

Ind. & Handelsmij Rivièra B.V.
Nijverheidsweg 16
1271 EA HUIZEN
Niederlande

Test Report No. 55965-001-QUL-L

| Test objective: | Evaluation according to QUL criteria |
|-------------------------------------|---|
| Name of test sample/item by client: | 92-13 MED. |
| Sample/batch by client: | 204933 |
| Sampled by: | Ohr. Y. B. Lafourcade |
| Date of sampling: | 14.12.2020 |
| Location of sampling: | Huizen |
| Date of production: | 03.12.2020 |
| Date of arrival of sample: | 21.12.2020 |
| Test period: | 21.12.2020 - 11.02.2021 |
| Date of report: | 11.02.2021 |
| Number of pages of report: | 26 |
| Testing laboratory: | eco-INSTITUT Germany GmbH, Köln except ‡ subcontracted # outside accreditation |
| Test objective fulfilled: | ✓ |
| 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 |

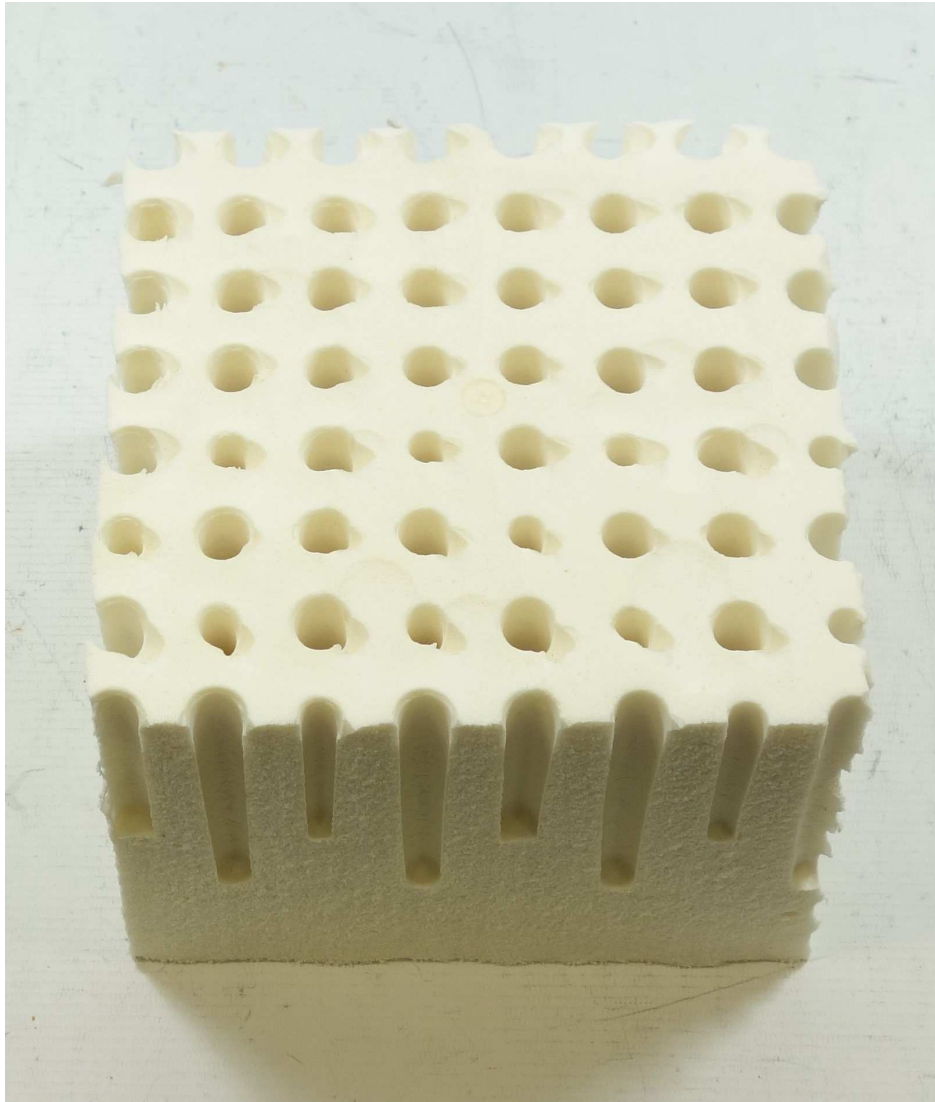


Content

| | |
|---|----|
| Sample View..... | 3 |
| Statement of conformity with QUL criteria | 4 |
| Laboratory report..... | 7 |
| 1 Emission analysis..... | 7 |
| 1.1 Sample A001, Volatile Organic Compounds after 2 days..... | 8 |
| 1.2 Sample A001, Volatile Organic Compounds after 7 days..... | 12 |
| 1.3 Carbon disulfide (CS ₂ , test chamber)..... | 15 |
| 1.4 Nitrosamines (test chamber) [†] #..... | 16 |
| 2 Odour test following VDA recommendation 270:2018-06..... | 17 |
| 3 Ash content [#] | 18 |
| 4 Polymer content [#] | 19 |
| Appendix..... | 20 |
| Sampling sheet..... | 20 |
| List of calibrated Volatile Organic Compounds (VOC)..... | 21 |
| Definition of terms..... | 23 |
| Commentary on emission analysis..... | 25 |
| Explanation of Specific Emission Rate SER..... | 26 |

Sample View

| Internal sample number (assigned by the laboratory) | Test sample/item by client | Sample/batch by client | Condition upon delivery | Type of sample |
|---|----------------------------|------------------------|-------------------------|----------------|
| 55965-A001 | 92-13 MED. | 204933 | without objection | Latex |



55965-A001



Statement of conformity with QUL criteria

The sample with the internal sample no. 55965-A001 was submitted to laboratory tests on behalf of **Ind. & Handelsmij Rivièra B.V.** for an ecological product examination according to the QUL test criteria (Qualitätsverband umweltverträglicher Latexmatratzen e.V.). The article description according to the customer is **92-13 MED**.
 The results documented in the test report were evaluated as follows.¹

| P11 Complete mattress | | | |
|--|-----------------------|-------------------------|------------------------|
