eco-INSTITUT Germany GmbH
Laborprüfung
Laboratory testing

Latvijas Finieris AS
Bauskas iela 59
1004 Riga
Latvia

Test Report No. 55413-001

Test objective:	**Evaluation according to M1-Criteria**
Name of test sample/item by client:	**Birch plywood Riga Ply BB/WG EXT-LN 18 mm**
Sample/batch by client:	**S-135571 am.2**
Sampled by:	Dina Melgalve, Latvijas Finieris AS
Date of sampling:	23.07.2020
Location of sampling:	mill Lignums, Finiera iela 6 Riga LV-1016
Date of production:	23.07.2020
Date of arrival of sample:	30.07.2020
Test period:	30.07.2020 - 13.10.2020
Date of report:	14.10.2020
Number of pages of report:	20
Testing laboratory:	eco-INSTITUT Germany GmbH, Köln except ‡ subcontracted # outside accreditation
Test objective fulfilled:	✓ Emission class M1
Note:	The test results in the report refer exclusively to the test sample submitted by the manufacturer. The report serves exclusively for submission to the awarding authority for the above-mentioned quality mark. The report is not permitted to be used in product and company advertising. More information at www.eco-institut.de/en/advertising

Content

Sample View

Internal sample-no. (will be filled in by laboratory)	Test sample/item by client	Sample/batch by client:	Condition upon delivery	Type of sample
A001	Birch plywood Riga Ply BB/WG EXT-LN 18 mm	S-135571 am.2	without objection	flooring

A001: Birch plywood Riga Ply BB/WG EXT-LN 18 mm

Statement of conformity with the M1 criteria

The product **Birch plywood Riga Ply BB/WG EXT-LN 18 mm** has been tested on behalf of **Latvijas Finieris AS**.

This evaluation bases on the test criteria of the Building Information Foundation RTS.
The results of the emission analysis are stated as Specific Emission Rate (SER).

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

Test parameter	SER Specific Emission Rate	Requirement Emission class M1	Requirement hold [yes/no]
Emission analysis			
Measurement time: 28 days after test chamber loading			
TVOC (Sum volatile organic compounds) [1)]	0.054 mg/(m² • h)	< 0.2 mg/m²h	yes
VOC single substances µg/m³	≤ EU-LCI	≤ EU-LCI	yes
Formaldehyde	0.0025 mg/(m² • h)	< 0.05 mg/m²h	yes
Sum CMR-substances (EU cat. 1A and 1B) [2)]	< 0.001 mg/m³	< 0.001 mg/m³	yes
Odour testing acc. to ISO 16000-28			
Odour / Acceptance	0.6	≥ 0	yes
Ammonia	< q.l.	< 0.03 mg/m²h	yes

[1)] for TVOC only substances ≥ 5 µg/m³ are considered
[2)] does not apply to formaldehyde

< q.l. = Value below quantification limit

[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 ≥ 50%. Similarly, a result slightly below the specification value also only has a probability of ≥ 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/).

Summary statement of conformity with the M1 criteria

The product **Birch plywood Riga Ply BB/WG EXT-LN 18 mm** meets the requirements of the **Emission Class M1.**

Cologne, 14.10.2020

Arne Herzog
(Project Manager)

Laboratory report

1 Emission analysis

Test method

DIN EN 16516:2018-01	Testing and evaluation of the release of dangerous substances; determination of emissions into indoor air

A001, Preparation of test sample

Date:	09.09.2020
Sample preparation:	not applicable
Masking of backside:	yes
Masking of edges:	yes,
Relationship of unmasked edges to surface:	not applicable
Loading:	related to area
Dimensions:	25 cm x 20 cm

A001, Test chamber conditions according to DIN ISO 16000-9:2008-04

Chamber volume:	0.125 m^3
Temperature:	23°C ± 1°C
Relative humidity:	50 % ± 1 %
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 $m^3/(m^2 \cdot h)$
Air sampling:	28 days after test chamber loading

