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Test Report No. 50539-001 II

VOC decree France

Client:	UAB Veika Vilnius
Sample description by client:	DECOJET digital Wallpaper, Art.-Nr. ER-007
Sampling by:	Client
Date of arrival of sample:	31.08.2015
Date of report:	20.10.2015
Number of pages of report:	13
Testing parameter:	see table of contents
Testing laboratory:	eco-INSTITUT Germany GmbH, Cologne

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Sample view

Internal Sample-no.	Description by customer	Condition upon delivery	Type of sample
A001	DECOJET digital Wallpaper printed with Balance Eco series eco-solvent inks; Decosand, Art.-Nr. ER-007	without objection	Batch 000104

Test Report

1 Emission test

1.1 Volatile Organic Compounds (VOC)

Definition of terms:

VOC (volatile organic compounds)	All individual materials with a concentration $\geq 0,001 \text{ mg/m}^3$ in retention range C_6 (n-Hexane) to C_{16} (n-Hexadecane) Substances refer to LCI lists / AgBB (DIBt)
TVOC (Total volatile organic compounds)	Sum of all individual substances in retention range C_6 to C_{16} .
CMR-VOC (carcinogenic, mutagenic, reproduction-toxic VOC, VVOC and SVOC)	All individual substances with the following categories: Regulation (EC) No. 1272/2008: Category Car.1A and 1B, Muta. 1A and 1B, Repr. 1A and 1B TRGS 905: K1 and K2, M1 and M2, R1 and R2 IARC: Group 1 and 2A DFG (MAK lists): Category III1 and III2
VVOC (very volatile organic compounds)	All individual substances with concentration $\geq 0,001 \text{ mg/m}^3$ in retention range $< C_6$
TVVOC (Total very volatile organic compounds)	Sum of all VVOC in retention range $< C_6$
SVOC (semi volatile organic compounds)	All individual materials $\geq 0,001 \text{ mg/m}^3$ in retention range $> C_{16}$ (n-Hexadecane) to C_{22} (Docosane)
TSVOC (Total semi volatile organic compounds)	Sum of all SVOC in retention range $> C_{16}$ to C_{22} .
Identified and calibrated substances ($C_{id \text{ sub}}$), substance specific calculated	Spectrum and retention time are concordant with the calibrated comparison substance
Not identified substances calculated as toluene equivalent ($C_{ni \text{ tol}}$)	Suggestion from the spectrum library with high probability and/or allocation to a group of substances
SER	Specific emission rate (see appendix)
LCI value	Lowest Concentration of Interest; calculated value for the evaluation of VOC, established by the Committee for Health-related Evaluation of Building Products (Ausschuss zur gesundheitlichen Bewertung von Bauprodukten - AgBB)
R value	The quotient of the concentration and the LCI value is generated for every substance which is detected in the test chamber air. The sum of the calculated quotients results in the R value.

List of analysed VOCs:

Aromatic hydrocarbons

Toluene
Ethylbenzene
p-Xylene
m-Xylene
o-Xylene
Isopropylbenzene
n-Propylbenzene
1,3,5-Trimethylbenzene
1,2,4-Trimethylbenzene
1,2,3-Trimethylbenzene
2-Ethyltoluene
1-Isopropyl-4-methylbenzene
1,2,4,5-Tetramethylbenzene
n-Butylbenzene
1,3-Diisopropylbenzene
1,4-Diisopropylbenzene
Phenyl octane
1-Phenyl decane²
1-Phenyl undecane²
4-Phenylcyclohexene
Styrene
Phenyl acetylene
2-Phenyl propene
Vinyl toluene
Naphthalene
Indene
Benzene
Cresol

Saturated aliphatic substances

Hydrocarbons
2-Methyl pentane¹
3-Methyl pentane¹
n-Hexane
Cyclohexane
Methylcyclohexane
n-Heptane
n-Octane
n-Nonane
n-Decane
n-Undecane
n-Dodecane
n-Tridecane
n-Tetradecane
n-Pentadecane
n-Hexadecane
Methylcyclopentane
1,4-Dimethylcyclohexane

Terpenes

δ-3-Carene
α-Pinene
β-Pinene
Limonene
Longifolene
Caryophyllene
Isolongifolene
alpha-Phellandrene
Myrcene
Camphene
alpha-Terpinend
Longipinene
beta-Caryophyllene
beta-Farnesen
alpha-Bisabolen

Aliphatic alcohols and ether

1-Propanol¹
2-Propanol¹
tert-Butanol
2-Methyl-1-propanol

1-Butanol
1-Pentanol
1-Hexanol
Cyclohexanol
2-Ethyl-1-hexanol
1-Octanol
4-Hydroxy-4-methyl-pentan-2-one
1-Heptanol
1-Nonanol
1-Decanol

Aromatic alcohols (phenols)

