ICP Test Report Certification Packet

Company name: Littelfuse, Inc.

Product Series: Ultra-low Capacitance Protection Array

Product #: SP300x-xxXTG

Issue Date: September 29, 2011

It is hereby certified by Littelfuse, Inc. that there is neither RoHS (EU Directive 2002/95/EC)-restricted substance nor such use, for materials to be used for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing processes.

In addition, it is hereby reported to you that the parts and sub-materials, the materials to be used for unit parts, the packing/packaging materials, and the additives and the like in the manufacturing processes, are all composed of the following components.

Issued by:

<Kristeen Bacila>
<Global EHS Engineer>

(1) Parts, sub-materials and unit parts
   This document covers the SP300x-xxXTG RoHS-Compliant series products manufactured by Littelfuse, Inc.

   < Raw Materials Used
   Please see Table 1

(2) The ICP data on all measurable substances
   Please see appropriate pages as identified in Table 1
Table 1: List of Raw Materials covered by this report

<table>
<thead>
<tr>
<th>Total Parts</th>
<th>Raw Material Part Number</th>
<th>Raw Material Description</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IC Wafer</td>
<td>Wafer</td>
<td>3-6</td>
</tr>
<tr>
<td>2</td>
<td>A194</td>
<td>Lead Frame</td>
<td>7-17</td>
</tr>
<tr>
<td>3</td>
<td>2200D</td>
<td>Adhesive - ROHS</td>
<td>18-22</td>
</tr>
<tr>
<td>4</td>
<td>2200D</td>
<td>Adhesive - Halogen</td>
<td>23-26</td>
</tr>
<tr>
<td>5</td>
<td>Wire</td>
<td>Gold Wire</td>
<td>27-31</td>
</tr>
<tr>
<td>6</td>
<td>KMC3580</td>
<td>Compound - RoHS</td>
<td>32-36</td>
</tr>
<tr>
<td>7</td>
<td>KMC3580</td>
<td>Compound - Halogen</td>
<td>37-40</td>
</tr>
<tr>
<td>8</td>
<td>EME G600</td>
<td>Epoxy Molding Compound</td>
<td>41-48</td>
</tr>
</tbody>
</table>
The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description: IC WAFER
Style/Item No.: ALUMINUM PROCESS
Sample Receiving Date: 2011/01/11
Testing Period: 2011/01/11 TO 2011/01/18

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

Test Method:

1) Determination of Cadmium by ICP-AES.
2) Determination of Lead by ICP-AES.
3) Determination of Mercury by ICP-AES.
4) Determination of Hexavalent Chromium by UV/Vis Spectrometry.

Test Result(s): Please refer to next page(s).
EPISIL TECHNOLOGIES INC.
NO. 3, INNOVATION RD 1, SCIENCE BASED INDUSTRIAL PARK,
HSIN-CHU, TAIWAN, R. O. C.

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

<table>
<thead>
<tr>
<th>Test Item (s):</th>
<th>Method (Refer to)</th>
<th>Result No.1</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>(1)</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>(2)</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>(3)</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td>Hexavalent Chromium Cr(VI) by alkaline extraction</td>
<td>(4)</td>
<td>n.d.</td>
<td>2</td>
</tr>
</tbody>
</table>

TEST PART DESCRIPTION:
No.1 : MULTICOLOR WAFER

Note:
1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr$^{6+}$ test method excluded)

2) Name of the person who made measurement: Climbing Yang

3) Name of the person in charge of measurement: Troy Chang

### Cutting / Preparation

### Sample Measurement

#### Pb - Cd

- Acid digestion by suitable acid depended on different sample material (as below table)

#### Hg

- Microwave digestion with HNO$_3$/HCl/HF

#### Cr$^{6+}$

- Add appropriate amount of digestion reagent

### Filtration

#### Solution

1) Alkali Fusion
2) HCl to dissolve

### ICP-AES

#### Residue

Add diphenyl-carbazide for color development

- Measure the absorbance at 540 nm by UV-VIS

### Sample Material

<table>
<thead>
<tr>
<th>Sample Material</th>
<th>Digestion Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel, copper, aluminum, solder</td>
<td>Aqua regia, HNO$_3$, HCl, HF, H$_2$O$_2$</td>
</tr>
<tr>
<td>Glass</td>
<td>HNO$_3$/HF</td>
</tr>
<tr>
<td>Gold, platinum, palladium, ceramic</td>
<td>Aqua regia</td>
</tr>
<tr>
<td>Silver</td>
<td>HNO$_3$</td>
</tr>
<tr>
<td>Plastic</td>
<td>H$_2$SO$_4$, H$_2$O$_2$, HNO$_3$, HCl</td>
</tr>
<tr>
<td>Others</td>
<td>Any acid to total digestion</td>
</tr>
</tbody>
</table>
Test Report

Test Report

Test Results

Sample Description: AI94/C194 ALLOY

Sample Receiving Date: 2011/01/05

Testing Period: 2011/01/05 TO 2011/01/10

Tested results:
The following samples were submitted and identified by/on behalf of the client as:

Based upon the performed tests by submitted samples, the test results of Cadmium, Lead, Mercury, Hexavalent Chromium Cr(VI), PBBS and PBDEs comply with the limits of RoHS Directive 2002/95/EC and its subsequent amendments.

