# INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a. s.

třída Tomáše Bati 299, Louky, 763 02 Zlín, Czech Republic

TESTING LABORATORY - TESTING DIVISION

issues

# ATTEST

# No. 472113331-01

On sample:

## Bags with printing made of LUKABROWN ALPHA paper

Client:

**Balsac Papermill s.r.o.**
**Lukavice 21, 789 01 Zábřeh, Czech Republic,**
**ID: 01610368**

**Evaluation of the measured parameters:**

The evaluated parameters mentioned on the pages 2 – 5 of the Attest meet hygienic requirements for the **products made of paper** given by Czech Health Ministry Decree No. 38/2001 Coll., *relating to hygienic requirements for the articles intended to come into contact with foodstuffs, as amended.*

The test results listed in the test report No. 13008/31 (see the Annex) meet requirements of German Recommendation BfR XXXVI *Paper and cardboard for food contact.*

The evaluated sample does not cause deterioration in organoleptic characteristics of food.

The evaluated sample is in compliance with the rules of the article 3 of Regulation (EC) No. 1935/2004 of the European Parliament and of the Council on materials and articles intended to come into contact with food and §§ 30 and 31 of German Foodstuffs, Consumer Goods and Animal Feed Code (LFGB).

This Attest is issued on the base of the test results listed in the test reports of the accredited laboratory: 472113331-01 issued by Institut pro testování a certifikaci, a.s. on July 29, 2020 and No. 13008/31 issued by ISEGA laboratory on June 5, 2020 (Annex of the Attest) and on the base of Certificate 52278 U 20 issued by ISEGA on June 5, 2020 (Annex of the Attest).

**Issued on:** July 29, 2020
**Valid till:** July 31, 2023

ZKUŠEBNÍ LABORATOR Institut pro testování a certifikaci, a.s.

**Dipl. Ing. Jiří Samsonek, Ph.D.**
Head of the testing laboratory

*Conditions for use of the Attest and associated information:*

1. *The Attest applies only to the sample tested by our laboratory.*
2. *The Attest remains in effect until production technology, initial materials and standards or corresponding regulations are changed; however, its validity will extend beyond the period of its effect.*
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# ATTEST
## No. 472113331-01

**Submitted sample:**

**Figure No. 1: Bags with printing made of LUKABROWN ALPHA paper**

**Values obtained:**

**Assessment of organoleptic properties**

| Food simulant | | ČSN EN 1230-2 biscuits | | ČSN EN 1230-2 chocolate | | ČSN EN 1230-1 without food simulant |
|---|---|---|---|---|---|---|
| **Assessor No.** | **Unit** | **Odour** | **Flavour** | **Odour** | **Flavour** | **Odour** |
| 1 | level | 0 | 0 | 0 | 0 | 1 |
| 2 | level | 0 | 0 | 0 | 0 | 0 |
| 3 | level | 0 | 0 | 0 | 0 | 1 |
| 4 | level | 0 | 0 | 0 | 0 | 1 |
| 5 | level | 0 | 0 | 0 | 0 | 0 |
| 6 | level | 0 | 0 | 0 | 0 | 0 |
| **Mean** | **level** | **0** | **0** | **0** | **0** | **0.5** |

Off-odour and off-taste scale:
0 = No perceptible off-odour or off-taste
1 = Just perceptible off-odour or off-taste (off-odour and off-taste determination is very difficult)
2 = Slightly perceptible off-odour or off-taste
3 = Clearly perceptible off-odour or off-taste
4 = Strong off-odour or off-taste

According to Regulation (EC) No. 1935/2004 of the European Parliament and of the Council the articles shall not cause deterioration in the organoleptic characteristics of food

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# ATTEST
# No. 472113331-01
## Bags with printing made of LUKABROWN ALPHA paper

**Test results according to the requirements of Suppl. No. 12 to Decree No. 38/2001 Coll.**

| Parameter | Unit | Value obtained [1] | Limit [2] |
|---|---|---|---|
| **Assessment of the paper material** | | | |
| Moisture | % w/w | 7.02±0.05 | max. 8.0 |
| PCB [3] | mg/kg of dry matter | < 0.10 | max. 2.0 |
| Polychlorinated phenols [4] | mg/kg of dry matter | < 0.05 | max. 0.05 |
| PAH [5] | mg/kg of dry matter | < 0.01 | max. 0.05 |
| **Content of the substances in the leachate (20 $dm^2$ / 1000 ml of distilled water, 20°C, 24 hrs)** | | | |
| Formaldehyde | mg of $CH_2O$/ $dm^2$ | < 0.01 | max. 0.10 |
| Total nitrogen | mg of N / $dm^2$ | 0.12±0.02 | max. 0.2 |
| Phthalates [6] | mg/$dm^2$ | < 0.02 | max. 0.20 |
| Primary aromatic amines | mg /$dm^2$ [7] | < 0.002 | max. 0.002 |
| Phenolic compound | mg of phenol /$dm^2$ | < 0.01 | max. 0.05 |
| Fluorescence (365 nm) | - | fluorescence [8] | No fluorescence |
| Mercury | mg/kg of dry matter | < 0.05 | max. 0.3 |
| Cadmium | mg/kg of dry matter | < 0.05 | max. 0.5 |
| Chromium | mg/kg of dry matter | < 0.05 | max. 0.1 |
| Lead | mg/kg of dry matter | < 0.05 | max. 3.0 |
| Arsenic | mg/kg of dry matter | < 0.05 | max. 3.0 |

