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VOC TEST REPORT ANSI/BIFMA

2 December 2025

1 Sample Information

Sample name	See Section 4.2
Batch no.	See Section 4.2
Stated production date	03/11/2025
Product type	Wall covering (textile and wall paper)
Sample reception	10/11/2025

2 Brief Evaluation of the Results

Regulation or protocol	Conclusion	Version of regulation or protocol
ANSI/BIFMA, section 7.6.1	Pass	ANSI/BIFMA e3-2014e "Furniture Sustainability Standard"
ANSI/BIFMA, section 7.6.2	Pass	ANSI/BIFMA e3-2014e "Furniture Sustainability Standard"
ANSI/BIFMA, section 7.6.3	Pass	ANSI/BIFMA e3-2014e "Furniture Sustainability Standard"

Full details based on the testing and direct comparison with limit values is available in the following pages
Due to the registered deviations, please refer to section 4.4



Claus Bonde
Analytical Service Manager



Isabella B. Larsen
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3 Applied Test Methods

3.1 General Test References

Regulation, protocol or standard	Version	Reporting limit VOC [$\mu\text{g}/\text{m}^3$]	Calculation of TVOC	Combined uncertainty ^a [RSD(%)]
EN 16516	2017 + A1:2020	5	Toluene equivalents	22%
ISO 16000 -3 -6 -9 -11	2021-2024 depending on part	2	Toluene equivalents	22%
ASTM D5116-10	2010	-	-	-
ANSI/BIFMA	ANSI/BIFMA M7.1-2011 (R2016)	2	Toluene equivalents	22%
ANSI/BIFMA	e3-2014e	-	-	-
CDPH	CDPH/EHLB/Standard Method V1.2. (January 2017)	2	Toluene equivalents	22%

3.2 Specific Laboratory Sampling and Analyses

Procedure	External Method	Internal S.O.P.	Quantification limit	Analytical principle	Uncertainty ^a [RSD(%)]
Sample preparation	ISO 16000-11:2024, EN 16516:2017+A1:2020, AgBB:2024, EMICODE:2020	71M549810	-	-	-
Emission chamber testing	ISO 16000-9:2024, EN 16516:2017+A1:2020	71M549811	-	Chamber and air control	-
Sampling of VOC	ISO 16000-6:2021, EN 16516:2017+A1:2020	71M549812	5 L	Tenax TA	-
Analysis of VOC	ISO 16000-6:2021, EN 16516:2017+A1:2020	71M542808B	1 $\mu\text{g}/\text{m}^3$	ATD-GC/MS	10%
Sampling of aldehydes	ISO 16000-3:2022, EN 16516:2017+A1:2020	71M549812	35 L	DNPH	-
Analysis of aldehydes	ISO 16000-3:2022, EN 16516:2017+A1:2020	71M548400	3-6 $\mu\text{g}/\text{m}^3$	HPLC-UV	10%

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4 Test Parameters, Sample Preparation and Deviations

4.1 VOC Emission Chamber Test Parameters

Parameter	Value	Parameter	Value
Chamber volume, V[L]	1000	Date and time of unpacking and start of sample preparation	13/11/2025 - 10:10
Air change rate, n[h ⁻¹]	1.0	Preconditioning period	-
Air Velocity [m/s]	0.1	Chamber test period	13/11/2025 - 20/11/2025
Area specific ventilation rate, q [m/h or m ³ /m ² /h]	1.01	Analytical test period	13/11/2025 - 26/11/2025
Relative humidity of supply air, RH [%]	50 ± 3	Exposed sample area [m ²]	0.9875
Temperature of supply air, T [°C]	23 ± 1	Loading factor [m ² /m ³]	0.99
Background concentration of individual VOC's [µg/m ³]	< 2	Background concentration of TVOC [µg/m ³]	< 20