Signature:

Ray Chang / Asst. Manager
Signed for and on behalf of SGS Taiwan Limited
# Test Report

**ASM HK & ASM TECHNOLOGY SINGAPORE**

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG, HONG KONG (ASM HK), 2 YISHUN AVENUE 7, SINGAPORE (ASM TECHNOLOGY SINGAPORE)

## Test Results

<table>
<thead>
<tr>
<th>Test Item (Test Items)</th>
<th>Unit</th>
<th>Method</th>
<th>Limit Value (MDL)</th>
<th>Result (Result)</th>
<th>Compliance (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>銅 / Cadmium (Cd)</td>
<td>mg/kg</td>
<td>参考IEC 62321: 2008方法，用感应耦合電磁原子射光譜儀檢測。/ With reference to IEC 62321: 2008 and performed by ICP-AES.</td>
<td>2</td>
<td>n.d.</td>
<td>160</td>
</tr>
<tr>
<td>鋅 / Lead (Pb)</td>
<td>mg/kg</td>
<td>参考IEC 62321: 2008方法，用感应耦合電磁原子射光譜儀檢測。/ With reference to IEC 62321: 2008 and performed by ICP-AES.</td>
<td>2</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>汞 / Mercury (Hg)</td>
<td>mg/kg</td>
<td>参考IEC 62321: 2008方法，用感应耦合電磁原子射光譜儀檢測。/ With reference to IEC 62321: 2008 and performed by ICP-AES.</td>
<td>2</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>六價鉻 / Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction</td>
<td>**</td>
<td>参考IEC 62321: 2008方法，用Spot test / boiling water extraction方法檢測。/ With reference to IEC 62321: 2008 and performed by Spot test / boiling water extraction Method. (See Note 5)</td>
<td>0.02mg/kg with 50 cm² surface area</td>
<td>Negative</td>
<td>—</td>
</tr>
<tr>
<td>鎻 / Antimony (Sb)</td>
<td>mg/kg</td>
<td>参考US EPA Method 3052方法，用感应耦合電磁原子射光譜儀檢測鉻含量。/ With reference to US EPA Method 3052 for Antimony Content. Analysis was performed by ICP-AES.</td>
<td>2</td>
<td>n.d.</td>
<td>—</td>
</tr>
</tbody>
</table>
## Test Report

**ASM HK & ASM TECHNOLOGY SINGAPORE**

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG, HONG KONG (ASM HK), 2 YISHUN AVENUE 7, SINGAPORE (ASM TECHNOLOGY SINGAPORE)

<table>
<thead>
<tr>
<th>测试项目</th>
<th>测试方法 (Method)</th>
<th>方法检测极限值 (MDL)</th>
<th>结果 (Result) NO.1</th>
<th>法规限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS)</td>
<td>参考US EPA 3540C: 1996方法, 以液相色谱法检测全氟辛烷磺酸含量。/ With reference to US EPA 3540C: 1996 method for PFOS Content. Analysis was performed by LC/MS.</td>
<td>10 ng/kg</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>PFOS - Acid</td>
<td>参考US EPA 3540C: 1996方法, 以液相色谱法检测全氟辛烷磺酸含量。/ With reference to US EPA 3540C: 1996 method for PFOS Content. Analysis was performed by LC/MS.</td>
<td>10 ng/kg</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>全氟辛酸 (酸) / PFOA (CAS No.: 00035-67-1)</td>
<td>参考US EPA 3540C: 1996方法, 以液相色谱法检测全氟辛酸 (酸)含量。/ With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.</td>
<td>10 ng/kg</td>
<td>n.d.</td>
<td>-</td>
</tr>
</tbody>
</table>

### 卤素 / Halogen

<table>
<thead>
<tr>
<th>测试项目</th>
<th>测试方法 (Method)</th>
<th>方法检测极限值 (MDL)</th>
<th>结果 (Result) NO.1</th>
<th>法规限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>氟素 (氟) / Halogen-Fluorine (F) (CAS No.: 014762-94-8)</td>
<td>参考BS EN 14582:2007, 以电感耦合等离子体质谱分析。/ With reference to BS EN 14582:2007. Analysis was performed by ICP.</td>
<td>50 mg/kg</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>氯素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 022557-15-1)</td>
<td>参考BS EN 14582:2007, 以电感耦合等离子体质谱分析。/ With reference to BS EN 14582:2007. Analysis was performed by ICP.</td>
<td>50 mg/kg</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>溴素 (溴) / Halogen-Bromine (Br) (CAS No.: 010097-32-2)</td>
<td>参考BS EN 14582:2007, 以电感耦合等离子体质谱分析。/ With reference to BS EN 14582:2007. Analysis was performed by ICP.</td>
<td>50 mg/kg</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>碘素 (碘) / Halogen-Iodine (I) (CAS No.: 014362-44-8)</td>
<td>参考BS EN 14582:2007, 以电感耦合等离子体质谱分析。/ With reference to BS EN 14582:2007. Analysis was performed by ICP.</td>
<td>50 mg/kg</td>
<td>n.d.</td>
<td>-</td>
</tr>
</tbody>
</table>
### 测试报告