**Notes to the table:**

1) Symbol „<" means less than limit of detection of the analytical method. The test results are expressed including the reported expanded uncertainty based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.
2) Limit values according to the Ministry of Health Decree No. 38/2001 Coll., as amended
3) PCB – polychlorinated biphenyls, sum of congeners 28, 52, 101, 118, 138, 153 a 180
4) Polychlorinated phenols expressed as pentachlorophenol
5) PAH - polycyclic aromatic hydrocarbons expressed as benzo/a/pyrene
6) Sum of dibutylphthalate DBP, di-2-ethylhexylphthalate DEHP, diisodecylphthalate DIDP, benzylbutylphthalate BBP, diisononylphthalate DINP, di-n-octylphthalate DNOP
7) mg of anilinhydrochloride/$dm^2$
8) For detail analysis of fluorescence see the table on the page 4 and evaluation on the page 7.

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# ATTEST
# No. 472113331-01

## Identification of low-molecular substances by TD-GC-MS method

| Retention time /min/ | Identified substances [1)] | CAS |
|---|---|---|
| 4.2 | Nonanal | 124-19-6 |
| 5.7 | Nonanoic acid | 112-05-0 |
| 6.8 | Vanillin *) | 121-33-5 |
| 9.07 | 4-Hydroxy-2-methoxycinnamaldehyde *) | 127321-19-1 |
| 9.15 | Tetradecanoic acid | 544-63-8 |
| 10.2 | Hexadecanoic acid | 57-10-3 |
| 10.5 | 3,5-Dimethoxy-4-hydroxycinnamaldehyde *) | 87345-53-7 |
| 11.3 | Octadecanoic acid | 57-11-4 |
| 12.3 | Adipic acid, bis(2-ethylhexyl) ester | 103-23-1 |
| 10 till 30 | Aliphatic unsaturated oil | - |
| 21.6 | Palmitone DAK (Dialkylketone) substance *) | - |
| 27.5 | Ethyl palmitone and DAK substance *) | - |
| 30.5 | Irgafos 168 trace | 31570-04-4 |
| 36.65 | Stearone M/e 267 and DAK substance like palmitone M/e 239 *) | - |

**Notes to the table:**

1) Match of the MS spectra of found substances with standard MS spectra from D-base are in the range of 70-95 %.
Substances marked with the symbol *) may cause fluorescence of the paper extract solution. Optical brighteners of the stilbene sulfonic acid type were not detected by this method.

## Overall migration into food simulants

***– the side without printing***

| Food simulant, migration conditions | Unit | Value obtained | | Uncertainty [1)] | Limit [2)] |
|---|---|---|---|---|---|
| | | Single results | Average | | |
| MPPO [3)], (40±2)°C, 10 days | mg/ dm² | 0.7; 1.1; 1.3 | **1.0** | 0.4 | max. 10 |

**Notes to the table:**

1) Symbol „<" means less than limit of detection of the analytical method.
2) Limit values according to Decree of Health Ministry No. 38/2001 Coll., as amended and according to Commission Regulation (EU) No. 10/2011
3) Modified polyphenyleneoxide

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ITC®

# ATTEST
# No. 472113331-01

## Determination of fastness according to ČSN EN 648 – fluorescence
## Method A for long-term contact

| Simulant | Unit | Value obtained [1] | |
|---|---|---|---|
| | | *outer bag side* | *inner bag side* |
| Distilled water | level | 5 | 5 |
| 3% acetic acid | level | 5 | 5 |
| Alkaline salt solution | level | 5 | 5 |
| Olive oil | level | 5 | 5 |
| **Limit** [2] | level | - | Min. 5 |

**Notes to the table:**

[1] Level 5 corresponds to the zero content of fluorescent brighteners that migrate into filter paper = good fastness

[2] Limit value according to BfR XXXVI *Paper and cardboard for food contact*

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INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a. s.
třída Tomáše Bati 299, Louky, 763 02 Zlín, Czech Republic
Testing Laboratory - D2

