

ONEFLOR EUROPE bv
 Wittestraat 10
 8501 HEULE (Kortrijk)
 Belgium

Test Report No. 60243-A001-EUVOC-L

Test objective:	Proof of conformity with the European VOC product emission requirements
Article designation according to order:	LOOM+ LOCK (Article no. OFO-2605)
Date of report:	11/09/2025
Number of pages of report:	29
Testing / responsible laboratory:	eco-INSTITUT Germany GmbH, Köln
Test objective fulfilled:	<ul style="list-style-type: none"> ✓ AgBB 2024 ✓ French VOC- and CMR regulation class A+ ✓ Belgian VOC regulation ✓ Italian VOC regulation (CAM) ✓ EU taxonomy ✓ BREEAM criteria ✓ LEED criteria low emitting materials (outside US)
Note:	<p>The test results in the report refer exclusively to the test sample submitted by the manufacturer. The report is not permitted to be used in product and company advertising. The report may be published in full as technical documentation on the Internet with the written consent of eco-INSTITUT Germany GmbH. eco-INSTITUT Germany GmbH has recommended that the manufacturer repeats the test after 3 years at the latest. More information at www.eco-institut.de/en/advertising</p>

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Sample View

Internal sample number (filled in by laboratory)

60243-A001

Photo of the test specimen: A001



Article designation according to order:

LOOM+ LOCK (Article no. OFO-2605)

Sample/batch number according to order:

2307262BU

Type of sample:

PVC floor covering

Date of production:

March 2025

Sampling by:

Alban Parisse, Oneflor Europe

Date of sampling:

03/07/2025

Location of sampling:

Heule, Belgium

Receipt of sample / Condition upon delivery:

08/07/2025 / without objection

Statement of conformity with AgBB 2024

The sample with the internal sample number 60243-A001 has been tested on behalf of **ONEFLOR EUROPE bv**. The article description according to the order is **LOOM+ LOCK (Article no. OFO-2605)**.

This evaluation is based on the test criteria of the scheme "Health-related Evaluation of Emissions of Volatile Organic Compounds (VVOC, VOC and SVOC) from Building Products" of the Committee for Health-Related Evaluation of Building Products (AgBB 2024).

The results documented in the test report were evaluated as follows.¹

Test parameter	Result	Requirement	Requirement hold [yes/no]
Emission analysis			
Measurement time: 3 days after test chamber loading			
Sum VOC (C6-C16) ^{a)}	0.34 mg/m ³	≤ 10 mg/m ³	yes
Carcinogenic substances, cat. 1A and 1B acc. to Regulation (EC) No. 1272/2008 (and TRGS 905) (per substance) ^{b)}	≤ 0.01 mg/m ³	≤ 0.01 mg/m ³	yes
Measurement time: 28 days after test chamber loading			
Sum VOC (C6-C16) including SVOC with LCI ^{a)}	0.055 mg/m ³	≤ 1.0 mg/m ³	yes
Sum SVOC without LCI (C16-C22) ^{a)}	< 0.005 mg/m ³	≤ 0.1 mg/m ³	yes
R-value (dimensionless)	0.16	≤ 1	yes
Sum VOC without LCI	< 0.005 mg/m ³	≤ 0.1 mg/m ³	yes
Carcinogenic substances, cat. 1A and 1B acc. to Regulation (EC) No. 1272/2008 (and TRGS 905) (per substance) ^{b)}	≤ 0.001 mg/m ³	≤ 0.001 mg/m ³	yes

a) For sum VOC (C6-C16) and sum SVOC (C16-C22) only substances $\geq 5 \mu\text{g}/\text{m}^3$ are considered.

b) Excluded are defined substances classified as carcinogen 1A or 1B for which a limit value can be derived for the most sensitive endpoint at which a carcinogenic potential can no longer be assumed and for which a LCI value is derived on this basis.

¹ If a measurement result that slightly exceeds the specification is assessed as "not fulfilled", this is based on the agreement of the "shared risk of measurement uncertainty (shared risk approach)". According to this, the probability that the statement is correct is $\geq 50\%$. Similarly, a result slightly below the specification value also only has a probability of $\geq 50\%$ of being compliant. I.e., the risk of making a false negative statement regarding the fulfilment of the specification is just as high as the risk of making a false positive statement (more information at https://www.eco-institut.de/en/2019/07/measurement_uncertainty/).

Statement of conformity with VOC- and CMR- regulation

The sample with the internal sample number 60243-A001 has been tested on behalf of **ONEFLOR EUROPE bv**. The article description according to the order is **LOOM+ LOCK (Article no. OFO-2605)**.

This evaluation bases on the test criteria of the decree no. 2011-321 of 23rd March 2011 (VOC regulation) and executive decisions of 28th May 2009 and 30th April 2009 (CMR regulation) of the French Ministry of Ecology, Sustainable Development, Transport and Housing.

The results documented in the test report were evaluated as follows.²

VOC regulation

Emission analysis	Concentration (Test chamber air) [$\mu\text{g}/\text{m}^3$]	Class			
Substance	after 28 days	C	B	A	A+
Formaldehyde	< 2	> 120	< 120	< 60	< 10
Acetaldehyde	< 2	> 400	< 400	< 300	< 200
Toluene	< 1	> 600	< 600	< 450	< 300
Tetrachlorethylene	< 1	> 500	< 500	< 350	< 250
Xylene	< 1	> 400	< 400	< 300	< 200
1,2,4-Trimethylbenzene	< 1	> 2000	< 2000	< 1500	< 1000
1,4-Dichlorbenzene	< 1	> 120	< 120	< 90	< 60
Ethylbenzene	< 1	> 1500	< 1500	< 1000	< 750
2-Butoxyethanol	< 1	> 2000	< 2000	< 1500	< 1000
Styrene	< 1	> 500	< 500	< 350	< 250
TVOC _{tol}	120	> 2000	< 2000	< 1500	< 1000

CMR regulation

Emission analysis	Concentration (Test chamber air) [$\mu\text{g}/\text{m}^3$]	Requirement [$\mu\text{g}/\text{m}^3$]
Substance	after 28 days	after 28 days
Benzene	< 1	< 1
Trichlorethylene	< 1	< 1
Bis(2-ethylhexyl) phthalate (DEHP)	< 1	< 1
Dibutyl phthalate (DBP)	< 1	< 1

² If a measurement result that slightly exceeds the specification is assessed as "not fulfilled", this is based on the agreement of the "shared risk of measurement uncertainty (shared risk approach)". According to this, the probability that the statement is correct is $\geq 50\%$. Similarly, a result slightly below the specification value also only has a probability of $\geq 50\%$ of being compliant. I.e., the risk of making a false negative statement regarding the fulfilment of the specification is just as high as the risk of making a false positive statement
(more information at https://www.eco-institut.de/en/2019/07/measurement_uncertainty/).

Statement of conformity with Belgian VOC regulation

The sample with the internal sample no. 60243-A001 has been tested on behalf of **ONEFLOR EUROPE bv**. The article description according to the order is **LOOM+ LOCK (Article no. OFO-2605)**.

This evaluation bases on the test criteria of the "Royal Decree establishing threshold levels for the emissions to the indoor environment from floor coverings, flooring adhesives and surface coatings for wood floorings" submitted for EU notification by Belgian ministries on 18th August 2014.

