Tarkett Limited (Marley Floors Ltd.)
Dickley Lane
ME17 2QX Lenham, Maidstone
UNITED KINGDOM

**Eurofins Product Testing A/S**
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Date
18 November 2013

# AgBB Test Report

## 1 Sample Information

| | |
|---|---|
| Sample identification | Safetred Universal |
| Batch no. | FV 1416 |
| Production date | 19/09/2013 |
| Product type | Flooring |
| Date when sample was received | 08/10/2013 |
| Testing (start - end) | 15/10/2013 - 12/11/2013 |

## 2 Evaluation of the Results

The tested product complies with the requirements of DIBt (October 2010) and AgBB(June 2012).

| **Parameter** | **Test after 3 days** | | **Test after 28 days** | |
|---|---|---|---|---|
| | **Concentration** mg/m³ | **Limit value** mg/m³ | **Concentration** mg/m³ | **Limit value** mg/m³ |
| **TVOC** | 0.6 | ≤ 10 | 0.2 | ≤ 1.0 |
| **TSVOC** | <0.005 | - | 0.02 | ≤ 0.1 |
| **R-value (dimensionless)** | 2 | - | 0 | ≤ 1 |
| **Total VOC without NIK** | 0.03 | - | <0.005 | ≤ 0.1 |
| **Total carcinogens** | <0.001 | ≤ 0.01 | <0.001 | ≤ 0.001 |
| **Formaldehyde** | - | - | 0.003 | ≤ 0.12 |

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# 3 Test Method

| **Method** | **Principle** | **Parameter** | **Quantification limit** | **Uncertainty** |
|---|---|---|---|---|
| AgBB Method (version June 2012), DIBt (version October 2010) | | | | |
| Internal method numbers: 9810, 9811, 9812, 2808, 8400 | GC/MS | VVOC, VOC, SVOC | 1 µg/m³ | 22% (RSD) |
| | GC/MS | TVVOC, TVOC, TSVOC | 5 µg/m³ | Um = 2 x RSD= 45 % |
| | HPLC | Volatile alde-hydes | 3 µg/m³ | |
| **Test chamber parameter** | | | | |
| Chamber volume, l 119 | Temperature, °C 23±1 | | Relative humidity, % 50±5 | |
| Air change rate, 1/h 0.5 | Loading ratio, m²/m³ 0.4 | | | |
| **Sample preparation** | | | | |
| Edges and back were covered with aluminum foil, and the sample was mounted into a frame in accordance with JIS A 1901. | | | | |
| **Deviations from the test method** | None | | | |

For detailed method description see: 5.3 Description of the applied test method

# 4 Results

## 4.1 Emissions Test after 3 Days

| | CAS No. | Retention time min | ID-Cat. | Concen-tration µg/m³ | NIK-value µg/m³ | R-value | Emission rate µg/(m²*h) | Toluene equivalent µg/m³ |
|---|---|---|---|---|---|---|---|---|
| **TVOC (C6-C16)** | | | | **590** | | | 740 | 150 |
| **VOC with NIK** | | | | | | | | |
| 1-Butanol | 71-36-3 | 2.61 | 1 | 9.4 | 3100 | 0.0030 | 12 | 2.8 |
| n-Heptane | 142-82-5 | 3.04 | 1 | 3.1 | 21000 | (<5) | 3.9 | 2.1 |
| 1,2-Propandiol * | 57-55-6 | 3.69 | 1 | 210 | 2500 | 0.083 | 260 | 35 |
| Toluene | 108-88-3 | 4.34 | 1 | 1.4 | 1900 | (<5) | 1.7 | 1.4 |
| Hexanal | 66-25-1 | 5.06 | 1 | 2.3 | 890 | (<5) | 2.9 | 1.1 |
| Butyl acetate | 123-86-4 | 5.40 | 1 | 2.2 | 4800 | (<5) | 2.7 | 1.1 |
| Cyclohexanone * | 108-94-1 | 6.99 | 1 | 19 | 410 | 0.048 | 24 | 6.4 |
| Phenol * | 108-95-2 | 8.47 | 1 | 7.6 | 10 | 0.76 | 9.5 | 4.5 |
| Dipropylene glycolmethylether * | 34590-94-8 | 9.00 | 1 | 5.1 | 3100 | 0.0016 | 6.3 | 1.9 |
| 2-Ethyl-1-hexanol | 104-76-7 | 9.20 | 1 | 8.5 | 540 | 0.016 | 11 | 8.0 |
| 2-Ethylhexanoic acid * | 149-57-5 | 10.33 | 1 | 8.9 | 50 | 0.18 | 11 | 2.6 |
| Butyldiglycol * | 112-34-5 | 11.27 | 1 | 300 | 670 | 0.45 | 380 | 72 |
| Texanol * | 25265-77-4 | 13.31 | 1 | 4.8 | 600 | (<5) | 6.1 | 4.2 |
| n-Tetradecane | 629-59-4 | 13.45 | 1 | 1.8 | 6000 | (<5) | 2.2 | 2.1 |
| Butylhydroxytoluene BHT * | 128-37-0 | 14.62 | 1 | 2.0 | 100 | (<5) | 2.4 | 2.6 |
| **R-value = ∑ $Conc_i/NIK_i$** | | | | | | 1.5 | | |
| **VOC without NIK** | | | | | | | | |
| Not identified * | - | 2.75 | 4 | 1.3 | - | - | 1.6 | 1.3 |
| Not identified * | - | 6.29 | 4 | 1.0 | - | - | 1.3 | 1.0 |
| Not identified * | - | 7.13 | 4 | 1.2 | - | - | 1.5 | 1.2 |
| Not identified * | - | 8.59 | 4 | 1.1 | - | - | 1.4 | 1.1 |
| m-Cresol * | 108-39-4 | 9.83 | 3 | 2.4 | - | - | 3.0 | 2.4 |
| Not identified * | - | 10.06 | 4 | 1.8 | - | - | 2.3 | 1.8 |
| Not identified * | - | 10.17 | 4 | 2.1 | - | - | 2.7 | 2.1 |
| Not identified * | - | 10.54 | 4 | 2.4 | - | - | 3.0 | 2.4 |
| Not identified * | - | 10.58 | 4 | 5.2 | - | - | 6.5 | 5.2 |
| Not identified * | - | 10.70 | 4 | 4.5 | - | - | 5.6 | 4.5 |
| 1-Nonanol * | 143-08-8 | 11.04 | 2 | 5.2 | - | - | 6.6 | 5.2 |
| Not identified * | - | 11.22 | 4 | 1.4 | - | - | 1.8 | 1.4 |
| Not identified * | - | 11.37 | 4 | 4.1 | - | - | 5.1 | 4.1 |

