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

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):

測試期間 (Testing Period) : 2019/11/25 to 2019/11/29

測試結果 (Test Results) : 根據客戶指定，參考RoHS 2011/65/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(s).)

結論 (Conclusion) : 根據客戶所指定的樣品，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 2011/65/EU Annex II及其修訂指令(EU) 2015/863之限值要求。(Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.)
### Test Results

**Test部位 (PART NAME)** No. 1 : 透明塑膠粒 (TRANSPARENT 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>MDL</th>
<th>結果 (Result)</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)，以感應耦合電漿等離子體檢測。/ With reference to IEC 62321-5 (2013) and performed by ICP-OES.</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 62321-5 (2013)，以感應耦合電漿等離子體檢測。/ With reference to IEC 62321-5 (2013) and performed by ICP-OES.</td>
<td>2</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>水銀 / Mercury (Hg)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-4:2013+ AMD1:2017，以感應耦合電漿等離子體檢測。/ With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.</td>
<td>2</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>六鉻 / Hexavalent Chromium(Cr(VI))</td>
<td>mg/kg</td>
<td>參考 IEC 62321-7-2 (2017)，以UV-VIS檢測。/ With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.</td>
<td>8</td>
<td>n.d.</td>
<td>1000</td>
</tr>
</tbody>
</table>

多溴聯苯總和 / Sum of PBBs

- 一溴聯苯 / Monobromobiphenyl  | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 二溴聯苯 / Dibromobiphenyl   | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 三溴聯苯 / Tribromobiphenyl  | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 四溴聯苯 / Tetrabromobiphenyl | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 五溴聯苯 / Pentabromobiphenyl | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 六溴聯苯 / Hexabromobiphenyl  | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 七溴聯苯 / Heptabromobiphenyl | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 八溴聯苯 / Octabromobiphenyl  | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 九溴聯苯 / Nonabromobiphenyl  | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |
- 十溴聯苯 / Decabromobiphenyl  | mg/kg | 參考 IEC 62321-6 (2015)，以氣相層析/質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5   | n.d.          | -             |

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# 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

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<th>結果 (Result)</th>
<th>限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>多溴聯苯醚總和 / Sum of PBDEs</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，以氣相層析 / 質譜儀檢測。/ With reference to IEC 62321-6 (2015) and performed by GC/MS.</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>參考 IEC 62321-6 (2015)，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>二溴聯苯醚 / Dibromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>三溴聯苯醚 / Tribromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>四溴聯苯醚 / Tetrabromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>五溴聯苯醚 / Pentabromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>六溴聯苯醚 / Hexabromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>七溴聯苯醚 / Heptabromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>八溴聯苯醚 / Octabromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>九溴聯苯醚 / Nonabromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>十溴聯苯醚 / Decabromodiphenyl ether</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，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>還苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (2017)，以氣相層析 / 質譜儀檢測。/ With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>還苯二甲酸丁苯酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (2017)，以氣相層析 / 質譜儀檢測。/ With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>還苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (2017)，以氣相層析 / 質譜儀檢測。/ With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>還苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-8 (2017)，以氣相層析 / 質譜儀檢測。/ With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.</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. MDL = Method Detection Limit（方法偵測極限值）
3. n.d. = Not Detected（未檢出）
4. "-" = Not Regulated (無規格值)
Heavy Metal Analytical Flow Chart

- Sample Measurement
- Cutting, Preparation
- Non-metal / Non-metallic
- ABS / PC / PVC
- Other materials / Others
- Metal / Metallic
- Boiling water extraction
- Cool, filter digestate through filter
- Add diphenyl-carbazide for color development
- Add diphenyl-carbazide for color development
- Measure the absorbance at 540 nm by UV-VIS
- Measure the absorbance at 540 nm by UV-VIS
- Total in 150~160°C / Digesting at 150~160°C
- Ultrasonication
- Digestion at 60°C by ultrasonication
- Alkali fusion / Alkaline fusion
- HCl to dissolve
- Solution / Solution
- Residue / Residue
- Filtration / Filtration
- Acid digestion with microwave / hotplate
- Lead / Tin / Cadmium / Hg
- Cadmium / Sn / Pb / Hg
- Lead / Sn / Pb / Hg

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr VI test method excluded)

- Technician: Rita Chen
- Supervisor: Troy Chang
- Test responsible: 張啟興

Test Report

FORMOSA CHEMICALS & FIBRE CORPORATION

Technician: Rita Chen

Test responsible: 張啟興

Sample Measurement

Heavy Metal Analytical Flow Chart

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SGS Taiwan Ltd. 台灣檢驗科技股份有限公司

201, TUNG HWA N. ROAD, TAIPEI, TAIWAN
Test Report

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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 测试人员：涂雅苓 / Technician: Yaling Tu
- 测试负责人：张啟興 / Supervisor: Troy Chang

初次测试程序 / First testing process
选择性篩检程序 / Optional screen process
确认程序 / 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

GC/MS / 氣相層析質譜儀

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Member of the SGS Group
可塑劑分析流程圖 / Analytical flow chart - Phthalate

- 测试人员：涂雅芩 / Technician: Yaling Tu
- 测试负责人：张啟興 / Supervisor: Troy Chang

【测试方法/Test method: IEC 62321-8】

1. 样品前处理/分样 / Sample pretreatment/separation
2. 样品以 THF 四氢呋喃溶解萃取 / Sample dissolved/extracted by THF
3. 萃取液稀释 / Dilute Extracted solution
4. 气相层析质谱仪分析 / Analysis was performed by GC/MS
Test Report

* The tested sample / part is marked by an arrow if it’s shown on the photo. *

** 報告結尾 (End of Report) **