eco-INSTITUT Germany GmbH
Laborprüfung
Laboratory testing

Coco-Latex Exports (P) Ltd.
Chungom Alleppey
688011 Kerala
India

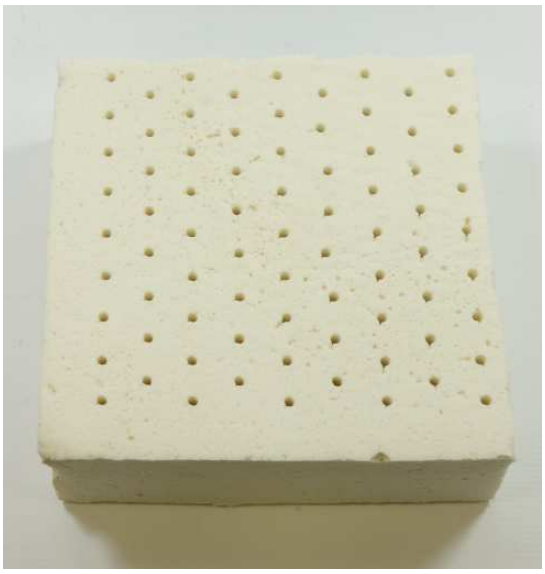
Test Report No. 58140-A001-QUL-L

Test objective:	**Evaluation according to QUL criteria**
Article designation according to order:	**Natural Organic Latex Foam - made from 100% Organic Natural Latex**
Date of report:	25/05/2023
Number of pages of report:	26
Testing / responsible laboratory:	eco-INSTITUT Germany GmbH, Köln
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. Further information at www.eco-institut.de/en/advertising

Content

‡ subcontracted, # outside accreditation

Sample View

Internal sample number (filled in by laboratory)	**58140-A001**
Photo of the test sample: A001	
Article designation according to order:	Natural Organic Latex Foam - made from 100% Organic Natural Latex
Sample/batch number according to order:	EC 23 - I
Type of sample:	Mattress Component
Date of production:	22/02/2023
Sampling by:	Ms. Sumi Sebastian, Research Fellow, Coir Board, Alappuzha, Kerala, India
Date of sampling:	14/03/2023
Location of sampling:	Coco-Latex Exports (P) Ltd., Vazhathoppu Building, Chungom, Alleppey, Kerala, India.
Receipt of sample / Condition upon delivery:	17/03/2023 / without objection

Statement of conformity with QUL criteria

The sample with the internal sample no. 58140-A001 was submitted to laboratory tests on behalf of **Coco-Latex Exports (P) Ltd.** for an ecological product examination according to the QUL test criteria (Qualitätsverband umweltverträglicher Latexmatratzen e.V.). The article description according to the order is **Natural Organic Latex Foam - made from 100% Organic Natural Latex.**

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

Test parameters	Result		Requirement		Requirement hold [yes/no]
Emission analysis					
Measurement time: 2 days after test chamber loading					
TVOC (total volatile organic compounds)	43	µg/m³	≤ 400	µg/m³	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/m³	≤ 1	µg/m³	yes
Formaldehyde	2	µg/m³	≤ 24	µg/m³	yes
Acetaldehyde	< 2	µg/m³	≤ 24	µg/m³	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/m³	≤ 1	µg/m³	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: K2, M2, R2; IARC: Group 2B; DFG (MAK list): Category III3 (Sum)	3	µg/m³	≤ 50	µg/m³	yes
TVOC (total volatile organic compounds including SVOC with LCI)	21	µg/m³	≤ 200	µg/m³	yes
TSVOC (total semi-volatile organic compounds)	< 1	µg/m³	≤ 40	µg/m³	yes
VOC (Sum) without LCI	11	µg/m³	≤ 100	µg/m³	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 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/).