| | CAS No. | Retention time min | ID-Cat. | Concen-tration µg/m³ | NIK-value µg/m³ | R-value | Emission rate µg/(m²*h) | Toluene equivalent µg/m³ |
|---|---|---|---|---|---|---|---|---|
| Not identified * | - | 11.57 | 4 | 2.5 | - | - | 3.1 | 2.5 |
| Not identified * | - | 12.25 | 4 | 1.8 | - | - | 2.2 | 1.8 |
| Not identified * | - | 12.56 | 4 | 2.5 | - | - | 3.1 | 2.5 |
| Not identified * | - | 13.57 | 4 | 5.0 | - | - | 6.2 | 5.0 |
| Not identified * | - | 14.00 | 4 | 9.7 | - | - | 12 | 9.7 |
| Not identified * | - | 14.16 | 4 | 6.5 | - | - | 8.2 | 6.5 |
| **Total VOC without NIK** | | | | 27 | | | 33 | 27 |
| **Total VVOC (< C6)** | | | | 20 | | | 25 | 20 |
| 2-Propanol * | 67-63-0 | 1.73 | 2 | 20 | - | - | 25 | 20 |
| **Total SVOC (> C16)** | | | | < 5 | | | < 7 | < 5 |
| Not identified * | - | 15.34 | 4 | 1.6 | - | - | 1.9 | 1.6 |
| Not identified * | - | 15.74 | 4 | 3.2 | - | - | 4.0 | 3.2 |
| **Total Carcinogens** | | | | **< 1** | | | < 2 | < 1 |
| n.d. | - | - | - | < 1 | - | - | < 2 | < 1 |

n.d. Not detected
< Means less than
* Not a part of our accreditation. See 5.3.6 Accreditation
(<5) The R-value is not calculated for compounds with a concentration <5 µg/m³.

## 4.2 Emissions Test after 28 Days

| | CAS No. | Retention time min | ID-Cat. | Concen-tration µg/m³ | NIK-value µg/m³ | R-value | Emission rate µg/(m²*h) | Toluene equivalent µg/m³ |
|---|---|---|---|---|---|---|---|---|
| **TVOC (C6-C16)** | | | | **170** | | | 220 | 35 |
| **VOC with NIK** | | | | | | | | |
| 1,2-Propandiol * | 57-55-6 | 3.69 | 1 | 65 | 2500 | 0.026 | 81 | 11 |
| Cyclohexanone * | 108-94-1 | 7.01 | 1 | 7.1 | 410 | 0.017 | 8.8 | 2.3 |
| Phenol * | 108-95-2 | 8.48 | 1 | 2.7 | 10 | (<5) | 3.3 | 1.6 |
| 2-Ethyl-1-hexanol | 104-76-7 | 9.21 | 1 | 3.1 | 540 | (<5) | 3.9 | 2.9 |
| Butyldiglycol * | 112-34-5 | 11.27 | 1 | 100 | 670 | 0.15 | 130 | 24 |
| **R-value = ∑ $Conc_i/NIK_i$** | | | | | | **0.19** | | |
| **VOC without NIK** | | | | | | | | |
| Not identified * | - | 10.59 | 4 | 1.9 | - | - | 2.4 | 1.9 |
| Not identified * | - | 10.71 | 4 | 1.7 | - | - | 2.1 | 1.7 |
| Not identified * | - | 11.04 | 4 | 1.1 | - | - | 1.3 | 1.1 |
| Not identified * | - | 11.40 | 4 | 1.1 | - | - | 1.4 | 1.1 |
| Not identified * | - | 11.56 | 4 | 1.0 | - | - | 1.3 | 1.0 |
| Not identified * | - | 13.93 | 4 | 1.7 | - | - | 2.2 | 1.7 |
| Not identified * | - | 14.06 | 4 | 2.2 | - | - | 2.8 | 2.2 |
| Not identified * | - | 14.17 | 4 | 2.7 | - | - | 3.4 | 2.7 |
| Not identified * | - | 14.23 | 4 | 1.1 | - | - | 1.4 | 1.1 |
| **Total VOC without NIK** | | | | **< 5** | | | < 7 | < 5 |
| **Total VVOC (< C6)** | | | | < 5 | | | < 7 | < 5 |
| n.d. | - | - | - | < 5 | - | - | < 7 | < 5 |
| **Total SVOC (> C16)** | | | | **19** | | | 23 | 19 |
| Not identified * | - | 16.71 | 4 | 1.3 | - | - | 1.6 | 1.3 |
| Not identified * | - | 16.75 | 4 | 1.7 | - | - | 2.2 | 1.7 |
| Not identified * | - | 16.93 | 4 | 5.6 | - | - | 7.0 | 5.6 |
| Not identified * | - | 17.04 | 4 | 2.4 | - | - | 3.0 | 2.4 |
| Not identified * | - | 17.16 | 4 | 5.0 | - | - | 6.3 | 5.0 |
| Not identified * | - | 17.28 | 4 | 7.9 | - | - | 9.9 | 7.9 |
| Not identified * | - | 17.44 | 4 | 3.7 | - | - | 4.7 | 3.7 |
| **Total Carcinogens** | | | | **< 1** | | | < 2 | < 1 |
| n.d. | - | - | - | < 1 | - | - | < 2 | < 1 |
| **Volatile Aldehydes C1-C4 measured with DNPH-Method ( see 5.3.4)** | | | | | | | | |
| Formaldehyde | 50-00-0 | - | - | **3.2** | | - | 4.0 | - |

