

Test Report

號碼(No.): EKR23901023 日期(Date): 22-Sep-2023 頁數(Page): 1 of 16

台灣麥德美股份有限公司 (MACDERMID PERFORMANCE SOLUTIONS TAIWAN LTD.)
新竹縣湖口鄉光復北路77號 (77 KUANG FU N. RD, HSIN-CHU ENLARGED INDUSTRIAL PARK, HSIN-CHU 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) : 台灣麥德美股份有限公司 (MACDERMID PERFORMANCE SOLUTIONS TAIWAN

LTD.)

樣品名稱(Sample Name) : MICROFAB CU MSA 100 MU, MICROFAB CU MSA 100 R,

MICROFAB CU MSA 200 MU, MICROFAB CU MSA 200 R, MICROFAB NF ACID, MICROFAB SC COPPER SULFATE

收件日(Sample Receiving Date) : 18-Sep-2023

測試期間(Testing Period) : 18-Sep-2023 to 22-Sep-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.)

報告簽署人/張伯睿 博士/部 報告簽署人/張伯睿 博士/部 Ray Chang, Ph.D./ Department Manager Signed for and on behali SGS TAIWAN LTD. 化學實驗室-高雄/Chemical Laboratory-Kaohsiung



PIN CODE: 800F41E5



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測試部位敘述 (Test Part Description)

No.1 : 藍色液體(客戶自行調配之樣品) (BLUE LIQUID (SAMPLE IS BLENDED BY CLIENT))

測試結果 (Test Results)

測試項目 (Task Harra)	測試方法	單位 (Unit)	MDL	結果 (Posult)
(Test Items)	(Method)	(Unit)		(Result) No.1
鎘 (Cd) (Cadmium (Cd))	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.
鉛 (Pb) (Lead (Pb))	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.
汞 (Hg) (Mercury (Hg))	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.
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI))	參考IEC 62321-7-2: 2017·以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.
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	mg/kg	5	n.d.
六溴聯苯 (Hexabromobiphenyl)	儀分析。(With reference to IEC 62321-6:	mg/kg	5	n.d.
七溴聯苯 (Heptabromobiphenyl)	2015, 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	mg/kg	5	n.d.
六溴聯苯醚 (Hexabromodiphenyl ether)	儀分析。(With reference to IEC 62321-6:	mg/kg	5	n.d.
七溴聯苯醚 (Heptabromodiphenyl ether)	2015, analysis was performed by GC/MS.)	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	-	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		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	mg/kg	50	n.d.
(2-ethylhexyl) phthalate (DEHP))	後分析。(With reference to IEC 62321-8:			
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl	2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
phthalate (DINP)) (CAS No.: 28553-12-	2017, analysis was performed by GC/W3.)			
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)
		a		No.1
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-		mg/kg	50	n.d.
8) = (CI) (CI) (CASA) = 22527		//	F.0	
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-	參考BS EN 14582: 2016 · 以離子層析儀分	mg/kg	50	n.d.
15-1) 海 (Pa) (Paparaina (Pa)) (CAC No. 10007	析。(With reference to BS EN 14582: 2016,		50	al
溴 (Br) (Bromine (Br)) (CAS No.: 10097- 32-2)	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.
全氟辛酸 (PFOA)及其鹽類			0.01	
主無干酸 (PrOA)及兵鹽粮 (Perfluorooctanoic acid (PFOA) and it's	參考CEN/TS 15968: 2010,以液相層析串聯	mg/kg	0.01	n.d.
salt) (CAS No.: 335-67-1 and its salts)	質譜儀分析。(With reference to CEN/TS			
全氟辛烷磺酸及其鹽類 (PFOS and its	15968: 2010, analysis was performed by	mg/kg	0.01	n.d.
salts) (CAS No.: 1763-23-1 and its salts)	LC/MS/MS.)	1119/19	0.01	ii.d.
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-	参考US EPA 3052: 1996·以感應耦合電漿發	mg/kg	2	n.d.
36-0)	射光譜儀分析。(With reference to US EPA	3. 3		
	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	mg/kg	2	n.d.
41-7)	射光譜儀分析。(With reference to US EPA			
	3052: 1996, analysis was performed by			
	ICP-OES.)			
N,N-二甲基乙醯胺 (DMAC) (N,N-	參考US EPA 3550C: 2007 · 以氣相層析儀/質	mg/kg	10	n.d.
Dimethylacetamide (DMAC)) (CAS No.:	譜儀分析。(With reference to US EPA			
127-19-5)	3550C: 2007, analysis was performed by			
	GC/MS.)			
聚氯乙烯 (Polyvinyl chloride) (PVC)	參考ASTM E1252: 2021 · 以傅立葉轉換紅外	**	-	Negative
	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.)			



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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. **= 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)



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PFAS Remark:

現有PFAS定量技術是分析PFAS物質的特定結構,但同碳數族群之PFAS酸及鹽類物質,其可被辨識的特定結構相同,因此無法區別所分析的特定結構是來自酸或者鹽類,故測試結果為同碳數族群之PFAS之酸及鹽類物質的濃度總合。下表PFAS物質濃度皆已包含在測試結果中,相關資訊請參見下表:(下表列舉PFAS物質僅為範例,並不包含所有同碳數族群之PFAS鹽類。) (The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The

analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.))