The results documented in the test report were evaluated as follows.³

Test parameter	Result	Requirement	Requirement hold [yes/no]
Emission analysis			
Measurement time: 28 days after test chamber loading			
Total concentration of volatile organic compounds (TVOC DIN EN 16516) ^{a)}	35 $\mu\text{g}/\text{m}^3$	\leq 1000 $\mu\text{g}/\text{m}^3$	yes
Total concentration of semi volatile organic compounds (TSVOC DIN EN 16516) ^{a)}	< 5 $\mu\text{g}/\text{m}^3$	\leq 100 $\mu\text{g}/\text{m}^3$	yes
Carcinogenic, mutagenic and reprotoxic substances, cat. 1A and 1B acc. to Regulation (EC) No. 1272/2008	1 $\mu\text{g}/\text{m}^3$	\leq 1 $\mu\text{g}/\text{m}^3$	yes
R value (without dimension) ^{b)}	0.13	\leq 1	yes
Toluene	< 1 $\mu\text{g}/\text{m}^3$	\leq 300 $\mu\text{g}/\text{m}^3$	yes
Formaldehyde	< 2 $\mu\text{g}/\text{m}^3$	\leq 100 $\mu\text{g}/\text{m}^3$	yes
Acetaldehyde	< 2 $\mu\text{g}/\text{m}^3$	\leq 200 $\mu\text{g}/\text{m}^3$	yes

a) for TVOC and TSVOC only substances $\geq 5 \mu\text{g}/\text{m}^3$ are considered

b) In 2021 the European Commission subgroup on EU-LCI values derived an EU-LCI value for methyl formate (VVOC, CAS 107-31-3) of 3000 $\mu\text{g}/\text{m}^3$. However, methyl formate cannot be determined quantitatively under test conditions according to DIN EN 16516:2020-10.

³ If a measurement result that slightly exceeds the specification is assessed as "not fulfilled", this is based on the agreement of the "shared risk of measurement uncertainty (shared risk approach)". According to this, the probability that the statement is correct is $\geq 50\%$. Similarly, a result slightly below the specification value also only has a probability of $\geq 50\%$ of being compliant. I.e., the risk of making a false negative statement regarding the fulfilment of the specification is just as high as the risk of making a false positive statement (more information at https://www.eco-institut.de/en/2019/07/measurement_uncertainty/).

Statement of conformity with the Italian VOC regulation

The sample with the internal sample no. 60243-A001 has been tested on behalf of **ONEFLOR EUROPE bv**. The article description according to the order is **LOOM+ LOCK (Article no. OFO-2605)**.

This evaluation bases on the test criteria of the DECRETO 11 Ottobre 2017 in G.U. Serie Generale n. 259 of november 6th, 2017 (Criteri ambientali minimi per l'affidamento di servizi di progettazione e lavori per la nuova costruzione, ristrutturazione e manutenzione di edifici pubblici) of the Italian Ministry of Ecology, Protection of Territory and the Sea.

The results documented in the test report were evaluated as follows.⁴

Test parameter	Concentration (Test chamber air) [$\mu\text{g}/\text{m}^3$]	Requirement [$\mu\text{g}/\text{m}^3$]	Requirement hold [yes/no]
Emission analysis			
Measurement time: 28 days after test chamber loading			
Formaldehyde	< 2	< 60	yes
Acetaldehyde	< 2	< 300	yes
Toluene	< 1	< 450	yes
Tetrachlorethylene	< 1	< 350	yes
Xylene	< 1	< 300	yes
1,2,4-Trimethylbenzene	< 1	< 1500	yes
1,4-Dichlorbenzene	< 1	< 90	yes
Ethylbenzene	< 1	< 1000	yes
2-Butoxyethanol	< 1	< 1500	yes
Styrene	< 1	< 350	yes
Benzene	< 1	< 1	yes
Trichlorethylene	< 1	< 1	yes
Di(2-ethylhexyl)phthalate (DEHP)	< 1	< 1	yes
Dibutylphthalate (DBP)	< 1	< 1	yes
TVOC_{tol}	120	< 1500	yes

⁴ If a measurement result that slightly exceeds the specification is assessed as "not fulfilled", this is based on the agreement of the "shared risk of measurement uncertainty (shared risk approach)". According to this, the probability that the statement is correct is $\geq 50\%$. Similarly, a result slightly below the specification value also only has a probability of $\geq 50\%$ of being compliant. I.e., the risk of making a false negative statement regarding the fulfilment of the specification is just as high as the risk of making a false positive statement (more information at https://www.eco-institut.de/en/2019/07/measurement_uncertainty/).

Statement of conformity with the EU taxonomy regulations

The sample with the internal sample number 60243-A001 has been tested on behalf of **ONEFLOR EUROPE bv**. The article description according to the order is **LOOM+ LOCK (Article no. OFO-2605)**.

This evaluation is based on the test criteria of the EU Taxonomy regulations (EU) 2021/2139 and (EU) 2023/2486 for product emission requirements for formaldehyde and other categories 1A and 1B carcinogenic volatile organic compounds.

The results documented in the test report were evaluated as follows.⁵

Test parameter	Result	Requirement	Requirement hold [yes/no]
Emission analysis			
Measurement time: 28 days after test chamber loading			
Formaldehyde	< 0.002 mg/m ³	< 0.06 mg/m ³	yes
Carcinogenic substances, cat. 1A and 1B acc. to Regulation (EC) No. 1272/2008 (per substance)	< 0.001 mg/m ³	< 0.001 mg/m ³	yes

⁵ If a measurement result that slightly exceeds the specification is assessed as "not fulfilled", this is based on the agreement of the "shared risk of measurement uncertainty (shared risk approach)". According to this, the probability that the statement is correct is $\geq 50\%$. Similarly, a result slightly below the specification value also only has a probability of $\geq 50\%$ of being compliant. I.e., the risk of making a false negative statement regarding the fulfilment of the specification is just as high as the risk of making a false positive statement

(more information at https://www.eco-institut.de/en/2019/07/measurement_uncertainty/).

Statement of conformity with BREEAM criteria

The sample with the internal sample number 60243-A001 has been tested on behalf of **ONEFLOR EUROPE bv**. The article description according to the order is **LOOM+ LOCK (Article no. OFO-2605)**.

This evaluation is based on the test criteria of

BREEAM International New Construction v7 (Technical Manual SD6073, 2025, Hea 04 Indoor air quality), covering:

BREEAM International New Construction v6 (Technical Manual SD250, 2021, Hea 02 Indoor air quality)

BREEAM UK New Construction v6.1 (Technical Manual SD5079, 2024, Hea 02 Indoor air quality)

BREEAM UK New Construction v7 (Technical Manual SD6074, 2025, Hea 04 Indoor air quality)

BREEAM-NL Nieuwbouw v1.0 (Beoordelingsrichtlijn, 2020, Hea 02 Interne luchtkwaliteit)

BREEAM-NOR New Construction v6.0 (Technical Manual SD5076NOR, 2022, Hea 02 Indoor air quality)

BREEAM-NOR New Construction v6.1.1 (Technical Manual SD5076NOR, 2024, Hea 02 Indoor air quality)

for "Flooring materials (including floor levelling compounds and resin flooring)".

The results documented in the test report were evaluated as follows.⁶

Emissions from building products

Test parameter	Result	Requirement - Emissions from building products	Requirement hold [yes/no]
Emission analysis			
Measurement time: 28 days after test chamber loading			
Formaldehyde	< 0.002 mg/m ³	≤ 0.06 mg/m ³	yes
Total concentration of volatile organic compounds (TVOC DIN EN 16516) ^{a)}	0.035 mg/m ³	≤ 1.0 mg/m ³	yes
Carcinogenic substances, cat. 1A and 1B acc. to Regulation (EC) No. 1272/2008 (per substance) ^{b)}	≤ 0.001 mg/m ³	≤ 0.001 mg/m ³	yes

a) For TVOC only substances $\geq 5 \mu\text{g}/\text{m}^3$ are considered.

b) Excluded are defined substances classified as carcinogen 1A or 1B for which an EU-LCI value is derived.

