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Aschaffenburg, 27 December 2022

From: lb-ci
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REPORT

Order No.: 18285/8-I **Page 1 of 8 pages**

Client: Woodland Pulp LLC
Woodland Mill
144 Main Street
Baileyville, ME 04694
United States

Date of order: 7 October 2022

Receipt of sample material: 10 October 2022

Origin of sample material: From the client

Purpose: Analysis of two pulp grades for various parameters

(Dr. Derra)
Managing Director

(lbel)
Officially certified
food chemist
Project manager

The present report exclusively refers to the samples mentioned. It meets the requirements of the DIN EN ISO/IEC 17025:2018 for simplified test reports. Additional information and statistical data on the results are available upon request.

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

Sample Material

For analysis the following sample material was in hand:

Sample 1:	Northern Bleached Softwood Kraft
Sample 2:	Hardwood

Carrying out of the Tests

Examination period: 10 October 2022 to 22 December 2022

1. 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:

Sample 1:	9.1	%

2. 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:	2 hours at 80 °C
Isooctane:	2 hours at 60 °C
95 % Ethanol:	2 hours at 60 °C

3. 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:

Sample 1:	3.9	mg/g dry matter

4. 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:

Sample 1:	not quantifiable	<	0.004	mg/g

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

After the Kjeldahl disintegration and subsequent water vapour distillation, the determination of the ammonium nitrogen was performed photometrically according to DIN 38406-E5-1:1983-10.

Result:

Sample 1:	not quantifiable	<	0.013	mg/g

6. Determination of the Elements in the Water Extract *

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

Result:

Sample 1:

Cadmium	(Cd):	not quantifiable	<	0.001	mg/l water extract
Lead	(Pb):	not quantifiable	<	0.001	mg/l water extract
Aluminium	(Al):	not quantifiable	<	0.2	mg/l water extract

7. Determination of Acrylamide [79-06-1] in the Water Extract *

The determination was performed according to SOP 162.200 by means of LCMS.

Result:

Sample 1:	not quantifiable	<	0.01	mg/l extract

8. 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:

Sample 1:	1.1	mg/g dry matter

9. 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:

Sample 1:

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:

The 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.

10. Test for Fluorescent Substances *

The test was made by UV irradiation.

Result:

Sample 1: The sample did not contain optically brightened fibres.

11. Determination of Anthraquinone [84-65-1] * and 2-Ethylanthraquinone [84-51-5]

The determination was performed according to DIN CEN/TS 17630:2021-09 by means of GCMS after extraction with 95 % ethanol (v/v).

Result:

Sample 1:

Anthraquinone:	not quantifiable	< 0.13	mg/kg dry matter
2-Ethylanthraquinone:	not quantifiable	< 0.13	mg/kg dry matter

12. Determination of Organic Halogenated Compounds (OX) *

The determination was performed according to ISO 11480:2017-05, clause 4 (microcoulometric method).

Result:

Sample 1: 179 mg/kg

13. Determination of the Residue on Ignition *

The determination was performed according to ISO 2144:2015-05 gravimetrically after the sample was incinerated at 900 °C.

Result:

Sample 1:	0.6	% of the dry matter

14. Determination of Mineral Oil Hydrocarbons (MOSH/MOAH) *

The determination was performed according to the method published by the German "National Reference Laboratory for Materials in contact with food".
The paraffinic, naphthenic mineral oil hydrocarbons (MOSH) and the aromatic mineral oil hydrocarbons (MOAH) were examined by means of on-line coupled HPLC-GC-FID after extraction with a mixture of ethanol/n-hexane.

Result:

Sample 1:

MOSH – ≥ C_{10} - ≤ C_{16}:	not quantifiable	<	2	mg/kg
MOSH – > C_{16} - ≤ C_{25}:	not quantifiable	<	2	mg/kg
MOSH – > C_{16} - ≤ C_{35}:			4	mg/kg
MOSH – > C_{20} - ≤ C_{35}:			3	mg/kg
MOAH – ≥ C_{10} - ≤ C_{16}:	not quantifiable	<	2	mg/kg
MOAH – > C_{16} - ≤ C_{25}:	not quantifiable	<	2	mg/kg
MOAH – > C_{16} - ≤ C_{35}:	not quantifiable	<	2	mg/kg

15. Determination of Methanol and 1,4-Dioxane

The determination was performed according to SOP 160.200 by means of head space chromatography and mass spectrometric detection after a storage of 60 minutes at 80 °C.

