



Pira International
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Test laboratory number

Reference number 05A12J1677

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P.C.C. (UK) Ltd.
NIOC House
4 Victoria Street
London SW1H 0NE

This report is made subject to the conditions that it is confidential and may not be disclosed in whole or part to others without written consent.

Attention: Nigel Suttie

Test material:

Two samples of PET bottle identified as:

1. PARS PET BG 781
2. PARS PET BG 821

Sampled and supplied by:

P.C.C. (UK) Ltd.

Samples received:

4 November 2005

Date(s) of testing:

4 November to 12 December 2005

Test(s) required:

Overall migration by filling into simulants B, C and D; exposure conditions 10 days at 40°C.

Overall migration simulants and conditions as defined in EC Directive 97/48/EC.

Simulant B - 3% w/v acetic acid

Simulant C - 10% v/v ethanol

Simulant D - rectified olive oil

Specific migration of terephthalic acid and isophthalic acid into 3% acetic acid, 10% ethanol and olive oil.

Exposure conditions as specified for overall migration.

Specific migration of ethylene glycol (MEG/DEG) into 3% acetic acid 10% ethanol and olive oil. *Exposure conditions as specified for overall migration*

Migration of Antimony into 3% Acetic Acid.

Matthew Gravett

Tested N. Cornwall

Date 30/12/2005

Dr Alistair Irvine

Checked A. Irvine



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Attention: Nigel Suttie

Determination of the levels of lead (Pb), cadmium (Cd), chromium (Cr) and mercury (Hg).

Method(s):

Overall migration into aqueous simulants (B and C)

After exposure to the simulant under conditions specified, test specimens were removed from contact; the aqueous extract was transferred to a weighed container and evaporated to dryness and constant weight.

EN 1186 - 9 - single side contact by filling.

Overall migration into olive oil (simulant D)

After exposure to the simulant under conditions specified, test specimens were removed from contact; excess oil blotted off, and re-weighed. Absorbed oil was determined by extraction and GC quantification.

EN 1186-2 - total immersion

Matthew Gravett

Tested

M. Gravett

Date

20/12/2005

Dr Alistair Irvine

Checked

A. Irvine



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Test results:

The overall migration is expressed in milligrams per kilogram of foodstuff (mg/kg), as specified in EC Directive 2002/72/EC for containers between 500 ml and 10 l in volume. Where the total immersion method was used, results were calculated taking into account the area of only one surface of the test specimen, i.e. for a 1 dm² test specimen the surface area used for the calculation was 1 dm².

The results were calculated assuming the following ratios;

1. PARS PET BG 781 - 1.0 litre in contact with 5.3dm².
2. PARS PET BG 821 - 1.0 litre in contact with 5.4dm².

Sample: 1) PARS PET BG 781
 Test conditions: 10 days at 40°C

| Method Replicates | EN 1186-9 Migration into 3% w/v acetic acid (Simulant B) mg/kg | EN 1186-9 Migration into 10% v/v ethanol (Simulant C) mg/kg | EN 1186-2 Migration into olive oil (Simulant D) mg/kg |
|----------------------|--|---|---|
| 1 | 0.0 | 1.0 | 0.0 |
| 2 | 2.0 | 2.0 | 0.0 |
| 3 | 1.5 | 4.0 | 0.0 |
| 4 | - | - | 0.0 |
| Mean result | 1.2 | 2.3 | 0.0 |
| Limit | 60.0 | 60.0 | 60.0 |

Matthew Gravett

Tested M Gravett

Date 20/12/2005

Dr Alistair Irvine

Checked h h



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Attention: Nigel Suttie

Sample: PARS PET BG 821
 Test conditions: 10 days at 40°C

| Method Replicates | EN 1186-9 Migration into 3% w/v acetic acid (Simulant B) | EN 1186-9 Migration into 10% v/v ethanol (Simulant C) | EN 1186-2 Migration into olive oil (Simulant D) |
|----------------------|---|--|--|
| | mg/kg | mg/kg | mg/kg |
| 1 | 1.0 | 2.0 | 2.7 |
| 2 | 3.0 | 1.5 | 3.8 |
| 3 | 2.5 | 3.0 | 0.0 |
| 4 | - | - | 0.0 |
| Mean result | 2.2 | 2.2 | 1.6 |
| Limit | 60.0 | 60.0 | 60.0 |