⁶ If a measurement result that slightly exceeds the specification is assessed as "not fulfilled", this is based on the agreement of the "shared risk of measurement uncertainty (shared risk approach)". According to this, the probability that the statement is correct is $\geq 50\%$. Similarly, a result slightly below the specification value also only has a probability of $\geq 50\%$ of being compliant. I.e., the risk of making a false negative statement regarding the fulfilment of the specification is just as high as the risk of making a false positive statement (more information at https://www.eco-institut.de/en/2019/07/measurement_uncertainty/).

Exemplary Level Criteria

Test parameter	Result	Requirement - Exemplary Level Criteria	Requirement hold [yes/no]
Emission analysis			
Measurement time: 28 days after test chamber loading			
Formaldehyde	< 0.002 mg/m ³	≤ 0.01 mg/m ³	yes
Total concentration of volatile organic compounds (TVOC DIN EN 16516) ^{a)}	0.035 mg/m ³	≤ 0.3 mg/m ³	yes
Total concentration of semi volatile organic compounds (TSVOC DIN EN 16516)	< 0.005 mg/m ³	≤ 0.1 mg/m ³	yes
Carcinogenic substances, cat. 1A and 1B acc. to Regulation (EC) No. 1272/2008 (per substance) ^{b)}	≤ 0.001 mg/m ³	≤ 0.001 mg/m ³	yes

a) For TVOC only substances $\geq 5 \mu\text{g}/\text{m}^3$ are considered.

b) Excluded are defined substances classified as carcinogen 1A or 1B for which an EU-LCI value is derived.

Statement of conformity with LEED criteria low emitting materials (outside US)

The sample with the internal sample number 60243-A001 has been tested on behalf of **ONEFLOR EUROPE bv**. The article description according to the order is **LOOM+ LOCK (Article no. OFO-2605)**.

This evaluation is based on the test criteria for low emitting materials in credit EQc2 of the LEEDv4 Rating System and the LEEDv4.1 Rating System for projects outside the US.

The results documented in the test report were evaluated as follows.⁷

Test parameter	Result	Requirement	Requirement hold [yes/no]
Emission analysis			
Compliance: AgBB Testing and Evaluation Scheme (2018-2024)			yes
Measurement time: 28 days after test chamber loading			
Sum VOC (C6-C16) including SVOC with LCI ^{a)}	55 $\mu\text{g}/\text{m}^3$	\leq 1000 $\mu\text{g}/\text{m}^3$	yes
R-value (dimensionless)	0.16	\leq 1	yes
Sum VOC without LCI	< 5 $\mu\text{g}/\text{m}^3$	\leq 100 $\mu\text{g}/\text{m}^3$	yes
Formaldehyde	< 2 $\mu\text{g}/\text{m}^3$	\leq 10 $\mu\text{g}/\text{m}^3$	yes

a) For sum VOC (C6-C16) and sum SVOC (C16-C22) only substances $\geq 5 \mu\text{g}/\text{m}^3$ are considered.

Köln, 18.09.2025



Manuel Hiertz,
(Project manager)

⁷ If a measurement result that slightly exceeds the specification is assessed as "not fulfilled", this is based on the agreement of the "shared risk of measurement uncertainty (shared risk approach)". According to this, the probability that the statement is correct is $\geq 50\%$. Similarly, a result slightly below the specification value also only has a probability of $\geq 50\%$ of being compliant. I.e., the risk of making a false negative statement regarding the fulfilment of the specification is just as high as the risk of making a false positive statement
(more information at https://www.eco-institut.de/en/2019/07/measurement_uncertainty/).

Laboratory report

1 Emission analysis

Test method

DIN EN 16516:2020-10

Testing and evaluation of the release of dangerous substances;
determination of emissions into indoor air

A001, Preparation of test specimen

Date:	08/08/2025
Test specimen preparation:	Sample cut to size; transfer of the test specimen into the test chamber immediately after preparation
Masking of backside:	yes
Masking of edges:	yes, 100 %
Relationship of unmasked edges to surface:	not applicable
Arrangement in test chamber:	on tripod
Loading reference unit:	area-specific [m ²]
Dimensions:	31.6 cm x 31.6; thickness: 0.6 cm

A001, Test chamber conditions according to DIN EN ISO 16000-9:2024-08

Chamber volume:	0.250 m ³
Temperature:	23 °C ± 1 °C
Relative humidity:	50 % ± 5 %
Air pressure:	normal
Air:	cleaned
Air change rate:	0.5 h ⁻¹
Air velocity:	0.3 m/s
Loading:	0.4 m ² /m ³
Specific air flow rate:	1.25 m ³ /(m ² ·h)
Starting time of the test (t0):	08/08/2025
Air sampling:	11/08/2025 (3 days after test chamber loading) 05/09/2025 (28 days after test chamber loading)

1.1 Sample A001, Volatile organic compounds after 3 days

Test objective:

Volatile organic compounds (VOC), test chamber, air sampling 3 days after test chamber loading

Method description / Analytics:

Formaldehyde and other carbonyl compounds:	DIN ISO 16000-3:2023-12 (DNPH method, HPLC-DAD)
Limit of quantification:	2 µg/m³
Volatile organic compounds:	DIN ISO 16000-6:2022-03 (Tenax TA®, TD-GC-MS)
Limit of quantification calibrated substances:	1 µg/m³ (1,4-Cyclohexanediethanol, Diethylene glycol, 1,4-Butanediol: 5 µg/m³; Neodecanoic acid: 10 µg/m³)
Limit of quantification non-calibrated substances:	1 µg/m³

Test result:

Internal sample number: 60243-A001

	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³ [µg/m³]	Toluene- equivalent substances ≥ 5 µg/m³ [µg/m³]	SER+ [µg/(m²·h)]	CMR Classifi- cation++	LCI AgBB 2024 [µg/m³]	R- value
	Aromatic hydrocarbons								
VOC	Toluene	108-88-3	8.25	3	< 5	3.8	Repr. 2	2900	0.00
VOC	Isopropylbenzene (Cumene)	98-82-8	11.9	1	< 5	1.3	Carc. 1B	1700	0.00
	Aliphatic hydrocarbons (n-, iso- and cyclo-)								
VOC	2,2,4,6,6-Pentamethylheptane	13475-82-6	13.34	2	< 5	2.5		6000	0.00
VOC	n-Dodecane	112-40-3	17.62	3	< 5	3.8		6000	0.00
VOC	n-Tetradecane	629-59-4	22.22	7	11	8.8		6000	0.00
VOC	n-Hexadecane	544-76-3	25.31	3	5	3.8		6000	0.00
	Terpenes								
VOC	delta-3-Carene	498-15-7	13.93	2	< 5	2.5		1500	0.00
VOC	alpha-Pinene	80-56-8	12.24	2	< 5	2.5		2500	0.00
	Aliphatic mono alcohols (n-, iso-, cyclo-) and dialcohols								
VOC	1-Butanol	71-36-3	5.86	2	< 5	2.5		3000	0.00
VOC	2-Ethyl-1-hexanol	104-76-7	13.97	42	43	53		300	0.14

