

**Test Report****Report No: TJAFF150100083E-1b-S1****Date: Mar 18 2015**

Client name: Jinhui ZhaoLong High Technology Co.,Ltd  
Client address: Xiaoyi Economic Development Zone,Shanxi,PR.China  
\*Sample name: Ecoworld® PBAT  
Batch No.: /  
Product Date: 2014.11.30  
Manufacturer: Jinhui ZhaoLong High Technology Co.,Ltd

**Above information and sample(s) was/were submitted and certified by the client, SGS quoted the information with no responsibility as to the accuracy, adequacy and/or completeness.**

SGS Sample No.: TJAFF150100083-1  
SGS reference No.: TSNFD1500104801  
Date of sample received: Jan 08 2015  
Testing period: Jan 12 2015 ~ Jan 27 2015

**TEST(S) REQUESTED:**

In accordance with German Food, Articles of Daily Use and Feed Code of September 1, 2005 (LFGB), Section 30 and 31 with amendments, European Commission Regulation (EU) No 10/2011 with amendments and BfR recommendations, to determine overall migration, to determine sensorial examination odour and taste, to determine specific migration of 1,4-Butanediol, to determine specific migration of heavy metal, to determine lead (Pb) and cadmium (Cd), to determine polynuclear aromatic hydrocarbons(PAHs).

**TEST METHOD(S):**

Please refer to the next page(s).

**TEST RESULT(S):**

Please refer to the next page(s)

**Conclusion:**

The tested parameters comply with the requirements stated in LFGB, Section 30 and 31 with amendments and Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004.

**Remark:** This test report has been drafted in Chinese and maybe translated into other languages, The Chinese version shall prevail.

**Remark:** \* Information was modified by the request of the client after test report/testing summary was issued.

**THIS REPORT IS TO SUPERSEDE TEST REPORT TJAFF150100083E-1b.**

**The results shown in this test summary refer only to the sample(s) tested, and for clients internal use only.**



SGS Authorized Signature

OSTC Standards Technical Services (Tianjin) Co., Ltd.

Page 1 of 4

RAND: 7965113



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**TEST METHOD(S):**

- 1) With reference to Commission Regulation (EU) No 10/2011 of 14 January 2011 Annex III and Annex V for selection of condition and EN 1186-1:2002 for selection of test methods; EN1186-3:2002 aqueous food simulants by total immersion method; EN1186-2:2002 olive oil by total immersion method;
- 2) With reference to DIN 10955:2004
- 3) With reference to EN13130-1: 2004, analysis was performed by GC-MS.
- 4) With reference to EN13130-1:2004, analysis was performed by ICP-OES.
- 5) Total lead and cadmium: Acidic digestion, analysis was performed by ICP-OES.
- 6) With reference to ZEK 01.4-08, analysis was performed by GC-MS.

**TEST RESULT(S):**

- 1) Overall migration:

Simulant Used	Time	Temperature	Max. Permissible Limit	Overall Migration
3% Acetic Acid (W/V) Aqueous Solution	1.0hr(s)	100°C	10mg/dm <sup>2</sup>	< 3.0mg/dm <sup>2</sup>
10% Ethanol (V/V) Aqueous Solution	1.0hr(s)	100°C	10mg/dm <sup>2</sup>	< 3.0 mg/dm <sup>2</sup>
Rectified Olive Oil	1.0hr(s)	100°C	10mg/dm <sup>2</sup>	8.2 mg/dm <sup>2</sup>

- Remark:**
1. Analytical tolerance of aqueous simulants is 1 mg/dm<sup>2</sup>
  2. Analytical tolerance of fatty food simulants is 3 mg/dm<sup>2</sup>
  3. Test condition & simulant were specified by client.

- 2) Sensorial examination odour and taste test:

Test media: Deionized water

No. of panelist: 6

Test time: 1.0hr

Temperature: 100°C

Test Item	Limit	Test Result
Sensorial examination odour (Point scale)	2.5	0.0
Sensorial examination taste (Point scale)	2.5	0.0

- Scale evaluation:**
- 0: no perceptible difference
  - 1: just perceptible difference
  - 2: light difference
  - 3: marked difference
  - 4: strong difference

- 3) Specific migration of 1,4-Butanediol:

Simulant Used: 3% Acetic acid (W/V) aqueous solution

Test Condition: 40°C 1hr(s)

Test Item	Max. Permissible Limit	Unit	Method Detection limit	Test Result
Specific migration of 1,4-Butanediol	5	mg/kg	1	Not Detected

- Remark:** Test condition & simulant were specified by client.



