



# Test Report

Dalsouple

Product Emissions in  
accordance with CDPH-IAQ


**DalUni lisse (Standard  
Formula)**

May 2011

**Client:** **Dalsouple**  
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France

**Date:** 2 May 2011

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## Introduction

On 17 February 2011 Eurofins Product Testing A/S received a sample of flooring named

**DalUni lisse (Standard Formula)**

Batch: -, Date of production: 1<sup>st</sup> February 2011

for emissions testing in accordance with the CDPH-IAQ test method. The sample was clearly labelled, properly packaged and not damaged. Testing was carried out in the laboratories of Eurofins Product Testing A/S. Before starting the testing procedure on 4 March 2011 the sample had been stored unopened at room temperature.

# 1 Description of the Applied Testing Method

The applied method complies with the method "Standard method for the testing and evaluation of volatile organic chemical emissions from indoor sources using environmental chambers (version 1.1)" as defined by the California Department of Public Health (CDPH) - Version of February 2010. The internal method numbers are: 9810; 9811, 9812, 2802, 2803, 8400.

## 1.1 Test Specimen

A sample was sent by the client to the laboratory of Eurofins Product Testing A/S in an airtight package. The package was opened and a test specimen was cut out. Edges and back were covered with aluminium foil. The test specimen was transferred into a test chamber immediately (internal method no.: 9810).

## 1.2 Test Chamber

The test chamber was consisting of stainless steel and had a volume of 119 litres. The air clean-up was realized in multiple steps. Before loading the chamber a blank check of the empty chamber was performed. The operation parameters were 23 °C, 50 % relative air humidity (in the supply air) with an air exchange rate of 0.5 per hour. The loading of the test chamber was 0.4 m<sup>2</sup> test specimen per m<sup>3</sup> air volume (internal method 9811).

## 1.3 Sampling, Desorption, Analyses

### 1.3.1 Testing for Carcinogens after 11, 12 and 14 Days

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/m<sup>3</sup>) 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).

### 1.3.2 VOC Emissions Testing after 11, 12 and 14 Days

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/m<sup>3</sup>. 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/m<sup>3</sup>.

Calculation of the TVOC (Total Volatile Organic Compounds) was done by addition of the results of all substances between C<sub>5</sub> and C<sub>17</sub> as toluene equivalent.



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).

### 1.3.3 Testing of Aldehydes after 11, 12 and 14 Days

The presence of aldehydes (formaldehyde and acetaldehyde) was tested by drawing air samples from the chamber outlet through DNPH-coated silicagel tubes after 11, 12 and 14 days. Analysis was done by solvent desorption, HPLC and UV-/diode array detection (internal methods no.: 9812 / 8400).

The absence of the aldehydes 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.

### 1.3.4 Accreditation

The testing methods described above have been accredited (EN ISO/IEC 17025:2005) by DANAK (no. 522). But some parameters are not yet covered by that accreditation. At present the accreditation does not cover the parameters marked with a note \*. But the analysis was done for these parameters at the same level of quality as for the accredited parameters.

### 1.3.5 Deviations from the Test Method

The chamber had a volume of 119 litres, not between 50 and 100 litres.

The air exchange in the test chamber was ½ per hour, not 1.

The test specimen had been stored the whole period of 14 days in the emission test chamber.

Aldehydes were not tested after 14 days.

No other deviations.

### 1.3.6 Calculation of the Results

In order to calculate the model room concentrations, following formulas have been used:

#### Calculation of VOC concentration in classrooms:

$$C_{Classroom} = \frac{SER_A \cdot A}{n \cdot V \cdot 0.9}$$

$C_{Classroom}$  Concentration in the classroom,  $\mu\text{g}/\text{m}^3$

$SER_A$  Area specific emission rate,  $\mu\text{g}/\text{m}^2\text{h}$

$A$  Floor area of classroom =  $89.2 \text{ m}^2$

$n$  air exchange rate in classroom =  $0.9 \text{ h}^{-1}$

$V$  Volume of classroom =  $231 \text{ m}^3$



### Calculation of VOC concentration in office buildings:

$$C_{Office} = \frac{SER_A \cdot A}{n \cdot V \cdot 0.9}$$

$C_{Office}$  Concentration in the office building,  $\mu\text{g}/\text{m}^3$

$SER_A$  Area specific emission rate,  $\mu\text{g}/\text{m}^2\text{h}$

A Floor area of office =  $11.1 \text{ m}^2$

n air exchange rate in office =  $0.75 \text{ h}^{-1}$

V Volume of office =  $30.6 \text{ m}^3$

## 1.4 Uncertainty of the test method

The relative standard deviation of the test method is amounted to 22% (RSD). The expanded uncertainty  $U_m$  is 45% and equals 2 x RSD%, see also [www.eurofins.dk](http://www.eurofins.dk), search: Uncertainty.