	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³ [µg/m³]	Toluene-equivalent substances ≥ 5 µg/m³ [µg/m³]	SER+ [µg/(m²·h)]	CMR Classification++	LCI AgBB 2024 [µg/m³]	R-value
	Aromatic alcohols								
VOC	Phenol	108-95-2	12.76	14	12	18	Muta. 2	70	0.20
VOC	2,6-Di-tert-butyl-4-methylphenol (BHT)	128-37-0	24.25	5	9	6.3	Group 3	100	0.05
	Glycols, Glycol ethers, Glycol esters								
VOC	Diethylene glycol monobutyl ether	112-34-5	17.36	1	< 5	1.3		350	0.00
	Aldehydes								
VOC	Hexanal	66-25-1	8.77	2	< 5	2.5		900	0.00
VOC	2-Ethylhexanal	123-05-7	12.38	1	< 5	1.3		900	0.00
	Ketones								
VOC	Methylisobutylketone	108-10-1	7.42	6	5	7.5	Carc. 2	1000	0.01
VOC	Cyclohexanone	108-94-1	11.25	2	< 5	2.5	III3	1400	0.00
VOC	Acetophenone	98-86-2	15.17	15	12	19		490	0.03
	Acids								
VOC	Neodecanoic acid	26896-20-8	17.0 - 19.5	21	20	26		750	0.03
	Esters								
VOC	Methyl acrylate	96-33-3	5.1	1	< 5	1.3	Group 2B	180	0.01
VOC	Hexamethylene diacrylate	13048-33-4	25.07	1	< 5	1.3		10	0.10
	Other identified substances in addition to LCI list								
VOC	Tetramethylsuccinonitrile (TMSN) / 2,2'-Azobisisobutyronitrile	3333-52-6 / 78-67-1	14.03	1	< 5	1.3			
VOC	Dipropylenglycol diacrylate	57472-68-1	23.37	10	10	13		110	0.09
VVOC	Dimethyl carbonate*		5.12	1	< 5	1.3			
VOC	not ident. VOC, m/z 91 61*		5.82	2	< 5	2.5			
VOC	Cluster isoalkanes, alkenes and/or other alcohols*	--	9.5 - 11.5	20	20	25		6000	0.00
VOC	Other acrylates (acrylic acid esters)*	--	11.63	7	7	8.8		110	0.06

	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³ [µg/m³]	Toluene- equivalent substances ≥ 5 µg/m³ [µg/m³]	SER+ [µg/(m²·h)]	CMR Classifi- cation++	LCI AgBB 2024 [µg/m³]	R- value
VOC	Other acrylates (acrylic acid esters)*	--	12.35	11	11	14		110	0.10
VOC	Other acrylates (acrylic acid esters)*	--	12.55	5	5	6.3		110	0.05
VOC	Other saturated aliphatic hydrocarbons C9 - C16*	--	13.7 - 16.0	80	80	100		6000	0.01
VOC	aromatic compound, m/z 43 121*		15.5	11	11	14			
VOC	Cluster isoalkanes, alkenes and/or other alcohols*	--	16.6 - 17.8	25	25	31		6000	0.00
VOC	other saturated iso-alcohols, C6 - C13*	--	17.9	60	60	75		300	0.20
VOC	not ident. VOC, m/z 55 59*		18.54	2	< 5	2.5			
VOC	not ident. VOC, m/z 55 141*		18.9	2	< 5	2.5			
VOC	Phenoxypropanol*		19	3	< 5	3.8			
VOC	not ident. VOC, m/z 55 141*		19.21	1	< 5	1.3			
VOC	Ethylhexyl butyrate*		20.49	2	< 5	2.5			
VOC	not ident. VOC, m/z 57 71*		23.93	2	< 5	2.5			
VOC	not ident. VOC, m/z 85 128*		24.09	5	5	6.3			
VOC	not ident. VOC, m/z 58 128*		24.39	4	< 5	5			

+ identified and calibrated substances, substance specific calculated

++ classification according to Regulation (EG) N° 1272/2008: Categories Carc. 1A, 1B and 2, Muta. 1A, 1B and 2, Repr. 1A, 1B and 2, TRGS 905: K1A, K1B, K2, M1A, M1B, M2, R1A, R1B, R2; IARC: Group 1, 2A, 2B and 3, DFG MAK-list: Categorie III1 to III5

* unidentified substances, calculated as toluene equivalent reported with significant mass fragments as mass-to-charge ratio (m/z)

n. d.: not determined

Carcinogenic, mutagenic, and reproductive toxic compounds*	Concentration after 3 days [$\mu\text{g}/\text{m}^3$]	SERa [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
CMR 1: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EC) No. 1272/2008: Category Carc. 1A and 1B, Muta. 1A and 1B, Repr. 1A and 1B; TRGS 905: K1A, K1B, M1A, M1B, R1A, R1B; IARC: Group 1 and 2A; DFG (MAK list): Categories III1, III2 (sum)	1	< 1.3
C 1: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EG) Nr. 1272/2008: Category Carc. 1A u. 1B; TRGS 905: K1A, K1B (sum)	1	< 1.3

TVOC, Total volatile organic compounds	Concentration after 3 days [$\mu\text{g}/\text{m}^3$]	SERa [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
Sum of VOC according to DIN EN 16516	350	440
Sum of VOC according to AgBB 2024	340	430
Sum of VOC according to eco-INSTITUT-Label	390	490
Sum of VOC according to DIN ISO 16000-6	420	530

TSVOC, Total semi volatile organic compounds	Concentration after 3 days [$\mu\text{g}/\text{m}^3$]	SERa [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
Sum of SVOC according to DIN EN 16516	< 5	< 6.3
Sum of SVOC without LCI according to AgBB 2024	< 5	< 6.3
Sum of SVOC without LCI according to eco-INSTITUT-Label	< 1	< 1.3
Sum of SVOC with LCI according to AgBB 2024	< 5	< 6.3

TVVOC, Total very volatile organic compounds	Concentration after 3 days [$\mu\text{g}/\text{m}^3$]	SERa [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
Sum of VVOC according to AgBB 2024	< 5	< 6.3
Sum of VVOC according to eco-INSTITUT-Label	1	< 1.3

*Excluding formaldehyde and acetaldehyde (Carc. 1B) due to an assumed "practical threshold" under which a significant carcinogenic risk is no longer to be expected (see Federal Institute for Risk Assessment (2006): Toxicological evaluation of formaldehyde and Federal Environment Agency (2016): Reference value for formaldehyde in indoor air and protocol of the 11th meeting of 'Ausschusses für Innenraumrichtwerte' (AIR), 11/2020). In the case of a toxicological emission assessment, a single-substance analysis of the concentrations is necessary.

In the opinion of the committee for Indoor Air Guide Values (Ausschuss für Innenraumrichtwerte) of the Federal Environment Agency, the concentration of 0.1 mg formaldehyde/ m^3 indoor air, based on a measurement period of half an hour, should not be exceeded, also for a short time (Bundesgesundheitsblatt 2016 · 59: 1040-1044 DOI 10.1007 / s00103 -016-2389-5 © Springer-Verlag Berlin Heidelberg 2016).

Other sums of VOC	Concentration after 3 days [μ g/m ³]	SERa [μ g/(m ² · h)]
VOC without LCI according to AgBB 2024 (sum)	16	20
VOC without LCI according to eco-INSTITUT-Label (sum)	35	44
CMR 2: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EC) No. 1272/2008: Category Carc. 2, Muta. 2, Repr. 2; TRGS 905: K2, M2, R2; IARC: Group 2B; DFG (MAK list): Category III3 (sum)	26	33
Sensitising compounds with the following categorisations: DFG (MAK list): Category IV; Regulation (EC) No. 1272/2008: skin sensitising, respiratory sensitising; TRGS 907 (sum)	17	21
Bicyclic Terpenes (sum)	4	5
C9 - C14 Alkanes / Isoalkanes as dekane-equivalent (sum)	90	110
C4 - C11 Aldehydes, acyclic, aliphatic (sum)	3	3.8
C9 - C15 Alkylated benzenes (sum)	1	< 1.3
Cresols (sum)	< 1	< 1.3

Risk value for assessment of LCI	R-value
R-value according to eco-INSTITUT-Label	1.10
R-value according to AgBB 2024	0.98
R-value according to Belgian regulation	0.85
R-value according to EU-LCI	0.82

Note:

Due to different requirements in the respective guidelines, the calculation of TVOC, TVVOC, TSVOC and R-value may result in different values.
Short-chain carbonyl compounds (C1-C5) are quantified via HPLC acc. to DIN ISO 16000-3:2013-01. Therefore, no toluene equivalents are given for VVOC. These substances are taken into concern by means of their substance specific calibration via the sum of VVOC acc. to DIN EN 16516:2020-10. For VOC however, the substance specific calibration takes place via HPLC whereas the TVOC is calculated using the toluene equivalent determined via Tenax acc. to DIN EN 16516:2020-10.

