

Test Report

號碼(No.): EKR23100496 日期(Date): 19-Jan-2023

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國巨股份有限公司楠梓分公司(國巨/飛元/華亞) (YAGEO CORPORATION NANTZE BRANCH (YAGEO/PHYCOMP/COMPOSTAR))

811626高雄市楠梓區西三街16號 (NO. 16, WEST. 3RD ST., NANZIH DIST., KAOHSIUNG (N.T.I.P) 811626, 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)

國巨股份有限公司楠梓分公司 (YAGEO CORPORATION NANTZE BRANCH)

樣品名稱(Sample Name)

: MULTI-LAYER CERAMIC CAPACITOR

樣品型號(Style/Item No.)

: X5R

收件日(Sample Receiving Date)

04-Jan-2023

測試期間(Testing Period)

04-Jan-2023 to 19-Jan-2023

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.)

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.)





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測試部位敘述 (Test Part Description)

No.1 : 棕色/銀色 MULTI-LAYER CERAMIC CAPACITOR (BROWN/SILVER MULTI-LAYER CERAMIC

CAPACITOR)

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-	參考IEC 62321-5: 2013,以感應耦合電漿	mg/kg	2	n.d.	100
43-9)	發射光譜儀分析。(With reference to IEC				
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	, i	mg/kg	2	n.d.	1000
	by ICP-OES.)				
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-	參考IEC 62321-4: 2013+ AMD1: 2017,	mg/kg	2	n.d.	1000
97-6)	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)) (CAS No.: 18540-29-9)	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)	參考IEC 62321-6: 2015·以氣相層析儀/質 譜儀分析。(With reference to IEC 62321- 6: 2015, analysis was performed by GC/MS.)	mg/kg	5	n.d.	=
四溴聯苯 (Tetrabromobiphenyl)		mg/kg	5	n.d.	=
五溴聯苯 (Pentabromobiphenyl)		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)	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/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	ı	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)					
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl		mg/kg	50	n.d.	1000
phthalate (DIBP)) (CAS No.: 84-69-5)					
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	 參考IEC 62321-8: 2017 · 以氣相層析儀/質				
No.: 117-81-7)	i				
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl	譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by	mg/kg	50	n.d.	-
phthalate (DINP)) (CAS No.: 28553-12-	GC/MS.)				
0, 68515-48-0)	GC/MS.)				
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)					
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)					



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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	
鄰苯二甲酸二正戊酯 (DNPP) (Di-n-		mg/kg	50	n.d.	-
pentyl phthalate (DNPP)) (CAS No.:	參考IEC 62321-8: 2017 · 以氣相層析儀/質				
131-18-0)	譜儀分析。(With reference to IEC 62321-				
鄰苯二甲酸二(2-甲氧基乙基)酯 (DMEP)	8: 2017, analysis was performed by	mg/kg	50	n.d.	=
(Bis-(2-methoxyethyl) phthalate	GC/MS.)				
(DMEP)) (CAS No.: 117-82-8)					
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)	Lead, amaryona maa parrammaa ay ran,				
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)		mg/kg	50	n.d.	-
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-	参考US EPA 3052: 1996 · 以感應耦合電漿	mg/kg	2	n.d.	-
36-0)	發射光譜儀分析。(With reference to US				
	EPA 3052: 1996, analysis was performed				
	by ICP-OES.)				
三氧化二銻(Sb₂O₃) (Antimony trioxide	由銻結果計算得之。(Calculated from the	mg/kg	2▲	n.d.	-
(Sb ₂ O ₃)) (CAS No.: 1309-64-4)	result of Antimony.)				

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)



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5. ▲: 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
三氧化二銻 (Antimony trioxide) (Sb ₂ O ₃)	銻 (Antimony)	1.1971

參數換算表 (Parameter Conversion Table):

https://eecloud.sgs.com/Region_TW/DocDownload.aspx?name=Others

6. 除非另有說明·參照ILAC-G8:09/2019·採用簡單二元(w=0)允收規則進行符合性判定;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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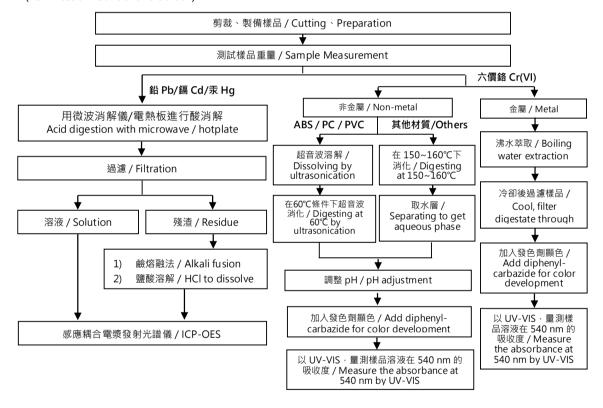
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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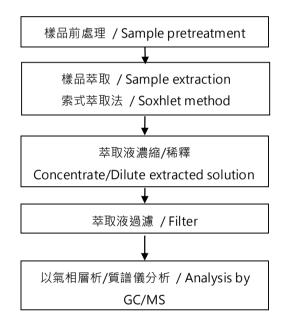
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多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART





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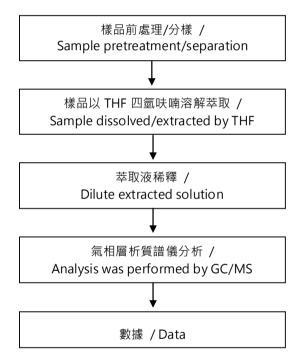
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

【測試方法/Test method: IEC 62321-8】





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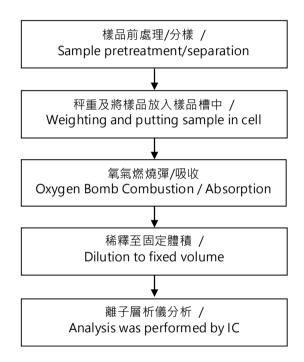
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鹵素分析流程圖 / Analytical flow chart of Halogen





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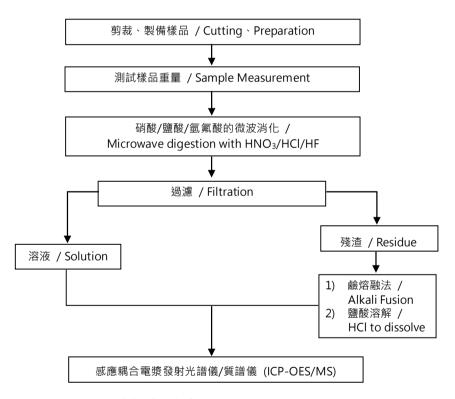
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元素(含重金屬)分析流程圖 / Analytical flow chart of Elements (Heavy metal included)

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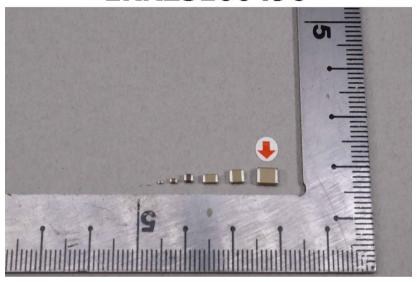
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

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** 報告結尾 (End of Report) **