#### 测试项目 (Test Items)

<table>
<thead>
<tr>
<th>多溴联苯烯和 / Sum of PBDEs</th>
<th>多溴联苯烯 / PBDEs</th>
<th>单位 (Unit)</th>
<th>测试方法 (Method)</th>
<th>方法检出极限值 (MDL)</th>
<th>结果 (Result)</th>
<th>法规限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>多溴联苯烯 / PBDEs</td>
<td></td>
<td>mg/kg</td>
<td>参考 IEC 62321: 2008方法，以气相色谱仪/质谱仪检测。/ With reference to IEC 62321: 2008 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>一溴联苯甲基 / Monobromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>二溴联苯甲基 / Dibromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>三溴联苯甲基 / Tribromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>四溴联苯甲基 / Tetrabromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>五溴联苯甲基 / Pentabromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>六溴联苯甲基 / Hexabromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>七溴联苯甲基 / Heptabromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>八溴联苯甲基 / Octabromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>九溴联苯甲基 / Nonabromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>十溴联苯甲基 / Decabromodiphenyl</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
</tbody>
</table>

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized reproduction, copying or distribution of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
Test Report

ASM HK & ASM TECHNOLOGY SINGAPORE

4/F. WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG, HONG KONG (ASM HK), 2 YISHUN AVENUE 7, SINGAPORE (ASM TECHNOLOGY SINGAPORE)

備註(Note):

1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected (未検出)
3. MDL = Method Detection Limit (方法検出限界值)
4. "-" = Not Regulated (無規格値)
5. Spot-test:
   Negative = Absence of Cr(VI) coating / surface layer (鍍層中検測不到六價鉻).
   Positive = Presence of Cr(VI) coating / surface layer (鍍層中検測到六價鉻);
   The tested sample should be further verified by boiling-water-extraction method if the
   spot test result cannot be confirmed.
   (若該測試項目無法確認時, 測試樣品可藉由boiling-water-extraction測試方法進一步確認)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating / surface layer (鍍層中検測不到六價鉻).
Positive = Presence of Cr(VI) coating / surface layer (鍍層中検測到六價鉻);
   the detected concentration in boiling-water-extraction solution is equal or
   greater than 0.02 mg/kg with 50 cm² sample surface area.
   該溶液濃度≥0.02 mg/kg with 50 cm² (sample surface area)

6. # = Positive indicates the presence of Cr(VI) on the tested areas and result be regarded
   as not comply with RoHS requirement. (Positive表示測試區域之六價鉻不符合RoHS要求)
   Negative indicates the absence of Cr(VI) on the tested areas and result be regarded
   as comply with RoHS requirement. (Negative表示測試區域之六價鉻符合RoHS要求)


(1) 該物質不可置於市場上或使用於特殊物質之配置成分重量濃度等於或大於0.005%。
   (May not be placed on the market or used as a substance or constituent of preparations in a
   concentration equal to or higher than 0.005 % by mass.)

(2) 該物質不可置於市場上的半成品或商品或其物件; 假若零件上明顯地含有PPoS並参照結構上及微結構上計算
   PPOS重量濃度等於或大於0.1%, 而整體品或其他覆蓋物質, 如果PPOS在覆蓋物質中含量等於或大於1μg/cm².
   (May not be placed on the market in semi-finished products or articles, or parts thereof, if the
   concentration of PPOS is equal to or higher than 0.1% by mass calculated with reference to the
   mass of structurally or microstructurally distinct parts that contain PPOS or, for textiles or other
   coated materials, if the amount of PPOS is equal to or higher than 1μg/cm² of the coated material.)
These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr₆⁺ test method excluded)

1) 溶解方法
2) 可见光光度法 (Add diphenyl-carbazide for color development)

<table>
<thead>
<tr>
<th>溶液/溶液</th>
<th>溶解方法</th>
<th>指示剂/溶剂</th>
</tr>
</thead>
<tbody>
<tr>
<td>硫酸/硝酸</td>
<td>HNO₃, H₂SO₄</td>
<td>二苯碳酰二肼 (Diphenyl-carbazide)</td>
</tr>
<tr>
<td>盐酸/硝酸</td>
<td>HCl, HNO₃</td>
<td>二苯碳酰二肼 (Diphenyl-carbazide)</td>
</tr>
<tr>
<td>硝酸/盐酸</td>
<td>HNO₃, HCl</td>
<td>二苯碳酰二肼 (Diphenyl-carbazide)</td>
</tr>
<tr>
<td>盐酸/盐酸</td>
<td>HCl, HCl</td>
<td>二苯碳酰二肼 (Diphenyl-carbazide)</td>
</tr>
</tbody>
</table>

[Note: This document is a test report and contains technical information relevant to the analysis and testing of materials.]
**Test Report**

**ASM HK & ASM TECHNOLOGY SINGAPORE**

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG, HONG KONG (ASM HK), 2 YISHUN AVENUE 7, SINGAPORE (ASM TECHNOLOGY SINGAPORE)