Analytics

Aldehydes and Ketones	DIN ISO 16000-3:2013-01
Limit of determination:	2 µg/m^3
Volatile Organic Compounds	DIN ISO 16000-6:2012-11
Limit of determination:	1 µg/m^3 (1,4-Cyclohexanedimethanol, Diethylene glycol, 1,4-Butanediol: 5 µg/m^3)
Note for analysis:	not specified

1.1 Sample A001, Volatile Organic Compounds after 28 days

Test objective:
Volatile Organic Compounds (VOC), test chamber, air sampling 28 days after test chamber loading

Test result:

Sample:	A001: Birch plywood Riga Ply BB/WG EXT-LN 18 mm

No.	Substance	CAS No.	RT [min]	Concentration+ Substances ≥ 1 µg/m³ [µg/m³]	Toluene-equivalent Substances ≥ 5 µg/m³ [µg/m³]	CMR Classifi-cation++	LCI M1 [µg/m³]	< EU-LCI
7	**Aldehydes**							
7-2	Pentanal	110-62-3	6.61	6			800	yes
7-3	Hexanal	66-25-1	8.66	11	10		900	yes
7-20	Acetaldehyde	75-07-0		9		Carc. 2	1200	yes
7-21	Propanal	123-38-6		2				
7-22	Formaldehyde	50-00-0		2		Carc. 1B Muta. 2	100	yes
8	**Ketones**							
8-10	Acetone	67-64-1		17				
9	**Acids**							
9-1	Acetic acid	64-19-7	4.93	84	33		1200	yes
10	**Esters**							
10-1	Methyl acetate	79-20-9	4.38	27	14			

+ identified and calibrated substances, substance specific calculated

++ Classification according to Regulation (EG) N° 1272/2008: Categories 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: Categorie III1 and III2

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

Carcinogenic, mutagenic and reproductive toxic components*	Concentration after 28 days [µg/m³]	SERa [µg/(m² • 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	< 1.25
C 1: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EG) Nr. 1272/2008: Category Carc. 1A u. 1B (Sum)	< 1	< 1.25

TVOC, Total volatile organic compounds	Concentration after 28 days [µg/m³]	SERa [µg/(m² • h)]
Sum of VOC according to DIN EN 16516	43	54
Sum of VOC according to AgBB 2018 / DIBt	100	130
Sum of VOC according to eco-INSTITUT-Label	100	130
Sum of VOC according to ISO 16000-6	51	64

TSVOC, Total semi volatile organic compounds	Concentration after 28 days [µg/m³]	SERa [µg/(m² • h)]
Sum of SVOC according to DIN EN 16516	< 5	< 6.25
Sum of SVOC without LCI according to AgBB 2018 / DIBt	< 5	< 6.25
Sum of SVOC without LCI according to eco-INSTITUT-Label	< 1	< 1.25
Sum of SVOC with LCI according to AgBB 2018 / DIBt	< 5	< 6.25

TVVOC, Total very volatile organic compounds	Concentration after 28 days [µg/m³]	SERa [µg/(m² • h)]
Sum of VVOC according to AgBB 2018 / DIBt and Belgian regulation	53	66
Sum of VVOC according to eco-INSTITUT-Label	57	71

*Excluding formaldehyde (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). In the case of a toxicological emission assessment, a single-substance analysis of the formaldehyde concentration 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/m³ 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/DIBt and Belgian regulation (Sum)	< 5	< 6.25
VOC without LCI according to eco-INSTITUT-Label (Sum)	< 1	< 1.25
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: K3; IARC: Group 2B; DFG (MAK list): Category III3 (Sum)	11	14
Sensitising compounds with the following categorisations: DFG (MAK list): Category IV, German Federal Institute for Risk Assessment lists: Cat A, TRGS 907 (Sum)	8	10
Bicyclic Terpenes (Sum)	< 1	< 1.25
C9 - C14: Alkanes / Isoalkanes as dekane-equivalent (Sum)	< 1	< 1.25
C4 - C11 Aldehydes, acyclic, aliphatic (Sum)	17	21
C9 - C15 Alkylated benzenes (Sum)	< 1	< 1.25
Cresols (Sum)	< 1	< 1.25

Risk value for assessment of LCI	R-value
R-value according to eco-INSTITUT-Label	0.13
R-value according to AgBB 2018 / DIBt	0.11
R-value according to Belgian regulation	0.11
R-value according to AFSSET	0.40

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 16516:2018-01. 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 16516:2018-01.

