

**Test Report** 

號碼(No.): EKR25800119 日期(Date): 08-Aug-2025 頁數(Page): 1 of 24

SENJU METAL INDUSTRY CO.,LTD.
23 SENJU HASHIDO-CHO ADACHI-KU TOKYO, 120-8555 JAPAN

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 the applicant as):

送樣廠商(Sample Submitted By) : SENJU METAL INDUSTRY CO.,LTD.

樣品名稱(Sample Name) : ECO SOLDER BALL S 樣品型號(Style/Item No.) : M34(Sn/1Ag/0.5Cu)

收件日(Sample Receiving Date)

: 01-Aug-2025

測試期間(Testing Period)

: 01-Aug-2025 to 08-Aug-2025

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 鎬、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.)

測試結果(Test Results)

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.)

報告簽署人/張伯睿 博士/部 图理**SGS**Ray Chang, Ph.D./ Department Manager
Signed for and on behalitary
SGS TAIWAN LTD.

化學實驗室-高雄/Chemical Laboratory-Kaohsiung



PIN CODE: A5BFF478



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#### 測試部位敘述 (Test Part Description)

No.1 : 銀色金屬球 (SILVER COLORED METAL BALL)

#### 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))	參考IEC 62321-5: 2013 · 以感應耦合電漿	mg/kg	2	n.d.	100
	發射光譜儀分析。(With reference to IEC				
	62321-5: 2013, analysis was performed				
	by ICP-OES.)				
鉛 (Pb) (Lead (Pb))	參考IEC 62321-5: 2013·以感應耦合電漿	mg/kg	2	70.7	1000
	發射光譜儀分析。(With reference to IEC				
	62321-5: 2013, analysis was performed				
	by ICP-OES.)				
汞 (Hg) (Mercury (Hg))	參考IEC 62321-4: 2013+ AMD1: 2017·	mg/kg	2	n.d.	1000
	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.)				
六價鉻 (Hexavalent Chromium) Cr(VI)	參考IEC 62321-7-1: 2015 · 以紫外光-可見	μg/cm²	0.1	n.d.	-
(#2)	光分光光度計分析。(With reference to				
	IEC 62321-7-1: 2015, analysis was				
	performed by UV-VIS.)				
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)	● 参考IEC 62321-6: 2015·以氣相層析儀/質	mg/kg	5	n.d.	-
五溴聯苯 (Pentabromobiphenyl)	- 譜儀分析。(With reference to IEC 62321-	mg/kg	5	n.d.	-
六溴聯苯 (Hexabromobiphenyl)	6: 2015, analysis was performed by GC/MS.)	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)	iii 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/1VI3.)	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
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-	参考US EPA 3052: 1996,以感應耦合電漿	mg/kg	2	33.0	-
36-0)	發射光譜儀分析。(With reference to US				
	EPA 3052: 1996, analysis was performed				
	by ICP-OES.)				
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.)				
多氯聯苯 (PCBs) (Polychlorinated	參考US EPA 3550C: 2007,以氣相層析儀/	mg/kg	0.5	n.d.	-
biphenyls (PCBs))	質譜儀分析。(With reference to US EPA	J. J			
	3550C: 2007, analysis was performed by				
	GC/MS.)				
多氯奈 (PCNs) (Polychlorinated	参考US EPA 3550C: 2007,以氣相層析儀/	mg/kg	5	n.d.	-
naphthalene (PCNs))	質譜儀分析。(With reference to US EPA	J. J			
	3550C: 2007, analysis was performed by				
	GC/MS.)				
多氯三聯苯 (PCTs) (Polychlorinated	参考US EPA 3550C: 2007·以氣相層析儀/	mg/kg	0.5	n.d.	-
terphenyls (PCTs))	質譜儀分析。(With reference to US EPA	9			
	3550C: 2007, analysis was performed by				
	GC/MS.)				
	36,1113.,				



