Organoid Technologies GmbH
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Test Report No. 43590-001

Client:	**Organoid Technologies GmbH** **Fließ**
Sample designation according to client:	**Wildspitze Organoid Decoration Coating**
Providing of samples:	Client
Sample reception:	02.04.2014
Date of report:	07.05.2014
Number of pages of the test report:	19
Test goals:	Refer to the table of contents
Testing laboratories:	eco-INSTITUT GmbH,Cologne

DAkkS Deutsche Akkreditierungsstelle D-PL-14117-01-00

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Overview of the samples

eco-sample number	**Sample designation**	**Condition of the sample at the time of delivery**	**Sample type**
A001	Wildspitze Organoid Decoration Coating	No complaints	Material sample

Test Report

1 Emission analyses

1.1 Volatile Organic Compounds (VOC)

Definition of terms: VOC (Volatile Organic Compounds)	All individual substances with concentrations ≥ 0,001 mg/m^3 in the retention range **C_6** (n-hexane) to **C_{16}** (n-hexadecane) For substances, refer to the NIK list /AgBB
TVOC (Total Volatile Organic Compounds)	Sum of all individual substances in the retention range **C_6** to **C_{16}.**
$TVOC_{tol}$ (Total Volatile Organic Compounds)	Sum of all VOC in the retention range C_6 to C_{16} as toluene equivalent (according to DIN ISO 16006-6)
KMR-VOC (carcinogenic, mutagenic, toxic-for-reproduction VOC, WOC, and SVOC)	All individual substances with the following classifications: Regulation (EC) No. 1272/2008: Categories Carc. 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 list: Category 1111 and 1112
VVOC (Very Volatile Organic Compounds)	All individual substances with concentrations > 0,001 mg/m^3 in the retention range < C_6
TVVOC (Total Very Volatile Organic Compounds)	Sum of all VVOC in the retention range < C_6
SVOC (Semi-Volatile Organic Compounds)	All individual substances **>** 0,001 mg/m^3 in the retention range **>** C_{16} (n-hexadecane) to C_{22}(docosane)
TSVOC (Total Semi-Volatile Organic Compounds)	Sum of all SVOC in the retention range **>** C_{16} to C_{22}
Identified and calibrated substances ($c_{id\ sub}$), calculated substance-specific	Spectrum and retention time coincide with the calibrated comparison substance
Not identified substances, calculated as toluene equivalent $_{(Cni\ tol)}$ SER	Suggestion from the spectra library with high probability or association with a substance group
NIK value	Specific emission rate (refer to the appendix) Lowest interesting concentration; calculation value for rating of VOC, established by the committee for health rating of building products (AgBB)
R-value	For each substance accounted for in the test chamber air, the quotient of concentration and NIK value is obtained. The sum of the quotients obtained in this way is the R-value.

List of the analyzed volatile organic compounds:

Aromatic hydrocarbons

Toluol
Ethylbenzol
p-Xylol
m-Xylol
o-Xylol
Isopropylbenzol
n-Propylbenzol
1,3,5-Trimethylbenzol
1,2,4-Trimethylbenzol
1,2,3-Trimethylbenzol
2-Ethyltoluol
1-Isopropyl-4-methylbenzol
1,2,4,5-Tetramethylbenzol
n-Butylbenzol
1,3-Diisopropylbenzol
1,4-Diisopropylbenzol
Phenyloctan
1-Phenyldecan[2]
1-Phenylundecan[2]
4-Phenylcyclohexen
Styrol
Phenylacetylen
2-Phenylpropen
Vinyltoluol
Naphthalin
Inden
Benzol
Kresol

Saturated aliphatic hydrocarbons

2-Methylpentan[1]
3-Methylpentan[1]
n-Hexan
Cyclohexan
Methylcyclohexan
n-Heptan
n-Octan
n-Nonan
n-Decan
n-Undecan
n-Dodecan
n-Tridecan
n-Tetradecan
n-Pentadecan
2-Methyl-1-propanol
1-Butanol
1-Pentanol
1-Hexanol
n-Hexadecan
Methylcyclopentan
1,4-Dimethylcyclohexan