4.2 Preparation of the Test Specimen

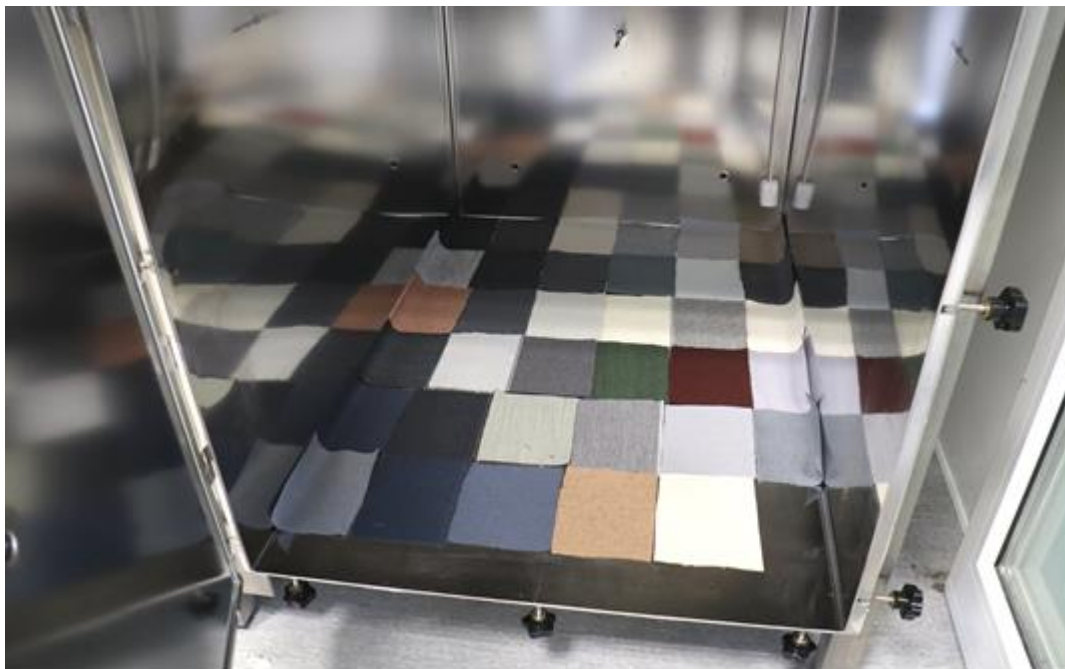
The fabrics were cut into pieces of 10 x 14 cm and were transferred directly into the chamber.

Name		Batch number
Breeze Fusion	242604001	3702699022
Capture	247202701	3726302012
Comfort+	858000004	241492304
Connect	251560146	3652337022
Crisp	242404013	3720451041
CrissCross	245901102	3490941011
Europost 2	170160017	3602310131
Fame	240960017	3702883191
Fame Hybrid	247901101	3598448021
Focus	253660008	3678344101
Focus Melange	253061239	3700141142
Focus Melange Screen	255060411	3700099022
Focus Royal	256161535	3705537091
Gaja	241760001	3539683153
Gaja Antistatic	240760002	3657182062
Gaja Classic	226960001	3705537091
Harmony	242801101	3489581011
Hush	880860156	2514673
Hush Flair	4060880860154	2304679.00
Lamina	5100255960329	361552224
Luna 2	239304006	3560976012
Luna Fleur 2	1043249304011	3373486021
Mood	242501101	3720454012
Morph	251101101	3730205032
Nobel	259160347	3682585012
Passion	250601101	367049401102
Savak	180300001	3580341042
Select	249860003	3687723112
Soul	880260098	2323132
Soul Melange	881060098	2204941
Swing	246651101	3733090012
Tailor	237660353	3633576022
TwillWool	237801001	3671278011
Umber	253761273	3686633111
UMI	230860000	3718398122

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4.3 Picture of Sample



4.4 Deviations from Referenced Protocols and Regulations

No sampling date is stated, and therefore it is unknown if sampling occurred within 24 hours of production.

The handover section of the “Chain of custody” document was not completed by the client.

