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AB 053

Test report

no. DBL-2025-0393-01-BLS of 13.02.2025

SUBJECT	**Volatile organic compounds (VOCs) and aldehydes emission tests by chamber method acc PN-EN 16516 from 3 sample variants: chipboard, MDF board and glass plate.**
ORDER NUMBER	A/DBL/BLS/0393/2025
NAME AND ADDRESS OF ORDERING PARTIES	**ORDERING PARTY** Ecco Adhesives Sp. z o.o., Młyny 90, 37-552 Młyny
	TESTED OBJECT
IDENTIFICATION OF TESTED SAMPLES	3 sample variants: chipboard, MDF board and glass plate
DATE OF ACCEPTANCE OF SAMPLES FOR TESTS	29.01.2025
DATE OF PERFORMANCE OF TESTS	31.01 – 3.02.2025
LOCATION OF PERFORMANCE OF TESTS	Laboratory headquarters
ENTITIES CARRYING OUT TESTS	Patrycja Kwaśniewska-Sip, PhD Beata Wojkiewicz, M.Sc.Eng.

	NAME AND SURNAME POSITION	DATE, SIGNATURE
Authorized by	Magdalena Czajka, PhD. Eng. Area Leader - Deputy Manager for Environmental Research	M. Czajka 13.02.2025

1. TEST METHODS

Name of the test	Document	Method status (A/NA)*
Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air.	PN-EN 16516+A1:2020	A
Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air — Active sampling method	ISO 16000-3:2022	A
Indoor air – Part 6: Determination of Volatile Organic Compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS/FID.	ISO 16000-6:2021	A
Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing. Emission test chamber method	PN-EN ISO 16000-9:2009	A

*A – accredited method; NA – non-accredited method

** standard withdrawn, standard withdrawn and replaced

2. EQUIPMENT OF THE TEST STANDS

Name	Type	Producer	ID No.
test chambers	Glass chamber, capacity 0.225 m3	ITEE Radom	F6/16
air sampling pump	GilAir Plus	Gilian	F6/23
gas chromatograph with mass spectrometer detector and thermal desorber	GC Clarus 680; MS Clarus SQ8S; TurboMatrix 350	PerkinElmer	F13/62
liquid chromatography with UV detector	UltiMate 3000 Standard (SD) HPLC/UHPLC	Thermo Scientific	G16/31

3. DESCRIPTION OF TEST SAMPLE

The object of the assessment were a samples of plywood and door blocks. The samples were described by the Customer as:

1) 16mm chipboard, natural blocker with adhesive properties based on plant proteins SKL021CA
2) 15mm MDF board; natural blocker with adhesive properties based on plant proteins SCAP031PC
3) On a glass plate:

Natural blocker with adhesive properties based on plant proteins SKLO12CSPC, solids content 64%, blocker weight 14g

- Producer: Ecco Adhesives Sp. z. o. o.

The samples were taken by the customer and delivered to the laboratory of Łukasiewicz Research Network - Poznań Institute Of Technology on 29.01.2025.

4. ADDITIONAL INFORMATION

1. In the case of samples taken by the client, the Laboratory is not responsible for the identification and representativeness of the object, method and place of collection.
2. The expanded uncertainty was determined for coverage factor k = 2 and 95% confidence level. The measurement uncertainty does not take into account the uncertainty component associated with the sampling.

Record No. 01/0393/2025/BLS

Determination of volatile organic compounds (VOC) concentration in the air of testing chamber with HPLC and GC-MS methods

1. LIST OF TESTED COMPOUNDS

Compounds	CAS	Unit	Method status (A/NA)*
formaldehyde	50-00-0	µg/m^3	A
acetaldehyde	75-07-0	µg/m^3	A

*A – accredited method; NA – non-accredited method

2. TEST CONDITIONS

Tested sample	Conditions
volume of the test chamber	0.225 m^3
climatic conditions	temperature 23±1°C
	relative humidity 50±5%
air change rate	0,5 h^{-1}
chamber loading factor	1,0 m^2/m^3
test period	31.01 – 3.02.2025

3. CHROMATOGRAPHIC CONDITIONS

	HPLC-UV analysis	GC-MS-TD analysis
adsorbent/conditioning temperature	DNPH	Tenax TA®, 310 °C
Conditions of chromatographic analysis	column: C18, 4.6 mm × 250 mm, grain size 5 µm (Acclaim ™ 120, Thermo Scientific)	column: Elite-5MS 0,25 mm × 0,25 um ×30 m
	mobile phase: 60% (B) acetonitrile + 40% (A) water (1 ml/min)	mobile phase: helium (1 ml/min) program: 35°C (4 min) 5°C/min→ 140°C (0 min) 12°C/min→ 240°C (3 min)
	detector: UV przy długości fali 360nm	detector: MS 220°C

4.RESULTS

Concentrations of aldehydes in the air of a chamber with a capacity of 0.225 m^3 after 3 days of sample exposure:

CAS	Aldehyde	Concentration in chamber with glass		Concentration in chamber with chipboard		Concentration in chamber with MDF board		Uncertainty [±][1]
		[µg/m³]	[ppm]	[µg/m³]	[ppm]	[µg/m³]	[ppm]	[ppm]
50-00-0	formaldehyde	<1	0,000	13	0,011	56	0,045	0,003
75-07-0	acetaldehyde	21	0,002	33	0,027	202	0,163	0,003

[1] The expanded uncertainty was determined for coverage factor k = 2 and 95% confidence level

Concentrations of volatile organic compounds (VOC) in the air of a chamber with a capacity of 0.225 m^3 after 3 days of samples exposure:

CAS	VOC	Concentration in chamber with glass	Concentration in chamber with chipboard	Concentration in chamber with MDF board
		[µg/m³]	[µg/m³]	[µg/m³]
67-64-1	2-Propanone	<1	45	269
64-19-7	Acetic acid	7	359	239
590-86-3	3-Methylbutanal	3	18	69
108-88-3	Toluene	-	33	51
66-25-1	Hexanal	3	36	272
78-93-3	2-Butanone	32	11	5
80-56-8	α-Pinene	3	22	2
100-52-7	Benzaldehyde	<1	3	4
498-15-7	3-Carene	5	11	4
5989-27-5	Limonene	2	2	3
541-02-6	Decamethylcyclopenta-siloxane	1	1	1
Σ VVOC (<C6)		10	422	577
Σ VOC (C6 – C16)		56	119	342
Σ SVOC (C16 – C22)		<1	<1	<1
TVOC C6 – C16		56	119	342
Toluene equivalent ($TVOC_{ID}$)		39	81	230
Carcinogenic		-	-	-
Uncertainty [±][1]		3	3	3

[1] The expanded uncertainty was determined for coverage factor k = 2 and 95% confidence level

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