| | CAS No. | Retention time min | ID-Cat. | Concen-tration µg/m³ | NIK-value µg/m³ | R-value | Emission rate µg/(m²*h) | Toluene equivalent µg/m³ |
|---|---|---|---|---|---|---|---|---|
| Acetaldehyde | 75-07-0 | - | - | <3 | - | - | <4 | - |
| Propionaldehyd | 123-38-6 | - | - | <3 | - | - | <4 | - |
| Butyraldehyd | 123-72-8 | - | - | <3 | - | - | <4 | - |

n.d. Not detected
< Means less than
* Not a part of our accreditation. See 5.3.6 Accreditation
(<5) The R-value is not calculated for compounds with a concentration <5 µg/m³.

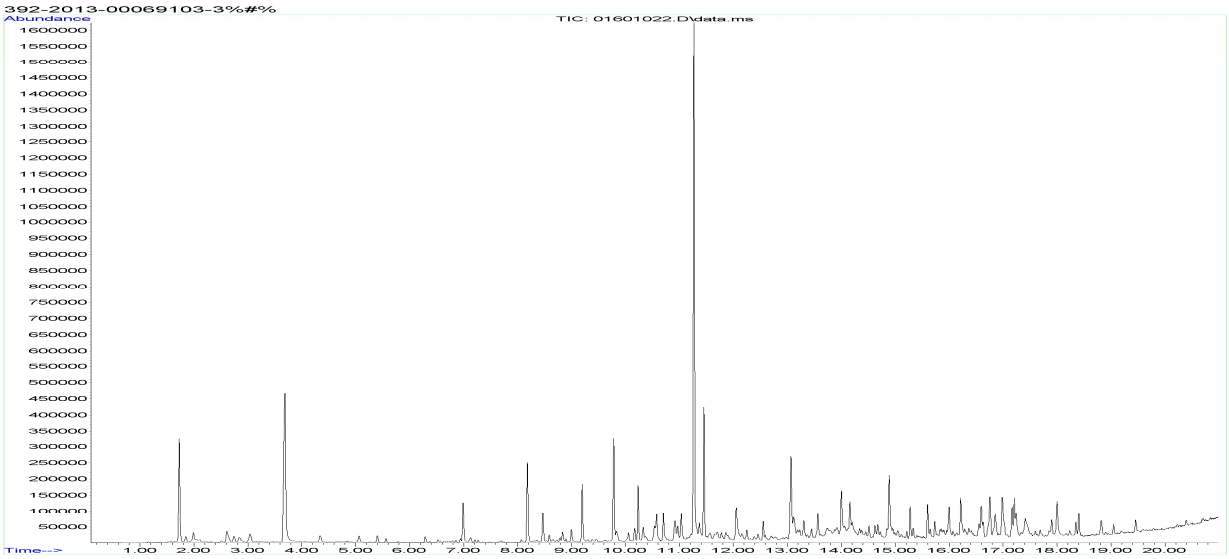
## Categories of identity:

1: Identified and specifically calibrated
2: Identified by comparison with a mass spectrum obtained from a library and supported by other information. Calibrated as toluene equivalent
3: Identified by comparison with a mass spectrum obtained from a library. Calibrated as toluene equivalent
4: Not identified. Calibrated as toluene equivalent

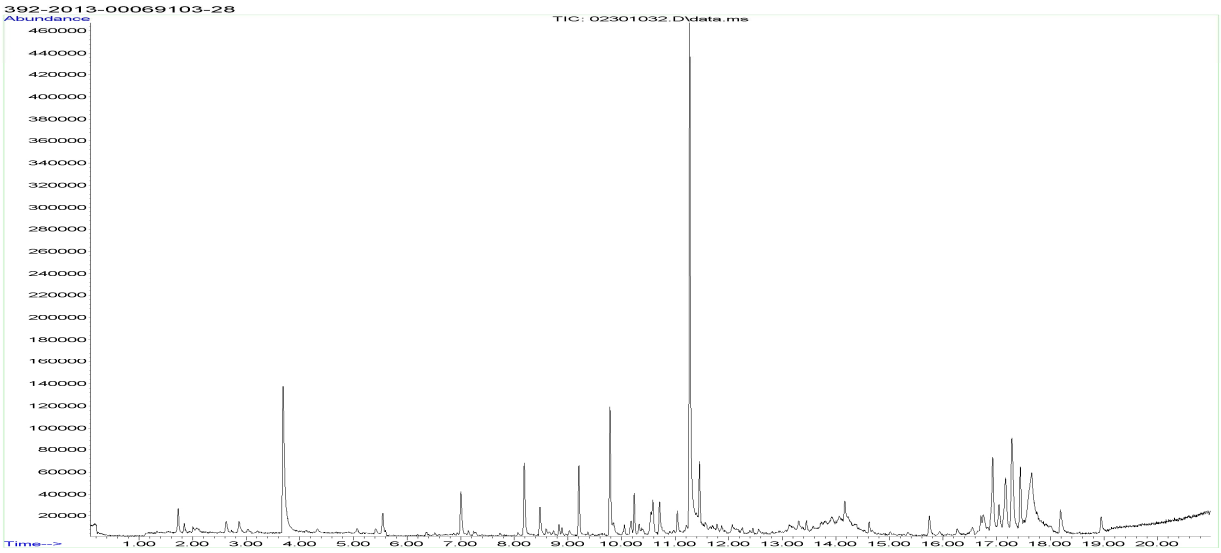
Dr. Arja Valtanen
Analytical Service Manager

