TEST REPORT

Applicant: NANO AND ADVANCED MATERIALS INSTITUTE
NEW ISLAND PRINTING GROUP CO., LTD
ROOM 1701, 17/F, BILLION PLAZA,
8 CHEUNG YUE STREET,
CHEUNG SHA WAN, KOWLOON,
HONG KONG
Attn: RAIN NG

Number: HKGH0302050001

Date: Jul 28, 2023

Sample and Information provided by customer	:	
Item Name	:	**AGS-WB**
PO No.	:	NA2300506
Quantity	:	1 bag
Packaging Provided	:	Yes
Manufacturer	:	New Island Printing Group Co., Ltd.
Country of Origin	:	China

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For and on behalf of :
Intertek Testing Services HK Ltd.

Cindy I.K. Chan
Vice President

Intertek Testing Services Hong Kong Limited
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Conclusion:
The submitted sample was tested under the following requirements requested by the applicant, subject to the information stated in the remark and attached page(s) for details :

	Requirement	Result
(1)	Resolution ResAP (2004) 1 - Overall migration Test	Pass
(2)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Sensory Evaluation	Pass
(3)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Overall Gas Phase Migration	Pass
(4)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Colour Fastness of Dyed Paper and Board	Pass
(5)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Specific Migration of 4,4'-Bis(dimethyl-amino) Benzophenone (Michler's ketone)	Pass
(6)	Paper and board used in food contact materials and articles, EDQM 2021, 1st Edition - Specific Migration of Bisphenol A	Pass
(7)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Specific Migration of Polycyclic Aromatic Hydrocarbons	Pass
(8)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Specific Migration of Benzophenone, 2-Methyl benzophenone, 3-Methyl benzophenone and 4-Methyl benzophenone	Pass
(9)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Specific Migration of Phthalates	Pass
(10)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Specific Migration of Primary Aromatic Amines	Pass
(11)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Specific Migration of Lead	Pass
(12)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Fastness of Fluorescent Whitened Paper and Board	Pass

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	Requirement	Result
(13)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Transfer of antimicrobial constituents	Pass
(14)	Council of Europe Resolution CM/Res (2020) 9 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021, 1st Edition - Colour Fastness of Dyed Paper and Board	Pass

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Decision Rule(s):
When a statement of conformity to a specification or standard is provided on test report, the decision rule shall be applied. For details, please refer to Intertek's "Decision Rule Document" and is available on Intertek's website. https://intertekhk.grd.by/decision-rule-doc..
If decision rule already inhered in the requested specification or standard, Intertek's "Decision Rule Document" is not applicable and indication of "∞" was shown as above table.
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(1) Overall Migration Test

Test method: Resolution ResAP (2004) 1.

I. Test condition :

Aqueous food simulant	
Time	Temperature
2 hours	70 °C

Fatty food simulant	
Time	Temperature
2 hours	70 °C

II. Test result :

Tested component	Results (mg/dm^2)
	Fatty food simulant
(1)	8
Limit (mg/dm^2)	10

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
Testing period : Jun 05, 2023 to Jul 25, 2023

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(2) Sensory Evaluation

Test Standard : EN 1230-1 : 2009 and EN 1230-2 : 2009.

I. Odour

The test specimens were stored in a glass jar for 24 hours at 23°C in the dark, and a blank jar was set in the same manner as control. The odour of the air in the jars was estimated by a panel of 6 assessors. The intensity of the odour was evaluated on a scale from 0 to 4.

Tested component	Result (Score)	Requirement (Score)
(1)	0	<3

Score description :
0 = no perceptible odour
1 = odour just perceptible (difficult to define)
2 = weak odour
3 = clear odour
4 = strong odour

II. Off-flavour (taint)

The test specimens were incubated in a glass desiccator at 23°C and 75% relative humidity under darkness with chocolate. Two sets of chocolate were set in the same manner as controls. After 44 - 48 hours of incubation, three sets of chocolate (2 controls and 1 sample) were presented as blind samples to a panel of 6 assessors. Any taint (off-flavour) transferred was evaluated by Triangle Test. The intensity of the taint was evaluated on a scale from 0 to 4.

