

Fraunhofer Institute for Wood Research  
Wilhelm-Klauditz-Institut WKI

Director  
Prof. Dr. Bohumil Kasal

Bienroder Weg 54 E  
38108 Braunschweig | Germany

Alexander Omelan

Material Analysis & Indoor Chemistry  
Phone + 49 531 2155-360 | Fax + 49 531 2155-905  
sample\_info@wki.fraunhofer.de  
www.wki.fraunhofer.de

Fraunhofer WKI | Bienroder Weg 54 E | 38108 Braunschweig | Germany

Financiera Maderera S.A. (Finsa)  
Attn: Mr. Rafael Fort  
Carretera de A Coruna-Tui, Km 57

15884 Santiago de Compostela  
Spanien - Spain

Braunschweig, 10.04.2017

## Test report No. MAIC-2017-1637

<b>Customer:</b>	Financiera Maderera S.A. (Finsa), Santiago de Compostela.	
<b>Object of the test:</b>	Chamber emission test and evaluation of a wood based sample according to French standard DEVL1104875A.	
<b>Contents:</b>	1. Sample description	Page 2
	2. Methods	Page 2
	3. Results	Page 3

This report comprises 5 pages.

The test report may be made available or duplicated only in its unabridged form. Publication in excerpt form is subject to the written consent of the Fraunhofer Institute for Wood Research – Wilhelm-Klauditz-Institut (WKI). The test results refer solely to the objects tested. The tested material was used up.

## Sample description:

WKI no.	Date of reception	Sample Name (this information is provided by the customer)	Product No.	Manufacturer-Code	Date-Stamp
P58445	27.01.2017	Superpan Tech P6 (38 mm antideslizante) (loading factor 0.4 m <sup>2</sup> /m <sup>3</sup> )	n.a.	n.a.	n.a.

(Sample P58445: foil/wrapped separately, wrapping ok)

Notice: Sample material will be stored for 2 months after test report date. Please contact us if an extended storage time is required or if sample material needs to be returned. Sample material for emission tests cannot be retained for repeated tests, it will only be stored for identification and documentation purposes.



## Methods:

**Sample preparation:** Directly after unwrapping 0.4 m<sup>2</sup> of the sample material were placed in a 1 m<sup>3</sup> glass chamber. The back side and the small faces were sealed with aluminum foil. The sample was placed on the chamber floor during the entire testing time.

**Chamber emission test:** The sample was tested in an emission test chamber without prior conditioning. After defined times (3, 7 and 28 days) samples of the chamber air were collected on sorbent tubes (Tenax TA) and analyzed on a thermal desorption-GC/MS system. Compounds were identified using MS-Spectra libraries, quantification was done using pure reference compound mixtures. The described method has a limit of determination of approx. 1 µg/m<sup>3</sup>. The volatile aldehydes were trapped on DNPH-coated cartridges and analyzed after elution with acetonitrile by HPLC-UV.

The measurements were performed according to DIN EN ISO 16000 part 3, 6, 9 and 11.

**Results:**
**Results of the chamber emission test of sample P58445 (Superpan Tech P6 (38 mm antideslizante))**

RT	CAS-No.	Substance	Concentration in $\mu\text{g}/\text{m}^3$ after			Info
			3d	7d	28d	
16.50	000066-25-1	n-Hexanal	1	1	1	bd
27.53		saturated aliphatic hydrocarbons C9-C16 <sub>(Toluene)</sub>	2	2	3	b

(The fragments/substances shown in subscript were used for the quantification)

Additional information: **a** acute toxic substance cat. 1+2+3 (acc. UN-GHS/CLP); **b** German LCI list; **c** safe sampling volume too low, under-estimation likely;

**d** odor relevant; **e** compound boiling point exceeds thermal limit of the TDS unit – underestimation likely; **f** terpene, possibly wood-related;

**g** chronic toxic substance CMR cat. 1A+1B (acc. UN-GHS/CLP); **h** aromatic solvent IOS-MAT-0054; **i** chlorinated solvent IOS-MAT-0054;

**l** specific target organ toxic substance STOT RE1+SE1 (acc. UN-GHS/CLP); **p** listed in Proposition 65; **<C6** VVOC compound; **>C16** SVOC compound.