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測試方法	單位	MDL	結果	限值
(Method)	(Unit)		(Result)	(Limit)
			No.1	
參考ISO 18219-1: 2021‧以氣相層析儀/	mg/kg	50	n.d.	-
質譜儀分析。(With reference to ISO				
18219-1: 2021, analysis was performed				
by GC/MS.)				
參考BS EN 14582: 2016,以離子層析儀分	mg/kg	50	n.d.	-
析。(With reference to BS EN 14582:				
2016, analysis was performed by IC.)				
參考BS EN 14582: 2016,以離子層析儀分	mg/kg	50	n.d.	-
析。(With reference to BS EN 14582:				
2016, analysis was performed by IC.)				
參考BS EN 14582: 2016,以離子層析儀分	mg/kg	50	n.d.	-
析。(With reference to BS EN 14582:				
2016, analysis was performed by IC.)				
參考BS EN 14582: 2016 · 以離子層析儀分	mg/kg	50	n.d.	-
析。(With reference to BS EN 14582:				
2016, analysis was performed by IC.)				
參考ISO 17353: 2004 · 以氣相層析儀/火	mg/kg	0.03	n.d.	-
焰光度偵測器分析。(With reference to				
ISO 17353: 2004, analysis was				
performed by GC/FPD.)				
參考ISO 17353: 2004 · 以氣相層析儀/火	mg/kg	0.03	n.d.	-
焰光度偵測器分析。(With reference to				
ISO 17353: 2004, analysis was				
由三丁基錫測試結果計算得之。	mg/kg	0.03 🛦	n.d.	-
(Calculated from the result of Tributyl				
Tin (TBT).)				
參考ISO 17353: 2004,以氣相層析儀/火	mg/kg	0.03	n.d.	-
焰光度偵測器分析。(With reference to				
ISO 17353: 2004, analysis was				
performed by GC/FPD.)				
	(Method)  参考ISO 18219-1: 2021・以氣相層析儀/ 質譜儀分析。(With reference to ISO 18219-1: 2021, analysis was performed by GC/MS.)  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.) 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.) 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.) 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.) 参考ISO 17353: 2004・以氣相層析儀/火 焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.) 参考ISO 17353: 2004、以氣相層析儀/火 焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.) 由三丁基錫測試結果計算得之。 (Calculated from the result of Tributyl Tin (TBT).) 参考ISO 17353: 2004・以氣相層析儀/火 焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was	(Method) (Unit)  参考ISO 18219-1: 2021・以氣相層析儀/ 質譜儀分析。(With reference to ISO 18219-1: 2021, analysis was performed by GC/MS.)  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.)  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.)  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.)  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.)  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.)  参考ISO 17353: 2004・以氣相層析儀/火焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.)  参考ISO 17353: 2004・以氣相層析儀/火焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.)  由三丁基錫測試結果計算得之。 (Calculated from the result of Tributyl Tin (TBT).)  参考ISO 17353: 2004・以氣相層析儀/火焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.)	(Method) (Unit) (Unit) 参考ISO 18219-1: 2021・以氣相層析儀/ 質譜儀分析。(With reference to ISO 18219-1: 2021, analysis was performed by GC/MS.) 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.) 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.) 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.) 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.) 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.) 参考ISO 17353: 2004・以氣相層析儀/火焰光度偵測器分析。(With reference to ISO 17353: 2004・以氣相層析儀/火焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.) 由三丁基錫測試結果計算得之。 (Calculated from the result of Tributyl Tin (TBT).) 参考ISO 17353: 2004・以氣相層析儀/火焰光度偵測器分析。(With reference to ISO 17353: 2004・以氣相層析儀/火焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.)	(Method) (Unit) (Result) No.1 参考ISO 18219-1: 2021・以氣相層析儀/質譜儀分析。(With reference to ISO 18219-1: 2021, analysis was performed by GC/MS.) 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.) 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.) 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.) 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.) 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.) 参考ISO 17353: 2004・以氣相層析儀/次焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.) 参考ISO 17353: 2004・以氣相層析儀/次焰光度偵測器分析。(With reference to ISO 17353: 2004, analysis was performed by GC/FPD.) 由三丁基錫測試結果計算得之。 (Calculated from the result of Tributyl Tin (TBT).) 参考ISO 17353: 2004・以氣相層析儀/次焰光度偵測器分析。(With reference to ISO 17353: 2004・以氣相層析後/次焰光度偵測器分析。(With reference to ISO 17353: 2004・以氣相層析後/次焰光度信息表述



