TÜVRheinland®	List of Criteria	Mattresses
Test specification: 2 PfG S 0135/03.14	Keywords: • Emission tested • Tested for harmful substances • Low odour	Creation date: 08.2013 Revision date: 07.2014
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1. Purpose

The present criteria catalogue for the product group "Mattresses" includes the requirements for mattresses regarding possible and relevant emission/contaminant loads. After successful testing and evaluation by TÜV Rheinland LGA Products GmbH, the products may be awarded with a certification mark.

Based on the positive test and considering the Testing and Certification Regulations of TÜV Rheinland LGA Products GmbH (TRLP), either the certification mark "LGA-tested for contaminants" or, alternatively, the TÜV Rheinland certification mark "TÜV Rheinland Certified" - keyword: "Tested for harmful substances" can be awarded. Within the scope of awarding the "TÜV Rheinland Certified" signets as well as the "LGA-tested for contaminants" eco-label, both the defined requirements of the emission parameter [volatile organic compounds (VOC), odour (RAL-GZ 430)] and the demands of the material specifications must be met in a complete examination. As part of the complete examination and if the "TÜV Rheinland Certified" signet is selected, the keyword "Emission tested" can be awarded in addition to the keyword „Tested for harmful substances".

If the mattress is subject to an additional odour test according to DIN ISO 16000-28 and/or VDI 4302, then the keyword "Low odour" may be awarded with the "TÜV Rheinland Certified" label. An award with the latter keyword is only possible in combination with the keyword "Tested for harmful substances" and the associated requirements. If the keyword "Low odour" is awarded, the mattress must undergo a quarterly verifying surveillance test.

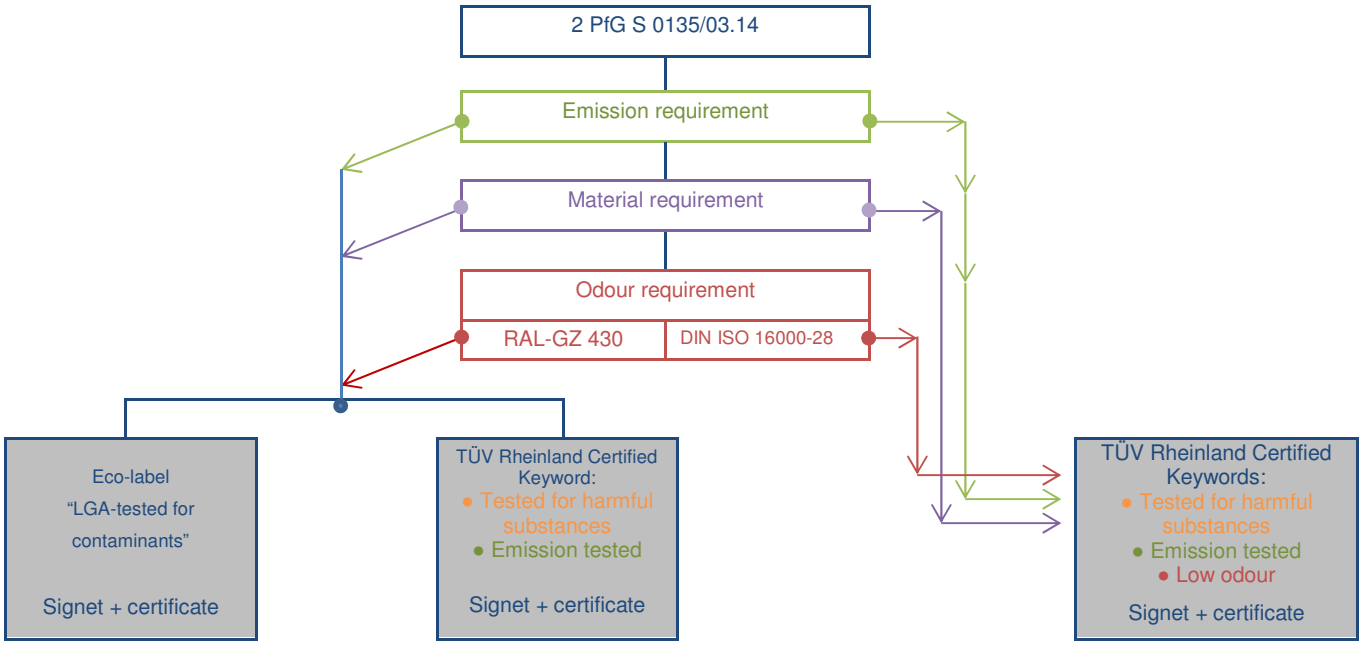
The definition of the test parameters was made considering the decisive state-of-the-art technology, existing legal requirements as well as the relevance of a contaminant load with reference to a potential exposure effect. The testing of a product refers exclusively to the designated test parameters, a comprehensive statement about the marketability as well as other relevant aspects on the safety of the product cannot be made.

Certification and labelling of a mattress with the aforementioned labels and keywords is only possible if the polyurethane foam/foams contained in the mattress have been separately tested according to the current test specification of these materials. If the PUR foams used are already certified according to the current test specification, the initial test is not required before examination of the complete mattress.