4.5 Air Samplings from the Test Chamber

Sampling media	Day (yyyy-mm-dd)	Time (hh:mm)	Volume [L]
3 Day, DNPH silicagel	2025-11-16	09:43 - 11:32	36
3 Day-Res, DNPH silicagel	2025-11-16	09:44 - 11:33	36
3 Day, Tenax TA	2025-11-16	09:45 - 10:44	5.1
3 Day-Res, Tenax TA	2025-11-16	10:44 - 11:34	2.3
7 Day, Tenax TA	2025-11-20	09:42 - 10:41	5.2
7 Day-Res, Tenax TA	2025-11-20	10:41 - 11:30	2.3
7 Day, DNPH silicagel	2025-11-20	09:41 - 11:29	36
7 Day-Res, DNPH silicagel	2025-11-20	09:41 - 11:29	36

4.6 VOC Emission Test Results after 3 and 7 Days

	CAS No.	Retention time [min]	ID-Cat	3 day conc. [µg/m³]	3 day SER [µg/(m²h)]	7 day conc. [µg/m³]	7 day SER [µg/(m²h)]
VOC Compounds							
None determined				< 2	< 3	< 2	< 3
TVOC toluene eq.				< 2	< 3	< 2	< 3
TVOC specific				< 2	< 3	< 2	< 3
Aldehydes							
Formaldehyde	50-00-0		1	3.6	3.7	3.6	3.7
Acetaldehyde	75-07-0		1	< 3	< 4	< 3	< 4

4.7 Results as Extrapolated to 14 Days VOC Emission

	CAS No.	Retention time [min]	ID-Cat	SER [µg/(m²h)]	Open plan [µg/m³]	Private office [µg/m³]
VOC Compounds						
None determined				< 3	< 3	< 1
TVOC toluene eq.				< 3	< 3	< 1
TVOC specific				< 3	< 3	< 1
Aldehydes						
Formaldehyde	50-00-0		1	3.7	2.7	0.8
Acetaldehyde	75-07-0		1	< 4	< 3	< 1

4.7.1 Calculation of Concentration after 14 Days

The emission rates (SER) after 3 and 7 days were extrapolated to 14 day emission rates using equation 8, 9, 10 given in ANSI/BIFMA M7.1-2011.

$$(8) \quad E_{14} = a \cdot t_3^{-b}$$

$$(9) \quad b = \frac{\ln E(t_1) - \ln E(t_2)}{\ln t_2 - \ln t_1}$$

$$(10) \quad a = E(t_1) \cdot t_1^b = E(t_2) \cdot t_2^b$$

E_{14} = Emission rate after 14 days (336 hours)

t_1 = 3 days (72 hours), t_2 = 7 days (168 hours) and t_3 = 14 days (336 hours)

The emission rates as calculated after 14 days were used to calculate model room concentrations using the following formula:

$$C = \frac{A \cdot E}{Q}$$

with:

C Model room concentration, $\mu\text{g}/\text{m}^3$

A Workstation surface area

Open plan: Panel area = 11.08 m^2 , work surface area = 6.10 m^2 , storage area = 4.57 m^2

Private office: Panel area = 7.63 m^2 , work surface area = 6.73 m^2 , storage area = 10.55 m^2

E Area specific emission factor, $\mu\text{g}/(\text{unit} \cdot \text{h})$

Q Ventilation rate, Open plan = 15.01 m^3/h , private office = 34.67 m^3/h

5 Summary and Evaluation of the Results

5.1 Comparison with Limit Values of ANSI/BIFMA; section 7.6.1

Parameter	Results after 7 days		
	Emission rate $\mu\text{g}/(\text{m}^2\text{h})$	Limit value, open plan $\mu\text{g}/(\text{m}^2\text{h})$	Limit value, private office $\mu\text{g}/(\text{m}^2\text{h})$
TVOC _{toluene}	< 3	< 345	< 694
4-Phenylcyclohexene	< 3	< 4.5	< 9.0
Formaldehyde	3.7	< 42.3	< 85.1
Total aldehydes (other)	0.12 $\mu\text{mol}/(\text{m}^2\cdot\text{h})$	< 2.8 $\mu\text{mol}/(\text{m}^2\cdot\text{h})$	< 5.7 $\mu\text{mol}/(\text{m}^2\cdot\text{h})$

