測試報告
Test Report
ISOLA GROUP

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）:

樣品名稱(Sample Description) : LAMINATE
樣品型號(Style/Item No.) : TACHYON 100G
收件日期(Sample Receiving Date) : 2019/11/12
測試期間(Testing Period) : 2019/11/12 to 2019/11/26

=============================================================================================================================

測試結果(Test Results) : 請參閱下一页（Please refer to following pages).
### Test Results

#### Test Part (PART NAME) No.1: Copper Colored Sheet (COPPER COLORED SHEET)

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Unit</th>
<th>Method</th>
<th>MDL</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>卤素 / Halogen</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>参考 BS EN 14582 (2016)，以电位滴定分析</td>
<td>50</td>
<td>n.d.</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)，以电位滴定分析</td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>卤素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016)，以电位滴定分析</td>
<td>50</td>
<td>27500</td>
</tr>
<tr>
<td>卤素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016)，以电位滴定分析</td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>全卤辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)</td>
<td>mg/kg</td>
<td>参考 US EPA 3550C (2007)，以液相色谱/质谱仪分析</td>
<td>10</td>
<td>n.d.</td>
</tr>
<tr>
<td>全卤辛酸 / PFOA (CAS No.: 335-67-1)</td>
<td>mg/kg</td>
<td>参考 US EPA 3550C (2007)，以液相色谱/质谱仪分析</td>
<td>10</td>
<td>n.d.</td>
</tr>
<tr>
<td>四溴双酚-A / Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7)</td>
<td>mg/kg</td>
<td>参考 Global SOP RSTS-E&amp;E-121 (2012)，以液相色谱/质谱仪分析</td>
<td>10</td>
<td>n.d.</td>
</tr>
<tr>
<td>双酚 A / Bisphenol A (CAS No.: 80-05-7)</td>
<td>mg/kg</td>
<td>参考 Global SOP RSTS-E&amp;E-121 (2012)，以液相色谱/质谱仪分析</td>
<td>1</td>
<td>n.d.</td>
</tr>
<tr>
<td>聚氯乙烯 / Polyvinyl chloride (PVC)</td>
<td>**</td>
<td>以红外光谱分析及荧光法检测 / Analysis was performed by FTIR and FLAME Test</td>
<td>-</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Analysis was performed by UPLC-MSMS.

Analysis was performed by LC/MS.

Analysis was performed by FTIR and FLAME Test.
<table>
<thead>
<tr>
<th>测试项目 (Test Items)</th>
<th>单位 (Unit)</th>
<th>测试方法 (Method)</th>
<th>WDL</th>
<th>结果 (Result)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As / Arsenic (As)</td>
<td>mg/kg</td>
<td>参考 US EPA 3052 (1996)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>2</td>
<td>n.d.</td>
</tr>
<tr>
<td>Be / Beryllium (Be)</td>
<td>mg/kg</td>
<td>参考 US EPA 3052 (1996)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>2</td>
<td>n.d.</td>
</tr>
<tr>
<td>Sb / Antimony (Sb)</td>
<td>mg/kg</td>
<td>参考 US EPA 3052 (1996)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>2</td>
<td>11.9</td>
</tr>
<tr>
<td>Ni / Nickel (Ni)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>2</td>
<td>3.75</td>
</tr>
<tr>
<td>Sn / Tin (Sn)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>2</td>
<td>n.d.</td>
</tr>
<tr>
<td>P / Phosphorus (P)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>2</td>
<td>54.7</td>
</tr>
<tr>
<td>Dibutyl Tin (DBT)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>0.03</td>
<td>n.d.</td>
</tr>
<tr>
<td>Tributyl Tin (TBT)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>0.03</td>
<td>n.d.</td>
</tr>
<tr>
<td>Diocetyl Tin (DOT)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>0.03</td>
<td>n.d.</td>
</tr>
<tr>
<td>Triphenyl Tin (TPhT)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD.</td>
<td>0.03</td>
<td>n.d.</td>
</tr>
<tr>
<td>Bis(tributyl)oxide (TBTO) (CAS No.: 56-35-9)</td>
<td>mg/kg</td>
<td>参考 ISO 17353 (2004)，以气相层析仪/火焰光度检测器检测。 / With reference to ISO 17353 (2004). Analysis was performed by GC/FPD. Calculated from the result of Tributyl Tin (TBT).</td>
<td>0.03</td>
<td>n.d.</td>
</tr>
</tbody>
</table>
測試報告
Test Report
ISOLA GROUP

總揮發性有機物質 / Total Volatile Organic Compounds (TVOC)

<table>
<thead>
<tr>
<th>测試項目 (Test Items)</th>
<th>單位 (Unit)</th>
<th>测試方法 (Method)</th>
<th>MDL</th>
<th>結果 (Result)</th>
</tr>
</thead>
<tbody>
<tr>
<td>総揮發性有機物質 / Total Volatile Organic Compounds (TVOC)</td>
<td>mg/kg</td>
<td>以頂空氣體進樣裝置，連接氣相層析儀/質譜儀檢測。/ Analysis was performed by Headspace linked GC/MS. (測試條件 / Test Condition: 90℃, 30 mins)</td>
<td>1</td>
<td>7.77</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)
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)
7. (▲): MDL是針對元素/測試化合物之評估。/ The MDL was evaluated for element / tested substance.