The mattress can only be awarded with aforementioned test marks if, in addition to the evaluation of emissions and harmful substances, also the fitness for use and the product safety is taken into account in the scope of the certification process. After assessment of an expert from TRLP, the product must be free from any obvious defects in terms of usability and safety. The obligation of the manufacturer regarding the declaration of conformity in order to maintain existing legal requirements or normative product directives remains unaffected.

The following flowchart shows the possibilities of the label award taking into account the corresponding partial test sample aspects.

Fig. 1



2. Scope of Application

The following test and certification requirements apply to mattresses made up of polyurethane, latex and innersprings, coconut core, horsehair, mattress covers as well as sleeping mats and neck pillows made up of various synthetic materials.

3. Basics

The requirements of this list of criteria and the implementing rules were set and defined in consideration of the indexed and literature accessible documents listed below.

The following test specification and implementing rules have been considered for the generation of the relevant criteria catalogue (applicable rules are marked):	
Act on the provision of products on the market (product safety law - ProdSG), ProdSG, date of issue: 08.11.2011; Product Safety Act of 8. November 2011 (Federal Law Gazette I page 2179; 2012 I p. 131).	☒
Food, Commodities and Feed Code (Food and Feed Code – LFGB) in the version published on 26.04.2006 (Federal Law Gazette. I p. 945), last amended by Article 12 of the law from 26.02.2008 (Federal Law Gazette I p. 215).	☒
Commodities Regulation in the version published on 23.12.1997 (Federal Law Gazette 1998 I p. 5), recently changed by Regulation from 23.09. 2009 (Federal Law Gazette I p. 3130).	☒
Chemical Prohibition Ordinance (ChemProhDecree) Regulation on bans and restrictions on the marketing of dangerous substances, preparations and products under the Chemical Act in the version promulgated on 13. June 2003, Federal Law Gazette I p. 867, last amended on 23.12.2004, Federal Law Gazette I p. 3855.	☒
Regulation (EC) No. 1907/2006 (REACH) OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Annex XVII on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing an European Chemicals Agency, amending Directive 1999/45/EC and repealing Regulation (EEC) No. 793/93 of the Council, the Commission Regulation (EC) No. 1488/94, Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.	☒
REGULATION (EC) No. 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16. December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006.	☒
Directive 2004/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21. April 2004 on the limitation of emissions of volatile organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC.	☒
Regulation (EC) No. 528/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22. May 2012 concerning the making available on the market and use of biocidal products.	☒
DIRECTIVE 2002/61/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19. July 2002 amending for the nineteenth time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (azocolourants).	☒
TVOC concept of the ad hoc working group of members of the Indoor Air Hygiene Commission (IRK) of the Federal Environment Agency and the highest health authorities of the countries (ad hoc working group IRK/AOLG).	☒

Guide values for indoor air of the ad hoc working group IRK/AOLG (RW I / RW II) taking into account the current release status.	☒
BGA News Service 19/77 of 12.10.1977. / Bundesgesundheitsbl. – Gesundheitsforsch. – Gesundheitsschutz Evaluation for formaldehyde in indoor air 7:2007.	☒
AgBB, Committee for health-related evaluation of building products, approach to health-related evaluation of emissions of volatile organic compounds (VOC and SVOC) from building products, status 2012.	☒
Oeko-Tex 100 Standard, Certification system for textile raw materials, intermediate and end products in the current version.	☒
DIN EN 717-1 2005-01 Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission according to the test chamber method.	☒
DIN EN 71-3: 2012-05 Safety of toys – Part 3: Migration of certain elements; German Version EN 71-3:2012.	☒
DIN ISO 16000-3 Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – Active sampling method (ISO 16000-3:2011).	☒
DIN ISO 16000-6 Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID (ISO 16000-6:2011).	☒
DIN ISO 16000-9 2008-04 Indoor air – Part 9: Determination of the emission of volatile organic compounds from building products and furnishing – Emission test chamber method (ISO 16000-9:2006); German version EN ISO 16000-9:2006.	☒
DIN EN ISO 16000-11 2006-06 Indoor air – Part 11: Determination of the emission of volatile organic compounds from building products and furnishing – Sampling, storage of samples and preparation of test specimens.	☒
DIN ISO 16000-28 Indoor air –Part 28: Determination of odour emissions from building products using test chambers (ISO/DIS 16000-28:2010).	☒
VDI 4302 Sheet 1 2012-05 Sensory testing of indoor air and determination of odour emissions from building products.	☒
VDI 3484 Sheet 2 2001-11 Gaseous ambient air measurements – Indoor-air pollution measurements – Measurement of the formaldehyde concentration with the acatylacetone method.	☒
DIN 38414-S4 German standard methods for the examination of water, waste water and sludge; sludge and sediments (group S); determination of leachability by water (S 4).	☒

DIN EN ISO 11885 Water quality –Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885:2007); German version EN ISO 11885:2009.	☒
ZEK 01.1-08 Testing and validation of "polycyclic aromatic hydrocarbons (PAH)" in the course of GS-Mark certification.	☒
Greenguard GGTM.P066.R8 2008-10 Standard Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings using Dynamic Environmental Chambers.	☒

