

Test Report

號碼(No.): EKR23302192M01 日期(Date): 15-Jun-2023 頁數(Page): 1 of 17

光頡科技股份有限公司高雄分公司 (VIKING TECH CORPORATION KAOHSIUNG BRANCH) 高雄市前鎮區新生路248-3號 (NO. 284-3, SIN-SHENG RD., CIAN-JHEN DIST., KAOHSIUNG, 806, 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) 光頡科技股份有限公司高雄分公司 (VIKING TECH CORPORATION KAOHSIUNG

BRANCH)

樣品名稱(Sample Name) THICK FILM CHIP RESISTOR

樣品型號(Style/Item No.) CR(AC)/CN/RT/AS/HVR/PWR/SWR/HMR/CR..A/AS..A/CN..A/

HVRC/CRW/CNF/CNF..A/CRTC..A/PWR..A/SWR..A/HVR..A/

CRW.A

收件日(Sample Receiving Date) 25-Mar-2023

測試期間(Testing Period) 25-Mar-2023 to 07-Apr-2023

測試需求(Test Requested) 依據客戶要求進行測試‧測試項目請參閱測試結果表格。 (Testing item(s) is/are

specified by client. Please refer to result table for testing item(s).)

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

Ray Chang, Ph.D./ Department Manage Signed for and on behalf SĞS TAIWAN LTD.

化學實驗室-高雄/Chemical Laboratory-Kaohsiung





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測試部位敘述 (Test Part Description)

No.1 : 整體混測 (MIXED ALL PARTS)

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
鎘 (Cd) (Cadmium (Cd))	參考IEC 62321-5: 2013·以感應耦合電漿發射光	mg/kg	2	n.d.
	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 · 以感應耦合電漿發射光	mg/kg	2	923
	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,以感應耦	mg/kg	2	n.d.
	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-可見光分光	mg/kg	8	n.d.
Cr(VI))	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)		mg/kg	5	n.d.
五溴聯苯 (Pentabromobiphenyl)	參考IEC 62321-6: 2015,以氣相層析儀/質譜儀分	mg/kg	5	n.d.
六溴聯苯 (Hexabromobiphenyl)	析。(With reference to IEC 62321-6: 2015,	mg/kg	5	n.d.
七溴聯苯 (Heptabromobiphenyl)	analysis was performed by GC/MS.)	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.



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測試項目	測試方法	單位	MDL	結果
(Test Items)	(Method)	(Unit)		(Result)
				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)		mg/kg	5	n.d.
五溴聯苯醚 (Pentabromodiphenyl ether)	參考IEC 62321-6: 2015,以氣相層析儀/質譜儀分	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.
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	ı	n.d.
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl		mg/kg	50	n.d.
phthalate (BBP))				
鄰苯二甲酸二丁酯 (DBP) (Dibutyl		mg/kg	50	n.d.
phthalate (DBP))				
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl	1	mg/kg	50	n.d.
phthalate (DIBP))				
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-	 参考IEC 62321-8: 2017·以氣相層析儀/質譜儀分	mg/kg	50	n.d.
(2-ethylhexyl) phthalate (DEHP))				
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl	析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
phthalate (DINP)) (CAS No.: 28553-12-	lanalysis was performed by GC/Wis.			
0, 68515-48-0)				
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl		mg/kg	50	n.d.
phthalate (DIDP)) (CAS No.: 26761-40-				
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)				



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測試項目	測試方法	單位	MDL	結果
(Test Items)	(Method)	(Unit)		(Result)
				No.1
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·以離子層析儀分析。	mg/kg	50	n.d.
15-1)	(With reference to BS EN 14582: 2016, analysis			
溴 (Br) (Bromine (Br)) (CAS No.: 10097-	was performed by IC.)	mg/kg	50	n.d.
32-2)	was performed by fe.,			
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)		mg/kg	50	n.d.
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/質譜儀分	mg/kg	5	n.d.
物(HBCDD) (α- HBCDD, β- HBCDD, γ-	析。(With reference to IEC 62321: 2008, analysis			
HBCDD) (Hexabromocyclododecane	was performed by GC/MS.)			
(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))				
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-	參考US EPA 3052: 1996·以感應耦合電漿發射光	mg/kg	2	n.d.
36-0)	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·以感應耦合電漿發射光	mg/kg	2	n.d.
41-7)	譜儀分析。(With reference to US EPA 3052:			
	1996, analysis was performed by ICP-OES.)			
砷 (As) (Arsenic (As)) (CAS No.: 7440-	參考US EPA 3052: 1996·以感應耦合電漿發射光	mg/kg	2	n.d.
38-2)	譜儀分析。(With reference to US EPA 3052:			
	1996, analysis was performed by ICP-OES.)			



