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# **Test Report**

台灣化學纖維股份有限公司 FORMOSA CHEMICALS & FIBRE CORPORATION 台北市敦化北路201號 201, TUNG HWA N. ROAD, TAIPEI, 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/on behalf of the applicant as):

送樣廠商(Sample Submitted Bv) 台灣化學纖維股份有限公司 (FORMOSA CHEMICALS & FIBRE CORPORATION)

樣品名稱(Sample Description) PC+20%GF AC2120 Grade

FORMOSA CHEMICALS & FIBRE CORPORATION Manufacturer

TAIRILITE AC2120 PC20GF Material Part Number

Color O WHITE Color code F1001-47 收件日期(Sample Receiving Date) 2019/11/06

測試期間(Testing Period) 2019/11/06 to 2019/11/12

#### 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測試編、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, DEHP, DIBP contents in the submitted sample(s).)

(2) 依據客戶指定,檢測 PAHs 及其他測項. (As specified by client, to test PAHs and 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,其鐍、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.)

(2) 根據客戶所提供的樣品,18項多環芳香烴測試結果符合德國產品安全委員會(AfPS) GS PAHs第 2 類 「列於德國產品安全法之其他產品」之限值要求. (Based upon the performed tests on the submitted sample(s), the test results of PAHs (18 items) comply with the limits of PAHs requirement (Category 2) <sup>↑</sup>Other products under ProdSG<sub>→</sub> as set by German Committee on Product Safety (AfPS) GS PAHs.)

Troy Chang / Manager - Tec 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 : 白色塑膠 (WHITE PLASTIC)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) No.1	限值 (Limit)
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	2	n. d.	100
鉛 / Lead (Pb)	mg/kg	to IEC 62321-5 (2013) and performed by ICP-OES.	2	n. d.	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)	mg/kg	多考IEC 62321-7-2 (2017),以UV-VIS檢 測. / With reference to IEC 62321-7- 2 (2017) and performed by UV-VIS.	8	n. d.	1000
多溴聯苯總和 / Sum of PBBs	mg/kg		-	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	參考IEC 62321-6 (2015),以氣相層析/	5	n. d.	_
五溴聯苯 / Pentabromobiphenyl	mg/kg	質譜儀檢測. / With reference to IEC	5	n. d.	_
六溴聯苯 / Hexabromobiphenyl	mg/kg	62321-6 (2015) and performed by GC/MS.	5	n. d.	_
七溴聯苯 / Heptabromobiphenyl	mg/kg	oo/ mo.	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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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) No.1	限值 (Limit)
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		_	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	<del>-</del>		n. d.	-
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg	參考IEC 62321-6 (2015),以氣相層析/	5	n. d.	-
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg	質譜儀檢測. / With reference to IEC	5	n. d.	-
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg	62321-6 (2015) and performed by GC/MS.	5	n. d.	-
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg	GC/ MS.	5	n. d.	-
へ溴聯苯醚 / 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 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n. d.	1000
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	參考IEC 62321-8 (2017),以氣相層析/ 質譜儀檢測. / With reference to IEC	50	n. d.	1000
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	62321-8 (2017). Analysis was performed by GC/MS.	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
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 ( $\alpha$ - HBCDD, $\beta$ - HBCDD, $\gamma$ - 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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測試項目 (Test Items)	單位 (Unit)	* * * * * * * * * * * * * * * * * * * *		結果 (Result) No.1	限值 (Limit)
多環芳香煙 / Polycyclic Aromatic				110. 1	
Hydrocarbons (PAHs)					
苊 / Acenaphthene (CAS No.: 83-32-9)	mg/kg		0.2	n. d.	-
苊烯 / Acenaphthylene (CAS No.: 208-96-8)	mg/kg		0.2	n. d.	-
蔥 / Anthracene (CAS No.: 120-12-7)	mg/kg		0.2	n. d.	-
苯騈蒽 / Benzo[a]anthracene (CAS No.: 56-55-3)	mg/kg		0.2	n. d.	-
苯騈(a)芘 / Benzo[a]pyrene (CAS No.: 50-32-8)	mg/kg		0. 2	n. d.	-
苯(b)苯駢芴 / Benzo[b]fluoranthene (CAS No.: 205-99-2)	mg/kg		0. 2	n. d.	-
苯駢芘 / Benzo[g, h, i]perylene (CAS No.: 191-24-2)	mg/kg		0. 2	n. d.	-
苯騈(k)螢蔥 / Benzo[k]fluoranthene (CAS No.: 207-08-9)	mg/kg	參考AfPS GS 2014:01 PAK,以氣相層析/	0. 2	n. d.	-
Chrysene (CAS No.: 218-01-9)	mg/kg	質譜儀檢測. / With reference to AfPS	0.2	n. d.	_
二苯駢蒽 / Dibenzo[a,h]anthracene (CAS No.: 53-70-3)	mg/kg	GS 2014:01 PAK. Analysis was performed by GC/MS.	0. 2	n. d.	-
苯騈苊 / Fluoranthene (CAS No.: 206-44-0)	mg/kg		0. 2	n. d.	-
芴 / Fluorene (CAS No.: 86-73-7)	mg/kg		0.2	n. d.	_
茚酮芘 / Indeno[1, 2, 3-c, d] pyrene (CAS No.: 193-39-5)	mg/kg		0.2	n. d.	-
茶 / Naphthalene (CAS No.: 91-20-3)	mg/kg		0.2	n. d.	_
菲 / Phenanthrene (CAS No.: 85-01-8)	mg/kg		0.2	n. d.	_
芘 / Pyrene (CAS No.: 129-00-0)	mg/kg		0.2	n. d.	-
苯(j)苯駢芴 / Benzo[j]fluoranthene (CAS No.: 205-82-3)	mg/kg		0. 2	n. d.	-
苯騈(e)芘 / Benzo[e]pyrene (CAS No.: 192-97-2)	mg/kg		0.2	n. d.	-
多環芳香烴18項總和 / Sum of 18 PAHs	mg/kg		-	n. d.	Δ



