

**TEST REPORT****Requested by:**

Ashworth Belts B.V.  
Attn. Mr. Guy Hopmans  
Postbus 4  
7620 AA Borne  
The Netherlands

**Subject:** Specific migration testing on a conveyor belt

Dear Mr. Hopmans,

Hereby I present to you the results of the laboratory investigation that was carried out by your request (ref SO09625).

Hoping this information will meet your approval,

Yours sincerely,



Daisy de Klein  
Expert Regulatory Services

Intertek Chemicals & Pharmaceuticals

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## TEST REPORT

**Sample and analysis**Date samples received

May 9, 2014

Description of samples

Conveyor belt

Conveyor belt consists of POM material which is colored (blue)

## Intended use:

- All kinds of foodstuffs
- Frozen conditions up to high temperature applications (max. 70 °C, short time)

Intertek LIMS ID: 21996407

Method(s) applied**1. Specific migration test**

Specific migration tests are performed according to rules as laid down in Commission Regulation (EU) No 10/2011 (and amendments) relating to plastic materials and articles intended to come into contact with food.

Tests are performed according to EN 13130-1 which describes the 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.

The samples shall be placed in contact with the food simulants and at the testing conditions as mentioned in the table 1. These test conditions represent the worst of the foreseeable conditions of use and have been agreed with Ashworth Belts B.V.

The simulants and test conditions have to cover contact with all types of foodstuffs for any contact conditions that include heating up to 70 °C for up to 2 hours or up to 100 °C for up to 15 minutes, which are not followed by long term room or refrigerated temperature storage.

Simulants	Test conditions
3 % acetic acid	2 hours, 70 °C, repeated use *
10 % ethanol	2 hours, 70 °C, repeated use *
Olive oil	2 hours, 70 °C, repeated use *
95 % ethanol **	2 hours, 60 °C, repeated use *
Iso-octane **	0.5 hour, 40 °C, repeated use *

Table 1: Test conditions Specific migration

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**Remarks:**

\* According to EN 1186-1, paragraph 9.8: Articles intended for repeated use

When a material is intended to come into repeated contact with foodstuffs, the migration tests are carried out three times on the same test sample in accordance with the conditions laid down, using a fresh sample of the food simulant on each occasion.

The compliance of the material shall be checked on the basis of the level of the migration found in the third test.

\*\* Not all specific migration components can be determined in olive oil (technical not feasible), therefore the substitute simulants 95 % ethanol and iso-octane are used.

The substances mentioned in table 2 are subject to a specific migration set out in the Union list of the Commission Regulation (EU) No 10/2011.

Based on the results of the overall migration some of the components can be excluded from specific migration testing in one or more simulants.

Components	CAS	Specific migration limit (mg/kg)	Simulants	Test method	Detection limit (mg/kg)
n-octylphosphonic acid	4724-48-5	0.05	No method available and has been determined by mathematical modelling, see paragraph 2 of this report		
1,3-dioxolane	646-06-0	5	95 % ethanol Iso-octane	GC-MS	5
1,3,5-trioxane	110-88-3	5	95 % ethanol Iso-octane	GC-MS	5
Formaldehyde	50-00-0	15	3 % acetic acid 10 % ethanol	HPLC	15
Irganox 1098	23128-74-7	45	Exclusion based on the results of the overall migration		
Melamine	108-78-1	2.5	3 % acetic acid 10 % ethanol 95 % ethanol Iso-octane	HPLC	2.5
Triethyleneglycol-bis[3-t-butyl-5-methyl-4-hydroxyphenyl]propionate]	36443-68-2	9	Exclusion based on the results of the overall migration		

Table 2: Specific migration components

The tests have been performed in triplicate.

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## 2. Migration modeling

The following specific migration component has been checked for compliance by mathematical modelling.

Components	CAS	Specific migration limit (mg/kg)
n-octylphosphonic acid	4724-48-5	0.05

The migration potential can be calculated by applying generally recognized diffusion models as described in the Commission Regulation (EU) No. 10/2011, in case sufficient information is available.