Attest No. 472113331-01

**Sample description and identification:**

| ITC's identification number | Sample identification by client | Description of submitted sample |
|---|---|---|
| 13331/1 | **Bags with printing made of LUKABROWN ALPHA paper** | Bags of brown paper with printing – see the figure No. 1 on the page 2 |

Together with the sample the client submitted the following documents:

1. The test report 13008/31 issued on June 5, 2020 by ISEGA laboratory accredited by German Body for Accreditation DAKKS. The test report related to the test results of paper LUKABROWN ALPHA in a scope according to § 64 of the Foodstuffs and Animal Feed Code (LFGB). The submitted test report is a part of the Attest.
2. "Certificate of Compliance" No. 52278 U 20 issued by ISEGA for Balsac Papermill s.r.o. on June 5, 2020. There is confirmed in the certificate that the examined paper is in compliance with article 3 of Regulation (EC) No. 1935/2004 of the European Parliament and of the Council on materials and articles intended to come into contact with food and as well as of §§ 30 and 31 of German Foodstuffs, Consumer Goods and Animal Feed Code (LFGB) and German Recommendation BfR XXXVI *Paper and cardboard for food contact.*

**Work requested:**
Evaluation of hygienic properties of the sample according to Decree of Health Ministry No. 38/2001 Coll. *for articles intended into a contact with foodstuffs,* as amended, Regulation (EC) No. 1935/2004 of the European Parliament and of the Council *on materials and articles intended to come into contact with food* and according to German Recommendation BfR XXXVI *Paper and cardboard for food contact.*

**Opinions and interpretations:**
The evaluated products **"Bags with printing made of LUKABROWN ALPHA paper"** are intended to contact with food.

The client requested assessment of the product compliance with the following regulations:

- Czech Health Ministry Decree No. 38/2001 Coll., as amended, (hereinafter referred to as 38/2001)
- Regulation (EC) No. 1935/2004 of the European Parliament and of the Council (hereinafter referred to as 1935/2004)
- German Foodstuffs, Consumer Goods and Animal Feed Code (hereinafter referred to as LFGB)
- German Recommendation XXXVI *Paper and cardboard for food contact* (hereinafter referred to as BfR XXXVI).

<u>General requirements – 38/2001, Regulation 1935</u>
The products intended to come into contact with foodstuffs shall be manufactured so that, under normal or foreseeable conditions of use, they do not transfer their constituents to food in quantities which could endanger human health or bring about an unacceptable change in the composition of the food or bring about a deterioration in the organoleptic characteristics thereof. The performed tests verified that the evaluated sample does not cause a deterioration in the organoleptic properties of the food (see the table on the page 2 of this attest). The constituent transferring is discussed further.

<u>Requirements for paper products – decree 38</u>

- Assessment of base materials, additives, adjuvants and the other substances (§ 21, paragraph 1, § 22, paragraph 2) is not a part of this Attest.

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- The moisture of products made of paper packaging shall be up to the limit of 8 % w/w. The conformity was proved by the test – see the table on the page 3 of this Attest.
- Paper packaging for direct contact with foodstuffs shall not be used repeatedly – it is not supposed that the products will be repeatedly used.
- The products made of paper, cartons and cardboard shall meet hygienic requirements given by the part 4 of the supplement No. 12. The conformity was proved by the tests and the product meets all limit values except the parameter "fluorescence in leachate". Whereas the paper is unbleached, natural brown, confirmation using a test for the identification of low molecular weight substances after thermal desorption by GC-MS was performed on the sample. Some substances of natural nature were identified by this method that can also cause the leachate fluorescence (see the table on the page 4). Optical brighteners of the stilbenesulfonic acid type were not detected by this method. The migration of optical brighteners into food simulants according to ČSN EN 648 was also verified. The optical brighteners do not migrate into foods. The test results are listed in the tables on the pages 3 and 5 of this Attest.
- In addition, the overall migration in simulant E (MPPO) that is used for demonstration of compliance in case of contact with dry foods was tested. The test results of the overall migration meet the limit value 10 mg/dm$^2$ – see the table on the page 4.

Requirements for articles made of paper – BfR XXXVI

- The test results in the scope as required German regulations BfR XXXVI and LFGB are listed in the test report No. 13008/31 that is the part of the Attest. The compliance of the test results with the requirements of these regulations and the requirements of Regulation (EC) No. 1935/2004 is stated in Certificate No. 52278 U 20 that is the part of the Attest.

**The opinion expressed and interpretation made by:**
Dipl. Ing. Šárka Kopečková, July 29, 2020

**Conclusion:**
The comparison of the obtained results with the limits of Decree No. 38/2001 Coll., as amended, Commission Regulation (EU) No. 10/2011, the article 3 of European Parliament and Council Regulation No. 1935/2004; §§ 30 and 31 of German Foodstuffs, Consumer Goods and Animal Feed Code (LFGB) and German Recommendation BfR XXXVI *Paper and cardboard for food contact* and evaluation of the conformity with these regulations are mentioned on the page 1 of this attest.