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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) No.1	限值 (Limit)
鹵素 / Halogen					
鹵素(氟)/ Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg		50	2240	-
鹵素 (氣) / Halogen-Chlorine (C1) (CAS No.: 22537-15-1)	mg/kg	参考BS EN 14582 (2016),以離子層析儀 分析. / With reference to BS EN	50	n. d.	-
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	14582 (2016). Analysis was performed by IC.	50	n. d.	-
鹵素(碘)/ Halogen-Iodine(I)(CAS No.: 14362-44-8)	mg/kg		50	n. d.	-

#### 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)



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#### $\Delta$ 德國產品安全委員會(AfPS) GS PAHs 要求 /

AfPS (German commission for Product Safety): GS PAHs requirements

	第1類(Category 1)	第2類(Ca	ategory 2)	第3類(Ca	ategory 3)	
項目 (Parameter)	the mouth of toys to skill for ronger than of see		與皮膚接觸). lling under oreseeable contact r than 30 seconds	可預見與皮膚接觸短於30秒(短期與皮膚接觸),以及不屬於第1類或第2類的材料. (Materials not falling under category 1 or 2 with foreseeable contact to skin for less than 30 seconds (short-term skin contact).)		
	30 s).)	玩具 (Toy under 2009/48/EC)	列於德國產品安全法 之其他產品(Other products under ProdSG)	列於2009/48/EC之 玩具 (Toy under 2009/48/EC)	列於德國產品安全法 之其他產品(Other products under ProdSG)	
Naphthalene	< 1	<	< 2	< 10		
Acenaphthylene						
Acenaphthene						
Fluorene						
Phenanthrene	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum	
Anthracene						
Fluoranthene						
Pyrene						
Benzo[a]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Chrysene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Benzo[b]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Benzo[j]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Benzo[k]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Benzo[a]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Benzo[e]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Indeno[1, 2, 3-c, d] pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Dibenzo[a, h]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
Benzo[g,h,i]perylene	< 0.2	< 0.2	< 0.5	< 0.5	< 1	
18項PAH總濃度 (Sum of 18 PAH)	< 1	< 5	< 10	< 20	< 50	