5.2 Comparison with Limit Values of ANSI/BIFMA; section 7.6.2

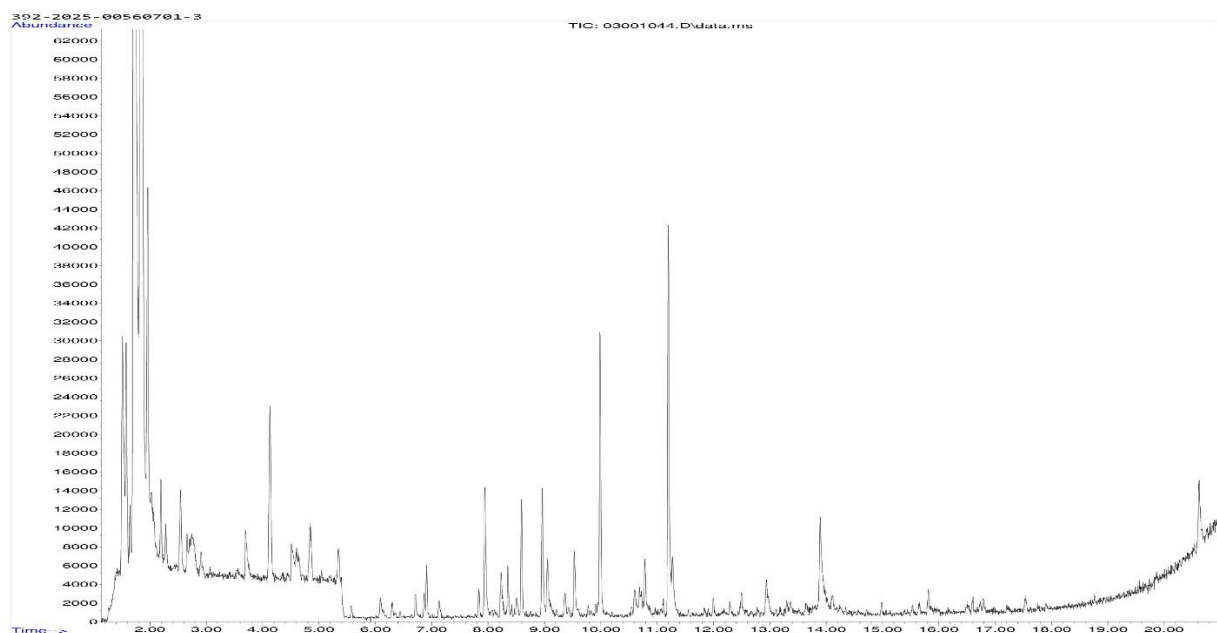
Individual compounds with CHREL-value after 14 days	Complies
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5.3 Comparison with Limit Values of ANSI/BIFMA; section 7.6.3

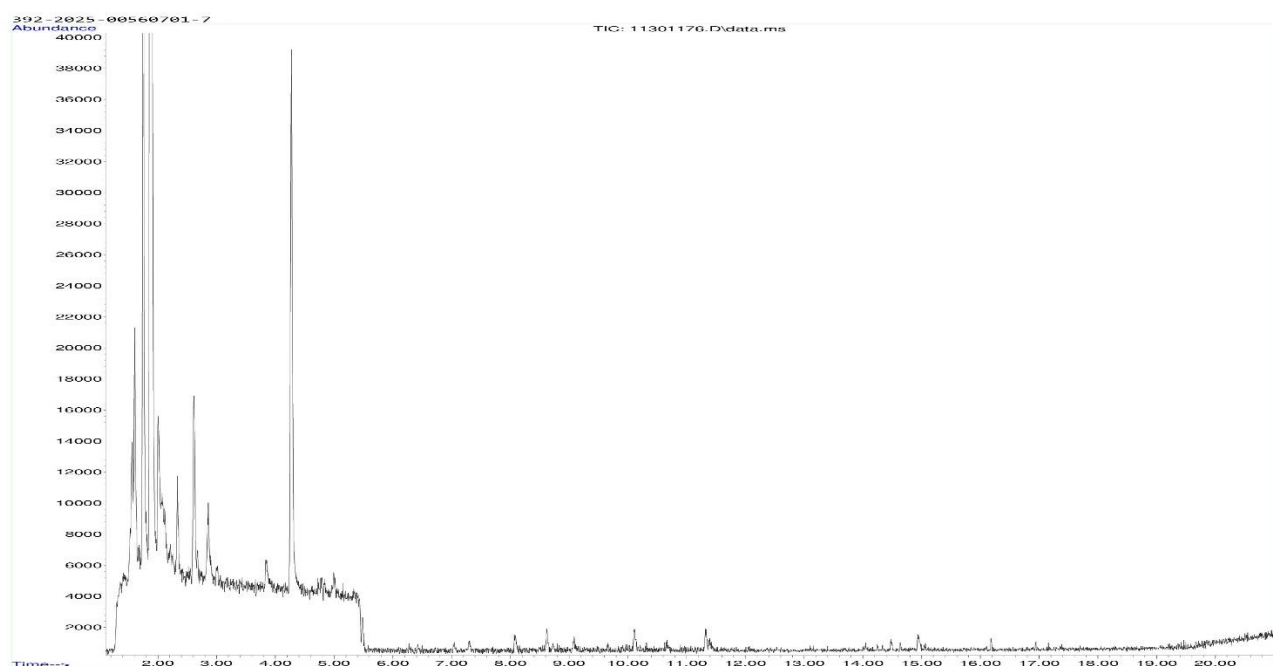
Parameter	Results after 14 days		
	Emission rate $\mu\text{g}/(\text{m}^2\text{h})$	Limit value, open plan $\mu\text{g}/(\text{m}^2\text{h})$	Limit value, private office $\mu\text{g}/(\text{m}^2\text{h})$
Formaldehyde	3.7	< 6.2	< 12.5