4. Required Tests, Documents and Certificates

A_Material components

In the scope of the certification process, the applicant / manufacturer has to provide complete information regarding all installed or used materials and components, including information of all sources of materials (supplier companies) of the used materials / components. A material list must be completed by the applicant / manufacturer in terms of materials / components used. Furthermore, the applicant / manufacturer confirms in a manufacturer's declaration that both halogenated plastics (e.g. PVC) and halogenated flame retardants as well as compounds listed under Point 11. have not been used as structural components. Along with a manufacturer's declaration, the applicant / manufacturer can confirm the non-usage of biocidal treatment on cover materials (refer to Point 6.2.9) as well as using chemicals for moth protection (pyrethroides, refer to Point 6.2.5). In case of a present manufacturer's declaration, TRLP reserves the right to suspend the active testing of these parameters, but can also demand a selective test of these parameters.

The fiber composition according to the valid Textiles Labelling Act has to be additionally specified for textiles. If valid test certificates according to OEKO-TEX Standard 100 or a comparable rating system is available for the used textiles, TRLP can do without a full examination of the materials, recognize the submitted test certificates or, alternatively, test selective parameters of these materials. In the case of used materials and components that are not covered by these test requirements, TRLP reserves the right to carry out more appropriate material-typical examinations.

B_Mattress cores

For the certification of a mattress it must be ensured that the used PUR foams meet the requirements of the "LGA-tested for contaminants" certificate, product group "PUR foams for mattresses" regarding all emission parameters. A separate emission test of the used foams is required if no valid certificates according to "LGA-tested for contaminants" are available.

As part of the safety assessment of the article to be certified, the holder must provide a declaration of conformity that the legal and/or normative product guidelines / standards are taken into account or are maintained.

5. Basics – Emission Testing

The emission test can alternatively be performed by method A or method B. It is important to note that in the scope of an initial examination test strategy A should be applied. In the course of periodic surveillance tests on already certified products, alternatively method A or method B can be used.

- Test method A

Test method A - Indoor air specific test approach	The testing in the test chamber is performed in accordance with the test concept of the AgBB testing scheme "Health-related Evaluation Procedure for Volatile Organic Compound Emissions (VOC and SVOC) from Building Products " [1]		
Test chamber conditions	Test chamber-based air exchange rate	n_{PK}	$n = 0.3\ h^{-1} \pm 0.01\ h^{-1}$
	Relative air humidity	r.h.	50 % ± 3 %
	Temperature	T_{PK}	23 °C ± 1 °C
	Size of test chamber	V_{PK}	25 m^3
	Loading	L	1 complete mattress

- Test method B

Test method B - Area-specific test approach	Testing in the test chamber is performed in accordance with DIN EN ISO 16000-9: Indoor air pollution – Part 9: Determining the emissions of volatile organic compounds from building materials and furnishings – Emission test chamber method (ISO 16000-9:2006); German version EN ISO 16000-9:2008. [2]		
Test chamber conditions	Area-specific air exchange rate	$q_{fl.}$	$q_{fl.} = n / L = 0.5\ m^3/(m^2 \cdot h) \pm 0.05\ m^3/(m^2 \cdot h)$
	Relative air humidity	r.h.	50 % ± 3 %
	Temperature	T_{PK}	23 °C ± 1 °C
	Size of test chamber	V_{PK}	1 – 3 m^3

Quantified test chamber concentrations resulting from the area-specific test approach are converted in unit-specific emission rates and these are recalculated into indoor air concentrations in a model room taking into account the horizontal mattress surface [length x width, front and back, no consideration of the circumferential area]. The conversion of the additionally resulting VOC indoor air pollution is based on the following assumptions:

Parameter		Dimension	Value
Model room volume	V_{MR}	m^3	25
Air exchange rate	n_{MR}	h^{-1}	0.3
Emission duration	t_{MR}	h	72, 168

The generated indoor air concentrations based upon test method A or correspondingly to modelled indoor air concentrations according to test method B are used as evaluation basis.

6. Guidelines Limits – Emission and Material Testings

6.1.1 Formaldehyde Emission

Analytical method	Based on DIN EN 717-1 [3] or according to DIN ISO 16000-3 [4]

Test method	**A or B**
Requirement after max. 7 days	**Permissible (modelled) test chamber concentration**
	≤ 10 µg/m³ [≤ 0.008 ppm]

6.1.2 Emission of Volatile Organic Compounds (VOC) [1]

Analytical method	Based on DIN ISO 16000-6 [5]

