

測試報告

Test Report

號碼(No.) : CE/2020/94581

日期(Date) : 2020/10/06

頁數(Page): 1 of 18

瑞昇金屬工業股份有限公司 / REDSUN METAL IND. CO., LTD.

(南通鈞元電子材料工業有限公司 / NANTONG CHUN-YUAN ELECTRONICS IND. CO., LTD.)

桃園市中壢區定寧路2號 / NO. 2, DINGNING RD., ZHONGLI DIST., TAOYUAN CITY 32061

(江蘇省南通市如東縣洋口化學工業園區黃海三路振洋二路交叉口 / NANTONG JU-TUNG HSIEN,

YANG KOU CHEMICAL INDUSTRIAL AREA, RUDONG, JIANGSU)

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):

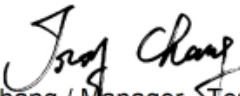
送樣廠商(Sample Submitted By) : 瑞昇金屬工業股份有限公司 (REDSUN METAL IND. CO., LTD.)
樣品名稱(Sample Description) : LEAD FREE SOLDER (無鉛錫製品)
應用於(Used For) : SN100E-B20、SN100E-B20(1)、SN100E-I21、SN100E-H1.5x0.75、
SN100E-H2.0x1.0、SN100E-H2.2x1.5、SN100E-H2.5x1.5、SN100E-H2.8x1.5、
SN100E-S2.5、SN100E-S3.5、SN100E-P08、SN100E-P14、SN100E-P24、SN100E-P41、
SN100E-P58、SN100E-P151x8...等SN100E系列
收件日期(Sample Receiving Date) : 2020/09/26
測試期間(Testing Period) : 2020/09/26 to 2020/10/06

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).)

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

結論(Conclusion) : (1) 根據客戶所提供的樣品, 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 2011/65/EU Annex II暨其修訂指令(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.)


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



PIN CODE: 105848A2

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測試結果(Test Results)

測試部位(PART NAME)No.1 : 銀色金屬 (SILVER COLORED METAL)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	限值 (Limit)
				No. 1	
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013, 以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n. d.	100
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5: 2013, 以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	17.5	1000
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4:2013+ AMD1:2017, 以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n. d.	1000
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	µg/cm ²	參考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.	-
多溴聯苯總和 / Sum of PBBs	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.	-	n. d.	1000
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		5	n. d.	-
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n. d.	-
十溴聯苯 / Decabromobiphenyl	mg/kg	5	n. d.	-	

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YANG KOU CHEMICAL INDUSTRIAL AREA, RUDONG, JIANGSU)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	限值 (Limit)
				No. 1	
多溴聯苯醚總和 / Sum of PBDEs	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.	-	n. d.	1000
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		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.	-	
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No. : 84-74-2)	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.	1000
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No. : 85-68-7)	mg/kg		50	n. d.	1000
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di-(2-ethylhexyl) phthalate) (CAS No. : 117-81-7)	mg/kg		50	n. d.	1000
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No. : 84-69-5)	mg/kg		50	n. d.	1000
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.	-

