

Aschaffenburg, 24 June 2026

From: IIs-kr

Authorized by: IIs

REPORT

Order No.: 20133/2 **Page 1 of 6 pages****Client:** HANKUK PAPER MFG. CO. LTD
97, Biseul-ro 96-gil, Yuga-eup
Dalseong-gun, Daegu
Republic of Korea**Date of order:** 16 March 2026**Receipt of sample material:** 18 May 2026**Origin of sample material:** From the client**Purpose:** Analysis of a board grade for its compliance with the
demands on food contact materials

(IIs)

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.

Sample Material

For analysis the following sample material was in hand:

Duplex Board with Grey Back (SC)

Carrying out of the Tests

Examination period: 19 May 2026 to 23 June 2026

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: 346 g/m² $\triangleq$ 327 g dry matter/m²

2. Determination of the Moisture Content *

The determination was performed as single determination according to DIN EN ISO 638-1:2022-07 in the condition as received.

Result: 5.1 %

3. Preparation of Extracts *

The extract was 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. 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

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: not quantifiable < 0.004 mg/g dry matter

5. 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.
Presence of a modification of the test microorganism *A. niger* growth at the edges of the test pieces.
Presence of a microbial contaminant of < 2 mm around the test pieces.

with *Bacillus subtilis*: Microbial growth up to the edges of the test specimens.
No growth of the test microorganism in a zone with a diameter of < 14 mm (on one side).
Presence of a modification of the test microorganism *B. subtilis* growth at the edges of the test pieces.
Presence of a microbial contaminant of < 2 mm around the test pieces.

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.

6. Determination of the Heavy Metals in Packagings *

It applies to those metals which are restricted according to the European Packaging Regulation (EU) 2025/40 as well as to the US American CONEG legislation.

The determination was performed after microwave disintegration according to DIN EN ISO 12846:2012-08 (Hg) and DIN EN ISO 11885:2009-09 (Pb, Cd, Cr), which was accordingly modified for the respective disintegration.

Result:

Lead	(Pb)	ICP-OES: not quantifiable	<	7.0	mg/kg dry matter
Cadmium	(Cd)	ICP-OES: not quantifiable	<	0.5	mg/kg dry matter
Mercury	(Hg)	AAS: not quantifiable	<	0.25	mg/kg dry matter
Chromium	(Cr)	ICP-OES:		4.5	mg/kg dry matter

Limit value 100 mg/kg (sum of Pb, Cd, Hg and Cr(VI)).

Comment:

The total chromium content including Cr(VI) is measured under the disintegration conditions.

7. 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:

Acenaphthylene, Fluorene, Fluoranthene, Triphenylene/Chrysene 0.03 mg/kg dry matter;
all other compounds 0.02 mg/kg dry matter.

Result:

Phenanthrene	0,04	mg/kg
Pyrene	0,04	mg/kg

Further compounds listed above were not quantifiable.

8. Determination of Total Fluorine, Inorganic Fluorine and Organic Fluorine *

The determination was performed in connection with the European Packaging Regulation (EU) 2025/40 (PPWR) according to SOP 162.200 by means of combustion ion chromatography (CIC).

a) Total Fluorine (TF)

The sample was incinerated at 1050 °C.

b) Total Inorganic Fluorine (TIF)

The sample was pre-incinerated at 525°C in order to remove organic fluorine portions. The subsequent incineration was performed according to point a).

c) Total Organic Fluorine (TOF)

TOF was calculated as difference between a) TF and b) TIF.

Result:

a) TF	47	mg/kg dry matter
b) TIF	46	mg/kg dry matter
c) TOF	< 10	mg/kg dry matter (calculated)

9. Determination of the Specific Migration into Tenax® (Modified Polyphenylene Oxide) *

The migration was performed as a single fold determination according to DIN EN 14338:2004-03.

Conditions: 10 days at 40 °C

Testing procedure: one-sided contact (food contact side)

Subsequently, the volatile components adsorbed onto Tenax were extracted.

9.1. Gas chromatographic Analysis

The determination was performed according to SOP 160.200 by means of GCMS after extraction with methyl *tert*-butylether.

a) Sum of the volatile components

The volatile components were summarized semi-quantitatively using deuterated nonadecane as internal standard.

Result: 2.0 mg/dm²

b) Specific Evaluation

In addition, an examination for the below listed contaminants was performed.

Result:

Diisopropyl-naphthalene (DIPN)	[38640-62-9]	not quantifiable	<	0.05	mg/dm ²
Other solvent		not quantifiable	<	0.05	mg/dm ²
Benzophenone	[119-61-9]	not quantifiable	<	0.02	mg/dm ²
4-Methyl benzophenone	[134-84-9]	not quantifiable	<	0.02	mg/dm ²
Dibutyl phthalate	[84-74-2]			0.014	mg/dm ²
Diisobutyl phthalate	[84-69-5]	not quantifiable	<	0.002	mg/dm ²
Di(2-ethylhexyl) phthalate	[117-81-7]			0.018	mg/dm ²
Benzylbutyl phthalate	[85-68-7]	not quantifiable	<	0.05	mg/dm ²
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate (TXIB)	[6846-50-0]	not quantifiable	<	0.02	mg/dm ²
Diethylene glycol dibenzoate	[120-55-8]	not quantifiable	<	0.002	mg/dm ²
Benzyl-2-naphthylether	[613-62-7]	not quantifiable	<	0.002	mg/dm ²

9.2. Mineral Oil (MOSH/MOAH) *

The determination was performed according to the DIN SPEC 5010:2018-05 after extraction with n-hexane.

The paraffinic, naphthenic mineral oil hydrocarbons (MOSH) and the aromatic mineral oil hydrocarbons (MOAH) were examined according to the method published by the German "National Reference Laboratory for Materials in contact with food" by means of on-line coupled HPLC-GC-FID.

	MOSH			
	$\geq C_{10} - \leq C_{16}$	$> C_{16} - \leq C_{20}$	$> C_{20} - \leq C_{35}$	
Result:	0.013	0.091	0.46	mg/dm ²

	MOAH			
	$\geq C_{10} - \leq C_{16}$	$> C_{16} - \leq C_{35}$	$\geq C_{10} - \leq C_{35}$	
Result:	< 0.005	0.045	0.046	mg/dm ²

The accreditation applies to the methods marked with * in the test report (Register no. D-PL-14160-01-00).

End of report