination limit µg/m <sup>3</sup> (carcinogenic, mutagenic and toxic substances) | 1  |

|                        | Limits | Measured<br>$\mu\text{g}/\text{m}^3$ |
|------------------------|--------|--------------------------------------|
| Rating                 | a+     |                                      |
| Formaldehyde           | <10    | < 5                                  |
| Acetaldehyde           | <200   | < 5                                  |
| Toluene                | <300   | < 5                                  |
| Tetrachloroethylene    | <250   | < 5                                  |
| Ethylbenzene           | <750   | < 5                                  |
| Xylene                 | <200   | < 5                                  |
| Styrene                | <250   | < 5                                  |
| 2 butoxyethanol        | <1000  | < 5                                  |
| 1,2,4-trimethylbenzene | <1000  | < 5                                  |
| 1,4-dichlorobenzene    | <60    | < 5                                  |
| TVOC                   | <1000  | 482                                  |
| Benzene                | <1     | < 1                                  |
| DBP                    | <1     | < 1                                  |
| DEHP                   | <1     | < 1                                  |
| Trichloroethylene      | <1     | < 1                                  |

### Sample identification

#### Type of test method

Flec -  
Test-chamber x

#### Material of test chamber

Steel  
x      Glass      Other

Test chamber volume

0,25 [m<sup>3</sup>]

Area of sample

0,25 [m<sup>2</sup>]

Air exchange rate

0,5 [h<sup>-1</sup>]

Area specific air exchange rate q

0,5 [mh<sup>-1</sup>]

Temperature

23 [°C]

Rel. humidity

50 [%]

Insert of sample into the test chamber  
Sampling after 28 days

Date  
06-04-18  
04-05-18

Table 1: Summary of conditions and results of 28 day emission test

Annex 1

Annex.1\_report18.01991.01.pdf

**Reference: T1807975\_01d - TONGA**

**Determination of aldehydes after emission**

Date of ending the test 18-05-2018  
 Standard used ISO 16000-3 (2011)  
 Product standard décret Français sur les COV

Deviation from the standard

Sample preparation The sample is conditioned in a simulation room at 23°C and 50% R.H.

Air exchange rate 0.5 air exchange per hour

Sampling formaldehyde and acetaldehyde are adsorbed on dinitrophenylhydrazine (DNPH) impregnated silica

Analytical method RP-HPLC (UV 360 nm)

Results

Determination limit 0.002 mg/m<sup>3</sup> for formaldehyde and acetaldehyde, 0.005 mg/m<sup>3</sup> for the other components

|                  | 28 days           |
|------------------|-------------------|
|                  | mg/m <sup>3</sup> |
| Formaldehyde     | < 0.002           |
| Acetaldehyde     | < 0.002           |
| Acrolein         | < 0.005           |
| Propionaldehyde  | < 0.005           |
| Crotonaldehyde   | < 0.005           |
| Butyraldehyde    | < 0.005           |
| Isovaleraldehyde | < 0.005           |
| Valeraldehyde    | < 0.005           |
| Hexaldehyde      | < 0.005           |

## Sample history

### **T1807975\_01d TONGA**

From sample T1807975 and the following procedure (TONGA)

#### **Quantitative determination of aldehydes (chamber method)**

Date of ending the test 16-07-2018  
Standard used ISO 16000-3 (2011)

Deviation from the standard  
Sample preparation

The sample is conditioned in a simulation room at 23°C and 50% R.H.

Residence time (in days) 28 days  
Air exchange rate 0.5 air exchange per hour

Sampling Aldehydes on dinitrophenylhydrazine (DNPH) impregnated silica

Results