1.2 Sample A001, Volatile organic compounds after 28 days

Test objective:

Volatile organic compounds (VOC), test chamber, air sampling 28 days after test chamber loading

Method description / Analytics:

Formaldehyde and other carbonyl compounds:	DIN ISO 16000-3:2023-12 (DNPH method, HPLC-DAD)
Limit of quantification:	2 µg/m³
Volatile organic compounds:	DIN ISO 16000-6:2022-03 (Tenax TA®, TD-GC-MS)
Limit of quantification calibrated substances:	1 µg/m³ (1,4-Cyclohexanediethanol, Diethylene glycol, 1,4-Butanediol: 5 µg/m³; Neodecanoic acid: 10 µg/m³)
Limit of quantification non-calibrated substances:	1 µg/m³

Test result:

Internal sample number: 60243-A001

	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³	Toluene-equivalent substances ≥ 5 µg/m³ [µg/m³]	SER+ [µg/(m²·h)]	CMR Classification++	LCI AgBB 2024 [µg/m³]	R-value
	Aliphatic hydrocarbons (n-, iso- and cyclo-)								
VOC	n-Tetradecane	629-59-4	22.2	3	< 5	3.8		6000	0.00
VOC	n-Hexadecane	544-76-3	25.3	2	< 5	2.5		6000	0.00
	Aliphatic mono alcohols (n-, iso-, cyclo-) and dialcohols								
VOC	2-Ethyl-1-hexanol	104-76-7	13.95	8	< 5	10		300	0.03
	Aromatic alcohols								
VOC	Phenol	108-95-2	12.74	3	< 5	3.8	Muta. 2	70	0.04
VOC	2,6-Di-tert-butyl-4-methylphenol (BHT)	128-37-0	24.23	3	< 5	3.8	Group 3	100	0.03
	Ketones								
VOC	Methylisobutylketone	108-10-1	7.41	2	< 5	2.5	Carc. 2	1000	0.00
VOC	Acetophenone	98-86-2	15.15	3	< 5	3.8		490	0.01
	Acids								
VOC	2-Ethylhexanoic acid	149-57-5	15.46	1	< 5	1.3	Repr. 1B	150	0.01
VOC	Neodecanoic acid	26896-20-8	18.94	10	< 5	13		750	0.01

	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³	[µg/m³]	Toluene-equivalent substances ≥ 5 µg/m³	SER+ [µg/(m²·h)]	CMR Classifi- cation++	LCI AgBB 2024	R-value
	Esters									
VOC	Hexamethylene diacrylate	13048-33-4	25.05	1	< 5	1.3		10	0.10	
	Other identified substances in addition to LCI list									
VOC	Dipropylenglycol diacrylate	57472-68-1	23.35	8	6	10		110	0.07	
VOC	Cluster isoalkanes, alkenes and/or other alcohols*	--	9.5 - 11.5	4	< 5	5		6000	0.00	
VOC	Other acrylates (acrylic acid esters)*	--	11.61	1	< 5	1.3		110	0.01	
VOC	Other acrylates (acrylic acid esters)*	--	12.33	2	< 5	2.5		110	0.02	
VOC	Other saturated aliphatic hydrocarbons C9 - C16*	--	13.7-16	16	16	20		6000	0.00	
VOC	aromatic compound, m/z 43 121*		15.5	3	< 5	3.8				
VOC	other saturated iso-alcohols, C6 - C13*	--	17.87	13	13	16		300	0.04	
VOC	not ident. glycol m/z 45 57 89*		23.38	2	< 5	2.5				
VOC	not ident. VOC, m/z 57 71*		23.93	1	< 5	1.3				
VOC	not ident. VOC, m/z 85 128*		24.09	2	< 5	2.5				
VOC	not ident. VOC, m/z 58 128*		24.37	2	< 5	2.5				

+ identified and calibrated substances, substance specific calculated

++ classification according to Regulation (EG) N° 1272/2008: Categories Carc. 1A, 1B and 2, Muta. 1A, 1B and 2, Repr. 1A, 1B and 2, TRGS 905: K1A, K1B, K2, M1A, M1B, M2, R1A, R1B, R2; IARC: Group 1, 2A, 2B and 3, DFG MAK-list: Categorie III1 to III5

* unidentified substances, calculated as toluene equivalent reported with significant mass fragments as mass-to-charge ratio (m/z)
n. d.: not determined

Carcinogenic, mutagenic, and reproductive toxic compounds*	Concentration after 28 days [$\mu\text{g}/\text{m}^3$]	SERA [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
CMR 1: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EC) No. 1272/2008: Category Carc. 1A and 1B, Muta. 1A and 1B, Repr. 1A and 1B; TRGS 905: K1A, K1B, M1A, M1B, R1A, R1B; IARC: Group 1 and 2A; DFG (MAK list): Categories III1, III2 (sum)	1	< 1.3
C 1: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EG) Nr. 1272/2008: Category Carc. 1A u. 1B; TRGS 905: K1A, K1B (sum)	< 1	< 1.3

TVOC, Total volatile organic compounds	Concentration after 28 days [$\mu\text{g}/\text{m}^3$]	SERA [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
Sum of VOC according to DIN EN 16516	35	44
Sum of VOC according to AgBB 2024	55	69
Sum of VOC according to eco-INSTITUT-Label	90	110
Sum of VOC according to DIN ISO 16000-6	120	150

TSVOC, Total semi volatile organic compounds	Concentration after 28 days [$\mu\text{g}/\text{m}^3$]	SERA [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
Sum of SVOC according to DIN EN 16516	< 5	< 6.3
Sum of SVOC without LCI according to AgBB 2024	< 5	< 6.3
Sum of SVOC without LCI according to eco-INSTITUT-Label	< 1	< 1.3
Sum of SVOC with LCI according to AgBB 2024	< 5	< 6.3

TVVOC, Total very volatile organic compounds	Concentration after 28 days [$\mu\text{g}/\text{m}^3$]	SERA [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$]
Sum of VVOC according to AgBB 2024	< 5	< 6.3
Sum of VVOC according to eco-INSTITUT-Label	< 1	< 1.3

*Excluding formaldehyde and acetaldehyde (Carc. 1B) due to an assumed "practical threshold" under which a significant carcinogenic risk is no longer to be expected (see Federal Institute for Risk Assessment (2006): Toxicological evaluation of formaldehyde and Federal Environment Agency (2016): Reference value for formaldehyde in indoor air and protocol of the 11th meeting of 'Ausschusses für Innenraumrichtwerte' (AIR), 11/2020). In the case of a toxicological emission assessment, a single-substance analysis of the concentrations is necessary.

In the opinion of the committee for Indoor Air Guide Values (Ausschuss für Innenraumrichtwerte) of the Federal Environment Agency, the concentration of 0.1 mg formaldehyde/ m^3 indoor air, based on a measurement period of half an hour, should not be exceeded, also for a short time (Bundesgesundheitsblatt 2016 · 59: 1040-1044 DOI 10.1007 / s00103 -016-2389-5 © Springer-Verlag Berlin Heidelberg 2016).