## 4.3 Chromatograms

### 4.3.1 Chromatogram after 3 days

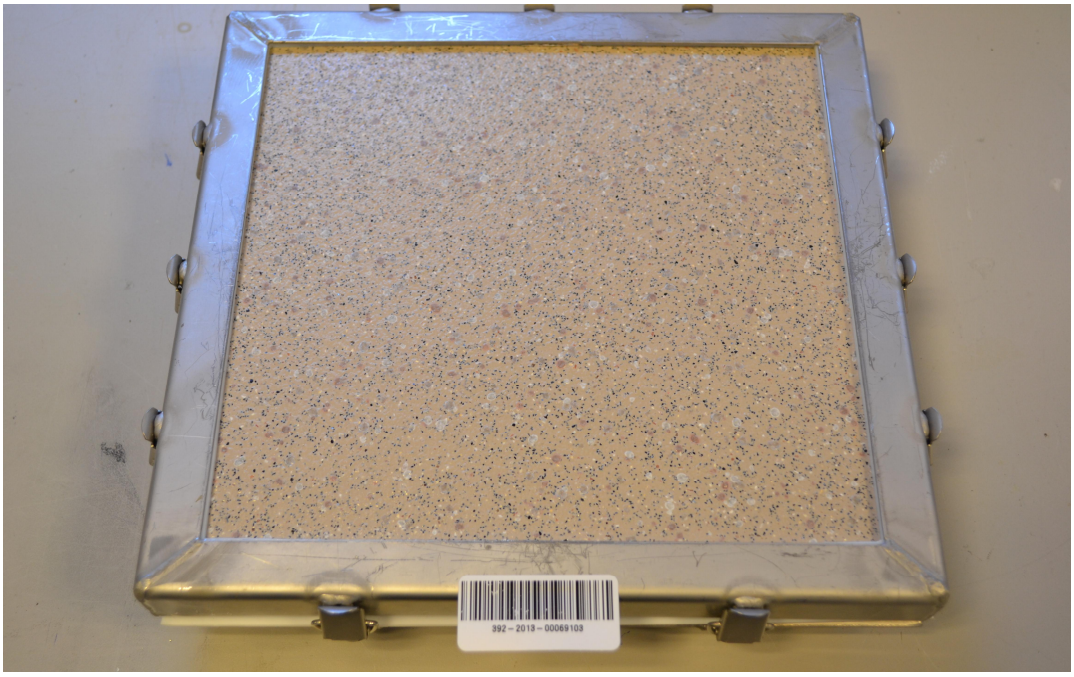



### 4.3.2 Chromatogram after 28 days




Please consider the different scales.

## 4.4 Image of the Sample



# 5 Appendices

## 5.1 Sampling Protocol

| | | | |
|---|---|---|---|
| **Name of applicant:** (name, company, phone): | Tarkett GDL SA<br>Lenzweiler<br>Luxembourg | **Producer** (if different from company's name at place of sampling): | Tarkett UK |
| **Production plant, where sampling takes place** | Tarkett UK<br>Dickley La, Lenham<br>Maidstone ME 12 2QX<br>United Kingdom | **Sampler *** (Please mark): | ☐ accredited lab<br>☒ PÜZ body<br>☐ producer |
| | | (name, company, phone): | Dr. Roland Augustin<br>CPT Eurofins<br>Mendelssohnstr.15 D<br>22761 Hamburg |
| **Name of the product:** | SAFETRED UNIVERSAL | **Type of product** | PVC |
| **Model / Program / Series:** | 382010 ~~SPU210~~ | **Batch N°:** | FV1416 |
| **Article N°:** | SPU210 MOON | **Date of batch production:** | 19/09/13 |
| **Sample was taken from** | ☐ ongoing production<br>☐ stocks<br>☒ retained sample | **Date of sampling:** | 02/10/13<br>**Time of sampling:** 15:10 |
| **Where had the product been stored prior to sampling?** | ☐ production<br>☐ store<br>☒ miscellaneous | **How had the product been stored prior to sampling?** | ☒ open<br>☐ in the stack<br>☐ wrapped up |
| **Place of storage:** | LAB | **Packing material:** | |
| **Specifics** (possible negative influences by air contamination where sample was taken, by petrol emissions, by solvent emissions from production; any other uncertainties, questions, etc). | | | |
| **Tests required**<br>☐ Emission test DIBt (Initial type testing)<br>☒ Construction details | | ☒ Emission test DIBt (Factory Production Control)<br>☐ other / further (PAK, Nitrosamines, Ammonia) | |
| **Confirmation**<br>Herewith the signer confirms the correctness of the data given above. The sample was selected, drawn and packed personally in accordance with the instructions for the taking of samples. | | | |
| **Date:** 02/10/13 | **Signature:**<br>(Stamp) | Eurofins Consumer Product Testing Überwachungs- und Zertifizierungsstelle Mendelssohnstr. 15d 22761 Hamburg | |

## 5.2 ADAM Report for DIBt

| 1. Allgemeine Angaben - General information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Prüfstelle** Testing laboratory | Eurofins Product Testing A/S | | | | | | | |
| **Verantwortlicher Prüfer** Responsible laboratory staff | Dr. Arja Valtanen | | | | | | | |
| **Prüfberichtsnr.** Number of the test report | 392-2013-00069103 | | | | | | | |
| **Kunde/Antragsteller** Client/Applicant | Tarkett Limited (Marley Floors Ltd.) | | | | | | | |
| **Produktname und Artikelnr.** Name of the product and material number | Safetred Universal | | | | | | | |
| **Aktenzeichen beim DIBt** File number at DIBt | Stellen-zeichen | SVA-Nr. | Sachgebiet | lfd. Nr. | Jahr (2 Ziffern) | Unter-sachgebiet | | |
| | -1. | | . | . | / | | | |
| **Art der Prüfung** Type of testing | A | $S_Q$ | $S_C$ | $S_{CL}$ | | | | |
| | 28 | | | | | | | |
| **Probenbezeichnung** Name of the sample | Safetred Universal | | | | | | | |
| **Datum des Probeneingangs bei der Prüfstelle** Date of receipt of the sample | 08-10-2013 | | | | | | | |
| **Lagerung der Probe bis zur Prüfung** Storage of the sample until testing | unopened at room temperature | | | | | | | |

