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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 ³ (emissions) | 5 |
| Determination limit µg/m ³ (carcinogenic, mutagenic and toxic substances) | 1 |

| | Limits | Measured $\mu\text{g}/\text{m}^3$ |
|------------------------|--------|--------------------------------------|
| 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 [m³]

Area of sample

0,25 [m²]

Air exchange rate

0,5 [h⁻¹]

Area specific air exchange rate q

0,5 [mh⁻¹]

Temperature

23 [°C]

Rel. humidity

50 [%]

Insert of sample into the test chamber

Date

06-04-18

Sampling after 28 days

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 ³ for formaldehyde and acetaldehyde, 0.005 mg/m ³ for the other components |

| | 28 days |
|------------------|-------------------|
| | mg/m ³ |
| 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