**PBB/PBDE analytical FLOW CHART**

1) 测试人员：Anson Tsao
2) 测试负责人：Ray Chang

- **Sample pretreatment** / 样品前处理
- **Screen analysis** / 初筛分析
- **Sample extraction** / 模样萃取
  - Soxhlet method / 索式萃取法
- **Concentrate/Dilute Extracted solution** / 萃取液浓缩/稀释
- **Filter** / 萃取液过滤
- **Analysis by GC/MS** / 气相反相谱仪分析

**Issue Report** / 检验报告
Test Report

ASM HK & ASM TECHNOLOGY SINGAPORE

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG, HONG KONG (ASM HK), 2 YISHUN AVENUE 7, SINGAPORE (ASM TECHNOLOGY SINGAPORE)

1) 根據以下的流程圖之條件，樣品已完全溶解。/ These samples were dissolved totally by pre-conditioning method according to below flow chart.

2) 測試人員：張俊雄 / Name of the person who made measurement: Alex Chang

3) 測試負責人：張伯希 / Name of the person in charge of measurement: Ray Chang

元素以 ICP-AES 分析的消化流程圖

(Flow Chart of digestion for the elements analysis performed by ICP-AES)

剪裁、製備樣品 / Cutting Preparation

測試樣品重量 / Sample Measurement

根據不同樣品的材質而以適當的酸進行消化（如下表所示） / Acid digestion by suitable acid depended on different sample material (as below table)

過濾 / Filtration

溶液 / Solution

殘渣 / Residue

1) 鹼性融解法 / Alkali Fusion

2) 鹼酸溶解 / HCl to dissolve

感應耦合電漿原子發射光譜儀 / ICP-AES

<table>
<thead>
<tr>
<th>材料</th>
<th>需加入酸類</th>
</tr>
</thead>
<tbody>
<tr>
<td>鋼,銅,鋁,鋁鎂</td>
<td>Steel, copper, aluminum, solder</td>
</tr>
<tr>
<td>玻璃</td>
<td>Glass</td>
</tr>
<tr>
<td>金,銀,陶瓷</td>
<td>Gold, platinum, palladium, ceramic</td>
</tr>
<tr>
<td>銀</td>
<td>Silver</td>
</tr>
<tr>
<td>塑膠</td>
<td>Plastic</td>
</tr>
<tr>
<td>其他</td>
<td>Others</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>材料</th>
<th>需加入酸類</th>
</tr>
</thead>
<tbody>
<tr>
<td>玻璃</td>
<td>Aqua regia, HNO₃, HCl, HF, H₂O</td>
</tr>
<tr>
<td>金,銀,陶瓷</td>
<td>硝酸,氫氟酸, HNO₃/HF</td>
</tr>
<tr>
<td>銀</td>
<td>鹼酸, HNO₃</td>
</tr>
<tr>
<td>塑膠</td>
<td>硝酸,沸水,硫酸,硝酸,鹽酸,鹽酸,硝酸, HNO₃, H₂O, HCl</td>
</tr>
<tr>
<td>其他</td>
<td>加入任何酸至完全溶解 / Any acid to total digestion</td>
</tr>
</tbody>
</table>
Analytical flow chart of PFOA/PFOS content

1) 試驗人員：曾嘉琪 / Name of the person who made measurement: Anson Tsao

2) 試驗負責人：張伯睿 / Name of the person in charge of measurement: Ray Chang
Analytical flow chart of halogen content

1) Name of the person who made measurement: Jean Hung
2) Name of the person in charge of measurement: Ray Chang

- Sample picture and report number
- Sample pretreatment/separation
- Weighting and putting sample in cell
- Oxygen Bomb Combustion / Absorption
- Dilution to fixed volume
- Analysis was performed by IC
Test Report

ASM HK & ASM TECHNOLOGY SINGAPORE

4/F, WATSON CENTRE, 16 KUNG VIP ST., KWAI CHUNG, HONG KONG (ASM HK), 2 YISHUN AVENUE 7, SINGAPORE (ASM TECHNOLOGY SINGAPORE)

KA/2011/10113

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

- **Sample Description**: ADHESIVE
- **Style/Item No.**: 2200D
- **Sample Receiving Date**: 2010/10/12
- **Testing Period**: 2010/10/12 TO 2010/10/18

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


1. Determination of Cadmium by ICP-AES.
2. Determination of Lead by ICP-AES.
3. Determination of Mercury by ICP-AES.
4. Determination of Hexavalent Chromium by UV/Vis Spectrometry.
5. Determination of PBB and PBDE by GC/MS.