**2. Beschreibung des Bauprodukts - Description of the construction product**

**Bitte auswählen! Choose, please!**

- ○ Textile Bodenbeläge - Textile floor coverings
- ○ Laminate und Paneele - Laminates and panels
- ○ Parkette und Holzfußböden - Parquet and wood floorings
- ◉ Elastische Bodenbeläge - Resilient floor coverings
- ○ Beschichtungen - Coatings
- ○ Korkbodenbeläge - Cork floor coverings
- ○ Sportbodenbeläge - Surfaces for sport areas
- ○ Oberflächenbeschichtungen - Surface coatings
- ○ Bodenbelagskleber - Adhesives for floor coverings
- ○ Verlegeunterlagen - Underlayers
- ○ Sonstige Produkte - Other products

| *Elastische Bodenbeläge - Resilient floor coverings* | | *Herstellerangaben Manufacturer's data* | *Prüfstellenangaben Testing laboratory's data* |
|---|---|---|---|
| **Allgemeine Produktbeschreibung (z.B. PVC, Kautschuk, PUR, Polyolefin, Linoleum)** General description of the product (e.g. PVC, rubber, polyurethane, polyolefin, linoleum) | | PVC | PVC |
| **Abmessung der gelieferten Probe [mm x mm]** Dimensions of the delivered sample [mm x mm] | | 2 x 300 x 300 | |
| **Bei PVC-Belägen bitte angeben, ob heterogen oder homogen** Please specify für PVC floor coverings, if it's heterogeneous or homogeneous | | heterogen | |
| **Herstellungsart** Manufacturing method | | | |
| **Oberseitengestaltung** Surface design | | rough | |
| **Farbgestaltung/Musterung** Colour design/patterning | | brown | peach-light brown with sand-like pattern |
| **Trittschalldämmung (falls vorhanden)** Impact sound insulation (if relevant) | Produktbeschreibung Product description | | |
| | Dicke [mm] Thickness [mm] | | |
| **Kleber für Trittschalldämmung** Adhesive used for impact sound insulation | Bezeichnung Product name | | |
| | Auftragsmenge [g/m²] Coating quantity [g/m²] | | |
| **Gesamtdicke [mm]** Total thickness [mm] | | 2 | 2 |
| **Flächengewicht [g/m²]** Area weight [g/m²] | | 3.150 | 3300 |
| **Oberflächenbeschichtung (falls vorhanden)** Surface coating (if relevant) | Chemische Basis Chemical basis | PU | |
| | Auftragsmenge [g/m²] Applied quantity [g/m²] | 16 | |
| **Kantenabdeckung? Verhältnis der offenen zu den abgedeckten Kanten?** Covering of the edges? Ratio of covered edges to uncovered edges? | | | All edges covered |
| **weitere Angaben** Additional information | | | |

**3. Bemerkungen (z.B. Produktbesonderheiten, Abweichungen von "Grundsätzen zur gesundheitlichen Bewertung von Bauprodukten in Innenräumen" etc.)** (neue Zeile mit [ALT] + [RETURN])
Comments (e.g. particularities on the product, variation of the "Principles for health assessment of construction products used in interiors" etc.) (new line with [ALT] + [RETURN])

NOTICE: The DIBt-file number is missing. An ADAM-file without the file number should not be delivered to DIBt.

ADAM 2012.08.3

| Produktname - Name of the product | Safetred Universal |
|---|---|
| **Datum der Prüfkörperherstellung**<br>Date of the manufacture of the test specimen | 15/10/2013 |
| **Herstellung des Prüfkörpers durch**<br>Preparation of the test specimen by | GKE |
| **verwendete Hilfsmaterialien**<br>used auxiliary materials | Frame JIS A 1901 |

| Prüfung - Testing | | Datum<br>date | Uhrzeit<br>time |
|---|---|---|---|
| **Beginn der Vorkonditionierung**<br>Start of preconditioning | $t_{0-x}$ | | |
| **Einbringen der Probe in die Prüfkammer und Beginn der Prüfung**<br>Placing of the test specimen into the test chamber and start of testing | $t_0$ | 15/10/2013 | 09:10 |
| **erste Probenahme**<br>first sampling | $t_{3d}$ | 18/10/2013 | 08:58 |
| **zweite Probenahme**<br>second sampling | $t_{7d}$ | | |
| **dritte Probenahme**<br>third sampling | $t_{28d}$ | 12/11/2013 | 08:44 |
| **Prüfkörperanordnung in der Prüfkammer**<br>Arrangement of the test specimen in the test chamber | | mittig / in the middle | |
| **Anwendung der Abbruchkriterien**<br>Use of the break-off criteria | 3d/7d | | |

| Prüfkammer - Test chamber | | |
|---|---|---|
| **Hersteller/Typ der Prüfkammer**<br>Manufacturer/type of the test chamber | | Eurofins |
| **Material der Prüfkammer**<br>Material of the test chamber | | Edelstahl / Stainless steel |
| **Volumen der Prüfkammer**<br>Volume of the test chamber | [m³] | 0,12 |
| **Fläche der Probe**<br>Area of the test specimen | [m²] | 0,05 |
| **Luftwechselrate**<br>Air exchange rate | [$h^{-1}$] | 0,50 |
| **flächenspezifische Luftdurchflussrate q**<br>Area specific air flow rate | [$mh^{-1}$] | 1,25 |
| **Temperatur**<br>Temperature | [°C] | 23±1 |
| **relative Luftfeuchte**<br>relative humidity | [%] | 50±5 |

| Berücksichtigungsgrenzen - Limits of consideration | $C_i$ [µg/m³] |
|---|---|
| **Substanzen mit NIK-Wert**<br>Substances with LCI value | 5 |
| **alle anderen Substanzen*)**<br>all other substances | 5 |
| **LCI list 2012** | |
| **AgBB scheme 2012** | |

Auswahl NIK-Liste/AgBB-Schema
(choice of LCI list/AgBB scheme)

