TEST REPORT: 7191191004-CHM18/02-CSY

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SUBJECT

Evaluation of "Toro Bonato" comply with Singapore Green Building Product (SGBC) for the Product Group: Paints and Coatings

CLIENT

CHH Construction System Pte Ltd
76 Playfair Road
#03-06
Singapore 367996

DESCRIPTION OF SAMPLE

Three pack of powder sample labelled as follows was received on 18 Jul 2018.

Sample Name	Quantity
TORO Bonato	3 x 100g

DATE OF TEST

25 Jul 2018 – 18 Sep 2018

METHOD OF TEST

According to client's instruction manual, 1g Toro Bonato was mixed with 0.4g water, and tested for the VOC. The sample was tested in the "as-received" condition.

1. **Heavy metals analysis of Mercury (Hg), Lead (Pb) and Cadmium (Cd)**
   The sample was digested by inorganic acid, followed by analysis using Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)
2. **Analysis of Hexavalent Chromium (Cr^{6+})**
   The sample was analysed by UV-Vis spectrometer using 1,5-Diphenylcarbohydrazide as derivatizing agent.
3. **Analysis of Hydrocarbon solvents, Halogenated solvents and Aromatic solvents**
   The sample was analysed by Headspace-Gas Chromatography with Mass Selective Detector (HS-GC-MSD)
4. **Analysis of Ethylene glycols, Phthalates, Epichlorohydrin, N-methyl pyrrolidone and Halogenated benzenes**
   The sample was analyzed by Gas Chromatography with Flame Ionization Detector (GC-FID) and/or Gas Chromatograph with Mass Selective Detector (GC-MSD), after appropriate pretreatment of the sample
5. **Analysis of Alkyl Phenol Ethoxylates**
   The sample was analysed according to BS3762: 1990 Analysis of formulated Detergent
6. **Analysis of Formaldehyde**
   The sample was analysed by UV-Vis Spectrophotometer using Acetylacetone as reagent
7. **Analysis of VOC**
   The sample was analysed according to BS EN ISO 11890-2:2006, Paints and varnishes – *Determination of volatile organic compound (VOC) content – Part 2 : Gas-chromatographic method*

SUMMARY OF TEST RESULTS

The summary of test results for "TORO Bonato"

Item No.	Test	Result	Method Detection Limit	SGBC Criteria	Inferred Remark
1	Heavy Metals: Mercury, Lead, Cadmium, Chromium (VI)	Not Detected	0.001%	N.D. (Pigment) < 0.01% or <0.1% *	Pass
2	Hydrocarbon solvent	Not Detected	0.01%	< 20% by weight	Pass
3	Aromatic solvents	Not Detected	0.01%	Not Detected	Pass
4	Halogenated solvents	Not Detected	0.01%	Not Detected	Pass
5	Ethylene glycols	Not Detected	0.01%	Not Detected or <0.1% **	Pass
6	Phthalates	Not Detected	0.01%	Not Detected	Pass
7	Epichlorohydrin	Not Detected	0.01%	Not Detected	Pass
8	N-methyl pyrrolidone	Not Detected	0.01%	Not Detected	Pass
9	Halogenated Benzenes	Not Detected	0.01%	Not Detected	Pass
10	Alkyl Phenol Ethoxylates	Not Detected	0.01%	Not Detected	Pass
11	Formaldehyde Content	Not Detected	0.01%	Not Detected	Pass
12	VOC Content **	<2 g/L	2 g/L	< 50 g/L ***	Pass

* Exempted are impurities of the elements in raw materials or components in trace levels < 0.01% for Pb, Hg, Cd; and Cr (VI) < 0.1%
** Exempted from this requirement are trace amount < 0.1 % for ethylene glycol, that may be present in raw materials or component
*** For Water Based Coatings (interior: Matt < 25 g/L; Low Sheen < 30 g/L; Semi Gloss to Gloss < 75 g/L)
For Water Based Coatings (exterior: Matt < 50 g/L; Low Sheen < 50 g/L; Semi Gloss to Gloss < 75 g/L
For Solvent Based Coatings (Solvent Paints and stains < 200 g/L; Solvent Varnishes < 250 g/L)

RESULTS

Table 1 : The Heavy metals results for "TORO Bonato".

Test	Result	Method Detection Limit
Mercury	Not Detected	0.001%
Lead	Not Detected	0.001%
Cadmium	Not Detected	0.001%
Hexavalent Chromium	Not Detected	0.001%

Table 2 : The Solvents analytical results for "TORO Bonato".

Test	Result	Method Detection Limit
Aromatic solvents	Not Detected	0.01%
Halogenated solvents	Not Detected	0.01%
Ethylene glycols	Not Detected	0.01%

** Exempted from this requirement are trace amount < 0.1 % for ethylene glycol, that may be present in raw materials or component

Table 3 : The Hazardous substances analytical results for "TORO Bonato".

Test	Result	Method Detection Limit
Phthalates	Not Detected	0.01%
Epichlorohydrin	Not Detected	0.01%
N-methyl pyrrolidone	Not Detected	0.01%
Halogenated Benzenes	Not Detected	0.01%
Alkyl Phenol Ethoxylates	Not Detected	0.01%

Table 4 : The Formaldehyde results for "TORO Bonato".

Test	Result	Method Detection Limit
Formaldehyde Content	Not Detected	0.01%

Table 5 : The Volatile Organic Compound (VOC) content for "TORO Bonato".

Test	Result	Method Detection Limit
VOC Content [a]	<2 g/L [b]	2 g/L

a) Volatile organic compound (VOC) means any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101,3kPa.
b) The result was calculated based on the specific gravity = 1.40 provided by the client

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