

Produktprüfung
Zertifizierung
Qualitätssicherung

eco
INSTITUT



Latex Pillow

P.T. RubberFoam Indonesia

Test Report Nr. 18605



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Test Report No. 18605

| | |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client: | P.T. RubberFoam Indonesia, Kawasan Industri Sentul Jl. Olympic Raya Blok B5 Kel. Sentul, Kec. Babakan Madang Kab. Bogor – 16810 Jawa Barat Indonesia |
| Sample description by client: | Latex Pillow |
| Sample No.: | 18605 |
| Type of sample: | Latex pillow |
| Sampled by: | P.T. RubberFoam Indonesia, Kawasan Industri Sentul Jl. Olympic Raya Blok B5 Kel. Sentul, Kec. Babakan Madang Kab. Bogor – 16810 Jawa Barat Indonesia |
| Sampled on (date): | 17 March 2008 |
| Location of sampling: | no details documented |
| Production date: | no details documented |
| Sample received: | 19 March 2008 |
| Date of report: | 18 April 2008 |
| Number of pages of the report: | 23 |
| Test aims: | see table of contents |
| Testing laboratory: | eco-INSTITUT, Cologne * external laboratory |



Product testing Certification Quality assurance
Latex mattresses • Undyed textile coverings

Contents

| | |
|----------------------------------------------------------|-----------|
| Test report | 4 |
| 1 Emission analysis | 4 |
| 1.1 Volatile organic compounds (VOC) | 4 |
| Measurement time 2 days after test chamber loading | 7 |
| 1.1.1 CMR VOC _{2d} | 7 |
| 1.1.2 VOC / TVOC _{2d} | 8 |
| 1.1.3 VVOC _{2d} | 10 |
| 1.1.4 SVOC _{2d} | 11 |
| Measurement time 7 days after test chamber loading | 12 |
| 1.1.5 VOC _{7d} / TVOC _{7d} | 12 |
| 1.1.6 VVOC _{7d} | 14 |
| 1.1.7 SVOC _{7d} | 15 |
| 1.2 Carbon Disulfide CS ₂ | 16 |
| 1.3 Nitrosamines | 17 |
| 1.4 Formaldehyde _{2d} | 18 |
| 1.5 Odour testing | 19 |
| 2 Contents analysis | 20 |
| 2.1 Polymers and filler percentage | 20 |
| Expert appraisal | 21 |
| Summary evaluation | 22 |
| Appendix | 23 |



Test report

1 Emission analysis

1.1 Volatile organic compounds (VOC)

Definition of terms:

| | |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VOC (volatile organic compounds) | All individual materials with a concentration $\geq 0,001$ mg/m ³ in retention range C ₆ (n-Hexane) to C ₁₆ (n-Hexadecane) Substances see NIK lists / AgBB (DIBt) Sum of all individual substances in retention range C ₆ to C ₁₆ . |
| TVOC (total volatile organic compounds) | |
| CMR VOC (carcinogenic, mutagenic, reproduction toxic VOC) | All individual substances with the following categories: Directive 67/548 EC: Carc. Cat.1, 2; Mut. Cat.1, 2; Repr. Cat.1, 2 IARC: Group 1, 2A DFG (MAK lists): Category III1, III2 |
| VVOC (lightly volatile organic compounds) | All individual substances with concentration $\geq 0,001$ mg/m ³ in retention range $< C_6$ |
| SVOC (semi-volatile organic compounds) | All individual materials $\geq 0,001$ mg/m ³ in retention range $> C_{16}$ (n-Hexadecane) to C ₂₂ (Docosane) |
| Total SVOC (total semi-volatile organic compounds) | Sum of all SVOC in retention range $> C_{16}$ to C ₂₂ . |
| Identified and calibrated and substances (c _{id sub}), substance specific calculated | Spectrum and retention time are concordant with the calibrated comparison substance |
| Not identified substances calculated as toluene equivalent (c _{ni tol}) | Suggestion from the spectrum library with high probability and/or allocation to a group of substances |
| SER | Specific emission rate (see appendix) |



List of the analysed VOCs:

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-4-methylbenzene
1,2,4,5-Tetramethylbenzene
n-Butylbenzene
1,3-Diisopropylbenzene
1,4-Diisopropylbenzene
Phenyl octane
1-Phenyl decane**
1-Phenyl undecane**
4-Phenylcyclohexene
Styrene
Phenyl acetylene
2-Phenyl propene
Vinyl toluene
Naphthalene
Indene
Benzene

Saturated aliphatic substances

Hydrocarbons

2-Methyl pentane*

3-Methyl pentane*
n-Hexane
Cyclohexane
Methylcyclohexane
1,4-Dimethylcyclohexane
n-Heptane
n-Octane
n-Nonane
n-Decane
n-Undecane
n-Dodecane
n-Tridecane
n-Tetradecane
n-Pentadecane
n-Hexadecane
Methylcyclopentane

Terpenes

δ-3-Carene
α-Pinene
β-Pinene
Limonene

Aliphatic alcohols and ethers

1-Propanol*
2-Propanol*
tert-Butanol
2-Methyl-1-propanol
1-Butanol
1-Pentanol
1-Hexanol
Cyclohexanol
2-Ethyl-1-hexanol
1-Octanol
4-Hydroxy-4-methyl-pentan-2-one
1-Heptanol
1-Nonanol
1-Decanol

Aromatic alcohols (phenols)

Phenol
BHT (2,6-di-tert-butyl-4-methylphenol)
Benzylalcohol

Glycols, Glycol ether, Glycol ester

Propylenglycol (1,2-Dihydroxypropane)
Ethylene glycol (Ethandiol)
Ethylene glycol monobutyl ether
Diethylene glycol
Diethylene glycol-monobutyl ether
2-Phenoxyethanol
Ethylene carbonate
1-Methoxy-2-propanol
Glycolic acid butyl ester
Butyldiglycol acetate
Dipropylenglycol mono-methyl ether
2-Methoxyethanol
2-Ethoxyethanol
2-Propoxyethanol
2-Methylethoxyethanol
2-Hexoxyethanol
1,2-Dimethoxyethane
1,2-Diethoxyethane
2-Methoxyethyl acetate
2-Ethoxyethyl acetate
2-Butoxyethyl acetate
2-(2-Hexoxyethoxy)-ethanol
1-Methoxy-2-(2-methoxy-ethoxy)-ethane
Propylene glycol di-acetate
Dipropylene glycol
Dipropylene glycol monomethylether acetate
Dipropylene glycol mono-n-propylether
Dipropylene glycol mono-t-butylether
1,4-Butanediol
Tripropyleneglycolmonomethyl ether
Triethylene glycol dimethyl ether
1,2-Propylene glycol dimethyl ether

Aldehydes

Butanal*
Pentanal
Hexanal
Heptanal
2-Ethylhexanal
Octanal
Nonanal
Decanal
2-Butenal
2-Pentenal
2-Hexenal
2-Heptenal
2-Octenal
2-Nonenal
2-Decenal
2-Undecenal
Furfural
Glutaraldehyde
Benzaldehyde

Ketones

Ethylmethylketone
3-Methyl-2-propanol
Methylisobutylketone
Cyclopentanone
Cyclohexanone
2-Methylcyclopentanone
2-Methylcyclohexanone
Acetophenone
1-Hydroxyacetone

Acids

Acetic acid
Propionic acid
Isobutyric acid
Butyric acid
Pivalic acid
n-Valeric acid
n-hexanoic acid
n-Heptanoic acid
n-Octanoic acid
2-Ethylhexanoic acid

Esters and Lactones

Methylacetate*
Ethyl acetate*
Vinyl acetate*
Isopropyl acetate
Propyl acetate
2-Methoxy-1-methylethyl acetate
n-Butyl formate
Methylmethacrylate
Isobutylacetate
1-Butyl acetate
2-Ethylhexyl acetate
Methyl acrylate
Ethyl acrylate
n-Butyl acrylate
2-Ethylhexyl acrylate
Adipic acid dimethyl ester
Fumaric acid dibutyl ester
Succinic acid dimethyl ester
Glutaric acid dimethyl ester

Hexandioldiacrylate
Maleic acid dibutyl ester
Butyrolactone
Dimethylphthalate
Texanol
TXIB (Texanolisobutyrate)**

