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Date
20 November 2014

Test Report in accordance CDPH-IAQ

1 Sample Information

Sample identification	Tretford
Batch no.	(#571) 4-7311
Production date	16/10/2014 8AM
Product type	Textile floor covering
Date when sample was received	17.10.2014
Testing (start - end)	28.10.2014 – 11.11.2014

2 Evaluation of the Results

The tested product complies with the requirements of of the Standard Method for the Testing and Evaluation of VOC Emissions from Indoor Sources using Environmental Chambers, version 1.1 of February 2010 by the California Department of Public Health.

Parameter	**Test after 14 Days**			
	CAS No. Single compounds	**Concentration in class room** µg/m³	**Concentration in office building** µg/m³	**Half CREL** Limit value µg/m³
TVOC (C_5-C_{17})	-	75	85	-
Single VOC components (with defined CREL)				
Phenol *	108-95-2	9.4	11	≤ 100
Formaldehyde	50-00-0	< 4	< 5	≤ 9
Acetaldehyde	75-07-0	< 4	< 5	≤ 70

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3 Test Method

Method	**Principle**	**Parameter**	**Quantification limit**	**Uncertainty**
Standard Method for the Testing and Evaluation of VOC Emissions from Indoor Sources using Environmental Chambers, version 1.1 of February 2010 by the California Department of Public Health				
Internal method numbers: 9810, 9811, 9812, 2803, 2808, 8400	GC/MS GC/MS HPLC	VVOC, VOC, SVOC TVVOC, TVOC, TSVOC Volatile Aldehydes	2 µg/m³ 5 µg/m³ 3 µg/m³	22% (RSD) U_m = 2 x RSD= 45 %
Test chamber parameter				
Chamber volume, l 119	Temperature, °C 23±1		Relative humidity, % 50±5	
Air exchange rate, 1/h 1	Loading ratio, m²/m³ 0.4			
Sample preparation				
Edges and back were covered with aluminium foil and the sample was mounted into a frame in accordance with JIS A 1901.				
Deviations from the test method:	None.			

For detailed method description see page 7: 5.2 Description of the applied test method

4 Results

4.1 Emissions Test after 11 Days

	CAS No.	Emission rate after 11 Days µg/(m²*h)
TVOC (C_5-C_{17})	-	430
Formaldehyde	50-00-0	< 8
Acetaldehyde	75-07-0	< 8

< Means less than

4.2 Emissions Test after 12 Days

	CAS No.	Emission rate after 12 Days µg/(m²*h)
TVOC (C_5-C_{17})	-	200
Formaldehyde	50-00-0	< 8
Acetaldehyde	75-07-0	< 8

< Means less than

4.3 Emissions Test after 14 days

	CAS No.	Retention time min	ID-Cat.	Emission rate µg/(m²*h)	Concentration class room µg/m³	Concentration small office µg/m³	Half CREL µg/m³
TVOC (C_5-C_{17})				160	75	85	-
Single VOC Substances:							
Phenol *	108-95-2	8.03	1	20	9.4	11	100
2-Ethyl-1-hexanol	104-76-7	8.75	1	140	66	75	-
Not identified *	-	10.10	4	5.7	2.7	3.0	-
Not identified *	-	10.15	4	10	4.7	5.3	-
(S)-(+)-6-Methyl-1-octanol *	110453-78-6	10.28	1	14	6.6	7.5	-
Not identified *	-	11.10	4	17	8.0	9.1	-
Volatile Aldehydes measured with DNPH-Method (see 5.2.4)							
Formaldehyde	50-00-0	-	-	< 8	< 4	< 5	9
Acetaldehyde	75-07-0	-	-	< 8	< 4	< 5	70

* Not a part of our accreditation. See 5.2.6 Accreditation

a The method is not optimal for very volatile compounds. For these substances smaller results and a higher uncertainty in the measurement cannot be excluded.

Categories of Identity:

1: Identified and specifically calibrated

2: Identified by comparison with a mass spectrum obtained from library and supported by other information. Calibrated as toluene equivalent