Test parameters	Result		Requirement		Requirement hold [yes/no]
Sensitising compounds with the following categorisations: DFG (MAK list): Category IV; Regulation (EC) No. 1272/2008: skin sensitising, respiratory sensitising; TRGS 907 (Sum)	3	µg/m³	≤ 100	µg/m³	yes
Bicyclic terpenes (Sum)	< 1	µg/m³	≤ 200	µg/m³	yes
C9 – C14 Alkanes / Isoalkanes (Sum)	< 1	µg/m³	≤ 200	µg/m³	yes
C4 – C11 Aldehydes, acyclic, aliphatic (Sum)	2	µg/m³	≤ 100	µg/m³	yes
C6 – C15 Alkyl benzenes (Sum)	1	µg/m³	≤ 100	µg/m³	yes
Cresols (Sum)	< 1	µg/m³	≤ 5	µg/m³	yes
Xylene (Sum)	< 1	µg/m³	≤ 100	µg/m³	yes
VOC (individual substances):					
Ethyl acetate (VVOC)	< 1	µg/m³	≤ 600	µg/m³	yes
Phenol	< 1	µg/m³	≤ 20	µg/m³	yes
Methylisothiazolinone (MIT)	< 1	µg/m³	≤ 1	µg/m³	yes
Octylisothiazolinone (OIT)	< 1	µg/m³	≤ 1	µg/m³	yes
Benzaldehyde	< 1	µg/m³	≤ 20	µg/m³	yes
2-Ethyl-1-hexanol	< 1	µg/m³	≤ 100	µg/m³	yes
Ethylen glycol monobutylether	< 1	µg/m³	≤ 100	µg/m³	yes
2-Hexoxyethanol	< 1	µg/m³	≤ 100	µg/m³	yes
Benzothiazole [1)]	6	µg/m³	≤ 15	µg/m³	yes
2-Butoxyethyl acetate	< 1	µg/m³	≤ 200	µg/m³	yes
2-Phenoxyethanol	< 1	µg/m³	≤ 30	µg/m³	yes
Propylene glycol (Propane-1,2-diol)	< 1	µg/m³	≤ 60	µg/m³	yes
R-Value	0.03		≤ 1.0		yes

1) preliminary, exceeding the limit does not lead to devaluation at present

Test parameter	Sample	Result	Limit value	Within limits [yes/no]
Further analyses				
Carbon Disulphide (only latex products) 2 days after test chamber loading	58140-A001	3 µg/m³	≤ 50 µg/m³	yes
Nitrosamines (only latex products) 2 days after test chamber loading	58140-A001	< q.l.	≤ 0.1 µg/m³	yes
Filler content	58140-A001	0.0 %	≤ 5 %	yes
Polymer content (NR: natural rubber)	58140-A001	100 % NR	≥ 95 %	yes
Odour	58140-A001	Grade 3	≤ Grade 3 (2 days after test chamber loading)	yes

< q.l. = Value below quantification limit

Cologne, 25/05/2023

Vanessa Laumann, Dipl.-Chem.
(Project management)

Laboratory report

1 Emission analysis

Test method

DIN EN 16516:2020-10	Testing and evaluation of the release of dangerous substances; determination of emissions into indoor air

A001, Preparation of test sample

Date:	02/05/2023
Sample preparation:	not applicable; transfer of the test specimen into the test chamber immediately
Masking of backside:	no
Masking of edges:	no
Relationship of unmasked edges to surface:	not applicable
Loading reference unit:	area-specific [m^2]
Dimensions:	21.7 cm x 21.7 cm; thickness: 7.9 cm

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

Chamber volume:	0.250 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:	0.65 m^2/m^3
Specific air flow rate:	0.769 $m^3/(m^2 \cdot h)$
Starting time of the test (t0):	02/05/2023
Air sampling:	2 days after test chamber loading 7 days after test chamber loading

Analytics

Aldehydes and ketones	DIN ISO 16000-3:2013-01
Limit of quantification:	2 µg/m^3
Volatile organic compounds	DIN ISO 16000-6:2022-03
Limit of quantification:	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 2 days

Test objective:

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

Test result:

Internal sample number: | 58140-A001

No.	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³ [µg/m³]	Toluene-equivalent substances ≥ 5 µg/m³ [µg/m³]	CMR Classification++	LCI AgBB 2021 [µg/m³]	R-value
1	**Aromatic hydrocarbons**							
1-16	1-Isopropyl-4-methylbenzene (p-Cymene)	99-87-6	13.47	4	< 5		1000	0.00
2	**Aliphatic hydrocarbons (n-, iso- and cyclo-)**							
2-2	n-Hexane	110-54-3	4.85	1	< 5	Repr. 2	4300	0.00
2-10.3	n-Undecane	1120-21-4	14.77	1	< 5		6000	0.00
3	**Terpenes**							
3-4	Limonene	138-86-3	13.59	3	< 5		5000	0.00
7	**Aldehydes**							
7-7	Nonanal	124-19-6	14.93	3	< 5		900	0.00
7-19	Benzaldehyde	100-52-7	12.19	1	< 5		90	0.01
7-22	Formaldehyde	50-00-0		2	n. d.	Carc. 1B Muta. 2	100	0.02
8	**Ketones**							
8-10	Acetone	67-64-1		2	n. d.		120000	0.00