Tested component	Result (Score)	Requirement (Score)
(1)	0	<3

Score description :
0 = no perceptible off-flavour
1 = just perceptible off-flavour (difficult to define)
2 = weak off-flavour
3 = clear off-flavour
4 = strong off-flavour

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
Testing period : Jun 05, 2023 to Jul 04, 2023

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(3) Overall Gas Phase Migration

Test standard : EN 14338 and EDQM Technical Guide on Paper and board used in food contact materials and articles, 2021.

I. Test condition :

Modified polyphenylene oxide	
Time	Temperature
2 hours	70 °C

II. Test result :

Tested component	Result in mg/dm^2
	Modified polyphenylene oxide
(1)	<3
Limit mg/dm^2	10

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
Testing period :Jun 05, 2023 to Jul 04, 2023

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(4) Colour Fastness of Dyed Paper and Board

Test Standard : EN 646 : 2018 Paper and board intended to come into contact with foodstuffs - Determination of colour fastness of dyed paper and board

Procedure applied : Procedure B: Medium time contact (4 hrs)
Side tested : Printed side

Tested component	Deionized water	Aqueous acetic acid 3.0% (m/v)	Alkaline salt solution with pH8.6 ± 0.1	Rectified olive oil
(1)	5	5	5	5

Remark: Evaluating against ISO Grey Scale for Staining
Requirement: No staining (Grade 5)

Tested component:
(1) White paper with black, blue printing.

Date sample received : Jun 05, 2023
Test Period : Jun 05, 2023 to Jun 13, 2023

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(5) Specific Migration of 4,4'-Bis(dimethyl-amino) Benzophenone (Michler's ketone)

Test method : EN 15519, By Liquid Chromatographic – Mass Spectrometric (LC-MS) Analysis.

I. Test condition :

95% ethanol	
Time	Temperature
2 hours	60 °C

II. Result :

Compounds	Result (mg/kg) (1)	Limit (mg/kg)
Michler's ketone	Not detected	Not detected

Remark :
Detection limit : 0.01 mg/kg

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
Testing period : Jun 05, 2023 to Jul 04, 2023

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(6) Specific Migration of Bisphenol A

Test method : EN 15519, By Liquid Chromatographic – Mass Spectrometric (LC-MS) Analysis.

I. Test condition :

95% ethanol	
Time	Temperature
2 hours	60 °C

II. Result :

Compounds	Result (mg/kg) (1)	Limit (mg/kg)
Bisphenol A	Not detected	Not detected

Remark :
Detection limit : 0.01 mg/kg

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
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(7) Specific Migration of Polycyclic Aromatic Hydrocarbons

Test method : EN 15519, By Gas Chromatographic - Mass Spectrometry (GC/MS) analysis.

I. Test condition :

Isooctane	
Time	Temperature
2 hours	60 °C

II. Result :

Compound	Result (1)	Requirement
Sum of Benzo[a]pyrene, Benzo[a]anthracene, Benzo[b]fluoranthene and Chrysene	Not detected	Not detected

Remark :
Detection limit : 1 µg/kg

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
Testing period : Jun 05, 2023 to Jul 04, 2023

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(8) Specific Migration of Benzophenone, 2-Methyl benzophenone, 3-Methyl benzophenone and 4-Methyl benzophenone

Test method : EN 15519, By Gas Chromatographic – Mass Spectrometric (GC/MS) Analysis.

I. Test condition :

95% ethanol	
Time	Temperature
2 hours	60 °C

II. Result :

Compounds	Result (mg/kg) (1)	Limit (mg/kg)
Sum of Benzophenone + 2-Methyl benzophenone + 3-Methyl benzophenone + 4-Methyl benzophenone	<0.01	0.6
Sum of 2-Methyl benzophenone + 3-Methyl benzophenone + 4-Methyl benzophenone	<0.01	0.05

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
Testing period : Jun 05, 2023 to Jul 04, 2023

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(9) Specific Migration of Phthalates

Test method : EN 15519, By Gas Chromatographic - Mass Spectrometry (GC/MS) analysis.