Requirements	**Permissible (modelled) test chamber concentration**		
CMR substances [2] after 3 days			
Category 1A carcinogens (Carc. 1A)	≤ 1	µg/m³	(total)[9]
Category 1B carcinogens (Carc. 1B)	≤ 1.5	µg/m³	(total)[9]
Germ-cell mutagens of Category 1B (Muta. 1B) and compounds toxic to reproduction of Category 1A (Repr. 1A) and 1B (Repr. 1B)	≤ 2.5	µg/m³	(total)[9]
Carcinogens, mutagens and compounds toxic to reproduction of Category 2 [3]	≤ 3.5	µg/m³	(total)[9]
CMR substances [2] after max. 7 days			
Category 1A carcinogens (Carc. 1A) and 1B (Carc. 1B)	≤ 1	µg/m³	(total)[9]
Germ-cell mutagens of Category 1B (Muta. 1B) and compounds toxic to reproduction of Category 1A (Repr. 1A) and 1B (Repr. 1B)	≤ 1	µg/m³	(total)[9]
Carcinogens, mutagens and compounds toxic to reproduction of Category 2 [3]	≤ 1.5	µg/m³	(total)[9]
Volatile organic compounds after max. 7 days			
Tetramethylsuccinodinitrile (TMSN)	≤ 2.5	µg/m³	
Styrene	≤ 6.5	µg/m³	
Substances classified as acutely toxic acc. to Category 1, 2 and 3 (Acute Tox. 1, 2, 3), or specific target organ toxic acc. to Category 1 (STOT single exposure 1, STOT repeated exposure 1) [4]	≤ 3.5	µg/m³	(total)[9]
Substances classified in Annex VI of EC Regulation No. 1272/2008 (GHS) as inhalant allergens (Category 1) and skin allergens (Category 1) or in TRGS 907 or MAK and BAT value lists as sensitising [5]	≤ 3.5	µg/m³	(total)[9]

Halogenated aromatic hydrocarbons	≤ 2.5	µg/m³	(total)[9]
Carbon disulphide [6]	≤ 6.5	µg/m³	
N-nitrosamines [6]	< 1	µg/m³	each single compound
∑ of volatile organic compounds in the retention range C_6 – C_{16} (TVOC)[7,9] and > C_{16} – C_{22} (TSVOC)[8, 9]	≤ 120	µg/m³	(total)[9]
Of this sum D4, D5, D6 siloxanes [10]	≤ 20	µg/m³	(total)[9]
R-value [11]		≤ 1	
∑ VOC without LCI [12]	≤ 15	µg/m³	(total)[9]

6.1.3 Odour Emission

In the scope of awarding the label "LGA-tested for contaminants" or "TÜV Rheinland Certified – keywords: Tested for harmful substances / emission tested", at the minimum, an odour evaluation of the mattress must be carried out according to the requirements of RAL-GZ 430 [6] after max. 7 days. When this odour evaluation is selected, the odour average value 3.0 [distinct, non-annoying odour] may not be exceeded. An odour evaluation based on DIN ISO 16000-28 [7] or VDI 4302 [8] is also permitted but not required. Exclusively the acceptance of the tested mattress is evaluated with an acceptance guideline limit to be compiled with of ≥ - 0.4 ± 0.2. The odour evaluation of the mattress must be carried out after a max. 7-day conditioning period in the emission test chamber.

If the mattress is to be awarded with the additional keyword "Low odour" under the "TÜV Rheinland Certified" logo, the following requirements must be met:

(1) The defined requirements regarding emission parameters listed under Point 6.1.1 und 6.1.2 must be met.

(2) The odour impression when unpacking the mattress may not exceed the odour average value of Δ = 2.0 determined by the group of probands (minimum number of 7 probands), [evaluation algorithm according to the specification of RAL-GZ 430].

(3) As part of the test chamber examination, an evaluation of the mattress in accordance with the requirements of DIN ISO 16000-28 [7] or VDI 4302 [8] must be implemented. To ensure that mattresses awarded with the keyword "Low odour" are perceived as olfactory or little odour intensive after an immediate use by the end user, the test must already be carried out after a conditioning period $t_{conditioning}$ = 24 h.

Analytical method	Method 1 Based on RAL-GZ 430 [6] (five-grade scale)	Method 2 Based on DIN ISO 16000-28 [7]

Requirements	**Odour in the test chamber**	**Benchmark**		
	After max. 7 days	**After 24 h**		
	Max. level 3 (distinct, non-annoying)	Intensity	Hedonic	Accept-ance

Requirement, method 2	**Benchmark**		
Parameter	Perceived intensity [pi]	Hedonic	Acceptance
Value	≤ 5	≥ 0	≥ - 0.1
Evaluation accuracy [1)]	$p_i = \pm 2$	$p_H = \pm 1$	$p_A = \pm 0.2$
Standard deviation [2)]	$S_I = \leq 3$ pi	$S_H \leq 1.5$	$S_A \leq 0.4$
Scale	0 – 15 [3)]	-4 ≤ 0 ≤ +4	-1 ≤ 0 ≤ +1
Scale resolution	± 0.5 pi	1	0.05
Group of probands	$N_I = 8$	$N_H = 8$	$N_A = 15$
Qualification of test person	Trained	Untrained	Untrained

1) 90% confidence interval

2) If the permissible standard deviation is exceeded, the group of probands must be adapted and enlarged by additional probands.

3) pi = 20 mg acetone / m³ air (odour threshold concentration), 15 pi = 320 mg acetone / m³ air, linear increase in the concentration range.