單位(Unit):mg/kg



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

日期(Date): 2019/12/10

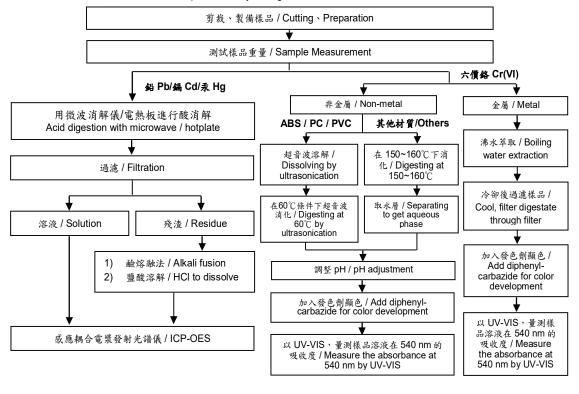
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根據以下的流程圖之條件,樣品已完全溶解。(六價鉻測試方法除外)

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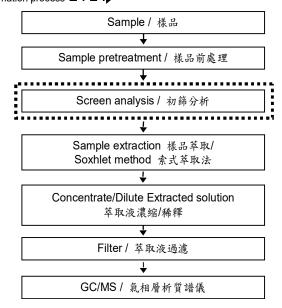
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#### 多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

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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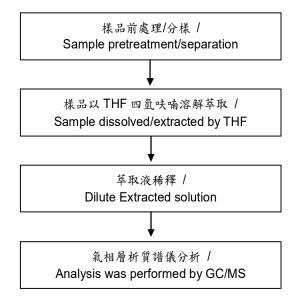
台灣化學纖維股份有限公司 FORMOSA CHEMICALS & FIBRE CORPORATION 台北市敦化北路201號 201, TUNG HWA N. ROAD, TAIPEI, TAIWAN

#### 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

【測試方法/Test method: IEC 62321-8】





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

日期(Date): 2019/12/10

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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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樣品前處理 / Sample pretreatment 樣品萃取 Sample extraction / 超音波萃取法 Ultrasonic method 萃取液濃縮/稀釋 / Concentrate/Dilute Extracted solution 萃取液過濾 / Filter 以氣相層析/質譜儀分析 / Analysis was performed by GC/MS 數據 / Data



**Test Report** 

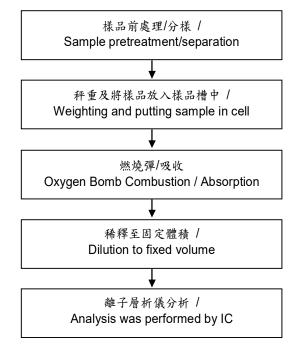
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#### 鹵素分析流程圖 / Analytical flow chart - Halogen

測試人員:陳恩臻 / Technician: Rita Chen

測試負責人:張啟興 / Supervisor: Troy Chang





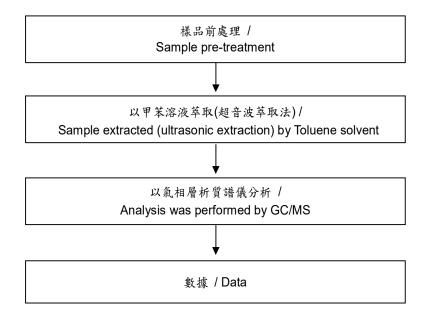
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#### 多環芳香烴分析流程圖 / Analytical flow chart - PAHs (Polycyclic Aromatic Hydrocarbons)

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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> \* 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) \*\*