TFI Report 471228-05

Emission testing

according to the AgBB scheme for VOC from construction products (June 2015)

Customer

Shaw Europe Ltd.
Subsidiary of Berkshire Hathaway
616 E Walnut Ave
30721 Dalton, GA
UNITED STATES

Product

textile floor covering

Shaw Combo Product

Further product designation

Taskworx

This report includes 2 pages and 2 annex(es).

This report is a supplemention of 471228-01 and replaces the report 471228-01.

Responsible at TFI

Dr. Anja Krick
head of dept. measurement and chemical analysis
Tel: +49 241 9679 143
a.krick@tfi-aachen.de

Aachen, 27 December 2018

Dr. Alexander Siebel
head of testing laboratory

The present document is provided with an advanced electronic signature.

This report only applies to the tested samples and has been established to the best of our knowledge. Only the entire report shall be reproduced. Under no circumstances, extracts shall be used. Furthermore, we apply the “General Terms and Conditions for the Execution of Contracts” of the TFI Aachen GmbH, also with regard to the order execution.

1 Transaction

Test order	Emission testing according to the AgBB scheme for VOC from construction products (June 2015)
Order date	27 July 2017
Your reference	Alan Best
Product designation	Shaw Combo Product, article no. M9408, batch no. na
Further product designation	Taskworx
TFI sample number	17-07-0289
Date of manufacture	7 July 2017
Date of sample receipt	25 July 2017
Sampling performed by	customer

2 Product Specification

Cf. Annex Emissions

3 Results

Emission testing	requirements fulfilled

The tested specimen fulfils in every particular the requirements of AgBB.

4 Annexes

Emission [a]	E 471228-05
Sampling report	

The annexes marked [a] are based on tests accredited in accordance with EN ISO/IEC 17025.

Notified Body No. 1658

Testing laboratory, inspection and certification body recognised by the DIBt (Deutsches Institut für Bautechnik)

DAkkS Deutsche Akkreditierungsstelle D-PL-17152-01-00

Accredited for the methods indicated in the annex to the DAkkS certificate

TFI Aachen GmbH
Charlottenburger Allee 41
52068 Aachen · Germany
www.tfi-aachen.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Dr.-Ing. Bayram Aslan

Evaluation according to AgBB 2015

E 471228-05

1. General Information

Testing laboratory	TFI Aachen GmbH
Responsible laboratory staff	Norbert Beckers/Tobias Dyczczak
Number of the test report	E 471228-05
Client/Applicant	Shaw Europe Ltd.
Name of the product and material number	Shaw Combo Product - Taskworx, Artikel Nr. / article no. M9408, TFI Probennummer / TFI sample no. 17-07-0289
Control type	Other
Date of batch production	2017-07-07
Date of receipt of the sample	2017-07-25
Storage of the sample until testing	geschützt vor Kontaminationen / saved for contaminations
Product Group	Textile floor coverings
Build	tufted
pile layer material	null
Backing	other

Description of the construction product:

Parameter	Manufacturer	Laboratory
General description of the product	Textiler Bodenbelag / textile floor covering	Textiler Bodenbelag / textile floor covering
Manufacturing method	tufted	tufted
Type of fibre (chemical basis)	100% solution dyed polyamide	not tested
Surface design	multi-level loop	
Backing material	Bitumen with glassfibre	heavy backing
Total thickness	6.0 mm	
Area weight	4134 g/m²	
Additional information		

Comments

2. Test parameter

Date of the completion of the test specimen	2017-08-07
Preparation of the test specimen by	Norbert Beckers
Used auxiliary materials	Glasplatte, Aluminiumfolie / glassplate, aluminiumfoil
Start of preconditioning	
Placing of the test specimen into the test chamber and start of testing	2017-08-07
Arrangement of the test specimen in the test chamber	mittig auf Gestell / centered on rack
Covering of the edges? Ratio of covered edges to uncovered edges?	keine / no
Use of the break-off criteria	No
Manufacturer/type of the test chamber	TFI Aachen GmbH
Material of the test chamber	Edelstahl / stainless steel
Volume of the test chamber [m³]	0.25
Area of the test specimen [m²]	0.1
Air exchange rate [1/h]	0.5
Area specific air flow rate [m/h]	1.250
Temperature [°C]	23.0
Relative humidity [%]	50.0
Comments on testing	EN ISO 16000-11:2006 EN ISO 16000-9:2006 ISO 16000-6:2011 EN ISO 16017-1:2000 ISO 16000-3:2011 VOC Probennahme auf Tenax, ca. 5 l, 80 ml/min Thermodesorption / Gaschromatographie / Massenspektrometrie (TD/GC/MS) Gerstel Thermodesorber / Kaltaufgabesystem, Agilent GC/MS, unpolare Kapillarsäule Aldehyde und Ketone Probennahme auf DNPH-Kartuschen, ca. 50 l, 1000 ml/min Lösungsmitteldesorption / Flüssigchromatographie / Dioden Array Detektor (HPLC/DAD) Agilent HP 1200 / DAD, C18-Säule, ternäres Eluentengemisch VOC sampling on Tenax, approx. 5 l, 80 ml/min Thermal desorption / gas chromatography / mass spectrometry (TD/GC/MS) Gerstel thermal desorber/ cooled injection system, Agilent GC/MS non-polar capillary column Aldehydes and ketones sampling on DNPH cartridges, approx. 50 l, 1000 ml/min Solvent desorption / liquid chromatography / diode array detector (HPLC/DAD) Agilent HP 1200 / DAD, C18-column, ternary eluent mixture