Matthew Gravett

Tested Nigel Suttie

Date 20/12/2005

Dr Alistair Irvine

Checked [Signature]



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Attention: Nigel Suttie

Method(s):

Specific migration of ethylene glycol (MEG) and diethylene glycol (DEG) using method ENV 13130-7: 1999

Specific migration was determined into 3% acetic acid, 10% ethanol and olive oil with test conditions as per the overall migration test. The level of MEG and DEG in the exposed food simulants was determined by cold on column GC with FID detection.

Test Results (Non UKAS):

Where no MEG or DEG was found the value quoted is the limit of detection for the method.

Specific migration of ethylene glycol (MEG) and diethylene glycol (DEG) into the following food simulants (mg/kg):

| Sample | | 3% acetic acid | 10% Ethanol | Olive Oil |
|-----------------|-----------|----------------|-------------|-----------|
| PARS PET BG 781 | MEG + DEG | < 5.8 | < 5.8 | < 3.5 |
| PARS PET BG 821 | MEG + DEG | < 5.8 | < 5.8 | < 3.5 |

The specific migration limit given in EC Directive 2002/72/EC for ethylene glycol (as the combined total of MEG + DEG) is 30 mg per kg of foodstuff.

Matthew Gravett

Tested M. Corneillat

Date 20/12/2005

Dr Alistair Irvine

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Attention: Nigel Suttie

Method(s):

Specific migration of terephthalic acid (TPA) and isophthalic acid (IPA) using method ENV 13130-2

Specific migration was determined into 3% acetic acid, 10% ethanol, olive oil with test conditions as per Overall Migration. The levels of terephthalic acid and isophthalic acid in the exposed food simulant were determined by HPLC.

Test Results (Non UKAS):

Where no IPA or TPA was found the value quoted is the limit of detection for the method.

Specific migration of terephthalic acid into the following food simulants (mg/kg):

| Sample | | 3% acetic acid | 10% Ethanol | Olive Oil |
|-----------------|-------------------|----------------|-------------|-----------|
| PARS PET BG 781 | Terephthalic acid | < 0.8 | < 0.8 | < 0.5 |
| PARS PET BG 781 | Isophthalic acid | < 1.0 | < 1.0 | < 0.6 |
| PARS PET BG 821 | Terephthalic acid | < 0.8 | < 0.8 | < 0.5 |
| PARS PET BG 821 | Isophthalic acid | < 1.0 | < 1.0 | < 0.6 |

The specific migration limit given in EC Directive 2002/72/EC for terephthalic acid is 7.5 mg per kg of foodstuff.

The specific migration limit given in EC Directive 2002/72/EC for isophthalic acid is 5 mg per kg of foodstuff

Matthew Gravett

Tested M. Gravett

Date 20/12/2005

Dr Alistair Irvine

Checked A. Irvine



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Attention: Nigel Suttie

Method(s):

Antimony

Samples were exposed to 3% acetic acid under the conditions indicated below and the level of Antimony in the extracts was determined using flame atomic absorption spectrophotometry.

NB The analysis of exposed food simulants for antimony was carried out by an expert subcontractor.

Test Results (Non UKAS):

Specific migration of antimony (ppb) into 3% Acetic Acid

| Sample | Conditions | Rep 1 | Rep 2 | Rep 3 | Mean |
|-----------------|-----------------|-------|-------|-------|------|
| PARS PET BG 781 | 10 days at 40°C | < 10 | < 10 | < 10 | < 10 |
| PARS PET BG 821 | 10 days at 40°C | < 10 | < 10 | < 10 | < 10 |

The limit specified in EC Directive 2005/79/EC for the migration of antimony is 0.04 mg per kg of food simulant (i.e. 40 ppb).

Matthew Gravett

Tested M Coanell

Date 20/12/2005

Dr Alistair Irvine

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Attention: Nigel Suttie

Method(s):

Determination of the levels of lead (Pb), cadmium (Cd), chromium (Cr) and mercury (Hg).