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YANG KOU CHEMICAL INDUSTRIAL AREA, RUDONG, JIANGSU)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	限值 (Limit)
				No. 1	
鄰苯二甲酸二正己酯 / DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	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.	-
鄰苯二甲酸二(2-甲氧基乙基)酯 / DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	mg/kg		50	n. d.	-
鄰苯二甲酸二(C7-11支鏈與直鏈)烷基酯 / DHNUP (1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters) (CAS No.: 68515-42-4)	mg/kg		50	n. d.	-
鄰苯二甲酸二(C6-8支鏈)烷基酯, 富C7 / DIHP (1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich) (CAS No.: 71888-89-6)	mg/kg		50	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.	-
鹵素 / Halogen					
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	參考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	n. d.	-
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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				No. 1	
全氟辛烷磺酸及其鹽類 / PFOS and its salts (CAS No.: 1763-23-1 and its salts)	mg/kg	參考US EPA 3550C: 2007, 以液相層析/質譜儀檢測。 / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n. d.	-
全氟辛酸及其鹽類 / PFOA and its salts (CAS No.: 335-67-1 and its salts)	mg/kg		10	n. d.	-
多氯聯苯 / Polychlorinated Biphenyls (PCBs) (CAS No.: 1336-36-3)	mg/kg	參考US EPA 3550C: 2007, 以氣相層析/質譜儀檢測。 / With reference to US EPA 3550C: 2007. Analysis was performed by GC/MS.	0.5	n. d.	-
多氯萘 / Polychlorinated Naphthalene (PCNs)	mg/kg	參考US EPA 3550C: 2007, 以氣相層析/質譜儀檢測。 / With reference to US EPA 3550C: 2007. Analysis was performed by GC/MS.	5	n. d.	-
多氯三聯苯 / Polychlorinated Terphenyls (PCTs)	mg/kg	參考US EPA 3550C: 2007, 以氣相層析/質譜儀檢測。 / With reference to US EPA 3550C: 2007. Analysis was performed by GC/MS.	0.5	n. d.	-
短鏈氯化石蠟 / Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	mg/kg	參考US EPA 3550C: 2007, 以氣相層析/質譜儀檢測。 / With reference to US EPA 3550C: 2007. Analysis was performed by GC/MS.	100	n. d.	-
銻 / Antimony (Sb)	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	3.67	-
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.	-
三氧化二銻 / Antimony trioxide (Sb ₂ O ₃) (CAS No.: 1309-64-4)	mg/kg	由銻結果計算得之。 / Calculated from the result of Antimony.	2 (▲)	4.39	-

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	限值 (Limit)
				No. 1	
三丁基錫 / Tributyl Tin (TBT)	mg/kg	參考ISO 17353: 2004, 以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n. d.	-
氧化雙三丁基錫 / Bis(tributyltin)oxide (TBTO) (CAS No.: 56-35-9)	mg/kg	參考ISO 17353: 2004, 以氣相層析儀/火焰光度偵測器檢測; 由三丁基錫測試結果計算得之. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD. Calculated from the result of Tributyl Tin (TBT).	0.03 (▲)	n. d.	-
三苯基錫 / Triphenyl Tin (TphT)	mg/kg	參考ISO 17353: 2004, 以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n. d.	-
二丁基錫 / Dibutyl Tin (DBT)	mg/kg	參考ISO 17353: 2004, 以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n. d.	-
二辛基錫 / Dioctyl Tin (DOT)	mg/kg	參考ISO 17353: 2004, 以氣相層析儀/火焰光度偵測器檢測. / With reference to ISO 17353: 2004. Analysis was performed by GC/FPD.	0.03	n. d.	-
聚氯乙烯 / Polyvinyl chloride (PVC)	**	以紅外光譜分析及焰色法檢測. / Analysis was performed by FTIR and FLAME Test.	-	Negative	-

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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. **= 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)
(#2) =
 - a. 當六價鉻結果大於0.13 $\mu\text{g}/\text{cm}^2$, 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 $\mu\text{g}/\text{cm}^2$. 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 $\mu\text{g}/\text{cm}^2$) , 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 $\mu\text{g}/\text{cm}^2$). The coating is considered a non-Cr(VI) based coating
 - c. 當六價鉻結果介於 0.10 及 0.13 $\mu\text{g}/\text{cm}^2$ 時, 無法確定塗層是否含有六價鉻. / The result between 0.10 $\mu\text{g}/\text{cm}^2$ and 0.13 $\mu\text{g}/\text{cm}^2$ is considered to be inconclusive - unavoidable coating variations may influence the determination.
7. 全氟辛烷磺酸及其鹽類包含 / PFOS and its salts including :
CAS No. : 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
8. 全氟辛酸及其鹽類包含 / PFOA and its salts including :
CAS No. : 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
9. 符合性結果之判定係以測試結果與限值做比較。/ The statement of compliance conformity is based on comparison of testing results and limits.
10. (▲) : 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) : $AX = A \times F$