Dipl. Ing. Věra Vilímková
Head of the laboratory of analytical
chemistry and microbiology

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Annex to the Attest No. 472113331-01

ISEGA
Forschungs- und Untersuchungs-
Gesellschaft mbH Aschaffenburg

**Dr. Ralph Derra**
Öffentlich bestellter und vereidigter Sachverständiger für Verpackungsmaterialien, Boden- und Luftanalysen; Sachverständiger in der Wasseranalytik

5 June 2020
Dr. Dr/lls-kr

# UNBEDENKLICHKEITSERKLÄRUNG
# CERTIFICATE OF COMPLIANCE
# CERTIFICAT DE CONFORMITE

| | |
|---|---|
| eingetragen<br>registered no.<br>registré | 52278 U 20 |
| für<br>for<br>pour | BALSAC Papermill s.r.o.<br>Lukavice 21<br>789 01 Zábřeh<br>Czech Republic |
| Produkt<br>Product<br>Produit | LUKABROWN ALPHA |

The product manufactured by the company mentioned above is a paper grade which is used for food packaging.

It was examined by us according to the

"Methoden zur Untersuchung von Papieren, Kartons und Pappen für Lebensmittelverpackungen", Stand 2008, entsprechend der Vorschrift Nr. 80.56 in der Amtlichen Sammlung von Untersuchungsverfahren nach § 64 des Lebensmittel- und Futtermittelgesetzbuchs - LFGB,

("Methods for testing papers and boards for food packaging", state of 2008, corresponding to the method no. 80.56 within the Official Collection of Test Methods according to § 64 of the Foodstuffs and Animal Feed Code - LFGB),

for the used raw materials, fabrication additives and special paper finishing agents as well as for the release of substances which might endanger health.



Postfach 100565 . 63704 Aschaffenburg . Germany . Fon: +49 6021 4989-0 . Fax: +49 6021 4989-30 . E-Mail: info@isega.de . www.isega.de
Geschäftsführer: Dr. Ralph Derra . Handelsregister Aschaffenburg HRB-Nr. 3329

Die Veröffentlichung von Ergebnissen unserer Arbeiten und Gutachten sowie die Verwendung für Werbezwecke bedürfen – auch auszugsweise – unserer schriftlichen Genehmigung. Erfüllungsort und Gerichtsstand Aschaffenburg.

DAkkS Deutsche Akkreditierungsstelle D-ZE-14160-01-00

The paper grade is in compliance with the rules of the

Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC, Official Journal of the European Union L 338/4 of 13.11.2004, modified by app. no. 5.17 of the regulation (EC) No 596/2009 of 18 June 2009, Official Journal of the European Union L 188 of 18 July 2009, article 3,

as well as of the

Lebensmittel-, Bedarfsgegenstände- und Futtermittelgesetzbuch (Lebensmittel- und Futtermittelgesetzbuch - LFGB) in der Fassung der Bekanntmachung vom 3. Juni 2013 (BGBl. I S. 1426), zuletzt geändert durch Artikel 28 des Gesetzes vom 20. November 2019 (BGBl. I S. 1626), §§ 30 und 31,

(Foodstuffs, Consumer Goods and Animal Feed Code (Foodstuffs and Animal Feed Code - LFGB) in the version of the notification of 3 June 2013 (BGBl. p. 1426), last amendment by article 28 of the act of 20 November 2019 (BGBl. I p. 1626), §§ 30 and 31),

and is approved according to the

BfR-Empfehlung XXXVI. Papiere, Kartons und Pappen für den Lebensmittelkontakt, neugefasst durch 62. Mitteilung, Bundesgesundheitsblatt 14 (1971) 83, zuletzt geändert durch 222. Mitteilung, Bundesgesundheitsblatt 62 (2019) 1546, Stand vom 01.06.2019,

(BfR Recommendation XXXVI. Paper and board for food contact, recasted by 62nd Announcement, Bundesgesundheitsblatt 14 (1971) 83, last amended by 222nd Announcement, Bundesgesundheitsblatt 62 (2019) 1546, as of 1 June 2019).

Thus the paper grade **LUKABROWN ALPHA** according to the sample material submitted may be used safely for food packaging. It may stand in direct contact with dry, moist and fatty foodstuffs.

This certificate of compliance has a validity of 2 years and consists of 3 pages.

