LATICRETE International, Inc. (UK)
Hamilton House / Mableton Place
WC1H 9BB London

Test Report No. 44460-005-006 (I)

Client:	**LATICRETE International, Inc. (UK) London**
Sample description by client:	**211 Powder (component A)** **73 Crete Admix (component B)**
Sampling by:	Client
Date of arrival of sample:	20.11.2014
Date of report:	27.08.2015
Number of pages of report:	11
Testing parameter:	see table of contents
Testing laboratory:	eco-INSTITUT Germany GmbH, Cologne

Content

Sample view

Internal Sample-no.	Description by customer	Condition upon delivery	Type of sample
A005	211 Powder	without objection	material sample
A006	73 Crete Admix	without objection	material sample

Test Report

1 Emission test

1.1 Volatile Organic Compounds (VOC)

Definition of terms:

VOC (volatile organic compounds)	All individual materials with a concentration ≥ 0,001 mg/m³ in retention range C_6 (n-Hexane) to C_{16} (n-Hexadecane) Substances refer to LCI lists / AgBB (DIBt)
$TVOC_{tol}$ (Total volatile organic compounds)	Sum of all individual substances in retention range C_6 to C_{16} as toluene equivalent (DIN ISO 16000-6).
Identified and calibrated substances ($c_{id\ sub}$), substance specific calculated	Spectrum and retention time are concordant with the calibrated comparison substance

Test method TS 16516 with following parameters:

Preparation of test sample:	Date:	06.02.2015
	Pre-treatment:	according to the requirements of GEV emicode (3mm on glass)
	Masking of backside:	not applicable
	Masking of edges:	yes 100 %
	Relationship of unmasked edges to surface:	not applicable
	Charging:	related to area
	Dimensions:	25 cm x 20 cm (3 mm)
Test chamber conditions:		
	Chamber volume:	0.125 m^3
	Temperature:	23 °C
	Relative humidity:	50 %
	Air pressure:	normal
	Air:	cleaned
	Air change rate:	0.5 h^{-1}
	Air velocity:	0,3 m/s
	Loading:	0.4 m^2/m^3
	Specific air flow rate:	1,25 $m^3/m^2 \cdot h$
	Air sampling:	3 and 28 days after test chamber loading
Analytics:	DIN ISO 16000-3	
	Limit of determination:	2 µg/m^3
	DIN ISO 16000-6	
	Limit of determination:	1 µg/m^3

Sample A005 / A006: Measurement time 28 days after test chamber loading

1.1.1 VOC / TVOC $_{28d}$

Test parameter:
Volatile organic compounds (VOC), test chamber, air sampling 28 days after test chamber loading

Test result:

Sample:	A005: 211 Powder A006: 73 Crete Admix

No.	Substance	CAS No.	Concentration (Test chamber air) [µg/m³]
VOC_{28d}: Identified and calibrated substances in accordance with LCI list/AgBB, substance specific calculated ($c_{id\ sub}$)			
1	**Aromatic hydrocarbons**		
1-1	Toluene	108-88-3	n.d.
1-2	Ethylbenzene	100-41-4	n.d.
1-4	p-Xylene	106-42-3	n.d.
1-5	m-Xylene	108-38-3	
1-6	o-Xylene	95-47-6	n.d.
1-11	1,2,4-Trimethylbenzene	95-63-6	n.d.
1-25	Styrene	100-42-5	n.d.
6	**Glycols, Glycol ethers, Glycol esters**		
6-3	Ethylene glycol monobutyl ether	111-76-2	n.d.
11	**Chlorinated hydrocarbons**		
11-1	Tetrachlorethene	127-18-4	n.d.
VOC_{28d}: Further identified and calibrated substances in addition with LCI list/AgBB, substance specific calculated ($c_{id\ sub}$)			
1	**Aromatic hydrocarbons**		
	Benzene	71-43-2	n.d.
11	**Chlorinated hydrocarbons**		
	1,4-Dichlorbenzene	106-46-7	n.d.

n.d. = not detectable

Total volatile organic compounds (Toluene Equivalent DIN ISO 16000-6)	Concentration (test chamber air) [µg/m³]
$TVOC_{tol,28d}$	**35**

1.1.1.1 Formaldehyde$_{28d}$ and Acetaldehyde$_{28d}$

Test parameter:

Formaldehyde and Acetaldehyde, test chamber, air sampling 28 days after test chamber loading

Test method:

Preparation of test sample:	according to DIN EN 717-1	
	see Volatile organic compounds	
Test chamber conditions:	DIN EN 717-1 with the following deviations: - No determination of the equilibrium concentration; the formaldehyde emission is indicated at a measuring point as determined above. - Chamber volume: see Volatile organic compounds - Relative humidity: 50% - Air change rate and loading: see Volatile organic compounds	
	Emission chamber parameters: see volatile organic compounds	
	Air sampling:	28 days after test chamber loading
Analytics:	DIN ISO 16000-3	
	Limit of determination:	2 µg/m³ ≈ 0,002 ppm

Test result:

Sample:	A005: 211 Powder A006: 73 Crete Admix

Substance	**Concentration** (Test chamber air) **[µg/m³]**	**Concentration** (Test chamber air) **[ppm]**
Formaldehyde	< 2	< 0,002
Acetaldehyde	< 2	-

2 Phthalates, chamber air analytics

Test parameter:
Phthalates, chamber air analytics

Test method:

Analytics:	DIN ISO 16000-6
Limit of determination:	1 µg/m³

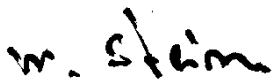
Test result:

Sample: A005: 211 Powder / A006: 73 Crete Admix

Substance	**Content (Test chamber air) [µg/m³]**
Dibutylphthalate (DBP)	n.d.
Diethylhexylphthalate (DEHP)	n.d.

n.d.: not detectable

Cologne, 27.08.2015



Michael Stein, Dipl.-Chem.
(Deputy Technical Manager)

3 Expert Evaluations

3.1 Expert evaluation (French VOC regulation)

The product **211 Powder / 73 Crete Admix** has been tested on behalf of **LATICRETE International Inc.**.