Migration modeling is performed using MIGRATEST © EXP (model for single and multi-layer calculation), updated September 2010 and 2013, FABES GmbH, Munich, Germany and under the worst case situation.

The following parameters are used:

- Modeling parameters according to the Piringer equation
- A partition coefficient between component P and simulant F of  $K_{P/F} = 1$  is considered as this is a worst-case scenario (good solubility of the substance in the food).
- Surface/volume ratio: 6 dm<sup>2</sup>/ kg (EU cube)
- **Test conditions: - 2 hours at 70 °C, all simulants**  
- 6 hours at 70 °C, all simulants (for the simulation of repeated use conditions)

Layer	Density g/cm <sup>3</sup>	Thickness µm	Polymer specific constant $A_p'$	Activation energy constant $\tau$	Partition coefficient $K_{P/F}$
POM material	1.410 – 1.420 (1.420 is used for modelling)	14300	0 *	0 K *	1
Food	1	16667	Diffusion Coefficient = $1.00 \text{ e}^{-3}$ (User defined constant Diffusion Coefficient)		

\* Based on estimation of diffusion coefficient with Fabes-Dp Formula.

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## Results

## 1. Specific migration test

Sample: Conveyor belt consists of POM material which is colored (blue)  
Contact area: 1.16 dm<sup>2</sup>  
Volume simulant: 100 ml

The results are expressed in mg/kg foodstuffs applying a surface to volume ratio of 6 dm<sup>2</sup> per kg of food.

Component	Specific migration limit (mg/kg)	Specific migration result in 3% acetic acid (mg/kg)	Specific migration result in 10% ethanol (mg/kg)	Specific migration result in iso-octane (mg/kg)	Specific migration result in 95% ethanol (mg/kg)	Specific migration result in olive oil (mg/kg)
1,3-dioxolane	5	Not applicable	Not applicable	< 5 < 5 < 5 Mean: < 5	< 5 < 5 < 5 Mean: < 5	Not applicable
1,3,5-trioxane	5	Not applicable	Not applicable	< 5 < 5 < 5 Mean: < 5	< 5 < 5 < 5 Mean: < 5	Not applicable
Formaldehyde	15	< 15 < 15 < 15 Mean: < 15	< 15 < 15 < 15 Mean: < 15	Not applicable	Not applicable	Not applicable
Melamine	2.5	< 2.5 < 2.5 < 2.5 Mean: < 2.5	< 2.5 < 2.5 < 2.5 Mean: < 2.5	< 2.5 < 2.5 < 2.5 Mean: < 2.5	< 2.5 < 2.5 < 2.5 Mean: < 2.5	Not applicable

## 2. Migration modeling

Migration modeling was done using MIGRATEST © EXP 2010 (model for single and multi layer calculation), updated September 2010, FABES GmbH, Munich, Germany and under the worst case situation.

The component on which migration modeling is performed is mentioned below.

Component	CAS	Specific migration limit (mg/kg)	Molecular weight	Concentration in product based on received information suppliers (mg/kg)
n-octylphosphonic acid	4724-48-5	0.05	194.21	5.168

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The migration modelling results of the specific migration component calculated with MIGRATEST © EXP are mentioned in the table below.

Specific migration component	CAS	SML (mg/kg food)	Modelling results 2 hours, 70 °C All simulants (mg/kg)	Modelling results 6 hours, 70 °C (as repeated use) All simulants (mg/kg)	Specific migration testing necessary
n-octylphosphonic acid	4724-48-5	0.05	< 0.01	< 0.01	No

### Conclusion

The above mentioned specific migration components of the Conveyor belt consists of POM material which is colored (blue) are below the specific migration limits as laid down in Commission Regulation (EU) No. 10/2011, based on mathematical modelling results and/or based on the specific migration test results under the above mentioned test conditions.

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