Portions of the samples were dissolved in an acid digestion bomb and the resultant solutions were analysed by atomic absorption spectrophotometry.

NB The analysis of the packaging sample for heavy metals was carried out by an expert subcontractor.

Test results:

| Sample: | Level of Heavy Metals in Packaging (mg per kg of packaging material) | | | | |
|-----------------|--|-----|----|-----|-------|
| | Pb | Cd | Cr | Hg | Total |
| PARS PET BG 781 | 4 | < 5 | 12 | < 1 | < 22 |
| PARS PET BG 821 | 2 | < 5 | 11 | < 1 | < 19 |

The limit specified in EC Directive 94/62/EC for the combined total of lead, cadmium, mercury and hexavalent chromium is 100 mg/kg from 30 June 2001.

The limit specified in the CONEG regulations in the USA for the combined total of these elements is 100 mg per kg of packaging material.

Matthew Gravett

Tested *M Gravett*

Date *20/12/2005*

Dr Alistair Irvine

Checked *[Signature]*



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Attention: Nigel Suttie



Pira's analytical group is accredited by UKAS against ISO 17025. Unless otherwise indicated, all results in this report are covered by our scope of accreditation. All comments and opinions expressed are those of Pira International and as such do not fall under our scope of UKAS accreditation.

Samples will be retained for 3 months after the completion of testing and will then be disposed of, unless the client requests otherwise.

Matthew Gravett

Tested M Gravett

Date 20/12/2005

Dr Alistair Irvine

Checked A Irvine

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Food Contact Plastics
Certificate of Conformity with the Requirements of EC Directive
2002/72/EC and UK Statutory Instrument 1376(1998) as
amended

Certificate no: 2005/2947

Product Name: 'PARS PET BG 781' **Date of Issue:** 20 December 2005
Pira Reference No: 05A12J1667

**Manufacturer/
Supplier:** National Petrochemical Company, Iran

The above product has been tested for overall migration with the simulants and test conditions listed below. The food simulants and test conditions are those defined in EC Directive 97/48/EC and UK Statutory Instrument 1376(1998).

| Food Simulants | Test Conditions | |
|----------------------|-----------------|---------|
| | Duration | Temp/°C |
| Simulants B, C and D | 10 days | 40°C |

The overall migration results obtained were found to be below the overall migration limits defined in EC Directive 2002/72/EC and UK Statutory Instrument 1376(1998).

Additionally, the above product contains 3 monomers and one additive which are listed with specific migration limits in section A of EC Directive 2002/72/EC as amended; terephthalic acid (SML = 7.5 mg/kg), isophthalic acid (SML = 5 mg/kg), ethylene glycol (SML = 30 mg/kg) and an antimony based additive (SML = 0.04 mg/kg). Tests showed that the limits specified for these substances in EC Directive 2002/72/EC and UK Statutory Instrument 1376(1998) are not exceeded under the above test conditions. The formulation contains no other constituents which are subject to restrictions under this legislation and is composed entirely of constituents which are either listed in this legislation, or exempt from its provisions.

The above product therefore fully meets the overall migration requirements of EC Directive 2002/72/EC and UK Statutory Instrument 1376(1998) as amended for use with all classes of foodstuff for;

- (a) any period at temperatures up to 40°C, and/or
 - (b) periods up to 2 hours at temperatures up to 70°C, and/or
 - (c) periods up to 15 minutes at temperatures up to 100°C,
- as specified in EC Directive 97/48/EC.

Certified by: Dr Alistair Irvine
Principal Consultant
Food Packaging Safety

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Food Contact Plastics
Certificate of Conformity with the Requirements of EC Directive
2002/72/EC and UK Statutory Instrument 1376(1998) as
amended

Certificate no: 2005/2948

Product Name: 'PARS PET BG 821' **Date of Issue:** 20 December 2005
Pira Reference No: 05A12J1667

**Manufacturer/
Supplier:** National Petrochemical Company, Iran

The above product has been tested for overall migration with the simulants and test conditions listed below. The food simulants and test conditions are those defined in EC Directive 97/48/EC and UK Statutory Instrument 1376(1998).


| Food Simulants | Test Conditions | |
|----------------------|-----------------|---------|
| | Duration | Temp/°C |
| Simulants B, C and D | 10 days | 40°C |

The overall migration results obtained were found to be below the overall migration limits defined in EC Directive 2002/72/EC and UK Statutory Instrument 1376(1998).