Test Result(s): Please refer to next page(s).
## Test Report

No.: CE/2010/A1945  Date: 2010/10/18  Page: 2 of 5

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

<table>
<thead>
<tr>
<th>Test Item(s):</th>
<th>Method (Refer to)</th>
<th>Result No.1</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>(1)</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>(2)</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>(3)</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td>Hexavalent Chromium Cr(VI) by alkaline extraction</td>
<td>(4)</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td>Sum of PBBs</td>
<td></td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>Monobromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Dibromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Tribromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Tetrabromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Pentabromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Hexabromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Heptabromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Octabromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Nonabromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Decabromobiphenyl</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Sum of PBDEs</td>
<td></td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>Monobromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Dibromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Tribromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Tetrabromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Pentabromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Hexabromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Heptabromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Octabromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Nonabromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
<tr>
<td>Decabromodiphenyl ether</td>
<td></td>
<td>n.d.</td>
<td>5</td>
</tr>
</tbody>
</table>

### TEST PART DESCRIPTION:

No.1: SILVER COLORED PASTE

**Note:**

1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. "-" = Not Regulated
1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)

2) Name of the person who made measurement: Climbgreat Yang

3) Name of the person in charge of measurement: Troy Chang

<table>
<thead>
<tr>
<th>Sample Measurement</th>
<th>Pb - Cd</th>
<th>Hg</th>
<th>Cr⁶⁺</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid digestion by suitable acid depended on different sample material (as below table)</td>
<td>Microwave digestion with HNO₃/HCl/HF</td>
<td>Add appropriate amount of digestion reagent</td>
<td></td>
</tr>
</tbody>
</table>

Filtration

Solution

Residue

1) Alkali Fusion
2) HCl to dissolve

ICP-AES

<table>
<thead>
<tr>
<th>Sample Material</th>
<th>Digestion Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel, copper, aluminum, solder</td>
<td>Aqua regia, HNO₃, HCl, HF, H₂O₂</td>
</tr>
<tr>
<td>Glass</td>
<td>HNO₃/HF</td>
</tr>
<tr>
<td>Gold, platinum, palladium, ceramic</td>
<td>Aqua regia</td>
</tr>
<tr>
<td>Silver</td>
<td>HNO₃</td>
</tr>
<tr>
<td>Plastic</td>
<td>H₂SO₄, H₂O₂, HNO₃, HCl</td>
</tr>
<tr>
<td>Others</td>
<td>Any acid to total digestion</td>
</tr>
</tbody>
</table>

Heat to appropriate temperature to extract

Cool, filter digestate through filter

Add diphenyl-carbazide for color development

measure the absorbance at 540 nm by UV-VIS
PBB/PBDE analytical FLOW CHART

1) Name of the person who made measurement: Roman Wong
2) Name of the person in charge of measurement: Troy Chang

First testing process → Sample
Optional screen process → Sample pretreatment
Confirmation process → Screen analysis

Sample extraction/ Soxhlet method
Concentrate/Dilute
Extracted solution
Filter
Analysis by GC/MS
Issue Report
End of Report
Test Report

HENKEL CORPORATION
HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE, CALIFORNIA, 92606 U.S.A

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

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>: ADHESIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style/Item No.</td>
<td>2200D</td>
</tr>
<tr>
<td>Sample Receiving Date</td>
<td>2010/10/12</td>
</tr>
<tr>
<td>Testing Period</td>
<td>2010/10/12 TO 2010/10/18</td>
</tr>
</tbody>
</table>

Test Result(s): Please refer to next page(s).
Test Report

HENKEL CORPORATION
HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE,
CALIFORNIA, 92606 U.S.A

Test Result(s)

PART NAME No.1 : SILVER COLORED PASTE

<table>
<thead>
<tr>
<th>Test Item(s)</th>
<th>Unit</th>
<th>Method</th>
<th>MDL</th>
<th>Result No.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halogen</td>
<td></td>
<td></td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>Halogen-Fluorine (F) (CAS No.: 014762-94-8)</td>
<td></td>
<td>With reference to BS EN 14582:2007. Analysis was performed by IC.</td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)</td>
<td>mg/kg</td>
<td></td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>Halogen-Bromine (Br) (CAS No.: 010097-32-2)</td>
<td></td>
<td></td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>Halogen-Iodine (I) (CAS No.: 014362-44-8)</td>
<td></td>
<td></td>
<td>50</td>
<td>n.d.</td>
</tr>
</tbody>
</table>

Note:
1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
Analytical flow chart of halogen content

1) Name of the person who made measurement: Rita Chen
2) Name of the person in charge of measurement: Troy Chang

- Sample pretreatment / Separation
- Weighting and putting sample in cell
- Oxygen Bomb Combustion / Absorption
- Dilution to fixed volume
- Analysis was performed by IC
Test Report

HENKEL CORPORATION
HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE, CALIFORNIA, 92606 U.S.A

** End of Report **
The following merchandise was (were) submitted and identified by the client as:

Sample Description : AU WIRE F0
Sample Receiving Date : 22/11/2010

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.
Test Method : Please refer to next page(s).
Test Results : Please refer to next page(s).
Analysts : Ng Mei Kheng & Loi Woan Yee
Test Part Description: AU WIRE F0

Test results:

<table>
<thead>
<tr>
<th>Test Item(s):</th>
<th>Unit</th>
<th>Test Method</th>
<th>Results</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by ICP-OES</td>
<td>N.D.</td>
<td>2</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by ICP-OES</td>
<td>N.D.</td>
<td>2</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by ICP-OES</td>
<td>N.D.</td>
<td>2</td>
</tr>
<tr>
<td>Hexavalent Chromium (CrVI)</td>
<td>---</td>
<td>With reference to IEC 62321:2008, and performed by UV-VIS Spectrophotometry (boiling water extraction only)</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Sum of PBs</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td></td>
</tr>
<tr>
<td>Monobromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Dibromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tribromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tetrabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Hexabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Pentabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Heptabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Octabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Nonabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Decabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
</tbody>
</table>

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CHONG KIEN LEN
B.Sc.(HONS) AMIC
LAB MANAGER

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**Test Report**  

No. LPCI/24523/10  
CTS Ref. CTS/10/4480/MEM  

**Date:** 26/11/2010  
**Page:** 3 of 5

<table>
<thead>
<tr>
<th>Test Item(s):</th>
<th>Unit</th>
<th>Test Method</th>
<th>Results</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of PBDEs</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>-</td>
</tr>
<tr>
<td>Monobromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Dibromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tribromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tetrabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Pentabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Hexabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Heptabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Octabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Nonabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Decabromodiphenyl ether #</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Note:**

(a) mg/kg = ppm; (0.1wt% = 1000ppm)
(b) N.D. = Not Detected
(c) MDL = Method Detection Limit
(d) "#" = The exemption of DecabDPE in polymeric application according 2005/717/EC was overruled by the European Court of Justice by its decision of 01.04.2008. Subsequently DecabDPE is included in the sum of PBDE after 01.07.2008
(e) "#" = a. Positive means the presence of Cr(VI) on the tested areas  
   b. Negative means the absence of Cr(VI) on the tested areas
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.

(f) "-" = Not regulated

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B.Sc.(HONS) AMIC  
LAB MANAGER

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Test Report

No. LPCI/24523/10
CTS Ref. CTS/10/4480/MEM

Date: 26/11/2010

Page: 4 of 5

Test Part Description:

Sample Description: AU WIRE F0
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 (0.1-0.5g) 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 (0.5-2g) into extraction thimble
   Soxhlet Extraction with Toluene
   →
   Filter through 0.45 μm membrane filter
   →
   Analyses by GC-MS (with appropriate dilution)

**** End of Report ****

SGS LABORATORY SERVICES (M) SDN. BHD.

CHONG KIEN LEN
B.Sc.(HONS) AMIC
LAB MANAGER
Test Report

No. LPCI/01020/11  
CTS Ref. CTS/11/0170/Shin

Date : 19/01/2011  
Page: 1 of 5

SHIN-ETSU ELECTRONICS (M) SDN BHD  
LOT 50, JALAN SERENDAH 25/17, HICOM INDUSTRIAL ESTATE  
40000 SHAH ALAM, SELANGOR DARUL EHSAN

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

| Sample Description | : | KMC-3580-14F |
| Sample Received | : | 13/01/2011 |
| Testing Date | : | 13/01/2011 to 19/01/2011 |

| Test Requested | : | In accordance with the RoHS Directive 2002/95/EC, and its amendment directives. |
| Test Method | : | Please refer to next page(s). |
| Test Results | : | Please refer to next page(s). |
| Analysts | : | Ng Mei Kheng & Loi Woon Yee |

SGS LABORATORY SERVICES (M) SDN. BHD.

CHONG KIEN LEN  
B.Sc. (HONS) AMIC  
LAB MANAGER

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SGS Laboratory Services (M) Sdn. Bhd.  
No.26 Jalan Anggerik Vanilla 31/63 Kota Kemuning 40460 Selangor Darul Ehsan, Malaysia  
T: +6(60) 5121 3520  F: +6(60) 5121 9082  www.sgs.com
Test Report
No. LPCI/01020/11
CTS Ref. CTS/11/0170/Shin
Date : 19/01/2011
Page: 2 of 5

Test Part Description:
Sample Description: KMC-3580-14F

RoHS Directive 2002/95/EC

<table>
<thead>
<tr>
<th>Test Item(s):</th>
<th>Unit</th>
<th>Test Method</th>
<th>Results</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium(Cd)</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by ICP-OES</td>
<td>N.D.</td>
<td>2</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by ICP-OES</td>
<td>N.D.</td>
<td>2</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by ICP-OES</td>
<td>N.D.</td>
<td>2</td>
</tr>
<tr>
<td>Hexavalent Chromium (CrVI)</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by UV-VIS Spectrophotometry</td>
<td>N.D.</td>
<td>2</td>
</tr>
<tr>
<td>Sum of PBBS</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>-</td>
</tr>
<tr>
<td>Monobromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Dibromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tribromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tetrabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Hexabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Pentabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Heptabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Octabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Nonabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Decabromobiphenyl</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
</tbody>
</table>

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CHONG KIEN LEN
B.Sc. (HONS) AMIC
LAB MANAGER

