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Report date 16.05.2018

Analytical report AR-18-JR-009512-02

This report replaces report number: AR-18-JR-009512-01

Sample Code 799-2018-00132206

Reference	Polystyrene trays and lunch-boxes of assorted shapes, sizes, and colors. Sampled: Kyiv region, Radiatorna 42 street. Sampling date: 27.03.2018. Supplier: Novopak SV TOV
Client sample code	P11/18
Purchase order code	N/A
Lot-no.	N/A
Number of received Samples	60
Ordered by	Mr. Anar Rakhmetov
Submitted by	Mr. Denis Ganshevsky
Carrier	DHL
Reception date	03.04.2018
Start/end of analyses	06.04.2018 / 25.04.2018

TEST RESULTS

Sensory Analysis

JR01B Preparation sensory packaging materials and articles of daily use

Method: Internal method, PV 1453, Preparation

Migration Type	Immersion	
Food simulant	Water	
Temperature	40	°C
Duration of experiment	10	days
surface volume ratio	2.5/500	dm²/ml
Variation from Norm	No	

JJ814 Sensory analysis (consumer goods)

Method: DIN 10955, PV 00602, Organoleptic evaluation

Subcontracted to a Eurofins laboratory accredited for this test.

sensory indication

Number of judges

6

Odour

slight to distinct deviation, chemical, plastic aroma

median: 2,5

Taste

slight to distinct deviation, chemical, plastic flavour

median: 2,5

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Physical-chemical Analysis

JJ028 Screening with thermal desorption (TDS) (#)
Method: Internal method, PV 00515, TD-GC-MS

(+)-3-Carene	see attachment		

JR07H Specific migration of zinc in 3% acetic acid (#)
Method: EN 13130, , ICP-MS

Migration Type	Immersion		
Temperature	60		°C
Duration of experiment	10.0		days
Replicate 1	<0.006	*	mg/kg food
Replicate 2	<0.006	*	mg/kg food
Replicate 3	<0.006	*	mg/kg food
Mean	<0.006	*	mg/kg food
surface volume ratio	2/100		dm²/ml
Layer thickness	>= 0.5 mm		
Variation from Norm	No		

JJ0HN Overall migration in iso-octane (#)
Method: EN 1186, , Gravimetry

Migration Type	Immersion		
according to EN	1186-14		
Temperature	20		°C
Duration of experiment	2		days
Replicate 1	<2	*	mg/dm²
Replicate 2	<2	*	mg/dm²
Replicate 3	<2	*	mg/dm²
Mean	<2	*	mg/dm²
surface volume ratio	2/100		dm²/ml
Layer thickness	>= 0.5 mm		
Variation from Norm	No		

JJ0HQ Overall migration in 3% acetic acid (#)
Method: EN 1186, , Gravimetry

Migration Type	Immersion		
according to EN	1186-3		
Temperature	40		°C
Duration of experiment	10		days
Replicate 1	<2	*	mg/dm²
Replicate 2	<2	*	mg/dm²
Replicate 3	<2	*	mg/dm²
Mean	<2	*	mg/dm²
surface volume ratio	2/100		dm²/ml
Layer thickness	>= 0.5 mm		
Variation from Norm	No		

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JJ0TZ Overall migration in 10% ethanol (#)

Method: EN 1186, , Gravimetry

Migration Type	Immersion		
according to EN	1186-3		
Temperature	40		°C
Duration of experiment	10.0		days
Replicate 1	<2	*	mg/dm²
Replicate 2	<2	*	mg/dm²
Replicate 3	<2	*	mg/dm²
Mean	<2	*	mg/dm²
surface volume ratio	2/100		dm²/ml
Layer thickness	>= 0.5 mm		
Variation from Norm	No		

JJ0PD Overall migration in 95% ethanol (#)

Method: EN 1186, , Gravimetry

Migration Type	Immersion		
according to EN	1186-14		
Temperature	40		°C
Duration of experiment	10		days
Replicate 1	<2	*	mg/dm²
Replicate 2	<2	*	mg/dm²
Replicate 3	<2	*	mg/dm²
Mean	<2	*	mg/dm²
surface volume ratio	2/100		dm²/ml
Layer thickness	>= 0.5 mm		
Variation from Norm	No		

JR0EM Screening from food simulant 95%Ethanol (#)

Method: Internal method, PV 01437 , GC-MS

Migration Type	Immersion		
Temperature	60		°C
Duration of experiment	10		days
surface volume ratio	2/100		dm²/ml
Result	See Attachment		
Layer thickness	>= 0.5 mm		

only the yellow material

JJG19 Colourfastness

Method: 24. Mitteilung, BundesgesundhBl. 15, 285 (1972), , Visual examination

Light fastness/ water	colourfast
Colourfastness to vinegar	colourfast
Colourfastness to ethanol	colourfast
Colourfastness to oil	colourfast

* = Below indicated quantification level

(#) = Eurofins Consumer Product Testing (Hamburg) is accredited for this test.