I. Test condition :

Isooctane	
Time	Temperature
2 hours	60 °C

II. Result :

Compounds	Result (mg/kg) (1)	Limit (mg/kg)
Benzyl butyl phthalate (BBP)	<1	3
Diethyl hexyl phthalate (DEHP)	<0.2	0.3
Sum of Diisobutyl phthalate (DIBP) + Dibutyl phthalate (DBP)	<0.01	0.012
Sum of Diisononyl phthalate (DINP) + Diisodecyl phthalate (DIDP)	<0.2	0.9

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
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(10) Specific Migration of Primary Aromatic Amines

I. Test method: Commission Regulation (EU) No. 10/2011 and its amendments and JRC Technical Guidelines EN24815 EN2011, By Liquid Chromatograph - Tandem Mass Spectrometry (LC-MS/MS) Analysis

I. Test condition :

3% (w/v) Acetic acid	
Time	Temperature
2 hours	70 °C

Result :

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Compound		Result (mg/kg) (1)	Detection Limit (mg/kg)	Limit (mg/kg)
4-Aminodiphenyl	92-67-1	ND	0.002	0.002
Benzidine	92-87-5	ND	0.002	0.002
4-Chloro-o-toluidine	95-69-2	ND	0.002	0.002
2-Naphthylamine	91-59-8	ND	0.002	0.002
o-Aminoazotoluene	97-56-3	ND	0.002	0.002
2-Amino-4-nitrotoluene	99-55-8	ND	0.002	0.010
p-Chloroaniline	106-47-8	ND	0.002	0.002
2,4-Diaminoanisole	615-05-4	ND	0.002	0.002
4,4'-Diaminodiphenylmethane	101-77-9	ND	0.002	0.002
3,3'-Dichlorobenzidine	91-94-1	ND	0.002	0.002
3,3'-Dimethoxybenzidine	119-90-4	ND	0.002	0.002
3,3'-Dimethylbenzidine	119-93-7	ND	0.002	0.002
3,3'-Dimethyl-4,4'-diamino diphenylmethane	838-88-0	ND	0.002	0.002
p-Cresidine	120-71-8	ND	0.002	0.002
4,4'-Methylene-bis (2-chloroaniline)	101-14-4	ND	0.002	0.002
4,4'-Oxydianiline	101-80-4	ND	0.002	0.002
4,4'-Thiodianiline	139-65-1	ND	0.002	0.002
o-Toluidine	95-53-4	ND	0.002	0.002
2,4-Toluylenediamine	95-80-7	ND	0.002	0.002
2,4,5-Trimethylaniline	137-17-7	ND	0.002	0.002
o-Anisidine	90-04-0	ND	0.002	0.002
4-Aminoazobenzene	60-09-3	ND	0.002	0.002
m-Phenylendiamine	108-45-2	ND	0.002	0.010
Benzoguanamin	91-76-9	ND	0.05	5
4,4'-Methylenebis(3-chloro-2,6-diethylaniline)	106246-33-7	ND	0.05	0.05
Total of other primary aromatic amines	/	ND	0.010	0.010

Remark :
ND = Not detected

Other primary aromatic amines as listed in appendix 1 are included in the analysis.