***) mit Ausnahme aller cancerogenen Substanzen, hier gilt Nachweisgrenze**
with exception of all carcinogenic substances, detection limit applies here

**Anmerkungen zur Prüfung** (neue Zeile mit [ALT] + [RETURN])
Comments on testing (new line with [ALT] + [RETURN])

ADAM_2012_08_3

| Emissionen nach 3 Tagen<br>Emission after 3 days<br>**Safetred Universal** | Kommentar<br>Comment | CAS-No. | RT [min] | Retentionsbereich<br>Retention range | Quantifizierung<br>Quantification | Identifikation<br>Identification | $C_i$ [µg/m³] | $SER_i$ [µg/m²h] | Zuordnung<br>Classification<br>[canc./NIK/o.NIK]<br>[carc./LCI/no LCI] | $R_i$ | lfd. Nr<br>Serial number | ADAM_2012_08_3 | legend<br>VVOC = < C6<br>VOC = C6 - C16<br>SVOC = C16 - C22<br>a = substanzspezifisch<br>substance-specific<br>b = substanzähnlich<br>substance-like<br>c = Toluoläquivalent<br>toluene equivalent<br>d = DNPH<br>1 = Klasse 1<br>class 1<br>2 = Klasse 2<br>class 2<br>3 = Klasse 3<br>class 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| gefundene Substanzen<br>Detected substances | Daten nur über den Button "Messergebnisse eingeben/löschen" in diese Tabelle eintragen<br>Data to be entered only via the button "enter/delete results" | | | | | | | | | | | | |
| 2-Propanol | | 67-63-0 | 1,73 | VVOC | c | 2 | 20 | 25,00 | ohne NIK | | 4-3 | 0 | |
| 1-Butanol | | 71-36-3 | 2,61 | VOC | a | 1 | 9 | 11,25 | 3100 | 0,003 | 4-6 | 1 | |
| Not identified | | - | 2,75 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| n-Heptane | | 142-82-5 | 3,04 | VOC | a | 1 | 3 | 3,75 | 21000 | 0,000 | 2-8 | 1 | |
| Propylene glycol | | 57-55-6 | 3,69 | VOC | a | 1 | 210 | 262,50 | 2500 | 0,084 | 6-1 | 1 | |
| Toluene | | 108-88-3 | 4,34 | VOC | a | 1 | 1 | 1,25 | 1900 | 0,001 | 1-1 | 1 | |
| Hexanal | | 66-25-1 | 5,06 | VOC | a | 1 | 2 | 2,50 | 890 | 0,002 | 7-3 | 1 | |
| 1-Butyl acetate | | 123-86-4 | 5,40 | VOC | a | 1 | 2 | 2,50 | 4800 | 0,000 | 10-11 | 1 | |
| Not identified | | - | 6,29 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Cyclohexanone | | 108-94-1 | 6,99 | VOC | a | 1 | 19 | 23,75 | 410 | 0,046 | 8-5 | 1 | |
| Not identified | | - | 7,13 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Phenol | | 108-95-2 | 8,47 | VOC | a | 1 | 8 | 10,00 | 10 | 0,800 | 5-1 | 1 | |
| Not identified | | - | 8,59 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Dipropylene glycol monomethyl ether | | 34590-94-8 | 9,00 | VOC | a | 1 | 5 | 6,25 | 3100 | 0,002 | 6-12 | 1 | |
| 2-Ethyl-1-hexanol | | 104-76-7 | 9,20 | VOC | a | 1 | 8 | 10,00 | 540 | 0,015 | 4-10 | 1 | |
| m-Cresol | | 108-39-4 | 9,83 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 10,06 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 10,17 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| 2-Ethylhexane acid | | 149-57-5 | 10,33 | VOC | a | 1 | 9 | 11,25 | 50 | 0,180 | 9-10 | 1 | |
| Not identified | | - | 10,54 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 10,58 | VOC | c | 3 | 5 | 6,25 | ohne NIK | | | 0 | |
| Not identified | | - | 10,70 | VOC | c | 3 | 4 | 5,00 | ohne NIK | | | 0 | |
| 1-Nonanol | | 143-08-8 | 11,04 | VOC | c | 2 | 5 | 6,25 | ohne NIK | | 4-13.2 | 0 | |
| Not identified | | - | 11,22 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Diethylene glycol-monobutylether | | 112-34-5 | 11,27 | VOC | a | 1 | 300 | 375,00 | 670 | 0,448 | 6-5 | 1 | |
| Not identified | | - | 11,37 | VOC | c | 3 | 4 | 5,00 | ohne NIK | | | 0 | |
| Not identified | | - | 11,57 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 12,25 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 12,56 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| 2,2,4-Trimethyl-1,3-pentane diol, monoisobutyrate | | 25265-77-4 | 13,31 | VOC | a | 1 | 5 | 6,25 | 600 | 0,008 | 6-9 | 1 | |
| n-Tetradecane | | 629-59-4 | 13,45 | VOC | a | 1 | 2 | 2,50 | 6000 | 0,000 | 2-10.6 | 1 | |
| Not identified | | - | 13,57 | VOC | c | 3 | 5 | 6,25 | ohne NIK | | | 0 | |
| Not identified | | - | 14,00 | VOC | c | 3 | 10 | 12,50 | ohne NIK | | | 0 | |
| Not identified | | - | 14,16 | VOC | c | 3 | 6 | 7,50 | ohne NIK | | | 0 | |
| BHT | | 128-37-0 | 14,62 | VOC | a | 1 | 2 | 2,50 | 100 | 0,020 | 5-2 | 1 | |
| Not identified | | - | 15,34 | SVOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 15,74 | SVOC | c | 3 | 3 | 3,75 | ohne NIK | | | 0 | |

