

Report No. 報告號碼: 48280665b 001

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Client 客戶: First Hi-tec Enterprise Co. Ltd./ 高技企業股份有限公司
No.3, Lane 43, Hsing Pang Rd., Taoyuan District, Taoyuan City 330, Taiwan,
R.O.C./ 台灣 330 桃園市桃園區興邦路 43 巷 3 號

Identification/Model No(s): PCB /鋁基板 Aluminum substrate

樣品描述/規格:

Sample obtaining method: Sending by customer

樣品獲取方式:

Condition at delivery: Test item complete and undamaged.

樣品接收狀態:

Sample receiving date: 2025-08-12

收樣日期:

Testing period: 2025-08-12 – 2025-08-20

測試週期:

Place of testing: Chemical laboratory Hong Kong

測試地點:

Test specification 測試要求:

Test result 測試結果:

Testing according to customer's specification for the following parameters:

According to RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU Annex II and its amendment Directive (EU) 2015/863: Total Content of Lead, Cadmium, Mercury, Chromium VI, Polybrominated Biphenyls, Polybrominated Diphenyl Ethers; and Benzyl butyl phthalate (BBP), Dibutyl phthalate (DBP), Bis(2-ethylhexyl) phthalate (DEHP), Diisobutyl phthalate (DIBP) / 依據電機電子設備限用有害物質指令(RoHS 2011/65/EU) 附錄 II 及其修正指令(EU) 2015/863: 鉛、鎘、汞、六價鉻、多溴聯苯、多溴二苯醚、鄰苯二甲酸苯基丁酯、鄰苯二甲酸二丁酯、鄰苯二甲酸二(2-乙基己基)酯、鄰苯二甲酸二異丁酯 之總含量

Pass/合格

Phthalates/鄰苯二甲酸酯類 (DIDP/DINP/DNOP), Perfluorooctane Sulfonate (PFOS)/ 全氟辛烷磺酸, Perfluorooctanoic Acid (PFOA)/全氟辛酸, Hexabromocyclododecane (HBCDD)/六溴環十二烷

Refer to result page
參照測試報告

For and on behalf of
TÜV Rheinland Hong Kong Ltd.



2025-09-05
Date 日期

Amenda Yung / Senior CS Manager
Name/Position 姓名/職位

Report Authenticity Verification, please email: softlines@tw.tuv.com.
報告真實性確認, 如需驗證, 請電郵至 softlines@tw.tuv.com。

Sample information is provided by customer. Test result is drawn according to the kind and extent of tests performed. This test report relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products. "Decision Rule" document announced in our website (<https://www.tuv.com/landingpage/en/qm-gcn/>) describes the statement of conformity and its rule of enforcement for test results are applicable throughout this test report.

樣品信息由客戶提供。測試結果根據所做測試的種類和範圍而得出。本測試報告僅對來樣負責。未經本測試中心許可, 測試報告不得部分複製。不能根據此報告在上述產品或類似產品上使用任何安全標誌。本測試報告中, 描述符合性聲明所應用的判定規則發佈在我司官網 <https://www.tuv.com/landingpage/en/qm-gcn/>。

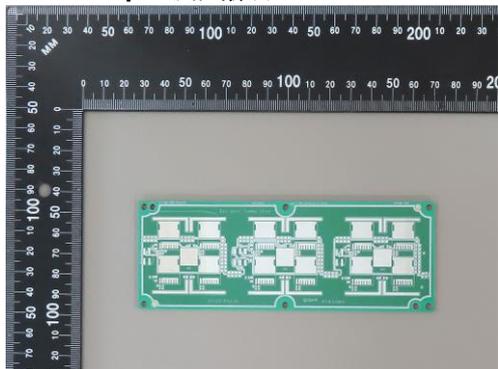
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Tested Material list/測試材料清單

| Material No./ 材料編號 | Material/材質 | Color/顏色 | Location/位置 |
|-----------------------|------------------------------|----------|--------------|
| 1 | PCB (Metal+Coating/金屬+塗層) | Green/綠色 | TCL250812-03 |

