測試報告

Test Report

號碼(No.)：CE/2018/13262 日期(Date)：2018/01/19 頁數(Page)：1 of 10

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.

其他測試項目請見下一頁. (Please refer to next pages for the other item(s).)

依據客戶指定,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).)

請參阅下一頁 (Please refer to following pages).

以下測試樣品係由申請廠商所提供之確認 (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) : POLYSTYRENE（聚苯乙烯）
樣品型號(Style/Item No.) : TAIIREX GP550N
收件日期(Sample Receiving Date) : 2018/01/15
測試期間(Testing Period) : 2018/01/15 TO 2018/01/19

測試需求(Test Requested):

(1) 依客戶所指定,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).)

(2) 其他測試項目請參閱下頁. (Please refer to next pages for the other item(s).)

測試結果(Test Results) : 請參閱下頁 (Please refer to following pages).

結論(Conclusion) : (1) 根據客戶所指定的樣品，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 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 and amending Directive (EU) 2015/863.)
### Test Results

**Test部位 (PART NAME):** 透明塑膠粒 (TRANSPARENT PLASTIC PELLETS)

<table>
<thead>
<tr>
<th>测试項目 (Test Items)</th>
<th>單位 (Unit)</th>
<th>测试方法 (Method)</th>
<th>方法偵測極限值 (MDL)</th>
<th>結果 (Result)</th>
<th>限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>鎘 / Cadmium (Cd)</td>
<td>mg/kg</td>
<td>参考 IEC 62321-5 (2013) , 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 n.d. 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>铅 / Lead (Pb)</td>
<td>mg/kg</td>
<td>参考 IEC 62321-5 (2013) , 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 n.d. 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>汞 / Mercury (Hg)</td>
<td>mg/kg</td>
<td>参考 IEC 62321-4 (2013) , 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 n.d. 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>六價銻 / Hexavalent Chromium Cr(VI)</td>
<td>mg/kg</td>
<td>参考 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 n.d. 1000</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>参考 IEC 62321-8 (2017) , 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.</td>
<td>50 n.d. 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>邻苯二甲酸二丁酯 / DIBP (Diisononyl phthalate) (CAS No.: 87-24-9)</td>
<td>mg/kg</td>
<td>参考 IEC 62321-8 (2017) , 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.</td>
<td>50 n.d. 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>邻苯二甲酸二异丁酯 / DIBP (Di-2-ethylhexyl) phthalate) (CAS No.: 117-84-7)</td>
<td>mg/kg</td>
<td>参考 IEC 62321-8 (2017) , 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.</td>
<td>50 n.d. 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>测试项目 (Test Items)</td>
<td>单位 (Unit)</td>
<td>测试方法 (Method)</td>
<td>方法侦测&lt;br&gt;极限值 (MDL)</td>
<td>结果 (Result)</td>
<td>限值 (Limit)</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>多溴联苯总和 / Sum of PBBs</td>
<td>mg/kg</td>
<td></td>
<td>-</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>一溴联苯 / Monobromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>二溴联苯 / Dibromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>三溴联苯 / Tribromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>四溴联苯 / Tetrabromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>五溴联苯 / Pentabromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>六溴联苯 / Hexabromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>七溴联苯 / Heptabromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>八溴联苯 / Octabromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>九溴联苯 / Nonabromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>十溴联苯 / Decabromobiphenyl</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>多溴联苯醚总和 / Sum of PBDEs</td>
<td>mg/kg</td>
<td>参考 IEC 62321-6 (2015)，以气相层析/质谱仪检测。/ 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>一溴联苯醚 / Monobromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>二溴联苯醚 / Dibromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>三溴联苯醚 / Tribromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>四溴联苯醚 / Tetrabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>五溴联苯醚 / Pentabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>六溴联苯醚 / Hexabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>七溴联苯醚 / Heptabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>八溴联苯醚 / Octabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>九溴联苯醚 / Nonabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>十溴联苯醚 / Decabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>聚氯乙烯 / PVC</td>
<td></td>
<td>以红外光谱分析及焰色法检测。/ Analysis was performed by FTIR and FLAME Test.</td>
<td>-</td>
<td>Negative</td>
<td>-</td>
</tr>
</tbody>
</table>

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## Test Report

### FORMOSA CHEMICALS & FIBRE CORPORATION

201, TUNG HWA N. ROAD, TAIPEI, TAIWAN, R. O. C.

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<table>
<thead>
<tr>
<th>Test Items</th>
<th>Unit</th>
<th>Method</th>
<th>MDL</th>
<th>Result</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>卤素 / Halogen</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>卤素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)</td>
<td>mg/kg</td>
<td></td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>卤素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)</td>
<td>mg/kg</td>
<td>参考BS EN 14582 (2016)，以离子层析仪分析。/ With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>卤素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)</td>
<td>mg/kg</td>
<td></td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>卤素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)</td>
<td>mg/kg</td>
<td></td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
</tbody>
</table>

### Note:

1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected (未検出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. **= Qualitative analysis (No Unit) 定性分析 (無單位)
6. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)
測試報告
Test Report

台灣化學纖維股份有限公司
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台北市敦化北路201號
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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

測試人員:王志瑋 / Technician: JR Wang
測試負責人:張啟興 / Supervisor: Troy Chang

剪裁、製備樣品 / Cutting, Preparation
測試樣品重量 / Sample Measurement

用微波消解儀 /電熱板進行酸消解
Acid digestion with microwave / hotplate

過濾 / Filtration
溶液 / Solution
殘渣 / Residue

1) 鹽酸熔融法 / Alkali fusion
2) 塩酸溶解 / HCl to dissolve

以UV-VIS，量測樣品溶液在540 nm的吸光度
Measure the absorbance at 540 nm by UV-VIS
測試報告
Test Report

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

- 測試人員: 凃雅苓 / Technician: Yaling Tu
- 測試負責人: 張啟興 / Supervisor: 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 / 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
測試報告
Test Report

可塑劑分析流程圖 / Analytical flow chart - Phthalate

- 測試人員: 徐毓明 / Technician: Andy Hsu
- 測試負責人: 張啟興 / Supervisor: 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
測試報告
Test Report

卤素分析流程图 / Analytical flow chart - Halogen

- 测试人员：陈恩臻 / Technician: Rita Chen
- 测试负责人：张啟興 / Supervisor: Troy Chang

1. 样品前处理/分离
   Sample pretreatment/separation

2. 称重及将样品放入样品槽中
   Weighting and putting sample in cell

3. 燃烧弹/吸收
   Oxygen Bomb Combustion / Absorption

4. 稀释至固定体积
   Dilution to fixed volume

5. 阴离子分析仪分析
   Analysis was performed by IC
測試報告

Test Report

聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC

- 測試人員: 涂雅苓 / Technician: Yaling Tu
- 測試負責人: 張啟興 / Supervisor: Troy Chang

樣品前處理 / Sample pre-treatment

焰色法檢測 / Flame test

紅外光譜分析 / Sample analyzed by FTIR

確認C-Cl鍵波數 / Check wave-number of C-Cl bonding

數據 / Data
TEST REPORT

FORMOSA CHEMICALS & FIBRE CORPORATION

台北市敦化北路201號
201, TUNG HWA N. ROAD, TAIPEI, TAIWAN, R. O. C.

* 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) **