Certification decision

Von der Industrie- und Handelskammer Aschaffenburg
Dr. rer. nat. Ralph Derra
Sachverständiger für Verpackungsmaterialien
öffentlich bestellt und vereidigt

staatlich anerkannter Sachverständiger zur Untersuchung der Gegenproben von Verpackungsmitteln aus Papier, Pappe, Kunststoffen, Glas, Weißblech, und sonstigen Metallverpackungen auf ihre lebensmittelrechtliche Unbedenklichkeit

(Höfert)
Officially certified
and authorized food
chemist

The translation of the above stamps is given on page 3.
La traduction des estampilles est donnée en page 3.

Von der Industrie- und Handelskammer Aschaffenburg
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Dr. Ralph Derra

Authorized expert for the analyses of packaging materials, attested by the Aschaffenburg Chamber of Industry and Commerce.

Expert autorisé pour l'analyse des matériaux d'emballage, assermenté par la Chambre d'Industrie et de Commerce d'Aschaffenburg.

State registered expert for the analysis of contrasting samples of packaging materials of paper, board, plastics, glass, tin plate and other metallic packaging materials as to their suitability for use with foodstuffs.

Expert public pour l'étude du contrôle des contre-échantillons d'emballages de papier, cartons, plastiques, verre, fer-blanc et d'autres emballages métalliques concernant leur conformité alimentaire.

Dr. rer. nat. Ralph Derra
Von der Industrie- u. Handelskammer Aschaffenburg für Boden- u. Luftanalysen
öffentl. best. u. vereidigter Sachverständiger

Dr. Ralph Derra

Authorized expert for the analyses of soil and air, attested by the Aschaffenburg Chamber of Industry and Commerce.

Expert autorisé pour l'analyse du sol et de l'air, assermenté par la Chambre d'Industrie et de Commerce d'Aschaffenburg.

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Die Rücklagen des untersuchten Materials werden bei der Gutachterstelle verwahrt.
Dieses Dokument ist eine Übersetzung einer deutschen Originalversion. In Streitfällen ist das Originaldokument die rechtlich bindende Version.
A file sample of the tested material is kept at the expert's office.
This document is a translation of an original in German. In case of dispute, the original document should be taken as authoritative.

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E-Mail: info@isega.de . www.isega.de

Aschaffenburg, 5 June 2020

From: Ils-kr
Authorized by: Ils

# REPORT

| | |
|---|---|
| **Order No.:** | 13008/31 **Page 1 of 8 pages** |
| **Client:** | BALSAC Papermill s.r.o.<br>Lukavice 21<br>789 01 Zábřeh<br>Czech Republic |
| **Date of order:** | 29 April 2020 |
| **Receipt of sample material:** | 29 April 2020 |
| **Origin of sample material:** | From the client |
| **Purpose:** | Analysis of a paper grade for its compliance with the demands on food contact materials |

(Dr. Derra)
Managing Director

(Ils)
Officially certified
food chemist
Project manager

The present report refers exclusively to the samples as laid out therein. Information and statistical data on the results can be obtained on request.

Geschäftsführer: Dr. Ralph Derra . Handelsregister Aschaffenburg HRB 3329
Die Veröffentlichung von Ergebnissen unserer Arbeiten und Gutachten sowie die Verwendung für Werbezwecke bedürfen – auch auszugsweise – unserer schriftlichen Genehmigung. Erfüllungsort und Gerichtsstand Aschaffenburg.

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-14160-01-01
D-PL-14160-01-02

## Sample Material

For analysis the following sample material was at hand:

LUKABROWN ALPHA 60 g/m²

## Carrying out of the Tests

Examination period: 7 May 2020 to 3 June 2020

### 1. Determination of the Grammage *

The determination was performed according to DIN EN ISO 536:2012-11 after conditioning of the sample at 23 °C/50 % relative humidity which is prescribed as standard atmosphere with a reduced amount of test specimens.

| | | | | | |
|---|---|---|---|---|---|
| Result: | 57.8 | g/m² | ≙ | 53.7 | g dry matter/m² |

### 2. Determination of the Moisture Content *

The determination was performed as single determination according to DIN EN ISO 638:2009-01 in the condition as received.

| | | |
|---|---|---|
| Result: | 6.4 | % |

### 3. Preparation of Extracts *

The extracts were prepared according to the "Methodensammlung zur Untersuchung von Papier, Karton und Pappe für den Lebensmittelkontakt" (collection of methods for the examination of paper and board for food contact) of the BfR as well as according to DIN EN 645:1994-01, 647:1994-01 and 15519:2008-01. The selection of suitable procedures for simulating the transfer of substances was performed according to the corresponding BfR guideline ("Leitfaden zur Überprüfung der Stoffübergänge von Bedarfsgegenständen aus Papier, Karton und Pappe").

| | |
|---|---|
| Water: | 24 hours at 23 °C |
| Isooctane: | 24 hours at 20 °C |

