



המעבדה לאריזה

PACKAGING LABORATORY

27/11/2019

Madaf-Plazit Packaging ACA Ltd and Benda ACA Ltd

Kibutz Gazit

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Att: Mr Moshe Kanskevitz

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Sir,

Re: **Migration tests according to EU Regulation, EU Directives and Israeli standard 5113 from 250 ml printed PS cups and their SB lids intended for dairy products and manufactured by "MADAF-PLAZIT",**
Order number 008-19, Our code MADAFPLAZIT10E-2019

Description of samples: 250 ml white printed cups made from polystyrene (PS) and their clear lids made from styrene butadiene (SB) copolymer intended for dairy products. The packages were manufactured by "MADAF-PLAZIT". The samples were selected and delivered to the Packaging Laboratory by the client.

Purpose of tests: Migration from the cups and lids to test their suitability to come in contact with dairy products.

Methods of tests: The overall migration tests were done according to EU Regulation, EU Directives and Israeli standard 5113 as follows:

1. Regulation (EC) 10/2011: Commission Regulation (EU) 10/2011 "on plastic materials and articles intended to come into contact with food" and Commission Regulation (EU) 2016/1416 of 24 August 2016 and Commission regulation (EU) 2017/752, 2018/79, and 2019/37 amending and correcting Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food.
2. Framework Regulation (EC) No. 1935/2004: Regulation of the European Parliament and of the Council 27 October 2004 on Materials and Articles intended to come into contact with foods.
3. DD ENV 1186: Materials and articles in contact with foodstuffs – Plastics, parts 1-16.
4. Israeli standard 5113: Plastic materials and plastic articles in contact with food and beverages.
5. CONEG Regulations (USA) heavy metals content requirements of the Coalition of Northeastern Governors ("CONEG") Model Toxics in Packaging legislation.
6. European standard EN 71-3: Safety of toys, part 3: Migration of certain elements.

The tests performed included overall migration from the cups and lids into the following food simulants: solutions of 3% acetic acid and 50% ethanol in water at 40°C for 10 days, followed by evaporation of the simulants and determination of the residual extract (total migration). The ratios of simulant volume to the package area in the tests were 135 ml/dm² and 100 ml/dm² for the cups and lids, respectively.

For metals analysis, the PS cups were filled with a 3% acetic acid solution in water and left for 10 days at 40°C. The ratio of simulant volume to package area in the test of the cups was 135 ml/dm². Afterwards the extract was tested for elements concentration. The analysis of elements was done in an ICP (Inductively Coupled Plasma emission spectroscopy): ICAP 6000 made by THERMO.

Documents: Documents certifying that all raw materials and additives used for the cups and lids production conform to the different health authorities such as the FDA and EU. These documents are kept in our files.

Results

The overall migration is expressed as milligrams of material extracted from one square decimeter of the tested articles or into 1 kg of simulant, and is presented in table 1. The results reported are an average of at least 3 replicates. Results for metals concentration are reported in table 2.

Table 1: **Overall Migration from the cups and lids**

The samples	3% acetic acid		50% ethanol	
	mg/kg	mg/dm ²	mg/kg	mg/dm ²
250 ml PS printed cups	<1	<1	4.8	<1
SB lids	-	<1	-	<1

Table 2: **Results for metals concentration according to the EU regulation**

Metal tested	250 ml PS printed cups mg/kg	Specific migration limit according to Regulation mg/kg
Al – Aluminum	0.024	1.0
Ba – Barium	<0.02	1.0
Co – Cobalt	<0.02	0.05
Cu – Copper	<0.02	5.0
Fe – Iron	<0.02	48.0
Li – Lithium	<0.02	0.6
Mn – Manganese	<0.02	0.6
Ni – Nickel	<0.02	0.02
Zn – Zinc	0.021	5.0

According to the EU Directive and EU Regulation relating to Plastic Materials and Articles intended to come in Contact with Foodstuffs: "Plastic materials and articles shall not transfer their constituents to foodstuffs in quantities exceeding **10 mg per decimeter square** of surface area of material or article, or **60 mg per kilogram of simulant**".

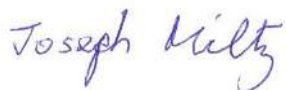
Based on above tests, migration from the 250 ml PS printed in white cups and their clear SB lids was within the allowed limits of the EU Regulations, EU Directives, and Israeli Standard 5113 for dairy food products.

According to the Regulation: "Testing for 10 days at 40°C shall cover all storage times at refrigerated and frozen conditions including hot fill conditions and/or heating up to 70°C ≤ T ≤ 100°C for maximum time: $t = 120/2^{((T-70)/10)}$ minutes" and storage at room temperature for up to 30 days.

According to the regulation "plastic materials shall not release the specified elements exceeding the migration limits...". Based on above tests concentration of the tested elements were below the allowed limit.

Results refer to the samples tested only.

Sincerely Yours,



Prof. Joseph Miltz
Head of laboratory



Vladimir Polyakov
Research Engineer



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