

Certificate of Analysis No. : 23275025

Customer

KARAKOUSIS G. INDUSTRIAL AND COMMERCIAL S.A.
5th KLM ONR LIVADEIA - ATHENS
32100 LIVADEIA

Attn. Mr. KARAKOUSIS

Date of issue: 01/12/2023

Sample information

Sample kind : Material intended to come into contact with food (plastic tank for repeated use)
Sample identification : ---
Received on : 02/10/2023 02:45:00 pm
Packaging : 30 pieces
Seals : None
Temperature : Ambient
Condition on receipt : Normal

Sampling information

Sampling responsible : Customer
Date : ---
Location : ---
Point : ---
Method : ---

The analysis results refer only to the items tested

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Testing
Certificate No.16

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Analysis results

Date of analysis: 03/10/2023 – 28/11/2023

The following results apply to the sample as received.

PARAMETER	METHOD	UNITS	RESULT	LIMITS
Overall migration (simulant D2: vegetable oil)	O.633 based on EN 1186-4:2002	Contact conditions:	10 days @ 40°C	M1
	1 st measurement	mg / dm ²	4,1 ± 0,4	-
	2 nd measurement	mg / dm ²	4,3 ± 0,4	-
	3 rd measurement	mg / dm ²	4,1 ± 0,4	-
	4 th measurement	mg / dm ²	3,9 ± 0,4	-
	Average	mg / dm ²	4,1 ± 0,4	-
Overall migration (simulant D2: vegetable oil)	O.633 based on EN 1186-4:2002	Contact conditions:	20 days @ 40°C	M2
	1 st measurement	mg / dm ²	3,9 ± 0,4	-
	2 nd measurement	mg / dm ²	4,1 ± 0,4	-
	3 rd measurement	mg / dm ²	4,3 ± 0,4	-
	4 th measurement	mg / dm ²	3,9 ± 0,4	-
	Average	mg / dm ²	4,1 ± 0,4	(M2-M1)<M1
Overall migration (simulant D2: vegetable oil)	O.633 based on EN 1186-4:2002	Contact conditions:	30 days @ 40°C	M3
	1 st measurement	mg / dm ²	3,9 ± 0,4	-
	2 nd measurement	mg / dm ²	3,9 ± 0,4	-
	3 rd measurement	mg / dm ²	4,2 ± 0,4	-
	4 th measurement	mg / dm ²	4,2 ± 0,4	-
	Average	mg / dm ²	4,1 ± 0,4	Difference (M3-M2): max 10 & (M3-M2)<(M2-M1)
Overall migration (simulant A: ethanol 10%)	EN 1186-5:2002	Contact conditions:	10 days @ 40°C	A1
	1 st measurement	mg / dm ²	Not detected	LOD=0,8 -
	2 nd measurement	mg / dm ²	Not detected	LOD=0,8 -
	3 rd measurement	mg / dm ²	Not detected	LOD=0,8 -
	Average	mg / dm ²	Not detected	LOD=0,8 -
Overall migration (simulant A: ethanol 10%)	EN 1186-5:2002	Contact conditions:	10 days @ 40°C	A2
	1 st measurement	mg / dm ²	Not detected	LOD=0,8 -
	2 nd measurement	mg / dm ²	Not detected	LOD=0,8 -
	3 rd measurement	mg / dm ²	Not detected	LOD=0,8 -
	Average	mg / dm ²	Not detected	LOD=0,8 A2<A1

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PARAMETER	METHOD	UNITS	RESULT	LIMITS
Overall migration (simulant A: ethanol 10%)	EN 1186-5:2002	Contact conditions:	10 days @ 40°C	A3
	1 st measurement	mg / dm ²	Not detected	LOD=0,8 -
	2 nd measurement	mg / dm ²	Not detected	LOD=0,8 -
	3 rd measurement	mg / dm ²	Not detected	LOD=0,8 -
	Average	mg / dm ²	Not detected	LOD=0,8 A3: max 10 & A3<A2
Overall migration (simulant B: acetic acid 3% w/v)	EN 1186-5:2002	Contact conditions:	10 days @ 40°C	B1
	1 st measurement	mg / dm ²	Not detected	LOD=0,8 -
	2 nd measurement	mg / dm ²	Not detected	LOD=0,8 -
	3 rd measurement	mg / dm ²	Not detected	LOD=0,8 -
	Average	mg / dm ²	Not detected	LOD=0,8 -
Overall migration (simulant B: acetic acid 3% w/v)	EN 1186-5:2002	Contact conditions:	10 days @ 40°C	B2
	1 st measurement	mg / dm ²	Not detected	LOD=0,8 -
	2 nd measurement	mg / dm ²	Not detected	LOD=0,8 -
	3 rd measurement	mg / dm ²	Not detected	LOD=0,8 -
	Average	mg / dm ²	Not detected	LOD=0,8 B2<B1
Overall migration (simulant B: acetic acid 3% w/v)	EN 1186-5:2002	Contact conditions:	10 days @ 40°C	B3
	1 st measurement	mg / dm ²	Not detected	LOD=0,8 -
	2 nd measurement	mg / dm ²	Not detected	LOD=0,8 -
	3 rd measurement	mg / dm ²	Not detected	LOD=0,8 -
	Average	mg / dm ²	Not detected	LOD=0,8 B3: max 10 & B3<B2

LOD: Limit of detection.

