

Test Report

測試結果(Test Results)

TAMURA CORPORATION

16-2, SAYAMAGAHARA, IRUMA-SHI, SAITAMA-KEN, 358-8501, JAPAN

號碼(No.): ETR21502139 日期(Date): 17-May-2021 頁數(Page): 1 of 19

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) : TAMURA CORPORATION

樣品名稱(Sample Name) : SOLDER PASTE 樣品型號(Style/Item No.) : LF-204-301H-F27

收件日(Sample Receiving Date) : 10-May-2021

測試期間(Testing Period) : 10-May-2021 to 17-May-2021

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).)

請參閱下一頁 (Please refer to following pages.)

告 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 Change Manager Te h SGS
Signed for and on behalf of SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: B59AE748



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測試部位敘述 (Test Part Description)

No.1 : 灰色膏狀 (GRAY PASTE)

測試結果 (Test Results)

測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013 · 以感應耦合電漿 發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	100
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013 · 以感應耦合電漿 發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	144	1000
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439- 97-6)	參考IEC 62321-4: 2013+ AMD1: 2017·以 感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	1000
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) (CAS No.: 18540-29-9)	參考IEC 62321-7-2: 2017·以紫外光-可見 光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	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)	 參考IEC 62321-6: 2015,以氣相層析儀/質	mg/kg	5	n.d.	-
五溴聯苯 (Pentabromobiphenyl)	iii 儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	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.	-
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.	1000



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測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
	, ,	, ,		No.1	
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)	│ 參考IEC 62321-6: 2015·以氣相層析儀/質	mg/kg	5	n.d.	-
五溴聯苯醚 (Pentabromodiphenyl ether)	参考IEC 02321-0. 2015・以照伯層が1歳/貝 譜儀分析。(With reference to IEC 62321-	mg/kg	5	n.d.	-
六溴聯苯醚 (Hexabromodiphenyl ether)	6: 2015, analysis was performed by	mg/kg	5	n.d.	-
七溴聯苯醚 (Heptabromodiphenyl ether)	GC/MS.)	mg/kg	5	n.d.	-
八溴聯苯醚 (Octabromodiphenyl ether)	GC/1V13.)	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.	-
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.	1000
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl		mg/kg	50	n.d.	1000
phthalate (BBP)) (CAS No.: 85-68-7)					
鄰苯二甲酸二丁酯 (DBP) (Dibutyl	†	mg/kg	50	n.d.	1000
phthalate (DBP)) (CAS No.: 84-74-2)					
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-		mg/kg	50	n.d.	1000
(2-ethylhexyl) phthalate (DEHP)) (CAS					
No.: 117-81-7)					
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl	參考IEC 62321-8: 2017,以氣相層析儀/質	mg/kg	50	n.d.	1000
phthalate (DIBP)) (CAS No.: 84-69-5)	譜儀分析。(With reference to IEC 62321-	J. J.			
娜苯二甲酸二異癸酯 (DIDP) (Diisodecyl	8: 2017, analysis was performed by	mg/kg	50	n.d.	-
phthalate (DIDP)) (CAS No.: 26761-40-	GC/MS.)	9, 9			
0, 68515-49-1)					
		mg/kg	50	n.d.	_
phthalate (DINP)) (CAS No.: 28553-12-		9/ 19		1	
0, 68515-48-0)					
		mg/kg	50	n.d.	_
phthalate (DNOP)) (CAS No.: 117-84-0)		1119/ Kg	30	11.0.	
Printidate (D1401)) (CA3140 117 04 0)					



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測試項目	\$RI(≜±+ → 2+	므 <i>스</i>	MDI	結果	阳坊
測試填目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	福果 (Result)	限值 (Limit)
(Test items)	(Wethou)	(OIIII)		No.1	(Lillil)
六溴環十二烷及所有主要被辨別出的異構物(HBCDD) (α - HBCDD, β - HBCDD, γ - HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321: 2008·以氣相層析儀/質譜儀分析。(With reference to IEC 62321: 2008, analysis was performed by GC/MS.)	mg/kg	5	n.d.	-
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	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.)	mg/kg	50	n.d.	-
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537- 15-1)		mg/kg	50	n.d.	-
溴 (Br) (Bromine (Br)) (CAS No.: 10097- 32-2)		mg/kg	50	291	-
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)		mg/kg	50	n.d.	-
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考US EPA 3550C: 2007·以液相層析儀/ 質譜儀分析。(With reference to US EPA 3550C: 2007, analysis was performed by LC/MS.)	mg/kg	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 (PCBs) (Polychlorinated biphenyls (PCBs))	參考US EPA 3550C: 2007·以氣相層析儀/ 質譜儀分析。(With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.)	mg/kg	0.5	n.d.	-
多氯奈 (PCNs) (Polychlorinated naphthalene (PCNs))		mg/kg	5	n.d.	-
多氯三聯苯 (PCTs) (Polychlorinated terphenyls (PCTs))		mg/kg	0.5	n.d.	-
短鏈氯化石蠟(C10-C13) (SCCP) (Short Chain Chlorinated Paraffins(C10-C13) (SCCP)) (CAS No.: 85535-84-8)	參考ISO 18219: 2015 · 以氣相層析儀/質譜儀分析。(With reference to ISO 18219: 2015, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

