

Eurofins Product Testing A/S
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Date
 June 20th, 2013

your ref.
 Box 1 - Black

Our ref.
 G22431/BJ1

Test report – Migration

Sample material

Identification	One sample to be tested for overall and specific migration
Sample receipt	April 17, 2013
Number / type	1 sample identified as: Lab no. G22431: Box 1 – Black
Analytical period	April 17 – June 18, 2013

Applied methods

Method nor.	Parameter	Principle	Limit of detection	U _m (%) ⁽¹⁾
EN 1186-2	Overall migration	Exposure to olive oil by total immersion. Gravimetric + GC/FID determination	2 mg/dm ²	30%
EN 1186-3	Overall migration	Exposure to 3% acetic acid and 10% ethanol by total immersion. Gravimetric determination	1 mg/dm ²	20%
EN 1186-14	Preparation for specific migration	Exposure to isooctane by total immersion	-	-
EN 13130*	Irganox 3114	Migration simulant analysed by HPLC/DAD/UV	0.5 mg/kg	20%
EN 13130*	Substance A [#]	Migration simulant analysed by GC/MS	0.2 mg/kg	20%
EN 13130*	Substance B [#]	Migration simulant analysed by LC-MS/MS	0.2 mg/kg	20%

The migration was performed in accordance with relevant parts of EN 1186

Principle

Olive oil: The sample was exposed for 10 days at 40 °C by total immersion. At the end of the test period, the sample was removed from the food simulant. The sample was weighed and extracted with pentane by means of Soxhlet extraction for 16 hours. The amount of extracted olive oil was determined by gaschromatography with flame ionisation detection (GC/FID). The loss of weight was adjusted the excessive oil extracted from the sample and the calculated loss equals the total migration.

3% acetic acid and 10% ethanol: The sample was exposed for 10 days at 40 °C. At the end of the test period, the sample was removed from the food simulant. The simulant was then evaporated and the dry matter determined by weighing.

Isooctane: The sample was exposed for 2 days at 20 °C. At the end of the test period, the sample was removed from the food simulant.

Specific migration: An aliquot of the food simulant is analysed for the specific compound as listed above.

The test was performed with triplicates.

(1)U_m (%): The expanded uncertainty U_m is equal to 2 x RSD%, see also www.eurofins.dk. Keyword: Uncertainty

* Not part of the accreditation

Substances are known to Eurofins but protected by NDA between Eurofins PT and the FBK raw material supplier

Results

Results are presented on the following page

The test results relate only to the items tested.

The report shall not be reproduced except in full without the written approval of the testing laboratory.

Analytical results

The determined overall migration from the sample to the simulant is given in the table below. The result is an average of the three determinations. As described in the standard EN 1186 all results are given in total mg/dm².

Table 1: Overall migration.

Unit: mg/dm ² / Sample id: Simulant	Box 1 – Black				OML value
	Single determinations			Average	
3% acetic acid	< 1	< 1	< 1	< 1	10
10% ethanol	< 1	< 1	< 1	< 1	10
Olive oil	< 2	< 2	< 2	< 2	10

<: means less than

Table 2: Specific migration.

Unit: mg/kg / Sample id: Specific compound	Box 1 – Black			
	Cas. no.	Food simulant	Average	SML value
Irganox 3114*	27676-62-6	Isooctane	< 0.5	5
Substance A*	Confidential	Olive oil	< 0.2 (Pass)	Confidential
Substance B*	Confidential	Isooctane	< 0.2 (Pass)	Confidential

<: means less than; * Not part of the accreditation

Substances A and B are known to Eurofins but protected by NDA between Eurofins PT and the FBK raw material supplier

Conclusion:

The results for specific migration are well below the specific migration limit.

The threshold value for overall migration is 10 mg/dm² and the results show that the product tested **complies** with the requirements in EU regulation No 10/2011/EC as amended by regulation No 321/2011/EC, No 1282/2011/EC and 1183/2012/EC on plastic material and articles intended to come into contact with food for the above mentioned test conditions.