In the scope of upcoming and periodically recurrent surveillance tests on a product that has been awarded with the keyword "Low odour", a test according to the requirements of RAL-GZ 430 [6] is permissible, if at the initial examination, a correlation between the values of the odour determination according to DIN ISO 16000-28 [7] and VDI 4302 [8] and RAL-GZ 430 [6] was generated. Testing according to RAL-GZ 430 [6] is considered as passed if the determined odour value does not exceed the value 2.0. If the correlation shows that the generated and defined requirements of DIN ISO 16000-28 [7] and VDI 4302 [8] are adhered to but exceed the odour value 2.0 according to RAL-GZ 430 [6], then in each case, an odour evaluation based on DIN ISO 16000-28 [7] and VDI 4302 [8] has to be performed as part of the surveillance test.

The frequency and the number of annually required surveillance tests are bound to the results of the initial odour assessment. In case of very low values for perceived intensity, and hedonic and acceptance values distinctly ranging above below defined guideline values, it is up to the tester to define reasonable surveillance testing intervals. In a worst case scenario a quarterly test of the "Low odour" keyword awarded product is indicated. The following table provides information on decision guidance for defining necessary surveillance intervals.

Perceived intensity	Hedonic	Acceptance	Proposed monitoring interval(s)
0 pi ≤ x pi ≤ 2 pi	4 ≥ x ≥ 3	+1 ≥ x ≥ 0.5	Annual testing
3 pi ≤ x pi ≤ 4 pi	3 > x ≥ 2	0.5 > x ≥ 0.2	Semi-annual testing
5 pi	2 > x ≥ 0	0.2 > x ≥ - 0.1	Quarterly test

If one of the defined *horizontal* requirements for the evaluation parameters "Perceived intensity", "Hedonic" and/or "Acceptance" is not complied with, then the monitoring interval of the next higher monitoring frequency is mandatory.

6.2 Material Testing [13]

6.2.1 Flame Retardant

Analytical method	Extraction, determination by means of GC-MS

Test parameters	Materials for testing	Requirements
Tris(2-chloroethyl)phosphate (TCEP)	• Transversal section of cover materials (respectively winter side / summer side) • PUR foams • Latex	≤ 10 mg/kg
Tris(2-chloropropyl)phosphate (TCPP)		≤ 50 mg/kg
Tris(1,3-dichloro-2-propyl)phosphate (TDCP)		≤ 50 mg/kg

6.2.2 Tin-Organic Compounds

Analytical method	Derivatization, extraction, determination by means of GC-MS

Test parameters	Materials for testing	Requirements
Total of tributyltin (TBT) and dibutyltin (DBT)	• Cover materials (synthetic fibers)	≤ 0.05 mg/kg
	• PUR foams	≤ 0.1 mg/kg
Total of other tin-organic compounds [14]	• Cover materials (synthetic fibers)	≤ 0.5 mg/kg
	• PUR foams	≤ 0.5 mg/kg

6.2.3 Phthalate Plasticizers

Analytical method	Extraction, determination by means of GC-MS

Test parameters	Materials for testing	Requirements
Di-ethylhexylphthalate (DEHP) Di-n-butylphthalate (DBP) Benzylbutylphthalate (BBP)	• Cover materials (synthetic fibers)	≤ 0.1 % (total)
	• PUR foams	≤ 0.1 % (total)
Di-iso-nonylphthalates (DINP) Di-iso-decylphthalates (DIDP) Di-n-octylphthalate (DNOP)	• Cover materials (synthetic fibers)	≤ 0.1 % (total)
	• PUR foams	≤ 0.1 % (total)
Di-iso-butylphthalate (DIBP) Further C_6-C_{11}-di-n/iso phthalates [15] Bis(2-methoxyethyl)phthalate (DMEP)	• Cover materials (synthetic fibers)	each ≤ 0.1 %
	• PUR foams	each ≤ 0.1 %

6.2.4 Optical Brighteners

Analytical method	UV (ultraviolet) light

Test parameters	Materials for testing	Requirement
Optical brighteners	Outer fabric of the cover material	Not detectable

6.2.5 Moth Protection

Analytical method	Extraction, determination by means of GC-MS

Test parameters	Materials for testing	Requirement
Pyrethroides	Cover materials made up of animal fibers	Not treated, i.e. ≤ 0.1 mg/kg (each single compound) ≤ 1 mg/kg (total)

6.2.6 Heavy Metals

Analytical method	Extraction with acid sweat solution (solution 2) according to ISO 105-E04, analysed using ICP-OES, ICP-MS, AAS, Chrome VI according to DIN ISO 17075

Test parameters	Materials for testing	Requirements
Arsenic	Transversal section of cover materials (respectively winter side / summer side)	≤ 1 mg/kg
Antimony		≤ 5 mg/kg
Lead		≤ 1 mg/kg
Cadmium		≤ 0.1 mg/kg
Chrome (total)		≤ 2 mg/kg
Mercury		≤ 0.02 mg/kg
Nickel		≤ 4 mg/kg

6.2.7 Azo Dyes

Analytical method	According to § 64 LFGB B 82.02-2 (DIN EN 14362-1/06.05) and § 64 LFGB B 82.02-4 (DIN EN 14362-2/06.05)

Test parameters	Materials for testing	Requirement
The amines listed in EU Regulation 2002/61/EC	Dyed cover materials	Not detectable / not used (detection limit < 5 mg/kg)