Phenol
BHT (2,6-di-tert-butyl-4-methylphenol)
Benzylalcohol

Glycols, Glycol ether, Glycol ester

Propylenglycol (1,2-Dihydroxypropane)
Ethylene glycol (Ethandiol)
Ethylene glycol monobutyl ether
Diethylene glycol
Diethylene glycol-monobutyl ether
2-Phenoxyethanol
Ethylene carbonate
1-Methoxy-2-propanol
Glycolic acid butyl ester
Texanol
Butyldiglycol acetate
Dipropylenglycol mono-methyl ether
2-Methoxyethanol
2-Ethoxyethanol
2-Propoxyethanol
2-Methylethoxyethanol
2-Hexoxyethanol
1,2-Dimethoxyethane
1,2-Diethoxyethane
2-Methoxyethyl acetate
2-Ethoxyethyl acetate
2-Butoxyethyl acetate
2-(2-Hexoxyethoxy)-ethanol
1-Methoxy-2-(2-methoxy-ethoxy)-ethane
Propylene glycol di-acetate
Dipropylene glycol
Dipropylene glycol monomethylether acetate
Dipropylene glycol mono-n-propylether
1,4-Butanediol
Tripropyleneglycolmonomethyl ether
Triethylene glycol dimethyl ether
1,2-Propylene glycol dimethyl ether
TXIB
Ethylidiglycol
Dipropylene glycol-dimethyl ether
Propylene carbonate
Hexylene glycol
3-Methyl-1-butanol
1,2-Propylene glycol n-propyl ether
1,2-Propylene glycol n-butyl ether
Diethylglycol phenyl ether
Neopentyl glycol

Aldehydes

Butanal^{1,3}
Pentanal³
Hexanal
Heptanal
2-Ethylhexanal
Octanal
Nonanal
Decanal
2-Butenal³

2-Pentenal³
2-Hexenal
2-Heptenal
2-Octenal
2-Nonenal
2-Decenal
2-Undecenal
Furfural
Glutaraldehyde
Benzaldehyde
Acetaldehyde^{1,3}
Propanal^{1,3}
Propenal^{1,3}
Isobutenal
3-Methyl-2-propanol
Methylisobutylketone
Cyclopentanone
Cyclohexanone

Ketones

Ethylmethylketone³
3-Methyl-2-propanol
Methylisobutylketone
Cyclopentanone
Cyclohexanone
Acetone^{1,3}
2-Methylcyclopentanone
2-Methylcyclohexanone
Acetophenone
1-Hydroxyacetone

Acids

Acetic acid
Propionic acid
Isobutyric acid
Butyric acid
Pivalic acid
n-Valeric acid
n-Hexanoic acid
n-Heptanoic acid
n-Octanoic acid
2-Ethylhexanoic acid

Esters and Lactones

Methylacetate¹
Ethyl acetate¹
Vinyl acetate¹
Isopropyl acetate
Propyl acetate
2-Methoxy-1-methylethyl acetate
n-Butyl formate
Methylmethacrylate
Isobutylacetate
1-Butyl acetate
2-Ethylhexyl acetate
Methyl acrylate
Ethyl acrylate
n-Butyl acrylate
2-Ethylhexyl acrylate
Adipic acid dimethyl ester
Fumaric acid dibutyl ester
Succinic acid dimethyl ester
Hexandioldiacrylate
Maleic acid dibutyl ester
Butyrolactone
Dibutyl glutarate
Dibutyl succinate
Dimethylphthalate
Texanol
Dipropylene glycol diacrylate

Chlorinated hydrocarbons

Tetrachlorethene
1,1,1-Trichlorethane
Trichlorethene
1,4-Dichlorbenzene

Others

1,4-Dioxane
Caprolactam
N-Methyl-2-pyrrolidone
Octamethylcyclotetrasiloxane
Methenamine
2-Butanonoxime
Triethyl phosphate
5-Chlor-2-methyl-4-isothiazolin-3-one
2-Methyl-4-isothiazolin-3-one (MIT)
Triethylamine
Decamethylcyclopentasiloxane
Dodecamethylcyclopentasiloxane
Tetrahydrofuran (THF)
1-Decene
1-Octene
2-Pentylfuran
Tetramethyl succinonitrile
Propylencarbonate
Isophorone
Dimethylformamide (DMF)
Tributyl phosphate

1 VVOC
2 SVOC
3 Analysis according to
DIN ISO 16000-3

Explanation of the Specific Emission Rate SER

Emission measurements are accomplished in test chambers under defined physical conditions (temperature, relative humidity, room loading, air change rate etc.).

Test chamber measurement results are directly comparable only if the investigations were accomplished under the same basic conditions.

If the differences of the physical conditions refer only to the change of air rate and/or the loading, the "SER" or "specific emission rate" can be used for comparability of the measurement results. The SER indicates how many volatile organic compounds (VOC) are released by the sample for each material unit and hour (h). The SER can be calculated using the formula below for each proven individual component of the VOC from the data in the test report.