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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	
二辛基錫 (DOT) (Dioctyl tin (DOT))	參考ISO 17353: 2004 · 以氣相層析儀/火	mg/kg	0.03	n.d.	-
	焰光度偵測器分析。(With reference to				
	ISO 17353: 2004, analysis was				
	performed by GC/FPD.)				
六溴環十二烷及所有主要被辨別出的異構	參考IEC 62321: 2008 · 以氣相層析儀/質譜	mg/kg	5	n.d.	-
物(HBCDD) (α- HBCDD, β- HBCDD, γ-	儀分析。(With reference to IEC 62321:				
HBCDD) (Hexabromocyclododecane	2008, analysis was performed by				
(HBCDD) and all major	GC/MS.)				
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))					
聚氯乙烯 (Polyvinyl chloride) (PVC)	■ 参考ASTM E1252: 2021・以傅立葉轉換紅	**		Negative	_
I organistic inorder (i ve)	外線光譜儀及焰色法分析。(With			rteganie	
	reference to ASTM E1252: 2021, analysis				
	was performed by FT-IR and Flame Test.)				
全氟辛烷磺酸及其鹽類 (PFOS and its	修改EN 17681-1: 2022 & EN 17681-2:	mg/kg	0.01	n.d.	-
salts) (Perfluorooctane sulfonates and	2022,以液相層析串聯質譜儀分析。				
its salts (PFOS and its salts)) (CAS No.:	(Modified EN 17681-1: 2022 & EN				
1763-23-1 and its salts)	17681-2: 2022, analysis was performed				
	by LC/MS/MS.)				
全氟辛酸及其鹽類 (PFOA and its salts)	修改EN 17681-1: 2022 & EN 17681-2:	mg/kg	0.01	n.d.	-
(Perfluorooctanoic acid and its salts	2022,以液相層析串聯質譜儀分析。				
(PFOA and its salts)) (CAS No.: 335-67-1	I `				
and its salts)	17681-2: 2022, analysis was performed				
	by LC/MS/MS.)				



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(Test Items)	(Method)	(Unit)		(Result)	(Limit)
Number of the state of the stat				No.1	1000
鄰苯二甲酸二丁酯 (DBP) (Dibutyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	1000
phthalate (DBP))	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	1000
phthalate (BBP))	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	1000
(2-ethylhexyl) phthalate (DEHP))	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				
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))	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DIDP)) (CAS No.: 26761-40-	譜儀分析。(With reference to IEC 62321-				
0, 68515-49-1)	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DINP)) (CAS No.: 28553-12-	譜儀分析。(With reference to IEC 62321-				
0, 68515-48-0)	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl	參考IEC 62321-8: 2017,以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DNOP)) (CAS No.: 117-84-0)	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二 (C6-8支鏈)烷基酯,富C7	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	-
(DIHP) (1,2-Benzenedicarboxylic acid,	譜儀分析。(With reference to IEC 62321-				
di-C6-8-branched alkyl esters, C7-rich	8: 2017, analysis was performed by				
(DIHP)) (CAS No.: 71888-89-6)	GC/MS.)				



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•				結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
,	參考IEC 62321-8: 2017,以氣相層析儀/質	mg/kg	50	n.d.	-
` ' ' '	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
7	GC/MS.)				
42-4)					
, , , , , , , , , , , , , , , , , , , ,	參考IEC 62321-8: 2017,以氣相層析儀/質	mg/kg	50	n.d.	-
	譜儀分析。(With reference to IEC 62321-				
· ·	8: 2017, analysis was performed by				
	GC/MS.)				
	參考IEC 62321-8: 2017·以氣相層析儀/質	mg/kg	50	n.d.	-
•	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				
` / `	參考IEC 62321-8: 2017·以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DNHP)) (CAS No.: 84-75-3)	譜儀分析。(With reference to IEC 62321-				
8	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二乙酯 (DEP) (Di-ethyl	參考IEC 62321-8: 2017·以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DEP)) (CAS No.: 84-66-2)	譜儀分析。(With reference to IEC 62321-				
8	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二甲酯 (DMP) (Dimethyl	參考IEC 62321-8: 2017·以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DMP)) (CAS No.: 131-11-3)	譜儀分析。(With reference to IEC 62321-				
8	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二正戊酯 (DNPP) (Di-n-	參考IEC 62321-8: 2017·以氣相層析儀/質	mg/kg	50	n.d.	-
pentyl phthalate (DNPP)) (CAS No.:	譜儀分析。(With reference to IEC 62321-				
131-18-0)	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二丙酯 (DPrP) (Dipropyl	參考IEC 62321-8: 2017,以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DPrP)) (CAS No.: 131-16-8)	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				



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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	
鄰苯二甲酸二(支鏈及直鏈戊基)酯 (DPP)	參考IEC 62321-8: 2017,以氣相層析儀/質	mg/kg	50	n.d.	-
(1,2-Benzenedicarboxylic acid,	譜儀分析。(With reference to IEC 62321-				
dipentylester, branched and linear	8: 2017, analysis was performed by				
(DPP)) (CAS No.: 84777-06-0)	GC/MS.)				

