

LOTTE CHEMICAL CORPORATION
Lotte world Tower, 300, Olympic-ro, Songpa-gu, Seoul
Korea

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Consumer and Retail
Non Food

Taunusstein, 21/01/2021

Test-report no. 5126701
Test-report version < 1 >

Original Sample ID	Sample Description	Sample Receipt Date
201228334	LOTTE CHEMICAL BIO	03/12/2020



General Information

SGS-Client's ID	:	10008109
SGS-Customer-Order	:	5589078
Ordering date	:	02/12/2020
Testing period	:	07/12/2020 – 19/01/2021
Order No.	:	AYAR20-03208
Testing scope	:	Test according to client's requirements

Assessment

Overall assessment	pass
The tested samples meet the requirements of LFGB and Regulation (EC) No. 1935/2004 in the tested items.	

SGS INSTITUT FRESENIUS GmbH

This test report was electronically created and released:

	date	name	function	department
created	20.01.2021	i.A. Fabienne Greuling	Customer Service Assistant	Consumer and Retail Non Food
released	21.01.2021	i.A. Jana Sturm	Customer Service Consultant	Consumer and Retail Non Food

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Summary of results

Test	Result
sensory test	pass
overall migration	pass
Specific migration of metals according to Regulation (EU) No 10/2011	pass
specific migration of terephthalic acid (Ref. No: 24910, CAS No: 100-21-0)	pass
specific migration of isophthalic acid (Ref. No: 19150, CAS No: 121-91-5)	pass
specific migration of ethyleneglycol (Ref. No: 16990/53650, CAS No: 107-21-1) and diethyleneglycol (Ref. No: 13326/15760/47680, CAS No: 111-46-6)	pass

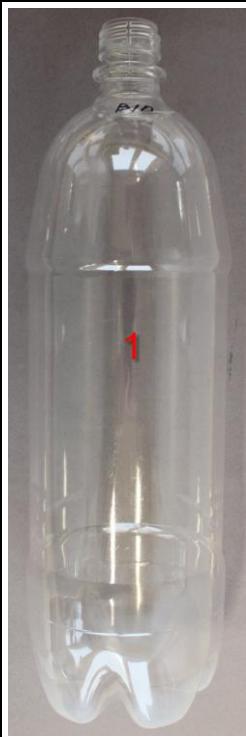
Note:

Conclusions on pass/fail are based on the test result from the actual sampling of the received sample(s). Conclusions are based on the relevant requirements; measurement uncertainties are not taken into account. Only results above the relevant detection limit are taken into account for the calculation of sums. Test was conducted on composite of random parts of the item as per client's request and the test result is the overall result. The composite sampling method is based on the client's special request and could be a modification from the testing standard. For 2-composite mix with results exceeding one half of the relevant requirements or 3-composite mix with results exceeding one third of the relevant requirements, the composite sample may have the possibility of one or more components that can lead to a failure result, it is recommended to test on individual basis.

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Photo documentation**List of sample parts**

Comp. no	Component-ID	Sample-Description		Original Sample ID
1	-	Lotte Chemical Bio	PET	201228334

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Analytical results

sensory test

Test Method
DIN 10955 2004-06

simulant water
duration 3 days at 40°C followed by 10 days at 60°C
approach 5 dm²/L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
		<u>1</u>
Median Odour ^[1]	1st contact	0
Median Taste ^[1]		0
Conclusion		Pass

Note:

Key:	0	=	no change
	1	=	very slight off odour / off-taste
	2	=	slight off- odour / off-taste
	3	=	distinct off- odour / off-taste
	4	=	strong off-odour/ off-taste

Requirement: With an assessment from 0 to 2.5 there is no, respectively a tolerable organoleptic impact existent in terms of Regulation (EC) No 1935/2004.

^[1]Median rounded at 0.5 grades

overall migration

Test Method
DIN EN 1186 2002-07

simulant 3% acetic acid
duration 10 days
temperature 40 +/- 2°C
approach 5 dm²/L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
		<u>1</u>
overall migration	1st contact mg/dm ²	3 Pass

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Test Method
DIN EN 1186 2002-07

simulant 95% ethanol
duration 10 days
temperature 40 +/- 2°C
approach 5 dm²/L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
overall migration	mg/dm ²	1st contact
Conclusion		2 Pass

Test Method
DIN EN 1186 2002-07

simulant isoctane
duration 2 days
temperature 20 +/- 1°C
approach 5 dm²/L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
overall migration	mg/dm ²	1st contact
Conclusion		< 1 Pass

Note:

Requirement: max. 10 mg/dm² (Regulation (EU) No 10/2011)

analytical tolerance of the method (§ 64 LFGB B 80.30-3 (EG)):

2 mg/dm² for aqueous simulants
3 mg/dm² for olive oil and fat substitutes

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Specific migration of metals according to Regulation (EU) No 10/2011
Test Method

ICP-MS (DIN EN ISO 17294-2 2017-01) resp. ICP-OES (DIN EN ISO 11885 2009-09) migration DIN 13130-1

simulant	3% acetic acid
duration	10 days
temperature	60 +/- 2°C
approach	5 dm ² /L