Sum of VVOC (< C6)*:	<5	<5	<5
Sum of VOC (C6-C16) as TVOC <sub>original response</sub> * <sup>1</sup> :	<5	<5	<5
Sum of VOC (C6-C16) as TVOC <sub>Toluene</sub> according to AgBB <sup>2</sup> :	<5	<5	<5
Sum of VOC (C6-C16) as TVOC <sub>Toluene</sub> according to DIN EN ISO 16000-6 <sup>3</sup> :	<5	<5	<5
Sum of SVOC (> C16)*:	<5	<5	<5

\*Limit value of consideration is  $5 \mu\text{g}/\text{m}^3$

<sup>1</sup>LCI-substances were quantified with the original response and non-LCI substances were quantified with toluene.

<sup>2</sup>Sum of TVOC<sub>original response</sub> quantified with toluene

<sup>3</sup>Sum of all measured VOC quantified with toluene

**Lower aldehyde results of sample P58445**

CAS-No.	Substance	Concentration in $\mu\text{g}/\text{m}^3$ after			Limit of Determination [ $\mu\text{g}/\text{m}^3$ ]
		3d	7d	28d	
50-00-0	Formaldehyde	4	4	4	2
75-07-0	Acetaldehyde	< 3	< 3	< 3	3
123-38-6	Propanal	< 3	< 3	< 3	3
123-72-8	Butanal	< 4	< 4	< 4	4
67-64-1	Aceton	5	5	5	2

**Parameters of the emission chamber test:**

 Chamber type: 1m<sup>3</sup>-glass chamber L

Climatic conditions: 23 °C, 50 % r.h.

**Air exchange: 0.50 h<sup>-1</sup>**
**Loading factor: 0.40 m<sup>2</sup>/m<sup>3</sup> (q= 1.25 m<sup>3</sup>/(m<sup>2</sup> h))**
**Scenario: Floor**

Test started: 06.03.2017 10:08:50

Sampling: Tenax TA, DNPH

Analysis: Thermal desorption GC/MS, HPLC/UV


**Evaluation according to the French Standard DEVL1104875A**

Name of the product and material ... Superpan Tech P6 (38 mm antides... Client/Applicant Financiera Maderera S.A. (FINSA), S...

Number of the test report MAIC-2017-1637

Testing laboratory Fraunhofer WKI

Parameter	Day 28					
	Results		A+	A	B	C
	[µg/m <sup>3</sup> ]	[µg/m <sup>3</sup> ]	[µg/m <sup>3</sup> ]	[µg/m <sup>3</sup> ]	[µg/m <sup>3</sup> ]	[µg/m <sup>3</sup> ]
<b>TVOC</b>	<b>4</b>	<b>4</b>	<1000	<1500	<2000	≥2000
<b>Formaldehyde</b>	<b>4</b>	<b>4</b>	<10	<60	<120	≥120
<b>Acetaldehyde</b>	-	-	<200	<300	<400	≥400
<b>Toluene</b>	-	-	<300	<450	<600	≥600
<b>Tetrachlorethene</b>	-	-	<250	<350	<500	≥500
<b>Xylene</b>	-	-	<200	<300	<400	≥400
<b>1,2,4-Trimethylbenzene</b>	-	-	<1000	<1500	<2000	≥2000
<b>1,4-Dichlorbenzene</b>	-	-	<60	<90	<120	≥120
<b>Ethylbenzene</b>	-	-	<750	<1000	<1500	≥1500
<b>2-Butoxyethanol</b>	-	-	<1000	<1500	<2000	≥2000
<b>Styrene</b>	-	-	<250	<350	<500	≥500
<b>Total</b>	A+					

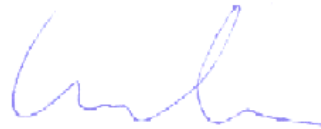
**Remarks:** The sample material fulfills the requirements for class "A+" according to the French standard 'ARRÊTÉ relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils' (DEVL1104875A) with an area specific ventilation rate of 1.25 m<sup>3</sup>/(m<sup>2</sup> h) after 28 days .

Officer in Charge



A. Omelan

For the department



Dr. E. Uhde