## 2 Results

### 2.1 Emissions Test after 11 Days

DalUni lisse (Standard Formula)	CAS No.	Emission rate after 11 days $\mu\text{g}/(\text{m}^2\cdot\text{h})$
TVOC (C <sub>5</sub> -C <sub>17</sub> )	-	850
Formaldehyde	50-00-0	< 4
Acetaldehyde	75-07-0	< 4

< Means less than

### 2.2 Emissions Test after 12 Days

DalUni lisse (Standard Formula)	CAS No.	Emission rate after 12 days $\mu\text{g}/(\text{m}^2\cdot\text{h})$
TVOC (C <sub>5</sub> -C <sub>17</sub> )	-	690
Formaldehyde	50-00-0	< 4
Acetaldehyde	75-07-0	< 4

< Means less than



## 2.3 Emissions Test after 14 Days

DalUni lisse (Standard Formula)	CAS No.	Retention time min	ID-Cat.	Emission rate $\mu\text{g}/(\text{m}^2\cdot\text{h})$	Concentration in class room $\mu\text{g}/\text{m}^3$	Concentration in office building $\mu\text{g}/\text{m}^3$	Half CREL $\mu\text{g}/\text{m}^3$
<b>TVOC (C<sub>5</sub>-C<sub>17</sub>)</b>				690	330	370	-
<b>Single VOC Substances:</b>							
Cyclohexanone *	108-94-1	6.97	1	3.6	1.7	1.9	-
Styrene	100-42-5	7.27	1	130	62	70	450
iso-Propylbenzene (Cumene) *	98-82-8	8.08	3	3.9	1.9	2.1	-
Diethylenglycol *	111-46-6	8.42	1	40	19	22	-
Phenol	108-95-2	9.02	1	9.4	4.5	5.1	100
Not identified *	-	9.11	4	14	6.7	7.5	-
cis-1-Methyl-4-(1-methylethyl)cyclohexane *	6069-98-3	9.27	3	25	12	13	-
trans-1-Methyl-4-(1-methylethyl)cyclohexane *	1678-82-6	9.52	3	18	8.6	9.7	-
p-Cymene (1-methyl-4-isopropylbenzol) *	99-87-6	9.91	3	11	5.2	5.9	-
Benzothiazole *	95-16-9	12.39	2	200	95	108	-
Not identified *	-	12.47	4	33	16	18	-
Not identified *	-	12.58	4	12	5.7	6.4	-
Not identified *	-	15.22	4	3.1	1.5	1.7	-
Butylhydroxytoluene BHT	128-37-0	15.47	1	89	42	48	-
Sum of not identified VOC	-	7.9-12.1	4	130	62	70	-
<b>Volatile Aldehydes measured with DNPH-Method ( see 1.3.3)</b>							
Formaldehyde **	50-00-0	-	-	< 4	< 2	< 2	16.5 <sup>1</sup>
Acetaldehyde **	75-07-0	-	-	< 4	< 2	< 2	70 <sup>2</sup>

n.d.: Not detected

< means less than

\* Not a part of our accreditation. See 1.3.4.

<sup>1</sup> Half Indoor REL developed by OEHHA

<sup>2</sup> as from December 18, 2008

\*\* Aldehydes were not tested after 14 days. But according to the 11 and 12 days results no formaldehyde or acetaldehyde was present in the sample.

### Categories of identity:

- 1 = definitely identified, specifically calibrated
- 2 = identified by comparison with a mass spectrum obtained from a library, identity 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

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

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### 3 Interpretation of the Results

The results of DalUni lisse (Standard Formula) can be summarised as follows:

No carcinogens and reproductive/developmental toxins could be detected.

No individual VOC exceeds one-half of the lowest concentration of interest in a building (chronic REL).

Formaldehyde concentration does not exceed one-half of the lowest concentration of interest in a building (indoor REL).

**The tested product DalUni lisse (Standard Formula) complies with the requirements of the “Standard method for the testing and evaluation of volatile organic chemical emissions from indoor sources using environmental chambers (version 1.1)” as defined by the California Department of Public Health (CDPH) - Version of February 2010.**





**Appendix 1: Photo of the sample**