Chlorinated hydrocarbons

Tetrachlorethene
1,1,1-Trichlorethane
Trichlorethene
1,4-Dichlorbenzene

Others

1,4-Dioxane
Caprolactam
N-Methyl-2-pyrrolidone
Octamethylcyclotetrasiloxane
Methenamine
2-Butanonoxime
Tributyl phosphate
Triethyl phosphate
5-Chlor-2-methyl-4-isothiazolin-3-one
Tetrahydrofuran (THF)
1-Decene
1-Octene
2-Pentylfuran
Tetramethyl succinonitrile

* VVOC

** SVOC



Test method:

| | | |
|-----------------------------|--------------------------------------------------------|---------------------------------------------------------------|
| Preparation of test object: | DIN EN ISO 16000-11 | |
| | Pre-treatment: | n/a |
| | Back masked: | no |
| | Side/s masked: | no |
| | Relationship of open edges to surface: | n/a |
| | Charging: | related to surface |
| | Dimensions: | 17.8 x 17.7 x 14 cm |
| Test chamber conditions: | DIN EN ISO 16000-9 | |
| | Chamber volume: | 0.125 m ³ |
| | Temperature: | 23°C |
| | Relative humidity: | 50 % |
| | Air pressure: | normal |
| | Air: | cleaned |
| | Air change rate: | 1 h ⁻¹ |
| | Inflow velocity: | 0.3 m/s |
| | Charging: | 1.3 m ² /m ³ |
| | Specific air flow rate: | 0.77 m ³ /m ² *h |
| Air sampling | 2 days (CMR VOC) and 7 days after test chamber loading | |
| Analytics: | DIN ISO 16000-6 | |
| | Assessment limit: | 1 µg/m ³ (CMR VOC) 2 µg/m ³ (others) |

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Measurement time 2 days after test chamber loading

1.1.1 CMR VOC_{2d}

Test aim:

Carcinogenic, mutagenic and reproduction-toxic volatile organic compounds (CMR VOC), test chamber, air sampling 2 days after test chamber loading

Test result:

CMR VOCs were not detectable 2 days after test chamber loading.



1.1.2 VOC / TVOC_{2d}

Test aim:

Volatile organic compounds (VOC), test chamber, air sampling 2 days after test chamber loading

Test result:

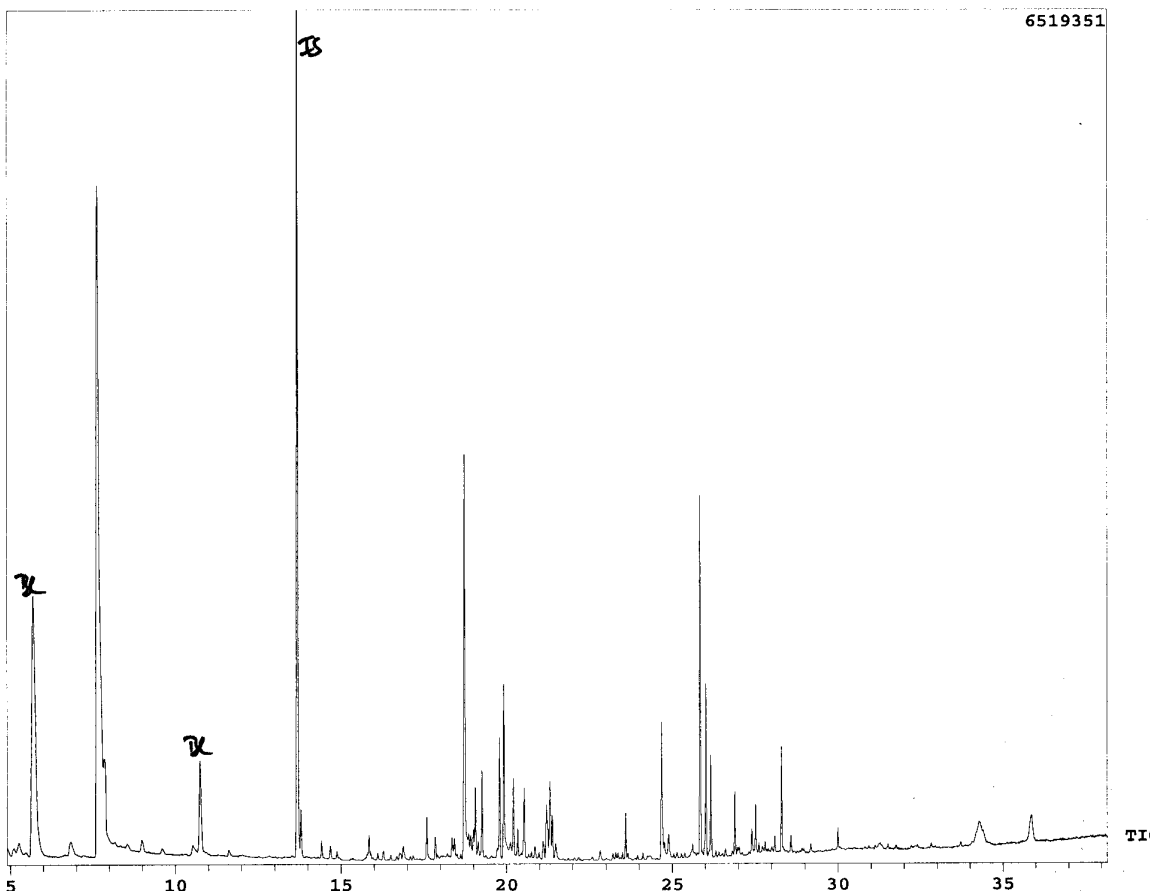
| No. | Substance | CAS No. | Concentration (Test chamber air) [µg/m ³] |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------|-------------------------------------------------------------|
| VOC_{2d}: Identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (C_{id sub}) | | | |
| - | - | - | - |
| 1 | Aromatic hydrocarbons | | |
| 1-16 | 1-Isopropyl-4-methylbenzene | 99-87-6 | 5 |
| 2 | Saturated aliphatic hydrocarbons | | |
| 2-7.5 | n-Undecane | 1120-21-4 | 2 |
| 3 | Terpenes | | |
| 3-4 | Limonene | 138-86-3 | 5 |
| 5 | Aromatic alcohols (phenols) | | |
| 5-2 | BHT (2,6-di-tert-butyl-4-methylphenol) | 128-37-0 | 3 |
| 8 | Ketones | | |
| 8-9 | 1-Hydroxyacetone | 116-09-6 | 3 |
| 9 | Acids | | |
| 9-1 | Acetic acid | 64-19-7 | 6 |
| VOC_{2d}: Further identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (C_{id sub}) | | | |
| - | - | - | - |
| VOC_{2d}: Not identified substances calculated as toluene equivalent (c_{ni tol}) | | | |
| | N,N-Diethylformamide | --- | 2 |
| | Aniline | --- | 16 |
| | Alkene, possibly branched | --- | 2 |
| | Alkene, possibly branched | --- | 3 |
| | Terpene | --- | 3 |
| | Alkyl benzene | --- | 2 |
| | Benzothiazene | --- | 5 |
| | Alkene, possibly branched | --- | 10 |
| | Alkene, possibly branched | --- | 5 |
| | Alkene, possibly branched | --- | 3 |
| | Sesquiterpene | --- | 2 |

Note: The test results exclusively refer to the submitted tested material. On changes of the composition or the production procedure of the material the report loses its validity. Publication of the test report requires permission in writing.



| Total volatile organic compounds | Concentration (Test chamber air) [$\mu\text{g}/\text{m}^3$] | SER _a [$\mu\text{g}/\text{m}^3\text{h}$] |
|----------------------------------|---------------------------------------------------------------------|----------------------------------------------------------|
| TVOC _{2d} | 77 | 59 |

For the determination of the TVOC value, the detector signal within the retention range between C6 (n-hexane) and C16 (n-Hexadecane) is evaluated using the response factor for toluene and determines the TVOC concentration in accordance with DIN ISO 16000-6.



Note: The test results exclusively refer to the submitted tested material. On changes of the composition or the production procedure of the material the report loses its validity. Publication of the test report requires permission in writing.



