

測試報告

Test Report

號碼(No.): ETA22B00062

日期(Date): 18-Nov-2022

頁數(Page): 1 of 19

ISOLA GROUP

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):

樣品名稱(Sample Name) : LAMINATE 樣品型號(Style/Item No.) : FR408 HR

收件日(Sample Receiving Date)

: 09-Nov-2022

測試期間(Testing Period)

: 09-Nov-2022 to 18-Nov-2022

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,其編、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)

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.)

Troy Chang / Department Makager
Signed for and on behalf of Alwah
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: D44A5C89



號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 2 of 19

ISOLA GROUP

測試部位敘述 (Test Part Description)

No.1 : 銅色片狀 (COPPER COLORED SHEET)

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	限值 (Limit)
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013 · 以感應耦合電漿 發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	100
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013 · 以感應耦合電漿 發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	1000
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013 + AMD1: 2017 · 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.)	mg/kg	2	n.d.	1000
六價鉻 (Hexavalent Chromium) Cr(VI) (CAS No.: 18540-29-9) (◆)	參考IEC 62321-5: 2013, IEC 62321-7-2: 2017 · 以感應耦合電漿發射光譜儀、紫外光-可見光分光光度計分析。(With reference to IEC 62321-5: 2013, IEC 62321-7-2: 2017, analysis was performed by ICP-OES, UV-VIS.)	mg/kg	8	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)	- 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) 七溴聯苯 (Heptabromobiphenyl)		mg/kg	5 5	n.d. n.d.	-
八溴聯苯 (Octabromobiphenyl)		mg/kg mg/kg	5	n.a. 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

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at https://www.sgs.com.tw/terms-of-service. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

新北市五股區新北產業園區五權七路 25 號 t+886(02)2299 3939 f+886(02)2299 3237 25, Wu Chyuan 7th Road, New Taipei Industrial Park, Wu Ku District, New Taipei City, Taiwan



ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 3 of 19

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.	ı
三溴聯苯醚 (Tribromodiphenyl ether)		mg/kg	5	n.d.	ı
四溴聯苯醚 (Tetrabromodiphenyl ether)	 參考 EC 62321-6: 2015 · 以氣相層析儀/質	mg/kg	5	n.d.	ı
五溴聯苯醚 (Pentabromodiphenyl ether)	参与IEC 02321-0. 2013,以無怕層が 酸/貝 譜儀分析。(With reference to IEC 62321-	mg/kg	5	n.d.	ı
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
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(2-乙基己基)酯 (DEHP) (Di-	1	mg/kg	50	n.d.	1000
(2-ethylhexyl) phthalate (DEHP)) (CAS					
No.: 117-81-7)					
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質 譜儀分析。(With reference to IEC 62321-	mg/kg	50	n.d.	1000
phthalate (DIBP)) (CAS No.: 84-69-5)	•				
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl	-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
phthalate (DIDP)) (CAS No.: 26761-40-					
0, 68515-49-1)					
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)					
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)					



ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 4 of 19

測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
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))					
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-		mg/kg	50	542	-
8)					
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-	參考BS EN 14582: 2016 · 以離子層析儀分	mg/kg	50	63.4	=
15-1)	析。(With reference to BS EN 14582:			1==00	
溴 (Br) (Bromine (Br)) (CAS No.: 10097-	2016, analysis was performed by IC.)	mg/kg	50	15500	-
32-2)			F0		
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)	# */·· • · • • • • • • • · · · · · · ·	mg/kg	50	n.d.	=
全氟辛烷磺酸及其鹽類 (PFOS and its	参考US EPA 3550C: 2007 · 以液相層析串	mg/kg	10	n.d.	-
salts) (CAS No.: 1763-23-1 and its salts)	聯質譜儀分析。(With reference to US	/1	10		
全氟辛酸及其鹽類 (PFOA and its salts)	EPA 3550C: 2007, analysis was performed by LC/MS/MS.)	mg/kg	10	n.d.	_
(CAS No.: 335-67-1 and its salts)	参考RSTS-E&E-121·以液相層析儀/質譜	ma /lea	10	n.d.	
四溴雙酚-A (TBBP-A) (Tetrabromobisphenol A (TBBP-A))	参考KSTS-E&E-121 · 以被怕層が展/真蹟 儀分析。(With reference to RSTS-E&E-	mg/kg	10	n.a.	_
(CAS No.: 79-94-7)	121, analysis was performed by LC/MS.)				
雙酚A (Bisphenol A) (CAS No.: 80-05-7)	参考RSTS-CHEM-239-1 · 以液相層析串聯	ma/ka	1	n.d.	
愛朗A (BISPHEHOLA) (CAS No 60-05-7)	質譜儀分析。(With reference to RSTS-	mg/kg	1	n.a.	_
	CHEM-239-1, analysis was performed by				
	LC/MS/MS.)				
有機錫 (Organic-tin compounds)	ze, me, me.,				
三丁基錫 (TBT) (Tributyl tin (TBT))	參考ISO 17353: 2004 · 以氣相層析儀/火	mg/kg	0.03	n.d.	-
三苯基錫 (TPT) (Triphenyl tin (TPT))	焰光度偵測器分析。(With reference to	mg/kg	0.03	n.d.	-
二丁基錫 (DBT) (Dibutyl tin (DBT))	ISO 17353: 2004, analysis was performed by GC/FPD.)	mg/kg	0.03	n.d.	-
二辛基錫 (DOT) (Dioctyl tin (DOT))		mg/kg	0.03	n.d.	-
氧化雙三丁基錫 (TBTO) (Bis(tributyltin)	由三丁基錫測試結果計算得之。	mg/kg	0.03 🛦	n.d.	-
oxide (TBTO)) (CAS No.: 56-35-9)	(Calculated from the result of Tributyl				
	Tin (TBT).)				