| Test parameters | Result | Limit Value | Within limits [yes/no] |
| Emission analysis | | | |
| Measurement time: 2 days after test chamber loading | | | |
| TVOC (total volatile organic compounds including SVOC with LCI) | 77 µg/m ³ | ≤ 400 µg/m ³ | yes |
| 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 µg/m ³ | ≤ 1 µg/m ³ | yes |
| Formaldehyde | 5 µg/m ³ | ≤ 24 µg/m ³ | yes |
| Acetaldehyde | 2 µg/m ³ | ≤ 24 µg/m ³ | yes |
| Measurement time: 7 days after test chamber loading | | | |
| 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 µg/m ³ | ≤ 1 µg/m ³ | yes |
| CMR 2: CMR: 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) | 4 µg/m ³ | ≤ 50 µg/m ³ | yes |
| TVOC (total volatile organic compounds including SVOC with LCI) | 42 µg/m ³ | ≤ 200 µg/m ³ | yes |

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 positive 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/).



| Test parameters | Result | Limit Value | Within limits [yes/no] |
|---|-----------------------|-------------------------|------------------------|
| Emission analysis | | | |
| TSVOC (total semi-volatile organic compounds) | < 1 µg/m ³ | ≤ 40 µg/m ³ | yes |
| VOC (Sum) without LCI | 15 µg/m ³ | ≤ 100 µg/m ³ | yes |
| Sensitising compounds with the following categorisations: DFG (MAK list): Category IV, German Federal Institute for Risk Assessment lists: Cat A, TRGS 907 (Sum) | 4 µg/m ³ | ≤ 100 µg/m ³ | yes |
| Bicyclic terpenes (Sum) | < 1 µg/m ³ | ≤ 200 µg/m ³ | yes |
| C9 - C14 Alkanes / Isoalkanes (Sum) | 7 µg/m ³ | ≤ 200 µg/m ³ | yes |
| C4 - C11 Aldehydes, acyclic, aliphatic (Sum) | < 2 µg/m ³ | ≤ 100 µg/m ³ | yes |
| C6 - C15 Alkyl benzenes (Sum) | < 1 µg/m ³ | ≤ 100 µg/m ³ | yes |
| Cresols (Sum) | < 1 µg/m ³ | ≤ 5 µg/m ³ | yes |
| Xylene (Sum) | < 1 µg/m ³ | ≤ 100 µg/m ³ | yes |
| VOC (individual substances): | | | |
| Styrene | < 1 µg/m ³ | ≤ 10 µg/m ³ | yes |
| Phenole | < 1 µg/m ³ | ≤ 20 µg/m ³ | yes |
| Methylisothiazolinone (MIT) | < 1 µg/m ³ | ≤ 1 µg/m ³ | yes |
| Benzaldehyde | < 1 µg/m ³ | ≤ 20 µg/m ³ | yes |
| 2-Ethyl-1-hexanol | < 1 µg/m ³ | ≤ 100 µg/m ³ | yes |
| Ethylen glycol monobutylether | < 1 µg/m ³ | ≤ 100 µg/m ³ | yes |
| 2-Hexoxyethanol | < 1 µg/m ³ | ≤ 100 µg/m ³ | yes |
| Methylisobutylketone | < 1 µg/m ³ | ≤ 100 µg/m ³ | yes |
| 2-Butoxyethylacetate | < 1 µg/m ³ | ≤ 200 µg/m ³ | yes |
| 2-Phenoxyethanol | < 1 µg/m ³ | ≤ 30 µg/m ³ | yes |
| Propylene glycol (Propane-1,2-diol) | < 1 µg/m ³ | ≤ 60 µg/m ³ | yes |
| R-Value | 0.07 | ≤ 1.0 | yes |