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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result) No.1
石綿 (Asbestos)				
陽起石綿 (Actinolite) (CAS No.: 77536- 66-4)	參考EPA 600/R-93/116: 1993·以立體顯微鏡(SM)與分散染色式偏光顯微鏡(DS-PLM)及X光繞射光譜分析法(XRD)分析。(With reference to EPA 600/R-93/116: 1993, analysis was performed by Stereo Microscope (SM), Dispersion Staining Polarized Light Microscope (DS-PLM) and X-ray Diffraction Spectrometer (XRD).)	-	-	Negative
褐石綿/鐵石綿 (Amosite) (CAS No.: 12172-73-5)		-	-	Negative
斜方角閃石綿 (Anthophyllite) (CAS No.: 77536-67-5)		-	-	Negative
白石綿/溫石綿 (Chrysotile) (CAS No.: 12001-29-5)		-	-	Negative
青石綿 (Crocidolite) (CAS No.: 12001- 28-4)		-	-	Negative
透閃石綿 (Tremolite) (CAS No.: 77536-68-6)		-	-	Negative
中鏈氯化石蠟(C14-C17) (MCCP) (Medium Chain Chlorinated Paraffins(C14-C17) (MCCP)) (CAS No.: 85535-85-9)	參考ISO 18219-2: 2021 · 以氣相層析儀/質譜儀分析。(With reference to ISO 18219-2: 2021, analysis was performed by GC/MS.)	mg/kg	50	n.d.
四溴雙酚 A (TBBP-A) (Tetrabromobisphenol A (TBBP-A)) (CAS No.: 79-94-7)	參考RSTS-E&E-121 · 以液相層析儀/質譜儀分析。 (With reference to RSTS-E&E-121, analysis was performed by LC/MS.)	mg/kg	10	n.d.
全氟辛酸 (PFOA)及其鹽類 (Perfluorooctanoic acid (PFOA) and it's salt) (CAS No.: 335-67-1 and its salts)	參考CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	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CEN/TS 15968: 2010 · 以液相層析串聯質譜 儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.



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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. 石綿定性分析試驗範圍: <0.1%~100%,石綿鑑定的判定基準是以檢出含有石綿纖維為『Positive』,未檢出石綿纖維為『Negative』。(Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".)
- 6. 全氟辛烷磺酸及其鹽類包含等物質 (PFOS and its salts including): CAS No.: 1763-23-1, 2795-39-3, 29457-72-5, 29081-56-9, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7, 91036-71-4, 4021-47-0 and others.
- 7. 全氟辛酸及其鹽類包含等物質 (PFOA and its salts including): CAS No.: 335-67-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 3825-26-1 and others.
- 8. 樣品的測試是基於申請人要求混合測試‧報告中的混合測試結果不代表其中個別單一材質的含量。
 The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value.
- 9. 本報告為 EKR23302192 之異動報告。(This is the additional test report of EKR23302192.)



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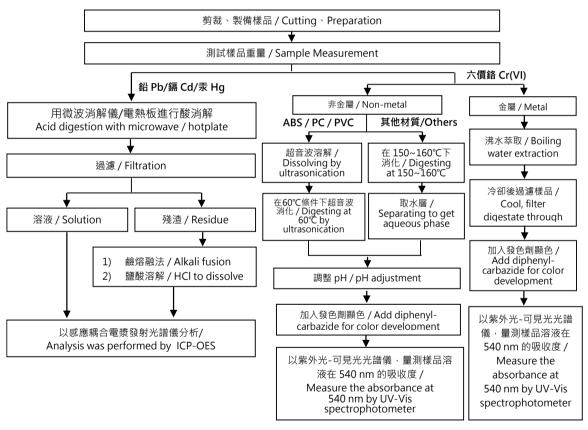
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重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件,樣品已完全溶解。(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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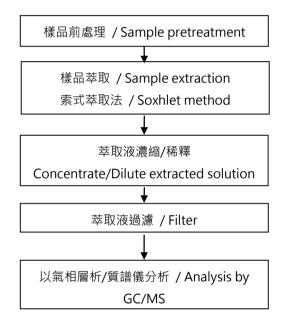
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多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART





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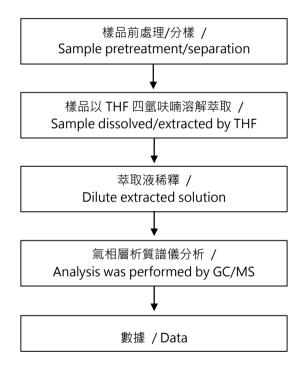
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

