

TEST REPORT No. 323015

Place and date of issue: Bellaria-Igea Marina - Italy, 16/03/2015

Customer: INGROSERVICE ITALIA S.r.l. - Via del Pantano, 71 - 50018 SCANDICCI (FI) - Italy

Date test requested: 02/12/2014

Order number and date: 65036, 03/12/2014

Date sample received: 10/12/2014

Test date: from 13/01/2015 to 24/02/2015

Purpose of test: determination of overall migration, colour migration and specific migration of food contact materials

Sample origin: sampled and supplied by the Customer

Identification of sample received: No. 2014/2516

Sample name*

The test sample comprises a water-based resin coating system called ARTEVIVA with AVF topcoat.

Description of sample*

The test sample comprises metal sheets with a grey coating.

(*) according to that stated by the Customer.

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This test report consists of 4 sheets.
This document is the English translation of the test report No. 323015 dated 16/03/2015 issued in Italian; in case of dispute the only valid version is the Italian one. Date of translation: 31/07/2015.

Sheet
1 of 4

Normative References

The test was carried out in accordance with the requirements of the following documents:

- Health Ministry Decree dated 21/03/1973 published in the ordinary supplement of the Official Journal No. 104 dated 20/04/1973 “Hygiene control of packaging, containers and utensils intended to come into contact with foodstuffs or with substances for personal use” as amended and consolidated;
- Commission Regulation (EU) No. 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food.

Test method

The sample underwent the following tests:

- determination of overall migration;
- determination of colour migration by measuring transmittance between 400 and 750 nm;
- analysis of liquid simulants for specific migration tests using LC-MS/MS and GC-MS.

Testing was carried out under the following conditions:

- type of simulant = distilled water;
- test temperature = 40 °C;
- contact time = 10 days;
- test surface to volume ratio = 1,0 cm²/cm³.

Test results

Determination of overall migration

Liquid simulant	Value obtained [mg/dm ²]	Maximum permissible limit [mg/dm ²]
Distilled water	8,1	10

Determination of colour migration

Liquid simulant	Transmittance between 400 and 750 nm [%]	Minimum permissible limit [%]
Distilled water	98,4	95

Determination of specific migration in distilled water

Substance of interest	Value obtained [mg/kg]	LOQ [mg/kg]*	Metodi di prova
BADGE, BFDGE and derivatives			
BADGE	< LOQ	0,05	In-house method using LC-MS/MS
BADGE.2H ₂ O	< LOQ	0,05	In-house method using LC-MS/MS
BADGE.2HCl	< LOQ	0,05	In-house method using LC-MS/MS
BADGE.H ₂ O	< LOQ	0,05	In-house method using LC-MS/MS
BADGE.HCl	< LOQ	0,05	In-house method using LC-MS/MS
BADGE.HCl.H ₂ O	< LOQ	0,05	In-house method using LC-MS/MS
BFDGE	< LOQ	0,05	In-house method using LC-MS/MS
BFDGE.2H ₂ O	< LOQ	0,05	In-house method using LC-MS/MS
BFDGE.2HCl	< LOQ	0,05	In-house method using LC-MS/MS
NOGE Novolac Glycidyl Ether (3-4-5-6-Ring)			
NOGE 3 ring	< LOQ	0,05	In-house method using LC-MS/MS
NOGE 4 ring	< LOQ	0,05	In-house method using LC-MS/MS
NOGE 5 ring	< LOQ	0,05	In-house method using LC-MS/MS
NOGE 6 ring	< LOQ	0,05	In-house method using LC-MS/MS
Bisphenol A	< LOQ	0,05	In-house method using LC-MS/MS
Group 1 phthalates			
Dimethyl phthalate (CAS 131-11-3)	< LOQ	0,01	In-house method using GC-MS
Diethyl phthalate (CAS 84-66-2)	< LOQ	0,01	In-house method using GC-MS
Diisobutyl phthalate (CAS 84-69-5)	< LOQ	0,01	In-house method using GC-MS
Dibutyl phthalate (CAS 84-74-2)	< LOQ	0,01	In-house method using GC-MS
Butyl benzyl phthalate (CAS 85-68-7)	< LOQ	0,01	In-house method using GC-MS
Bis(2-ethylhexyl) phthalate (CAS 117-81-7)	< LOQ	0,01	In-house method using GC-MS
Di-n-octyl phthalate (CAS 117-84-0)	< LOQ	0,01	In-house method using GC-MS
Diisononyl phthalate (isomers) (CAS 28553-12-0)	< LOQ	0,01	In-house method using GC-MS
Diisodecyl phthalate (isomers) (CAS 26761-40-0)	< LOQ	0,01	In-house method using GC-MS
Group 2 phthalates			
Diisopropyl phthalate (CAS 605-45-8)	< LOQ	0,01	In-house method using GC-MS
Di-n-propyl phthalate (CAS 131-16-8)	< LOQ	0,01	In-house method using GC-MS
Di-n-pentyl phthalate (CAS 131-18-0)	< LOQ	0,01	In-house method using GC-MS

Substance of interest	Value obtained [mg/kg]	LOQ [mg/kg]*	Metodi di prova
Dinonyl phthalate (CAS 84-76-4)	< LOQ	0,01	In-house method using GC-MS
Didecyl phthalate (CAS 84-77-5)	< LOQ	0,01	In-house method using GC-MS
Diundecyl phthalate (CAS 3648-20-2)	< LOQ	0,01	In-house method using GC-MS
Didodecyl phthalate (CAS 2432-90-8)	< LOQ	0,01	In-house method using GC-MS
Dihexyl phthalate (CAS 84-75-3)	< LOQ	0,01	In-house method using GC-MS
Dicyclohexyl phthalate (CAS 84-61-07)	< LOQ	0,01	In-house method using GC-MS
Diheptyl phthalate (CAS 3648-21-3)	< LOQ	0,01	In-house method using GC-MS

(*) LOQ: limit of quantification: is the smallest concentration of analyte in the sample that can be determined with acceptable precision (repeatability) and accuracy under stated conditions.

Findings

On the basis of the overall migration, colour migration and specific migration of phthalates, bisphenol A, BADGE, BFDGE and NOGE tests carried out in accordance with current legislation, the material under examination may be considered **SUITABLE** for contact with the liquid simulant utilised. Suitability remains valid only as long as the monomers, additives and processing aids utilised meet the requirements of current legislation, there is compliance with any specific migration limits and no deterioration in organoleptic characteristics has occurred.

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