| Test parameter | Sample | Result | Limit value | Within limits [yes/no] |
|--|------------|-------------------------|--|---------------------------|
| Further emission and content analyses | | | | |
| Disulphide (only latex products) | 55965-A001 | 6 µg/m ³ | ≤ 50 µg/m ³ | yes |
| Nitrosamines (only latex products) | 55965-A001 | 0.082 µg/m ³ | ≤ 0.1 µg/m ³ | yes |
| Odour | 55965-A001 | Grade 2.5 | ≤ Grade 3 (24 hours after loading of desiccator) | yes |
| Filler content | 55965-A001 | 2.1 % | ≤ 5 % | yes |
| Polymer content (NR: natural rubber) | 55965-A001 | 100 % NR | ≥ 95 % | yes |

Cologne, 11.02.2021

A handwritten signature in black ink, appearing to read 'V. Laumann', is positioned above the printed name.

Vanessa Laumann, Dipl.-Chem.
(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: 11.01.2021
Sample preparation: not applicable
Masking of backside: no
Masking of edges: no
Relationship of unmasked edges to surface: not applicable
Loading: related to area
Dimensions: 18.4 cm x 18.4 cm x 13 cm

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

Chamber volume: 0.250 m³
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: 0.650 m³/m³
Specific air flow rate: 0.769 m³/(m² · h)
Air sampling: 2 days after test chamber loading
7 days after test chamber loading

Analytcs

Aldehydes and Ketones | DIN ISO 16000-3:2013-01
Limit of determination: 2 µg/m³
Volatile Organic Compounds | DIN ISO 16000-6:2012-11
Limit of determination: 1 µg/m³ (1,4-Cyclohexanedimethanol, Diethylene glycol,
1,4-Butanediol: 5 µg/m³)
Note for analysis: not specified



1.1 Sample A001, Volatile Organic Compounds after 2 days

Test objective:

Volatile Organic Compounds (VOC), test chamber, air sampling 2 days after test chamber loading

Test result:

Internal sample number: | 55965-A001

| 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 AgBB 2018 [µg/m³] | R-value |
|----------|---|-----------|-------------|--|--|------------------------------|-----------------------------|---------|
| 1 | Aromatic hydrocarbons | | | | | | | |
| 1-11 | 1.2.4-Trimethylbenzene | 95-63-6 | 13.2 | 1 | | | 450 | 0.00 |
| 1-17 | 1.2.4.5-Tetramethyl benzene | 95-93-2 | 15.95 | 1 | | | 250 | 0.00 |
| 2 | Aliphatic hydrocarbons (n-, iso- and cyclo-) | | | | | | | |
| 2-10.2 | n-Decane | 124-18-5 | 13 | 2 | | | 6000 | 0.00 |
| 2-10.3 | n-Undecane | 1120-21-4 | 15.14 | 2 | | | 6000 | 0.00 |
| 2-10.4 | n-Dodecane | 112-40-3 | 17.19 | 1 | | | 6000 | 0.00 |
| 3 | Terpenes | | | | | | | |
| 3-4 | Limonene | 138-86-3 | 13.97 | 2 | | | 5000 | 0.00 |
| 5 | Aromatic alcohols | | | | | | | |
| 5-2 | BHT (2,6-di-tert-butyl-4-methylphenol) | 128-37-0 | 23.87 | 5 | | Group 3 | 100 | 0.05 |
| 7 | Aldehydes | | | | | | | |
| 7-7 | Nonanal | 124-19-6 | 15.29 | 1 | | | 900 | 0.00 |
| 7-20 | Acetaldehyde | 75-07-0 | | 2 | | Carc. 2 | 1200 | 0.00 |
| 7-22 | Formaldehyde | 50-00-0 | | 5 | | Carc. 1B Muta. 2 | 100 | 0.05 |
| 9 | Acids | | | | | | | |
| 9-1 | Acetic acid | 64-19-7 | 4.77 | 20 | 6 | | 1200 | 0.02 |