1.2 Ammonia (test chamber)

Test parameter:
Ammonia

Test method:

Analytics:	UV/VIS Spectrometric analysis, Method of DIBt (German Institute for Structural Engineering) The test chamber air is passed through a sulphuric acid solution. The determination of the Ammonia concentration is carried out spectroscopically Bertholot's indophenol assay.

Test result:

Sample	Measurement after [days]	Concentration (Test chamber air) [µg/m³]	Specific Emission Rate (SER) [µg/(m²·h)]	Limit of determination [µg/m³]
A001: Birch plywood Riga Ply BB/WG EXT-LN 18 mm	28	< q.l.	n.d.	15

< q.l. = Value below quantification limit
n.d. = not determinable

2 Odour Testing

Test parameter:
Odour, Acceptance

Test Method:

Analytics:	DIN EN ISO 16000-28:2012-12 i.A., VDI 4302:2015-04

Test conditions

Test chamber	see 1 Emission analysis
Air sampling [days]	1
Probands	12
Therefrom female	4
Evaluation Acceptance	Continuous scale from +1 (clearly acceptable) to -1 (clearly unacceptable)

Test Result:

Sample:	A001: Birch plywood Riga Ply BB/WG EXT-LN 18 mm

	Acceptance
Arithmetic mean	0.6
Standard deviation	0.3
Half width of the 90% confidence interval	0.2
PD-value	0 %

	Acceptance
Arithmetic mean (background odour)	0.9
Requirement (background odour)	≥ 0.6

Test person	Evaluation (Acceptance)	
	Evaluation Sample	Evaluation Test Room
Test person 01	1.0	0.9
Test person 02	0.6	0.9
Test person 03	0.9	1.0
Test person 04	0.8	0.8
Test person 05	0.1	0.9
Test person 06	0.5	0.9
Test person 07	0.1	1.0
Test person 08	0.4	0.8
Test person 09	0.8	0.9
Test person 10	0.1	0.9
Test person 11	0.9	0.9
Test person 12	0.4	0.9