#### 備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 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/未檢出); Positive = Detectable 陽性(已偵測到/檢出)
- 7. (#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 $0.10 \mu g/cm^2$ ),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  $0.10 \mu g/cm^2$ ). The coating is considered a non-Cr(VI) based coating)
  - c. 當六價鉻結果介於 0.10 及 0.13  $\mu g/cm^2$  時,無法確定塗層是否含有六價鉻。(The result between 0.10  $\mu g/cm^2$  and 0.13  $\mu g/cm^2$  is considered to be inconclusive unavoidable coating variations may influence the determination.)
- 8. ▲: 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

37.31 21 0 (33.11.31.31.11.31.11.31.11.31.31.31.31.3		
AX	Α	F
氧化雙三丁基錫 (Bis(tributyltin)oxide) (TBTO)	三丁基錫 (Tributyl Tin) (TBT)	1.0276

參數換算表 (Parameter Conversion Table):

https://eecloud.sgs.com/Region\_TW/DocDownload.aspx?name=Others

9. 除非另有說明,參照ILAC-G8:09/2019決定規則,採用簡單允收規則之二分法(w=0)進行符合性判定;根據此規則,符合性結果之判定係以測試結果與限值做比較。(Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.)



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#### PFAS Remark:

現有PFAS定量技術是分析PFAS物質的特定結構,但同碳數族群之PFAS酸及鹽類物質,其可被辨識的特定結構相同,因此無法區別所分析的特定結構是來自酸或者鹽類,故測試結果為同碳數族群之PFAS之酸及鹽類物質的濃度總合。下表PFAS物質濃度皆已包含在測試結果中,相關資訊請參見下表:(下表列舉PFAS物質僅為範例,並不包含所有同碳數族群之PFAS鹽類。)

(The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.))

群組名稱	物質名稱	CAS No.
(Group Name)	(Substance Name)	
	全氟辛烷磺酸 (Perfluorooctane sulfonates) (PFOS)	1763-23-1
	全氟辛基磺酸鉀 (PFOS-K)	2795-39-3
	Potassium perfluorooctanesulfonate (PFOS-K)	
	全氟辛基磺酸鋰 (PFOS-Li)	29457-72-5
	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	
	全氟辛基磺酸銨 (PFOS-NH <sub>4</sub> )	29081-56-9
	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH <sub>4</sub> )	
	全氟辛基磺酸二乙醇銨 (PFOS-NH(C2H4OH)2)	70225-14-8
	Perfluorooctane sulfonate diethanolamine salt (PFOS-	
	NH(C2H4OH)2)	
	全氟辛基磺酸四乙基銨 (PFOS-N(C <sub>2</sub> H <sub>5</sub> ) <sub>4</sub> )	56773-42-3
	Perfluorooctanesulfonic acid, tetraethylammonium salt	
PFOS, 及其鹽&衍生物	(PFOS-N(C <sub>2</sub> H <sub>5</sub> ) <sub>4</sub> )	
(PFOS, its salts & derivatives)	全氟辛基磺酸二癸二甲基銨 (PFOS-DDA)	251099-16-8
	N-decyl-N,N-dimethyldecan-1-aminium	
	1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-	
	sulfonate (PFOS-DDA)	
	全氟辛基磺酸四丁基銨 (PFOS-N(C <sub>4</sub> H <sub>9</sub> ) <sub>4</sub> )	111873-33-7
	TetrabutylAmmonium perfluorooctanesulfonate (PFOS-	
	$N(C_4H_9)_4)$	
	全氟辛基磺醯氟 (POSF)	307-35-7
	Perfluorooctane sulfonyl fluoride (POSF)	
	全氟辛基磺酸鎂 (PFOS-Mg)	91036-71-4
	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	
	全氟辛基磺酸鈉 (PFOS-Na)	4021-47-0
	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	



