

Kahrs Holding, AB
 Dunderbergsgatan 10
 38228 Nybro
 Sweden

Eurofins Product Testing A/S
 Smedeskovvej 38
 8464 Galten
 Denmark

voc@eurofins.com
 www.eurofins.com/voc-testing

Date
 15 January 2014

Test Report in accordance CDPH-IAQ

1 Sample Information

Sample identification	Kährs Avanti
Batch no.	23:02 04
Production date	13-12-09
Product type	Wood floor strips
Date when sample was received	12 December 2013
Testing (start - end)	25 December 2013 – 8 January 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 com- pounds	Concentration in class room $\mu\text{g}/\text{m}^3$	Concentration in office building $\mu\text{g}/\text{m}^3$	Half CREL Limit value $\mu\text{g}/\text{m}^3$
TVOC (C₅-C₁₇)	-	200	230	-
Single VOC components (with defined CREL)				
None determined	-	< 2	< 2	-
Formaldehyde	50-00-0	6.1	6.9	≤ 9
Acetaldehyde	75-07-0	8.5	9.6	≤ 70

The results are only valid for the tested sample(s).

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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	VVOC, VOC, SVOC	2 µg/m ³	22% (RSD) U _m = 2 x RSD = 45 %	
	GC/MS	TVVOC, TVOC, TSVOC	5 µg/m ³		
	HPLC	Volatile Aldehydes	3 µg/m ³		
Test chamber parameter					
Chamber volume, l	119	Temperature, °C	23±1	Relative humidity, %	50±5
Air exchange rate, 1/h	1	Loading ratio, m ² /m ³	0.4		
Sample preparation					
Edges and back were covered with aluminium foil.					
Deviations from the test method:		-			

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 24 hours $\mu\text{g}/(\text{m}^2\cdot\text{h})$
TVOC (C ₅ -C ₁₇)	-	390
Formaldehyde	50-00-0	15
Acetaldehyde	75-07-0	20

< Means less than

4.2 Emissions Test after 12 Days

	CAS No.	Emission rate after 48 hours $\mu\text{g}/(\text{m}^2\cdot\text{h})$
TVOC (C ₅ -C ₁₇)	-	460
Formaldehyde	50-00-0	14
Acetaldehyde	75-07-0	20

< Means less than

4.3 Emissions Test after 14 days

	CAS No.	Retention time min	ID-Cat.	Emission rate $\mu\text{g}/(\text{m}^2\cdot\text{h})$	Concentration class room $\mu\text{g}/\text{m}^3$	Concentration office building $\mu\text{g}/\text{m}^3$	Half CREL $\mu\text{g}/\text{m}^3$
TVOC (C₅-C₁₇)				430	200	230	-
Single VOC Substances:							
Pentanal	110-62-3	2.99	1	7.9	3.7	4.2	-
Not identified *	-	4.29	4	5.8	2.7	3.1	-
Hexanal	66-25-1	5.01	1	21	9.9	11.2	-
a-Pinen *	80-56-8	7.70	1	160	75.3	85.4	-
b-Pinene *	127-91-3	8.43	1	59	27.8	31.5	-
b-Myrcene *	123-35-3	8.62	2	6.3	3.0	3.4	-
3-Carene *	13466-78-9	8.94	1	140	65.9	74.7	-
p-Cymene	99-87-6	9.15	3	7.2	3.4	3.8	-
Limonene *	138-86-3	9.21	1	15	7.1	8.0	-
Terpinolene *	586-62-9	10.05	1	7.6	3.6	4.1	-
Not identified *	-	11.01	4	3.1	1.5	1.7	-
Not identified *	-	12.36	4	3.9	1.8	2.1	-
Volatile Aldehydes measured with DNPH-Method							
Formaldehyde	50-00-0	-	-	13	6.1	6.9	9
Acetaldehyde	75-07-0	-	-	18	8.5	9.6	70

* Not a part of our accreditation. See 5.2.6 Accreditation

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




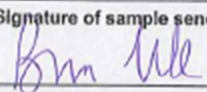

Thomas Neuhaus
Head of product emission test centre

4.4 Image of the sample



5 Appendices

5.1 Chain of Custody

Name of the product: Kährs Avantl		Type of product: Wood Flooring	
Model / Program / Series: Avantl Collections 13mm		Batch N°: 23:02 04	
Article N°: 133N19EK50		Date of batch production: 13-12-09	
Name of the manufacturer at the place of sampling (address / stamp): Kährs Dunderbergsgatan 10, Nybro, Sweden 382 28		Manufacturer (if deviating from company's name at the place of sampling):	
Sample collector (Name, company, telephone): Bruce Uhler		Signature of sample collector: 	
Sample is taken from	<input checked="" type="checkbox"/> the ongoing production stocks	Date of sampling: 12-12-10	
Number of Samples	4 pieces	Time: 15:27	
Where had the product been stored prior to sampling?	<input checked="" type="checkbox"/> Production Store	How had the product been stored prior to sampling?	<input type="checkbox"/> open
	<input checked="" type="checkbox"/> Miscellaneous		<input checked="" type="checkbox"/> in the stack wrapped up
Place of storage: Packaging line		Packing material: n/a	
Further links in chain of custody (Name, function, company, telephone)		Signature	
Sample sender (Name, company, telephone): Bruce Uhler, Kährs Holding, AB +46		Signature of sample sender: 	
Date and time of sending: 13-12-10 10:00		Shipment details/Carrier: DHL	
Where had the product sample been stored prior to sending?	<input type="checkbox"/> Production Store	How had the product sample been stored prior to sending?	<input type="checkbox"/> open in the stack
	<input checked="" type="checkbox"/> Miscellaneous		<input checked="" type="checkbox"/> wrapped up
Place of storage: Reception mail room		Packing material: Yes, aluminum foil and clear plastic, sealed bags	
Laboratory receiving details (date, condition of package and sample, assigned lab no.): 12/12-2013			
Receptionist, Eurofins Product Testing A/S: Eurofins Product Testing A/S Smedeskovvej 38 DK-8464 Galten		Signature of receptionist: 	

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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:

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

Unit representation	Classroom parameters	Office Building parameters
SER _A Area specific emission rate, µg/(m ² h)	As tested	As tested
A Floor area, m ²	89.2	11.1
n air exchange, h ⁻¹	0.82	0.68
V Volume of room, m ³	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.