6.2.8 Dispersion Dyes [16]

Analytical method	Extraction, determination by means of HPLC-DAD/MS

Test parameters	Materials for testing	Requirement
In accordance with Oeko-Tex Standard 100 requirement (Product Class I / II) or as per Decision 2002/371/EC for the issue of an eco-label for textile products	• Dyed cover materials • Fleeces	Not detectable / not used (verification given by certificate)

6.2.9 Biocides

Analytical method	Extraction, determination by means of GC-MS

Test parameters	Materials for testing	Requirement
Biocides according to the Oeko-Tex Standard 100 requirement (Product Class I / II)	• Mattress cores, cover materials, fleeces made up of animal or vegetable fibers • Latex • Coconut materials • Horsehair	Not treated, i.e. ≤ 0.1 mg/kg (each single compound) ≤ 1 mg/kg (total)

6.2.10 pH Value

Analytical method	According to DIN EN ISO 3071

Test parameters	Materials for testing	Requirements
pH value	• Cover materials • Fleece	4.0 – 7.5

6.2.11 Chlorine-Organic Carrier

Analytical method	Extraction, determination by means of GC-MS

Test parameters	Materials for testing	Requirement
Chlorobenzene and toluene	Cover materials	≤ 2 mg/kg

6.2.12 Sweat Resistance

Analytical method	According to § 64 LFGB, B 82.10-1

Test parameters	Materials for testing	Requirement
Sweat resistance	Dyed cover materials	3 – 4

6.2.13 Saliva Resistance

Analytical method	According to § 64 LFGB, B 82.10-1

Test parameters	Materials for testing	Requirement
Saliva resistance	Dyed cover materials	3 – 4

For Indices, see Appendix

7. Factory Inspection

An (initial) inspection of the production plant is to be carried out as part of the certification process.

8. Surveillance Tests

Monitoring checks are to be carried out once a year as minimum requirement on selected certified products to manage or extend the certificate, or alternatively, a new inspection of the production plant is required. A monitoring check can take the form of a full or partial test using selected test parameters. The number of mattresses to be tested is coupled to the production volume as well as to the model types contained in a product line and is defined when the surveillance contract is concluded. If no certification proof according to 2 PfG_S_0089/03.12 is available, the used PUR foams of the mattress are subject to a separate, additional monitoring test. This monitoring frequency of the foams is based on the evaluation results of the completely assembled mattress.

9. Sampling, Packaging and Shipping

The mattresses for testing should be packaged in the same way as for a standard commercial delivery. This also applies to the time interval between production and packaging. In the case of the first testing of a mattress, a maximum of 7 days is allowed between the time of packaging and arrival of the specimen at TRLP (TÜV Rheinland LGA Products GmbH). For monitoring tests, certified mattresses can be taken directly from retail stores.

10. Manufacturer's Information

For the purposes of certification the applicant must send details of all materials built in or used, including all alternative suppliers (materials list). In a Manufacturer's Declaration the manufacturer confirms that no halogenated plastics (e.g. PVC) or halogenated flame retardants or any of the compounds named below have been used as structural components.

11. Exclusion of Chemicals

The following substances and substance classifications may not be used as constituents in the used materials, components and used formulations (e.g. adhesives). Their exclusion must be confirmed in a manufacturer's declaration and, if necessary, justify and explain the imperative necessity of its technical use.