3. Evaluation for AgBB 2015

Parameter	Day 3					Day 7				Day 28			
			✓	➡	✗			✓	➡			✓	✗
	[µg/m³]	[mg/m³]	[mg/m³]	[mg/m³]	[mg/m³]	[µg/m³]	[mg/m³]	[mg/m³]	[mg/m³]	[µg/m³]	[mg/m³]	[mg/m³]	[mg/m³]
TVOC	1136	**1.1**	0.3	10.0	>10.0	-	**-**	0.5	>0.5	527	**0.5**	1.0	>1.0
S SVOC	0	**0.00**	0.03	>0.03	-	-	**-**	0.05	>0.05	0	**0.0**	0.1	>0.1
R-Value *	1.312	**1.3**	0.5	>0.5	-	-	**-**	0.5	>0.5	1.020	**1**	1	>1
S VOC w/o LCI	53	**0.05**	0.05	>0.05	-	-	**-**	0.05	>0.05	0	**0.0**	0.1	>0.1
S Carcinogenic	0	**0.000**	0.001	0.01	>0.01	-	**-**	0.001	>0.001	0	**0.000**	0.001	>0.001
Total				➡			-					✓	
DIBt Parameter													
Formaldehyde	10	**0.010**	0.060	>0.060	-	-	**-**	0.060	>0.060	4	**0.004**	0.120	>0.120
Additional Information													
S VVOC	16	**0**	-	-	-	-	**-**	-	-	0	**0**	-	-

*) dimension less ✓ Pass ➡ Continue ✗ Fail

4. Measurement

4.1. Day 3

Date of measurement: 2017-08-10
TVOC ISO 16000-6: 660 µg/m³

CAS-No.	Compound name	Ret. Range	RT [min]	C [µg/m³]	Identification	C_tol [µg/m³]	Quantification	Comment	Ri	LCI Value
64-19-7	Acetic acid	VOC	6.902	183	specific	44	II		0.146	1250
116-09-6	1-Hydroxyacetone	VOC	7.582	1	similar	1	III		0.000	2400
57-55-6	Propylene glycol	VOC	8.47-8.99	630	specific	316	II		0.252	2500
111-65-9	n-Octane	VOC	9.312	2	specific	2	II		-	-
	Not identified VOC	VOC	10.511	2	Tol. equiv.	2	III		-	-
111-84-2	n-Nonane	VOC	11.661	2	specific	1	II		0.000	6000
124-18-5	n-Decane	VOC	14.209	2	specific	2	II		0.000	6000
104-76-7	2-Ethyl-1-hexanol	VOC	14.954	84	specific	78	I		0.280	300
1120-21-4	n-Undecane	VOC	16.768	2	specific	2	I		0.000	6000
	Not identified VOC	VOC	16.812	2	Tol. equiv.	2	III		-	-
132739-31-2	Dipropylene glycol-mono-t-butylether	VOC	18.2	6	specific	4	II		0.007	810
132739-31-2	Dipropylene glycol-mono-t-butylether	VOC	18.285	7	specific	5	II		0.009	810
95-93-2	1,2,4,5-Tetramethyl benzene	VOC	18.383	2	specific	3	II		0.000	500
132739-31-2	Dipropylene glycol-mono-t-butylether	VOC	18.437	2	specific	1	II		0.000	810
132739-31-2	Dipropylene glycol-mono-t-butylether	VOC	18.476	3	specific	2	II		0.000	810
	Nicht identifiziertes Alken	VOC	19.056	3	Tol. equiv.	3	III		-	-