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群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
	全氟辛烷磺酸哌啶 Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8- heptadecafluorooctanesulfonate	71463-74-6
	全氟辛烷磺酸鹽 Perfluorooctanesulfonate (anion)	45298-90-6
	全氟辛烷磺酸與 N,N-二乙基乙胺 (1:1) (PFOS-N( $C_2H_5$ ) <sub>3</sub> ) 1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, compd. with N,N-diethylethanamine (1:1) (PFOS-N( $C_2H_5$ ) <sub>3</sub> )	54439-46-2
	N,N,N-三甲基-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-1-辛烷 磺酸甲銨(1:1) (PFOS-N(CH <sub>3</sub> ) <sub>4</sub> ) Methanaminium, N,N,N-trimethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1- octanesulfonate (1:1) (PFOS-N(CH <sub>3</sub> ) <sub>4</sub> )	56773-44-5
PFOS, 及其鹽&衍生物	1-五胺·N,N,N-三丙基-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七 氟-1 -辛烷磺酸鹽(1:1) (PFOS-N(C <sub>3</sub> H <sub>7</sub> ) <sub>3</sub> (C <sub>5</sub> H <sub>11</sub> )) 1-Pentanaminium, N,N,N-tripropyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1- octanesulfonate (1:1) (PFOS-N(C <sub>3</sub> H <sub>7</sub> ) <sub>3</sub> (C <sub>5</sub> H <sub>11</sub> ))	56773-56-9
(PFOS, its salts & derivatives)	$1$ -丁銨 · N,N-二丁基-N-甲基- · 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8 ,8-十七氟- $1$ -辛烷磺酸鹽 (1:1) (PFOS-N( $C_4H_9$ ) $_3$ (CH $_3$ ))	124472-68-0
	碘鎓・雙[4-(1,1-二甲基乙基)苯基]-・1,1,2,2,3,3,4,4,5,5,6,6,7,7 ,8,8,8 - 十七氟-1-辛烷磺酸鹽 (1:1) lodonium, bis[4-(1,1-dimethylethyl)phenyl]-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1- octanesulfonate (1:1)	213740-80-8
	三苯基鍺(2,4,6-三甲基苯基)-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8- 十七氟- 1-辛烷磺酸鹽 (1:1) Sulfonium, diphenyl(2,4,6-trimethylphenyl)-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1- octanesulfonate (1:1)	258341-99-0
	吡啶鎓 · 1-十六烷基- · 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七 氟-1 -辛烷磺酸鹽 (1:1) Pyridinium, 1-hexadecyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8- heptadecafluoro-1-octanesulfonate (1:1)	334529-63-4



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群組名稱	物質名稱	CAS No.
(Group Name)	(Substance Name)	
	1-癸胺·N,N,N-三乙基-·1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七 氟-1 -辛烷磺酸鹽(1:1) 1-Decanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1- octanesulfonate (1:1)	773895-92-4
	全氟辛烷磺酸四丁基鏻 (PFOS-P( $C_4H_9$ ) <sub>4</sub> )) Tetrabutylphosphonium perfluorooctane sulfonate (PFOS-P( $C_4H_9$ ) <sub>4</sub> ))	2185049-59-4
PFOS, 及其鹽&衍生物	全氟辛烷磺酸二乙胺鹽 (PFOS- $C_4H_{11}N$ ) Perfluorooctanesulfonic acid diethylamine salt (PFOS- $C_4H_{11}N$ )	2205029-08-7
(PFOS, its salts & derivatives)	庚基二甲基 $\{2-[(2-$ 甲基丙 $-2-$ 烯酰基)氧基 $\}$ 至氟辛烷磺酸氮	1203998-97-3
	1-辛烷磺酸·1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-,1,1'-酸酐 (PFOSAN) 1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, 1,1'-anhydride (PFOSAN)	423-92-7
	全氟辛基磺醯氯(PFOS-CI) Perfluoro-1-octanesulfonyl chloride (PFOS-CI)	423-60-9



