

REPORT
Emission chamber test
according to AgBB Evaluation Scheme

Product: VF

Report-No.: ULY18-006841-1

Sample-No: 19-019116-03
Order-No: ULY-01612-19

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Saint-Quentin-Fallavier, 11th April 2019

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ATTACHMENT

Attachment 1: ADAM_mask 19-019116-03

1 Introduction

WESSLING was contracted to perform an emission test chamber study of a coating to AgBB-scheme (Status: August 2018).

2 Test Data

2.1 Product Data

Name of product:	VF
Sample-No.	19-019116-03
Date of production	17 th January 2019
Type of packaging	Lab container
Date of receipt	11 th February 2019
Period of examination	18 th February 2019 – 18 th March 2019

2.2 Test chamber specifications

Test-Norm	DIN EN ISO 16000-9 (2008-04) ^A / DIN EN 16516 (2018-01) ^A (Produktanalytik Altenberge)
Type	Self made, stainless steel
Volume	0,11 m ³
Temperature	23 °C
Rel. Humidity	50 %
Exchange rate	0,5 h ⁻¹

2.3 Preparation of test specimen

The preparation and application were performed according to the client's specification.

Loading	1	m ² /m ³
Area-specific Air Exchange Rate	0,5	m ³ /m ² h
Surface area of sample	0,11	m ²
Test chamber load	18 th February 2019	

2.4 Sampling

Air-sampling after 3 days					
Date	Parameter	Test-norm	Sorbens	sampling-volume	Sampling-time
21 th February 2019	VOC	DIN EN 16516 (2018-01) ^A	Tenax-TA	5,2 L	50 min
	Aldehydes	DIN ISO 16000-3 (2013-01) ^A	DNPH	50 L	100 min
Air-sampling after 28 days					
Date	Parameter	Test-norm	Sorbens	sampling-volume	Sampling-time
18 th March 2019	VOC	DIN EN 16516 (2018-01) ^A	Tenax-TA	5,6 L	50 min
	Aldehydes	DIN ISO 16000-3 (2013-01) ^A	DNPH	50 L	100 min

The analyses were carried out by WESSLING according to DIN EN 16516 (2018-01)^A and DIN ISO 16000-3 (2013-01)^A in Altenberge and Hannover (Germany).

3 General information

The health and well-being of occupants in building interiors may be influenced by possible pollution of indoor air. Such pollution of indoor air can be caused by construction materials, as many of them cover large surface areas in a room.

According to the Landesbauordnung (State Building Regulations) facilities shall be constructed and maintained in such a way that especially "life, health and natural resources are not endangered". Construction materials have to meet these requirements, particularly in the way that "dangers or unreasonable harassment are not caused by chemical, physical or biological effects".

Members of the AgBB-Committee (Committee for Health-related Evaluation of Building Products - "Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (AgBB)") in addition to the countries and the Federal Environmental Agency (UBA - Umweltbundesamt) are the Federal Institute for Risk Assessment (BfR - Bundesinstitut für Risikobewertung), the Federal Institute for Materials Research and Testing (BAM - Bundesanstalt für Materialforschung und -prüfung), the German Institute for Building Technology (DIBt - Deutsches Institut für Bautechnik), the Coordinating Committee for hygiene, health and environmental protection of the Standards Committee for Construction of DIN (Koordinierungsausschuss 03 für Hygiene, Gesundheit und Umweltschutz des Normenausschusses Bauwesen im DIN) and the Minister of Construction Conference - Conference of Ministers of Planning, Building and Housing Ministers and Senators of the States (ARGEBAU - Bauministerkonferenz - Konferenz der für Städtebau, Bau- und Wohnungswesen zuständigen Minister und Senatoren der Länder). The AgBB office is part of the Federal Environment Agency (Umweltbundesamt).

The Committee presented a procedural scheme for the health assessment of the VOC emissions from building materials used in interiors of buildings ("AgBB scheme").

The effects of volatile organic compounds can range from unpleasant odour and irritation of the mucous membranes of the eyes, nose and throat to effects on the nervous system to long-term effects. VOC include substances with allergenic or allergy-enhancing properties and in particular with carcinogenic, mutagenic or reproductive toxic potency. For the toxicological evaluation of substances in construction products, AgBB has used the available information. Concentration levels were determined below which no adverse health effects are feared.

To determine the emissions from building products, test chamber studies are conducted and the following parameters are analyzed:

TVOC Total Volatile Organic Compounds

TVOC₃ TVOC after 3 days

TVOC₂₈ TVOC after 28 days

TSVOC₂₈ Total Semi-Volatile Organic Compounds after 28 days

LCI lowest concentration of interest

R-value sum of all quotients of individual material concentration to the LCI value of the individual material

The AgBB scheme gives following criteria for the emission test:

Substance	Criteria (3rd day)	Criteria (28th day)
Total VOC	≤ 10.000 µg/m ³	≤ 1.000 µg/m ³
Total SVOC	---	≤ 100 µg/m ³
C-substances	≤ 10 µg/m ³ <u>Total</u>	≤1 µg/m ³ <u>per single value</u>
Total VOC without LCI	---	≤ 100 µg/m ³
R-value	---	≤ 1

Building products that meet these requirements are suitable for indoor use.

These criteria are also implemented in the AgBB / DIBt Auswertemaske (ADAM), an Excel sheet for the measurement results recording of emission tests with subsequent assessment by the "Procedure for health assessment of emissions of volatile organic compounds (VOC and SVOC) from Building Products" of the Committee for Health-related Evaluation of Building Products "Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (AgBB)" and the "Principles for the health assessment of indoor construction products" of the Deutsches Institut für Bautechnik (DIBt).

4 Results and Assessment

For the recording and assessment of the measurement results the AgBB / DIBt Assessment mask (ADAM) was used (see attachment).

4.1 TVOC₃, TVOC₂₈

The analysed values for total volatile organic compounds on day 3 ($\leq 10,000 \mu\text{g}/\text{m}^3$) and day 28 ($\leq 1.000 \mu\text{g}/\text{m}^3$) were below the limit values. The product meets the criterion in terms of VOC emissions.

4.2 TSVOC₂₈

There was no evidence of semi volatile compounds after 28 days in the test chamber air. The product meets the criteria terms of TSVOC₂₈ emissions.

4.3 C-substances₃₊₂₈

There was no evidence of carcinogenic substances in the analyzed samples taken on day 3 and day 28. The product meets the criterion for the emissions of carcinogenic substances.

4.4 Total VOC without LCI₂₈

The product meets the requirement of AgBB for VOC without LCI on day 28 ($\leq 100 \mu\text{g}/\text{m}^3$).

4.5 R-value₂₈

The R-value meets the requirements after 28 days.

5 Summary

WESSLING was contracted to perform an emission test chamber study of a coating to AgBB-scheme (Status: August 2018).

The sample was prepared according to the client's specification and placed in an emission test chamber according to DIN EN ISO 16000-9 (2008-04)^A and DIN EN 16516 (2018-01)^A. On day 3 and 28 after loading the test chamber air was analysed for the content of VOCs and aldehydes. The results were recorded and assessed using AgBB / DIBt assessment mask (ADAM).

With regard to manner and extent of the performed examinations the sample complies with all requirements of the AgBB-scheme.

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