AX	A	F
三氧化二銻 / Antimony trioxide ($\text{Sb}_2 \text{O}_3$)	銻 / Antimony	1.1971
氧化雙三丁基錫 / Bis(tributyltin)oxide (TBTO)	三丁基錫 / Tributyl Tin (TBT)	1.024

參數換算表 / Parameter Conversion Table : https://twap.sgs.com/sgsrsts/chn/download-REACH_tw.asp

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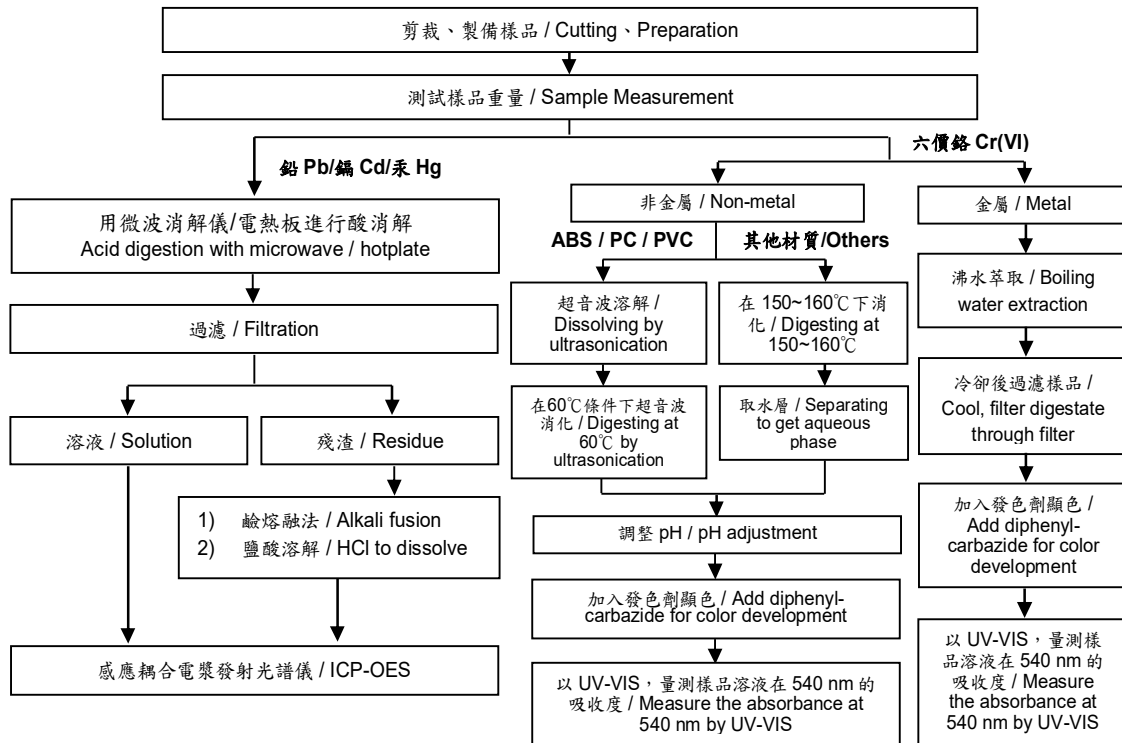
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YANG KOU CHEMICAL INDUSTRIAL AREA, RUDONG, JIANGSU)

重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外)

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)