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測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
四溴雙酚-A (TBBP-A)	參考RSTS-E&E-121 · 以液相層析儀/質譜儀	mg/kg	10	n.d.	-
(Tetrabromobisphenol A (TBBP-A))	分析。(With reference to RSTS-E&E-121,				
(CAS No.: 79-94-7)	analysis was performed by LC/MS.)				
三丁基錫 (TBT) (Tributyl tin (TBT))	參考ISO 17353: 2004 · 以氣相層析儀/火	mg/kg	0.03	n.d.	-
三苯基錫 (TPhT) (Triphenyl tin (TPhT))	焰光度偵測器分析。(With reference to	mg/kg	0.03	n.d.	-
二丁基錫 (DBT) (Dibutyl tin (DBT))	ISO 17353: 2004, analysis was	mg/kg	0.03	n.d.	-
二辛基錫 (DOT) (Dioctyl tin (DOT))	performed by GC/FPD.)	mg/kg	0.03	n.d.	-
氧化雙三丁基錫 (TBTO) (Bis(tributyltin)	由三丁基錫測試結果計算得之。	mg/kg	0.03 🛦	n.d.	=
oxide (TBTO)) (CAS No.: 56-35-9)	(Calculated from the result of Tributyl				
	Tin (TBT).)				
聚氯乙烯 (Polyvinyl chloride) (PVC)	參考ASTM E1252: 2013·以傅立葉轉換紅外	**	-	Negative	-
	線光譜儀及焰色法分析。(With reference to				
	ASTM E1252: 2013, analysis was				
	performed by FT-IR and Flame Test.)				
雙酚A (Bisphenol A) (CAS No.: 80-05-7)	參考RSTS-CHEM-239-1,以液相層析串聯	mg/kg	1	n.d.	-
	質譜儀分析。(With reference to RSTS-				
	CHEM-239-1, analysis was performed by				
Off. (D.) (D.) (CACA) 7440	LC/MS/MS.)				
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-	參考US EPA 3052: 1996 · 以感應耦合電漿	mg/kg	2	n.d.	-
41-7)	發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed				
	by ICP-OES.)				
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-	参考US EPA 3052: 1996 · 以感應耦合電漿	mg/kg	2	108	_
36-0)	發射光譜儀分析。(With reference to US	mg/kg	_	100	-
30 0)	EPA 3052: 1996, analysis was performed				
	by ICP-OES.)				
L					



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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); 小於MDL / Less than MDL
- 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. 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. ▲: 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

AX	Α	F
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://eecloud.sgs.com/Region_TW/DocDownload.aspx#otherDoc

10. 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.)



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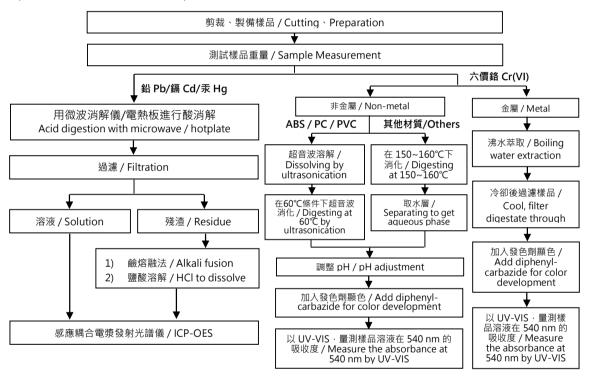
TAMURA CORPORATION

16-2, SAYAMAGAHARA, IRUMA-SHI, SAITAMA-KEN, 358-8501, JAPAN

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. (Cr^{6+} test method excluded)





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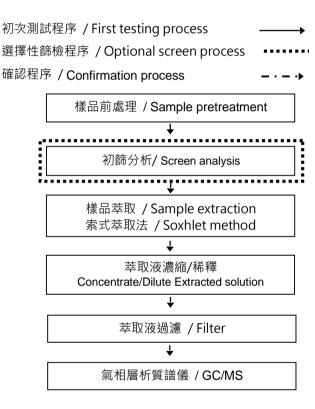
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs

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測試報告 Test Report

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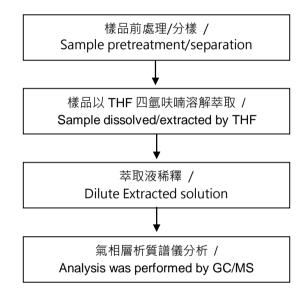
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】





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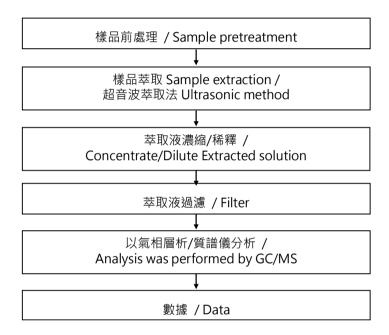
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD





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



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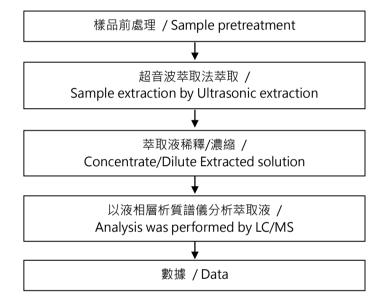
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全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS





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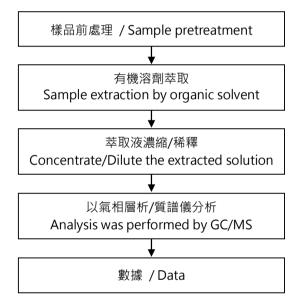
分析流程圖 / Analytical flow chart

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【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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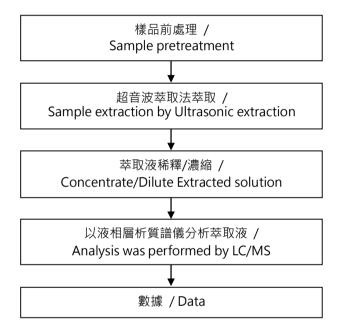
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四溴雙酚-A 分析流程圖 / Analytical flow chart - TBBP-A





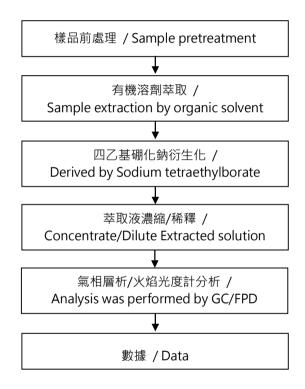
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有機錫分析流程圖 / Analytical flow chart - Organic-Tin





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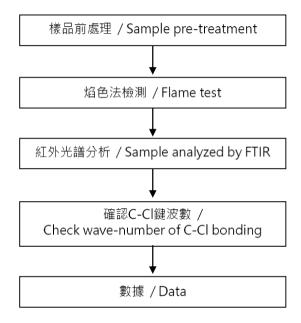
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聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC





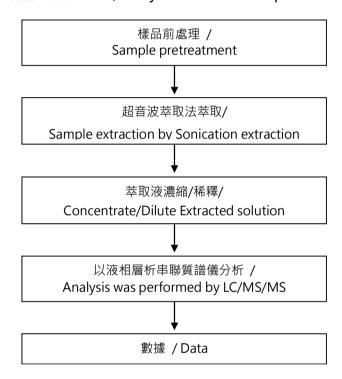
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雙酚A分析流程圖 / Analytical flow chart - Bisphenol A





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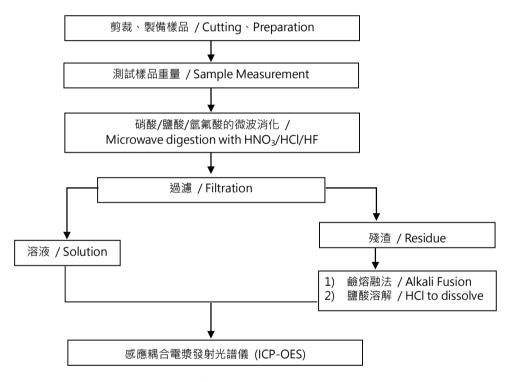
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重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件,樣品已完全溶解。

These samples were dissolved totally by pre-conditioning method according to below flow chart.

【參考方法/Reference method: US EPA 3051A、US EPA 3052】



* US EPA 3051A 方法未添加氫氟酸 / US EPA 3051A method does not add HF.



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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.)

ETR21502139



** 報告結尾 (End of Report) **