This evaluation bases on the test criteria of the decree no. 2011-321 of March 23rd, 2011 (VOC regulation) and executive decisions of May 28th, 2009 and April 30th, 2009 (CMR regulation) of the French Ministry of Ecology, Sustainable Development, Transport and Housing.

The results documented in the test report were evaluated as follows.

VOC regulation

Emission analysis	**Concentration (Test chamber air) [µg/m³] after 28 days**	**Class**			
Substance		**C**	**B**	**A**	**A+**
Formaldehyde	< 2	>120	<120	<60	<10
Acetaldehyde	< 2	>400	<400	<300	<200
Toluene	< 1	>600	<600	<450	<300
Tetrachlorethylene	< 1	>500	<500	<350	<250
Xylene	< 1	>400	<400	<300	<200
1,2,4-Trimethylbenzene	< 1	>2000	<2000	<1500	<1000
1,4-Dichlorbenzene	< 1	>120	<120	<90	<60
Ethylbenzene	< 1	>1500	<1500	<1000	<750
2-Butoxyethanol	< 1	>2000	<2000	<1500	<1000
Styrene	< 1	>500	<500	<350	<250
$TVOC_{tol}$	**35**	**>2000**	**<2000**	**<1500**	**<1000**

CMR regulation

Emission analysis	**Concentration (Test chamber air) [µg/m³] after 28 days**	**Limit Value [µg/m³] after 28 days**
Substance		
Benzene	< 1	< 1
Trichlorethylene	< 1	< 1
Di(2-ethylhexyl)phthalate (DEHP)	< 1	< 1
Dibutylphthalate (DBP)	< 1	< 1

3.1.1 Summary evaluation

The product **211 Powder / 73 Crete Admix** meets the requirements of the **Class A+** of the decree no. 2011-321 of March 23, 2011 (VOC regulation) and executive decisions of May 28th, 2009 and April 30th, 2009 (CMR regulation) of the French Ministry of Ecology, Sustainable Development, Transport and Housing.

Cologne, 27.08.2015

Tobias Rüsing, Dipl.-Geol.
(Project Manager)

3.2 Evaluation d'expert (COV-décret)

Le produit **211 Powder / 73 Crete Admix** a été testé sous la responsabilité du producteur **LATICRETE International Inc.**.

Cette évaluation est basée sur les critères du décret n° 2011-321 du 23 mars 2011 (COV décret) et arrêté du 28 mai 2009 et 30 april 2009 (CMR arrêté) par le Ministère de l'écologie, du développement durable, des transports et du logement.

Les résultats documentés dans le rapport du test sont évalués comme suit.

COV décret

Analyse des émissions	**Concentration (air de la chambre d'essai) [µg/m³] au bout de 28 jours**	**Classe**			
Substance		**C**	**B**	**A**	**A+**
Formaldéhyde	< 2	>120	<120	<60	<10
Acétaldéhyde	< 2	>400	<400	<300	<200
Toluène	< 1	>600	<600	<450	<300
Tétrachloréthylène	< 1	>500	<500	<350	<250
Xylène	< 1	>400	<400	<300	<200
1,2,4-Triméthylbenzène	< 1	>2000	<2000	<1500	<1000
1,4-Dichlorobenzène	< 1	>120	<120	<90	<60
Ethylbenzène	< 1	>1500	<1500	<1000	<750
2-Butoxyéthanol	< 1	>2000	<2000	<1500	<1000
Styrène	< 1	>500	<500	<350	<250
$COVT_{tol}$	**35**	**>2000**	**<2000**	**<1500**	**<1000**

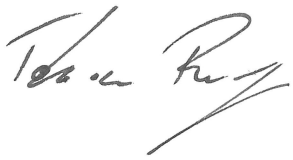
CMR arrêté

Analyse des émissions	**Concentration (air de la chambre d'essai) [µg/m³] au bout de 28 jours**	**Valeur limite [µg/m³] aprés 28 jours**
Substance		
Benzène	< 1	< 1
Trichloréthylène	< 1	< 1
Phthalate de bis (2-éthylhexle) (DEHP)	< 1	< 1
Phthalat de dibutyle (DBP)	< 1	< 1

3.2.1 Résumé d'évaluation

Le produit **211 Powder / 73 Crete Admix** correspond aux exigences de la **classification A+** sur les critères du décret n° 2011-321 du 23 mars 2011 (COV décret) et arrêté du 28 mai 2009 et 30 april 2009 (CMR arrêté) par le Ministère de l'écologie, du développement durable, des transports et du logement.

Cologne, 27.08.2015



Tobias Rüsing, Dipl.-Geol.
(Chargé de projet)