Additionally, the above product contains 3 monomers and one additive which are listed with specific migration limits in section A of EC Directive 2002/72/EC as amended; terephthalic acid (SML = 7.5 mg/kg), isophthalic acid (SML = 5 mg/kg), ethylene glycol (SML = 30 mg/kg) and an antimony based additive (SML = 0.04 mg/kg). Tests showed that the limits specified for these substances in EC Directive 2002/72/EC and UK Statutory Instrument 1376(1998) are not exceeded under the above test conditions. The formulation contains no other constituents which are subject to restrictions under this legislation and is composed entirely of constituents which are either listed in this legislation, or exempt from its provisions.

The above product therefore fully meets the overall migration requirements of EC Directive 2002/72/EC and UK Statutory Instrument 1376(1998) as amended for use with all classes of foodstuff for;

- (a) any period at temperatures up to 40°C, and/or
 - (b) periods up to 2 hours at temperatures up to 70°C, and/or
 - (c) periods up to 15 minutes at temperatures up to 100°C,
- as specified in EC Directive 97/48/EC.


Certified by: Dr Alistair Irvine
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**Packaging and Packaging Waste (Essential Requirements)
Certificate of Conformity with the Heavy Metal Requirements of
EC Directive 94/62/EC (as amended), UK Statutory Instrument
1165(1998) and the CONEG Regulations (USA/Canada)**

Certificate no: 2005/2949

Supplier/Manufacturer: National Petrochemical Company, Iran

Regarding Products: 'PARS PET BG781'

Date of Issue: 20 December 2005

The above product is in compliance with ultimate limit (in force from 30 June 2001) specified in EC Directive 94/62/EC, as amended, 'The Packaging and Packaging Waste Directive' for the combined levels of lead, cadmium, mercury and hexavalent chromium. The product therefore also complies with the heavy metal requirements of UK Statutory Instrument 1165(1998) which enforces this Directive in the UK.

The above product is also in compliance with the limit for heavy metals contained in the CONEG regulations which are in force in a number of the states in the USA and Canada.

The limit specified in EC Directive 94/62/EC, as amended, for the combined total of lead, cadmium, mercury and hexavalent chromium is as follows;

- 100 mg/kg from 30 June 2001

The limit specified in the CONEG regulations in the USA for the combined total of these elements is 100 mg per kg of packaging material.

Certified by: Dr A M L Irvine
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**Packaging and Packaging Waste (Essential Requirements)
Certificate of Conformity with the Heavy Metal Requirements of
EC Directive 94/62/EC (as amended), UK Statutory Instrument
1165(1998) and the CONEG Regulations (USA/Canada)**

Certificate no: 2005/2950

Supplier/Manufacturer: National Petrochemical Company, Iran

Regarding Products: 'PARS PET BG821'

Date of Issue: 20 December 2005

The above product is in compliance with ultimate limit (in force from 30 June 2001) specified in EC Directive 94/62/EC, as amended, 'The Packaging and Packaging Waste Directive' for the combined levels of lead, cadmium, mercury and hexavalent chromium. The product therefore also complies with the heavy metal requirements of UK Statutory Instrument 1165(1998) which enforces this Directive in the UK.

The above product is also in compliance with the limit for heavy metals contained in the CONEG regulations which are in force in a number of the states in the USA and Canada.

The limit specified in EC Directive 94/62/EC, as amended, for the combined total of lead, cadmium, mercury and hexavalent chromium is as follows;

- 100 mg/kg from 30 June 2001

The limit specified in the CONEG regulations in the USA for the combined total of these elements is 100 mg per kg of packaging material.

Certified by: Dr A M L Irvine
Principal Consultant
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