6 Appendices

6.1 Chromatogram of VOC Emissions after 3 Days



6.2 Chromatogram of VOC Emissions after 7 Days



Please consider the different scales.

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6.3 Chain of Custody




EUDKGA – 25005607

version 1
10 NOV. 2025
ABJ PROS

Product Testing

Combined Sampling Report and Chain of Custody	
Name of applicant: Bente Ellingsøe, Gabriel A/S, Hjulmagervej 55, 9000 Aalborg, . (name, company, phone)	
Product information	
Name of the product: See Excel sheet with names	Product type: Upholstery fabrics various
Batch N°: See Excel sheet with numbers	Article N°: See Excel sheet with numbers
Model / Program / Series:	Manufacture: Gabriel A/S, Hjulmagervej 55, 9000 Aalborg, . (Company, Address, Stamp)
Production & Sampling information	
Production Date: See Excel sheet Time:	Sampling Date: See Excel sheet Time:
Place of sampling 2BPack our warehouse in Lithuania (If deviating from the manufacture)	Sample is taken from: ☒ ongoing production ☐ stocks ☐ retained sample
Number of samples: 35	
Person in charge of sampling: Monika Untuliene, 2BPack (Name, company, telephone)	Signature of sample collector: <i>Monika Untuliene</i>
Where has the product been stored prior to sampling? ☐ production ☒ store ☐ miscellaneous	How has the product been stored prior to sampling? ☐ open ☐ in the stack ☒ wrapped up
Place of storage: 2BPack our warehouse in Lithuania	Packing material: 100% virgin plastic
Specifics (possible negative influences by air contamination where sample was taken, by petrol emissions, by solvent emissions from production; any other uncertainties, questions, etc).	
Cut edges (identification of cut edges when present and identification of new surfaces and surface to be exposed in the emission test):	
Confirmation from the applicant	
Herewith the signer confirms the correctness of the data given above. The sample was selected, drawn and packed personally in accordance with the instructions for the taking of samples.	
Date:	Signature: (Stamp)


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version 1

Chain of custody			
What is a Chain of custody?			
Whenever the sample is handed over, please fill out the below information			
Handed over between:	Initials + Signature	Date + Time	Condition
Handed over by			
Handed over to			
Handed over by			
Handed over to			
Handed over by			
Handed over to			
Laboratory receiving details (date, condition of package and sample, assigned lab no.): 10/11-25, ok, 392-2025-00560701			
Receptionist, Eurofins Product Testing A/S:		Signature of receptionist:	
91x2		Anders Jansson	

6.4 How to Understand the Results

6.4.1 Acronyms Used in the Report

- < Means less than
- > Means bigger than (Tube/GC-MS overload)
- * Not a part of our accreditation
- α Um(%) is given as 2x RSD%. Please see section regarding Uncertainty in the Appendices.
- § Deviation from method. Please see deviation section
- a The method is not optimal for very volatile compounds. For these substances smaller results and a higher measurement uncertainty cannot be ruled out.
- b The component originates from the wooden panels and is thus removed.
- c The results have been corrected by the emission from wooden panels.
- d Very polar organic compounds are not suitable for reliable quantification using tenax TA adsorbent and HP-5 GC column. A high degree of uncertainty must be expected.