No.	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³ [µg/m³]	Toluene-equivalent substances ≥ 5 µg/m³ [µg/m³]	CMR Classifi-cation++	LCI AgBB 2021 [µg/m³]	R-value
13	**Other identified substances in addition to LCI list**							
	Benzothiazole	95-16-9	18.19	6	< 5			
2-10	2,2,4,6,6-Pentamethylheptane	13475-82-6	12.60	8	11		6000	0.00
	Diethylformamid*		11.26	3	< 5			
3-5	Other terpenes*	--	14.16	2	< 5		1400	0.00
	Ester m/z 74 87 57*		15.2	2	< 5			
	Ester m/z 74 87 143*		19.55	2	< 5			
3-5	Other terpenes*	--	21.54	4	< 5		1400	0.00
	Ester m/z 74 87 143*		23.52	3	< 5			

+ identified and calibrated substances, substance specific calculated
++ classification according to Regulation (EG) N° 1272/2008: Categories Carc. 1A, 1B and 2, Muta. 1A, 1B and 2, Repr. 1A, 1B and 2, TRGS 905: K1A, K1B, K2, M1A, M1B, M2, R1A, R1B, R2; IARC: Group 1, 2A, 2B and 3, DFG MAK-list: Categorie III1 to III5
* unidentified substances, calculated as toluene equivalent reported with significant mass fragments as mass-to-charge ratio (m/z)
n. d.: not determined

Carcinogenic, mutagenic, and reproductive toxic 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; TRGS 905: K1A, K1B (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	11	8.5
Sum of VOC according to AgBB 2021	8	6.2
Sum of VOC according to eco-INSTITUT-Label	43	33
Sum of VOC according to DIN ISO 16000-6	82	63

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	< 3.9
Sum of SVOC without LCI according to AgBB 2021	< 5	< 3.9
Sum of SVOC without LCI according to eco-INSTITUT-Label	< 1	< 0.77
Sum of SVOC with LCI according to AgBB 2021	< 5	< 3.9

TVVOC, Total very volatile organic compounds	Concentration after 2 days [µg/m³]	SERa [µg/(m² • h)]
Sum of VVOC according to AgBB 2021	< 5	< 3.9
Sum of VVOC according to eco-INSTITUT-Label	4	3.1

*Excluding formaldehyde and acetaldehyde (Carc. 1B) due to an assumed "practical threshold" under which a significant carcinogenic risk is no longer to be expected (see Federal Institute for Risk Assessment (2006): Toxicological evaluation of formaldehyde and Federal Environment Agency (2016): Reference value for formaldehyde in indoor air and protocol of the 11th meeting of 'Ausschusses für Innenraumrichtwerte' (AIR), 11/2020). In the case of a toxicological emission assessment, a single-substance analysis of the concentrations is necessary.
In the opinion of the committee for Indoor Air Guide Values (Ausschuss für Innenraumrichtwerte) of the Federal Environment Agency, the concentration of 0.1 mg formaldehyde/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 2021 (sum)	< 5	< 3.9
VOC without LCI according to eco-INSTITUT-Label (sum)	16	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: K2, M2, R2; IARC: Group 2B; DFG (MAK list): Category III3 (sum)	3	2.3
Sensitising compounds with the following categorisations: DFG (MAK list): Category IV; Regulation (EC) No. 1272/2008: skin sensitising, respiratory sensitising; TRGS 907 (sum)	5	3.9
Bicyclic Terpenes (sum)	< 1	< 0.77
C9 - C14 Alkanes / Isoalkanes as dekane-equivalent (sum)	9	6.9
C4 - C11 Aldehydes, acyclic, aliphatic (sum)	3	2.3
C9 - C15 Alkylated benzenes (sum)	4	3.1
Kresoles (sum)	< 1	< 0.77

Risk value for assessment of LCI	R-value
R-value according to eco-INSTITUT-Label	0.05
R-value according to AgBB 2021	0.00
R-value according to Belgian regulation	0.00
R-value according to EU-LCI	0.00

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

1.2 Sample A001, Volatile organic compounds after 7 days

Test objective:

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

Test result:

Internal sample number: | 58140-A001

No.	Substance	CAS No.	RT [min]	Concentration+ calib. substances ≥ 1 µg/m³ uncalib. substances ≥ 1 µg/m³ DNPH ≥ 2 µg/m³ [µg/m³]	Toluene-equivalent substances ≥ 5 µg/m³ [µg/m³]	CMR Classification++	LCI AgBB 2021 [µg/m³]	R-value
1	**Aromatic hydrocarbons**							
1-16	1-Isopropyl-4-methylbenzene (p-Cymene)	99-87-6	13.47	1	< 5		1000	0.00
2	**Aliphatic hydrocarbons (n-, iso- and cyclo-)**							
2-2	n-Hexane	110-54-3	4.85	1	< 5	Repr. 2	4300	0.00
3	**Terpenes**							
3-4	Limonene	138-86-3	13.6	1	< 5		5000	0.00
7	**Aldehydes**							
7-7	Nonanal	124-19-6	14.94	2	< 5		900	0.00
7-22	Formaldehyde	50-00-0		2	n. d.	Carc. 1B Muta. 2	100	0.02
8	**Ketones**							
8-10	Acetone	67-64-1		2	n. d.		120000	0.00
13	**Other identified substances in addition to LCI list**							
	Benzothiazole	95-16-9	18.19	6	5			
	Diethylformamid*		11.27	1	< 5			
3-5	Other terpenes*	--	14.6	1	< 5		1400	0.00
	Ester m/z 74 87 143*		19.55	1	< 5			
3-5	Other terpenes*	--	21.54	4	< 5		1400	0.00
	Ester m/z 74 87 143*		23.52	3	< 5			