Other sums of VOC	Concentration after 28 days [µg/m³]	SERA [µg/(m² · h)]
VOC without LCI according to AgBB 2024 (sum)	< 5	< 6.3
VOC without LCI according to eco-INSTITUT-Label (sum)	10	13
CMR 2: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EC) No. 1272/2008: Category Carc. 2, Muta. 2, Repr. 2; TRGS 905: K2, M2, R2; IARC: Group 2B; DFG (MAK list): Category III3 (sum)	5	6.3
Sensitising compounds with the following categorisations: DFG (MAK list): Category IV; Regulation (EC) No. 1272/2008: skin sensitising, respiratory sensitising; TRGS 907 (sum)	9	11
Bicyclic Terpenes (sum)	< 1	< 1.3
C9 - C14 Alkanes / Isoalkanes as dekane-equivalent (sum)	17	21
C4 - C11 Aldehydes, acyclic, aliphatic (sum)	< 2	< 2.5
C9 - C15 Alkylated benzenes (sum)	< 1	< 1.3
Cresols (sum)	< 1	< 1.3

Risk value for assessment of LCI	R-value
R-value according to eco-INSTITUT-Label	0.38
R-value according to AgBB 2024	0.16
R-value according to Belgian regulation	0.13
R-value according to EU-LCI	0.12

Note:

Due to different requirements in the respective guidelines, the calculation of TVOC, TVVOC, TSVOC and R-value may result in different values.

Short-chain carbonyl compounds (C1-C5) are quantified via HPLC acc. to DIN ISO 16000-3:2013-01. Therefore, no toluene equivalents are given for VVOC. These substances are taken into concern by means of their substance specific calibration via the sum of VVOC acc. to DIN EN 16516:2020-10. For VOC however, the substance specific calibration takes place via HPLC whereas the TVOC is calculated using the toluene equivalent determined via Tenax acc. to DIN EN 16516:2020-10.

1.3 Phthalates (test chamber)

Test parameter:

Phthalates, test chamber, air sampling 28 days after test chamber loading

Test method:

Analytics: DIN ISO 16000-6:2022-03
following VDI 4301 Part 6:2012-09

Test result:

Internal sample number	Substance	Concentration (test chamber air) [$\mu\text{g}/\text{m}^3$]	Limit of quantification (test chamber air) [$\mu\text{g}/\text{m}^3$]
60243-A001	Dibutyl phthalate (DBP)	< LOQ	1
	Bis(2-ethylhexyl) phthalate (DEHP)	< LOQ	1

< LOQ = Value below limit of quantification

Cologne, 11/09/2025



Michael Stein, Dipl.-Chem.
(Laboratory Management)

Appendix

Sampling sheet



Sampling Sheet

Please fill in all fields. If the fields marked * are not filled in, the test piece cannot be accepted for laboratory testing.

60243-001

Please take one sampling sheet for each sample! The sampling instruction must be strictly maintained!

Order by*	Oneflor Europe bv Wittestraat 10, B - 8501 HEULE +32 56 41 06 04	Testing laboratory	eco-INSTITUT Germany GmbH Schwanenstr. 6-20, Carlswerk 1.19 D - 51063 Köln Tel. +49 (0)221 - 931245-0 Fax +49 (0)221 - 931245-33
Name of production company	NOX CORP.	Sampling by*	Alban Parisse, Oneflor Europe, +32 56 41 06 04 (name, company, phone)
Name of distribution	ONEFLOR EUROPE (if different from production)	Sampling location*	Heule (Belgium)
Name of test sample/ item*	LOOM+ LOCK	Product type	PVC floor covering (e.g. parquet, floor covering)
Article number	OFO-2805	Sample/ Batch*	2307262BU
Model / Program / Series	Woven vinyl tile	Production date of batch*	March 2025
Sample taken from	current production	Sampling date*	03/07/2025
<input checked="" type="checkbox"/> storage		Storage conditions before sampling	open
<input type="checkbox"/> other			<input checked="" type="checkbox"/> packaged
Storage location	Heule (Belgium)	Packaging material	Carton

Additional information, if applicable / Special issues
Uncertainties, questions, possible negative effects through emissions at
place of sampling - e.g. contaminations during production/storage

Validation*
By signing the accuracy of the above-mentioned statements (sampling) is affirmed.

Date
(dd/mm/yyyy) 03/07/2025

Signature: Alban Parisse

 ONEFLOR EUROPE BVBA
 Wittestraat 10 - 8501 Heule
 eco-INSTITUT Germany GmbH, Schwanenstrasse 6-20 / Carlswerk 1.19, D-51063 Köln, Germany
 BELGIUM
 Tel. +49 221 931245-0 / Fax +49 221 931245-33 / ecoinstitut.de / Geschäftsführer: Dr. Frank Körber, Daniel Tüges -32 56 41 06 04
 HRB 17917 / USt-ID: DE 122633308 / Volksbank Rhein-Gülz-Köln eG, BAN: 35803760133177 / GENOWATHE00845736777
info@oneflor-europe.com

List of calibrated Volatile Organic Compounds (VOC)

Aromatic hydrocarbons (30)

1,2,3-Trimethylbenzene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
1-Isopropyl-2-methylbenzene
1-Isopropyl-4-methylbenzene
1,2,4,5-Tetramethylbenzene
Ethylbenzene
n-Propylbenzene
Isopropylbenzene (Cumene)⁴
1,3-Diisopropylbenzene
1,4-Diisopropylbenzene
n-Butylbenzene
1-Propenylbenzene (beta-Methylstyrene)
Toluene
2-Ethyltoluene
Vinyltoluene
o-Xylene
m-/p-Xylene
Styrene
Phenylacetylene
2-Phenylpropene (alpha-Methylstyrene)
4-Phenylcyclohexene
1-Phenyloctane
1-Phenyldecane²
1-Phenylundecane²
Indene
Naphthalene
1-Methylnaphthalene
2-Methylnaphthalene
1,4-Dimethylnaphthalene

Aliphatic hydrocarbons (24)

2-Methylpentane¹
3-Methylpentane¹
Methylcyclopentane
n-Pentane¹
n-Hexane
Cyclohexane
Methylcyclohexane
1,4-Dimethylcyclohexane
n-Heptane
2,2,4,6,6-Pentamethylheptane
n-Octane
n-Nonane
n-Decane
n-Undecane
n-Dodecane
n-Tridecane
n-Tetradecane
n-Pentadecane
n-Hexadecane
Decahydronaphthalene
1-Octene
1-Decene
1-Dodecene
4-Vinylcyclohexene

Terpenes (12)

delta-3-Carene
alpha-Pinene
beta-Pinene
alpha-Terpinene
Longipinene
Limonene
Longifolene
Isolongifolene
beta-Caryophyllene
alpha-Phellandrene
Myrcene
Camphene

Aliphatic alcohols and ether (18)

Ethanol¹
1-Propanol¹
2-Propanol¹
2-Methyl-1-propanol
1-Butanol
tert-Butanol
1-Pentanol
1-Hexanol
Cyclohexanol
2-Ethyl-1-hexanol
1-Heptanol
1-Octanol
1-Nonanol
1-Decanol
1,4-Cyclohexandimethanol
4-Hydroxy-4-methyl-pentan-2-one
(Diacetone alcohol)
Methyl-tert-butyl ether (MTBE)¹
Tetrahydrofuran (THF)

Aromatic alcohols (phenoles) (8)

Furfuryl alcohol
Benzyl alcohol
Phenol
2-Phenylphenol (oPP)
BHT (2,6-Di-tert-butyl-4-methylphenol)
o-Cresol
m-/p-Cresol
4-Chloro-3-methylphenol (Chlorocresol)

Glycols, Glycol ether, Glycol ester (49)

Ethylene glycol (Ethan-1,2-diol)
Propylene glycol (Propane-1,2-diol)
Diethylene glycol
Dipropylene glycol
Neopentyl glycol
Hexylene glycol
Ethyldiglycol
Ethylene glycol monobutyl ether
Diethylene glycol methyl ether
Diethylene glycol monobutyl ether
Diethylene glycol phenyl ether
Dipropylene glycol-dimethyl ether