### 4. Determination of the Dry Matter in the Water Extract *

The determination was performed according to DIN EN 920:2000-12 gravimetrically after drying at 105 °C:

| | | | | | |
|---|---|---|---|---|---|
| Result: | 1.9 | mg/dm² | ≙ | 3.5 | mg/g dry matter |

## 5. Determination of Methanal (Formaldehyde) in the Water Extract *

The determination was performed according to DIN EN 1541:2001-07 photometrically in line with the acetylacetone method.

| | | | | |
|---|---|---|---|---|
| Result: | not quantifiable | < | 0.004 | mg/g dry matter |

## 6. Determination of Glyoxal in the Water Extract *

The determination was performed according to DIN 54603:2008-08.

| | | | | |
|---|---|---|---|---|
| Result: | 0.004 | mg/dm² | ≙ 0.007 | mg/g dry matter |

## 7. Determination of Pentachlorophenol (PCP) in the Water Extract *

The determination was performed according to DIN EN ISO 15320:2011-08 by means of GC-ECD after concentration at a column and esterification.

| | | | | |
|---|---|---|---|---|
| Result: | not quantifiable | < | 0.01 | mg/kg dry matter |

## 8. Determination of the Elements in the Water Extract *

The determination was performed according to DIN EN 12498:2019-02.

Result:

| | | | | |
|---|---|---|---|---|
| Cadmium | (Cd): | not quantifiable | < 0.001 | mg/l water extract |
| Lead | (Pb): | not quantifiable | < 0.001 | mg/l water extract |
| Chromium | (Cr): | not quantifiable | < 0.004 | mg/l water extract |
| Aluminium | (Al): | | 0.6 | mg/l water extract |

## 9. Determination of the Dry Matter in the Organic Solvent Extract *

The dry matter was determined according to DIN EN 1186:2002-07 after drying at 105 °C.

| | | | | |
|---|---|---|---|---|
| Result: | not quantifiable | < | 0.5 | mg/g dry matter |

## 10. IR-Spectroscopic Testing of the Dry Matters from the Water and the Organic Solvent Extract *

The dry matters were ground up with KBr and examined by IR-spectroscopy.

Result: Substances which might endanger health as well as deviations from the composition stated, which are detectable by this method, were not found.

## 11. Gaschromatographic Analysis of the Organic Solvent Extract *

The determination was performed according to SOP 160.200 by means of GC-FID. All compounds which elute between tetradecane ($C_{14}$) and tetracontane ($C_{40}$) were summed up semi-quantitatively against the internal standard tridecane ($C_{13}$). Analogously, a separate evaluation of the dialkyl ketones was performed considering the following substances:

Dipentadecyl ketone (Palmitone) Pentadecylheptadecyl ketone Diheptadecyl ketone (Stearone)
Heptadecylnonadecyl ketone Dinonadecyl ketone Nonadecylheneicosyl ketone
Diheneicosyl ketone

Result:

| | | | | |
|---|---|---|---|---|
| Sum $C_{14}$ - $C_{40}$ | 0.1 | mg/dm² | ≙ 0.2 | mg/g dry matter |
| Dialkyl ketones | 0.05 | mg/dm² | ≙ 0.1 | mg/g dry matter |

## 12. Determination of the Transfer of Antimicrobial Constituents *

The determination was made according to DIN EN 1104:2019-01. Test specimens of a diameter of 10 mm were placed onto an inoculated nutrient medium and then incubated. The inhibition zone is indicated as total diameter (including the test specimen).

Result:

with *Aspergillus niger*: Microbial growth up to the edges of the test specimens.

with *Bacillus subtilis*: Microbial growth up to the edges of the test specimens.
Presence of a modification of the test microorganism *B. subtilis* growth at the edges of the test pieces.

Comment:

According to the current state of standardization, proof of the presence of an inhibition zone is provided by the absence of test microorganism growth in a minimum diameter of 14 mm. Therefore, a transfer of antimicrobial constituents is considered as not detected.

## 13. Determination of 1,3-Dichloro-2-propanol [96-23-1] and 3-Monochloro-1,2-propanediol [96-24-2] *

The determination was performed after solid phase extraction according to the Official Collection of Analytical Methods § 64 of the LFGB, method B 80.56-2:2002-09 by means of GCMS.

The water extract was prepared according to DIN EN 645:1994-01.

Result:

| | | | | |
|---|---|---|---|---|
| 1,3-Dichloro-2-propanol (DCP): | not detected | < | 2 | µg/l water extract |
| 3-Monochloro-1,2-propanediol (MCPD): | not detected | < | 2 | µg/l water extract |

## 14. Test for Fluorescent Substances *

The test was made by UV irradiation.

Result: The sample did not contain optically brightened fibres.