SER Specific emission rate.

6.4.2 Explanation of ID Category

Categories of Identity:

- 1: Identified and specifically calibrated
- 2: Identified by comparison with a mass spectrum obtained from library and supported by other information. Calibrated as toluene equivalent.
- 3: Identified by comparison with a mass spectrum obtained from a library. Calibrated as toluene equivalent.
- 4: Not identified, calibrated as toluene equivalent.

6.5 Description of VOC Emission Test

6.5.1 Test Chamber

The test chamber is made of stainless steel. A multi-step air clean-up is performed before loading the chamber, and a blank check of the empty chamber is performed.

The chamber operation parameters are as described in the test method section (EN 16516, ISO 16000-9, internal method no.: 71M549811).

6.5.2 Expression of the Test Results

All test results are calculated as specific emissions rate, and as extrapolated air concentration in the European Reference Room (EN 16516, AgBB, EMICODE, M1 and Indoor Air Comfort).

6.5.3 Testing of VOCs

The emissions of volatile organic compounds are tested by drawing sample air from the test chamber outlet through Tenax TA tubes after the specified duration of storage in the ventilated test chamber. Analysis is performed by ATD-GC/MS using HP-5 column (30 m, 0.25mm ID, 0.25µm film) (EN 16516, ISO 16000-6, internal methods no.: 71M549812 / 71M542808B).

The results of the individual substances are calculated in three groups depending on their retention time when analyzing using a non-polar column (HP-1):

- Volatile Organic Compounds (VOC) are defined as: All substances eluting between and including n-hexane (n-C6) and n-hexadecane (n-C16)
- Semi-Volatile Organic Compounds (SVOC) are defined as: All substances eluting after n-hexadecane (n-C16) and before and including n-docosane (n-C22)
- Very Volatile Organic Compounds (VVOC) are defined as: All substances eluting before n-hexane (n-C6).

Total Volatile Organic Compounds (TVOC) is calculated by summation of all individual VOCs with a concentration $\geq 5 \mu\text{g}/\text{m}^3$. The TVOC can be expressed either in toluene equivalents as defined in EN 16516 and similar to ISO 16000-6, or as the sum of concentrations using specific or relative response factors. In the case of summation of concentrations using authentic or relative response factors, the toluene equivalent is applied to all non-target and non-identified VOCs before summing up. Compounds regarded as VOC in line with the above definition but elute before n-C6 or after n-C16 on the HP-5 column are treated as VOC, and are thus added to the TVOC.

This test only covers substances which can be adsorbed on Tenax TA and can be thermally desorbed. If emissions of substances outside these specifications occur then these substances cannot be detected (or with limited reliability only).

6.5.4 Testing of Aldehydes

The presence of aldehydes after the specified duration of storage in the ventilated test chamber is tested by drawing air samples from the test chamber outlet through DNPH-coated silicagel tubes after the specified duration of storage in the ventilated test chamber. Analysis is performed by solvent desorption and subsequently by HPLC and UV-/diode array detection (EN 16516, ISO 16000-3, VDI 3862 Blatt 3, internal methods no.: 71M549812 / 71M548400).

The absence of formaldehyde and other aldehydes is stated if UV detector response at the specific wavelength is lacking at the specific retention time in the chromatogram. Otherwise it is checked whether the reporting limit is exceeded. In this case the identity is finally checked by comparing full scan sample UV spectra with full scan standard UV spectra.

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6.5.5 Maximum Allowable Emission Factors

Below is given the maximum allowable emission factor after 14 days, as defined by BIFMA, for compounds with a CHREL value.