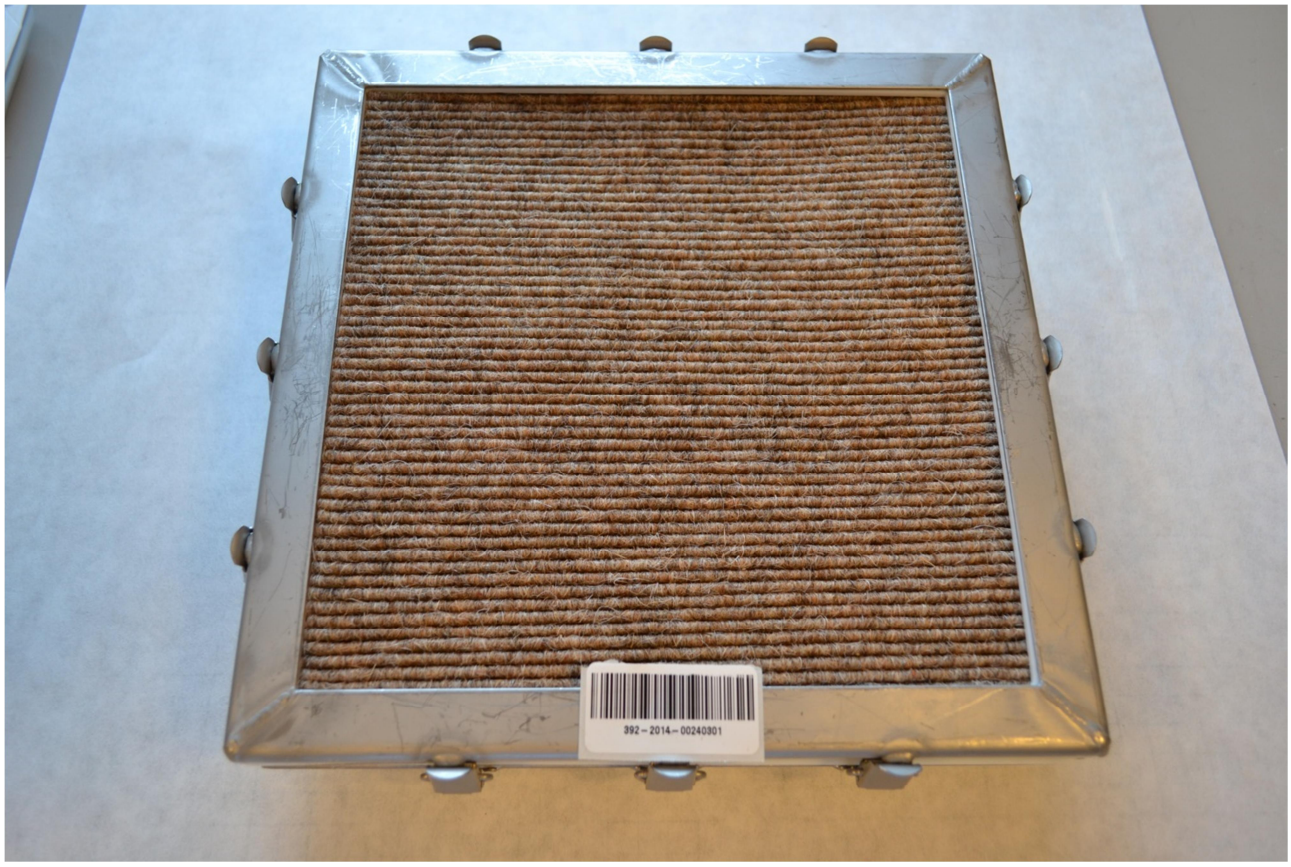
3: Identified by comparison with a mass spectrum obtained from a library. Calibrated as toluene equivalent

4: Not identified, calibrated as toluene equivalent

Maria Pelle
Chemist

Søren Ryom Villadsen
Analytical Service Manager

4.4 Image of the sample



5 Appendices

5.1 Chain of Custody

Name of the product: TRETFORD		**Type of product:** ROLL	
Model / Program / Series: #571 MUSHROOM		**Batch N°.:** 4-7311	
Article N°.: **Misc.**		**Date of batch production:** 16/10/2014	
Name of the manufacturer at the place of sampling (address / stamp): WATERFORD CARPETS LTD. INDUSTRIAL PARK, CORK ROAD WATERFORD, IRELAND		**Manufacturer** (if deviating from company's name at the place of sampling):	
Sample collector (Name, company, telephone): BART ZDROJOWY WATERFORD CARPETS LTD +353 (51) 375 941		**Signature of sample collector:**	
Sample is taken from	☑ the ongoing production ☐ stocks	**Date of sampling:** 16/10/2014	
Number of Samples	1, 0.5m x 2.0m	**Time:** 8:00 AM	
Where had the product been stored prior to sampling?	☑ Production ☐ Store ☐ Miscellaneous	**How had the product been stored prior to sampling?**	☑ open ☐ in the stack ☐ wrapped up
	Place of storage: On the machine		Packing material:
Further links in chain of custody (Name, function, company, telephone)		**Signature**	
Further links in chain of custody (Name, function, company, telephone)		**Signature**	
Sample sender (Name, company, telephone): BART ZDROJOWY WATERFORD CARPETS LTD +353 (51) 375 941		**Signature of sample sender:**	
Date and time of sending: 16/10/14 2:00PM		**Shipment details/Carrier:** Courier	
Where had the product sample been stored prior to sending?	☐ Production ☐ Store ☑ Miscellaneous	**How had the product sample been stored prior to sending?**	☐ open ☐ in the stack ☑ wrapped up
	Place of storage: Reception		Packing material: Aluminium foil + plastic foil
Laboratory receiving details (date, condition of package and sample, assigned lab no.): REF: 392-2014-00240301			
Receptionist, Eurofins Product Testing A/S:		**Signature of receptionist:**	