| No. | Substance | CAS No. | RT [min] | Concentration+ | Toluene-equivalent | CMR Classification++ | LCI AgBB 2018 [µg/m³] | R-value |
|------|--|---------|---------------|------------------------------------|------------------------------------|-------------------------|-----------------------------|---------|
| | | | | Substances ≥ 1 µg/m³ [µg/m³] | Substances ≥ 5 µg/m³ [µg/m³] | | | |
| 13 | Other identified substances in addition to LCI list | | | | | | | |
| | Benzothiazole | 95-16-9 | 18.64 | 6 | | | | |
| | Aniline | 62-53-3 | 12.8 | 1 | | Carc. 2 Muta. 2 | | |
| | Diethylamine m/z 58* | | 4.87 | 2 | | | | |
| | Diethylmethylamine m/z 72 44* | | 5.26 | 3 | | | | |
| | Diethylformamide m/z 58 101 44* | | 11.59 | 3 | | | | |
| | gamma-Terpinene m/z 93* | | 14.53 | 2 | | | | |
| | tert.-Butyltoluol m/z 133 105 148* | | 15.3 | 4 | | | | |
| | m/z 44 117 56? | | 16.8 | 2 | | | | |
| | m/z 57* | | 18.82 | 3 | | | | |
| 2-10 | Cluster isoalkanes, alkenes and/or other alcohols* | -- | 20.2- 21.1 | 16 | 16 | | 6000 | 0.00 |
| | Sesquiterpene m/z 119 105 161* | | 21.98 | 2 | | | | |

+ 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: Kategorie 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 2 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 | < 0.77 |
| C 1: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EG) Nr. 1272/2008: Category Carc. 1A u. 1B (Sum) | < 1 | < 0.77 |

| TVOC, Total volatile organic compounds | Concentration after 2 days [µg/m³] | SERa [µg/(m² · h)] |
|---|---|---------------------------|
| Sum of VOC according to DIN EN 16516 | 22 | 17 |
| Sum of VOC according to AgBB 2018 / DIBt | 41 | 32 |
| Sum of VOC according to eco-INSTITUT-Label | 77 | 59 |
| Sum of VOC according to ISO 16000-6 | 100 | 77 |

| TSVOC, Total semi volatile organic compounds | Concentration after 2 days [µg/m³] | SERa [µg/(m² · h)] |
|---|---|---------------------------|
| Sum of SVOC according to DIN EN 16516 | < 5 | < 3.85 |
| Sum of SVOC without LCI according to AgBB 2018 / DIBt | < 5 | < 3.85 |
| Sum of SVOC without LCI according to eco-INSTITUT-Label | < 1 | < 0.77 |
| Sum of SVOC with LCI according to AgBB 2018 / DIBt | < 5 | < 3.85 |

| TVVOC, Total very volatile organic compounds | Concentration after 2 days [µg/m³] | SERa [µg/(m² · h)] |
|--|---|---------------------------|
| Sum of VVOC according to AgBB 2018 / DIBt and Belgian regulation | 5 | 3.9 |
| Sum of VVOC according to eco-INSTITUT-Label | 7 | 5.4 |

*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 2 days [µg/m³] | SERa [µg/(m² · h)] |
|--|------------------------------------|--------------------|
| VOC without LCI according to AgBB/DIBt and Belgian regulation (Sum) | 6 | 4.6 |
| VOC without LCI according to eco-INSTITUT-Label (Sum) | 26 | 20 |
| 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) | 8 | 6.2 |
| Sensitising compounds with the following categorisations: DFG (MAK list): Category IV, German Federal Institute for Risk Assessment lists: Cat A, TRGS 907 (Sum) | 8 | 6.2 |
| Bicyclic Terpenes (Sum) | < 1 | < 0.77 |
| C9 - C14: Alkanes / Isoalkanes as dekane-equivalent (Sum) | 13 | 10 |
| C4 - C11 Aldehydes, acyclic, aliphatic (Sum) | 1 | 0.77 |
| C9 - C15 Alkylated benzenes (Sum) | 2 | 1.5 |
| Kresoles (Sum) | < 1 | < 0.77 |

| Risk value for assessment of LCI | R-value |
|---|---------|
| R-value according to eco-INSTITUT-Label | 0.13 |
| R-value according to AgBB 2018 / DIBt | 0.12 |
| R-value according to Belgian regulation | 0.12 |
| R-value according to AFSSET | 0.63 |

Anmerkung:

Aufgrund unterschiedlicher Vorgaben in den jeweiligen Richtlinien kommt es zu divergierenden Werten bei der Berechnung des TVOC, TVVOC, TSVOC und R-Wertes.