CAS-No.	Compound name	Ret. Range	RT [min]	C [µg/m³]	Identifi-cation	C_tol [µg/m³]	Quantifi-cation	Comment	Ri	LCI Value
91-20-3	Naphthalene	VOC	19.255	1	specific	1	I		0.000	5
112-40-3	n-Dodecane	VOC	19.255	2	specific	3	II		0.000	6000
	Not identified VOC	VOC	19.446	2	Tol. equiv.	2	III		-	-
	Not identified VOC	VOC	19.7	3	Tol. equiv.	3	III		-	-
	Nicht identifiziertes Alken	VOC	20.009	3	Tol. equiv.	3	III		-	-
	saturated aliphatic hydrocarbons higher than C9	VOC	20.009	3	Tol. equiv.	3	III		0.000	6000
	Nicht identifiziertes Alken	VOC	20.309	6	Tol. equiv.	6	III		-	-
	saturated aliphatic hydrocarbons higher than C9	VOC	20.805	7	Tol. equiv.	7	III		0.001	6000
105-60-2	Caprolactam	VOC	20.805	146	specific	80	I		0.487	300
	saturated aliphatic hydrocarbons higher than C9	VOC	20.921	2	Tol. equiv.	2	III		0.000	6000
	Nicht identifiziertes Alken	VOC	20.973	7	Tol. equiv.	7	III		-	-
	other saturated n- and iso-alcohols, C11-C13	VOC	21.075	5	similar	5	III		0.010	500
	saturated aliphatic hydrocarbons higher than C9	VOC	21.134	8	Tol. equiv.	8	III		0.001	6000
	saturated aliphatic hydrocarbons higher than C9	VOC	21.247	4	Tol. equiv.	4	III		0.000	6000
	Not identified VOC	VOC	21.298	6	Tol. equiv.	6	III		-	-
	Nicht identifiziertes Alken	VOC	21.385	5	Tol. equiv.	5	III		-	-
	Nicht identifiziertes Alken	VOC	21.454	9	Tol. equiv.	9	III		-	-
	Nicht identifiziertes Alken	VOC	21.596	11	Tol. equiv.	11	III		-	-
	Nicht identifiziertes Alken	VOC	21.802	3	Tol. equiv.	3	III		-	-
	Nicht identifiziertes Alken	VOC	21.916	9	Tol. equiv.	9	III		-	-

CAS-No.	Compound name	Ret. Range	RT [min]	C [µg/m³]	Identifi-cation	C_tol [µg/m³]	Quantifi-cation	Comment	Ri	LCI Value
	other saturated n- and iso-alcohols, C11-C13	VOC	22.254	7	similar	6	III		0.014	500
	Nicht identifiziertes Alken	VOC	22.342	3	Tol. equiv.	3	III		-	-
629-59-4	n-Tetradecane	VOC	23.715	2	specific	3	I		0.000	6000
	Nicht identifiziertes Glycol	VOC	24.614	2	Tol. equiv.	2	III		-	-
	other saturated n- and iso-alcohols, C11-C13	VOC	25.153	2	specific	2	II	1-Dodecanol	0.000	500
50-00-0	Formaldehyde	VVOC	1,005.3	10	DNPH		I		0.100	100 (VVOC)
75-07-0	Acetaldehyde	VVOC	1,006.3	6	DNPH		I		0.005	1200 (VVOC)
123-38-6	Propanal	VVOC	1,007.8	3	DNPH		I		-	- (VVOC)

