

TEST REPORT

Requested by:

M&Q Packaging Corp.
Attn. Mrs. D. Demcher
Gwynedd Corporate Center,
1120 Welsh Roda, Suite 170
North Wales, PA 19454
USA

Subject: Test results of the overall and specific migration testing on PanSaver ECO Liners.

Dear Mrs. Demcher,

Hereby I present to you the results of the laboratory investigation that was carried out by your request (ref. SO01671 and SO02211).

Hoping this information will meet your approval,

Yours sincerely,

Intertek Polychemlab



Daisy de Klein
Expert Regulatory Services

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TEST REPORT

Sample and analysis

Date samples received

September 21, 2011

Description of samples

Film MQ120 ECO COEX

Method(s) applied

1. Overall migration

Overall migration according to Commission Regulation (EU) No. 10/2011 relating to plastic materials and articles intended to come into contact with food and its amendments.

Test conditions and simulants as defined Commission Regulation (EU) No. 10/2011.

Test methods as described in:

- EN 1186-1; *Guide to the selection of conditions and test methods for overall migration.*
- EN 1186-3; *Test methods for overall migration into aqueous food simulants by total immersion.*
- EN 1186-4; *Test methods for overall migration into olive oil by cell.*
- EN 1186-13; *Test methods for overall migration at high temperatures, method B with MPPO (Tenax).*

Simulants	Test conditions
3 % acetic acid	4 hours at reflux temperature, by total immersion
10 % ethanol	4 hours at reflux temperature, by total immersion
Olive oil	2 hours at 100 °C, by total single side contact (cell)
MPPO*	2 hours at 175 °C, single side contact

* MPPO (Modified Polyphenylene Oxide)

The tests with the aqueous simulants and MPPO are performed in triplicate and the test with olive oil in quadruplicate.

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2. Specific migration

Specific migration tests according to the Commission Regulation (EU) No 10/2011.

Components	CAS	FCM no.	SML (mg/kg)	Test method	Detection limit
Component X ⁽¹⁾	-	-	5 ⁽²⁾	GC-FID	3 mg/kg
Ethylene glycol	107-21-1	227	(T) 30	⁽³⁾	⁽³⁾
Antimony trioxide	1309-64-4	398	0.04 (expressed as antimony)	ICP-MS	0.01 mg/kg
Cobalt	-	Annex II	0.05	ICP-MS	0.01 mg/kg
Manganese	-	Annex II	0.6	ICP-MS	0.01 mg/kg

⁽¹⁾ The identity of this component has been disclosed under secrecy agreement.

⁽²⁾ This component can be excluded for the specific migration testing with the simulant MPPO based on the overall migration results.

⁽³⁾ This component can be excluded for specific migration testing based on the overall migration results.

Tests are performed according to EN 13130-1; *Guide to test methods for the specific migration of substances from plastics to foods and food simulants and the determination of substances in plastics and the selection of conditions of exposure to food simulants.*

Simulants	Test conditions
3 % acetic acid	4 hours at reflux
10 % ethanol	4 hours at reflux
Olive oil	2 hours at 100 °C, single side contact (cell)
MPPO	2 hours at 175 °C, single side contact

The tests are performed in triplicate.

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Results

1. Overall migration

The results are expressed in mg/dm².

Method Replicates	EN 1186-3 Migration into 3 % acetic acid	EN 1186-3 Migration into 10 % ethanol
	Contact area: 1 dm ² Volume simulant: 100 ml	Contact area: 1 dm ² Volume simulant: 100 ml
	(mg/dm ²)	(mg/dm ²)
1	1.7	0.9
2	0.6	0.9
3	< 0.5	0.9
Mean result	0.9	0.9

Method Replicates	EN 1186-4 Migration into olive oil	EN 1186-13 Migration into MPPO
	Contact area: 0.95 dm ² Volume simulant: 100 ml	Contact area: 1 dm ² Amount of simulant: 4 grams
	(mg/dm ²)	(mg/dm ²)
1	4.7	0.5
2	1.0	0.6
3	0.9	0.6
4	1.1	-
Mean result	1.9	0.6

Overall migration limit is 10 mg/dm² contact area.