(M1)-(M2)-(M3): The tests were carried out on 3 different test specimens.

(A1)-(A2)-(A3) & (B1)-(B2)-(B3): The 3 tests were carried out successively on the same test specimen using another portion of the simulant on each occasion.

The reported uncertainty is the expanded uncertainty at 95% (k = 2) confidence level.

LIMITS: Regulation (EU) 10/2011, on plastic materials and articles intended to come into contact with food, as amended and is valid.

Decision rule: According to EN 1186-01:2002, a material or article with a mean overall migration result that exceeds the overall migration limit by an amount not exceeding the analytical tolerance, shall be deemed to be in compliance with the overall migration limit. The following analytical tolerances are allowed: 1 mg/dm² for aqueous food simulants and 3 mg/dm² for fatty food simulants and substitute test media.

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PARAMETER	METHOD	UNITS	RESULT	LIMITS
Specific Migration of Metals (reg.10/11)	0.522 / ICP-MS		D1	-
Test Conditions :			.	-
Simulant			Acetic acid 3% (i)	-
Technique			Cell	-
Time - Temperature			10 days @ 60°C	-
Barium		mg Ba/kg food	<0,00031	-
Cobalt		mg Co/kg food	<0,000061	-
Lithium		mg Li/kg food	Not detected	LOD=0,0002
Manganese		mg Mn/kg food	0,0088	-
Iron		mg Fe/kg food	0,039	-
Copper		mg Cu/kg food	<0,0012	-
Zinc		mg Zn/kg food	<0,031	-
Aluminium		mg Al/kg food	0,032	-
Nickel		mg Ni/kg food	0,0013	-
Antimony		mg Sb/kg food	Not detected	LOD=0,00009
Arsenic		mg As/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Cadmium		mg Cd/kg food	Not detected	LOD=0,002 N.D.(LOD 0,002)
Calcium		mg Ca/kg food	Not detected	LOD=0,2
Chromium		mg Cr/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Europium		mg Eu/kg food	Not detected	LOD=0,00002
Gadolinium		mg Gd/kg food	Not detected	LOD=0,00002
Lanthanum		mg La/kg food	Not detected	LOD=0,00002
Terbium		mg Tb/kg food	Not detected	LOD=0,00002
Lead		mg Pb/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Magnesium		mg Mg/kg food	Not detected	LOD=0,2
Mercury		mg Hg/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Potassium		mg K/kg food	Not detected	LOD=0,2
Sodium		mg Na/kg food	Not detected	LOD=0,2
Ammonium	* UV-VIS	mg NH4/kg food	<1	-

LOD: Limit of detection. N.D.: Not detected.

(i): The choice of the simulant constitutes the worst case scenario.

LIMITS: Regulation (EU) 10/2011, as amended and is valid, on plastic materials and articles intended to come into contact with food. Decision rule: The laboratory applies the decision rule of guarded reject at 95% confidence level.

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PARAMETER	METHOD	UNITS	RESULT	LIMITS
Specific Migration of Metals (reg.10/11)	0.522 / ICP-MS		D2	D2<D1
Test Conditions :			.	-
Simulant			Acetic acid 3% (i)	-
Technique			Cell	-
Time - Temperature			10 days @ 60°C	-
Barium		mg Ba/kg food	<0,00031	-
Cobalt		mg Co/kg food	<0,000061	-
Lithium		mg Li/kg food	Not detected	LOD=0,0002
Manganese		mg Mn/kg food	0,0071	-
Iron		mg Fe/kg food	Not detected	LOD=0,009
Copper		mg Cu/kg food	Not detected	LOD=0,0004
Zinc		mg Zn/kg food	Not detected	LOD=0,009
Aluminium		mg Al/kg food	<0,031	-
Nickel		mg Ni/kg food	0,00080	-
Antimony		mg Sb/kg food	Not detected	LOD=0,00009
Arsenic		mg As/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Cadmium		mg Cd/kg food	Not detected	LOD=0,002 N.D.(LOD 0,002)
Calcium		mg Ca/kg food	Not detected	LOD=0,2
Chromium		mg Cr/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Europium		mg Eu/kg food	Not detected	LOD=0,00002
Gadolinium		mg Gd/kg food	Not detected	LOD=0,00002
Lanthanum		mg La/kg food	Not detected	LOD=0,00002
Terbium		mg Tb/kg food	Not detected	LOD=0,00002
Lead		mg Pb/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Magnesium		mg Mg/kg food	Not detected	LOD=0,2
Mercury		mg Hg/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Potassium		mg K/kg food	Not detected	LOD=0,2
Sodium		mg Na/kg food	Not detected	LOD=0,2
Ammonium	* UV-VIS	mg NH4/kg food	<1	-

LOD: Limit of detection. N.D.: Not detected.