Cologne, 14.10.2020

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

Appendix

Sampling sheet

eco-INSTITUT Germany GmbH
Laborprüfung
Laboratory testing

Sampling Sheet

55413-001

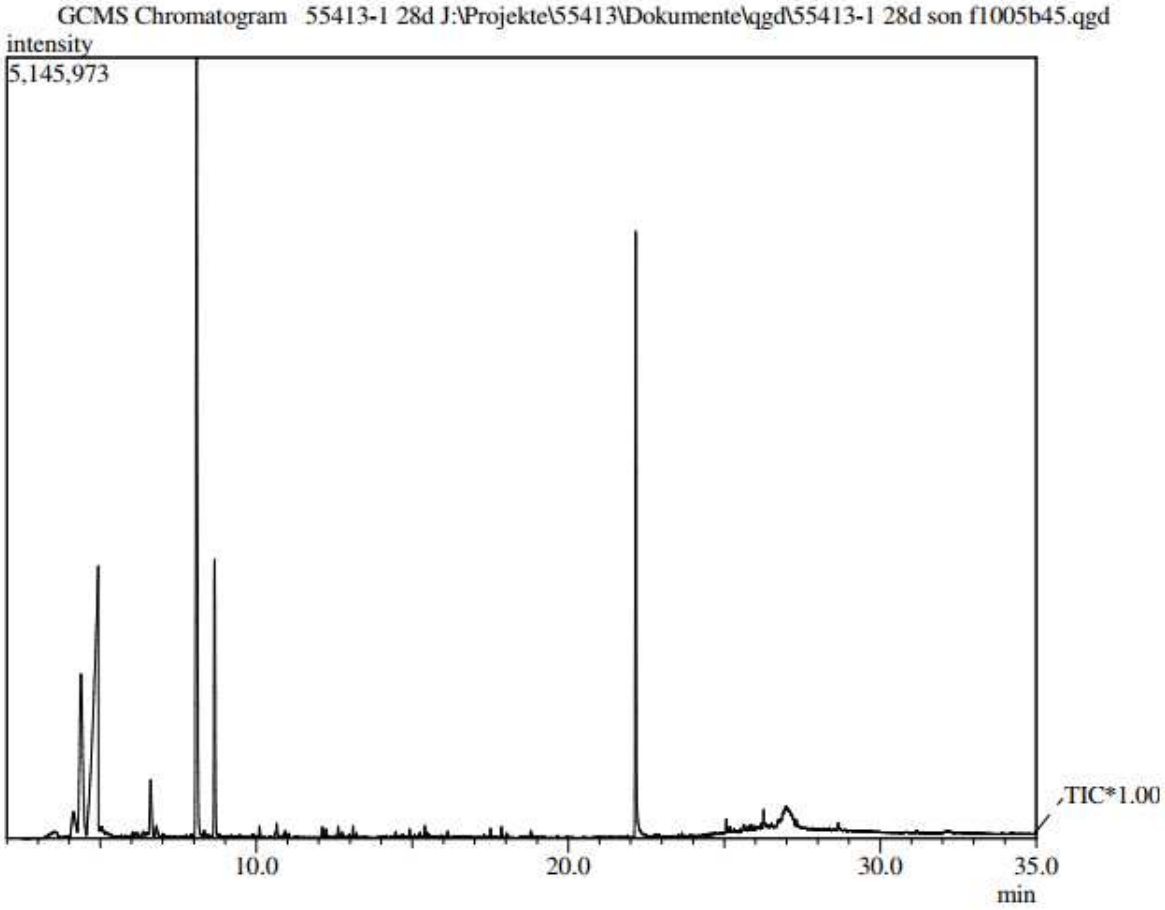
Please fill in all fields. If the fields marked or red outlined are not filled in, the test pieces cannot be accepted for laboratory testing.*
Please take one sampling sheet for each sample! The sampling instruction must be strictly maintained!

Customer *	Latvijas Finieris AS Bauskas iela 59 Riga LV-1004 Latvia	**Testing laboratory**	eco-INSTITUT Germany GmbH Schanzenstr. 6-20, D-51063 Cologne Tel. +49 (0)221 - 931245-0 Fax +49 (0)221 - 931245-33
☒ Name of manufacturer ☐ Name of distributor (if different from customer)		**Sampler** * (Name, Company, Phone	Dina Melgalve, Latvijas Finieris AS Standardisation and Certification Expert. Ph.+371 6706 59 69
		Sampling location *	mill Lignums, Finiera iela 6 Riga LV-1016
Name of test sample/ Item *	Birch plywood Riga Ply BB/WG EXT-LN 18 mm	**Product type** (e.g. parquet, floor covering)	flooring
Article number	n/a	**Batch***	S-135571 am.2
Model / programme / series	plywood bonded with lignin-phenol-formaldehyde EXT-LN resins	**Producion date of batch** * (yyyy/mm/dd)	23.07.2020
Samples are taken from	☒ current production ☐ storage ☐ other	**Sampling date** (yyyy/mm/dd)	2020/07/23
		Storage conditions before sampling	☒ open ☐ packaged
Storage location:		**Packaging material**	Alluminium foil, plastic film
Special issues (Uncertainties, questions, possible negative effects through emissions at place of sampling - e.g. contaminations during production / storage)	n/a		

Validation *
Hereby the signer affirms the accuracy of the above-mentioned statements.

Date (yyyy/mm/dd):	**Signature/Stamp:**
2020/07/24	Dina Melgalve A/S "LATVIJAS FINIERIS" Quality and Production Development Department Bauskas Str. 59, Riga, Latvia, LV-1004

Chromatogram



List of calibrated Volatile Organic Compounds (VOC)