Kurzkettige Carbonylverbindungen (C1-C5) werden gemäß DIN ISO 16000-3:2013-01 über HPLC quantifiziert. Bei VVOC erfolgt daher keine Angabe des Toluoläquivalents, diese Substanzen werden mit ihrer substanzspezifischen Kalibrierung in der Summe VVOC gem. DIN EN 16516:2018-01 berücksichtigt. Bei VOC erfolgt die substanzspezifische Kalibrierung über HPLC, zur Summenbildung TVOC gemäß DIN EN 16516:2018-01 wird jedoch das Toluoläquivalent über Tenax bestimmt.

1.2 Sample A001, Volatile Organic Compounds after 7 days

Test objective:

Volatile Organic Compounds (VOC), test chamber, air sampling 7 days after test chamber loading

Test result:

Internal sample number: | 55965-A001

| No. | Substance | CAS No. | RT [min] | Concentration+ | Toluene-equivalent | CMR Classifi- cation++ | LCI | R-value |
|--------|--|-----------|---------------|------------------------------------|------------------------------------|------------------------------|----------------------|---------|
| | | | | Substances ≥ 1 µg/m³ [µg/m³] | Substances ≥ 5 µg/m³ [µg/m³] | | AgBB 2018 [µg/m³] | |
| 2 | Aliphatic hydrocarbons (n-, iso- and cyclo-) | | | | | | | |
| 2-10.3 | n-Undecane | 1120-21-4 | 15.47 | 1 | | | 6000 | 0.00 |
| 5 | Aromatic alcohols | | | | | | | |
| 5-2 | BHT (2,6-di-tert-butyl-4-methylphenol) | 128-37-0 | 24.2 | 3 | | Group 3 | 100 | 0.03 |
| 7 | Aldehydes | | | | | | | |
| 7-22 | Formaldehyde | 50-00-0 | | 3 | | Carc. 1B Muta. 2 | 100 | 0.03 |
| 9 | Acids | | | | | | | |
| 9-1 | Acetic acid | 64-19-7 | 4.97 | 8 | | | 1200 | 0.01 |
| 13 | Other identified substances in addition to LCI list | | | | | | | |
| | Benzothiazole | 95-16-9 | 19.13 | 8 | | | | |
| | Aniline | 62-53-3 | 13.08 | 1 | | Carc. 2 Muta. 2 | | |
| | Diethylamine m/z 58* | | 5.02 | 5 | 5 | | | |
| | Diethylformamide m/z 58 101 44* | | 11.92 | 2 | | | | |
| | tert.-Butyltoluol m/z 133 105 148* | | 15.64 | 2 | | | | |
| 2-10 | Cluster isoalkanes, alkenes and/or other alcohols* | -- | 20.6- 21.4 | 15 | 15 | | 6000 | 0.00 |
| | Sesquiterpene m/z 119 105 161* | | 22.37 | 2 | | | | |

+ 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: Kategorie 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 7 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 | < 0.77 |
| C 1: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EG) Nr. 1272/2008: Category Carc. 1A u. 1B (Sum) | < 1 | < 0.77 |

| TVOC, Total volatile organic compounds | Concentration after 7 days [µg/m³] | SERa [µg/(m² · h)] |
|---|---|-------------------------------|
| Sum of VOC according to DIN EN 16516 | 15 | 12 |
| Sum of VOC according to AgBB 2018 / DIBt | 23 | 18 |
| Sum of VOC according to eco-INSTITUT-Label | 42 | 32 |
| Sum of VOC according to ISO 16000-6 | 60 | 46 |

| TSVOC, Total semi volatile organic compounds | Concentration after 7 days [µg/m³] | SERa [µg/(m² · h)] |
|---|---|-------------------------------|
| Sum of SVOC according to DIN EN 16516 | < 5 | < 3.85 |
| Sum of SVOC without LCI according to AgBB 2018 / DIBt | < 5 | < 3.85 |
| Sum of SVOC without LCI according to eco-INSTITUT-Label | < 1 | < 0.77 |
| Sum of SVOC with LCI according to AgBB 2018 / DIBt | < 5 | < 3.85 |

| TVVOC, Total very volatile organic compounds | Concentration after 7 days [µg/m³] | SERa [µg/(m² · h)] |
|--|---|-------------------------------|
| Sum of VVOC according to AgBB 2018 / DIBt and Belgian regulation | < 5 | < 3.85 |
| Sum of VVOC according to eco-INSTITUT-Label | 3 | 2.3 |