Eurofins Product Testing A/S



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Date
June 20th, 2013

your ref.
Box 1 - Yellow

Our ref.
G22432/BJ1

Test report – Migration

Sample material

Identification	One sample to be tested for overall and specific migration
Sample receipt	April 17, 2013
Number / type	1 sample identified as: Lab no. G22432: Box 1 – Yellow
Analytical period	April 17 – June 18, 2013

Applied methods

Method nor.	Parameter	Principle	Limit of detection	U _m (%) ⁽¹⁾
EN 1186-2	Overall migration	Exposure to olive oil by total immersion. Gravimetric + GC/FID determination	2 mg/dm ²	30%
EN 1186-3	Overall migration	Exposure to 3% acetic acid and 10% ethanol by total immersion. Gravimetric determination	1 mg/dm ²	20%
EN 1186-14	Preparation for specific migration	Exposure to isooctane by total immersion	-	-
EN 13130*	Substance A [#]	Migration simulant analysed by GC/MS	0.2 mg/kg	20%
EN 13130*	Substance B [#]	Migration simulant analysed by LC-MS/MS	0.2 mg/kg	20%
Calculation*	Zinc	Worst case calculation based on the results from overall migration	-	-

The migration was performed in accordance with relevant parts of EN 1186

Principle

Olive oil: The sample was exposed for 10 days at 40 °C by total immersion. At the end of the test period, the sample was removed from the food simulant. The sample was weighed and extracted with pentane by means of Soxhlet extraction for 16 hours. The amount of extracted olive oil was determined by gaschromatography with flame ionisation detection (GC/FID). The loss of weight was adjusted the excessive oil extracted from the sample and the calculated loss equals the total migration.

3% acetic acid and 10% ethanol: The sample was exposed for 10 days at 40 °C. At the end of the test period, the sample was removed from the food simulant. The simulant was then evaporated and the dry matter determined by weighing.

Isooctane: The sample was exposed for 2 days at 20 °C. At the end of the test period, the sample was removed from the food simulant.

Specific migration: An aliquot of the food simulant is analysed for the specific compound as listed above.

The test was performed with triplicates.

(1) U_m (%): The expanded uncertainty U_m is equal to 2 x RSD%, see also www.eurofins.dk. Keyword: Uncertainty

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Analytical results

The determined overall migration from the sample to the simulant is given in the table below. The result is an average of the three determinations. As described in the standard EN 1186 all results are given in total mg/dm².

Table 1: Overall migration.

Unit: mg/dm ² / Sample id: Simulant	Box 1 – Yellow				
	Single determinations			Average	OML value
3% acetic acid	< 1	< 1	< 1	< 1	10
10% ethanol	< 1	< 1	< 1	< 1	10
Olive oil	2.2	< 2	3.0	2.4	10

<: means less than

Table 2: Specific migration.

Unit: mg/kg / Sample id: Specific compound	Box 1 – Yellow			
	Cas. no.	Food simulant	Average	SML value
Substance A*	Confidential	Olive oil	< 0.2 (Pass)	Confidential
Substance B*	Confidential	Isooctane	< 0.2 (Pass)	Confidential
Zinc*	7440-66-6	Worst case calculation	< 6	25

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Substances A and B are known to Eurofins but protected by NDA between Eurofins PT and the FBK raw material supplier

Conclusion:

The results for specific migration are well below the specific migration limit.

The threshold value for overall migration is 10 mg/dm² and the results show that the product tested **complies** with the requirements in EU regulation No 10/2011/EC as amended by regulation No 321/2011/EC, No 1282/2011/EC and 1183/2012/EC on plastic material and articles intended to come into contact with food for the above mentioned test conditions.