+ identified and calibrated substances, substance specific calculated
++ classification according to Regulation (EG) N° 1272/2008: Categories Carc. 1A, 1B and 2, Muta. 1A, 1B and 2, Repr. 1A, 1B and 2, TRGS 905: K1A, K1B, K2, M1A, M1B, M2, R1A, R1B, R2; IARC: Group 1, 2A, 2B and 3, DFG MAK-list: Categorie III1 to III5
* unidentified substances, calculated as toluene equivalent reported with significant mass fragments as mass-to-charge ratio (m/z)
n. d.: not determined

Carcinogenic, mutagenic, and reproductive toxic 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; TRGS 905: K1A, K1B (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	5	3.9
Sum of VOC according to AgBB 2021	5	3.9
Sum of VOC according to eco-INSTITUT-Label	21	16
Sum of VOC according to DIN ISO 16000-6	40	31

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	< 3.9
Sum of SVOC without LCI according to AgBB 2021	< 5	< 3.9
Sum of SVOC without LCI according to eco-INSTITUT-Label	< 1	< 0.77
Sum of SVOC with LCI according to AgBB 2021	< 5	< 3.9

TVVOC, Total very volatile organic compounds	Concentration after 7 days [µg/m³]	SERa [µg/(m² • h)]
Sum of VVOC according to AgBB 2021	< 5	< 3.9
Sum of VVOC according to eco-INSTITUT-Label	4	3.1

*Excluding formaldehyde and acetaldehyde (Carc. 1B) due to an assumed "practical threshold" under which a significant carcinogenic risk is no longer to be expected (see Federal Institute for Risk Assessment (2006): Toxicological evaluation of formaldehyde and Federal Environment Agency (2016): Reference value for formaldehyde in indoor air and protocol of the 11th meeting of 'Ausschusses für Innenraumrichtwerte' (AIR), 11/2020). In the case of a toxicological emission assessment, a single-substance analysis of the concentrations is necessary.
In the opinion of the committee for Indoor Air Guide Values (Ausschuss für Innenraumrichtwerte) of the Federal Environment Agency, the concentration of 0.1 mg formaldehyde/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 2021 (sum)	5	3.9
VOC without LCI according to eco-INSTITUT-Label (sum)	11	8.5
CMR 2: VOC (incl. VVOC and SVOC) with the following categorisations: Regulation (EC) No. 1272/2008: Category Carc. 2, Muta. 2, Repr. 2; TRGS 905: K2, M2, R2; IARC: Group 2B; DFG (MAK list): Category III3 (sum)	3	2.3
Sensitising compounds with the following categorisations: DFG (MAK list): Category IV; Regulation (EC) No. 1272/2008: skin sensitising, respiratory sensitising; TRGS 907 (sum)	3	2.3
Bicyclic Terpenes (sum)	< 1	< 0.77
C9 - C14 Alkanes / Isoalkanes as dekane-equivalent (sum)	< 1	< 0.77
C4 - C11 Aldehydes, acyclic, aliphatic (sum)	2	1.5
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	0.03
R-value according to AgBB 2021	0.00
R-value according to Belgian regulation	0.00
R-value according to EU-LCI	0.00

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

1.3 Carbon disulfide (CS_2, test chamber)

Test parameter:
Carbon disulfide (CS_2)

Test method:

Analytics:	DIN ISO 16000-6:2022-03
Limit of quantification:	1 µg/m³

Test result:

Internal sample number:	58140-A001

Parameter	Measurement time (after test chamber loading)	Concentration (test chamber) [µg/m³]
Carbon disulfide CS_2	2 days	3

< q.l. = Value below quantification limit

1.4 Nitrosamines (test chamber) ‡#

Test parameter:

Determination of Nitrosamines

Test method:

Method description / analytics: | IFA 8172 (IV/18) resp. DGUV-Information 213-523 (09/2019)

Test result:

Internal sample number	Parameter	Measurement time (after test chamber loading)	Concentration (test chamber air) [ng/m³]	limit of quantification [ng/m³]
58140-A001	N-Nitrosodimethylamine (NDMA)	2 days	< BG	20
	N-Nitrosomethylethylamine (NMEA)		< BG	20
	N-Nitrosodiethylamine (NDEA)		< BG	20
	N-Nitrosodiisopropylamine (NDIPA)		< BG	20
	N-Nitrosodiisobutylamine (NDIBA)		< BG	20
	N-Nitrosodipropylamine (NDPA)		< BG	20
	N-Nitrosodibutylamine (NDBA)		< BG	20
	N-Nitrosopyrrolidine (NPYR)		< BG	20
	N-Nitrosopiperidine (NPIP)		< BG	20
	N-Nitrosomorpholine (NMOR)		< BG	20

< q.l. = Value below quantification limit

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

2 Ash content

Test parameter:
Ash content, filler content

Test method:

Analytics:	Thermogravimetry at 520 °C

Test result:

Internal sample number:	58140-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	1.9047	39.5214	39.5540	0.0326	1.7	0.0
Determination 2	1.8191	41.2651	41.2879	0.0228	1.3	0.0

Parameter	Content [M%]
Ash content (incl. zinc oxide), with reference to the sample	1.5
Filler content, with reference to the sample [1)]	0.0

[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.

3 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/%]
58140-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 34 %.
[2)] If NR content is < 5 %, the result is shown as 100 % SBR. Usually there is 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.

4 Odour Testing

Test parameter:

Assessment of odour emissions

Test Method:

Analytics:	Determination of odour as part of the eIL-test, following VDA recommendation 270:2018

Test conditions

Test chamber	see 1 Emission analysis
Air sampling [days]	2
Probands	5
Therefrom female	1
Evaluation Acceptance	Continuous scale from +1 (not perceptible) to +6 (unbearable)

Test result:

Internal sample number:	58140-A001

	Evaluation
Odour intensity after 2 days (arithmetic mean)	3.0

Individual results:

Test person	Odour after 2 days [Note]
Test person 01	3.0
Test person 02	3.0
Test person 03	3.0
Test person 04	3.0
Test person 05	3.0

Cologne, 25/05/2023

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

Appendix

Sampling sheet

Produktprüfung Product testing
Zertifizierung Certification
Beratung Consulting

eco INSTITUT

eco-INSTITUT-Label
Sampling Sheet*

eco INSTITUT TESTED PRODUCT ID 0808 - 47110 - 001

Project number eco-INSTITUT / will be filled in by Laboratory: **58140-001**

Testing laboratory	eco-INSTITUT Germany GmbH Schanzenstr. 6-20, D-51063 Cologne Tel. +49 (0)221 - 931245-0 Fax +49 (0)221 - 931245-33	**Sampler** (Name, Company, Phone)	Ms.Sumi Sebastian Research Fellow, Coir Board Alappuzha, Kerala, India Ph:0091 9539011345
Name of manufacturer / distributor at place of sampling (Address / Stamp)	Coco-Latex Exports (P) Ltd. Vazhathoppu Building Chungom, Alleppey, Kerala, India. PIN: 688011	**Customer/ Invoice recipient** (if different from manufacturer)	
Product name	Natural Organic Latex Foam - made from 100% Organic Natural Latex	**Product type** (e.g. parquet, floor covering)	Mattress Component
Model / programme / series		**Batch**	EC 23 - I
Article number		**Production date of batch**	22.02.23
Samples are taken from	☒ current production ☐ storage	**Sampling date**	14.03.23
		Sampling time	10:00
Storage location before sampling	☐ production ☒ storage ☐ other:	**Storage conditions before sampling**	☐ open ☒ packaged
	Storage location: Ware House		Packaging material: Aluminium Foil
Special features (possible negative effects through emissions at place of sampling (e.g. benzine, exhaust fumes), unclarities, questions etc.)			

Validation

Hereby the signer affirms the accuracy of the above-mentioned statements. The sample was chosen, sampled and packaged according to the sampling guidelines.

Date: 14.03.23 Signature: For COCOLATEX EXPORTS PVT LTD
(Stamp)
SUNOJ SEBASTIAN
MANAGER (Administration)
COCO LATEX EXPORTS ALLEPPEY

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

Order (Please insert quote number, or - if not available, please enter the desired analysis)	Emission analysis

List of calibrated Volatile Organic Compounds (VOC)

Aromatic hydrocarbons (31)
Benzene[4]
1,2,3-Trimethylbenzene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
1-Isopropyl-2-methylbenzene
1-Isopropyl-4-methylbenzene
1,2,4,5-Tetramethylbenzene
Ethylbenzene
n-Propylbenzene
Isopropylbenzene (Cumene)
1,3-Diisopropylbenzene
1,4-Diisopropylbenzene
n-Butylbenzene
1-Propenylbenzene (beta-Methylstyrene)
Toluene
2-Ethyltoluene
Vinyltoluene
o-Xylene
m-/p-Xylene
Styrene
Phenylacetylene
2-Phenylpropene (alpha-Methylstyrene)
4-Phenylcyclohexene
1-Phenyloctane
1-Phenyldecane[2]
1-Phenylundecane[2]
Indene
Naphthalene
1-Methylnaphthalene
2-Methylnaphthalene
1,4-Dimethylnaphthalene