1.1.3 VVOC_{2d}

Test aim:

Very volatile organic compounds (VVOC), test chamber, air sampling 2 days after test chamber loading

Test result:

| No. | Substance | CAS No. | Concentration (Test chamber air) [µg/m ³] |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|-------------------------------------------------------------|
| VVOC_{2d}: Identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| - | - | - | - |
| VVOC_{2d}: Further identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| - | - | - | - |
| V 02.X05 | 2-Methyl pentane | 107-83-5 | |
| VVOC_{2d}: Not identified substances calculated as toluene equivalent (c_{ni tol}) | | | |
| | Diethylamine | --- | 80 |

Note: The test results exclusively refer to the submitted tested material. On changes of the composition or the production procedure of the material the report loses its validity. Publication of the test report requires permission in writing.



1.1.4 SVOC_{2d}

Test aim:

Semi-volatile organic compounds (SVOC), test chamber, air sampling 2 days after test chamber loading

Test result: (only include substances detected! Delete the rest!!!)

| No. | Substance | CAS No. | Concentration (Test chamber air) [µg/m ³] |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------|-------------------------------------------------------------|
| SVOC_{2d}: Identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (C_{id sub}) | | | |
| - | - | - | - |
| SVOC_{2d}: Further identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (C_{id sub}) | | | |
| - | - | - | - |
| SVOC_{2d}: Not identified substances calculated as toluene equivalent (c_{ni tol}) | | | |
| | Alkane with more than 6 carbon atoms | - | 4 |
| | Alkane with more than 6 carbon atoms | - | 2 |

| Total semi-volatile organic compounds | Concentration (Test chamber air) [µg/m ³] | SER _a [µg/m ³ h] |
|---------------------------------------|-------------------------------------------------------------|-------------------------------------------|
| Σ SVOC _{2d} | 6 | 5 |



Measurement time 7 days after test chamber loading

1.1.5 VOC_{7d} / TVOC_{7d}

Test aim:

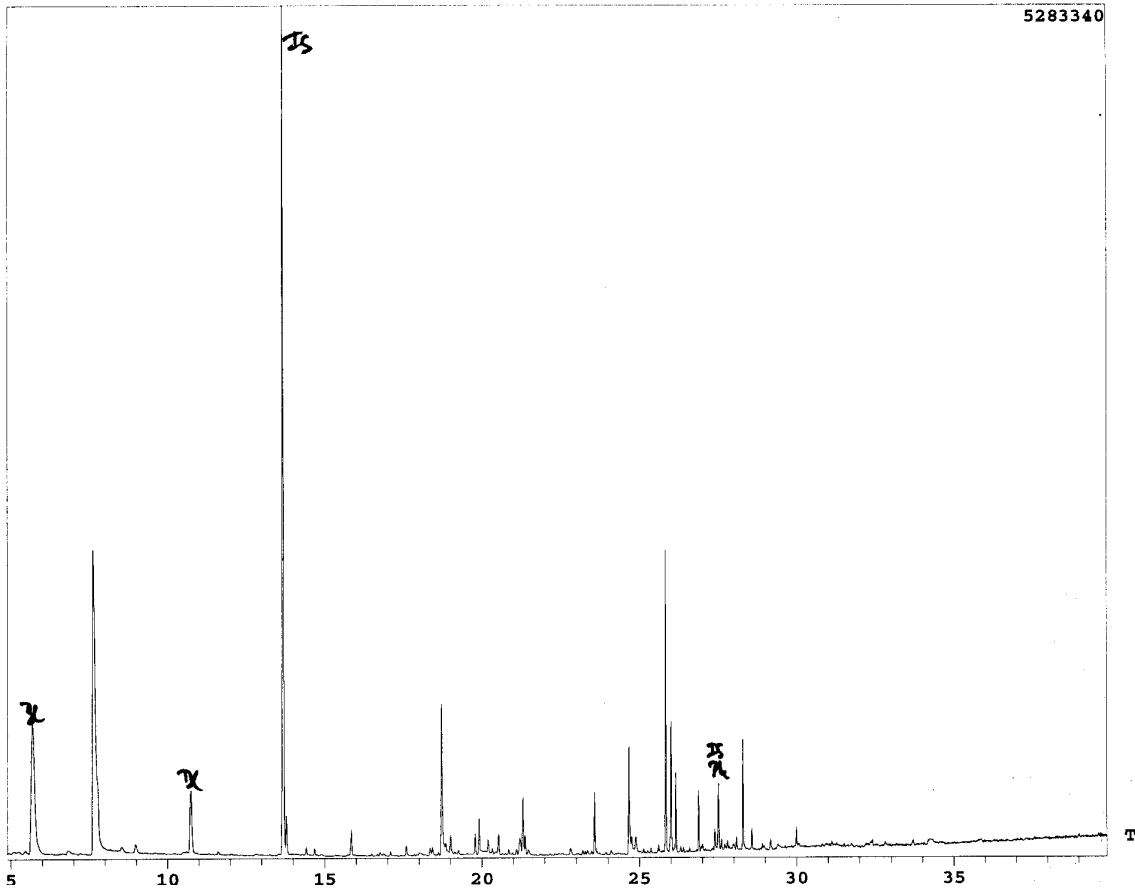
Volatile organic compounds (VOC), test chamber, air sampling 7 days after test chamber loading

