測試報告

Test Report

台灣化學纖維股份有限公司
FORMOSA CHEMICALS & FIBRE CORPORATION
台北市敦化北路201號
201, TUNG HWA N. ROAD, TAIPEI, TAIWAN, R. O. C.

以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as):

送樣廠商 (Sample Submitted By) : 台灣化學纖維股份有限公司 (FORMOSA CHEMICALS & FIBRE CORPORATION)
樣品名稱 (Sample Description) : PC/ABS ALLOYS (聚碳酸酯/丙烯腈-丁二烯-苯乙烯 合膠)
樣品型號 (Style/Item No.) : TAILADOY AC3250
收件日期 (Sample Receiving Date) : 2015/10/14

測試需求 (Test Requested)

- 依據客戶指定, 參考RoHS2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP. (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample.)

測試期間 (Testing Period)

- 2015/10/14 TO 2015/10/20 AND 2016/01/15 TO 2016/01/20

測試結果 (Test Results)

- 請見下頁 (Please refer to next pages).

結論 (Conclusion)

- 根據客戶所提供的樣品, 其鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP的測試結果符合RoHS指令暨 (EU) 2015/863之限值要求. (Based on the performed tests on submitted samples, the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS and amending Directive (EU) 2015/863.)

* 此份報告為加測及合併CE/2015/A2277之報告 *

(This report is added testing and combined with CE/2015/A2277)
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測試結果(Test Results)

測試部位(PART NAME)No.1 : 白色塑膠粒 (WHITE PLASTIC PELLETS)

<table>
<thead>
<tr>
<th>測試項目 (Test Items)</th>
<th>單位 (Unit)</th>
<th>測試方法 (Method)</th>
<th>方法偵測極限值 (MDL)</th>
<th>結果 (Result) No.1</th>
<th>限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>鉛 / Cadmium (Cd)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-5: 2013方法，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-AES.</td>
<td>2</td>
<td>n.d.</td>
<td>100</td>
</tr>
<tr>
<td>鉛 / Lead (Pb)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-4: 2013方法，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4: 2013 and performed by ICP-AES.</td>
<td>2</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>水 / Mercury (Hg)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-4: 2013方法，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4: 2013 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)</td>
<td>mg/kg</td>
<td>參考 IEC 62321: 2008方法，以UV-VIS檢測. / With reference to IEC 62321: 2008 and performed by UV-VIS.</td>
<td>2</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>多溴聯苯總和 / Sum of PBBs</td>
<td>mg/kg</td>
<td></td>
<td>-</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>一溴聯苯 / Monobromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>二溴聯苯 / Dibromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>三溴聯苯 / Tribromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>四溴聯苯 / Tetrabromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>五溴聯苯 / Pentabromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>六溴聯苯 / Hexabromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>七溴聯苯 / Heptabromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>八溴聯苯 / Octabromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>九溴聯苯 / Nonabromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>十溴聯苯 / Decabromobiphenyl</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
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<td>測試項目 (Test Items)</td>
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<td>-----------------------</td>
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<td>-------------</td>
</tr>
<tr>
<td>多溴聯苯醚總和 / Sum of PBDEs</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6: 2015方法，以氣相層析/質譜儀檢測。</td>
<td>-</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>一溴聯苯醚 / Monobromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>二溴聯苯醚 / Dibromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>三溴聯苯醚 / Tribromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>四溴聯苯醚 / Tetrabromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>五溴聯苯醚 / Pentabromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>六溴聯苯醚 / Hexabromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>七溴聯苯醚 / Heptabromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>八溴聯苯醚 / Octabromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>九溴聯苯醚 / Nonabromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>十溴聯苯醚 / Decabromodiphenyl ether</td>
<td>mg/kg</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>邻苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (111/321/CD)，以氣相層析/質譜儀檢測。</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸丁二酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (111/321/CD)，以氣相層析/質譜儀檢測。</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二 (2-乙基已基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (111/321/CD)，以氣相層析/質譜儀檢測。</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (111/321/CD)，以氣相層析/質譜儀檢測。</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
</tbody>
</table>

備註(Note):
1. mg/kg = ppm：0.1wt% = 1000ppm
2. n.d. = Not Detected（未檢出）
3. MDL = Method Detection Limit（方法偵測極限值）
4. "-" = Not Regulated（無規格值）
1) 根據以下的流程圖之條件，樣品已完全溶解。（六價鉻測試方法除外） / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cd" test method excluded)
2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreet Yang
3) 測試負責人：張啟興 / Name of the person in charge of measurement: Troy Chang

![流程圖](image)

- **六價鉻 Cd" (Note**)**
  - 染焙融法 / Alkali Fusion
  - 鹽酸溶解 / HCl to dissolve
  - 加熱至適當溫度進行消化萃取 / Heat to appropriate temperature to extract
  - 冷卻後過濾樣品 / Cool, filter digestate through filter
  - 加入發色劑顯色 / Add diphenyl-carbazide for color development
  - 以紫外光-可見光光譜儀, 量測樣品溶液在 540 nm 的吸光度 / measure the absorbance at 540 nm by UV-VIS

**Note** (For IEC 62321)
(1) 針對非金屬材料加入酸性消化液，加熱至 90〜95°C萃取。/ For non-metallic material, add acidic digestion reagent and heat to 90〜95°C.
(2) 針對金屬材料加入純水，加熱至沸騰萃取。/ For metallic material, add pure water and heat to boiling.
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多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

- 測試人員: 翁賜彬 / Name of the person who made measurement: Roman Wong
- 測試負責人: 張啟興 / Name of the person in charge of measurement: Troy Chang

初次測試程序 / First testing process
選擇性篩檢程序 / Optional screen process
確認程序 / Confirmation process

Sample / 樣品
Sample pretreatment / 樣品前處理
Screen analysis / 初篩分析
Sample extraction / 樣品萃取
Soxhlet method / 索式萃取法
Concentrate/Dilute Extracted solution / 萃取液濃縮/稀釋
Filter / 萃取液過濾
Analysis by GC/MS / 氣相層析質譜儀分析
Issue Report / 撰打報告
測試報告
Test Report

FORMOSA CHEMICALS & FIBRE CORPORATION
201, TUNG HWA N. ROAD, TAIPEI, TAIWAN, R. O. C.

可塑劑分析流程圖 / Analytical flow chart of phthalate content

- 测试人员: 徐毓明 / Name of the person who made measurement: Andy Shu
- 测试负责人: 张啟興 / Name of the person in charge of measurement: Troy Chang

【測試方法/Test method: IEC 62321-8】

1. 樣品前處理/分樣 / Sample pretreatment/separation
2. 樣品以 THF 四氫呋喃溶解萃取 / Sample dissolved/extracted by THF
3. 萃取液稀釋 / Dilute Extracted solution
4. 氣相層析質譜儀分析 / Analysis was performed by GC/MS
5. 數據 / Data

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Test Report

*照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*
(The tested sample / part is marked by an arrow if it's shown on the photo.)

**報告結尾 (End of Report)**