Aliphatic hydrocarbons (23)
2-Methylpentane[1]
3-Methylpentane[1]
Methylcyclopentane
n-Hexane
Cyclohexane
Methylcyclohexane
1,4-Dimethylcyclohexane
n-Heptane
2,2,4,6,6-Pentamethylheptane
n-Octane
n-Nonane
n-Decane
n-Undecane
n-Dodecane
n-Tridecane
n-Tetradecane
n-Pentadecane
n-Hexadecane
Decahydronaphthalene
1-Octene
1-Decene
1-Dodecene
4-Vinylcyclohexene

Terpenes (12)
delta-3-Carene
alpha-Pinene
beta-Pinene
alpha-Terpinene
Longipinene
Limonene
Longifolene
Isolongifolene
beta-Caryophyllene
alpha-Phellandrene
Myrcene
Camphene

Aliphatic alcohols and ether (18)
Ethanol[1]
1-Propanol[1]
2-Propanol[1]
2-Methyl-1-propanol
1-Butanol
tert-Butanol
1-Pentanol
1-Hexanol
Cyclohexanol
2-Ethyl-1-hexanol
1-Heptanol
1-Octanol
1-Nonanol
1-Decanol
1,4-Cyclohexandimethanol
4-Hydroxy-4-methyl-pentan-2-one (Diacetone alcohol)
Methyl-tert-butyl ether (MTBE)[1]
Tetrahydrofuran (THF)

Aromatic alcohols (phenoles) (8)
Furfuryl alcohol
Benzyl alcohol
Phenol
2-Phenylphenol (oPP)
BHT (2,6-Di-tert-butyl-4-methylphenol)
o-Cresol
m-/p-Cresol
4-Chloro-3-methylphenol (Chlorocresol)

Glycols, Glycol ether, Glycol ester (49)
Ethyleneglycol (Ethan-1,2-diol)
Propylenglycol (Propane-1,2-diol)
Diethylene glycol
Dipropylene glycol
Neopentyl glycol
Hexyleneglycol
Ethyldiglycol
Ethylene glycol monobutyl ether
Diethylene glycol methyl ether
Diethylene glycol monobutyl ether
Diethylene glycol phenyl ether
Dipropylene glycol-dimetyl ether
Dipropylene glycol mono-n-butyl ether
Dipropylene glycol mono-tert-butyl ether
Dipropylene glycol monomethyl ether
Dipropylene glycol mono-n-propyl ether
Tripropylene glycol monomethyl ether
Triethylene glycol dimethyl ether
1,2-Propylene glycol dimethyl ether
1,2-Propylene glycol-n-propyl ether
1,2-Propylene glycol-n-butyl ether
Butyl glycolate
2-Methoxyethanol
2-Ethoxyethanol
2-Methylethoxyethanol
2-Propoxyethanol
2-Hexoxyethanol
2-(2-Hexoxyethoxy)ethanol
2-Phenoxyethanol
1-Methoxy-2-propanol
2-Methoxy-1-propanol
1-Ethoxy-2-propanol
1-tert-Butoxy-2-propanol
3-Methoxy-1-butanol
1,4-Butanediol
1,2-Dimethoxyethane
1,2-Diethoxyethane
1-Methoxy-2-(2-methoxy-ethoxy)ethane
Ethylene carbonate
Propylene carbonate
2-Methoxy-1-propyl acetate
Diethylene glycol monomethyl ether acetate
2-Methoxyethyl acetate
2-Ethoxyethyl acetate
2-Butoxy ethyl acetate
Dipropylene glycol monomethyl ether acetate
Propylene glycol diacetate
Texanol
TXIB (Texanol isobutyrate)

Aldehydes (26)
Formaldehyde[1,3,4]
Acetaldehyde[1,3,4]
Propanal[1,3]
Butanal[1,3]
3-Methyl-1-butanal
Pentanal
Hexanal
2-Ethylhexanal
Heptanal
Octanal
Nonanal
Decanal
Propenal (Acrolein)[1,3]
Isobutenal (Methacrolein)[3]
2-Butenal[3]
2-Pentenal[3]
2-Hexenal
2-Heptenal
2-Octenal

2-Nonenal
2-Decenal
2-Undecenal
Ethanedial (Glyoxal)[1,3]
Glutaraldehyde
Furfural
Benzaldehyde

