

Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024 頁數(Page): 1 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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)

: 璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

樣品名稱(Sample Name)

EPI SUBSTRATE

樣品型號(Style/Item No.)

: EPI SUBSTRATE ALL SERIAL

收件日(Sample Receiving Date)

: 26-Aug-2024

測試期間(Testing Period)

: 26-Aug-2024 to 29-Aug-2024

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/限伯睿 博士/部 图理**SGS**Ray Chang, Ph.D./ Department Manager
Signed for and on behalit SGS TAIWAN LTD.
化學實驗室-高雄/Chemical Laboratory-Kaohsiung

CHECK REPORT

PIN CODE: 7CB9247D



Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024 頁數(Page): 2 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

測試部位敘述 (Test Part Description)

No.1 : EPI SUBSTRATE

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	n.d.	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))	参考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 Cr(VI) (Hexavalent Chromium	參考IEC 62321-7-2: 2017·以紫外光-可見	mg/kg	8	n.d.	1000
Cr(VI))	光分光光度計分析。(With reference to				
	IEC 62321-7-2: 2017, 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)	→ 參考IEC 62321-6: 2015 · 以氣相層析儀/質	mg/kg	5	n.d.	-
五溴聯苯 (Pentabromobiphenyl)	iii (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



Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024 頁數(Page): 3 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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)	 参考IEC 62321-6: 2015·以氣相層析儀/質	mg/kg	5	n.d.	-
五溴聯苯醚 (Pentabromodiphenyl ether)	ii 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	1	n.d.	1000
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl		mg/kg	50	n.d.	1000
phthalate (BBP))					
鄰苯二甲酸二丁酯 (DBP) (Dibutyl		mg/kg	50	n.d.	1000
phthalate (DBP))					
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl		mg/kg	50	n.d.	1000
phthalate (DIBP))					
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl		mg/kg	50	n.d.	-
phthalate (DINP)) (CAS No.: 28553-12-					
0, 68515-48-0)	 参考IEC 62321-8: 2017·以氣相層析儀/質				
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-	参与IEC 02321-8. 2017,以来怕層別讓/員 譜儀分析。(With reference to IEC 62321-	mg/kg	50	n.d.	1000
(2-ethylhexyl) phthalate (DEHP))	8: 2017, analysis was performed by				
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl	GC/MS.)	mg/kg	50	n.d.	-
phthalate (DIDP)) (CAS No.: 26761-40-	GC/1413.)				
0, 68515-49-1)					
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl		mg/kg	50	n.d.	-
phthalate (DNOP)) (CAS No.: 117-84-0)					
鄰苯二甲酸二正戊酯 (DNPP) (Di-n-		mg/kg	50	n.d.	-
pentyl phthalate (DNPP)) (CAS No.:					
131-18-0)					
鄰苯二甲酸二正己酯 (DNHP) (Di-n-hexyl		mg/kg	50	n.d.	-
phthalate (DNHP)) (CAS No.: 84-75-3)					



Test Report

號碼(No.): EKR24801391

日期(Date): 29-Aug-2024

頁數(Page): 4 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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(2-甲氧基乙基)酯 (DMEP)		mg/kg	50	n.d.	-
(Bis(2-methoxyethyl) phthalate (DMEP))					
(CAS No.: 117-82-8)	 參考IEC 62321-8: 2017,以氣相層析儀/質				
鄰苯二甲酸正戊異戊酯 (NPIPP) (N-pentyl	iii 儀分析。(With reference to IEC 62321-	mg/kg	50	n.d.	-
iso-pentyl phthalate (NPIPP)) (CAS No.:	8: 2017, analysis was performed by				
776297-69-9)	GC/MS.)				
鄰苯二甲酸二異戊酯 (DIPP) (Diisopentyl	GC, 1113.)	mg/kg	50	n.d.	-
phthalate (DIPP)) (CAS No.: 605-50-5)					
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-		mg/kg	50	n.d.	-
8)					
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-	 参考BS EN 14582: 2016·以離子層析儀分	mg/kg	50	n.d.	-
15-1)	析。(With reference to BS EN 14582:				
溴 (Br) (Bromine (Br)) (CAS No.: 10097-	2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
32-2)	, , ,				
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)		mg/kg	50	n.d.	-
			2.2		
六溴環十二烷及所有主要被辨別出的異構	參考IEC 62321-9: 2021 · 以氣相層析儀/質	mg/kg	20	n.d.	-
物(HBCDD) (α- HBCDD, β- HBCDD, γ-	譜儀分析。(With reference to IEC 62321-				
HBCDD) (Hexabromocyclododecane (HBCDD) and all major	9: 2021, analysis was performed by				
diastereoisomers identified (α - HBCDD,	GC/MS.)				
β- HBCDD, y- HBCDD)) (CAS No.:					
25637-99-4, 3194-55-6 (134237-51-7,					
134237-50-6, 134237-52-8))					
餅 (Sb) (Antimony (Sb)) (CAS No.: 7440-	⇔ ≯UC FDA 20F2:1006 □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□	ma/ka	2	n.d.	
55 (Antimony (Sb)) (CAS No.: 7440- 36-0)	參考US EPA 3052: 1996·以感應耦合電漿 發射光譜儀分析。(With reference to US	mg/kg	2	H.G.	-
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-	BPA 3052: 1996, analysis was performed	ma/ka	2	n.d.	
数 (Be) (Beryllium (Be)) (CAS No.: 7440- 41-7)	by ICP-OES.)	mg/kg		H.u.	-
+1-/)	by ICI OLS.)				



Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024 頁數(Page): 5 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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. 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.)



Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024

頁數(Page): 6 of 12

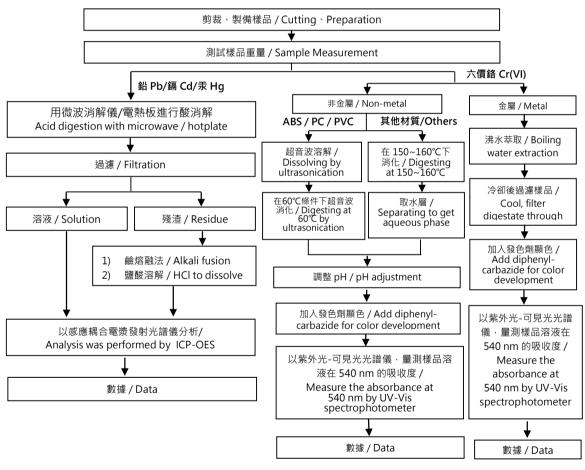
璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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)





Test Report

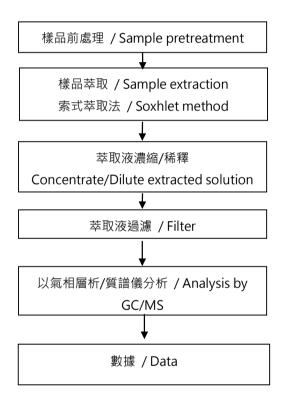
號碼(No.): EKR24801391 日期(Date): 29-Aug-2024

頁數(Page): 7 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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





Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024

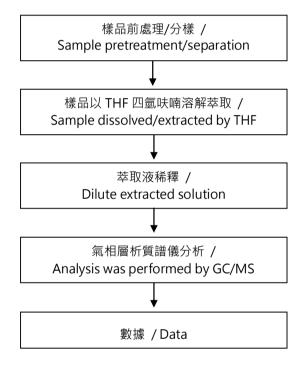
(Date): 29-Aug-2024 頁數(Page): 8 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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

【測試方法/Test method: IEC 62321-8】





Test Report

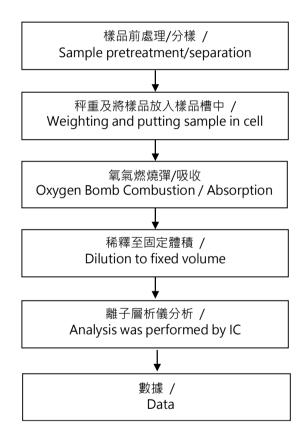
號碼(No.): EKR24801391 日期(Date): 29-Aug-2024

頁數(Page): 9 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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





Test Report

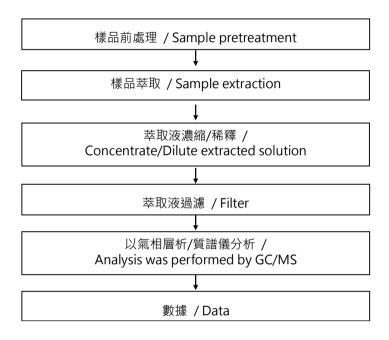
號碼(No.): EKR24801391 日期(Date): 29-Aug-2024

頁數(Page): 10 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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





Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024

頁數(Page): 11 of 12

璟茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.)

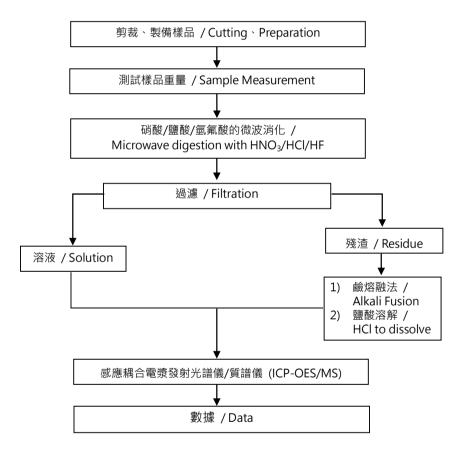
高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

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.

【參考方法/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.



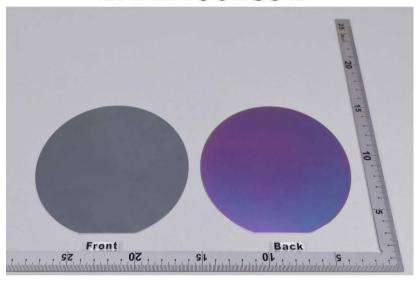
Test Report

號碼(No.): EKR24801391 日期(Date): 29-Aug-2024 頁數(Page): 12 of 12

環茂科技股份有限公司 (PYNMAX TECHNOLOGY CO., LTD.) 高雄市永安區永工一路17-2號 (NO.17-2, YONG GONG 1ST RD., YONG AN DISTRICT, KAOHSIUNG CITY 82841, TAIWAN)

* 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.)

EKR24801391



** 報告結尾 (End of Report) **