測試報告

Test Report

ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 5 of 19

測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
聚氯乙烯 (Polyvinyl chloride) (PVC)	參考ASTM E1252: 2021 · 以傅立葉轉換紅	**	-	Negative	-
	外線光譜儀及焰色法分析。(With				
	reference to ASTM E1252: 2021, analysis				
	was performed by FT-IR and Flame Test.)				
砷 (As) (Arsenic (As)) (CAS No.: 7440-	參考US EPA 3052: 1996,以感應耦合電漿	mg/kg	2	n.d.	-
38-2)	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.)				
鎳 (Ni) (Nickel (Ni)) (CAS No.: 7440-02-	參考US EPA 3052: 1996,以感應耦合電漿	mg/kg	2	31.2	-
0)	發射光譜儀分析。(With reference to US				
	EPA 3052: 1996, analysis was performed				
	by ICP-OES.)				
磷 (P) (Phosphorus (P)) (CAS No.: 7723-	參考US EPA 3052: 1996,以感應耦合電漿	mg/kg	2	31.5	-
14-0)	發射光譜儀分析。(With reference to US				
	EPA 3052: 1996, analysis was performed				
	by ICP-OES.)				
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.)				
錫 (Sn) (Tin (Sn)) (CAS No.: 7440-31-5)	參考US EPA 3052: 1996,以感應耦合電漿	mg/kg	2	n.d.	-
	發射光譜儀分析。(With reference to US				
	EPA 3052: 1996, analysis was performed				
	by ICP-OES.)				
總揮發性有機物質 (Total volatile organic	參考US EPA 5021A: 2014 · 以氣相層析儀/	mg/kg	1	n.d.	-
compounds (TVOC))	質譜儀分析。(With reference to US EPA				
	5021A: 2014, analysis was performed by				
	GC/MS.)				



號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 6 of 19

ISOLA GROUP

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); Positive = Detectable 陽性(已偵測到)
- 7. 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.

8. 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.

9. (*):

若鉻含量小於六價鉻之方法偵測極限值,則六價鉻為n.d.,不須再測試六價鉻。

The result of Cr(VI) is "n.d." as the result of Chromium (Cr) is less than the MDL of Cr(VI), and confirmation test of Cr(VI) is not required.

若鉻含量未小於六價鉻之方法偵測極限值,需進行六價鉻測試。

If the Chromium (Cr) content is not less than the MDL of Cr(VI), confirmation test of Cr(VI) is required.

10. ▲: 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	A	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#otherDoc

11. 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.)



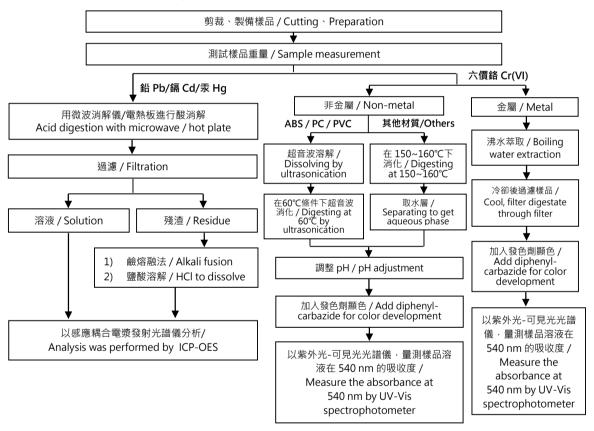
ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 7 of 19

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)