Ketones (14)
Acetone[1,3]
1-Hydroxyacetone
Ethylmethylketone[3]
Methylisobutylketone
3-Methyl-2-butanone
Cyclopentanone
2-Methylcyclopentanone
Cyclohexanone
2-Methylcyclohexanone
2-Hexanone
2-Heptanone
Acetophenone
Isophorone
Benzophenone[2]

Acids (11)
Acetic acid
Propionic acid
Pivalic acid
Butyric acid
Isobutyric acid
n-Valeric acid
n-Caproic acid
2-Ethylhexanoic acid
n-Heptanoic acid
n-Octanoic acid
Neodecanoic acid

Esters and Lactones (31)
Methyl acetate[1]
Ethyl acetate[1]
Vinyl acetate[1]
Propyl acetate
Isopropyl acetate
2-Methoxy-1-methylethyl acetate
n-Butyl acetate
Isobutylacetate
2-Ethylhexyl acetate
n-Butyl formate
Methyl acrylate
Methyl methacrylate
Butyl methacrylate
Ethyl acrylate
n-Butyl acrylate
2-Ethylhexyl acrylate
Hexanediol diacrylate
Dipropylene glycol diacrylate
Dimethyl succinate
Dimethyl glutarate
Dimethyl adipate
Dibutyl fumarate
Dibutyl maleate
Diisobutyl succinate
Diisobutyl glutarate
Butyrolactone
Dimethyl phthalate
Diethyl phthalate[2]
Dipropyl phthalate[2]
Dibutyl phthalate[2]
Diisobutyl phthalate[2]

Chlorinated hydrocarbons (17)
Dichloromethane[1]
Trichloromethane (Chloroform)[4]
Tetrachloromethane
1,2-Dichloroethane[4]
1,1,1-Trichloroethane
2-Chloropropane
1,2,3-Trichloropropane[4]
Trichloroethene[4]
Tetrachloroethene
trans-1,3-Dichloropropene[4]
cis-1,3-Dichloropropene[4]
Chloroprene[4]
1,3-Dichloro-2-propanol[4]
Chlorobenzene
1,4-Dichlorobenzene
alpha-Chlorotoluene[4]
alpha,alpha,alpha-Trichlorotoluene[4]

Cyclic siloxanes (5)
Hexamethylcyclotrisiloxane (D3)
Octamethylcyclotetrasiloxane (D4)
Decamethylcyclopentasiloxane (D5)
Dodecamethylcyclohexasiloxane (D6)
Tetradecamethylcycoheptasiloxane (D7)

Others (41)
1,4-Dioxane[4]
1,2-Dibromoethane[4]
2-Nitropropane[4]
2,3-Dinitrotoluene[4]
2,4-Dinitrotoluene[4]
2,6-Dinitrotoluene[4]
3,4-Dinitrotoluene[2,4]
o-Anisidine[4]
o-Toluidine[4]
4-Chloro-o-toluidine[4]
5-Nitro-o-toluidine[2]
Acrylonitrile[1,4]
2,2'-Azobisisobutyronitrile
Tetramethylsuccinonitrile
Azobenzene[2,4]
Caprolactam
Furan[1,4]
2-Methylfuran
2-Pentylfuran
Methenamine
Triethylamine
2-Butanonoxime[4]
Triethyl phosphate
Tributyl phosphate[2]
5-Chloro-2-methyl-4-isothiazolin-3-one (CIT)
2-Methyl-4-isothiazolin-3-one (MIT)
2-n-Octyl-4-isothiazolin-3-one (OIT)[2,4]
Formamide
Dimethylformamide (DMF)
Acetamide
N-Nitrosopyrrolidine[4]
N-Methyl-2-pyrrolidone
N-Ethyl-2-pyrrolidone
N-Butyl-2-pyrrolidone
Aniline
4-Chloroaniline[4]
2-Nitroanisole[4]
Cyclohexyl isocyanate
p-Cresidine[4]
Diethyl sulfate[4]
Epichlorohydrin[4]

1 VVOC
2 SVOC
3 Analysis acc. to DIN ISO 16000-3:2013-01 (DNPH)
4 Carcinogens, category 1A and 1B according to Regulation (EC) No 1272/2008 and TRGS 905