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## Test Report

No. LPCI/01020/11  
CTS Ref. CTS/11/0170/Shin  
Date: 19/01/2011  
Page: 3 of 5

<table>
<thead>
<tr>
<th>Test Item(s):</th>
<th>Unit</th>
<th>Test Method</th>
<th>Results</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of PBDEs</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>-</td>
</tr>
<tr>
<td>Monobromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Dibromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tribromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Tetra bromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Pentabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Hexabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Heptabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Octabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Nonabromodiphenyl ether</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
<tr>
<td>Decabromodiphenyl ether ##</td>
<td>mg/kg</td>
<td>With reference to IEC 62321:2008, and performed by GC-MS</td>
<td>N.D.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Note:**

(a) mg/kg = ppm : (0.1 wt% = 1000 ppm)  
(b) N.D. = Not Detected  
(c) MDL = Method Detection Limit  
(d) ## = The exemption of DecaBDE in polymeric application according 2005/71/EC was overruled by the European Court of Justice by its decision of 01.04.2008. Subsequently DecaBDE is included in the sum of PBDE after 01.07.2008  
(e) - = Not regulated  
(f) Testing based on original basis

---

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Test Report
No. LPCI/01020/11
CTS Ref. CTS/11/0170/Shin

Date: 19/01/2011
Page: 4 of 5

Test Part Description:

Sample Description: KMC-3580-14 F

SHIN-ETSU ELECTRONICS (M) SDN BHD
LPCI/01020/11

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SGS Laboratory Services (M) Sdn. Bhd. (Company No. 63892-M) No.26 Jalan Anggerik Vanilla 31/93 Kota Kemuning 40460 Selangor Darul Ehsan, Malaysia
Tel: +603 5121 2320 Fax: +603 5121 9082 www.sgs.com
1. **DETERMINATION OF CADMIUM CONTENT BY IEC 62321 2008**
   - Sample Receiving and Registration
   - Sample Preparation
   - 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
   - Sample Preparation
   - 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
   - Sample Preparation
   - Weight sample (0.1-0.5g) into digestion vessel
   - Acid digestion (Microwave)
   - "Totally Dissolved"
   - Filtration
   - Analyses by ICP

4. **DETERMINATION OF HEXAVALENT CHROMIUM BY IEC 62321 2008**
   - Sample Preparation
   - Add colour-developing reagent
   - Acidify with H$_2$SO$_4$
   - Let stand for 5-10 min
   - Analyses by UV- Spectrophotometer (540 nm)

5. **DETERMINATION OF PBBr/PBDE WITH GC-MS BY IEC 62321 2008**
   - Sample Preparation
   - 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**

SGS LABORATORY SERVICES (M) SDN. BHD.

[Signature]

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Test Report

No. LPCI/15263/11 Date: 04/07/2011 Page: 1 of 4
CTS Ref. CTS/11/2549/Shin

SHIN-ETSU ELECTRONICS (M) SDN BHD
LOT 50, JALAN SERENDAH 26/17, HICOM INDUSTRIAL ESTATE
40000 SHAH ALAM, SELANGOR DARUL EHSAN

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

Sample Description : KMC-3580P-14F
Sample Receiving Date : 26/06/2011
Testing Date : 26/06/2011 to 04/07/2011

Test Results : Please refer to next page.

Analyst : Eileen Tan Yi Pin

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B.Sc (HONS) AMIC
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Test results by chemical method:

<table>
<thead>
<tr>
<th>Test Item (s)</th>
<th>Unit</th>
<th>Method</th>
<th>Result</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halogen</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Halogen-Fluorine (F)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC method for Fluorine content.</td>
<td>N.D.</td>
<td>50</td>
</tr>
<tr>
<td>Halogen-Chlorine (Cl)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC method for Chlorine content.</td>
<td>N.D.</td>
<td>50</td>
</tr>
<tr>
<td>Halogen-Bromine (Br)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC method for Bromine content.</td>
<td>N.D.</td>
<td>50</td>
</tr>
<tr>
<td>Halogen-Iodine (I)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC method for Iodine content.</td>
<td>N.D.</td>
<td>50</td>
</tr>
</tbody>
</table>

Test Part Description:

Sample Description : KMC-3580P-14F

Note:
(a) mg/kg = ppm
(b) N.D. = Not Detected
(c) MDL = Method Detection Limit
(d) --- = Not Conducted
(e) Testing based on original basis
Test Report

No. LPCI/15263/11 Date: 04/07/2011
CTS Ref. CTS/11/2549/Shin

Test Part Description:

Sample Description: KMC-3580P-14F

SHIN-ETSU ELECTRONICS (M) SDN BHD
LPCI/15263/11

SGS LABORATORY SERVICES (M) SDN. BHD.