Aromatic hydrocarbons
Toluene
Ethylbenzene
p-Xylene
m-Xylene
o-Xylene
Isopropylbenzene
n-Propylbenzene
1,3,5-Trimethylbenzene
1,2,4-Trimethylbenzene
1,2,3-Trimethylbenzene
2-Ethyltoluene
1-Isopropyl-2-methylbenzene
1-Isopropyl-4-methylbenzene
1,2,4,5-Tetramethylbenzene
n-Butylbenzene
1,3-Diisopropylbenzene
1,4-Diisopropylbenzene
Phenyloctane
1-Phenyldecane[2]
1-Phenylundecane[2]
4-Phenylcyclohexene
Styrene
ß-Methylstyrene
Phenylacetylene
2-Phenylpropene
Vinyltoluene
Naphthalene
Indene
Benzene
1-Methylnaphthalene
2-Methylnaphthalene
1,4-Dimethylnaphthalene

Saturated aliphatic substances
2-Methylpentane[1]
3-Methylpentane[1]
n-Hexane
Cyclohexane
Methylcyclohexane
n-Heptane
n-Octane
n-Nonane
n-Decane
n-Undecane
n-Dodecane
n-Tridecane
n-Tetradecane
n-Pentadecane
n-Hexadecane
Methylcyclopentane
1,4-Dimethylcyclohexane
2,2,4,6,6-Pentamethylheptane

Terpenes
delta-3-Caren
alpha-Pinene
beta-Pinene
Limonene
Longifolene
beta-Caryophyllene
alpha-Phellandrene
Myrcene
Camphene
alpha-Terpinene
Longipinene

Aliphatic alcohols and ether
1-Propanol[1]
2-Propanol[1]
1-Butanol
1-Pentanol
1-Hexanol
tert-Butanol
Cyclohexanol
2-Ethyl-1-hexanol
2-Methyl-1-propanol
1-Octanol
4-Hydroxy-4-methyl-2-pentanone
1-Heptanol
1-Nonanol
1-Decanol
1,4-Cyclohexandimethanol
Ethanol[1]

Aromatic alcohols (phenoles)
Phenol
BHT (2,6-Di-tert-butyl-4-methylphenol)
Benzyl alcohol
Cresols

Glycols, Glycol ether, Glycol ester
Propylenglycol (1,2-Dihydroxypropane)
Ethyleneglycol (Ethandiol)
Ethylene glycol monobutyl ether
Diethylene glycol
Diethylene glycol-monobutyl ether
2-Phenoxyethanol
Ethylene carbonate
1-Methoxy-2-propanol
2-Methoxy-1-propanol
2-Methoxy-1-propyl acetate
Texanol
Glycolic acid butylester
Butyl diglycol acetate
Dipropylene glycol monomethyl ether
2-Methoxyethanol
2-Ethoxyethanol
2-Propoxyethanol
2-Methylethoxyethanol
2-Hexoxyethanol
1,2-Dimethoxyethane
1,2-Diethoxyethane
2-Methoxyethyl acetate
2-Ethoxyethyl acetate
2-(2-Hexoxyethoxy)ethanol
1-Methoxy-2-(2-methoxy-ethoxy)ethane
Propylene glycol diacetate
Dipropylene glycol
Dipropylene glycol monomethylether acetate
Dipropylene glycol n- butylether
Dipropylene glycol n-propyl ether
Di(propylene glycol) tert-butylether
1,4-Butanediol
Tri(propylene glycol) methyl ether
Triethylene glycol dimethyl ether
Propylene glycol dimethyl ether
TXIB (Texanol isobutyrate)
Ethyldiglycol
Dipropylene glycol dimentylether
Propylene carbonate
Hexyleneglycol
3-Methoxy-1-butanol
Propylene glycol n-propyl ether
Propylene glycol n-butyl ether
Diethylene glycol phenyl ether
Neopentyl glycol
Diethylene glycol methyl ether
1-Ethoxy-2-propanol
tert-Butoxy-2-propanol
2-Butoxy ethyl acetate

Aldehydes
Butanal[1,3]
3-Methyl-1-butanal
Pentanal
Hexanal
Heptanal
2-Ethylhexanal
Octanal
Nonanal
Decanal
2-Butenal[3]
2-Pentenal[3]
2-Hexenal
2-Heptenal
2-Octenal
2-Nonenal
2-Decenal
2-Undecenal
Furfural
Ethanedial (Glyoxal)[1,3]
Glutaraldehyde
Benzaldehyde
Acetaldehyde[1,3]
Formaldehyde[1,3]
Propanal[1,3]
Propenal[1,3]
Isobutenal[3]