物質濃度分類 (Classification of Substance Concentration)	物質名稱 (Substance Name)	CAS No.
全氟辛烷磺酸及其鹽類 Perfluorooctane sulfonates and its salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	全氟辛基磺酸鉀 (PFOS-K) Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
	全氟辛基磺酸鋰 (PFOS-Li) Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
	全氟辛基磺酸銨 (PFOS-NH ₄) Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄)	29081-56-9
	全氟辛基磺酸二乙醇銨 (PFOS-NH(OH) ₂) Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)	70225-14-8
	全氟辛基磺酸四乙基銨 (PFOS-N(C_2H_5) ₄) Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-N(C_2H_5) ₄)	56773-42-3
	全氟辛基磺酸二癸二甲基銨 (PFOS-DDA) N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-DDA)	251099-16-8
	全氟辛基磺醯氟 (POSF) Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	全氟辛基磺酸鎂 (PFOS-Mg) Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	全氟辛基磺酸鈉 (PFOS-Na) Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0

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物質濃度分類 (Classification of Substance Concentration)	物質名稱 (Substance Name)	CAS No.
	全氟辛酸鈉 (PFOA-Na) Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	全氟辛酸鉀 (PFOA-K) Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	全氟辛酸銀 (PFOA-Ag) Silver perfluorooctanote (PFOA-Ag)	335-93-3
	全氟辛氟 (PFOA-F) Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	全氟辛酸銨 (APFO) Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	全氟辛酸鋰 (PFOA-Li) Lithium perfluorooctanoate (PFOA-Li)	17125-58-5



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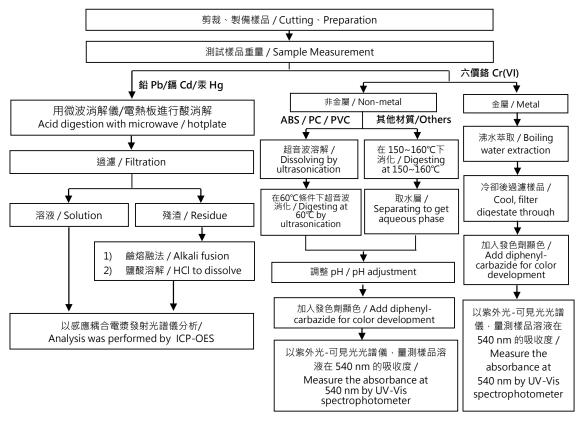
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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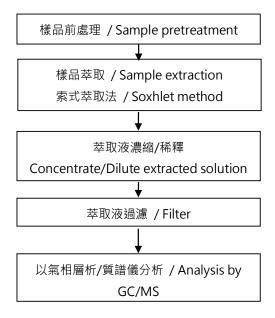
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多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART





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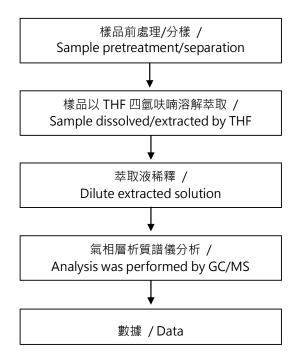
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

【測試方法/Test method: IEC 62321-8】



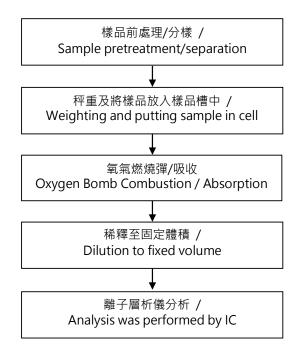


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鹵素分析流程圖 / Analytical flow chart of Halogen



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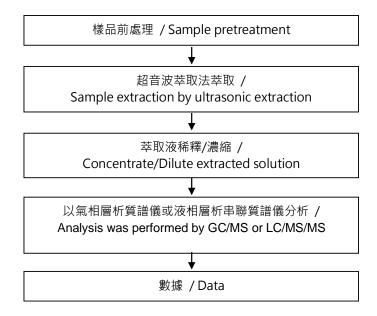


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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)





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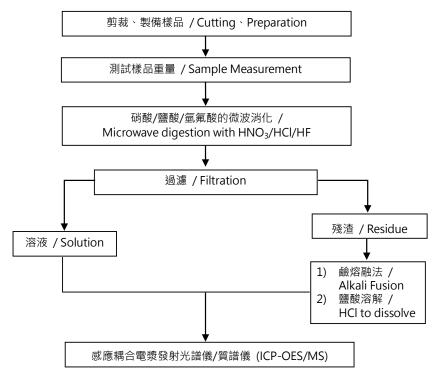
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元素(含重金屬)分析流程圖 / Analytical flow chart of Elements (Heavy metal included)

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.

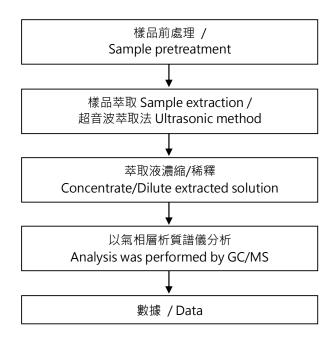


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台灣麥德美股份有限公司 (MACDERMID PERFORMANCE SOLUTIONS TAIWAN LTD.) 新竹縣湖口鄉光復北路77號 (77 KUANG FU N. RD, HSIN-CHU ENLARGED INDUSTRIAL PARK, HSIN-CHU TAIWAN)

N, N-二甲基乙醯胺分析流程圖 / Analytical flow chart of N,N-Dimethylacetamide





Test Report

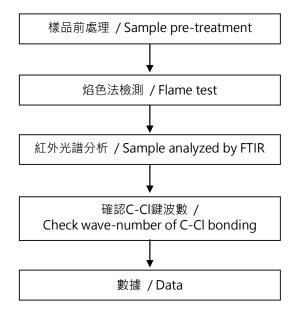
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聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC





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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.)

EKR23901023



** 報告結尾 (End of Report) **