| Emissionen nach 28 Tagen<br>Emission after 28 days | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Safetred Universal** | Kommentar<br>Comment | CAS-No. | RT [min] | Retentionsbereich<br>Retention range | Quantifizierung<br>Quantification | Identifikation<br>Identification | $C_i$ [µg/m³] | $SER_i$ [µg/m²h] | Zuordnung<br>Classification<br>[canc./NIK/o.NIK]<br>[carc./LCI/no LCI] | $R_i$ | lfd. Nr<br>Serial number | ADAM_2012_08_3 | legend<br>VVOC = < C6<br>VOC = C6 - C16<br>SVOC = C16 - C22<br>a = substanzspezifisch<br>substance-specific<br>b = substanzähnlich<br>substance-like<br>c = Toluoläquivalent<br>toluene equivalent<br>d = DNPH<br>1 = Klasse 1<br>class 1<br>2 = Klasse 2<br>class 2<br>3 = Klasse 3<br>class 3 |
| gefundene Substanzen<br>Detected substances | Daten nur über den Button "Messergebnisse eingeben/löschen" in diese Tabelle eintragen<br>Data to be entered only via the button "enter/delete results" | | | | | | | | | | | | |
| Propylene glycol | | 57-55-6 | 3,69 | VOC | a | 1 | 65 | 81,25 | 2500 | 0,026 | 6-1 | 1 | |
| Cyclohexanone | | 108-94-1 | 7,01 | VOC | a | 1 | 7 | 8,75 | 410 | 0,017 | 8-5 | 1 | |
| Phenol | | 108-95-2 | 8,48 | VOC | a | 1 | 3 | 3,75 | 10 | 0,300 | 5-1 | 1 | |
| 2-Ethyl-1-hexanol | | 104-76-7 | 9,21 | VOC | a | 1 | 3 | 3,75 | 540 | 0,006 | 4-10 | 1 | |
| Not identified | | - | 10,59 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 10,71 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 11,04 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Diethylene glycol-monobutylether | | 112-34-5 | 11,27 | VOC | a | 1 | 100 | 125,00 | 670 | 0,149 | 6-5 | 1 | |
| Not identified | | - | 11,40 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Not identified | | - | 11,56 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Not identified | | - | 13,93 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 14,06 | VOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 14,17 | VOC | c | 3 | 3 | 3,75 | ohne NIK | | | 0 | |
| Not identified | | - | 14,23 | VOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Not identified | | - | 16,71 | SVOC | c | 3 | 1 | 1,25 | ohne NIK | | | 0 | |
| Not identified | | - | 16,75 | SVOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 16,93 | SVOC | c | 3 | 6 | 7,50 | ohne NIK | | | 0 | |
| Not identified | | - | 17,04 | SVOC | c | 3 | 2 | 2,50 | ohne NIK | | | 0 | |
| Not identified | | - | 17,16 | SVOC | c | 3 | 5 | 6,25 | ohne NIK | | | 0 | |
| Not identified | | - | 17,28 | SVOC | c | 3 | 8 | 10,00 | ohne NIK | | | 0 | |
| Not identified | | - | 17,44 | SVOC | c | 3 | 4 | 5,00 | ohne NIK | | | 0 | |
| Formaldehyd | | 50-00-0 | 0,00 | VVOC | d | 1 | 0 | 0,00 | | | 7-22 | 1 | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Probenbezeichnung**<br>Name of the sample | **Safetred Universal** | | | | | | Wichtige Informationen (important information) | | | | | | Tabellenblätter schützen<br>protect worksheets | |
| **Aktenzeichen beim DIBt**<br>File number of DIBt | | | | | | | | | | | | | Blattschutz aufheben<br>unprotect worksheets | |
| **Prüfinstitut**<br>Testing laboratory | **Eurofins Product Testing A/S** | | | | | | | | | | | | | |
| **Ergebnisüberblick**<br>**General view of the results**<br>ADAM_2012_08_3 | **3 Tage (days)** | | | | | | **7 Tage (days)**<br>Keine Daten vorhanden - No data available | | | **28 Tage (days)** | | | | |
| | Ergebnisse<br>results | AgBB Anforderungen<br>requirements | | Abbruchkriterien<br>break-off criteria | | | Ergebnisse<br>results | Abbruchkriterien<br>break-off criteria | | Ergebnisse<br>results | AgBB Anforderungen<br>requirements | | Abbruchkriterien<br>break-off criteria | |
| | µg/m³ | mg/m³ | | mg/m³ | | | µg/m³ | mg/m³ | | µg/m³ | mg/m³ | | mg/m³ | |
| [A] **TVOC ($C_6$ - $C_{16}$)** | 604 | 1 | ≤ 10 mg/m³ | 0,6 !! | ≤ 0,3 mg/m³ | | 0 | 0,0 | ≤ 0,5 mg/m³ | 172 | 0,2 | ≤ 1,0 mg/m³ | | |
| [B] **Σ SVOC ($C_{16}$ - $C_{22}$)** | 0 | keine<br>none | | 0,00 | ≤ 0,03 mg/m³ | | 0 | 0,00 | ≤ 0,05 mg/m³ | 19 | 0,0 | ≤ 0,1 mg/m³ | | |
| [C] **R** (dimensionslos/dimensionless) | 1,586 | keine<br>none | | 1,6 !! | ≤ 0,5 | | 0,000 | 0,0 | ≤ 0,5 | 0,192 | 0 | ≤ 1 | | |
| [D] **Σ VOC o. NIK**<br>**without LCI** | 31 | keine<br>none | | 0,03 | ≤ 0,05 mg/m³ | | 0 | 0,00 | ≤ 0,05 mg/m³ | 0 | 0,0 | ≤ 0,1 mg/m³ | | |
| [E] **Σ Cancerogene** | 0 | 0,00 | ≤ 0,01 mg/m³ | 0,000 | ≤ 0,001 mg/m³ | | 0 | 0,000 | ≤ 0,001 mg/m³ | 0 | 0,000 | ≤ 0,001 mg/m³ | | |
| **Dieser Block liefert zusätzliche Information**<br>This part gives some additional information | | | | | | | | | | | | | | |
| [F] *VVOC (< $C_6$)* | 20 | | | | | | 0 | | | 0 | | | | |
| [G] *VOC ($C_6$ - $C_{16}$)*<br>*als Toluoläquivalent*<br>*as toluene equivalent* | 150 | ← Wert manuell eingeben!<br>Enter value manually! | | | | | | ← Wert manuell eingeben!<br>Enter value manually! | | 35 | ← Wert manuell eingeben!<br>Enter value manually! | | | |
| [H] **Formaldehyd**<br>Formaldehyde | n.n. | keine<br>none | | | ≤ 0,060 mg/m³ | | n.n. | | ≤ 0,060 mg/m³ | 0 | 0,000 | ≤ 0,120 mg/m³ | | |

