

## Test Report

No. CTSSA/27121/12

Date : 04/01/2013

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CTS Ref. CTSSA/12/4387/Luvata

LUVATA MALAYSIA SDN. BHD.  
PLO 573, JALAN KELULI 10, KAWASAN PERINDUSTRIAN PASIR GUDANG,  
81700 PASIR GUDANG, JOHOR.

The following merchandise was (were) submitted and identified by the client as:

Sample Description : DHP  
Sample Receiving Date : 13/12/2012  
Testing Period : 13/12/2012 to 19/12/2012  
Date Completed : 19/12/2012  
Reporting Date : 04/01/2013

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Test Requested : Selected test(s) as requested by client  
Test Method : Please refer to next page(s).  
Test Results : Please refer to next page(s).  
Analysts : Ng Jing Wei, Cho Kar Yen & Tay Siam Pine

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B.Sc.(HONS) AMIC  
SENIOR LAB MANAGER

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Test results:

Test Part Description :

Sample Description : DHP

## RoHS Directive 2011/65/EU Annex II

| Test Item(s):   | Unit  | Test Method  | Results  | MDL |
|---|-------|--|----------|-----|
| Cadmium (Cd)  | mg/kg | With reference to IEC 62321:2008, and performed by ICP-OES | N.D.     | 2   |
| Lead (Pb)   | mg/kg | With reference to IEC 62321:2008, and performed by ICP-OES | N.D.     | 2   |
| Mercury (Hg)  | mg/kg | With reference to IEC 62321:2008, and performed by ICP-OES | N.D.     | 2   |
| Hexavalent Chromium (CrVI) by Spot test / boiling water extraction (optional) # | ---   | With reference to IEC 62321:2008                           | Negative | -   |
| <b>Sum of PBBs</b>  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | -   |
| Monobromobiphenyl   | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Dibromobiphenyl   | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Tribromobiphenyl  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Tetrabromobiphenyl  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Pentabromobiphenyl  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Hexabromobiphenyl   | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Heptabromobiphenyl  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Octabromobiphenyl   | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Nonabromobiphenyl   | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |
| Decabromobiphenyl   | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS   | N.D.     | 5   |

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|                          |       |  |      |   |
|--------------------------|-------|--|------|---|
| Sum of PBDEs             | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | - |
| Monobromodiphenyl ether  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Dibromodiphenyl ether    | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Tribromodiphenyl ether   | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Tetrabromodiphenyl ether | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Pentabromodiphenyl ether | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Hexabromodiphenyl ether  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Heptabromodiphenyl ether | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Octabromodiphenyl ether  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Nonabromodiphenyl ether  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |
| Decabromodiphenyl ether  | mg/kg | With reference to IEC 62321:2008, and performed by GC-MS | N.D. | 5 |

Note : (a) mg/kg = ppm ; (0.1wt% = 1000ppm)

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) # = **Spot-Test:**

a. Negative means the absence of Cr(VI) on the tested areas

b. Positive means the presence of Cr(VI) on the tested areas

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is negative or cannot be confirmed)

**Boiling water extraction:**

a. Negative means the absence of Cr(VI) on the tested areas

b. Positive means the presence of Cr(VI) on the tested areas;

The detected concentration in 50 mL boiling water extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

(e) - = Not regulated

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Test Part Description :

Sample Description : DHP



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**1. DETERMINATION OF CADMIUM CONTENT BY**

**IEC 62321 2008**

Sample Receiving and Registration

↓  
Cut sample in small pieces

↓  
Weight sample (0.2-0.5g) into digestion vessel

↓  
Acid digestion (Microwave)

↓  
"Totally Dissolved"

↓  
Filtration

↓  
Analyses by ICP

**2. DETERMINATION OF LEAD CONTENT BY**

**IEC 62321 2008**

Sample Receiving and Registration

↓  
Cut sample in small pieces

↓  
Weight sample (0.2-0.5g) into digestion vessel

↓  
Acid digestion (Microwave)

↓  
"Totally Dissolved"

↓  
Filtration

↓  
Analyses by ICP

**3. DETERMINATION OF MERCURY CONTENT BY**

**IEC 62321 2008**

Sample Receiving and Registration

↓  
Cut sample in small pieces

↓  
Weight sample (0.2-0.5g) into digestion vessel

↓  
Acid digestion (Microwave)

↓  
"Totally Dissolved"

↓  
Filtration

↓  
Analyses by ICP

**4. DETERMINATION OF HEXAVALENT CHROMIUM**

**BY IEC 62321 2008**

Sample Receiving and Registration

↓  
Sample Preparation

↓  
Spot-test (Qualitative)

↓  
Boiling-water-extraction

↓  
Analyses by UV- Spectrophotometer

↓  
Test Report

**5. DETERMINATION OF PBB/PBDE WITH GC-MS**

**BY IEC 62321 2008**

Cut sample in small pieces

↓  
Weight sample (0.5-4.0g) into extraction thimble

↓  
Soxhlet Extraction with Toluene

↓  
Filter through 0.45 um membrane filter

↓  
Analyses by GC-MS (with appropriate dilution)

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

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