Test result:

| No. | Substance | CAS No. | Concentration (Test chamber air) [µg/m ³] |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------|-------------------------------------------------------------|
| VOC_{7d}: Identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| 5 | Aromatic alcohols (phenols) | | |
| 5-2 | BHT (2,6-di-tert-butyl-4-methylphenol) | 128-37-0 | 3 |
| VOC_{7d}: Further identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| - | - | - | - |
| VOC_{7d}: Not identified substances calculated as toluene equivalent (c_{ni tol}) | | | |
| | Aniline | - | 7 |
| | Benzothiazene | - | 5 |
| | Alkene, possibly branched | - | 9 |
| | Alkene, possibly branched | - | 4 |
| | Alkene, possibly branched | - | 2 |

| Total volatile organic compounds | Concentration (Test chamber air) [µg/m ³] | SER _a [µg/m ³ h] |
|----------------------------------|-------------------------------------------------------------|-------------------------------------------|
| TVOC_{7d} | 30 | 23 |

For the determination of the TVOC value, the detector signal within the retention range between C6 (n-hexane) and C16 (n-Hexadecane) is evaluated using the response factor for toluene and determines the TVOC concentration in accordance with DIN ISO 16000-6.



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1.1.6 VVOC_{7d}

Test aim:

Very volatile organic compounds (VVOC), test chamber, air sampling 7 days after test chamber loading

Test result:

| No. | Substance | CAS No. | Concentration (Test chamber air) [µg/m³] |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|------------------------------------------------|
| VVOC_{7d}: Identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| - | - | - | - |
| VVOC_{7d}: Further identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| - | - | - | - |
| V 02.X05 | 2-Methyl pentane | 107-83-5 | |
| VVOC_{7d}: Not identified substances calculated as toluene equivalent (c_{ni tol}) | | | |
| | Diethylamine | 37 | 28 |

Note: The test results exclusively refer to the submitted tested material. On changes of the composition or the production procedure of the material the report loses its validity. Publication of the test report requires permission in writing.



1.1.7 SVOC_{7d}

Test aim:

Semi- volatile organic compounds (SVOC), test chamber, air sampling 7 days after test chamber loading

Test result:

| No. | Substance | CAS No. | Concentration (Test chamber air) [µg/m ³] |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------|-------------------------------------------------------------|
| SVOC_{7d}: Identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| - | - | - | - |
| SVOC_{7d}: Further identified and calibrated substances in accordance with NIK list/AgBB, calculated substance-specific (c_{id sub}) | | | |
| - | - | - | - |
| SVOC_{7d}: Not identified substances calculated as toluene equivalent (c_{ni tol}) | | | |
| - | - | - | - |

| Total semi-volatile organic compounds | Concentration (Test chamber air) [µg/m ³] | SER _a [µg/m ³ h] |
|---------------------------------------|-------------------------------------------------------------|-------------------------------------------|
| Σ SVOC _{7d} | - | - |

Note: The test results exclusively refer to the submitted tested material. On changes of the composition or the production procedure of the material the report loses its validity. Publication of the test report requires permission in writing.