## 5.3 Description of the applied test method

### 5.3.1 Test Chamber

The test chamber is made of stainless steel. A multi-step air clean-up is performed before loading the chamber, and a blank check of the empty chamber is performed. The operation parameters are 23 °C, 50 % relative air humidity in the supply air.

### 5.3.2 Sampling, Desorption, Analyses

**Testing for Carcinogens**
The presence of carcinogens (EU Categories C1 and C2, as per the latest publication on the homepage of German BGIA Institute) was tested by drawing sample air from the chamber outlet through 2 Tenax TA tubes (main tube and backup tube). Analysis was performed by thermal desorption (Perkin Elmer) and gas chromatography / mass spectroscopy (30 m column, 0.25 mm ID, 0.25 µm HP-1 film, Agilent) (internal methods no.: 9812 / 2808). The absence of a listed carcinogen was stated if the specific combination of fragment ions was absent at the specific retention time in the chromatogram. If no listed carcinogens were found but the required detection limit was exceeded, the identity was checked by comparing full scan sample mass spectra with full scan standard mass spectra.

This test covered only substances that can be adsorbed on to Tenax TA and that can be thermally desorbed. If other emissions occurred, then these substances cannot be detected (or with limited reliability only).

**VOC Emissions Testing**
The emissions of organic compounds were tested by drawing sample air from the chamber outlet through 2 Tenax TA tubes (main tube and backup tube). Analysis was performed by thermal desorption (Perkin Elmer) and gas chromatography / mass spectroscopy (30 m column, 0.25 mm ID, 0.25 µm HP-1 film, Agilent) (internal methods no.: 9812 / 2808).

All single substances that are listed with a NIK value in the latest AgBB publication were identified. Quantification was done with the respective response factor and the TIC signal or in case of overlapping peaks by calculating with fragment ions. All other single substances, as well as all non-identified substances, were quantified as toluene equivalent.

The results of the individual substances were calculated in three groups depending on their appearance in a gas chromatogram when analysing with a non-polar column (HP-1):

- Volatile organic compounds VOC: All substances appearing between these limits.
- Semi-volatile organic compounds SVOC: All substances appearing after n-hexadecane (n-C16).
- Very volatile organic compounds VVOC: All substances appearing before n-hexane (n-C6).

Calculation of the TVOC (Total Volatile Organic Compounds) was performed according to the AgBB/DIBt test method, by addition of the results of all individual substances with concentrations = 5 µg/m³ in the retention time interval C6-C16. Furthermore the TVOC was calculated as the toluene equivalent, as defined in ISO 16000-6.

Calculation of the TSVOC (Total Semi-Volatile Organic Compounds) was performed by addition of the results of all substances with concentrations = 5 µg/m³ between C16 and C22 as toluene equivalent, as defined in ISO 16000-6.

Calculation of the TVVOC (Total Very Volatile Organic Compounds) was performed by addition of the results of all substances with concentrations = 5 µg/m³ appearing before C6 as toluene equivalent, as defined in ISO 16000-6.

This test covered only substances that can be adsorbed on Tenax TA and that can be thermally desorbed. If other emissions occurred then these substances cannot be detected (or with limited reliability only).

### 5.3.3 Calculation of R Values with the German NIK List

The concentrations of all substances = 5 µg/m³ in the interval between n-C6 and n-C16 were divided by their respective NIK value (if given). The sum of the quotients gives the R value:

$$R = \sum_{i}^{n} \left( {}^{c_i}/_{NIK_i} + \ldots + {}^{c_n}/_{NIK_n} \right)$$

In addition, all results were summed up for the substances without published NIK value, but in the interval be-tween n-C6 and n-C16, when concentrations were = 5 µg/m³.

### 5.3.4 Testing of Aldehydes

The presence of aldehydes was tested by drawing air samples from the chamber outlet through DNPH-coated silicagel tubes. Analysis was done by solvent desorption, HPLC and UV-/diode array detection (ISO 16000-3, internal methods no.: 9812 / 8400).

The absence of formaldehyde was stated if the specific wavelength UV detector response was lacking at the specific retention time in the chromatogram. Otherwise it was checked whether the detection limit was ex-ceeded. In this case the identity was finally checked by comparing full scan sample UV spectra with full scan standard UV spectra.

### 5.3.5 Quality assurance

Before loading the chamber a blank check of the empty chamber was performed and compliance with back-ground concentrations in accordance with ISO 16000-9 was determined. Sampling at the chamber outlet and subsequent analysis was performed in duplicate. For monitoring any breakthrough or overloading of the tubes, two Tenax TA tubes were used in series.

In each sequence stability of GC system was checked by a general function test of device and column, and by use of control charts for monitoring mean values and standard deviations for individual VOCs. Reproduci-bility of the method was monitored for two selected VOCs per sequence.

### 5.3.6 Accreditation

The testing methods described above are accredited to EN ISO/IEC 17025:2005 by DANAK (no. 522). Not all parameters are covered by this accreditation. At present the accreditation does not cover the parameters marked with a note *, however analysis was performed for these parameters at the same level of quality as for the accredited parameters.

### 5.3.7 Uncertainty of the test method

The relative standard deviation (RSD) of the test method amounts to 22%. The expanded uncertainty Um is 45% and equals 2 x %RSD. For further information please visit www.eurofins.dk/uncertainty.