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Appendix 1: List of Other Primary Aromatic Amines	
p-phenylenediamine	106-50-3
Aniline	62-53-3
2,4-xylidine	95-68-1
2,6-xylidine	87-62-7
3-Methoxyaniline	536-90-3
2,6-toluenediamine	823-40-5
1,5-diaminonaphthalene	2243-62-1
4-ethoxyaniline	156-43-4
3-amino-4-methoxybenzanilide	120-35-4
3-amino-4-methylbenzamide	19406-86-1
2-amino-5-methylbenzoic acid	2941-78-8
1-Amino-2-naphthol	2834-92-6
4-Chloro-2-nitroaniline	89-63-4
2-Aminobenzoic acid butyl ester	7756-96-9
2,4,5-Trichloraniline	636-30-6
2,4-Dichloroaniline	554-00-7
5-Chloro-o-toluidine	95-79-4
o-Phenylendiamine	95-54-5
m-Chloroaniline	108-42-9
o-Chloroaniline	95-51-2
m-Toluidine	108-44-1
p-Toluidine	106-49-0
2-Methoxy-4-nitroaniline	97-52-9
2-Ethoxyaniline	94-70-2
5-Chloro-2-methoxyaniline	95-03-4
4-Chloro-3-methoxyaniline	13726-14-2
5-Amino-6-methyl-1,3-dihydrobenzoimidazol-2-one	67014-36-2
p-Aminobenzamide	2835-68-9
2,5-Dichloroaniline	95-82-9
2-Chloro-4-nitroaniline	121-87-9
2,5-Dimethoxy-4-chloroaniline	6358-64-1
2,4-Dinitroaniline	97-02-9
4-Aminotoluene-3-sulfonic acid	88-44-8
2-Aminobiphenyl	90-41-5
Dimethyl-2-aminoterephthalate	5372-81-6
2-Amino-1-naphthalenesulfanic acid	81-16-3
2-Methyl-4-nitroaniline	99-52-5
2-Nitroaniline	88-74-4

Component no.	Component description
1	White paper with printings

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(11) Specific Migration of Lead

Test standard : Commission Regulation (EU) No. 10/2011 and its amendments.

I. Test condition :

3% (w/v) Acetic acid	
Time	Temperature
2 hours	70 °C

II. Test Results :

Food simulant: 3% (w/v) acetic acid		
Element	Result in mg/kg	Limit in mg/kg
	(1)	
Lead (Pb)	<0.01	ND (0.01)

Remark :
ND = Not detected

Component no.	Component description
1	White paper with printings

Date sample received : Jun 05, 2023
Testing period :Jun 05, 2023 to Jul 04, 2023

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(12) Fastness of Fluorescent Whitened Paper and Board

Test Standard : EN 648 : 2018 Paper and board intended to come into contact with foodstuffs - Determination of the fastness of fluorescent whitened paper and board

Procedure applied : Procedure B: Medium time contact (4 hrs)
Side tested : Printed side

Tested component	Deionized water	Aqueous acetic acid 3.0% (m/v)	Alkaline salt solution with pH8.6 ± 0.1	Rectified olive oil
(1)	5	5	5	5

Remark: Evaluating against Fluorescent Whitened Agent Paper
Requirement: No fluorescence (Grade 5)

Tested component:
(1) White paper with black, blue printing.

Date sample received : Jun 05, 2023
Test Period : Jun 05, 2023 to Jun 13, 2023

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(13) Determination of the transfer of antimicrobial constituents

Test Standard : *BS EN 1104:2018, British Standard*, Paper and board intended to come into contact with foodstuffs - Determination of the transfer of antimicrobial constituents.

Test culture : *Bacillus substilis* (ATCC 6633).
*Aspergilllus niger (*ATCC 6275).

Incubation temperature : 30°C (for *Bacillus substilis*)
25°C (for *Aspergillus niger*)

Incubation period : 3 days (for *Bacillus substilis*) & 5 days (for *Aspergillus niger*)

Agar medium : Nutrient Agar (for *Bacillus substilis*)
Sabouraud Dextrose Agar (for *Aspergillus niger*)

Test specimen : 12 mm in diameter / printing surface of submitted sample

Test microorganism	Result
Bacillus substilis	Absence of inhibition (Number of positive result : 0 of 9 test pieces)
Aspergillus niger	Absence of inhibition (Number of positive result : 0 of 9 test pieces)
Criteria	Absence of inhibition

Sample received condition: sample in closed plastic bag.