Test Sample/測試樣品



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Test Result 測試結果

| Test Item/測試項目 | Test Method/ 測試方法 | Unit / 單位 | MDL | Mat. 1 | Limit/限值 |
|--|---|--------------------|------|---------------|----------|
| | | | | Result/ 結果 | |
| Cadmium (Cd) / 鎘 | With ref. to IEC 62321-5:2013, ICP-OES/參考 IEC 62321-5: 2013,感應耦 合電漿發射光譜儀 | mg/kg | 2 | n.d. | 100 |
| Lead (Pb) / 鉛 | With ref. to IEC 62321-5:2013, ICP-OES/參考 IEC 62321-5: 2013,感應耦 合電漿發射光譜儀 | mg/kg | 2 | n.d. | 1000 |
| Mercury (Hg) / 汞 | With ref. to IEC 62321-4: 2013+ AMD1:2017, AAS/ 參考 IEC 62321-4: 2013+ AMD1: 2017, 原 子吸收光譜儀 | mg/kg | 2 | n.d. | 1000 |
| Chromium VI (Cr VI) / 六價鉻 | With ref. to IEC 62321-7-1:2015, UV-VIS/參考 IEC 62321-7-1: 2015,紫外 光-可見光分光光度計 | µg/cm ² | 0.1 | n.d. | -* |
| Sum of Polybrominated biphenyls (PBBs) / 多溴聯苯總和 | With ref. to IEC 62321-6:2015, GC-MS/參考 IEC 62321-6: 2015,氣相層 析儀-質譜儀 | mg/kg | - | n.d. | 1000 |
| Monobromobiphenyl/一溴聯苯 | | mg/kg | 5 | n.d. | - |
| Dibromobiphenyl/二溴聯苯 | | mg/kg | 5 | n.d. | - |
| Tribromobiphenyl/三溴聯苯 | | mg/kg | 5 | n.d. | - |
| Tetrabromobiphenyl/四溴聯苯 | | mg/kg | 5 | n.d. | - |
| Pentabromobiphenyl/五溴聯苯 | | mg/kg | 5 | n.d. | - |
| Hexabromobiphenyl/六溴聯苯 | | mg/kg | 5 | n.d. | - |
| Heptabromobiphenyl/七溴聯苯 | | mg/kg | 5 | n.d. | - |
| Octabromobiphenyl/八溴聯苯 | | mg/kg | 5 | n.d. | - |
| Nonabromobiphenyl/九溴聯苯 | | mg/kg | 5 | n.d. | - |
| Decabromobiphenyl/十溴聯苯 | | mg/kg | 5 | n.d. | - |
| Sum of Polybrominated diphenyl ethers (PBDEs) / 多溴二苯醚總和 | | mg/kg | - | n.d. | 1000 |
| Monobromodiphenyl ether/一溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Dibromodiphenyl ether/二溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Tribromodiphenyl ether/三溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Tetrabromodiphenyl ether/四溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Pentabromodiphenyl ether/五溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Hexabromodiphenyl ether/六溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Heptabromodiphenyl ether/七溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Octabromodiphenyl ether/八溴二苯醚 | | mg/kg | 5 | n.d. | - |
| Nonabromodiphenyl ether/九溴二苯醚 | mg/kg | 5 | n.d. | - | |
| Decabromodiphenyl ether/十溴二苯醚 | mg/kg | 5 | n.d. | - | |

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| Test Item/測試項目 | Test Method/ 測試方法 | Unit / 單位 | MDL | Mat.1 | Limit/限值 |
|--|--|--------------|------|---------------|----------|
| | | | | Result/ 結果 | |
| Benzyl butyl phthalate (BBP)/ 鄰苯二甲酸苯基丁酯 | With ref. to IEC 62321-8:2017, GC-MS/ 參考 IEC 62321-8: 2017, 氣相層析儀-質譜儀 | mg/kg | 50 | n.d. | 1000 |
| Dibutyl phthalate (DBP)/ 鄰苯二甲酸二丁酯 | | mg/kg | 50 | n.d. | 1000 |
| Diethylhexyl phthalate (DEHP)/ 鄰苯二甲酸二(2-乙基己基)酯 | | mg/kg | 50 | n.d. | 1000 |
| Diisobutyl phthalate (DIBP)/ 鄰苯二甲酸二異丁酯 | | mg/kg | 50 | n.d. | 1000 |
| Diisodecyl phthalate (DIDP) /鄰苯二甲酸二異癸酯 | | mg/kg | 50 | n.d. | - |
| Diisononyl phthalate (DINP) /鄰苯二甲酸二異壬酯 | | mg/kg | 50 | n.d. | - |
| Di-n-octyl phthalate (DNOP) /鄰苯二甲酸二辛酯 | | mg/kg | 50 | n.d. | - |
| Perfluorooctane Sulfonate (PFOS) and its salts/全氟辛烷磺酸 | With ref. to EN 17681- 1:2025, CI-GCMS / GC- MSMS and LC-MSMS / 參考 EN 17681-1:2025, 化學離子化氣相色譜-質 譜儀 /氣相層析串聯質譜 儀 /液相層析/質譜儀分析 | mg/kg | 0.01 | n.d. | - |
| Perfluorooctanoic Acid (PFOA) and its salts/全氟辛酸 | | mg/kg | 0.01 | n.d. | - |
| Hexabromocyclododecane (HBCDD)/六溴環十二烷 | With ref. to US EPA 3550C, LC-MSMS/ 參考 US EPA 3550C, 液相層析串聯質譜儀 | mg/kg | 10 | n.d. | - |