1.2 Carbon Disulfide CS₂

Test aim:

Emission of carbon disulfide CS₂ in the test chamber, air sampling 2 days after test chamber loading

Test method:

| | |
|-----------------------------|----------------------------------------------------------------------|
| Preparation of test object: | DIN EN ISO 16000-11 see No. 1.1 VOCs |
| Test chamber conditions: | DIN ISO 16000-9 and according to DIN V ENV 717-1 see No. 1.1 VOCs |
| Air sampling: | 2 days after test chamber loading |
| Analytics: | DIN EN 16000-6 |
| Assessment limit: | 1 µg/m ³ |

Test result:

| Substance | Concentration (Test chamber air) [µg/m ³] |
|----------------------------------|-------------------------------------------------------------|
| Carbon Disulfide CS ₂ | 3 |



1.3 Nitrosamines *

Test aim:

Emission of nitrosamines in the test chamber, air sampling 2 days after test chamber loading

Test method:

| | |
|-----------------------------|----------------------------------------------------------------------|
| Preparation of test object: | DIN EN ISO 16000-11 see No. 1.1 VOCs |
| Test chamber conditions: | DIN ISO 16000-9 and according to DIN V ENV 717-1 see No. 1.1 VOCs |
| Air sampling: | 2 days after test chamber loading |
| Analytics: | BGI 505-23 determination of nitrosamines |
| Assessment limit: | 100 ng/m ³ |

Test result:

| Substance | Concentration (Test chamber air) [ng/m ³] |
|-----------------------------------|-------------------------------------------------------------|
| N-Nitrosodimethylamine (NDMA) | < 100 |
| N-Nitrosomethylethylamine (NMEA) | < 100 |
| N-Nitrosodiethylamine (NDEA) | < 100 |
| N-Nitrosodiisopropylamine (NDIPA) | < 100 |
| N-Nitrosodipropylamine (NDPA) | < 100 |
| N-Nitrosodibutylamine (NDBA) | < 100 |
| N-Nitrosopyrrolidine (NPYR) | < 100 |
| N-Nitrosopiperidine (NPIP) | < 100 |
| N-Nitrosomorpholine (NMOR) | < 100 |



1.4 Formaldehyde_{2d}

Test aim:

Formaldehyde, test chamber, air sampling 2 days after test chamber loading, double determination

Test method:

| | |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preparation of test object: | according to DIN EN 717-1 see No. 1.1 VOCs |
| Test chamber conditions: | DIN EN 717-1 with the following deviations: <ul style="list-style-type: none"> – No determination of the equilibrium concentration; the formaldehyde emission is indicated at a measuring point as determined above. – test chamber size see chamber volumes – Relative humidity: 50% Emission chamber parameters: see No. 1.1 VOCs |
| Air sampling: | 2 days after test chamber loading |
| Analytics: | DIN EN 16000-3 |
| Assessment limit: | 3 µg/m ³ ≈ 0,003 ppm |

Test result:

| Substance | Concentration (Test chamber air) [µg/m ³] | Concentration (Test chamber air) [µg/m ³] |
|--------------|-------------------------------------------------------------|-------------------------------------------------------------|
| Formaldehyde | < 3 | < 0,003 |



1.5 Odour testing

Test aim:

Odour, test collective, odour test 24 hours after desiccator loading

Test method:

Analytics:

VDA recommendation 270 at 50 % humidity

Rating scale:

- | | |
|---|----------------------------------------|
| 1 | not discernable |
| 2 | discernable, not objectionable |
| 3 | clearly discernable, not objectionable |
| 4 | objectionable |
| 5 | strongly discernable |
| 6 | intolerable |

Test result:

| Temperature [°C] | Intensity [Note] | Type of odour |
|---------------------|---------------------|---------------|
| 23 | 1 | --- |