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DETERMINATION OF HALOGEN CONTENT

Sample pretreatment
↓
Weighting and putting sample in cell
↓
Combustion / Absorption
↓
Dilution to fixed volume
↓
Analyses by IC

**** End of Report ****
Test Result(s) : Please refer to next page(s).

Conclusion : Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of
SGS Testing & Control Services Singapore Pte Ltd

Y C Tham (Ms)
Laboratory Manager

Test Location: 26 Ayer Rajah Crescent, #07-09, Singapore 139944
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## Test Report

**Test Report No.** 10226583(8)  
**Date:** April 04, 2011  
**Page:** 2 of 8

### Test Result(s):

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Type</th>
<th>Lot No.</th>
<th>Manufacturing Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>:</td>
<td>:</td>
<td>1032046</td>
<td>05-03-11</td>
</tr>
</tbody>
</table>

### Test Item(s): Unit Method Results MDL RoHS Limit

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Unit</th>
<th>Method</th>
<th>Results</th>
<th>MDL</th>
<th>RoHS Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>mg/kg</td>
<td>With reference to IEC62321, Ed1:2008. Analysis was performed by ICP/AES</td>
<td>n.d.</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>mg/kg</td>
<td>With reference to IEC62321, Ed1:2008. Analysis was performed by ICP/AES</td>
<td>n.d.</td>
<td>2</td>
<td>1000</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>mg/kg</td>
<td>With reference to IEC62321, Ed1:2008. Analysis was performed by ICP/AES</td>
<td>n.d.</td>
<td>2</td>
<td>1000</td>
</tr>
<tr>
<td>Hexavalent Chromium (CrVI)</td>
<td>mg/kg</td>
<td>With reference to IEC62321, Ed1:2008. Analysis was performed by UV/Vis Spectrometry</td>
<td>n.d.</td>
<td>2</td>
<td>1000</td>
</tr>
</tbody>
</table>

### Sum of PBBs

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Unit</th>
<th>Method</th>
<th>Results</th>
<th>MDL</th>
<th>RoHS Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monobromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Dibromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tribromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tetrabromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Hexabromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Pentabromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Heptabromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Octabromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Nonabromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Decabromobiphenyl</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

### Sum of PBDE

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Unit</th>
<th>Method</th>
<th>Results</th>
<th>MDL</th>
<th>RoHS Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monobromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Dibromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tribromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tetrabromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Pentabromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Hexabromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Heptabromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Octabromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
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<tr>
<td>Nonabromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Decabromodiphenyl ether</td>
<td>mg/kg</td>
<td>n.d.</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

---

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29 Ayer Rajah Crescent #03-07 Singapore 139944  
+65 6379 0111  
+65 6777 2914  
www.sgs.com

Member of SGS Group
## Test Report

No. 10229583(8)  
Date: April 04, 2011  
Page 3 of 8

<table>
<thead>
<tr>
<th>Test Item(s)</th>
<th>Unit</th>
<th>Method</th>
<th>Result</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony (Sb)</td>
<td>mg/kg</td>
<td>With reference to US EPA3051A. Analysis was performed by ICP/AES</td>
<td>n.d.</td>
<td>2</td>
</tr>
<tr>
<td><strong>Halogen</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halogen - Bromine (Br)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC.</td>
<td>n.d.</td>
<td>50</td>
</tr>
<tr>
<td>Halogen - Chlorine (Cl)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC.</td>
<td>n.d.</td>
<td>50</td>
</tr>
<tr>
<td>Halogen - Fluorine (F)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC.</td>
<td>n.d.</td>
<td>50</td>
</tr>
<tr>
<td>Halogen - Iodine (I)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582. Analysis was performed by IC.</td>
<td>n.d.</td>
<td>50</td>
</tr>
</tbody>
</table>

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 2005/717/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  
6. *: Exceeds limit

Remarks: Sample received was totally dissolved by preconditioning method.  
Lab Analyst: Jay, Jenny and Jojo

Test Location: 26 Ayer Rajah Crescent, #07-08, Singapore 139944
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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

SGS Testing & Control Services Singapore Pte Ltd 26 Ayer Rajah Crescent #03-07 Singapore 139944 t +65 6376 0111 f +65 6777 2914 www.sgs.com  
Member of SGS Group
<table>
<thead>
<tr>
<th>Sample Description</th>
<th>EME-G600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>Lot No.</td>
<td>1032046</td>
</tr>
<tr>
<td>Manufacturing Date</td>
<td>05-03-11</td>
</tr>
<tr>
<td>Sample Submission Qty</td>
<td>50gm</td>
</tr>
</tbody>
</table>

SGS authenticate the photo on original report only
Process Flow of US EPA 3050B/3051A/3052

1. Cutting / Preparation
2. Sample measurement
3. Open Digestion (EPA3050B) / Microwave Digestion with HNO3 or HF
   - Solution
     - Dry Ashing
     - Add HNO3
     - No residue
   - Residue
     - ICP/AES
     - Data
Process Flow of BS EN 14582 (Halogen Analysis)

1. Cutting / Preparation
2. Sample Measurement 0.1g - 1g
3. Put the sample on sample cell
4. Transfer to Combustion Unit (with absorbent) and fill with oxygen
5. Burn the sample and transfer the absorbent to 100mL flask
6. Analyse by Ion-Chromatography
**Remarks:** Sample received was totally dissolved by preconditioning method. (CrVI method excluded)
Process Flow of PBBs and PBDEs by GC/MS (IEC 62321)

First Testing Process → Optional screen process → Confirmation process →

Sample

Screen Analysis by XRF

Sample pretreatment

Soxhlet Extraction

Concentrate/Dilute Extracted solution

Filter

High Mass Range GC/MS

Issue Report

***End of Report***