Notes/ 註釋:

MDL = Method Detection Limit/方法偵測極限值

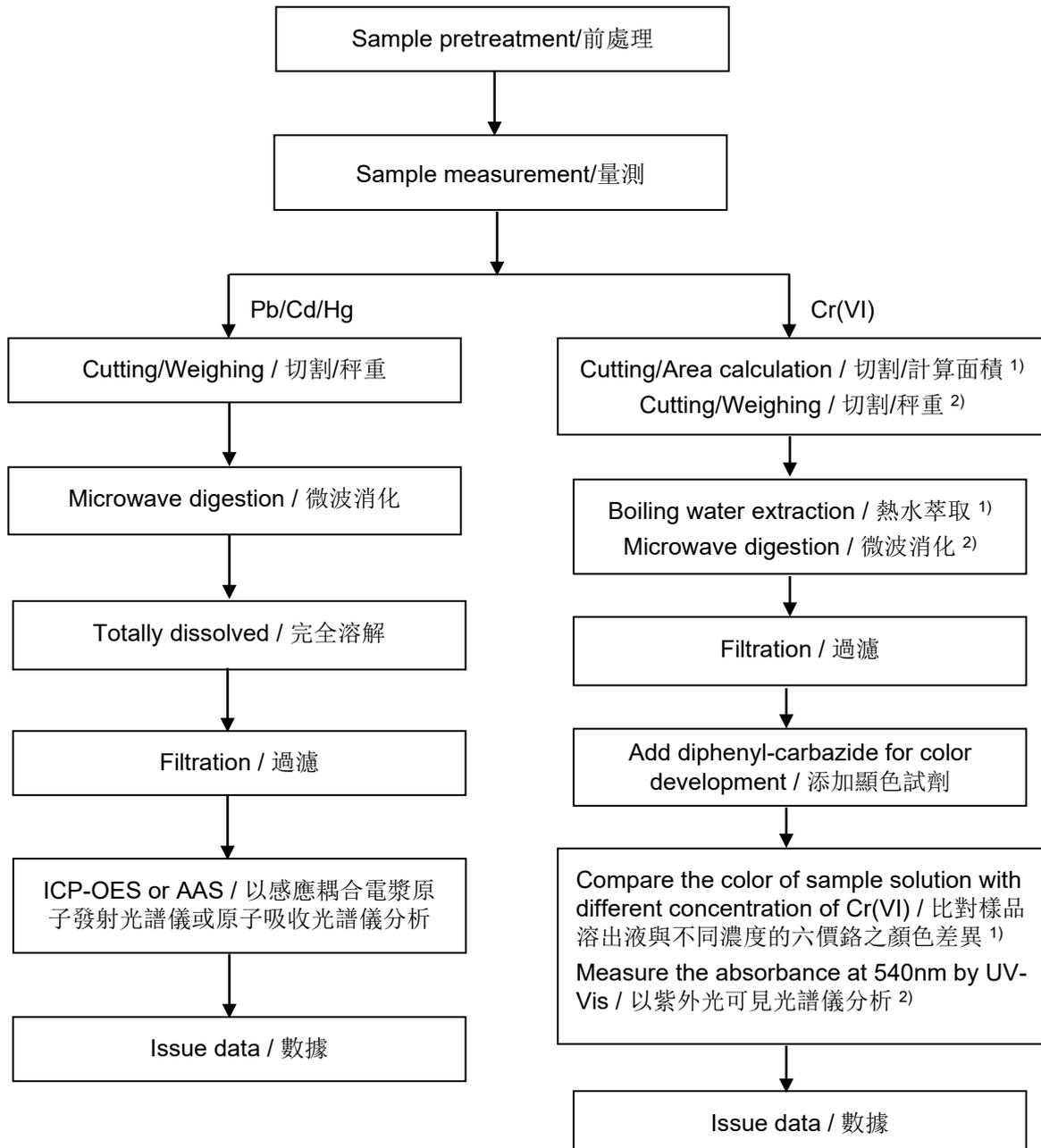
n.d. = Not Detected/未檢出; Less than MDL/小於 MDL

mg/kg = milligram per kilogram/ 毫克每公斤

| * Chromium (VI) concentration 六價鉻含量 | Qualitative result 定性結果 |
|---|---|
| <0.1µg/cm ² | The sample is negative (-ve) for Cr(VI). The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating. 樣品六價鉻測定結果為陰性。 六價鉻濃度低於定量限，塗層視為非六價鉻塗層。 |
| ≥0.1µg/cm ² and ≤0.13 µg/cm ² | The result is considered to be inconclusive. Unavoidable coating variations may influence the determination. Recommendation: if additional samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trails for the final determination. 六價鉻測定結果為無法判定。 塗層的差異不可避免的可能影響測定。 推薦：如果有額外的樣品，測試加大樣品表面積的三平行樣。以三平行測試的平均值作為最終測定結果。 |
| >0.13 µg/cm ² | The sample is positive (+ve) for Cr(VI). Concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI). 六價鉻測試結果為陽性。六價鉻濃度高於定量限及統計誤差幅度。樣品塗層視為含有六價鉻。 |