*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 7 days [µg/m³] | SERa [µg/(m² · h)] |
|--|------------------------------------|--------------------|
| VOC without LCI according to AgBB/DIBt and Belgian regulation (Sum) | 8 | 6.2 |
| VOC without LCI according to eco-INSTITUT-Label (Sum) | 15 | 12 |
| 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) | 4 | 3.1 |
| Sensitising compounds with the following categorisations: DFG (MAK list): Category IV, German Federal Institute for Risk Assessment lists: Cat A, TRGS 907 (Sum) | 4 | 3.1 |
| Bicyclic Terpenes (Sum) | < 1 | < 0.77 |
| C9 - C14: Alkanes / Isoalkanes as dekane-equivalent (Sum) | 7 | 5.4 |
| C4 - C11 Aldehydes, acyclic, aliphatic (Sum) | < 2 | < 1.54 |
| C9 - C15 Alkylated benzenes (Sum) | < 1 | < 0.77 |
| Cresols (Sum) | < 1 | < 0.77 |

| Risk value for assessment of LCI | R-value |
|---|---------|
| R-value according to eco-INSTITUT-Label | 0.07 |
| R-value according to AgBB 2018 / DIBt | 0.01 |
| R-value according to Belgian regulation | 0.01 |
| R-value according to AFSSET | 0.03 |

Anmerkung:

Aufgrund unterschiedlicher Vorgaben in den jeweiligen Richtlinien kommt es zu divergierenden Werten bei der Berechnung des TVOC, TVVOC, TSVOC und R-Wertes.

Kurzkettige Carbonylverbindungen (C1-C5) werden gemäß DIN ISO 16000-3:2013-01 über HPLC quantifiziert. Bei VVOC erfolgt daher keine Angabe des Toluoläquivalents, diese Substanzen werden mit ihrer substanzspezifischen Kalibrierung in der Summe VVOC gem. DIN EN 16516:2018-01 berücksichtigt. Bei VOC erfolgt die substanzspezifische Kalibrierung über HPLC, zur Summenbildung TVOC gemäß DIN EN 16516:2018-01 wird jedoch das Toluoläquivalent über Tenax bestimmt.

1.3 Carbon disulfide (CS₂, test chamber)

Test parameter:

Carbon disulfide (CS₂)

Test method:

Analytics: | DIN ISO 16000-6:2012-11
Limit of determination: | 1 µg/m³

Test result:

Internal sample number: | 55965-A001

| Parameter | Measurement time [days] | Concentration (test chamber) [µg/m ³] |
|----------------------------------|----------------------------|---|
| Carbon disulfide CS ₂ | 2 | 6 |



1.4 Nitrosamines (test chamber)^{†#}

Test parameter:

Nitrosamines

Test method:

Analytcs: | DGUV Information 213-523
 (formerly BGI/GUV-I 505-23 respectively ZH1/120.23)
 Determination of Nitrosamines

Test result:

| Internal sample number | Measurement time [days] | Parameter | Limit of determination [ng/m ³] | Concentration (Test chamber) [ng/m ³] |
|------------------------|-------------------------|-----------------------------------|---|---|
| 55965-A001 | 2 | N-Nitrosodimethylamine (NDMA) | 20 | < q.l. |
| | | N-Nitrosomethylethylamine (NMEA) | 20 | < q.l. |
| | | N-Nitrosodiethylamine (NDEA) | 20 | 82 |
| | | N-Nitrosodiisopropylamine (NDIPA) | 20 | < q.l. |
| | | N-Nitrosodiisobutylamin (NDIBA) | 20 | < q.l. |
| | | N-Nitrosodipropylamine (NDPA) | 20 | < q.l. |
| | | N-Nitrosodibutylamine (NDBA) | 20 | < q.l. |
| | | N-Nitrosopyrrolidine (NPYR) | 20 | < q.l. |
| | | N-Nitrosopiperidine (NPIP) | 20 | < q.l. |
| | | N-Nitrosomorpholine (NMOR) | 20 | < q.l. |

< q.l. = Value below quantification limit

Remark: Concentrations below the limit of determination are between quantification limit and limit of determination and provide only qualitative evidence.

2 Odour test following VDA recommendation 270:2018-06

Test parameter:

Odour

Test method:

| | |
|---------------|--|
| Analytically: | VDA-recommendation 270:2018-06 |
| Rating: | 1 not perceptible 2 perceptible, not bothering 3 clearly perceptible, not bothering 4 bothering 5 strongly bothering 6 unbearable |

A001

| | |
|------------------------------|--------------------------------------|
| Desiccator volume: | 3 L |
| Temperature: | 40°C |
| Relative humidity: | 50% |
| Sampling time: | 24 hours after loading of desiccator |
| Loading: | 4.33 m ² /m ³ |
| Sample size: | not applicable |
| Absolute application amount: | not applicable |
| Masking of edges: | no |
| Masking of backside: | no |
| Sample volume: | 150 cm ³ |
| Sample dimensions: | 5 cm x 5 cm x 6 cm |