5.2 Description of the applied test method

5.2.1 Test Chamber

The test chamber is made of stainless steel. A multi-step air clean-up is performed before loading the chamber, and a blank check of the empty chamber is performed. The operation parameters are 23 °C, 50 % relative air humidity in the supply air.

5.2.2 Sampling, Desorption, Analysis

VOC Emissions Testing

The emissions of organic compounds after 11, 12 and 14 days were tested by drawing air samples from the chamber outlet through Tenax TA tubes (main tube and backup tube). Analyses were done by thermal desorption and gas chromatography / mass spectroscopy (internal methods no.: 9812 / 2808). All single substances were identified if the toluene equivalent in the Total Ion Chromatogram (TIC) exceeded 2 µg/m³. Quantification was done with the respective response factor and the TIC signal, or in case of overlapping peaks by calculating with fragment ions. All non-identified substances were quantified as toluene equivalent if giving more than 2 µg/m³.

Testing for Carcinogens

The presence of carcinogens and reproductive/developmental toxins (Cal/EPA OEHHA) was tested by drawing air samples from the chamber outlet through Tenax TA tubes (main tube and backup tube) after 11, 12 and 14 days. Analyses were done by thermal desorption and gas chromatography / mass spectroscopy (internal methods no.: 9812 / 2808). The absence of a listed carcinogen was stated if the specific combination of fragment ions was lacking at the specific retention time in the chromatogram. Otherwise it was checked whether the required detection limit (1 µg/m³) was exceeded. In this case the identity was finally checked by comparing full scan sample mass spectra with full scan standard mass spectra.

This test covered only substances that can be adsorbed on Tenax TA and that can be thermally desorbed. If other emissions occurred, then these could not be monitored (or with limited reliability only).

5.2.3 Calculation of the Results

In order to calculate the concentrations in an office building or a classroom, the following formula have been used:

$$C_{Calculated} = \frac{SER_A \cdot A}{n \cdot V}$$

Unit representation		Classroom parameters	Office Building parameters
SER_A	Area specific emission rate, µg/(m²h)	As tested	As tested
A	Floor area, m²	89.2	11.1
n	air exchange, h⁻¹	0.82	0.68
V	Volume of room, m³	231	30.6

5.2.4 Testing of Aldehydes

The presence of aldehydes was tested by drawing air samples from the chamber outlet through DNPH-coated silicagel tubes. Analysis was done by solvent desorption, HPLC and UV-/diode array detection (ISO 16000-3, internal methods no.: 9812 / 8400).

The absence of formaldehyde was stated if the specific wavelength UV detector response was lacking at the specific retention time in the chromatogram. Otherwise it was checked whether the detection limit was exceeded. In this case the identity was finally checked by comparing full scan sample UV spectra with full scan standard UV spectra.

5.2.5 Quality assurance

Before loading the chamber a blank check of the empty chamber was performed and compliance with background concentrations in accordance with ISO 16000-9 was determined. Sampling at the chamber outlet and subsequent analysis was performed in duplicate. For monitoring any breakthrough or overloading of the tubes, two Tenax TA tubes were used in series.

In each sequence stability of GC system was checked by a general function test of device and column, and by use of control charts for monitoring mean values and standard deviations for individual VOCs. Reproducibility of the method was monitored for two selected VOCs per sequence.

5.2.6 Accreditation

The testing methods described above are accredited to EN ISO/IEC 17025:2005 by DANAK (no. 522). Not all parameters are covered by this accreditation. At present the accreditation does not cover the parameters marked with a note *, however analysis was performed for these parameters at the same level of quality as for the accredited parameters.

5.2.7 Uncertainty of the test method

The relative standard deviation of the test method amounts to 22% (RSD). The expanded uncertainty U_m is 45% and equals 2 x RSD%. For further information please visit www.eurofins.dk/uncertainty.