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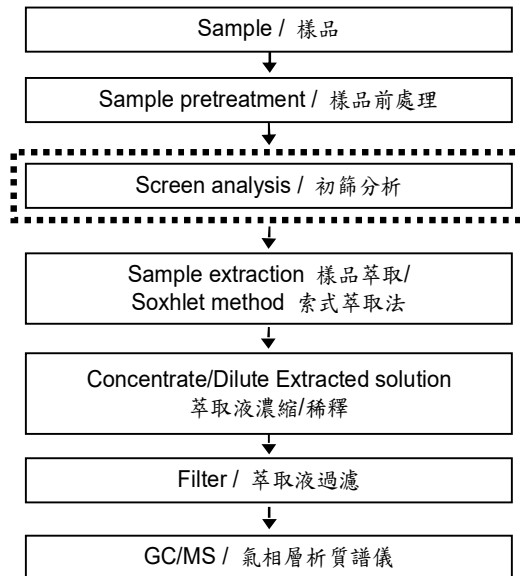
YANG KOU CHEMICAL INDUSTRIAL AREA, RUDONG, JIANGSU)

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

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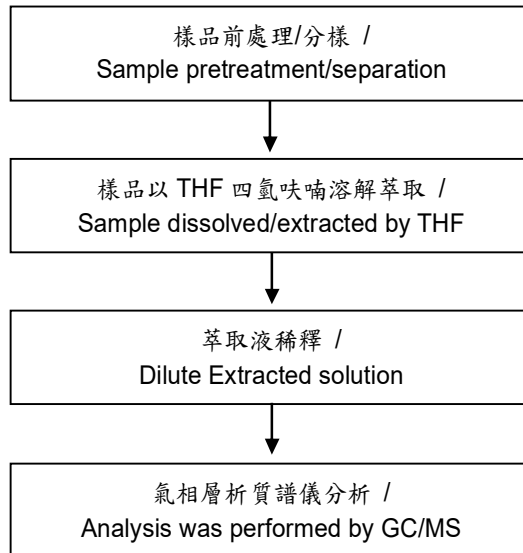
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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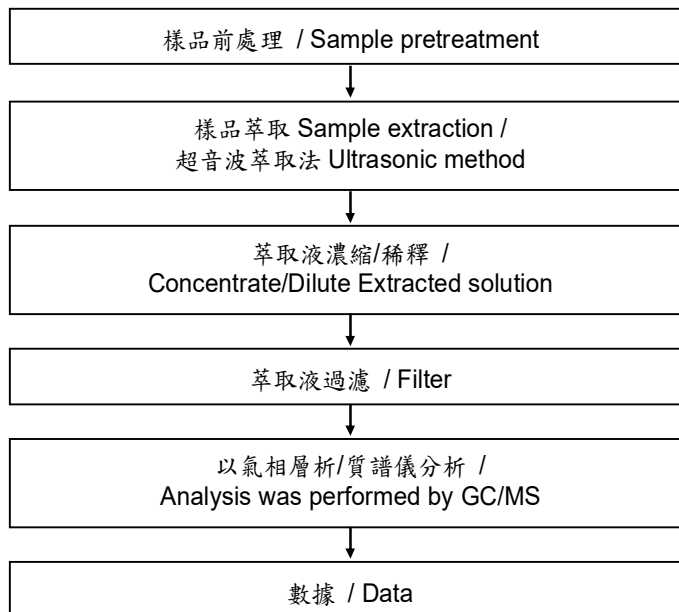
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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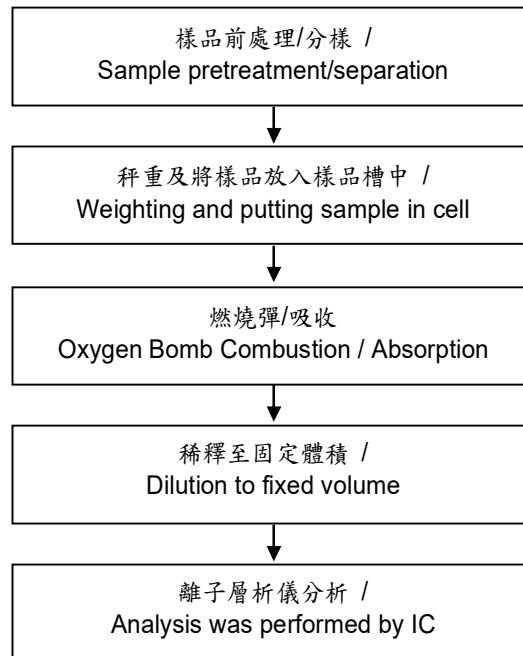
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鹵素分析流程圖 / Analytical flow chart - Halogen