Test result:

| Internal sample number | Intensity of odour [Grade] |
|------------------------|----------------------------|
| 55965-A001 | 2.5 |



3 Ash content[#]

Test parameter:

Ash content, filler content

Test method:

Analytics: | Thermogravimetry at 900 °C

Test result:

Internal sample number: | 55965-A001

| Duplicate Determination | Applied sample amount | Mass aluminium shell | Mass aluminium shell + sample after heating | Mass ash | Ash content | Filler content |
|-------------------------|-----------------------|----------------------|---|----------|-------------|----------------|
| | [g] | [g] | [g] | [g] | [%] | [%] |
| Determination 1 | 1.6255 | 39.5037 | 39.6197 | 0.1160 | 7.1 | 2.1 |
| Determination 2 | 1.7985 | 40.8389 | 40.9676 | 0.1287 | 7.2 | 2.2 |

| Parameter | Content [M%] |
|--|--------------|
| Ash content (incl. zinc oxide), with reference to the sample | 7.1 |
| Filler content, with reference to the sample ¹⁾ | 2.1 |

¹⁾ The amount of filler is calculated as difference between the amount of ash and zinc oxide, assuming that the maximum of zinc oxide is 5 % of the total latex foam.

4 Polymer content[#]

Test parameter:

Relation between natural rubber (NR) and synthetic rubber (SBR)

Test method:

Analytics: | IR/ATR

Test result:

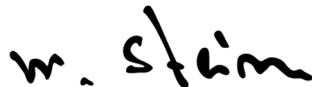
| Internal sample number | Polymer content | [weight/%] |
|------------------------|---|------------|
| 55965-A001 | NR, with reference to the polymer content ^{1) 2) 3)} | 100 |
| | SBR, with reference to the polymer content | 0 |

¹⁾ The averaged relative expanded measurement uncertainty (k=2) for the content of NR is estimated to 34 %.

²⁾ If NR-content is below 5 %, the result will be 100 % SBR. Usually there will be no use of NR below 5 % in a mixture of NR and SBR.

³⁾ The content of NR is based on the assumption that polyisoprene in latex mattresses is always of natural origin.

Cologne, 11.02.2021



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



Appendix

Sampling sheet



Probenahmebegleitblatt

Bitte möglichst alle Felder ausfüllen. Sind die mit einem * gekennzeichneten bzw. rot umrandeten Felder nicht ausgefüllt, können die Prüfstücke nicht zur Laborprüfung angenommen werden.
 Bitte pro Probe ein Probenahmebegleitblatt ausfüllen! Die Probenahmeanleitung ist unbedingt einzuhalten!

55965-001

| | | | |
|--|--|---|--|
| Auftraggeber * Ind. & Handelsmij. Riviera B.V. Nijverheidsweg 16 1271 EA HUIZEN (NH) Telefoon 035 - 5250024 | | Prüflabor eco-INSTITUT Germany GmbH Schanzenstr. 6-20, D-51063 Köln Tel. +49 (0)221 - 931245-0 Fax +49 (0)221 - 931245-33 | |
| Name des Herstellers Name des Händlers (wenn abweichend vom Auftraggeber) | | Probenehmer * (Name, Firma, Telefon) OHR U. B. Lafourcade | |
| | | Probenahmeort * Huizen | |
| Prüfstück-/Artikelbezeichnung * Q2-13 MED. | | Probentyp (z.B. Holzwerkstoff, Bodenbelag) | |
| Artikel-Nr. | | Proben-/Chargen-Nr. * 204933 | |
| Modell / Programm / Serie | | Produktionsdatum der Charge * (dd/mm/yyyy) 03.12.2020 | |
| Wo wurde die Probe vor Probenahme gelagert? <input type="checkbox"/> Fertigung <input type="checkbox"/> Lager <input type="checkbox"/> Sonstiges | | Datum der Probenahme * (dd/mm/yyyy) 14.12.2020 | |
| Lagerort: | | Wie wurde das Produkt vor Probenahme gelagert? <input type="checkbox"/> offen <input type="checkbox"/> verpackt | |
| Verpackungsmaterial: | | | |
| Besonderheiten zur Probenahme (Unklarheiten, Fragen, mögliche negative Einflüsse durch Emissionen am Probenahmeort (z.B. Kontaminationen während der Produktion/Lagerung)) | | | |
| Bestätigung * Hiermit bestätigt der Unterzeichner die Richtigkeit der oben gemachten Angaben. | | | |
| Datum (dd/mm/yyyy): 14.12.2020 | | Unterschrift/Stempel:  | |