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2. Specific migration

Simulant: 3 % acetic acid Test conditions: 4 hours at reflux temperature
Contact area: 1 dm² Volume simulant: 100 ml

The results are expressed in mg/kg foodstuffs and/or mg/6 dm² contact area.

Component	Specific migration limit (mg/kg)	Specific migration Individual results (mg/kg)	Specific migration Mean result (mg/kg)
Component X	5	< 3 < 3 < 3	< 3
Ethylene glycol	(T) 30	Exclusion for specific migration based on the overall migration results	
Antimony trioxide	0.04 (expressed as antimony)	0.014 0.018 0.022	0.018
Cobalt	0.05	< 0.01 < 0.01 < 0.01	< 0.01
Manganese	0.6	< 0.01 < 0.01 < 0.01	< 0.01

Simulant: 10 % ethanol Test conditions: 4 hours at reflux temperature
Contact area: 1 dm² Volume simulant: 100 ml

The results are expressed in mg/kg foodstuffs and/or mg/6 dm² contact area.

Component	Specific migration limit (mg/kg)	Specific migration Individual results (mg/kg)	Specific migration Mean result (mg/kg)
Component X	5	< 3 < 3 < 3	< 3
Ethylene glycol	(T) 30	Exclusion for specific migration based on the overall migration results	
Antimony trioxide	0.04 (expressed as antimony)	< 0.01 < 0.01 < 0.01	< 0.01
Cobalt	0.05	< 0.01 < 0.01 < 0.01	< 0.01
Manganese	0.6	< 0.01 < 0.01 < 0.01	< 0.01

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Simulant: Olive oil Test conditions: 2 hours at 100 °C
Contact area: 1.9 dm² Volume simulant: 100 ml (approx. 73 gram)

The results are expressed in mg/kg foodstuffs and/or mg/6 dm² contact area.

Component	Specific migration limit (mg/kg)	Specific migration Individual results (mg/kg)	Specific migration Mean result (mg/kg)
Component X	5	< 3 < 3 < 3	< 3
Ethylene glycol	(T) 30	Exclusion for specific migration based on the overall migration results	
Antimony trioxide	0.04 (expressed as antimony)	< 0.01 < 0.01 < 0.01	< 0.01
Cobalt	0.05	< 0.01 < 0.01 < 0.01	< 0.01
Manganese	0.6	< 0.01 < 0.01 < 0.01	< 0.01

Simulant: MPPO Test conditions: 2 hours at 175 °C
Contact area: 1 dm² Amount of simulant: 4 gram)

The results are expressed in mg/kg foodstuffs and/or mg/6 dm² contact area.

Component	Specific migration limit (mg/kg)	Specific migration Individual results (mg/kg)	Specific migration Mean result (mg/kg)
Component X	5	Exclusion for specific migration based on the overall migration results	
Ethylene glycol	(T) 30	Exclusion for specific migration based on the overall migration results	
Antimony trioxide	0.04 (expressed as antimony)	< 0.01 < 0.01 < 0.01	< 0.01
Cobalt	0.05	< 0.01 < 0.01 < 0.01	< 0.01
Manganese	0.6	< 0.01 < 0.01 < 0.01	< 0.01

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TEST REPORT**Conclusion****1. Overall migration**

The overall migration results obtained of the sample (*MQ120 ECO COEX*) were found to be in compliance with the restriction for the overall migration limit ($< 10 \text{ mg/dm}^2$) as defined in Commission Regulation (EU) No 10/2011 for food contact materials for the tests with the simulant 3 % acetic acid, 10 % ethanol, olive oil and MPPO under the above mentioned test conditions.

2. Specific migration

The specific migration results of all tested components of sample (*MQ120 ECO COEX*) are below the specific migration limits as laid down in Commission Regulation (EU) No 10/2011, for the tests with simulants 3 % acetic acid, 10 % ethanol, olive oil and MPPO under the above mentioned test conditions.

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