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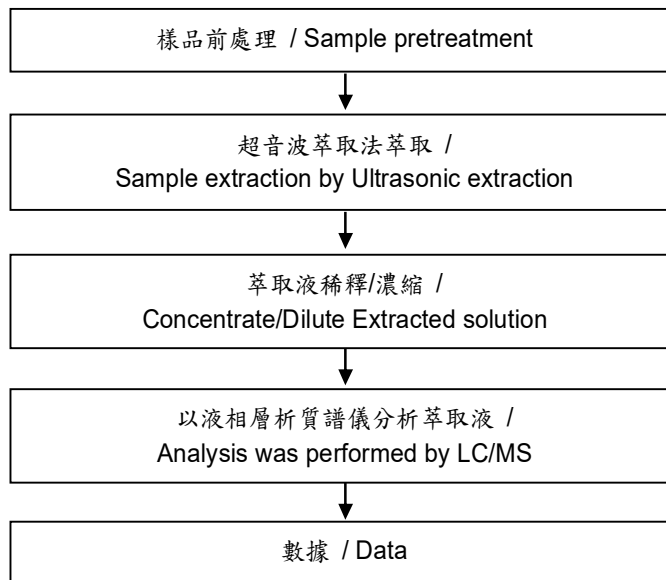
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全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS



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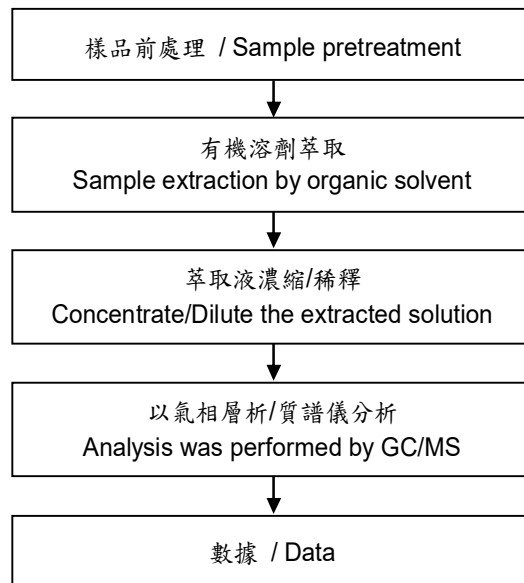
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分析流程圖 / Analytical flow chart

【適用於：多氯聯苯、多氯奈、多氯三聯苯、滅蟻靈、氯化石蠟、DBBT】

*Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



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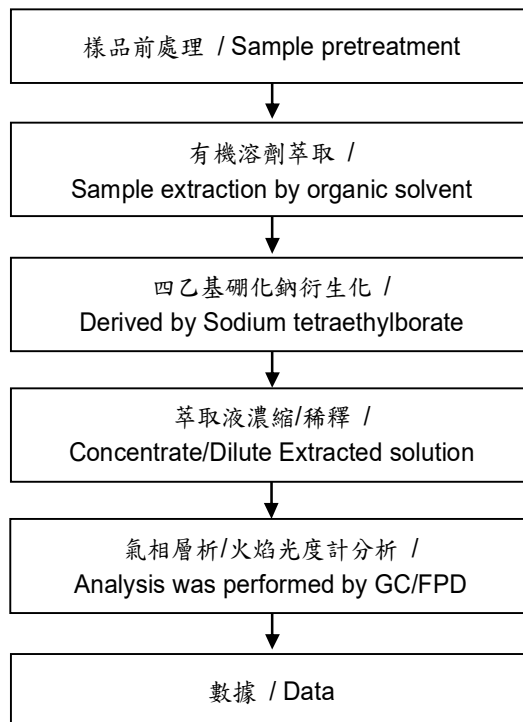
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有機錫分析流程圖 / Analytical flow chart - Organic-Tin



