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From: Honer
ci/kr

REPORT

Order No.: 5129/19 **Page 1 of 6 pages**

Client: Devon Valley Ltd.
Station Road
Hele, Exeter, Devon EX5 4PL / Great Britain

Date of order: 8 December 2015

Receipt of sample material: 10 December 2015

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)

(Honer)
Diplomaed
Food Chemist

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:

Casing Paper

Carrying out of the Tests

Examination period: 16 December 2015 to 26 January 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: 25.1 g/m² ≙ 23.6 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: 7.9 %

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: 2 hours at 80 °C
Isooctane: 2 hours at 60 °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: 1.0 mg/dm² ≙ 4.1 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: 0.002 mg/dm² ≙ 0.008 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: not determinable < 0.005 mg/g dry matter

7. Determination of the Nitrogen Content in the Water Extract *

After the Kjeldahl disintegration a water vapour distillation was made. The ammonium nitrogen was determined photometrically according to DIN 38 406 - E5 - 1.

Result: 0.008 mg/dm^2 ≙ 0.03 mg/g dry matter

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

The analysis was made according to DIN EN ISO 15320 by means of gas chromatography in the water extract after concentration at a column and esterification. The detection was performed by means of ECD.

Result: not determinable < 0.01 mg/kg dry matter

9. 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	< 0.05
Mercury	(Hg):	not determinable	< 0.025
Lead	(Pb):	not determinable	< 0.5
Chromium	(Cr):	not determinable	< 0.1

10. 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.

11. 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 (C_{14}) and tetracontane (C_{40}) was performed against the internal standard tridecane (C_{13}).

Result:

Sum C_{14} - C_{40}	0.03	mg/dm²	≙ 0.1	mg/g dry matter

12. Determination of Polychlorinated Biphenyls (PCB) *

The determination was performed according to DIN EN ISO 15318 by means of gas chromatography. The demands of the method B 80.56-1 within the Official Collection of Analytical Methods according to § 64 LFGB for consumer goods are considered. The numbers refer to the Ballschmiter nomenclature.

Result in mg/kg dry matter:

18	2,2′,5-Trichlorobiphenyl	not determinable	< 0.01
28	2,4,4′-Trichlorobiphenyl	not determinable	< 0.01
52	2,2′,5,5′-Tetrachlorobiphenyl	not determinable	< 0.01
101	2,2′,4,5,5′-Pentachlorobiphenyl	not determinable	< 0.01
138	2,2′,3,4,4′,5′-Hexachlorobiphenyl	not determinable	< 0.01
153	2,2′,4,4′,5,5′-Hexachlorobiphenyl	not determinable	< 0.01
180	2,2′,3,4,4′,5,5′-Heptachlorobiphenyl	not determinable	< 0.01

13. Determination of the Transfer of Antimicrobial Constituents *

The determination was made according to DIN EN 1104. Test specimen 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: no inhibition zone
with Bacillus subtilis: no inhibition zone

i.e.: a transfer of antimicrobial constituents was not detected.

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 Heavy Metals Contents *

The determination was performed after microwave disintegration by AAS/hydride technique or ICP-AES, respectively.

Result:

Arsenic	(As):	not determinable	<	2	mg/kg dry matter
Cadmium	(Cd):	not determinable	<	0.5	mg/kg dry matter
Chromium	(Cr):	not determinable	<	1	mg/kg dry matter
Mercury	(Hg):	not determinable	<	0.25	mg/kg dry matter
Lead	(Pb):	not determinable	<	5	mg/kg dry matter

16. 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

17. Determination of the Epichlorohydrin Hydrolysis Products *

The determination was performed after solid phase extraction by means of gas chromatography in accordance with the Official Collection of Analytical Methods according to § 64 of the LFGB, method B 80.56-2 with mass spectrometric detection.

The water extract was prepared according to DIN EN 647.

Result:

1,3-Dichloro-2-propanol:	not detected	<	2	µg/l water extract
3-Monochloro-1,2-propanediol:			5.4	µg/l water extract

18. Extraction Tests According to the FDA Regulations *

The tests were performed according to FDA 21 CFR Ch. I, § 176.170 in triplicate.

a) Extraction with Water

The extraction was made for 30 min at 100 °C.

Result: 0.14 mg/sq inch

Chloroform soluble portion: The determination is not necessary as test results are already in conformity with the limit value.

b) Extraction with n-Heptane

The extraction was made for 30 min at 49 °C.

Result:	0.06	mg/sq inch
Chloroform soluble portion:	The determination is not necessary as test results are already in conformity with the limit value.	

19. Sensory Analysis of a Filter Paper *

The examination was made on the basis of DIN 10 955.

The filter paper was scalded with 250 ml hot water. The water in its hot state was evaluated by six assessors in an extended triangular test according to DIN ISO 4120. As a reference sample water was taken which had been scalded, too, but which had not been in contact with the sample.

Result:

No statistically confirmed difference could be noticed between the taste of the water which had been in direct contact with the sample and the water which had not been in contact to the sample.

Evaluation (median): < 1

Scale of intensity:

0 = no perceptible off-flavour
1 = off-flavour just perceptible (still difficult to define)
2 = moderate off-flavour
3 = moderately strong off-flavour
4 = strong off-flavour

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