換算公式 (Conversion Formula): AX = A × F

<table>
<thead>
<tr>
<th>AX</th>
<th>A</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>氧化雙三丁基錫 / Bis(tributyltin)oxide (TBTO)</td>
<td>三丁基錫 / Tributyl Tin (TBT)</td>
<td>1.024</td>
</tr>
</tbody>
</table>

8. 參數換算表 / Parameter Conversion Table: http://twap.sgs.com/sgsrsts/chm/download-REACH_tw.asp

PFOS參考資訊 (Reference Information): 持久性有機污染物 POPs - (EU) 2019/1021

PFOS濃度在物質或製品中不得超過0.001%(10ppm)，在半成品、成品或零部件中不得超過0.1%(1000ppm)，在紡織品或塗層材料中不得超過1μg/m²。

(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².)
測試報告
Test Report

[Diagram of Analytical flow chart - Halogen]

- 技術人員: 陳恩臻 / Technician: Rita Chen
- 監督人員: 張啟興 / Supervisor: Troy Chang

樣品前處理/分樣 / Sample pretreatment/separation

秤重及將樣品放入樣品槽中 / Weighting and putting sample in cell

燃燒彈/吸收
Oxygen Bomb Combustion / Absorption

稀釋至固定體積 / Dilution to fixed volume

離子電析儀分析 / Analysis was performed by IC
**Test Report**

**測試報告**

**Analytical flow chart - PFOA/PFOS**

- 樣品前處理 / Sample pretreatment
  - 超音波萃取法萃取 / Sample extraction by Ultrasonic extraction
  - 萃取液稀釋/濃縮 / Concentrate/Dilute Extracted solution
  - 以液相層析質譜儀分析萃取液 / Analysis was performed by LC/MS
  - 數據 / Data

測試負貴人: 張啟興

測試人員: 凃雅苓 / Technician: Yaling Tu

樣品前處理

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**Analytical flow chart - TBBP-A**

- **Sample pretreatment**
- **Sample extraction by Ultrasonic extraction**
- **Concentrate/Dilute Extracted solution**
- **Analysis was performed by LC/MS**
- **Data**

**Analysis** was performed by LC/MS. The samples were pretreated and extracted using Ultrasonic extraction. The extracts were concentrated or diluted. Analysis was then conducted on these samples using LC/MS.
Supervisor: Troy Chang
Technician: Yaling Tu

Analytical flow chart - Bisphenol A

- Sample pretreatment
- Sample extraction by Sonication extraction
- Concentrate/Dilute Extracted solution
- Analysis was performed by UPLC-MSMS
- Data

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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

1. 樣品前處理 / Sample pre-treatment
2. 焰色法檢測 / Flame test
3. 紅外光譜分析 / Sample analyzed by FTIR
4. 確認C-Cl鍵波數 / Check wave-number of C-Cl bonding
5. 數據 / Data
These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Testing personnel: 陳恩臻 / Technician: Rita Chen
- Testing responsible: 張啟興 / Supervisor: Troy Chang

**Element by ICP-OES Analysis Flow Chart (Flow Chart of digestion for the elements analysis performed by ICP-OES)**

- Cutting, Preparation
- Sample Measurement
- Acid digestion by suitable acid depended on different sample material (as below table)
- Filtration
- Solution
- Residue

1) Alkali Fusion
2) HCl to dissolve

- Steel, copper, aluminum, solder: Aqua regia, HNO₃, HCl, HF, H₂O₂
- Glass: HNO₃/HF
- Gold, platinum, palladium, ceramic: Aqua regia
- Silver: HNO₃
- Plastic: H₂SO₄, H₂O₂, HNO₃, HCl
- Other: Add appropriate reagent to total digestion
測試報告

Test Report

ISOLA GROUP

號碼(No.) : CV/2019/B0120 日期(Date) : 2019/11/26 頁數(Page) : 11 of 12

有機錫分析流程圖 / Analytical flow chart - Organic-Tin

- 檢測人員: 涂雅苓 / Technician: Yaling Tu
- 檢測負責人: 張啟興 / Supervisor: Troy Chang

樣品前處理 / Sample pretreatment

有機溶劑萃取 / Sample extraction by organic solvent

四乙基硼酸鈉衍生化 / Derived by Sodium tetraethylborate

萃取液濃縮/稀釋 / Concentrate/Dilute Extracted solution

氣相層析/火焰光度計分析 / Analysis was performed by GC/FPD

數據 / Data
測試報告
Test Report
ISOLA GROUP

號碼(No.)：CV/2019/B0120    日期(Date)：2019/11/26    頁數(Page)：12 of 12

* 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）**