Report

Emission chamber test according to GEV-EMICODE

Product: ECO HYDRO SIL

Report No.: CAL22-038217-1

Sample No.:	21-211675-03
Order No.:	CAL-29807-21
Client:	ETS Europe BVBA Herentalsebaan 406 UNIT D1 2160 Wommelgem Belgien
Date of order:	12 th December 2021
Project manager:	Monique Elmer

Altenberge, Date 26th April 2022

Table of contents

1 Introduction

The company ETS Europe BVBA commissioned WESSLING GmbH to perform an emission chamber test of the sample ECO HYDRO SIL according to the GEV EMICODE (27th April.2020).

The sample was dispatched by the client.

2 Test data

2.1 Product data

Sample identifier	ECO HYDRO SIL
Sample number WESSLING	21-211675-03
Type of packaging	1 kg bottle
Date of receipt	09 th December 2021
Test period	8 th February 2022 – 12th April 2022

2.2 Test chamber specifications

Type of test chamber	Stainless steel	
Volume of test chamber	110	L
Temperature	23	°C
Rel. humidity	50	%
Air exchange	0,5	h^{-1}

2.3 Preparation of the test specimen

The test specimen was prepared according to manufacturer information.

Area-specific flow rate	1,25	m³/m²h (use: floor)
Sample area	0,044	m²
Mass oft he sample	4,4	g
Actual consumption	100	g/m²
Beginning of the emission chamber test	8th February 2022	

2.4 Investigative Procedures

Parameter	Test Norm	Measu in % (relativ)	Ausführender Standort
Testchamber Procedure	DIN EN 16516 (2020-10)[A]	-	WESSLING GmbH Altenberge
VOC – Measurement	DIN EN 16516 (2020-10)[A]	55	WESSLING GmbH Altenberge
Aldehyde - Measurement	DIN ISO 16000-3 (2013-01)[A]	20	WESSLING GmbH Hannover

Notice:

If conformity assessments were carried out for the examined sample(s) as part of the test report creation, the measurement uncertainties of the measurement methods were not taken into account (with reference to the specifications of DIN EN ISO 17025:2018), both in the case of compliance and non-compliance of limit values (= decision rule).

2.5 Sampling

Sampling after 3 days					
Date	**Parameter**	**Test norm**	**Sorbens**	**Sampling volume**	**Duration of sampling**
11th February 2022	VOC	DIN ISO 16000-6	Tenax-TA	5 L	50 min.
	Aldehydes	DIN ISO 16000-3[A]	DNPH	50 L	100 min.
Sampling after 28 days					
Date	**Parameter**	**Test norm**	**Sorbens**	**Sampling volume**	**Duration of sampling**
8th March 2022	VOC	DIN ISO 16000-6	Tenax-TA	5 L	50 min.
	Aldehydes	DIN ISO 16000-3[A]	DNPH	50 L	100 min.

The examinations according to DIN ISO 16000-3[A] and DIN ISO 16000-6 were performed at the WESSLING sites Hanover and Budapest*. (* not within the national accreditiation of WESSLING GmbH; measured in double determination)

3 Bases

EMICODE® is the trademark-protected designation for a classification system with which installation materials, adhesives and building products can be classified according to their emission behavior in the following three classes:

EMICODE® EC1^{Plus}: **"very low-emission^{Plus}"**

EMICODE® EC1: “very low emissions”

EMICODE® EC2: “low emissions”

The classification according to EMICODE® is based on analytically determined measurement data and specific classification criteria, measured according to a defined test method. The organic compounds that can be released from a product over a longer period of time are determined using a defined chamber procedure. Based on the result of this test, products are assigned to the appropriate EMICODE class depending on their type and intended use. The emissions are evaluated after 3 days and after 28 days using the following parameters:

TVOC Total Volatile Organic Compounds

$TVOC_3$ TVOC value after 3 days

$TVOC_{28}$ TVOC value after 28 days

$TSVOC_{28}$ Sum of all semi-volatile organic compounds (Total Semi-Volatile Organic Compounds) after 28 days

LCI lowest concentration of interest: Auxiliary values of the health-related individual substance evaluation for product emissions, the so-called LCI values, are updated annually or longer by the AgBB (committee for the health-related evaluation of building products).

R value The R value is the sum of all quotients from the measured substance concentrations and their associated LCI values

K1/K2 volatile organic substances that are considered carcinogenic or suspected of being carcinogenic (classification as K1, K2) according to European and/or German hazardous substance legislation.