(i): The choice of the simulant constitutes the worst case scenario.

LIMITS: Regulation (EU) 10/2011, as amended and is valid, on plastic materials and articles intended to come into contact with food. Decision rule: The laboratory applies the decision rule of guarded reject at 95% confidence level.

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PARAMETER	METHOD	UNITS	RESULT	LIMITS
Specific Migration of Metals (reg.10/11)	0.522 / ICP-MS		D3	D3<D2
Test Conditions :			.	-
Simulant			Acetic acid 3% (i)	-
Technique			Cell	-
Time - Temperature			10 days @ 60°C	-
Barium		mg Ba/kg food	Not detected	LOD=0,00009 max 1
Cobalt		mg Co/kg food	Not detected	LOD=0,00002 max 0,05
Lithium		mg Li/kg food	Not detected	LOD=0,0002 max 0,6
Manganese		mg Mn/kg food	0,0044	max 0,6
Iron		mg Fe/kg food	Not detected	LOD=0,009 max 48
Copper		mg Cu/kg food	Not detected	LOD=0,0004 max 5
Zinc		mg Zn/kg food	Not detected	LOD=0,009 max 5
Aluminium		mg Al/kg food	Not detected	LOD=0,01 max 1
Nickel		mg Ni/kg food	0,00088	max 0,02
Antimony		mg Sb/kg food	Not detected	LOD=0,00009 max 0,04
Arsenic		mg As/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Cadmium		mg Cd/kg food	Not detected	LOD=0,002 N.D.(LOD 0,002)
Calcium		mg Ca/kg food	Not detected	LOD=0,2 -
Chromium		mg Cr/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Europium		mg Eu/kg food	Not detected	LOD=0,00002 max 0,05 / (a)
Gadolinium		mg Gd/kg food	Not detected	LOD=0,00002 max 0,05 / (a)
Lanthanum		mg La/kg food	Not detected	LOD=0,00002 max 0,05 / (a)
Terbium		mg Tb/kg food	Not detected	LOD=0,00002 max 0,05 / (a)
Lead		mg Pb/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Magnesium		mg Mg/kg food	Not detected	LOD=0,2 -
Mercury		mg Hg/kg food	Not detected	LOD=0,01 N.D.(LOD 0,01)
Potassium		mg K/kg food	Not detected	LOD=0,2 -
Sodium		mg Na/kg food	Not detected	LOD=0,2 -
Ammonium	* UV-VIS	mg NH ₄ /kg food	<1	-

LOD: Limit of detection. N.D.: Not detected.

(D1)-(D2)-(D3): The 3 tests were carried out successively on the same test specimen using another portion of the simulant on each occasion.

(i): The choice of the simulant constitutes the worst case scenario.

(a): The sum of all lanthanides migrating towards the food must not exceed the specific migration limit of 0,05 mg/kg.

LIMITS: Regulation (EU) 10/2011, as amended and is valid, on plastic materials and articles intended to come into contact with food. Decision rule: The laboratory applies the decision rule of guarded reject at 95% confidence level.

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PARAMETER	METHOD	UNITS	RESULT	LIMITS
Sample's preparation (digestion)	* Microwave-Assisted digestion		.	-
Metals and Trace Elements	* ICP-MS		.	-
Cadmium - Cd		mg Cd / kg	<0,035	-
Lead - Pb		mg Pb / kg	<0,15	-
Mercury - Hg		mg Hg / kg	Not detected	LOD=0,035
Hexavalent chromium	* EPA 7196	mg Cr / kg	Not detected	LOD=3
Heavy metals (Directive 94/62/EC)	*		.	-
Sum of heavy metals	* By Calculation	mg / kg	<0,19	max 100

LOD: Limit of detection.

LIMITS: Directive 94/62/EC, article 11, on packaging and packaging waste, as amended and is valid.

Decision rule: The laboratory applies the decision rule of guarded reject at 95% confidence level.

Statement of Conformity: According to the above information, the sample complies with:

1. The limits set by Regulation (EU) 10/2011, for repeated use, for:

- The overall migration
- The specific migration of metals

for the following types of foods and intended food contact conditions:

Types of foods

All types of foods

Intended food contact conditions

Any long term storage at room temperature or below, including when packaged under hot-fill conditions, and / or heating up to a temperature T where $70\text{ }^{\circ}\text{C} \leq T \leq 100\text{ }^{\circ}\text{C}$ for a maximum of $t = 120/2^{((T-70)/10)}$ minutes.

2. The limit set by the Directive 94/62/EC, on the sum of concentration levels of lead, cadmium, mercury and hexavalent chromium on packaging & packaging waste.

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Sample's photograph



For
A. TSAKALIDIS Inc.

ANTONIOS TSAKALIDIS
Managing Director
Digitally signed certificate

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Testing
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