JUDGEMENT

According to §31 of the German Food and Feed Code (Lebensmittel- und Futtermittelgesetz, LFGB) and the European Framework-Regulation VO (EC) No. 1935/2004 food contact materials may not release substances in food or its surface in quantities that could

1. endanger human health
2. bring about an unacceptable deterioration of the composition or the organoleptic properties (smell, taste) or the appearance of food (e.g. colour)

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During the manufacturing process reaction- and degradation-products of formulation components may be formed (so-called NIAS, non-intentionally added substances). If yes, the manufacturer has to prove their harmlessness according to internationally accepted scientific standards for risk-assessment.
In the NIAS-screening substances were detected above the detection limit of 10 ppb (complete list see attachment)

Listed acc. Plastics-Regulation (EU) 10/2011, Annex I:

- Styrene (FCM 193, SML = 60 mg/kg, scan #1)

Not-listed substances / NIAS:

- Styrene Oligomer: According to Opinion 023/2016 of the German Federal Institute for Risk Assessment (BfR) from April 21st 2016 a limit 50 µg/kg food simulant should not be exceeded per styrene-oligomer.

The additional substances can't be identified further or are toxicological harmless. Therefore they aren't considered in the evaluation.
During the VOC-Screening similar substances were detected. According to the regulation 10/2011 only the migration of the substances needs to be considered. Therefore, the results aren't considered in the judgement.
In the scope of the analyses performed and under the above test conditions there was an indication for an objection. Therefore, under consideration of the above legal requirements, incl. the German Food and Feed Code (LFGB) and the European Framework-Regulation (EC) No. 1935/2004, there are concerns against the utilization of the investigated article under the above mentioned temperature and duration.

Signature

Analytical Service Manager (Lisa Hetzel)

Sample number: 132206

Determination of volatile organic compounds (VOC) and semivolatile organic compounds (SVOC) by thermal desorption GC/MS

Volatile organic compounds of the sample were extracted in a thermal extraction unit (100 °C/ 20 min) by trapping these volatiles on an adsorption tube and then this tube was desorbed in a thermal desorption unit and analytes were focused in the inlet of a GC/MS system by cold trapping and then injected for analysis.

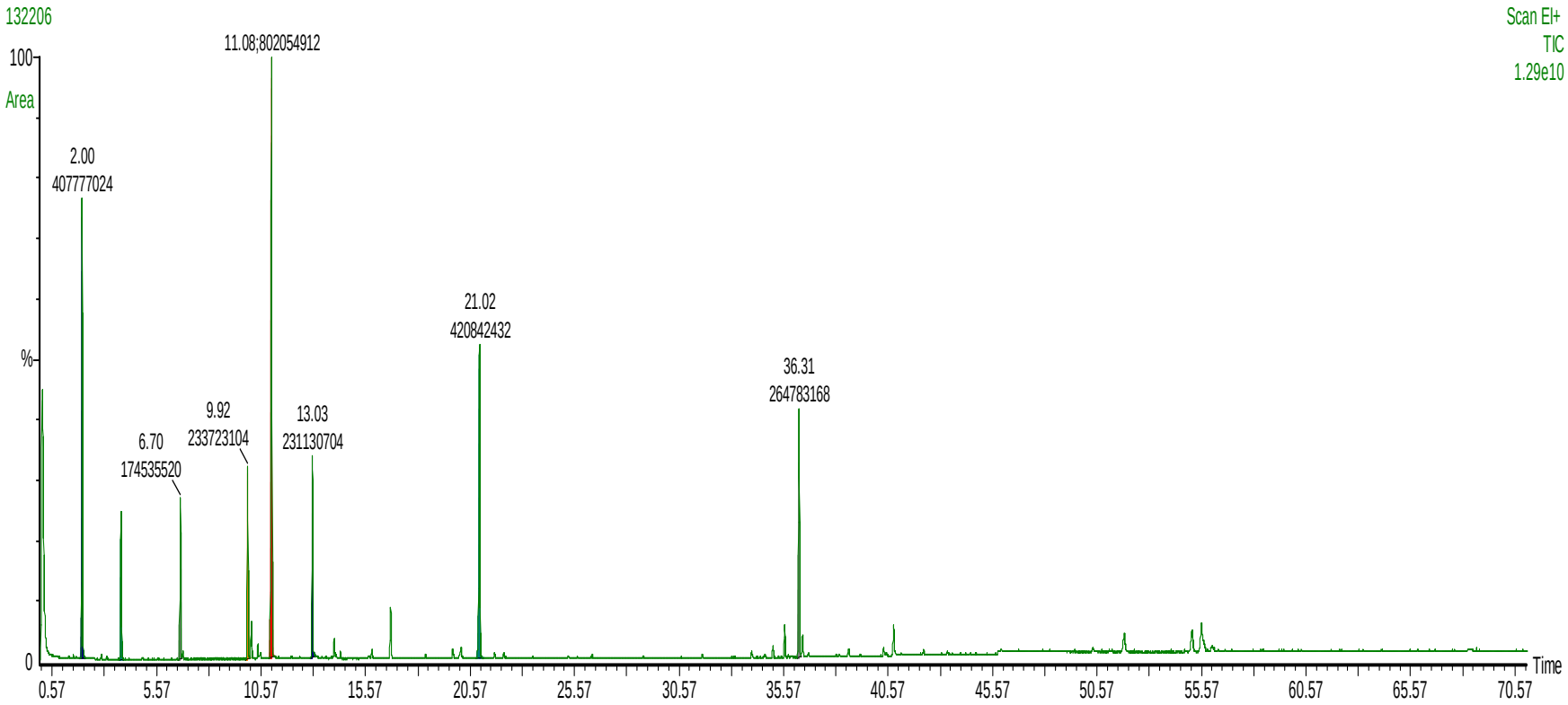
Results in mg/kg as d-Toluene equivalent (TE):