2 Contents analysis

2.1 Polymers and filler percentage

Test method:

| | |
|------------|---------------------------------------------------------------------------|
| Analytics: | Ash/filler percentage: Thermogravimetry; Polymer percentage : IR/ATR |
| Benchmark: | Filler percentage: $\leq 5 \pm 1$ % Polymer percentage: NR ≥ 95 % |

| Filler percentage | [weight/%] |
|-------------------------------------------------------------------------------------|------------|
| Related to the total sample the polymer portion amounts to. | 94 |
| Related to the total sample the ash portion (including zinc oxide) amounts to. | 6 |
| Related to the total sample the filler portion amounts to ¹⁾ | < 5 |
| Polymer percentage | [weight/%] |
| Related to the polymer content the natural latex portion amounts to ²⁾ | 100 |
| Related to the polymer content the synthetic latex portion amounts to ²⁾ | 0 |

¹⁾ The filler portion is calculated by the difference of ash portion and zinc oxide on the assumption that maximally 5% zinc oxide is contained related to the total weight of the expanded latex core.

²⁾ With findings < 5 % for natural latex the result is represented as 100 % synthetic latex. Usually no natural latex portion under 5 % is used.

Cologne, 18 April 2008

Dr. H.-U. Krieg
(Technical manager)



Expert appraisal

The product Latex Pillow was submitted to laboratory tests on behalf of P.T. RubberFoam Indonesia for an ecological product examination according to the eco-INSTITUT-Label test criteria "name" (Status: February 2008). The results documented in the test report were evaluated as follows.

| Test parameter | Concentration | Threshold value | Threshold reached [yes/no] |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------------------------------|----------------------------|
| Emission analysis | | | |
| TVOC (total volatile organic compounds) (2 days after test chamber loading) | 78 µg/m ³ | ≤ 400 µg/m ³ | yes |
| TVOC (total volatile organic compounds) (7 days after test chamber loading) | 30 µg/m ³ | ≤ 200 µg/m ³ | yes |
| VOC classified in: K1, K2; M1, M2; R1, R2 (as per TRGS 905, RL 67/548 EC); IARC group 1 & 2A; MAK III1, III2 (2 days after test chamber loading) | n.d. | ≤ 2 µg/m ³ | yes |
| VOC (sum) without NIK (7 days after test chamber loading) | 27 µg/m ³ | ≤ 100 µg/m ³ | yes |
| VOC (individual sums): | | | |
| Sum of sensitizing materials with the following categorization: DFG (MAK list): Category IV, German Federal Institute for Risk Assessment list: Cat A, TRGS 907 (7 days after test chamber loading) | n.d. | ≤ 100 µg/m ³ | yes |
| Sum of VOC with the following categorization: Directive 67/548 EC: Carc. Cat. 3, Mut. Cat. 3, Repr. Cat. 3, TRGS 905: K3, M3, R3, IARC: Group 2B, DFG (MAK lists): Category III3 (7 days after test chamber loading) | n.d. | ≤ 50 µg/m ³ | yes |
| Disulfide (only latex products) | 3 µg/m ³ | ≤ 50 µg/m ³ (2 days after test chamber loading) | yes |
| Nitrosamines (only latex products) | n.d. | ≤ 0.3 µg/m ³ (2 days after test chamber loading) | yes |
| R value | < 1 | ≤ 1.0 (7 days after test chamber loading) | yes |
| Formaldehyde | n.d. | ≤ 0.02 ppm (2 days after test chamber loading) | yes |
| Odour | 1 | ≤ Grade 3 (24 hours after loading of desiccator) | yes |
| Contents analysis | | | |
| Polymer percentage | 100 % NR | Declaration in % | yes |
| Filler portion (ash content) | < 5 % | ≤ 5% | yes |



Summary evaluation

The product Latex Pillow was submitted to an ecological product examination on behalf of P.T. RubberFoam Indonesia for the acquisition of the eco-INITIUT-Label. The eco-INITIUT-Label criteria were successfully fulfilled.

As a result of the successful ecological product examination the

eco-INITIUT-Label



Is awarded for the product/s:
Latex Pillow
For a period of two years.

| | |
|----------------------|-----------------------|
| Certification number | ID 0408 – 11427 – 001 |
| Test report Number | 18605 |
| Validity | 04/2010 |

After expiration of two years it is possible to acquire the eco-INITIUT-Label for another two year period. For this a laboratory test will be accomplished according to the latest eco-INITIUT-Label test criteria.

Cologne, 18 April 2008

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Appendix

Explanation of the 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.

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

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.