Ketones
Ethylmethylketone[3]
3-Methyl-2-butanone
Methylisobutylketone
Cyclopentanone
Cyclohexanone
Acetone[1,3]
2-Methylcyclopentanone
2-Methylcyclohexanone
Acetophenone
1-Hydroxyacetone
2-Heptanon

Acids
Acetic acid
Propionic acid
Isobutyric acid
Butyric acid
Pivalic acid
Valeric acid
Caproic acid
Heptanoic acid
Octanoic acid
2-Ethylhexanoic acid

Esters and Lactones
Methylacetate[1]
Ethyl acetate[1]
Vinyl acetate[1]
Isopropyl acetate
Propyl acetate
2-Methoxy-1-methylethyl acetate
2-Methoxy-1-propylacetate
n-Butyl formate
Methylmethacrylate
Isobutylacetate
1-Butyl acetate
2-Ethylhexyl acetate
Methyl acrylate
Ethyl acrylate
n-Butyl acrylate
2-Ethylhexyl acrylate
Adipic acid dimethylester
Fumaric acid dibutylester
Succinic acid dimethylester
Glutaric acid dimethylester
Hexandioldiacrylate
Maleic acid dibutylester
Butyrolactone
Glutaric acid diisobutylester
Succinic acid diisobutylester
Dimethylphthalate
Diethylphthalate[2]
Dipropylphthalate[2]
Dibutylphthalate[2]
Diisobutylphthalate[2]
Texanol
Dipropyleneglycoldiacrylate

Chlorinated hydrocarbons
Tetrachlorethene
1,1,1-Trichlorethane
Trichlorethene
1,4-Dichlorbenzene
2-chloro-propane

Others
1,4-Dioxane
Caprolactam
N-Methyl-2-pyrrolidone
Octamethylcyclotetrasiloxane
Hexamethylcyclotrisiloxane
Methenamine
2-Butanonoxime
Triethyl phosphate
Tributyl phosphate
5-Chlor-2-methyl-4-isothiazolin-3-one (CIT)
2-Methyl-4-isothiazolin-3-one (MIT)
2-n-Octyl-4-isothiazolin-3-one (OIT)
Triethylamine
Decamethylcyclopentasiloxane
Dodecamethylcyclohexasiloxane
Tetradecamethylcycoheptasiloxane
Tetrahydrofuran (THF)
1-Octene
1-Decene
1-Dodecene
2-Pentylfurane
2-Methylfurane
Isophorone
Tetramethyl succinonitrile
Dimethylformamide (DMF)
Tributyl phosphate
N-Ethyl-2-pyrrolidone
Aniline
4-Vinylcyclohexene
Dichlormethane
Carbon tetrachloride
Chlorobenzene
Chloroform
Chloroprene (monomer)
Acetamide
Formamide
1,3-Dichlor-2-propanol
Cyclohexylisocyanate
Butyl methacrylate
2-Hexanone
Azobis[isobutyronitrile]
Benzophenone
1-Buthyl-2-pyrrolidone
Acroleine
Furfuryl alcohol
Decahydronaphthalene