Scan #	RT min.	MW	mg/kg (as d-TE)	Identification	CAS #
1	2,00	N/MW		Chromatography artefact	N/P
2	3,87	N/MW		Internal standard	N/P
3	6,70	N/MW		Internal standard	N/P
4	9,92	N/MW		Internal standard	N/P
5	11,08	104	19,03	Styrene	100-42-5
6	13,03	106	5,48	Benzaldehyde	100-52-7
7	21,02	N/MW		Internal standard	N/P
8	36,31	N/MW	6,28	Aromatic hyadrocarbon	N/P
Sum			**30,79**		

Key: **N/MW** Not possible to determine molecular weight
N/CAS No CAS Number Assigned to this compound
N/P Not possible to assign a CAS Number because only functionality is named.

Probably: 80 % fit with spectra library
Possibly: 60 % fit with spectra library

Analysis performed by: gfin **Date:** 18.04.2018


132206
Scan EI+
TIC
1.29e10
100
Area
%
0
11.08;802054912
2.00
407777024
21.02
420842432
36.31
264783168
6.70
174535520
9.92
233723104
13.03
231130704
Time
0.57
5.57
10.57
15.57
20.57
25.57
30.57
35.57
40.57
45.57
50.57
55.57
60.57
65.57
70.57

Sample number: 132206

Determination of organic compounds in Ethanol migrate (95 %)
Organic compounds of the Ethanol migrate (2 dm² in 100 mL Ethanol 95 %) were detected and quantified as equivalent of internal standards.

Migration conditions:
Time: 10 d
Temperature: 60 °C

Results:
Migration in mg/kg (real filled foodstuff- here Ethanol 95 %) as equivalent of internal standards:

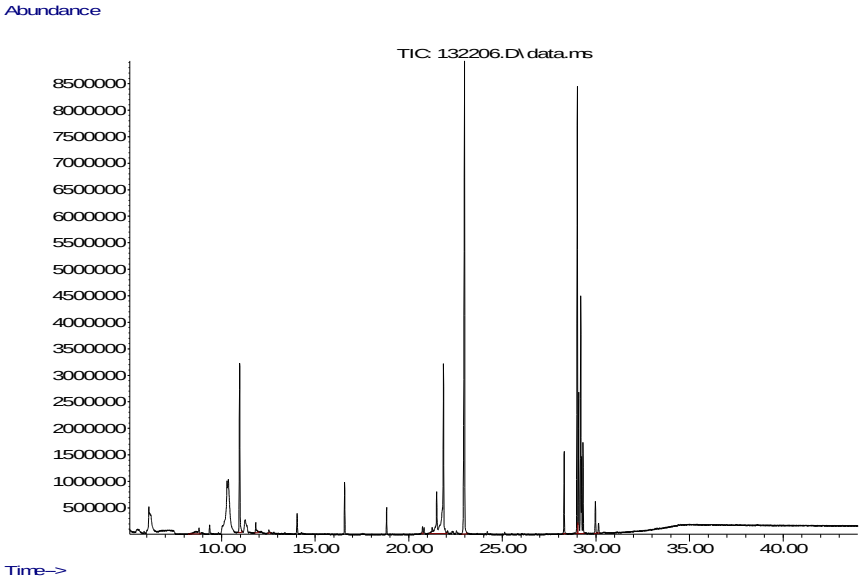
Scan #	RT min.	MW	mg/kg*	Identification	CAS #
1	8.795	104	0,12	Styrene	100-42-5
2	10.966			d-Phenol (IS 0-15 min)	
3	11.824	N/MW	0,07	Alkylalcohol	N/P
6	21.854	N/MW	0,41	Mix of Styrene Dimers	N/P
7	22.975			d-Nonadecane (IS 15-25 min)	
8	28.298	N/MW	0,12	probably Styrene Oligomer	N/P
9	29.005			d-DEHP (IS 25-44 min)	
10	29.185	N/MW	0,89	Mix of Styrene Oligomers	N/P
11	29.969	N/MW	0,06	probably Styrene Oligomer	N/P
Sum			**1,67**		

Key: **N/MW** Not possible to determine molecular weight
N/CAS No CAS Number Assigned to this compound
N/P Not possible to assign a CAS Number because only functionality is named.

mg/kg*: for the EU-convention of 6 dm2 packaging for 1 kg food

Probably: 80 % fit with spectra library
Possibly: 60 % fit with spectra library

Analysis performed by: ATRAUTMANN/APANZER **Date:** 20.04.2018



Not identified peaks: chromatography artefacts or peaks < 0.02 mg/kg*