Testing procedure / 測試流程圖:

RoHS (Pb/鉛, Cd/鎘, Hg/汞, Cr(VI)/六價鉻)



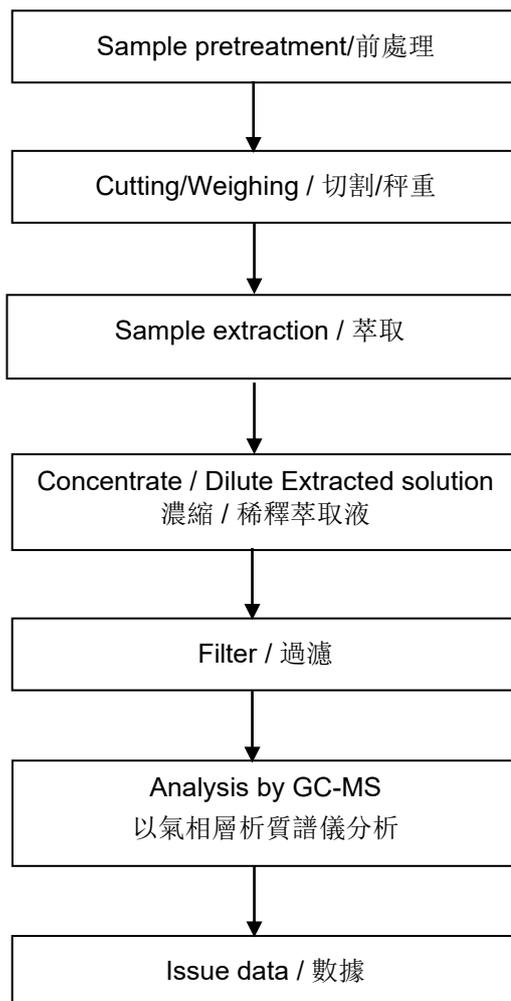
Notes/註釋: ¹⁾ For metallic material / 用於金屬物質
²⁾ For non-metallic material / 用於非金屬物質

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Testing procedure / 測試流程圖:

RoHS (PBBs/多溴聯苯, PBDEs/多溴二苯醚, BBP/鄰苯二甲酸苯基丁酯、DBP/鄰苯二甲酸二丁酯、DEHP/鄰苯二甲酸二(2-乙基己基)酯、DIBP/鄰苯二甲酸二異丁酯)

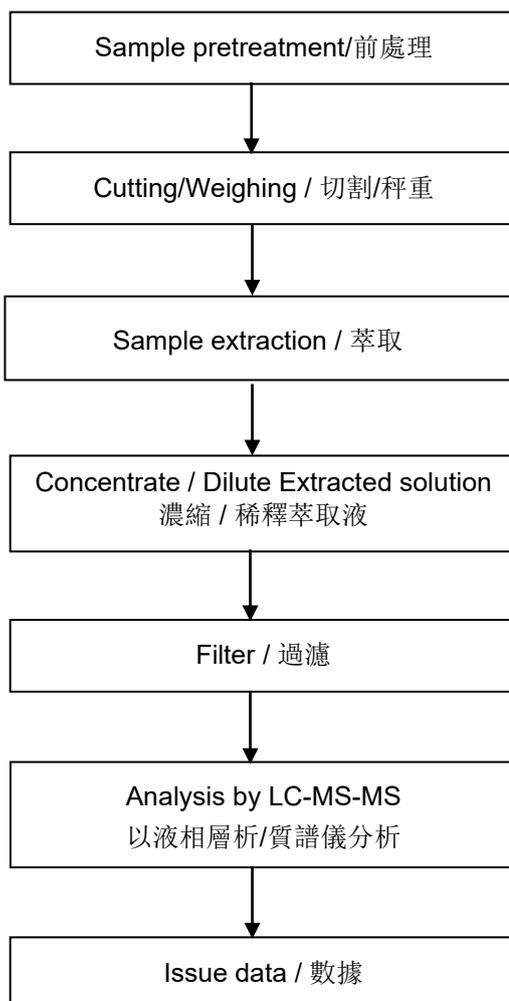


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Testing procedure / 測試流程圖:

PFOS/全氟辛烷磺酸, PFOA/全氟辛酸, HBCDD/六溴環十二烷



--- End of Test-Report / 此報告結束---