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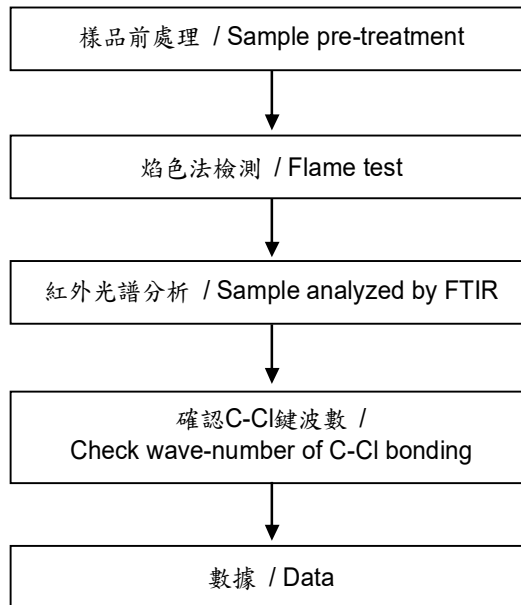
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聚氯乙烷物質判定分析流程圖 / Analysis flow chart - PVC



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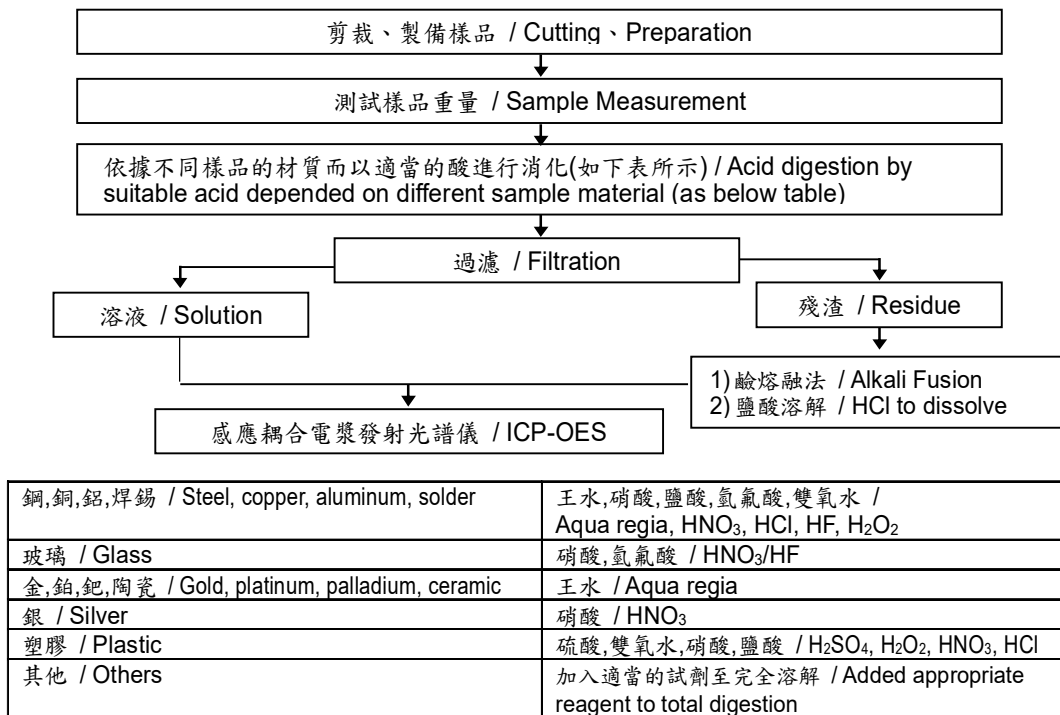
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元素以 ICP-OES 分析的消化流程圖 (Flow Chart of digestion for the elements analysis performed by ICP-OES)

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.



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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.)

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** 報告結尾 (End of Report) **