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Date
 June 20th, 2013

your ref.
 Box 1 - Red

Our ref.
 G22433/BJ1

Test report – Migration

Sample material

Identification	One sample to be tested for overall and specific migration
Sample receipt	April 17, 2013
Number / type	1 sample identified as: Lab no. G22433: Box 1 – Red
Analytical period	April 17 – June 18, 2013

Applied methods

Method nor.	Parameter	Principle	Limit of detection	U _m (%) ⁽¹⁾
EN 1186-2	Overall migration	Exposure to olive oil by total immersion. Gravimetric + GC/FID determination	2 mg/dm ²	30%
EN 1186-3	Overall migration	Exposure to 3% acetic acid and 10% ethanol by total immersion. Gravimetric determination	1 mg/dm ²	20%
EN 1186-14	Preparation for specific migration	Exposure to isooctane by total immersion	-	-
EN 13130*	Methyl acrylate	Migration simulant analysed by Headspace GC/MS	0.02 mg/kg	20%
EN 13130*	DBP, DEHP	Migration simulant analysed by GC/MS	0.3 – 0.5 mg/kg	20%
EN 13130*	Substance A [#]	Migration simulant analysed by GC/MS	0.2 mg/kg	20%
EN 13130*	Substance B [#]	Migration simulant analysed by LC-MS/MS	0.2 mg/kg	20%
Calculation*	Zinc	Worst case calculation based on the results from overall migration	-	-

The migration was performed in accordance with relevant parts of EN 1186

Principle

Olive oil: The sample was exposed for 10 days at 40 °C by total immersion. At the end of the test period, the sample was removed from the food simulant. The sample was weighed and extracted with pentane by means of Soxhlet extraction for 16 hours. The amount of extracted olive oil was determined by gaschromatography with flame ionisation detection (GC/FID). The loss of weight was adjusted the excessive oil extracted from the sample and the calculated loss equals the total migration.

3% acetic acid and 10% ethanol: The sample was exposed for 10 days at 40 °C. At the end of the test period, the sample was removed from the food simulant. The simulant was then evaporated and the dry matter determined by weighing.

Isooctane: The sample was exposed for 2 days at 20 °C. At the end of the test period, the sample was removed from the food simulant.

Specific migration: An aliquot of the food simulant is analysed for the specific compound as listed above.

The test was performed with triplicates.

(1)U_m (%): The expanded uncertainty U_m is equal to 2 x RSD%, see also www.eurofins.dk. Keyword: Uncertainty

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Analytical results

The determined overall migration from the sample to the simulant is given in the table below. The result is an average of the three determinations. As described in the standard EN 1186 all results are given in total mg/dm².

Table 1: Overall migration.

Unit: mg/dm ² / Sample id: Simulant	Box 1 – Red				OML value
	Single determinations			Average	
3% acetic acid	< 1	< 1	< 1	< 1	10
10% ethanol	< 1	< 1	< 1	< 1	10
Olive oil	< 2	< 2	< 2	< 2	10

<: means less than

Table 2: Specific migration.

Unit: mg/kg / Sample id: Specific compound	Box 1 – Red			
	Cas. no.	Food simulant	Average	SML value
Methyl acrylate*	96-33-3	Olive oil	< 0.02	6
Dibutylphthalate (DBP)*	84-74-2	Isooctane	< 0.3	0.3
Di(ethylhexyl)phthalate (DEHP)*	117-81-7	Isooctane	< 0.5	1.5
Substance A*	Confidential	Olive oil	< 0.2 (Pass)	Confidential
Substance B*	Confidential	Isooctane	< 0.2 (Pass)	Confidential
Zinc*	7440-66-6	Worst case calculation	< 6	25

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Substances A and B are known to Eurofins but protected by NDA between Eurofins PT and the FBK raw material supplier

Analytical results

Conclusion:

The results for specific migration are well below the specific migration limit.

The threshold value for overall migration is 10 mg/dm^2 and the results show that the product tested **complies** with the requirements in EU regulation No 10/2011/EC as amended by regulation No 321/2011/EC, No 1282/2011/EC and 1183/2012/EC on plastic material and articles intended to come into contact with food for the above mentioned test conditions.