【測試方法/Test method: IEC 62321-8】



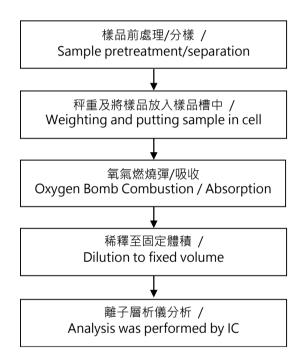


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鹵素分析流程圖 / Analytical flow chart of Halogen



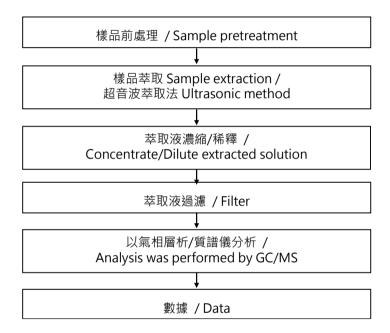


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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD





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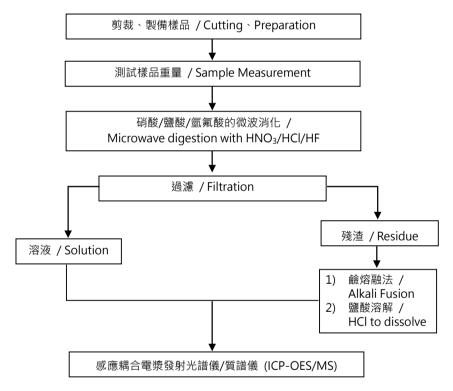
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元素(含重金屬)分析流程圖 / Analytical flow chart of Elements (Heavy metal included)

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.

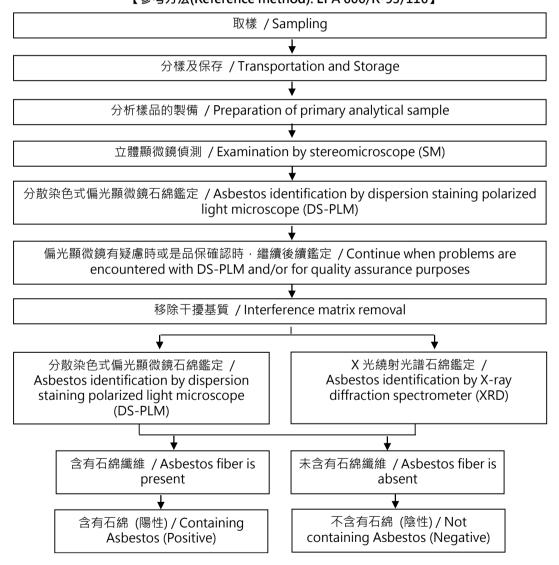


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石綿鑑定分析流程圖 / Analysis flow chart for determination of Asbestos 【參考方法(Reference method): EPA 600/R-93/116】



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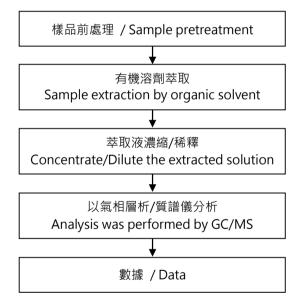
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分析流程圖 / Analytical flow chart

【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



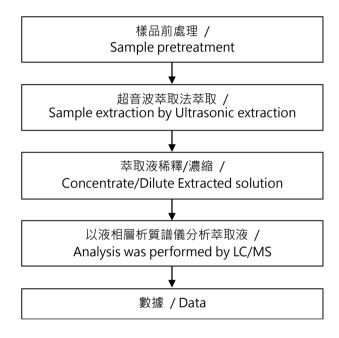


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四溴雙酚-A分析流程圖 / TBBP-A analytical flow chart



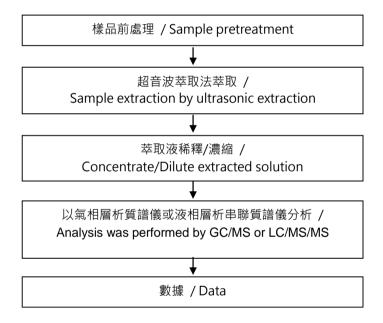


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光頡科技股份有限公司高雄分公司 (VIKING TECH CORPORATION KAOHSIUNG BRANCH) 高雄市前鎮區新生路248-3號 (NO. 284-3, SIN-SHENG RD., CIAN-JHEN DIST., KAOHSIUNG, 806, TAIWAN)

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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* 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.)

EKR23302192



** 報告結尾 (End of Report) **