Terpenes

δ-3-Caren
α-Pinen
β-Pinen
Limonen
Longifolen
Caryophyllen
Isolongifolen
alpha-Phellandren
Myrcen
Camphen
alpha-Terpinen
Longipinen
beta-Caryophyllen
beta-Farnesen
alpha-Bisabolen

Aliphatic alcohol and ether

1-Propanol[1]
2-Propanol[1]
tert-Butanol
Cyclohexanol
2-Ethyl-1-hexanol
1-Octanol
4-Hydroxy-4-methyl-pentan-2-on
1-Heptanol
1-Nonanol
1-Decanol

Aromatic alcohol (phenols)

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

Glycols, glycol ether, glycol ester

Propylenglykol (1,2-Dihydroxypropan)
Ethylenglykol (Ethandiol)
Ethylenglykolmonobutylether
Diethylenglykol
Diethylenglykol-monobutylether
2-Phenoxyethanol
Ethylencarbonat
1-Methoxy-2-propanol
Texanol
Glykolsäurebutylester
Butyldiglykolacetat
Dipropylenglykolmono-methylether
2-Methoxyethanol
2-Ethoxyethanol
2-Propoxyethanol
2-Methylethoxyethanol
2-Hexoxyethanol
1,2-Dimethoxyethan
1,2-Diethoxyethan
2-Methoxyethylacetat
2-Ethoxyethylacetat
2-(2-Hexoxyethoxy)-ethanol
1-Methoxy-2-(2-methoxy-ethoxy)-ethan
Propylenglykol-di-acetat
Dipropylenglykol
Dipropylenglykolmonomethyletheracetat
Dipropylenglykolmono-n-propylether
Dipropylenglykolmono-t-butylether
1,4-Butandiol
Tripropylenglykolmonomethylether
Triethylenglykoldimethylether
1,2-Propylenglykoldimethylether
TXIB (Texanolisobutyrat)
Ethyldiglykol
Dipropylenglykol-dimentylether
Propylencarbonat
Hexylenglykol
3-Methoxy-1-butanol
1,2-Propylenglykol-n-propylether
1,2-Propylenglykol-n-butylether
Diethylenglykol-phenylether
Neopentylglykol

Aldehyde

Butanal[1,3]
Pentanal[3]
Hexanal
Heptanal
2-Ethylhexanal
Octanal
Nonanal
Decanal
2-Butenal[3]
2-Pentenal[3]
2-Hexenal
2-Heptenal
2-Undecenal
Furfural
Glutaraldehyd
Benzaldehyd
Acetaldehyd[1,3]
Propanal[1,3]
Propenal[1,3]
Isobutenal[3]
2-Octenal
2-Nonenal
2-Decenal

Ketones

Ethylmethylketon[3]
3-Methyl-2-butanon
Methylisobutylketon
Cyclopentanon
Cyclohexanon
Aceton[1,3]
2-Methylcyclopentanon
2-Methylcyclohexanon
Acetophenon
1-Hydroxyaceton

Acids

Essigsäure
Propionsäure
Isobuttersäure
Buttersäure
Pivalinsäure
n-Valeriansäure
n-Capronsäure
n-Heptansäure
n-Octansäure
2-Ethylhexansäure

Esters and lactones

Methylacetat[1]
Ethylacetat[1]
Vinylacetat[1]
Isopropylacetat
Propylacetat
2-Methoxy-1-methylethylacetat
n-Butylformiat
Methylmethacrylat
Isobutylacetat
1-Butylacetat
2-Ethylhexylacetat
Methylacrylat
Ethylacrylat
n-Butylacrylat
2-Ethylhexylacrylat
Adipinsäuredimethylester
Fumarsäuredibutylester
Bernsteinsäuredimethylester
Glutarsäuredimethylester
Hexandioldiacrylat
Maleinsäuredibutylester
Butyrolacton
Glutarsäurediisobutylester
Bernsteinsäurediisobutylester
Dimethylphthalat
Texanol

Chlorinated hydrocarbons

Tetrachlorethen
1,1,1-Trichlorethan
Trichlorethen
1,4-Dichlorbenzol

Others

1,4-Dioxan
Caprolactam
N-Methyl-2-pyrrolidon
Octamethylcyclotetrasiloxan
Methenamin
2-Butanonoxim
Triethylphosphat
5-Chlor-2-methyl-4-isothiazolin-3-on
2-Methyl-4-isothiazolin-3-on (MIT)
Triethylamin
Decamethylcyclopentasiloxan
Dodecamethylcyclohexasiloxan
Tetrahydrofuran (THF)
1-Decen
1-Octen
2-Pentylfuran
Isophoron
Tetramethylsuccinonitril
Dimethylformamid (DMF)
Tributylphosphat