Definition of terms

CAS No. (Chemical Abstracts Service)	International designation standard for chemical substances
CMR	VOCs, VVOCs and SVOCs classified as carcinogenic, mutagenic or toxic for reproduction according to Regulation (EC) No. 1272/2008, TRGS 905, IARC list and DFG (MAK list)
NIK / LCI	Lowest concentration of interest; substance-specific value for health assessment of emissions from products, indicated in µg/m³
RT (retention time)	Total time required for an analyte to pass the column (time between injection and detection of the analyte)
R value	Sum of quotients of concentration and LCI value for all substances for which a LCI value is derived
R value according to AgBB	R-value for all substances ≥ 5 µg/m³ with LCI value, calculated according to the LCI list of the AgBB scheme
R-value according to Belgian regulation	R-value for all substances ≥ 5 µg/m³ with LCI-value, calculated according to the LCI-list of the Belgian regulation
R value according to eco-INSTITUT-Label	R-value for all substances ≥ 1 µg/m³ with LCI value, calculated according to the LCI list of the AgBB scheme
R value according to EU-LCI	R-value for all substances ≥ 5 µg/m³ with EU-LCI value, calculated according to the EU-LCI list of the European Commission
SER	Specific emission rate (see "Explanation of Specific Emission Rate SER")
Toluene equivalent	Concentration of a substance quantified by the TIC response factor of toluene (calculation of the concentration by comparing the integral of the substance with the integral of toluene)
VOC (volatile organic compound)	Organic compound eluting in the retention range from C6 (n-hexane) to C16 (n-hexadecane)
TVOC	Sum of the concentrations of all identified and unidentified volatile organic compounds eluting in the retention range from C6 (n-hexane) to C16 (n-hexadecane)
TVOC according to DIN EN 16516	Sum of all VOC ≥ 5 µg/m³ in the retention range C6 to C16, calculated as toluene equivalent (used i.a. for M1)
TVOC according to AgBB	Sum of all VOCs with LCI ≥ 5 µg/m³ (quantified substance-specific) and all VOCs without LCI ≥ 5 µg/m³ (as toluene equivalent) (used i.a. for the Blue Angel)
TVOC according to eco-INSTITUT-Label	Sum of all calibrated VOC ≥ 1 µg/m³ (quantified substance-specific) and all non-calibrated VOC ≥ 1 µg/m³ (as toluene equivalent) (used i.a. for natureplus)
TVOC according to ISO 16000-6	Total area of the chromatogram in the retention range C6 – C16 as toluene equivalent according to DIN ISO 16000-6, Annex A.1 item 3 (used i.a. for CDPH, BIFMA and the French VOC regulation)
TVOC without LCI according to AgBB	Sum of all VOCs without LCI ≥ 5 µg/m³ as toluene equivalent
TVOC without LCI according to eco-INSTITUT-Label	Sum of all calibrated VOCs without LCI ≥ 1 µg/m³ (quantified substance-specific) and all non-calibrated VOCs without LCI ≥ 1 µg/m³ (as toluene equivalent)
VVOC (very volatile organic compound)	Organic compound eluting in the retention range < C6 (n-hexane)

TVVOC	Sum of the concentrations of all identified and unidentified very volatile organic compounds eluting in the retention range < C6 (n-hexane)
TVVOC according to AgBB	Sum of all VVOC with LCI ≥ 5 µg/m³ (quantified substance-specificic) and all VVOC without LCI ≥ 5 µg/m³ (as toluene equivalent)
TVVOC according to eco-INSTITUT-Label	Sum of all calibrated VVOC ≥ 1 µg/m³ (substance-specific quantified) and all non-calibrated VVOC ≥ 1 µg/m³ (as toluene equivalent)
SVOC (semi volatile organic compound)	Organic compound eluting in the retention range > C16 (n-hexadecane) to C22 (docosane)
TSVOC	Sum of the concentrations of all identified and unidentified semi volatile organic compounds eluting in the retention range > C16 (n-hexadecane) to C22 (docosane)
TSVOC according to DIN EN 16516	Sum of all SVOC ≥ 5 µg/m³ (as toluene equivalent)
TSVOC without LCI according to AgBB	Sum of all SVOC without LCI ≥ 5 µg/m³ (as toluene equivalent)
TSVOC with LCI according to AgBB	Sum of all SVOC with LCI ≥ 5 µg/m³ (quantified substance-specific)
TSVOC without LCI according to eco-INSTITUT label	Sum of all calibrated SVOC without LCI ≥ 1 µg/m³ (quantified substance-specific) and all non-calibrated SVOC without LCI ≥ 1 µg/m³ (as toluene equivalent)
TSVOC with LCI according to eco-INSTITUT-Label	Sum of all SVOC with LCI ≥ 1 µg/m³ (quantified substance-specific)

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 at an air flow rate of 100 mL/min on Tenax and approx. 100 L at an air flow rate of 0.8 L/min on silica gel coated with DNPH (2,4-dinitrophenylhydrazine).

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

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

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

All other substances – insofar as 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 toluene.

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

Quality assurance

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

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

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

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

The expanded measurement uncertainty U for the analytical determination of all volatile organic compounds, including the test chamber method, is estimated to 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.