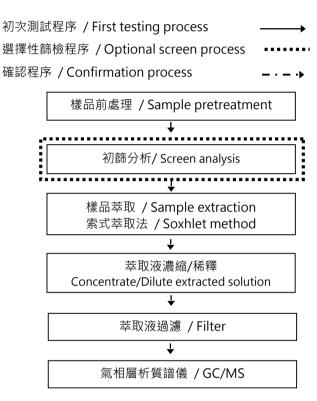




ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 8 of 19

多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



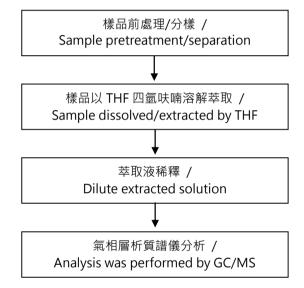


ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 9 of 19

可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】

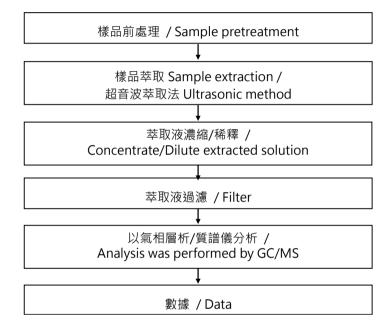




ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 10 of 19

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





ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 11 of 19

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

樣品前處理/分樣 / Sample pretreatment / Separation

平重及將樣品放入樣品槽中 / Weighting and putting sample in cell

燃燒彈/吸收 / Oxygen bomb combustion / Absorption

稀釋至固定體積 / Dilution to fixed volume

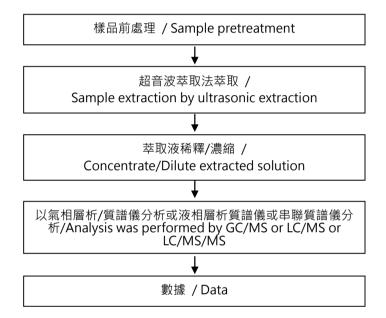
以離子層析儀分析 / Analysis was performed by IC



ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 12 of 19

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.)

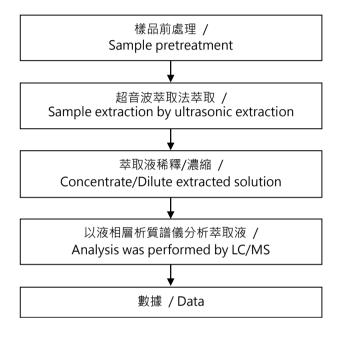




ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 13 of 19

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

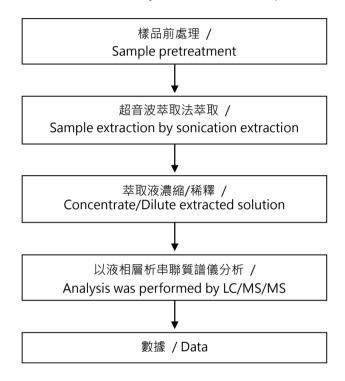




ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 14 of 19

雙酚A分析流程圖 / Analytical flow chart - Bisphenol A

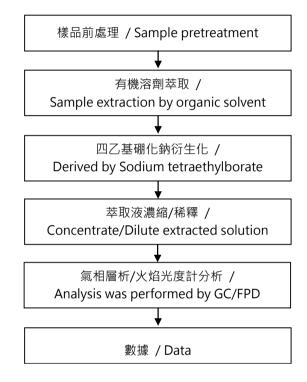




ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 15 of 19

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

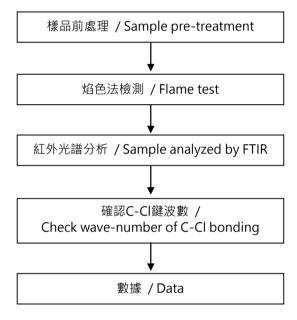




ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 16 of 19

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





ISOLA GROUP

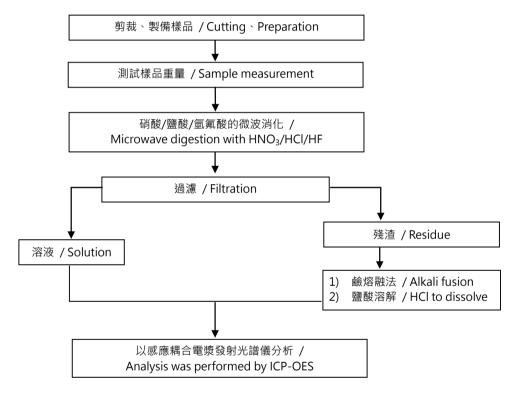
號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 17 of 19

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 3051A、US EPA 3052】



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

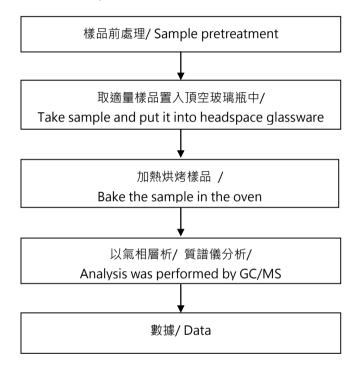


ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 18 of 19

揮發性有機化合物分析流程圖/ Analytical flow chart of volatile organic compounds (VOCs)

【參考方法/ Reference method: US EPA 5021A】





ISOLA GROUP

號碼(No.): ETA22B00062 日期(Date): 18-Nov-2022 頁數(Page): 19 of 19

* 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.)

ETA22B00062



** 報告結尾 (End of Report) **