4.2. Day 28

Date of measurement: 2017-09-04
TVOC ISO 16000-6: 240 µg/m³

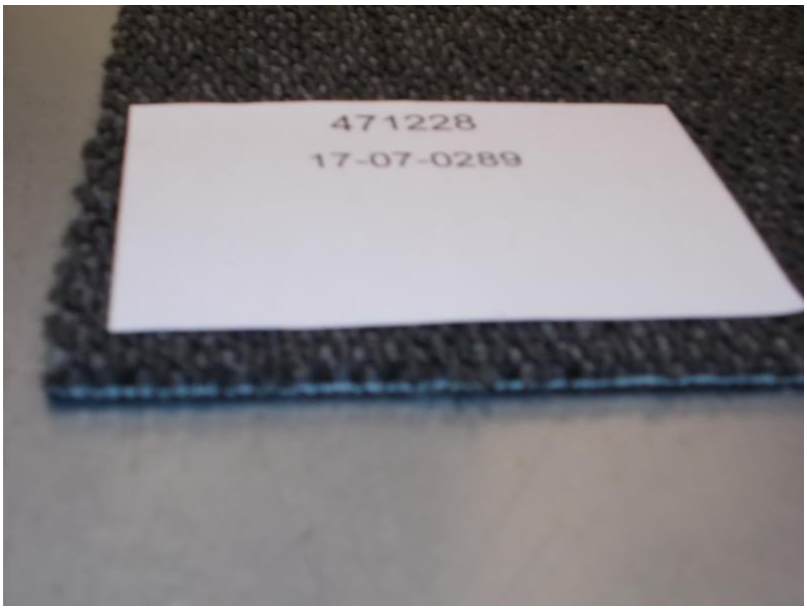
CAS-No.	Compound name	Ret. Range	RT [min]	C [µg/m³]	Identifi-cation	C_tol [µg/m³]	Quantifi-cation	Comment	Ri	LCI Value
64-19-7	Acetic acid	VOC	6.924	94	specific	23	II		0.075	1250
116-09-6	1-Hydroxyacetone	VOC	7.619	3	similar	2	III		0.000	2400
57-55-6	Propylene glycol	VOC	8.604	170	specific	85	II		0.068	2500
104-76-7	2-Ethyl-1-hexanol	VOC	14.905	9	specific	7	I		0.030	300
	Not identified VOC	VOC	16.77	4	Tol. equiv.	4	III		-	-
105-60-2	Caprolactam	VOC	20.792	254	specific	117	I		0.847	300
	Nicht identifiziertes Alken	VOC	20.931	2	Tol. equiv.	2	III		-	-

CAS-No.	Compound name	Ret. Range	RT [min]	C [µg/m³]	Identifi-cation	C_tol [µg/m³]	Quantifi-cation	Comment	Ri	LCI Value
50-00-0	Formaldehyde	VVOC	1,005.3	4	DNPH		I		0.000	100 (VVOC)
75-07-0	Acetaldehyde	VVOC	1,006.3	1	DNPH		I		0.000	1200 (VVOC)

