

測試報告 號碼(No.): CE/2020/10036 日期(Date): 2020/01/03 Test Report ^{欣興電子股份有限公司} UNIMICRON TECHNOLOGY CORPORATION

UNIMICRON TECHNOLOGY CORPORATION 桃園市龜山區龜山工業區山鶯路179號 NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY 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) : 欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION) 樣品名稱(Sample Description) : Cu PLATING LAYER 收件日期(Sample Receiving Date) : 2020/01/02 測試期間(Testing Period) : 2020/01/02 to 2020/01/03

測試需求(Test Requested):

- (1) 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).)
- (2) 其他測試項目請見下一頁. (Please refer to next pages for the other item(s).)

测試結果(Test Results) : 請參閱下一頁 (Please refer to following pages).

Troy Chang / Manager - Ve Signed for and behalf of SGS TAIWAN LTD. Chemical Laboratory - Taipei



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測試結果(Test Results)

測試部位(PART NAME)No.1 : 銅色片狀鍍層 (PLATING LAYER OF COPPER COLORED SHEET) 測試部位(PART NAME)No.2 : 銅色片狀(含鍍層) (COPPER COLORED SHEET (INCLUDING THE PLATING LAYER))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	
鎘 / Cadmium (Cd)	mg/kg	酸洗脫鍍層,參考IEC 62321-5 (2013) ,以感應耦合電漿發射光譜儀檢測. / IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-OES.	2	No. 1 n. d.	No. 2
鉛 / Lead (Pb)	mg/kg		2	n. d.	
汞 / Mercury (Hg)	mg/kg	酸洗脫鍍層,參考IEC 62321-4:2013+ AMD1:2017,以感應耦合電漿發射光譜 儀檢測. / IEC 62321-4:2013+ AMD1:2017 application of modified digestion by surface etching and performed by ICP-OES.	2	n. d.	
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	µg/cm²	参考IEC 62321-7-1 (2015),以UV-VIS 檢測. / With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n. d.	
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	µg∕m²	參考CEN/TS 15968 (2010),以液相層 析/質譜儀檢測. / With reference to CEN/TS 15968 (2010). Analysis was	1	n. d.	
全氟辛酸 / PFOA (CAS No.: 335-67-1)	µg∕m²	performed by LC/MS.	1	n. d.	
绨 / Antimony (Sb)	mg/kg	参考US EPA 3050B(1996),以感應耦 合電漿發射光譜儀檢測. / With reference to US EPA 3050B(1996). Analysis was performed by ICP-OES.	2	n. d.	
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3050B(1996),以感應耦 合電漿發射光譜儀檢測. / With reference to US EPA 3050B(1996). Analysis was performed by ICP-OES.	2	n. d.	



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桃園市龜山區龜山工業區山鶯路179號

NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	
				No. 1	No. 2
多溴聯苯總和 / Sum of PBBs	mg/kg	-	-		n.d.
一溴聯苯 / Monobromobiphenyl	mg/kg		5		n. d.
二溴聯苯 / Dibromobiphenyl	mg/kg		5		n.d.
三溴聯苯 / Tribromobiphenyl	mg/kg		5		n.d.
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5		n.d.
五溴聯苯 / Pentabromobiphenyl	mg/kg		5		n.d.
六溴聯苯 / Hexabromobiphenyl	mg/kg		5		n.d.
七溴聯苯 / Heptabromobiphenyl	mg/kg		5		n.d.
八溴聯苯 / Octabromobiphenyl	mg/kg	參考IEC 62321-6 (2015),以氣相層析	5		n.d.
九溴聯苯 / Nonabromobiphenyl	mg/kg		5		n.d.
十溴聯苯 / Decabromobiphenyl	mg/kg	/質譜儀檢測. / With reference to	5		n.d.
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	IEC 62321-6 (2015) and performed	-		n.d.
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg	by GC/MS.	5		n.d.
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5		n.d.
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg		5		n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5		n.d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5		n.d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5		n.d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5		n.d.
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5		n.d.
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5		n.d.
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5		n.d.
六溴環十二烷及所有主要被辨別出的異構 物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	參考IEC 62321 (2008),以氣相層析/ 質譜儀檢測. / With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5		n. d.



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NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	
				No. 1	No. 2
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	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.	50		n. d.
鄰苯二甲酸丁苯甲酯 / BBP(Butyl Benzyl phthalate)(CAS No.: 85-68-7)	mg/kg		50		n. d.
鄰苯二甲酸二丁酯 / DBP(Dibuty1 phthalate)(CAS No.: 84-74-2)	mg/kg		50		n. d.
鄰苯二甲酸二異丁酯 / DIBP (Di- isobutyl phthalate) (CAS No.: 84-69- 5)	mg/kg		50		n. d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0; 68515-49-1)	mg/kg		50		n. d.
鄰苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0; 68515-48-0)	mg/kg		50		n. d.
鄰苯二甲酸二正辛酯 / DNOP(Di-n- octyl phthalate)(CAS No.: 117-84-0)	mg/kg		50		n. d.
鹵素 / Halogen					
鹵素(氟)/ Halogen-Fluorine(F) (CAS No.: 14762-94-8)	mg/kg	参考BS EN 14582(2016),以離子層析 儀分析. / With reference to BS EN 14582(2016). Analysis was performed by IC.	50		252
鹵素(氯)/ Halogen-Chlorine(Cl) (CAS No.: 22537-15-1)	mg/kg		50		n. d.
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50		n. d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50		n. d.