1 VVOC
2 SVOC
3 Analyse gem. DIN ISO 16000-3

Explanation for the specific emission rate SER

Emission measuring is done in test chambers under defined physical conditions (temperature, relative humidity, room loading, air exchange rate, etc.).
Test chamber measuring results can be compared directly only when the investigations were made under the same boundary conditions.
When the differences of the physical conditions refer only to the air exchange rate and/or the loading, the “SER” (Specific Emission Rate) can be used for the comparability of the measuring results. The SER specifies the number of volatile organic compounds (VOC) discharged by the sample per unit and hour (h).
The SER can be calculated according to the following formula for each proven individual component of the VOC from the data in the test report.

Possible material units are:

l = Unit of length (m)	refers the emission to thelength
a = Unit of area (m^2)	refers the emission to thearea
v = unit of volume (m^3)	refers the emission to the volume
u = unit of pieces	refers the emission to the complete unit

The different dimensions for the SER result from this:

length-specific	SER_l in µg/m h
area-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

The SER thus represents a product-specific rate, describing the mass of the volatile organic compounds emitted by the product per unit of time at a specific point in time after the start of the test.

$SER = q \bullet C$

q: Specific air flow rate (quotient of air exchange rate and loading)
C: Concentration of the measured substance(s)

Instead of in micro-grams (µg), the result also may be stated in milligrams (mg), with 1 mg = 1000 µg.

Test method:

Preparation of the test body:	DIN EN ISO 16000-11	
	Date:	04.04.2014
	Pretreatment:	Not applicable
	Sealing of the rear:	Yes
	Sealing of the edges:	100 %
	Ratio of open edges to the surface:	Not applicable
	Loading:	Referred to the area
	Dimensions:	35.4 cm x 35.4 cm
Test chamber conditions:	According to DIN ISO 16000-9	
	Chamber volume:	0.125 m^3
	Temperature:	23 °C
	Relative humidity:	50 %
	Air pressure:	Normal
	Air:	Cleaned
	Air exchange rate:	0.50 h^{-1}
	Free-stream wind speed:	0.30 m/s
	Loading:	1.00 m^2/m^3
	Specific air flow rate: Air sampling:	0.5 m^3/m^2 • h
		3 and 28 days after test chamber loading
Analytics:	DIN ISO 16000-3 DIN ISO 16000-6	
	Determination limit:	1 µg/m^3

Expert rating (AgBB scheme)

The product Wildspitze Organoid decoration coating was subjected to a product test on order by Organoid Technologies GmbH, Fließ .

The basis for the rating is the “Scheme for health evaluation of VOC and SVOC emissions from building products of the committee for health evaluation of building products (AgBB) (level: 2012).

The results documented in the test report are rated as follows:

Test parameter	Result	Requirement	Requirement met [Yes/No]
Emission analyses			
Measuring time: 3 days after test chamber loading			
Total VOC (C_6-C_{16})	0.290 mg/m^3	≤ 10 mg/m^3	Yes
Total carcinogens (EU category 1A and 1B)	< 0.001 mg/m^3	≤ 0.01 mg/m^3	Yes
Measuring time: 28 days after test chamber loading			
Total VOC (C6-C_{16})	0.105 mg/m^3	≤ 1.0 mg/m^3	Yes
Total SVOC (C_{16}-C_{22})	< 0.001 mg/m^3	≤ 0.1 mg/m^3	Yes
R-value (dimension-less)	0.19 mg/m^3	≤ 1	Yes
Total VOC without NIK	0.003 mg/m^3	≤ 0.1 mg/m^3	Yes
Total carcinogens (EU category 1A and 1B)	< 0.001 mg/m^3	≤ 0.001 mg/m^3	Yes

Overall rating:

The product **Wildspitze Organoid decoration coating** satisfies the emission requirements of the AgBB scheme.

Cologne, 07.05.2014

Ralph Nitsche
(Project Manager)