Dipropylene glycol mono-n-butyl ether

Dipropylene glycol mono-tert-butyl ether
Dipropylene glycol monomethyl ether
Dipropylene glycol mono-n-propyl ether
Tripropylene glycol monomethyl ether
Triethylene glycol dimethyl ether
1,2-Propylene glycol dimethyl ether
1,2-Propylene glycol-n-propyl ether
1,2-Propylene glycol-n-butyl ether
Butyl glycolate
2-Methoxyethanol
2-Ethoxyethanol
2-Methylethoxyethanol
2-Propoxyethanol
2-Hexaoxyethanol
2-(2-Hexaoxyethoxy)ethanol
2-Phenoxyethanol
1-Methoxy-2-propanol
2-Methoxy-1-propanol
1-Ethoxy-2-propanol
1-tert-Butoxy-2-propanol
3-Methoxy-1-butanol
1,4-Butanediol
1,2-Dimethoxyethane
1,2-Diethoxyethane
1-Methoxy-2-(2-methoxy-ethoxy)ethane
Ethylene carbonate
Propylene carbonate
2-Methoxy-1-propyl acetate
Diethylene glycol monomethyl ether acetate
2-Methoxyethyl acetate
2-Ethoxyethyl acetate
2-Butoxyethyl acetate
Dipropylene glycol monomethyl ether acetate
Propylene glycol diacetate
Texanol
TXIB (Texanol isobutyrate)

Aldehydes (26)

Formaldehyde^{1,3,4}
Acetaldehyde^{1,3,4}
Propanal^{1,3}
Butanal^{1,3}
3-Methyl-1-butanal
Pentanal
Hexanal
2-Ethylhexanal
Heptanal
Octanal
Nonanal
Decanal
Propenal (Acrolein)¹
Isobutenal (Methacrolein)³
2-Butenal
2-Pentenal³
2-Hexenal
2-Heptenal
2-Octenal

2-Nonenal	Hexanediol diacrylate	2-Nitroanisole ⁴
2-Decenal	Dipropylene glycol diacrylate	p-Cresidine ⁴
2-Undecenal	Dimethyl succinate	Diethyl sulfate ⁴
Ethanedial (Glyoxal) ^{1,3}	Dimethyl glutarate	Epichlorohydrin ⁴
Glutaraldehyde	Dimethyl adipate	1,2-Dichloropropane ⁴
Furfural	Diethyl fumarate	Urethane ⁴
Benzaldehyde	Diethyl maleate	Acrylamide ⁴
Ketones (14)	Diisobutyl succinate	trans-1,4-Dichlorobut-2-ene ⁴
Acetone ^{1,3}	Diisobutyl glutarate	1,2-Dibromo-3-chloropropane ⁴
1-Hydroxyacetone	Butyrolactone	2-Nitrotoluene ⁴
Ethylmethylketone ³	Dimethyl phthalate	Quinoline ⁴
Methylisobutylketone	Diethyl phthalate ²	Phenylglycidyl ether ⁴
3-Methyl-2-butanone	Dipropyl phthalate ²	2,4,5-Trimethylaniline ⁴
Cyclopentanone	Diethyl phthalate ²	4-Chlorobenzotrifluoride ⁴
2-Methylcyclopentanone	Diisobutyl phthalate ²	Nitrosodipropylamin ⁴
Cyclohexanone	(5-Ethyl-1,3-dioxan-5-yl)methyl acrylate	
2-Methylcyclohexanone		Others (35)
2-Hexanone		5-Nitro-o-toluidine ²
2-Heptanone		2,2'-Azobisisobutyronitrile
Acetophenone		Tetramethylsuccinonitrile
Isophorone		Caprolactam
4-Methylbenzophenone ²		2-Methylfuran
Acids (11)		2-Pentylfuran
Acetic acid		Methenamine
Propionic acid		Diethylamine ¹
Pivalic acid		Triethylamine
Butyric acid		Triethylene diamine (DABCO [®])
Isobutyric acid		Triethyl phosphate
n-Valeric acid		Tributyl phosphate ²
n-Caprylic acid		5-Chloro-2-methyl-4-isothiazolin-3-one (CIT)
2-Ethylhexanoic acid		2-Methyl-4-isothiazolin-3-one (MIT)
n-Heptanoic acid		2-n-Octyl-4-isothiazolin-3-one (OIT)
n-Octanoic acid		Formamide
Neodecanoic acid		N-Methylformamide
		Dimethylformamide (DMF)
Esters and Lactones (33)		Acetamide
Methyl acetate ¹		N-Methyl-2-pyrrolidone
Ethyl acetate ¹		N-Ethyl-2-pyrrolidone
Vinyl acetate ¹		N-Butyl-2-pyrrolidone
Propyl acetate		Aniline ⁵
Isopropyl acetate		Cyclohexyl isocyanate
2-Methoxy-1-methylethyl acetate		5-Ethyl-1,3-dioxan-5-methanol
n-Butyl acetate		Dichloromethane ¹
Isobutylacetate		Tetrachloromethane
2-Ethylhexyl acetate		1,1,1-Trichloroethane
n-Butyl formate		2-Chloropropane
Methyl acrylate		Tetrachloroethene
Methyl methacrylate		Chlorobenzene
Butyl methacrylate		1,4-Dichlorobenzene
Ethyl acrylate		1,1-Dichlorethene ¹
n-Butyl acrylate		2-Pantanone oxime
2-Ethylhexyl acrylate		Tribromomethane (Bromoform)
2-Ethylhexyl methacrylate		

¹ VOC² SVOC³ Analysis acc. to DIN ISO 16000-3:2023-12 (DNPH)⁴ Carcinogens, category 1A and 1B according to Regulation (EC) No 1272/2008 and TRGS 905⁵ When analysing with TD-GC-MS, aniline can occur as a thermal decomposition product of other substances (e.g. 1,3-Diphenylguanidine). A cold analytical method is recommended to confirm the result.

Definition of terms

CAS No. (Chemical Abstracts Service)	International designation standard for chemical substances
CMR	VOCs, VVOCs and SVOCs classified as carcinogenic, mutagenic or toxic for reproduction according to Regulation (EC) No. 1272/2008, TRGS 905, IARC list and DFG (MAK list)
Limit of quantification (LOQ)	Lower limit of quantification in the analytical method within the defined measurement uncertainty
NIK / LCI	Lowest concentration of interest; substance-specific value for health assessment of emissions from products, indicated in $\mu\text{g}/\text{m}^3$
RT (retention time)	Total time required for an analyte to pass the column (time between injection and detection of the analyte)
R value	Sum of quotients of concentration and LCI value for all substances for which a LCI value is derived
R value according to AgBB	R-value for all substances $\geq 5 \mu\text{g}/\text{m}^3$ with LCI value, calculated according to the LCI list of the AgBB scheme
R-value according to Belgian regulation	R-value for all substances $\geq 5 \mu\text{g}/\text{m}^3$ with LCI-value, calculated according to the LCI-list of the Belgian regulation
R value according to eco-INSTITUT-Label	R-value for all substances $\geq 1 \mu\text{g}/\text{m}^3$ with LCI value, calculated according to the LCI list of the AgBB scheme
R value according to EU-LCI	R-value for all substances $\geq 5 \mu\text{g}/\text{m}^3$ with EU-LCI value, calculated according to the EU-LCI list of the European Commission
SER	Specific emission rate (see "Explanation of Specific Emission Rate SER")
SVOC (semi volatile organic compound)	Organic compound eluting in the retention range > C16 (n-hexadecane) to C22 (docosane)
Toluene equivalent	Concentration of a substance quantified by the TIC response factor of toluene (calculation of the concentration by comparing the integral of the substance with the integral of toluene)
TSVOC	Sum of the concentrations of all identified and unidentified semi volatile organic compounds eluting in the retention range > C16 (n-hexadecane) to C22 (docosane)
TSVOC according to DIN EN 16516	Sum of all SVOC $\geq 5 \mu\text{g}/\text{m}^3$ (as toluene equivalent)
TSVOC with LCI according to AgBB	Sum of all SVOC with LCI $\geq 5 \mu\text{g}/\text{m}^3$ (quantified substance-specific)
TSVOC with LCI according to eco-INSTITUT-Label	Sum of all SVOC with LCI $\geq 1 \mu\text{g}/\text{m}^3$ (quantified substance-specific)
TSVOC without LCI according to AgBB	Sum of all SVOC without LCI $\geq 5 \mu\text{g}/\text{m}^3$ (as toluene equivalent)
TSVOC without LCI according to eco-INSTITUT label	Sum of all calibrated SVOC without LCI $\geq 1 \mu\text{g}/\text{m}^3$ (quantified substance-specific) and all non-calibrated SVOC without LCI $\geq 1 \mu\text{g}/\text{m}^3$ (as toluene equivalent)
TVOC	Sum of the concentrations of all identified and unidentified volatile organic compounds eluting in the retention range from C6 (n-hexane) to C16 (n-hexadecane)