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
Phenyltoluene
1-Phenyldecane²
1-Phenylundecane²
4-Phenylcyclohexene
Styrene
β-Methylstyrene
Phenylacetylene
2-Phenylpropene
Vinyltoluene
Naphthalene
Indene
Benzene
1-Methylnaphthalene
2-Methylnaphthalene
1,4-Dimethylnaphthalene

Saturated aliphatic substances

2-Methylpentane¹
3-Methylpentane¹
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
2,2,4,4,6,6-Pentamethylheptane

Terpenes

delta-3-Carene
alpha-Pinene
beta-Pinene
Limonene
(iso)Longifolene
beta-Caryophyllene

alpha-Phellandrene
Myrcene
Camphene
alpha-Terpinene
Longipinene

Aliphatic alcohols and ether

1-Propanol¹
2-Propanol¹
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
Ethanol¹

Aromatic alcohols (phenoles)

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

Glycols, Glycol ether, Glycol ester

Propyleneglycol (1,2-Dihydroxypropane)
Ethleneglycol (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)
Ethylidiglycol
Dipropylene glycol dimethylene ether
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-butanol
Pentanal
Hexanal
Heptanal
2-Ethylhexanal
Octanal
Nonanal
Decanal
2-Butenal³
2-Pentenal³
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}
Isobutenal³

Ketones

Ethylmethylketone³
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

Methylacetate¹
Ethyl acetate¹
Vinyl acetate¹
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
Diethylphthalate²
Dipropylphthalate²
Dibutylphthalate²
Diisobutylphthalate²
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
Tetradecamethylcycloheptasiloxane
Tetrahydrofuran (THF)
1-Octene
1-Decene
1-Dodecene
2-Pentylfuran
2-Methylfuran
Isophorone
Tetramethyl succinonitrile
Dimethylformamide (DMF)
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
Benzothiazole

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 $\geq 1 \mu\text{g}/\text{m}^3$ 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 $\geq 5 \mu\text{g}/\text{m}^3$ 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 $\geq 5 \mu\text{g}/\text{m}^3$, SVOC $\geq 5 \mu\text{g}/\text{m}^3$ with LCI and not calibrated VOC $\geq 5 \mu\text{g}/\text{m}^3$ calculated as toluene equivalent |
| TVOC according to eco-INSTITUT-Label | Sum of all identified and calibrated VOC $\geq 1 \mu\text{g}/\text{m}^3$, SVOC $\geq 5 \mu\text{g}/\text{m}^3$ with LCI and not calibrated VOC $\geq 1 \mu\text{g}/\text{m}^3$ 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 $\geq 5 \mu\text{g}/\text{m}^3$ in the retention range C_6 to C_{16} |
| TVOC without LCI according to eco-INSTITUT-Label | Sum of all VOC without NIK $\geq 1 \mu\text{g}/\text{m}^3$ 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 III1 and III2 |
| VVOC (very volatile organic compounds) | All individual substances with a concentration $\geq 1 \mu\text{g}/\text{m}^3$ 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 $\geq 5 \mu\text{g}/\text{m}^3$ with LCI |
| TVVOC according to eco-INSTITUT-Label | Sum of all identified and calibrated VVOC $\geq 1 \mu\text{g}/\text{m}^3$ with LCI |
| SVOC (semi volatile organic compounds) | All individual substances $\geq 1 \mu\text{g}/\text{m}^3$ 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 $\geq 5 \mu\text{g}/\text{m}^3$ without LCI |
| TSVOC without LCI according to eco-INSTITUT-Label | Sum of all SVOC $\geq 1 \mu\text{g}/\text{m}^3$ without LCI |
| TSVOC with LCI according to AgBB/DIBt | Sum of all identified and calibrated SVOC $\geq 5 \mu\text{g}/\text{m}^3$ 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 $\geq 1 \mu\text{g}/\text{m}^3$ with LCI, established by the AgBB in 2018 |
| R value according to AgBB 2018/DIBt | R value for all identified and calibrated VOC $\geq 5 \mu\text{g}/\text{m}^3$ with LCI, established by the AgBB in 2018 |
| R value according to Belgian regulation | R value for all identified and calibrated VOC $\geq 5 \mu\text{g}/\text{m}^3$ with LCI, established by the Belgian regulation |
| R value according to AFSSET | R value for all identified and calibrated VOC $\geq 5 \mu\text{g}/\text{m}^3$ 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 $1\mu\text{g}/\text{m}^3$.

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 signal 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 $5\mu\text{g}/\text{m}^3$ 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.

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

- 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.