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群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
	全氟辛酸 (Perfluorooctanoic acid) (PFOA)	335-67-1
	全氟辛酸鈉 (PFOA-Na) Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	全氟辛酸鉀 (PFOA-K) Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	全氟辛酸銀 (PFOA-Ag) Silver perfluorooctanote (PFOA-Ag)	335-93-3
	全氟辛氟 (PFOA-F) Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	全氟辛酸銨 (APFO) Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	全氟辛酸鋰 (PFOA-Li) Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
	全氟辛酸鈷 (PFOA-Co) Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6
PFOA, 及其鹽&衍生物 (PFOA, its salts & derivatives)	全氟辛酸銫 (PFOA-Cs) Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
	全氟辛酸鉻 (PFOA-Cr(3 <sup>+</sup> )) Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-Cr(3 <sup>+</sup> ))	68141-02-6
	全氟辛酸-哌嗪(2:1) PFOA-NH( $C_4H_{10}N$ ) Pentadecafluorooctanoic acidpiperazine (2/1)PFOA-NH( $C_4H_{10}N$ )	423-52-9
	全氟辛酸鹽 Pentadecafluorooctanoate (anion)	45285-51-6
	全氟辛酸酐 Perfluorooctanoic Anhydride	33496-48-9
	乙銨·N,N,N-三乙基-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟辛酸 (1:1) Ethanaminium, N,N,N-triethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8- pentadecafluorooctanoate (1:1)	98241-25-9
	全氟辛酸四甲銨鹽 Tetramethylammoniumperfluoroctanoat	32609-65-7



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群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
PFOA, 及其鹽&衍生物 (PFOA, its salts & derivatives)	1-丙鈹·N,N,N-三丙基-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟辛酸(1:1) 1-Propanaminium, N,N,N-tripropyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)	277749-00-5
	辛酸·2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟-鉀鹽·水合物 (1:1:2) (PFOA-K(H <sub>2</sub> O) <sub>2</sub> ) Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, potassium salt, hydrate (1:1:2) (PFOA-K(H <sub>2</sub> O) <sub>2</sub> )	98065-31-7
	辛酸·2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟-·化合物。與乙胺 (1:1) (PFOA-C <sub>2</sub> H <sub>7</sub> N) Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, compd. with ethanamine (1:1) (PFOA-C <sub>2</sub> H <sub>7</sub> N)	1376936-03-6
	十五氟辛酸化合物與吡啶 (1:1) (9CI) (PFOA- $C_5H_5N$ ) Octanoic acid, pentadecafluoro-, compd. with pyridine (1:1) (9CI) (PFOA- $C_5H_5N$ )	95658-47-2
	十五氟辛酸-1-苯基哌嗪(1:1) (PFOA- $C_{10}H_{14}N_2$ ) Pentadecafluorooctanoic acid- 1-phenylpiperazine(1:1) (PFOA- $C_{10}H_{14}N_2$ )	1514-68-7
	1-辛胺·N,N,N-三甲基-·2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟 辛酸(1:1) (PFOA- C <sub>11</sub> H <sub>26</sub> N) 1-Octanaminium, N,N,N-trimethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8- pentadecafluorooctanoate (1:1) (PFOA- C <sub>11</sub> H <sub>26</sub> N)	927835-01-6
	全氟辛醯氯 (PFOA-Cl) Pentadecafluorooctanoyl chloride (PFOA-Cl)	335-64-8



## **Test Report**

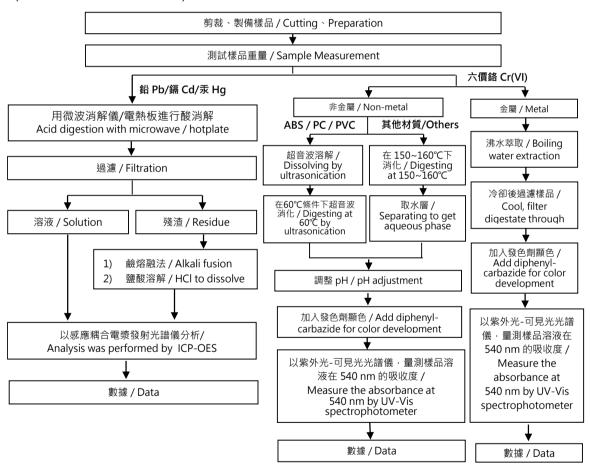
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#### 重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件,樣品已完全溶解。(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)



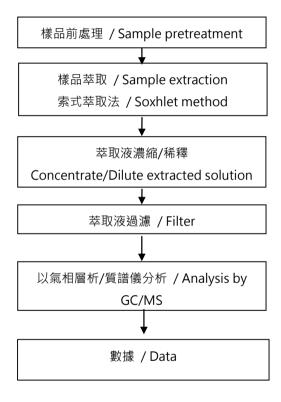


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#### 多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART





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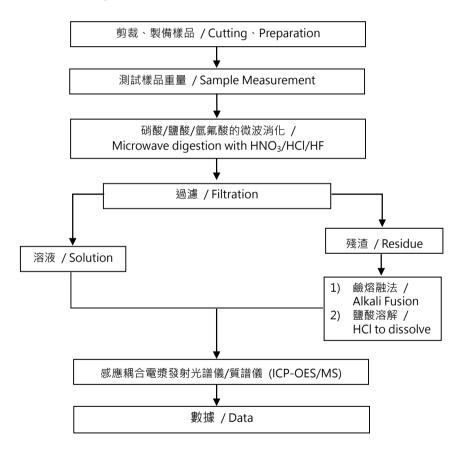
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#### 元素(含重金屬)分析流程圖 / Analytical flow chart of Elements (Heavy metal included)

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.

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



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



## **Test Report**

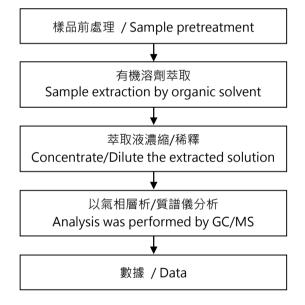
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#### 分析流程圖 / Analytical flow chart

【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



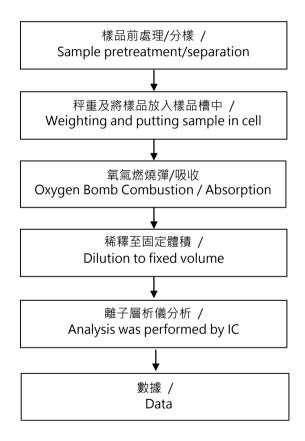


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#### 鹵素分析流程圖 / Analytical flow chart of Halogen



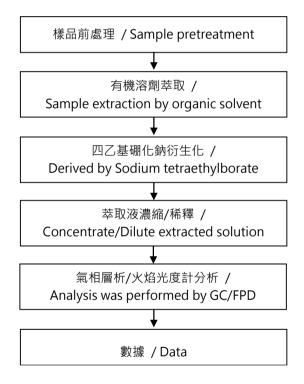


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#### 有機錫分析流程圖 / Analytical flow chart - Organic-Tin



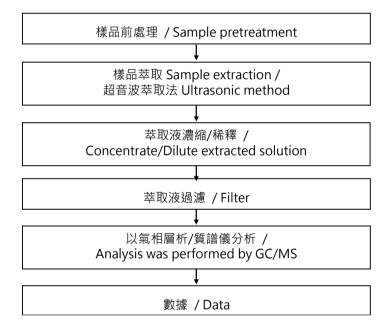


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#### 六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



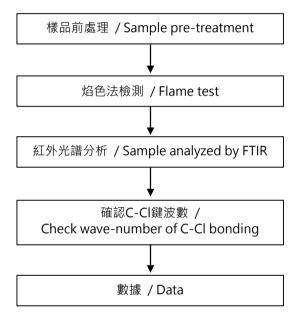


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#### 聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC



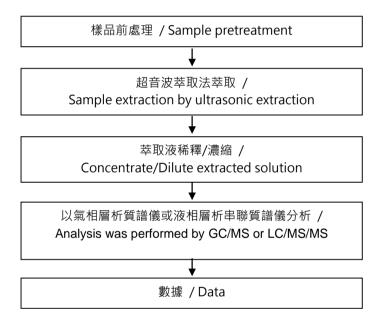


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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)





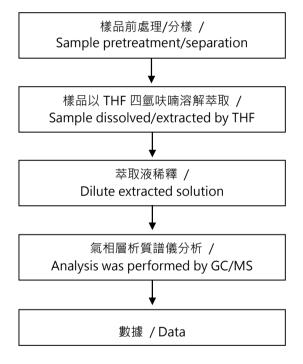
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#### 可塑劑分析流程圖 / Analytical flow chart of phthalate content

【測試方法/Test method: IEC 62321-8】





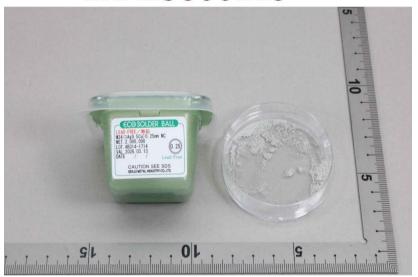
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\* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. \* (The tested sample / part is marked by an arrow if it's shown on the photo.)

## EKR25800119



\*\* 報告結尾 (End of Report) \*\*

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