The GEV provides the following requirements for the EMICODE classification:

Parameter (µg/m³)	**EC1Plus**	**EC1 (µg/m³)**	**EC2 (µg/m³)**
Total VOC after 3 Days	≤ 750	≤ 1000	≤ 3000
Total VOC after 28 Days	≤ 60	≤ 100	≤ 300
Total SVOC after 28 Days	≤ 40	≤ 50	≤ 100
R-value	1	-	-
Sum of unrated VOC	≤ 40	-	-
Formaldehydes after 3 Days	≤ 50	≤ 50	≤ 50
Acetaldehydes after 3 Days	≤ 50	≤ 50	≤ 50
Sum of From- and Acetaldehydes	≤ 0.05 ppm	≤ 0.05 ppm	≤ 0.05 ppm
Sum of K1/K2 after 3 Days	≤ 10	≤ 10	≤ 10
All K1/K2 after 28 Days	≤ 1	≤ 1	≤ 1

Only substances from 5 µg/m³ des are included in the calculation of TVOC and TSVOC, as well as TVVOC for parquet varnishes. The individual compounds are quantified both substance-specifically and with toluene as a reference substance for calibration (toluene equivalent = TÄ). When assessing the TVOC, however, only the value calculated from the toluene equivalents is taken into account.

4 Results and evaluation

4.1 Measurement after 3 Days

4.1.1 Table $TVOC_3$, K1/K2

Parameter (CAS-Nr.)	VOC-Concentration Test Chamber-spez. (µg/m³)	VOC-Concentration Test Chamber-TE (µg/m³)	Test value* (µg/m³)	Evaluation
Single Compounds				
Toluol (108-88-3)	3	< 1		
Cyclohexan (110-82-7)	1	< 1		
Andere Alkylbenzole	15	15		
Aceton (VVOC / DNPH) (67-64-1)	6	< 1		
TVOC (C6-C16)**	15	-		
TVOC (C6-C16) DIN EN 16516 (TE)**	**-**	**15**	**750 / 1000 / 3000**	**EC 1Plus**
Sum of volatile K1/K2	n.v.	**n.v.**	**10 /10 /10**	**EC 1Plus**

*according to GEV requirement criteria for installation materials, adhesives and construction products EC 1 Plus / EC1 / EC2
** taking into account the limits of substances with a LCI value > 5 µg/m³
n.v.: not verifiable (limit of quantification: < 1 µg/m³, as far as technically feasible)
TE = toluene equivalent

4.1.2 Table Aldehydes-Results

Parameter	Concentration Test Chambe (µg/m³)	Concentration Test Chambe (ppm)	Test value*	Evaluation
Formaldehyds	2	< 0,01	50 / 50 / 50 µg/m³	EC 1Plus
Acetaldehyds	4	< 0,01		
Total	6	0,01	0,05 / 0,05 / 0,05 ppm	EC 1Plus

*according to GEV requirement criteria for installation materials, adhesives and construction products EC 1 Plus / EC1 / EC2

4.2 Measurement after 28 Days

4.2.1 Table $TVOC_{28}$, TSVOC, VOC without LCI, R-value, K1/K2

Parameter (CAS-Nr.)	**VOC-Concent-ration Test Chamber-spez. (µg/m³)**	**VOC-Concent-ration Test Chamber-TE (µg/m³)**	**LCI (µg/m³)**	**R_i**	**Test value* (µg/m³)**	**Evaluati-on**
Single Compounds Acetaldehyd (75-07-0)	3	n.v.	1200	0,000		
Aceton (67-64-1)	6	n.v.	1200	0,005		
$TVOC_{spez}$ (C6-C16)**	< 5	-				
TVOC (C6-C16) DIN EN 16516 (TE)**	**-**	**< 5**			**60 / 100 / 300**	**EC 1Plus**
TSVOC (>C16)	< 5	**< 5**			**40 / 50 / 100**	**EC 1Plus**
VOC without LCI	< 5	**< 5**			**40 / - / -**	**EC 1Plus**
R-value	**0,005**	**-**			**1 / - /-**	**EC 1Plus**
Sum of volatile K1/K2	n.v.	**n.v.**			**1 / 1 / 1**	**EC 1Plus**

*according to GEV requirement criteria for installation materials, adhesives and construction products EC 1 Plus / EC1 / EC2
** taking into account the limits of substances with a LCI value > 5 µg/m³
n.v.: not verifiable (limit of quantification: < 1 µg/m³, as far as technically feasible)
TE = toluene equivalent

5 Summary

The company ETS Europe BVBA commissioned WESSLING GmbH to perform an emission chamber test of the sample ECO HYDRO SIL according to the GEV EMICODE (27th April 2020)

The sample was prepared and then placed in a test chamber according to DIN EN 16516 (2020-10)[A]. On the 3rd and 28th day after loading, the test chamber air was examined for VOC/SVOC, carcinogens and also on the 3rd day for formaldehyde and acetaldehyde. The measurement results were evaluated using the EMICODE classification criteria.

With regard to manner and extent of the performed examination, the tested product complies with the requirements of the EMICODE EC 1[Plus] after 3 and 28 Days.

26.04.2022 12:19

Monique Elmer
Chemical engineer
Project manager