<u>Sample(s) or Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
		<u>1</u>
		1 st contact
Aluminium (Al)	mg/kg	< 0.1
Arsenic (As)	mg/kg	< 0.005
Antimony (Sb)	mg/kg	< 0.01
Barium (Ba)	mg/kg	< 0.1
Lead (Pb)	mg/kg	< 0.005
Cadmium (Cd)	mg/kg	< 0.002
Chromium (Cr)	mg/kg	< 0.005
Cobalt (Co)	mg/kg	< 0.01
Iron (Fe)	mg/kg	< 1.0
Copper (Cu)	mg/kg	< 0.5
Lithium (Li)	mg/kg	< 0.1
Manganese (Mn)	mg/kg	< 0.1
Nickel (Ni)	mg/kg	< 0.01
Mercury (Hg)	mg/kg	< 0.005
Zinc (Zn)	mg/kg	< 1.0
Europium (Eu)	mg/kg	< 0.01
Gadolinium (Gd)	mg/kg	< 0.01
Lanthanum (La)	mg/kg	< 0.01
Terbium (Tb)	mg/kg	< 0.01
Conclusion		Pass

Note:

Requirement:	Regulation (EU) No 10/2011	Aluminium	max. 1 mg/kg food simulant
		Antimony	max. 0.04 mg/kg food simulant
		Arsenic:	ND (< 0.01 mg/kg food simulant)
		Barium:	max 1 mg/kg food simulant
		Cadmium:	ND (< 0.002 mg/kg food simulant)
		Chromium:	ND (< 0.01 mg/kg food simulant)
		Cobalt:	max. 0.05 mg/kg food simulant
		Copper:	max. 5 mg/kg food simulant
		Iron:	max. 48 mg/kg food simulant
		Lead:	ND (< 0.01 mg/kg food simulant)
		Lithium:	max. 0.6 mg/kg food simulant
		Manganese:	max .6 mg/kg food simulant
		Mercury:	ND (< 0.01 mg/kg food simulant)
		Nickel:	max. 0.02 mg/kg food simulant
		Zinc:	max. 5 mg/kg food simulant
		Europium:	max. 0.05 mg/kg food simulant
		Gadolinium:	max. 0.05 mg/kg food simulant
		Lanthan:	max. 0.05 mg/kg food simulant
		Terbium:	max. 0.05 mg/kg food simulant

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specific migration of terephthalic acid (Ref. No: 24910, CAS No: 100-21-0)

Test Method

According to DIN EN ISO 10304-1 2009-07, - method for the determination of dissolved anions with liquid ion chromatography, after migration DIN EN 13130-1

simulant	3% acetic acid
duration	10 days
temperature	60 +/- 2°C
approach	5 dm ² /L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
terephthalic acid (100-21-0)	mg/kg	1st contact < 0.5
Conclusion		Pass

Note:

Requirement: max. 7.5 mg/kg food simulant (Regulation (EU) No 10/2011)

specific migration of terephthalic acid (Ref. No: 24910, CAS No: 100-21-0)

Test Method

According to DIN EN ISO 10304-1 2009-07, - method for the determination of dissolved anions with liquid ion chromatography, after migration DIN EN 13130-1

simulant 95% ethanol
duration 10 days
temperature 60 +/- 2°C
approach 5 dm²/L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
terephthalic acid (100-21-0)	mg/kg	1st contact < 0.5
Conclusion		Pass

Note:

Requirement: max. 7.5 mg/kg food simulant (Regulation (EU) No 10/2011)

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specific migration of isophthalic acid (Ref. No: 19150, CAS No: 121-91-5)

Test Method

According to DIN EN ISO 10304-1 2009-07, - method for the determination of dissolved anions with liquid ion chromatography, after migration DIN EN 13130-1

simulant 3% acetic acid
duration 10 days
temperature 60 +/- 2°C
approach 5 dm²/L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
isophthalic acid (121-91-5)	mg/kg	1st contact < 0.5
Conclusion		Pass

Note:

Requirement: max. 5 mg/kg food simulant (Regulation (EU) No 10/2011)

specific migration of isophthalic acid (Ref. No: 19150, CAS No: 121-91-5)

Test Method

According to DIN EN ISO 10304-1 2009-07, - method for the determination of dissolved anions with liquid ion chromatography, after migration DIN EN 13130-1

simulant 95% ethanol
duration 10 days
temperature 60 +/- 2°C
approach 5 dm²/L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
isophthalic acid (121-91-5)	mg/kg	1st contact < 0.5
Conclusion		Pass

Note:

Requirement: max. 5 mg/kg food simulant (Regulation (EU) No 10/2011)

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specific migration of ethyleneglycol (Ref. No: 16990/53650, CAS No: 107-21-1) and diethyleneglycol (Ref. No: 13326/15760/47680, CAS No: 111-46-6)**Test Method**

SOP M 1713, GC-MS, after migration DIN EN 13130-1

simulant	95% ethanol
duration	10 days
temperature	60 +/- 2°C
approach	5 dm ² /L

<u>Sample(s) /Subsample(s)</u>	<u>Unit</u>	<u>Result</u>
		<u>1</u>
		1st contact
ethyleneglycol (107-21-1)	mg/kg	< 10
diethyleneglycol (111-46-6)	mg/kg	< 10
total	mg/kg	-
Conclusion		Pass

Note:

Requirement: max. Summe (ethyleneglycol + diethyleneglycol) 30 mg/kg food simulant (Regulation (EU) No 10/2011)

*** End of test report ***

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