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**Client: IRPC Public Company Limited** 

14 th Floor, Suntowers B, 123 Vibhavadi Rangsit Rd.,

**Chatuchak Bangkok 10900 Thailand** 

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description : Polystyrene Grade GP150

Sample No. : 1627212

Sample Condition : As per attached photograph

Lot No. 0901218 Manufacturer/Vendor Thai ABS Country of Origin : Thailand Country of Destination : Thailand

Sample Receiving Date : 10-Feb-2009

**Testing Period** : 10-Feb-2009 to 13-Feb-2009

Test Requested : In accordance with the RoHS Directive 2002/95/EC and its amendment directives

Test Method : (1) With reference to EPA Method 3050B for Lead Content. Analysis was performed

by ICP-OES.

(2) With reference to BS EN1122: 2001, Method B for Cadmium Content. Analysis

was performed by ICP-OES.

(3) With reference to EPA Method 3052 for Mercury Content. Analysis was

performed by ICP-OES.

(4) With reference to EPA Method 3060A & 7196A for Hexavalent Chromium.

Analysis was performed by UV/Vis Spectrometry.

(5) With reference to USEPA 3540C for PBB/PBDE content. Analysis was performed

by GC/MS.

**Test Results** : Please refer to next page.

# **CONCLUSION**

Based on the performed tests on submitted samples, the result comply with the RoHS Directive 2002/95/EC and its subsequent amendments.

> Signed for and on behalf of SGS (Thailand) Limited

Pornpana Lirathpong **Hardlines Testing Manager** 

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## **TEST RESULTS**

Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result (1)	MDL	RoHS Limit
Lead (Pb)	(1)	n.d.	2	1000
Cadmium (Cd)	(2)	n.d.	2	100
Mercury (Hg)	(3)	n.d.	2	1000
Hexavalent Chromium (CrVI)	(4)	n.d.	2	1000
sum of PBBs	(5)	n.d.	-	1000
Monobromobiphenyl		n.d.	5	-
Dibromobiphenyl		n.d.	5	-
Tribromobiphenyl		n.d.	5	-
Tetrabromobiphenyl		n.d.	5	-
Pentabromobiphenyl		n.d.	5	-
Hexabromobiphenyl		n.d.	5	-
Heptabromobiphenyl		n.d.	5	-
Octabromobiphenyl		n.d.	5	-
Nonabromobiphenyl		n.d.	5	-
Decabromobiphenyl		n.d.	5	-

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## **TEST RESULTS**

Test results by chemical method (Unit: mg/kg)

Test Item (s): Method Result (1) MDL RoHS L						
rest item (s).	(Refer to)	Nesuit (1)	MDL	Rons Limit		
Sum of PBDEs	(5)	n.d.	-	1000		
Monobromodiphenyl ether		n.d.	5	-		
Dibromodiphenyl ether		n.d.	5	-		
Tribromodiphenyl ether		n.d.	5	-		
Tetrabromodiphenyl ether		n.d.	5	-		
Pentabromodiphenyl ether		n.d.	5	-		
Hexabromodiphenyl ether		n.d.	5	-		
Heptabromodiphenyl ether		n.d.	5	-		
Octabromodiphenyl ether		n.d.	5	-		
Nonabromodiphenyl ether		n.d.	5	-		
Decabromodiphenyl ether		n.d.	5	-		

**Test Part Description** Result (1) clear plastic

#### Note:

- (1) mg/kg = ppm; 0.1 wt% = 1000 ppm
- (2) n.d. = Not Detected
- (3) MDL = Method Detection Limit
- (4) The exemption of DecaBDE in polymeric application according 2005/17/EC was overruled by the European Court of Justice by its decision of 01.04.2008. Subsequently DecaBDE will be included in the sum of PBDE after 01.07.2008
- (5) "-" = Not regulated

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Flow chart of digestion (EPA 3050B for Pb) +----+ | Cutting/Preparation | -+----+ | Sample measurement | 1 | digestion with HNO3 | +----+ +----+ | add H2O2 + Hcl | -----+ +----+ | digestion | +----+ 1 | Filtration | No residue 1 +-----Residue +----+ | Ashing with H2SO4 | +------ 1 +----+ | Add HNO3 | +----+ 1 No residue ------- 1 +----+ +----+ | ICP-OES | ---- | DATA | +----+

The samples were dissolved totally by pre-conditioning method according to above flow chart.

Operator : Siam Polarwut

Section Chief: Laddawan Uranpitr

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Flow chart of digestion (EN 1122 Method B for Cd) | Cutting/Preparation | +----+ +----+ | Sample measurement | +----+ 1 | add H2SO4 | +----+ +----+ | add H2O2 | +----+ | Total digestion | +----+ -+----+ | ICP-AES | - 1 +----+ | DATA | +----+

The samples were dissolved totally by pre-conditioning method according to above flow chart.

Operator : Siam Polarwut

Section Chief: Laddawan Uranpitr

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Flow chart of digestion (EPA 3052 for Hg) +----+ | Cutting/Preparation | +----+ 1 +----+ | Sample measurement | 1 | MiCrowave digestion with HNO3 + HF| +----+ +----+ | Filtration | +----+ - 1 No residue +----+ |Residue | Ashing with H2SO4 | +----+ | Add HNO3 | +----+ No residue ------+-----| ICP-OES | +----+ +----+ | DATA |

The samples were dissolved totally by pre-conditioning method according to above flow chart.

Operator : Wanwisa Saekow

Section Chief: Laddawan Uranpitr

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```
Flow chart of digestion (EPA 3060A,7196A for Cr(VI))
      | Cutting/Preparation |
     +----+
     +----+
      | Sample measurement |
      | Add digestion solution(NaOH+Na2CO3) |
     +----+
     +----+
      | Add MgCl2 and phosphate buffer |
     +----+
     +----+
      | add HNO3 |
     +----+
        -
     | Colorimetrically |
        - 1
     +----+
      | UV-Spectrophotometer |
        - 1
     +----+
      | DATA |
     +----+
Operator : Wanwisa Saekow
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Section Chief: Laddawan Uranpitr





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Flow chart of PBBs/PBDEs

```
+-----+
| Sample |
+-----+
| |
+------+
| |
| +------+
| | Sample pretreatment |
+------+
| | Sample extraction/Soxhlet method |
+------+
| |
| Concentrate/Dilute Extracted solution |
+------+
| Filter |
+-----+
| Analysis by GC/MS |
+------+
| DATA |
+-----+
```

Operator : Prapapan Puengpatiparn Section Chief : Sulkifli Mama

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#### SAMPLE/ATTACHMENT PICTURE



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