As material units the following are applicable:

l = unit of length (m)	relation between emission and length
a = unit area (m ²)	relation between emission and surface
v = unit volume (m ³)	relation between emission and volume
u = piece unit (unit = piece)	relation between emission and complete unit

From this the different dimensions for SER result:

length-specific	SER _l in µg/m h
surface-specific	SER _a in µg/m ² h
volume-specific	SER _v in µg/m ³ h
unit specific	SER _u in µg/u h

SER thus represents a product specific rate, which describes the mass of the volatile organic compound, which is emitted by the product per time unit at a certain time after beginning of the examination.

$$\boxed{SER = q \cdot C}$$

q	specific air flow rate (quotient from change of air rate and loading)
C	Concentration of the measured substance(s)

The result can be indicated in milligrams (mg) in place of micro grams (µg), whereby 1 mg = 1000 µg.

Test method TS 16516 with following parameters:

Preparation of test sample:	Date:	08.09.2015	
	Pre-treatment:	wall covering, loading 1m ² /m ³ , backside masked,	
	Masking of backside:	yes	
	Masking of edges:	not applicable	
	Relationship of unmasked edges to surface:	not applicable	
	Charging:	related to area	
Test chamber conditions:	Dimensions:	35,3 cm x 35,3 cm	
	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:	1 m ² /m ³	
	Specific air flow rate:	0.5 m ³ /m ² · h	
	Air sampling:	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

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: A001: DECOJET digital Wallpaper printed with Balance Eco series eco-solvent inks; Decosand, Art.-Nr. ER-007

No.	Substance	CAS No.	Concentration (Test chamber air) [µg/m ³]
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}	65

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: A001: DECOJET digital Wallpaper printed with Balance Eco series eco-solvent inks; Decosand, Art.-Nr. ER-007

Substance	Concentration (Test chamber air) [µg/m ³]	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

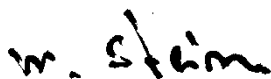
Test result:

Sample: A001, DECOJET digital Wallpaper printed with Balance Eco series eco-solvent inks; Decosand, Art.-Nr. ER-007

Substance	Content (Test chamber air) [µg/m ³]
Dibutylphthalate (DBP)	n.d.
Diethylhexylphthalate (DEHP)	n.d.

n.d.: not detectable

Cologne, 20.10.2015



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

Expert evaluation

The product **DECOJET digital Wallpaper, Art.-Nr. ER-007** has been tested on behalf of **UAB Veika**.

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

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

VOC- Decree France

Sample: A001: DECOJET digital Wallpaper printed with Balance Eco series eco-solvent inks; Decosand, Art.-Nr. ER-007

Substance	Concentration (Test chamber air) [µg/m ³] after 28 days	Class			
		C	B	A	A+
Formaldehyde	< 2	>120	<120	<60	<10
Acetaldehyde	< 2	>400	<400	<300	<200
Toluene	< 1	>600	<600	<450	<300
Tetrachlorethene	< 1	>500	<500	<350	<250
o-/m-/p-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
Ethylenglycol-monobutylether	< 1	>2000	<2000	<1500	<1000
Styrene	< 1	>500	<500	<350	<250
TVOC_{tol}	65	>2000	<2000	<1500	<1000

CMR Regulation

Substance	Concentration (Test chamber air) [mg/m ³] after 28 days	Limit value [mg/m ³] after 28 days
Benzene	< 1	< 1
Trichlorethene	< 1	< 1
Di(2-ethylhexyl)phthalate (DEHP)	< 1	< 1
Dibutylphthalate (DBP)	< 1	< 1

Summary evaluation

The product **DECOJET digital Wallpaper, Art.-Nr. ER-007** meets the requirements of the **Class A+** of the decree no. 2011-321 of March 23, 2011 and executive decisions of May 28th, 2009 and April 30th, 2009 (CMR) of the French Ministry of Ecology, Sustainable Development, Transport and Housing.

Cologne, 20.10.2015



Alexandra Kühn
(project manager)

Evaluation d'expert

Le produit **DECOJET digital Wallpaper, Art.-Nr. ER-007** a été testé sous la responsabilité du producteur **UAB Veika**.

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 avril 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) [$\mu\text{g}/\text{m}^3$] au bout de 28 jours	Classe			
		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	>2 000	<2 000	<1 500	<1 000
1,4-Dichlorobenzène	< 1	>120	<120	<90	<60
Ethylbenzène	< 1	>1 500	<1 500	<1 000	<750
2-Butoxyéthanol	< 1	>2 000	<2 000	<1 500	<1 000
Styrène	< 1	>500	<500	<350	<250
COVT_{tol}	65	>2 000	<2 000	<1 500	<1 000

CMR arrêté

Analyse des émissions	Concentration (air de la chambre d'essai) [$\mu\text{g}/\text{m}^3$] après 28 jours	Valeur limite [$\mu\text{g}/\text{m}^3$] après 28 jours
Substances		
Benzène	< 1	< 1
Trichloréthylène	< 1	< 1
Phthalate de bis (2-éthylhexle) (DEHP)	< 1	< 1
Phthalat de dibutyle	< 1	< 1

Résumé d'évaluation

Le produit **DECOJET digital Wallpaper, Art.-Nr. ER-007** 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 avril 2009 (CMR arrêté) par le Ministère de l'écologie, du développement durable, des transports et du logement.

Cologne, 20.10.2015



Alexandra Kühn
(Chef de projet)