Date sample received : Jun 05, 2023
Testing period : Jun 12, 2023 to Jun 27, 2023

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(14) Colour Fastness of Dyed Paper and Board

Test Standard : EN 646 : 2018 Paper and board intended to come into contact with foodstuffs - Determination of colour fastness of dyed paper and board

Procedure applied : Procedure B: Medium time contact (4 hrs)
Side tested : Printed side

Tested component	Deionized water	Aqueous acetic acid 3.0% (m/v)	Alkaline salt solution with pH8.6 ± 0.1	Rectified olive oil
(1)	5	5	5	5

Remark: Evaluating against ISO Grey Scale for Staining
Requirement: No staining (Grade 5)

Tested component:
(1) White paper with black, blue printing.

Date sample received : Jun 05, 2023
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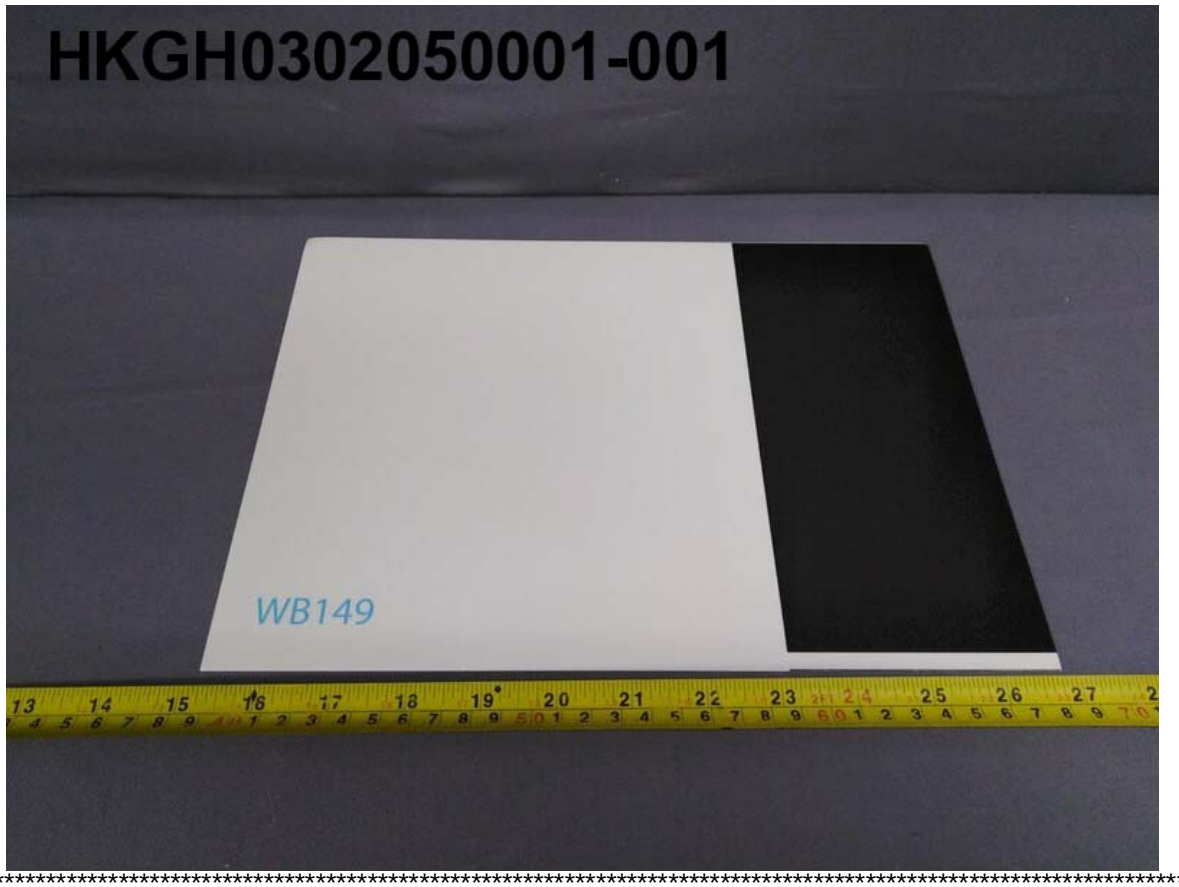

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End of report

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