Compound	CAS nr.	Max allowable emission factor Open Plan $\mu\text{g}/(\text{m}^2\text{h})$	Max allowable emission factor Private office $\mu\text{g}/(\text{m}^2\text{h})$
Ethylbenzene	100-41-4	689	1392
Styrene	100-42-5	310	627
1,4-Dichlorobenzene	106-46-7	276	557
Epichlorohydrin	106-89-8	1.0	2.1
Ethylene glycol	107-21-1	138	278
1-Methoxy-2-propanol	107-98-2	2413	4874
Vinyl acetate	108-05-4	68.9	139
Toluene	108-88-3	103	209
Chlorobenzene	108-90-7	345	696
Phenol	108-95-2	68.9	139
2-Methoxyethanol	109-86-4	21	42
Ethylene glycol monomethyl ether acetate	110-49-6	31	63
n-Hexane	110-54-3	2413	4874
2-Ethoxyethanol	110-80-5	24	49
2-Ethoxyethyl acetate	111-15-9	103	209
1,4-Dioxane	123-91-1	1034	2089
Tetrachloroethylene	127-18-4	12.1	24.4
Formaldehyde	50-00-0	11	23
Isopropanol	67-63-0	2413	4874
Chloroform	67-66-3	103	209
N,N-Dimethyl Formamide	68-12-2	28	56
Benzene	71-43-2	21	42
1,1,1-Trichloroethane	71-55-6	345	696
Acetaldehyde	75-07-0	48	97
Methylene Chloride	75-09-2	138	278
Carbon Disulfide	75-15-0	276	557
Trichloroethylene	79-01-6	207	418
1-Methyl-2-Pyrrolidinone	872-50-4	110	223
Naphthalene	91-20-3	3	6
Xylenes (m-, o-, p-Xylene combined)	108-38-3, 95-47-6, 106-42-3	241	487

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6.6 Quality Assurance

Before loading the test chamber, a blank check of the empty chamber is performed and compliance with background concentrations in accordance with EN 16516 / ISO 16000-9 is determined.

Air sampling at the chamber outlet and subsequent analysis is performed in duplicate. Relative humidity, temperature and air change rate in the chambers is logged every 5 minutes and checked daily. A double determination is performed on random samples at a regular interval and results are registered in a control chart to ensure the uncertainty and reproducibility of the method.

The stability of the analytical system is checked by a general function test of device and column, and by use of control charts for monitoring the response of individual substances prior to each analytical sequence.

6.7 Accreditation

The testing methods described above are accredited online with EN ISO/IEC 17025 by DANAK (no. 522). This accreditation is valid worldwide due to mutual approvals of the national accreditation bodies (ILAC/IAF, see also www.eurofins.com/galten.aspx#accreditation).

Eurofins Product Testing Denmark A/S is notified body for the construction products regulation (EU) No 305/2011 with number NB 2657 under system 3.

Not all parameters are covered by this accreditation. The accreditation does not cover parameters marked with an asterisk (*), however analysis of these parameters is conducted at the same level of quality as for the accredited parameters.

6.8 Uncertainty of the Test Method

The relative standard deviation of the overall analysis is 22%. The expanded uncertainty U_m equals 2 x RSD. For further information, please visit www.eurofins.dk/product-testing/uncertainty/.

6.9 Decision Rules

Eurofins Product Testing A/S, declare statement of conformity based on the "Binary Statement for Simple Acceptance Rule" described in ILAC's "Guidelines on decision Rules and Statements of Conformity" ILAC-G8:09/2019.

This means that results above the detection limit are always reported with two significant digits. Results are evaluated with the same number of significant digits as the corresponding limit values, and conformity is based on results being less than or equal to limit values.

For limit values with more than two significant digits, the third digit will be used to confirm whether a result is below or equal to the limit value. It will always be indicated in the evaluation table if this expanded evaluation is performed.

For further information please visit www.eurofins.dk/product-testing/om-os/beslutningsregler/

6.10 Version History

Report date	Report number	Modification
02/12/2025	392-2025-00560701_M_EN_rev1	The list of fabrics with batch number and production date were added to section 4.2. The sample name was removed from the front page. The deviation 'No production date is stated, and therefore it is unknown if the samples were older than the permissible 25 days at the start of the test. Therefore, it is also not known if the sample was received within the specified 15 days.' Was removed as production date was provided and the requirements of receiving sample and test start was fulfilled. This version is considered valid.
27/11/2025	392-2025-00560701_M_EN	This version is no longer considered valid.