EXCLUSION OF CHEMICALS

☝	All materials used shall comply with EU or national law statutory requirements of
❖	the Chemicals Prohibition Ordinance (ChemVerbotsV),
❖	the Biocides Regulation (EU) No. 528/2012 (BiozidV),
❖	Regulation (EC) No. 1907/2006 [1].
☝	The use of halogenated plastics (e.g. PVC) in the *packaging* of the product is not permissible. The non-use of halogenated plastics in the packaging is confirmed.
☝	The following substances and substance classes are not used as constitutional/structural components in the production of individual materials, formulations, components etc.:
	Halogenated compounds and their polymers
❖	Halogenated foaming agents (e.g. CFCs)
❖	Halogenated flame retardants (fluorine, chlorine, bromine, iodine derivatives)
❖	Halogenated plastics (e.g. PVC)
	Acute or chronic toxic and toxicologically relevant compounds
❖	CMR compounds: CMR = carcinogenic (C), mutagenic (M), reprotoxic (R) under EC classification as per Annex VI of Regulation (EC) No. 1272/2008 (GHS) and according to national classification as per TRGS 905 or MAK and BAT value list of the German Research Foundation (DFG), (Categories 1, 2 and 3, Pregnancy Groups A and B).
❖	Substances classified in Annex VI of EC Regulation No. 1272/2008 (GHS) as acutely toxic of Categories 1, 2 and 3, as specific target organ toxic for single or repeated exposure of Category 1 and 2 or according to Paragraph 3 Points 6. and 7. Classified by the Ordinance on Hazardous Substances (GefStoffV) as highly poisonous (T+) or poisonous (T).
❖	Substances classified in Annex VI of EC Regulation No. 1272/2008 (GHS) as inhalant allergens (Category 1) and skin allergens (Category 1) or in TRGS 907 or MAK and BAT value lists as sensitising.
❖	Substances that, according to the criteria of Annex XIII of EC Regulation No. 1907/2006 are persistent, bioaccumulative and toxic or very persistent, very bioaccumulative and very toxic, identified as such or are already included in Annex XIV of the aforementioned Regulation (SVHC, Substances of Very High Concern, www.echa.eu). [1]
❖	Phthalates, which are limited under EC Regulation No. 1907/2006/EC or were identified as SVHC and other representatives: Di-ethylhexyl phthalate (DEHP), di-n-butyl phthalate (DBP), benzyl butyl phthalate (BBP),di-iso-nonyl phthalates (DINP), di-iso-decylphthalates (DIDP), di-n-octyl phthalate (DNOP), di-iso-butyl phthalate (DIBP), bis(2-methoxyethyl) phthalate (DMEP), di-iso-hexylphthalates (DIHexP), di-iso-heptylphthalates (DIHeP), di-iso-octylphthalates (DIOP), di-iso-undecyl phthalates (DIUP), di-n-hexylphthalate, di-n-heptylphthalate, di-n-nonyl phthalate, di-n-decyl phthalate, di-n-undecylphthalate
❖	Compounds that have been identified according to the present knowledge as endocrine disruptors [compare this: Annex II of the document "State of the Science of Endocrine Disrupting Chemicals, WHO, 2012"], http://www.who.int/ceh/publications/endocrine/en/
❖	Azo dyes (the amines listed in EU Regulation 2002/61/EC)
❖	Carcinogenic, mutagenic, reprotoxic and potentially sensitising dyes according to Oeko-Tex Standard 100 requirement (Product Class I / II) or as per Decision 2002/371/EC for the award of an eco-label for textile products.
	Preservatives and biocides
❖	Biocides, which are not listed in Annex I of EC Regulation No. 528 / 2012 or are not permitted according to the requirements of the regulation.
❖	Biocides, which are prohibited according to Oeko-Tex Standard 100 requirement (Product Class I / II).
❖	Class 1a pesticides acc. to: WHO recommended classification of pesticides by hazard classified as 1 a (extremely hazardous).
❖	Class 1b pesticides acc. to: WHO recommended classification of pesticides by hazard classified as 1 b (highly hazardous).
❖	Pyrethroides
[1]	Germany as well as Denmark, Austria, France, Belgium, Sweden and Norway take the view that a one-time produced product does not lose its product character when it is installed in a composite product. The interpretation "Once a product is always a product" applies to

each individual product that fulfills the product definition within a composite product. Consequently, the individual product is the reference value for the 0.1% threshold that triggers the information and reporting requirements relating to candidate substances (SVHC substances).

☝ TRLP must be notified of any changes in the materials used including change of component or a change of supplier. In the event of a change of component or a change of supplier, the certified product might require to be retested. A material list / recipe list must be completed for the initial inspection and made available to TRLP.

If the products are intended for the US market – respectively for the Californian market – the following requirements on the exclusion or non-use of "critically assessed chemicals" must be adhered to.

The following substances and substance classes are not used as constitutional/structural components in the production of individual materials, formulations, components etc.:

➢ Chemicals that are persistent, bioaccumulative and toxic in accordance with EPCRA, Section 313, Final Rule of PBTs, Table 1 and 3; http://www.gpo.gov/fdsys/pkg/FR-1999-10-29/pdf/99-28169.pdf

➢ Carcinogens according to

➢ • the listing by IARC [International Agency for Research on Cancer]; IARC Monographs, Volume 100, Review of Human Carcinogens (25.07.2012) in the current version

➢ • California Proposition 65, http://oehha.ca.gov/prop65/prop65_list/files/P6509272013.pdf

➢ • National Toxicology Program, Report on Carcinogens (RoC), Part A and B, http://ntp.niehs.nih.gov/ntp/roc/twelfth/roc12.pdf

➢ Reprotoxic compounds according to the

➢ • California Proposition 65, http://oehha.ca.gov/prop65/prop65_list/files/P6509272013.pdf

Indices to 1. Emission Testings and 2. Material Testings

1 VOC = volatile organic compounds

2 CMR = carcinogen (C), mutagen (M), reprotoxicant (R) under EC classification as per Annex VI of EC Regulation No. 1272/2008 (GHS) of Categories 1A, 1B and 2 and as per national classification TRGS 905 or MAK and BAT value list of the German Research Foundation (DFG), (Categories 1, 2 and 3 and Pregnancy Groups A and B)

3 The imposed requirement for the sum of CMR substances of Category 2 (or according to national requirement Category 3, Pregnancy Groups A and B) is not taken into account when evaluating the mattress. The quantified sum of CMR substances of Category 2 is initially classified only as supplementary information for the manufacturer for the validity period of this test specification. In the course of updating the test specification and taking into account the state-of-the-art technology, this parameter will be completely effective as an evaluation criterion.

4 Substances classified in Annex VI of Regulation (EC) No. 1272/2008 (GHS) as acutely toxic and specific target organ toxic or according to § 3 Points 6. and 7. classified by the Ordinance on Hazardous Substances (GefStoffV) as highly poisonous (T+) or poisonous (T). The CMR substances listed under Index [2] and the substances listed individually are not included since these are already limited.