## 15. Determination of the Colour Fastness of Dyed Paper and Board *

The determination was performed according to EN 646:2019-02.

Contact conditions: 24 hours at room temperature (procedure A)

Glass fibre paper: MACHEREY-NAGEL MN 86/70 BF

| Result: | water | salt solution pH 8.6 | acetic acid solution | sunflower oil |
|---|---|---|---|---|
| Upper side: | 5 | 5 | 5 | 5 |
| Bottom side: | 5 | 5 | 5 | 5 |

Distinction is made between five evaluation grades, whereby 1 means poor and 5 good colour fastness.

## 16. Determination of Bisphenol A [80-05-7] *

The determination was performed according to SOP 162.200 by means of HPLC-fluorescence in an acetonitrile extract.

Conditions: 24 hours at 23 °C

Result: not determinable < 0.1 mg/kg dry matter

## 17. Determination of Benzophenone and Benzophenone Derivates *

The determination was performed according to SOP 162.200 by means of HPLC-UV in an acetonitrile extract after concentration.

Result:

| | | | | | |
|---|---|---|---|---|---|
| Benzophenone: | [119-61-9] | not determinable | < | 0.4 | mg/kg dry matter |
| 4-Hydroxybenzophenone: | [1137-42-4] | not determinable | < | 1 | mg/kg dry matter |
| 4-Methylbenzophenone: | [134-84-9] | not determinable | < | 1 | mg/kg dry matter |
| 4,4'-Bis(dimethylamino)-benzophenone (Michler's ketone): | [90-94-8] | not determinable | < | 0.1 | mg/kg dry matter |
| 4,4'-Bis(diethylamino)-benzophenone (DEAB): | [90-93-7] | not determinable | < | 0.1 | mg/kg dry matter |

## 18. Determination of Anthraquinone [84-65-1] *

The determination was performed according to SOP 160.200 by means of GCMS after extraction with 95 % ethanol (v/v) at 60 °C.

Result: not quantifiable < 0.13 mg/kg dry matter

## 19. Determination of Volatile Contaminants *

The determination was performed according to DIN EN 14719:2005-10/ SOP 160.200 by means of GCMS in an acetone extract.

Result:

| | | | | | |
|---|---|---|---|---|---|
| Diisopropylnaphthalene (DIPN) | [38640-62-9] | not determinable | < | 1 | mg/kg dry matter |
| Other solvent | | not determinable | < | 1 | mg/kg dry matter |
| Benzophenone | [119-61-9] | | | 1.2 | mg/kg dry matter |
| 4-Methylbenzophenone | [134-84-9] | not determinable | < | 1 | mg/kg dry matter |
| Diisobutylphthalate | [84-69-5] | not determinable | < | 1 | mg/kg dry matter |
| Dibutylphthalate | [84-74-2] | not determinable | < | 1 | mg/kg dry matter |
| Di(2-ethylhexyl)phthalate | [117-81-7] | not determinable | < | 1 | mg/kg dry matter |
| Di-(2-ethylhexyl)adipate | [103-23-1] | not determinable | < | 1 | mg/kg dry matter |
| 2,2,4-Trimethyl-1,3-pentane-diol diisobutyrate (TXIB) | [6846-50-0] | not determinable | < | 1 | mg/kg dry matter |
| Diethylene glycol dibenzoate | [120-55-8] | not determinable | < | 1 | mg/kg dry matter |
| Benzyl-2-naphthylether | [613-62-7] | not determinable | < | 1 | mg/kg dry matter |

## 20. Determination of Polycyclic Aromatic Hydrocarbons (PAH) *

The determination was performed according to the draft standard by means of GCMS. The following compounds were considered:

| | | | |
|---|---|---|---|
| Naphthalene | [91-20-3] | Benzo[b]naphtho[1,2-d]thiophene | [205-43-6] |
| 2-Methyl naphthalene | [91-57-6] | Benzo[a]anthracene | [56-55-3] |
| 1-Methyl naphthalene | [90-12-0] | Triphenylene/Chrysene | [217-59-4]/[218-01-9] |
| Acenaphthylene | [208-96-8] | Benzo[b]fluoranthene | [205-99-2] |
| Acenaphthene | [83-32-9] | Benzo[k]fluoranthene | [207-08-9] |
| Fluorene | [86-73-7] | Benzo[e]pyrene | [192-97-2] |
| Phenanthrene | [85-01-8] | Benzo[a]pyrene | [50-32-8] |
| Anthracene | [120-12-7] | Perylene | [198-55-0] |
| 2-Methyl phenanthrene | [2531-84-2] | Indeno[1,2,3-cd]pyrene | [193-39-5] |
| Fluoranthene | [206-44-0] | Dibenzo[a,h]anthracene | [53-70-3] |
| Pyrene | [129-00-0] | Benzo[g,h,i]perylene | [191-24-2] |
| Benzo[c]phenanthrene | [195-19-7] | | |

Limits of quantitation:
Acenapthylene, Fluorene, Fluoranthene, Triphenylene/Chrysene 0.03 mg/kg dry matter;
all other compounds 0.02 mg/kg dry matter.