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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. "---" = Not Conducted (未測項目)
- 6. (#2) =

a. 當六價鉻結果大於0.13 µg/cm²,表示樣品表層含有六價鉻. / The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm². The sample coating is considered to contain Cr(VI). b. 當六價鉻結果為n.d. (濃度小於0.10 µg/cm²),表示表層不含六價鉻. / The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 µg/cm²). The coating is considered a non-Cr(VI) based coating

c. 當六價鉻結果介於 0.10 及 0.13 µg/cm² 時,無法確定塗層是否含有六價鉻. / The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

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

PFOS濃度在物質或製備中不得超過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 $1\mu g/m^2$ 。

(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 $1\mu g/m^2$.)



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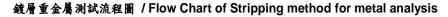
日期(Date): 2020/01/03

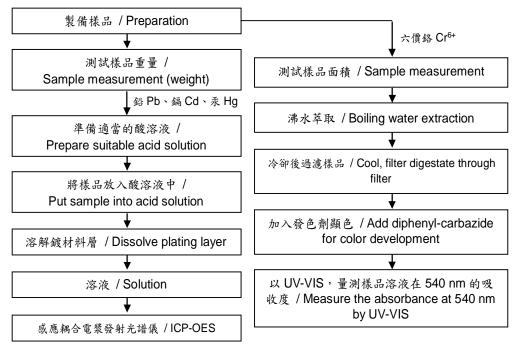
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> 根據以下的流程圖之條件,樣品之外部鍍層已完全溶解。(六價鉻測試方法除外) / The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)

- 測試人員:陳恩臻 / Technician: Rita Chen
- 測試負責人:張啟興 / Supervisor: Troy Chang







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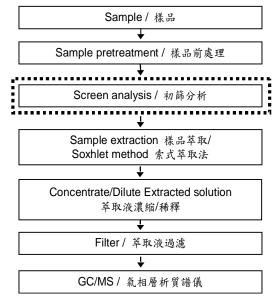
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

測試人員:涂雅苓 / 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 _ · _ · ▶





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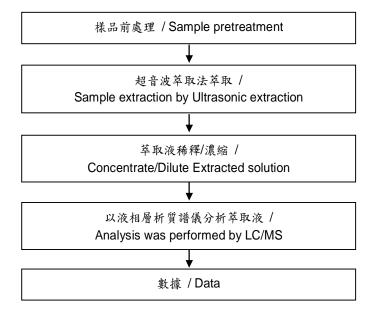
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全氯辛酸/全氯辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

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





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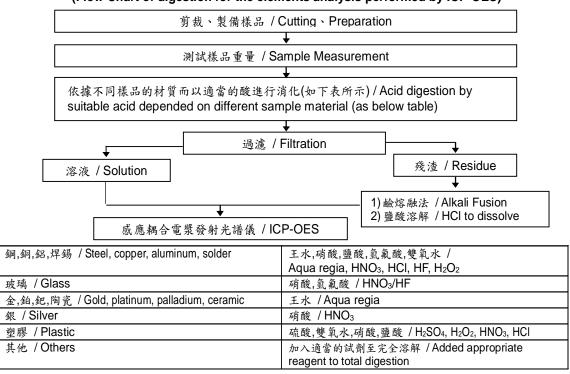
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根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.

- 測試人員:陳恩臻 / Technician: Rita Chen
- 測試負責人:張啟興 / Supervisor: Troy Chang

元素以 ICP-OES 分析的消化流程圖 (Flow Chart of digestion for the elements analysis performed by ICP-OES)





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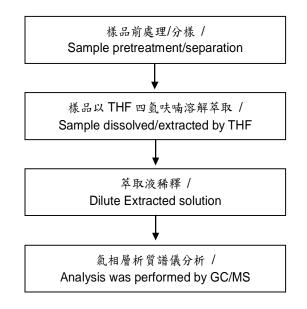
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

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

【测試方法/Test method: IEC 62321-8】





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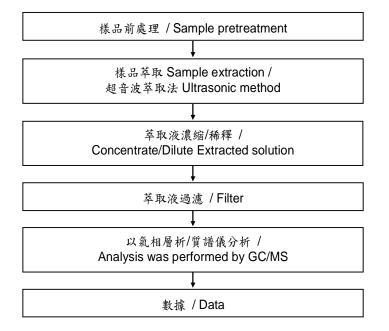
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

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



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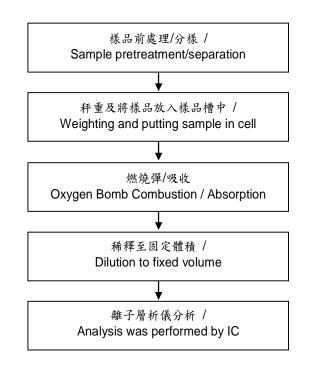
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鹵素分析流程圖 / Analytical flow chart - Halogen

- 測試人員:陳恩臻 / Technician: Rita Chen
- 測試負責人:張啟興 / Supervisor: Troy Chang





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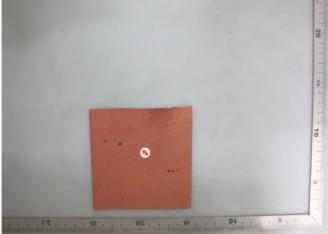
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> * 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2020/10036 NO.1



CE/2020/10036 NO.2



** 報告結尾 (End of Report) **