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Date
 July 25, 2013

your ref.
 Box 2 - Orange

Our ref.
 G22434Ver2/BJ1/JH

Test report – Migration

Sample material

Identification	One sample to be tested for overall and specific migration
Sample receipt	April 17, 2013 and again June 27, 2013
Number / type	1 sample identified as: Lab no. G22434: Box 2 – Orange
Analytical period	April 17 – July 24, 2013

Applied methods

Method nor.	Parameter	Principle	Limit of detection	U _m (%) ⁽¹⁾
EN 1186-2	Overall migration	Exposure to olive oil by total immersion. Gravimetric + GC/FID determination	2 mg/dm ²	30%
EN 1186-3	Overall migration	Exposure to 3% acetic acid and 10% ethanol by total immersion. Gravimetric determination	1 mg/dm ²	20%
EN 1186-14	Preparation for specific migration	Exposure to isooctane by total immersion	-	-
EN 13130*	Tetrahydrofurane	Migration simulant analysed by Headspace GC/MS	0.05 mg/kg	20%
EN 13130*	1,4-butandiol	Migration simulant analysed by GC/MS	0.5 mg/kg	20%
EN 13130*	Irganox 1425	Migration simulant analysed by LC-MS/MS	0.2 mg/kg	20%

The migration was performed in accordance with relevant parts of EN 1186

Principle

Olive oil: The sample was exposed for 10 days at 40 °C by total immersion. At the end of the test period, the sample was removed from the food simulant. The sample was weighed and extracted with pentane by means of Soxhlet extraction for 16 hours. The amount of extracted olive oil was determined by gaschromatography with flame ionisation detection (GC/FID). The loss of weight was adjusted the excessive oil extracted from the sample and the calculated loss equals the total migration.

Olive oil for specific migration: The sample was exposed for both 10 days at 40 °C and 1 hour at 40 °C by total immersion. At the end of the test period, the sample was removed from the food simulant and the simulant analysed for Tetrahydrofurane

3% acetic acid and 10% ethanol: The sample was exposed for 10 days at 40 °C. At the end of the test period, the sample was removed from the food simulant. The simulant was then evaporated and the dry matter determined by weighing.

Isooctane: The sample was exposed for 2 days at 20 °C. At the end of the test period, the sample was removed from the food simulant.

Specific migration: An aliquot of the food simulant is analysed for the specific compound as listed above.

The test was performed with triplicates.

(1)U_m (%): The expanded uncertainty U_m is equal to 2 x RSD%, see also www.eurofins.dk. Keyword: Uncertainty

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Results

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Analytical results

The determined overall migration from the sample to the simulant is given in the table below. The result is an average of the three determinations. As described in the standard EN 1186 all results are given in total mg/dm².

Table 1: Overall migration.

Unit: mg/dm ² / Sample id: Simulant	Box 2 – Orange				OML value
	Single determinations			Average	
3% acetic acid	< 1	< 1	< 1	< 1	10
10% ethanol	< 1	< 1	1.1	1.0	10
Olive oil	< 2	< 2	< 2	< 2	10

<: means less than

Table 2: Spec. fic migration.

Unit: mg/kg / Sample id: Specific compound	Box 2 – Orange			
	Cas. no.	Food simulant	Average	SML value
#Tetrahydrofurane*	109-99-9	Olive oil	0.8	0.6
##Tetrahydrofurane*	109-99-9	Olive oil	< 0.06	0.6
1,4-butanediol*	110-63-4	10% ethanol	< 0.5	5
Irganox 1425*	65140-91-2	Isooctane	< 0.2	6

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exposure 10 days at 40 °C ## exposure 1 hour at 40 °C

Conclusion:

The results for specific migration of tetrahydrofurane exceeds the limit value, hence the product tested **do not comply** with the requirements in EU regulation No 10/2011/EC as amended by regulation No 321/2011/EC, No 1282/2011/EC and 1183/2012/EC on plastic material and articles intended to come into contact with food for the above mentioned test conditions.

For all other parameters the sample complies with the above mentioned legislation for the test conditions 10 days at 40 °C.

At the less harsh conditions 1 hour at 40 °C the sample also complies regarding specific migration of tetrahydrofuran.

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