Result: compounds listed above were not quantifiable.

## 21. Determination of Mineral Oil Hydrocarbons (MOSH and MOAH) *

The determination of the paraffinic, naphthenic mineral oil hydrocarbons (MOSH) and of the aromatic mineral oil hydrocarbons (MOAH) was performed according to the method published by the German "National Reference Laboratory for Materials in contact with food".
After extraction with a mixture of ethanol/hexane, the analysis was performed by means of online coupled HPLC-GC-FID using internal standards. In both fractions the chromatographically not resolved hump including signals on top was integrated. Hydrocarbon compounds not defined as mineral oil were deducted during the quantification.

| | MOSH | | | MOAH | | |
|---|---|---|---|---|---|---|
| | $< C_{16}$ | $C_{16} - < C_{35}$ | $C_{20} - \leq C_{35}$ | $< C_{16}$ | $C_{16} - \leq C_{35}$ | |
| | | | | | | |
| Result: | < 10 | 10 | 10 | < 10 | < 6 | mg/kg |

## 22. Specific Determination of Primary Aromatic Amines in the Water Extract *

The determination was performed according to DIN EN 17163:2019-05 by means of LCMS. The following compounds were considered:

Aniline [62-53-3]
4-Aminodiphenyl [92-67-1]
Benzidine [92-87-5]
4-Chloro-o-toluidine [95-69-2]
2-Naphthylamine [91-59-8]
o- Aminoazotoluene [97-56-3]
2-Amino-4-nitrotoluene [99-55-8]
4-Chloroaniline [106-47-8]
2,4-Diaminoanisole [615-05-4]
4,4`-Diaminodiphenylmethane [101-77-9]
3,3`-Dichlorbenzidine [91-94-1]
3,3`-Dimethoxybenzidine [119-90-4]
p-Toluidine [106-49-0]
2,4-Dimethylaniline [95-68-1]
1,2-Phenylendiamine [95-54-5]
1,3-Phenylendiamine [108-45-2]
1,4-Phenylendiamine [106-50-3]
5-Chloro-2-methoxyaniline [95-03-4]
4-Chloro-2,5-dimethoxyaniline [6358-64-1]
2,6-Toluenediamine [823-40-5]
2,4-Dichloro aniline [554-00-7]
3,3`-Dimethylbenzidine [119-93-7]
3,3`-Dimethyl-4,4`-diaminodiphenylmethane [838-88-0]
p-Cresidine [120-71-8]
4,4`-Methylene-bis(2-chloroaniline) [101-14-4]
4,4`-Oxydianiline [101-80-4]
4,4`-Thiodianiline [139-65-1]
o-Toluidine [95-53-4]
2,4-Toluenediamine [95-80-7]
2,4,5-Trimethylaniline [137-17-7]
o-Anisidine [90-04-0]
4-Aminoazobenzene [60-09-3]
3-Amino-p-anisanilide [120-35-4]
2-Methoxy-4-nitroaniline [97-52-9]
5-Chloro-2-methylaniline [95-79-4]
3-Amino-4-methylbenzamide [19406-86-1]
2-Ethoxyaniline [94-70-2]
4-Amino-benzamide [2835-68-9]
1,5-Diaminonaphthaline [2243-62-1]
Dimethyl aminoterephthalate [5372-81-6]

Limit of quantitation: 0.002 mg/l water extract

Result:

None of the above-listed compounds were quantifiable.

## 23. Determination of Alkanolamines in the water extract *

The determination was performed according to SOP 162.200 by means of LCMS. The following compounds were considered:

| | | | |
|---|---|---|---|
| 2-Aminoethanol | [141-43-5] | N-Methyldiethanolamine (MDEA) | [105-59-9] |
| Diethanolamine (DEA) | [111-42-2] | 2-Dimethylaminoethanol (DMAE) | [108-01-0] |
| Triethanolamine (TEA) | [102-71-6] | 2-Amino-2-methyl-1-propanol (AMP) | [124-68-5] |
| 1-Amino-2-propanol | [78-96-6] | 2-Methylamino-2-methyl-1-propanol | [27646-80-6] |
| 2-(Diethylamino)ethanol | [100-37-8] | | |

Limit of quantitation: 0.01 mg/l extract

Result:

None of the above-listed compounds were quantifiable.

The accreditation applies to the methods marked with * in the test report (Register no. D-PL-14160-01-01 and D-PL-14160-01-02).

End of report