4) Specific migration of heavy metal:  
 Simulant Used: 3% Acetic Acid (W/V) Aqueous Solution  
 Test Condition: 40°C 1.0hr(s)

Test Item(s)	Max. Permissible Limit	Unit	Method Detection limit(s)	Test Result
Barium	1	mg/kg	0.25	Not Detected
Cobalt	0.05	mg/kg	0.01	Not Detected
Copper	5	mg/kg	0.25	Not Detected
Iron	48	mg/kg	0.25	Not Detected
Lithium	0.6	mg/kg	0.5	Not Detected
Manganese	0.6	mg/kg	0.25	Not Detected
Zinc	25	mg/kg	0.5	Not Detected

**Remark:** Test condition & simulant were specified by client.

5) Lead(Pb) and cadmium(Cd):

Test Item(s)	Limit	Unit	Method Detection limit(s)	Test Result
Total Lead	absent.	mg/kg	2	Not Detected
Total Cadmium	absent.	mg/kg	2	Not Detected

6) Polynuclear aromatic hydrocarbons (PAHs):

Test Item(s)	Max. Permissible Limit	Unit	Method Detection limit(s)	Test Result
Sum of 18 PAHs	★	mg/kg	-	1.7
Naphthalene(NAP)	★	mg/kg	0.1	1.7
Acenaphthylene(ANY)	★	mg/kg	0.1	Not Detected
Acenaphthene(ANA)	★	mg/kg	0.1	Not Detected
Fluorene(FLU)	★	mg/kg	0.1	Not Detected
Phenanthrene(PHE)	★	mg/kg	0.1	Not Detected
Anthracene(ANT)	★	mg/kg	0.1	Not Detected
Fluoranthene(FLT)	★	mg/kg	0.1	Not Detected
Pyrene(PYR)	★	mg/kg	0.1	Not Detected
Benzo(a)anthracene(BaA)	★	mg/kg	0.1	Not Detected
Chrysene(CHR)	★	mg/kg	0.1	Not Detected
Benzo(b)fluoranthene(BbF) and Benzo(j)fluoranthene(BjF)	★	mg/kg	0.1	Not Detected
Benzo(k)fluoranthene(BkF)	★	mg/kg	0.1	Not Detected
Benzo(a)pyrene(BaP)	★	mg/kg	0.1	Not Detected
Benzo(e)pyrene(BeP)	★	mg/kg	0.1	Not Detected





Test Item(s)	Max. Permissible Limit	Unit	Method Detection limit(s)	Test Result
Indeno(1,2,3-c,d)pyrene(IPY)	★	mg/kg	0.1	Not Detected
Dibenzo(a,h)anthracene(DBA)	★	mg/kg	0.1	Not Detected
Benzo(g,h,i)perylene(BPE)	★	mg/kg	0.1	Not Detected

Remark: ★ = See below.

ZEK 01.4-08: Restraining maximum values for products

Parameter	Category 1	Category 2	Category 3
	Material indented to be put in the mouth or material for toys with normal skin contact for children aged < 36 months	Materials those are not included in Category 1, with predictable contact with the skin longer than 30 s. (long-term skin contact).	Materials those are not included in Category 1 or 2, with predictable skin contact up to 30 s (short-term skin contact).
Benzo(a)pyrene (mg/kg)	<0.2**	1	20
Sum of 18 PAHs (mg/kg)*	<0.2**	10	200

Notes:

\* = Only PAH substances >0.1 mg/kg are taken into account while calculating the sum of PAHs

\*\* = In case that the maximum values exceed the limits of category 1, but are within the limits of category 2, one may confirm the suitability of the tested material which is indented to be put in the mouth by additional specific migration tests of PAH components based on DIN EN 1186ff and §64 LFGB 80.30-1. The conclusion of the migration test results must be made based on food law criteria.

**SAMPLE DESCRIPTION:** Transparent plastic film



\*\*\* End of Report\*\*\*

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Page 4 of 4

RAND: 7965113

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