TVOC according to DIN EN 16516	Sum of all VOC $\geq 5 \mu\text{g}/\text{m}^3$ in the retention range C6 to C16, calculated as toluene equivalent (used i.a. for M1)
TVOC according to AgBB	Sum of all VOCs with LCI $\geq 5 \mu\text{g}/\text{m}^3$ (quantified substance-specific) and all VOCs without LCI $\geq 5 \mu\text{g}/\text{m}^3$ (as toluene equivalent) (used i.a. for the Blue Angel)
TVOC according to eco-INSTITUT-Label	Sum of all calibrated VOC $\geq 1 \mu\text{g}/\text{m}^3$ (quantified substance-specific) and all non-calibrated VOC $\geq 1 \mu\text{g}/\text{m}^3$ (as toluene equivalent) (used i.a. for natureplus)
TVOC according to ISO 16000-6	Total area of the chromatogram in the retention range C6 – C16 as toluene equivalent according to DIN ISO 16000-6, Annex A.1 item 3 (used i.a. for CDPH, BIFMA and the French VOC regulation)
TVOC without LCI according to AgBB	Sum of all VOCs without LCI $\geq 5 \mu\text{g}/\text{m}^3$ as toluene equivalent
TVOC without LCI according to eco-INSTITUT-Label	Sum of all calibrated VOCs without LCI $\geq 1 \mu\text{g}/\text{m}^3$ (quantified substance-specific) and all non-calibrated VOCs without LCI $\geq 1 \mu\text{g}/\text{m}^3$ (as toluene equivalent)
TVVOC	Sum of the concentrations of all identified and unidentified very volatile organic compounds eluting in the retention range < C6 (n-hexane)
TVVOC according to AgBB	Sum of all VVOC with LCI $\geq 5 \mu\text{g}/\text{m}^3$ (quantified substance-specific) and all VVOC without LCI $\geq 5 \mu\text{g}/\text{m}^3$ (as toluene equivalent)
TVVOC according to eco-INSTITUT-Label	Sum of all calibrated VVOC $\geq 1 \mu\text{g}/\text{m}^3$ (substance-specific quantified) and all non-calibrated VVOC $\geq 1 \mu\text{g}/\text{m}^3$ (as toluene equivalent)
VOC (volatile organic compound)	Organic compound eluting in the retention range from C6 (n-hexane) to C16 (n-hexadecane)
VVOC (very volatile organic compound)	Organic compound eluting in the retention range < C6 (n-hexane)

Commentary on emission analysis

Test method

Measurement of the volatile organic compounds takes place in the test chamber in conditions similar to those applying in practice. Standardised test conditions are defined for the test chamber regarding loading, air exchange, relative humidity, temperature, and incoming air, based on the type of test specimen and the required guideline. These conditions and the underlying standards are to be found in the section on test methods in the laboratory report.

Air samples are taken from the test chamber at defined points in time during the continuously running test. To this end, approximately 5 L of air are collected from the test chamber at an air flow rate of 100 mL/min on Tenax and approx. 100 L at an air flow rate of 0.8 L/min on silica gel coated with DNPH (2,4-dinitrophenylhydrazine).

After thermal desorption, the substances adsorbed on Tenax are analysed using gas chromatographic separation and mass spectrometric determination. The gas chromatographic separation is performed with a slightly polar capillary column of 60 m in length.

The substances derivatised with DNPH for the determination of formaldehyde and other short-chain carbonyl compounds (C1 - C6) are analysed using high-performance liquid chromatography (HPLC).

Over 200 compounds, including volatile organic compounds (C6 - C16), semi-volatile organic compounds (C16 - C22) and – insofar as possible with this method – also very volatile organic compounds (less than C6) are determined and quantified individually.

All other substances – insofar as possible – are identified through comparison with a library of spectra. The quantification of these substances and non-identified substances is performed through a comparison of their signal area with the signal of toluene.

The determined substance concentrations are corrected using the recovery rate of the internal standard (toluene-d8). Identification and quantification of substances is carried out from a concentration (limit of quantification) of 1 µg per m³ test chamber air or 2 µg/m³ for DNPH-derivatised substances. In the case of highly loaded samples, the evaluation limit of non-calibrated substances is raised in some cases, as it is no longer possible to assign individual, small signals due to the large number of signals.

Quality assurance

The eco-INSTITUT Germany GmbH is granted flexible scope of accreditation pursuant to DIN EN ISO/IEC 17025:2018-03. The accreditation covers the analytical determination of all volatile organic compounds, including the test chamber method.

In each analysis the analytical system is checked using an external standard based on the specifications in standard DIN EN 16516:2020-10. The stability of the analytical systems is documented based on the test standard using control charts.

Laboratory performance is assessed at least once a year in inter-laboratory comparisons by comparing the results with those obtained by other laboratories for identical samples.

A blank is run prior to introducing the test specimen into the test chamber to check for the possible presence of volatile organic compounds.

The expanded measurement uncertainty U for the analytical determination of all volatile organic compounds, including the test chamber method, is estimated to 29.3 %. The calculation is based on DIN ISO 11352:2013-03 (Nordtest).

Explanation of Specific Emission Rate SER

Emission measurements are accomplished in test chambers under defined physical conditions (temperature, relative humidity, room loading, air change rate etc.).

Test chamber measurement results are directly comparable only if the investigations were accomplished under the same basic conditions.

If the differences of the physical conditions refer only to the change of air rate and/or the loading, the "SER" or "specific emission rate" can be used for comparability of the measurement results. The SER indicates how many volatile organic compounds (VOC) are released by the sample for each material unit and hour (h).

The SER can be calculated using the formula below for each proven individual component of the VOC from the data in the test report.

As material units the following are applicable:

l = unit of length (m)	relation between emission and length
a = unit area (m^2)	relation between emission and surface
v = unit volume (m^3)	relation between emission and volume
u = piece unit (unit = piece)	relation between emission and complete unit

From this the different dimensions for SER result:

length-specific	SER_l	in $\mu\text{g}/(\text{m}\cdot\text{h})$
surface-specific	SER_a	in $\mu\text{g}/(\text{m}^2\cdot\text{h})$
volume-specific	SER_v	in $\mu\text{g}/(\text{m}^3\cdot\text{h})$
unit-specific	SER_u	in $\mu\text{g}/(\text{u}\cdot\text{h})$

SER thus represents a product specific rate, which describes the mass of the volatile organic compound, which is emitted by the product per time unit at a certain time after beginning of the examination.

$$\boxed{\text{SER} = q \cdot c}$$

q specific air flow rate (quotient from change of air rate and loading)
c concentration of the measured substance(s)

The result can be indicated in milligrams (mg) in place of micro grams (μg), whereby 1 mg = 1000 μg .