5. Images

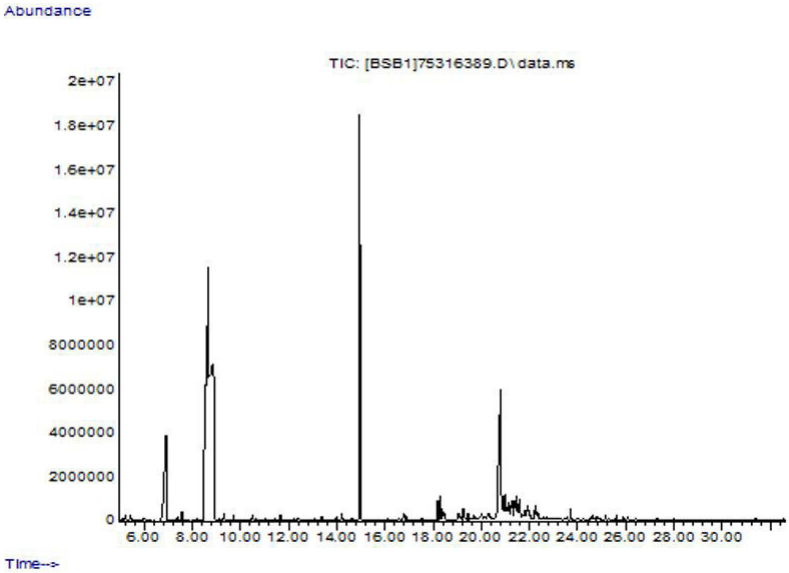
5.1. Specimen image

5.2. Product image

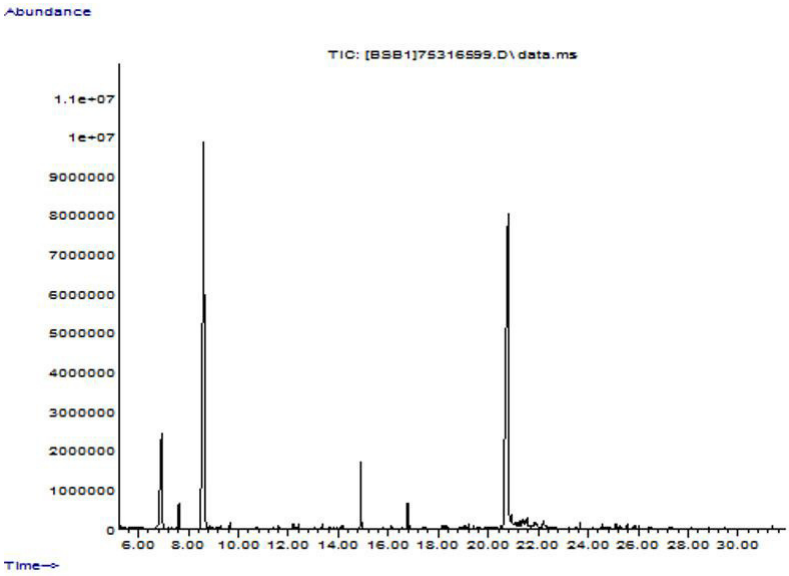


6. Chromatograms

6.1. Day 3



6.2. Day 28



Emissionen / Emissions
Probenahmeprotokoll / Sampling Report

Prüflabor - Testing Laboratory	TFI Aachen GmbH (TFI)	Charlottenburger Allee 41 52068 Aachen Germany	
Probennehmer - Sampler (Organisation / Name des Probennehmers - name of person) **Hersteller / Vertragspartner - Manufacturer / Contractor**	Alan Best Shaw Europe Ltd		
Prüfumfang - Scope of testing	x☐ DIBt - AgBB x☐ A+ France ☐ Belgien / Belgium ☐ M1 ☐ Emicode EC1plus	☐ RAL UZ ☐ US-California ☐ LEED v4 ☐ TÜV Interior ☐ BREEAM	☐ nur 3 Tage / only 3 days ☐ Geruch / Odour 16000-28 ☐
Produktname - Product name (bindend für Prüfbericht) (binding for test report)	Shaw Combo Product	**Artikel-Nr. - article no.**	M9408
Chargen-Nr. - Batch no.	na	**Produktionsdatum der Charge - Production date of batch:**	7 July 2017
Gruppe/Serie/Modell Group/product range (Name, abZ-Nr.- no. ...)	☐ DIBt ☐ TÜV ☐ na		
Produktart - Sample type	☐ textiler Bodebelag - textile floor covering ☐ elastischer Bodenbelag - resilient floor covering ☐ Laminat - laminate ☐ Parkett/holzfußboden - wood flooring ☐ Sportboden - surface for sports areas	☐ Wandbelag - wall covering ☐ Verlegeunterlage - underlay ☐ Beschichtung - coating ☐ Klebstoff - adhesive ☐	
Bestimmngsmäßige Verwendung - Intended use	☐ Boden - floor ☐ Wand - wall ☐ Decke - ceiling	☐ Wand und Decke -wall and ceiling ☐ Ober- und Unterseite identisch - top and bottom side identical ☐	
Datum der Probenahme / Uhrzeit - Sampling date / time	1500 / 7/07/2017		
Probenentnahme Sample taken from	☐ aus laufender Produktion - production ☐ aus Lagerbeständen - stock		
Art der Lagerung vor Entnahme - Storage mode	☐ offen - exposed ☐ verpackt - packed	☐ gestapelt - stacked ☐	
Lagerort - Storage location			
Verpackungsart und -material - Packaging material	☐ Aluminiumfolie - aluminium foil ☐ Verpackungseinheit - packaging unit	☐ PE-Folie - PE foil ☐	
Besonderheiten - Particular remarks (mögliche negative Einflüsse durch Emissionen am Probenahmeort, Unklarheiten, Fragen, etc.) (possible negative impacts caused by emissions at the sampling site, problems, questions ...)	☐ Gasbetriebene Gabelstapler - gas driven forklift ☐ Benzinemissionen - fuel emissions ☐ Lösungsmittelemissionen aus der Produktion - solvent emissions from the production ☐		
☐ Technisches Datenblatt wird innerhalb von drei Tagen dem TFI nachgereicht Technical datasheet will be submitted to the TFI within 3 days			
x☐ Technisches Datenblatt liegt bei - technical datasheet is attached			

Hiermit bestätigt der Unterzeichner die Richtigkeit der oben gemachten Angaben. Die Probe wurde eigenhändig gemäß Probenahmeanleitung DIBt/prEN 16516 ausgewählt, entnommen und verpackt.

Hereby the sigantory confirms the correctness of the above stated information. The sample was hand selected and packed in accordance with the sampling instructions DIBt/prEN 16516.

ALAN BEST

Stempel und Unterschrift Unternehmen - Stamp and signature of the company

TFI Aachen GmbH
Charlottenburger Allee 41
52068 Aachen · Germany
www.tfi-aachen.de

HRB 8157 Aachen
VAT No. DE209411312
Managing Director
Univ.-Prof. Prof. h.c. (MGU)
Dr.-Ing. Dipl.-Wirt.-Ing. Thomas Gries