Result:

Sample 1:

Methanol	not determinable	<	0.4	mg/m²
1,4-Dioxane	not determinable	<	0.4	mg/m²

Sample 2:

1,4-Dioxane	not determinable	<	0.4	mg/m²

16. Determination of Elements *

The determination was performed after microwave disintegration by means of AAS or ICP-OES.

Result:

Sample 1:

Arsenic	(As):	not quantifiable	<	2	mg/kg dry matter
Cadmium	(Cd):	not quantifiable	<	0.5	mg/kg dry matter
Chromium	(Cr):	not quantifiable	<	1	mg/kg dry matter
Copper	(Cu):	not quantifiable	<	2	mg/kg dry matter
Mercury	(Hg):	not quantifiable	<	0.25	mg/kg dry matter
Lead	(Pb):	not quantifiable	<	2	mg/kg dry matter
Zinc	(Zn):	not quantifiable	<	10	mg/kg dry matter

17. Extraction Tests According to the FDA Regulations *

The determination was performed according to 21 CFR 176.170 in triplicate.

a) Solvent: Water

Condition: 30 minutes at 100 °C (condition of use B)

Result:

Sample 1:	not quantifiable	<	0.065	mg/sq inch
chloroform soluble portion:	The determination is not necessary as the test result already corresponds with the limit value.			

Comment: Limit Value (chloroform soluble portions): 0.5 mg/ sg inch

b) Solvent: n-Heptane

Condition: 30 minutes at 49 °C (condition of use B)

Result:

Sample 1:	not quantifiable	<	0.065	mg/sq inch
chloroform soluble portion:	The determination is not necessary as the test result already corresponds with the limit value.			

Comment: Limit Value (chloroform soluble portions): 0.5 mg/ sg inch

c) Solvent: Water

Condition: 2 hours at 121 °C (condition of use A)

Result:

Sample 1:			0.3	mg/sq inch
chloroform soluble portion:			The determination is not necessary as the test result already corresponds with the limit value.	

Comment: Limit Value (chloroform soluble portions): 0.5 mg/ sg inch

d) Solvent: n-Heptane

Condition: 2 hours at 66 °C (condition of use A)

Result:

Sample 1:	not quantifiable	<	0.065	mg/sq inch
chloroform soluble portion:			The determination is not necessary as the test result already corresponds with the limit value.	

Comment: Limit Value (chloroform soluble portions): 0.5 mg/ sg inch

18. Sensory Analysis for Odour at 220 °C

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

The sample was stored in a sealed glass vessel at 220 °C for 30 min. Then the odour of the sample was evaluated by a group of selected assessors.

Result:

A moderate, but tolerable of odour was noticed which indicated a decomposition of the product and which was described as pungent and fatty.

19. Sensory Analysis: Transition of Taste *

The analysis was performed according to DIN 10955:2004-06 with six selected assessors.

Test food: tap water

Mass/volume ratio: 2 g per 250 ml, followed by another 250 ml

Boiling water was poured over the pulp grade. After 2 minutes the water was discarded and boiling water was again poured over the sample. After a contact time of 2 minutes, the water in its hot state was evaluated in an extended triangular test compared to water which had been treated the same way, but had not been in contact with the sample.

Result:

Sample 1:

A statistically significant deviation in taste of the water, which had been poured over the sample, was noticed compared to the reference water. It was described as bitter and tasting like pulp.

Evaluation (median): 2.0

Scale of intensity

0 = no perceptible deviation in taste
1 = just perceptible deviation in taste (still difficult to define)
2 = slight deviation in taste
3 = clear deviation in taste
4 = strong deviation in taste

18285/8-I ≙ Amended version; the original test report no. 18285/8 of 18 November 2022 remains valid. Amended was point 17 c) and d).

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