1 VVOC
2 SVOC
3 Analyse gem. DIN ISO 16000 3:2013-01

Definition of terms

VOC (volatile organic compounds)	All individual compounds with a concentration ≥ 1 µg/m³ in the retention range C_6 (n-Hexane) to C_{16} (n-Hexadecane)
TVOC	Total volatile organic compounds
TVOC according to DIN EN 16516:2018-01	Sum of all VOC ≥ 5 µg/m³ in the retention range C_6 to C_{16}, calculated as toluene equivalent
TVOC according to AgBB/DIBt	Sum of all identified and calibrated VOC ≥ 5 µg/m³, SVOC ≥ 5 µg/m³ with LCI and not calibrated VOC ≥ 5 µg/m³ calculated as toluene equivalent
TVOC according to eco-INSTITUT-Label	Sum of all identified and calibrated VOC ≥ 1 µg/m³, SVOC ≥ 5 µg/m³ with LCI and not calibrated VOC ≥ 1 µg/m³ calculated as toluene equivalent
TVOC according to ISO 16000-6:2012-11	Total area of chromatogram in the retention range C_6 to C_{16}, calculated as toluene equivalent
TVOC without LCI according to AgBB/DIBt and Belgian regulation	Sum of all VOC without NIK ≥ 5 µg/m³ in the retention range C_6 to C_{16}
TVOC without LCI according to eco-INSTITUT-Label	Sum of all VOC without NIK ≥ 1 µg/m³ in the retention range C_6 to C_{16}
CMR-VOC (carcinogenic, mutagenic, reproduction-toxic VOC, VVOC and SVOC)	All individual substances with the following categories: Regulation (EC) No. 1272/2008: Category Car.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 lists): Category III1and III2
VVOC (very volatile organic compounds)	All individual substances with a concentration ≥ 1 µg/m³ in the retention range < C_6
TVVOC	Total very volatile organic compounds
TVVOC according to AgBB/DIBt and Belgian regulation	Sum of all identified and calibrated VVOC ≥ 5 µg/m³ with LCI
TVVOC according to eco-INSTITUT-Label	Sum of all identified and calibrated VVOC ≥ 1 µg/m³ with LCI
SVOC (semi volatile organic compounds)	All individual substances ≥ 1 µg/m³ in the retention range C_{16} to C_{22}
TSVOC	Total semi volatile organic compounds
TSVOC according to DIN EN 16516:2018-01	Sum of all SVOC in the retention range C_{16} to C_{22}, calculated as toluene equivalent
TSVOC without LCI according to AgBB/DIBt	Sum of all SVOC ≥ 5 µg/m³ without LCI
TSVOC without LCI according to eco-INSTITUT-Label	Sum of all SVOC ≥ 1 µg/m³ without LCI
TSVOC with LCI according to AgBB/DIBt	Sum of all identified and calibrated SVOC ≥ 5 µg/m³ with LCI
SER	Specific emission rate (see "Explanation of Specific Emission Rate SER")
LCI value	Lowest Concentration of Interest; calculated value for the evaluation of VOC, established by the Committee for Health-related Evaluation of Building Products (Ausschuss zur gesundheitlichen Bewertung von Bauprodukten - AgBB)

R value	The quotient of the concentration and the LCI value is generated for every substance which is detected in the test chamber air. The sum of the calculated quotients results in the R value.
R value according to eco-INSTITUT-Label	R value for all identified and calibrated VOC ≥ 1 µg/m³ with LCI, established by the AgBB in 2018
R value according to AgBB 2018/DIBt	R value for all identified and calibrated VOC ≥ 5 µg/m³ with LCI, established by the AgBB in 2018
R value according to Belgian regulation	R value for all identified and calibrated VOC ≥ 5 µg/m³ with LCI, established by the Belgian regulation
R value according to AFSSET	R value for all identified and calibrated VOC ≥ 5 µg/m³ with LCI, established by ANSES (French National Agency on Food Safety, Environment, and Workplace Security)
RT (retention time)	Time for a particular analyte to pass through the system (from the column inlet to the detector)
CAS No. (Chemical Abstracts Service)	International unique numerical identifier for a chemical substance
Toluene equivalent	Concentration, calculated as toluene equivalent

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. Standardized 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 with an air flow rate of 100 mL/min for Tenax and approx. 100 L with an air flow rate of 0.8 L/min for DNPH (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 derivatized with DNPH for the determination of formaldehyde and other short-chain carbonyl compounds (C1 - C6) are analysed using high-performance liquid chromatography.

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 from 1µg/m³.

All other substances – insofar as is 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 signa of the standard d8 toluene. The identification and quantification of substances is carried out, as far as technically feasible, from a concentration (evaluation limit) of 5 µg/m3 test chamber air.

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 16516:2018-01. 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 41.7 %. 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 µg/(m·h)
surface-specific	SER_a	in µg/(m^2·h)
volume-specific	SER_v	in µg/(m^3·h)
unit specific	SER_u	in µg/(u·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.

$$SER = q \cdot c$$

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.