5 The substances listed under Indices [2] and [3] and the individually listed substances are not included since these are already limited.

6 This is exclusively relevant for products made up of latex.

7 TVOC: total volatile organic compounds

8 TSVOC: total semi volatile organic compounds

9 In forming the corresponding totals, all individually quantified components are included with a test chamber concentration of ≥ 1 µg/m³. Insofar as possible concentrations of all individual compounds are quantified against authentic standard. Unidentified substances are quantified on basis of substance groups against substance-like compounds from this group.

10 D4 siloxane = octamethylcyclotetrasiloxane, D5 siloxane = decamethylcyclopentasiloxane, D6 siloxane: Dodecamethylcyclohexasiloxane. D4, D5 and D6 siloxane effects are ascribed as endocrine disruptors (inhibition of the secretion).

11 R-value = total of all R_i-values ($R = \sum C_i / LCI_i$, Lowest Concentration of Interest). The R-value is based on a model indoor room analysis and is used here as a guide valuation of the (modelled) test chamber concentrations.

12 VOC without LCI value: CMR substances according to Index 2 are excluded in the summation as these substances are already limited.

13 If OEKO-TEX Standard 100 certificates are available for the used cover fabrics, Points 6.2.1 to 6.2.3 and 6.2.6 (except for antimony determination) to 6.2.13 of the material testing can be omitted if the test parameters are covered by the OEKO-TEX Standard 100 certificate.

14 Total of butyltin, tetrabutyltin, octyltin, dioctyltin, tricyclohexyltin and triphenyltin

15 Di-iso-hexylphthalates (DIHexP), Di-iso-heptylphthalates (DIHeP), Di-iso-octylphthalates (DIOP), Di-iso-undecylphthalates (DIUP), Di-n-hexylphthalate, Di-n-heptylphthalate, Di-n-nonylphthalate, Di-n-decylphthalate, Di-n-undecylphthalate

16 Carcinogenic, mutagenic, reprotoxic and potentially sensitising dyes

List of Literature

[1] AgBB — Ausschuss zur gesundheitlichen Bewertung von Bauprodukten, Vorgehensweise bei der gesundheitlichen Bewertung der Emissionen von flüchtigen organischen Verbindungen (VOC und SVOC) aus Bauprodukten, Stand 2012; *Committee for health-related evaluation of Construction Products, approach to health-related evaluation of emissions of volatile organic compounds (VOC and SVOC) i Construction Products, status 2012.*

[2] DIN EN ISO 16000-9 — Innenraumluftverunreinigungen - Teil 9: Bestimmung der Emission von flüchtigen organischen Verbindungen aus Bauprodukten und Einrichtungsgegenständen - Emissionsprüfkammer-Verfahren (ISO 16000-9:2006); Deutsche Fassung EN ISO 16000-9:2008; *Indoor air pollution - Part 9: Determining the emissions of volatile organic compounds from building materials and furnishings – Emission test chamber method (ISO 16000-9:2006); German version EN ISO 16000-9:2008*

[3] DIN EN 717-1 — Holzwerkstoffe – Bestimmung der Formaldehydabgabe – Teil 1: Formaldehydabgabe nach der Prüfkammer-Methode; Deutsche Fassung EN 717-1:2004; *Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method; German version EN 717-1:2004*

[4] DIN ISO 16000-3 — Innenraumluftverunreinigungen – Teil 3: Messen von Formaldehyd und anderen Carbonylverbindungen in der Innenraumluft und in Prüfkammern – Probenahme mit einer Pumpe (ISO 16000-3:2011); *Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – Active sampling method (ISO 16000-3:2011).*

[5] DIN ISO 16000-6 — Innenraumluftverunreinigungen – Teil 6: Bestimmung von VOC in der Innenraumluft und in Prüfkammern, Probenahme auf Tenax TA®, thermische Desorption und Gaschromatographie mit MS oder MS-FID (ISO 16000-6:2011); *Indoor air – Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID (ISO 16000-6:2011)*

[6] RAL-GZ 430 — Allgemeine Güte- und Prüfbestimmungen für Möbel, Gütesicherung RAL-GZ 430 mit Güte- und Prüfbestimmungen für Schutz von Umwelt und Gesundheit, Ausgabe April 2008; *General quality assurance and test criteria for furniture, quality assurance RAL-GZ 430 with quality and test criteria for protection of environment and health, Edition April 2008*

[7] DIN ISO 16000-28 — Innenraumluftverunreinigungen – Teil 28: Bestimmung der Geruchsstoffemissionen aus Bauprodukten mit einer Emissionsprüfkammer (ISO/DIS 16000-28:2010); *Indoor air – Part 28: Determination of odour emissions from building products using test chambers (ISO/DIS 16000-28:2010)*

[8] VDI 4302 — Blatt 1, Geruchsprüfung von Innenraumluft und Emissionen aus Innenraummaterialien – Grundlagen, Mai 2012; *Sheet 1, Odour testing of indoor air and emissions from indoor materials – Fundamentals, May 2012*