

Postfach 100565 · 63704 Aschaffenburg
Zeppelinstraße 3-5 · 63741 Aschaffenburg · Germany
Fon: +49 6021 4989-0 · Fax: +49 6021 4989-30
E-Mail: info@isega.de · www.isega.de

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From: Hh-pf
Authorized by: Dr. Hillmann

REPORT

Order No.: 4637/19-1 **Page 1 of 5 pages**

Client: PT. Indah Kiat Pulp & Paper Tbk.
Jl. Raya Serang Km. 76, Desa Kragilan, Sentul, 3rd Floor
Serang 42184, Banten
Indonesia

Date of order: 28 March 2016

Receipt of sample material: 31 March 2016

Origin of sample material: From the client

Purpose: Analysis of a board grade for its compliance with the demands on food contact materials



(Dr. Derra)

Managing Director



(Dr. Hillmann)

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.

Sample Material

For analysis the following sample material was in hand:

Sample 1: Bio Natura Cup

Carrying out of the Tests

Examination period: 30 November 2016 to 22 December 2016

1. Determination of the Grammage *

The determination was performed by analogy with DIN EN ISO 536 after conditioning of the sample at 23 °C / 50 % atmospheric humidity which is prescribed as norm climate.

Result: 277 g/m² \triangle 255 g dry matter/m²

2. Determination of the Moisture Content *

The determination was performed according to DIN EN ISO 638 directly after unpacking the sample.

Result: 6.7 %

3. Preparation of Extracts *

The extracts were prepared according to the "Methods for the examination of consumer goods" following the method B 80.56 of the Official Collection of Analytical Methods according to § 64 LFGB and according to the demands of the standards EN 645, EN 647 and EN 15519.

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

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

The dry matter was determined according to DIN EN 920 after drying at 105 °C.

Result: 15 mg/dm² \triangle 6.0 mg/g dry matter

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

The determination was performed photometrically according to the acetylacetone method in conformity with DIN EN 1541. The requirements of the method B 82.02-1 indicated in the Official Collection of Analytical Methods according to § 64 of the LFGB for consumer goods were observed.

Result: not determinable < 0.004 mg/g dry matter

6. Determination of Glyoxal in the Water Extract *

The determination was performed according to the DIN 54603. The demands of the method no. 4.3.2.2. of the loose-sheet collection "Examination of papers and boards intended for food packaging according to the German Recommendation XXXVI" are taken into consideration.

Result:

Result: not determinable < 0.005 mg/g dry matter

7. Determination of the Heavy Metals Contents in the Water Extract *

The determination was performed according to DIN EN 12497 and DIN EN 12498.

Result in mg/kg dry matter:

| | | |
|---------------|------------------|---------|
| Cadmium (Cd): | not determinable | < 0.025 |
| Mercury (Hg): | not determinable | < 0.025 |
| Lead (Pb): | not determinable | < 0.025 |

8. IR-Spectroscopic Testing of the Dry Matter from the Water Extract *

The dry matter was 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.

9. Gaschromatographic Analysis of the Organic Solvent Extract*

The isooctane extract was analysed gaschromatographically according to SOP 160.200 by means of flame ionization detection. A summary, semiquantitative estimation of all compounds eluting between tetradecane (C₁₄) and tetracontane (C₄₀) was performed against the internal standard tridecane (C₁₃).

Result:

Sum C₁₄ - C₄₀ 1.4 mg/dm² \triangleq 0.5 mg/g dry matter

10. Determination of the Transfer of Antimicrobial Constituents *

The determination was made according to DIN EN 1104. 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

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.

11. Test for Fluorescent Substances *

The test was made by UV irradiation.

Result: The sample did not contain optically brightened fibres.

12. Determination of Anthraquinone *

The sample was extracted with 95 % ethanol (v/v) at 60 °C. The determination was performed according to SOP 160.200 by means of gas chromatography and mass spectrometric detection.

Result: not determinable < 0.13 mg/kg dry matter

13. Sensory Test for Odour *

The examination was made according to EN 1230-1.

The sample was stored in a sealed glass vessel in the dark at 23 ± 2 °C for 20 - 24 hours. Then six assessors evaluated the odour.

Result:

A moderate odour was noticed which was described as sour.

Scale of intensity: 2.25.

- 0 = no perceptible odour
- 1 = odour just perceptible (still hard to define)
- 2 = moderate odour
- 3 = moderately strong odour
- 4 = strong odour

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