



檢測報告 Test Report

報告編號 A220001844914101E
Report No. A220001844914101E

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申請單位 加高電子股份有限公司(深圳)
Applicant HARMONY ELECTRONICS(SHEN ZHEN)
地址 深圳市寶安區福永街道塘尾社區橋塘路聚源工業區
Address JU YUAN INDUSTRIAL PARK,QIAO TANG ROAD,TANG WEI
COMMUNITY,FUYONG,BAOAN DISTRICT,SHEN AHEN CITY,PEOPLE'S REPUBLIC OF
CHINA.

以下測試之樣品及樣品信息由申請者提供並確認

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

樣品名稱 Sample Name(s)	CRYSTAL
樣品型號 Part No.	SMD-49
樣品顏色 Color	Silver
材料名稱 Material	SPACER
供應商 Supplier	HARMONY ELECTRONICS(SHEN ZHEN)
樣品接收日期	2020.02.24
Sample Received Date	Feb. 24, 2020
樣品檢測日期	2020.02.24-2020.02.29
Testing Period	Feb. 24, 2020 to Feb. 29, 2020
檢測要求	根據客戶要求, 對所提交樣品中的鉛(Pb), 鎘(Cd), 汞(Hg), 六價鉻(Cr(VI)), 多溴聯苯(PBBs), 多溴二苯醚(PBDEs), 鄰苯二甲酸酯進行測試。
Test Requested	As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs), Phthalates in the submitted sample(s).
檢測依據/檢測結果	請參見下頁。
Test Method/Test Result(s)	Please refer to the following page(s).

主 檢 張孝瑜 審 核 耿雨竹
Tested by _____ Reviewed by _____

批 准 陳凱敏 日 期 2020.03.02
Approved by _____ Date _____

陳凱敏
實驗室經理 Lab Manager

No. T172791790

上海市閔行區萬芳路 1351 號

上海華測品標檢測技術有限公司
Centre Testing International Pinbiao(Shanghai) Co., Ltd.

No.1351, Wanfang Road, Minhang District, Shanghai, China



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以下測試之樣品及樣品信息由申請者提供並確認

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

樣品序號 Sample No.	引用報告編號-樣品序號 Reference Report No. -Sample No.
001	A2200018449139E-001
002	A2200018449139E-002
003	A2200018449139E-003
004	A2200018449139E-004
005	A2200018449139E-005
006	A2200018449139E-006
007	A2200018449141E-007

備註:

上表格涉及到引用數據的樣品本次未測試。根據客戶聲明，“引用報告編號-樣品序號”列與“樣品序號”列對應的樣品為同材質，故“樣品序號”列測試結果及圖片引自於對應的“引用報告編號-樣品序號”列的數據及圖片。

Remark:

The samples with the reference information in the table above are non-tested in this report. According to the client's statement, the material of the samples in the column "Reference Report No. -Sample No. " in the table above are the same as the "Sample No.", so the test results and the photos of the "Sample No." are presented in reference to that one.

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檢測依據 Test Method

測試項目 Tested Item(s)	測試方法 Test Method	測試儀器 Measured Equipment(s)
鉛 Lead(Pb)	IEC 62321-5:2013	ICP-OES
鎘 Cadmium(Cd)	IEC 62321-5:2013	ICP-OES
汞 Mercury(Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
六價鉻 Hexavalent Chromium(Cr(VI))	IEC 62321-7-1:2015	UV-Vis
	IEC 62321-7-2:2017	UV-Vis
多溴聯苯 Polybrominated Biphenyls(PBBs)	IEC 62321-6:2015	GC-MS
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS
鄰苯二甲酸酯 Phthalates	IEC 62321-8:2017	GC-MS

檢測結果 Test Result(s)

測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	001	002	003	
鉛 Lead (Pb)	N.D.	N.D.	N.D.	2 mg/kg
鎘 Cadmium (Cd)	N.D.	N.D.	N.D.	2 mg/kg
汞 Mercury (Hg)	N.D.	N.D.	N.D.	2 mg/kg
六價鉻 Hexavalent Chromium (Cr(VI))	--	--	--	8 mg/kg
	N.D.▼	N.D.▼	N.D.▼	0.10 µg/cm ² (LOQ)

測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	004	005	006	
鉛 Lead (Pb)	N.D.	N.D.	N.D.	2 mg/kg
鎘 Cadmium (Cd)	N.D.	N.D.	N.D.	2 mg/kg
汞 Mercury (Hg)	N.D.	N.D.	N.D.	2 mg/kg
六價鉻 Hexavalent Chromium (Cr(VI))	--	N.D.	N.D.	8 mg/kg
	N.D.▼	--	--	0.10 µg/cm ² (LOQ)

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測試項目 Tested Item(s)	結果 Result		方法檢出限 MDL
	007		
鉛 Lead (Pb)	N.D.		2 mg/kg
鎘 Cadmium (Cd)	N.D.		2 mg/kg
汞 Mercury (Hg)	N.D.		2 mg/kg
六價鉻 Hexavalent Chromium (Cr(VI))	N.D.		8 mg/kg
	--		0.10 µg/cm ² (LOQ)

測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	001	002	003	
多溴聯苯 Polybrominated Biphenyls(PBBs)				
一溴聯苯 Monobromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
二溴聯苯 Dibromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
三溴聯苯 Tribromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
四溴聯苯 Tetrabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
五溴聯苯 Pentabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
六溴聯苯 Hexabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
七溴聯苯 Heptabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
八溴聯苯 Octabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
九溴聯苯 Nonabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
十溴聯苯 Decabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg

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測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	004	005	006	
多溴聯苯 Polybrominated Biphenyls(PBBs)				
一溴聯苯 Monobromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
二溴聯苯 Dibromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
三溴聯苯 Tribromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
四溴聯苯 Tetrabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
五溴聯苯 Pentabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
六溴聯苯 Hexabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
七溴聯苯 Heptabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
八溴聯苯 Octabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
九溴聯苯 Nonabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg
十溴聯苯 Decabromobiphenyl	N.D.	N.D.	N.D.	5 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	007	
多溴聯苯 Polybrominated Biphenyls(PBBs)		
一溴聯苯 Monobromobiphenyl	N.D.	5 mg/kg
二溴聯苯 Dibromobiphenyl	N.D.	5 mg/kg
三溴聯苯 Tribromobiphenyl	N.D.	5 mg/kg
四溴聯苯 Tetrabromobiphenyl	N.D.	5 mg/kg
五溴聯苯 Pentabromobiphenyl	N.D.	5 mg/kg
六溴聯苯 Hexabromobiphenyl	N.D.	5 mg/kg
七溴聯苯 Heptabromobiphenyl	N.D.	5 mg/kg
八溴聯苯 Octabromobiphenyl	N.D.	5 mg/kg
九溴聯苯 Nonabromobiphenyl	N.D.	5 mg/kg
十溴聯苯 Decabromobiphenyl	N.D.	5 mg/kg

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測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	001	002	003	
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)				
一溴二苯醚 Monobromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
三溴二苯醚 Tribromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
四溴二苯醚 Tetrabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
五溴二苯醚 Pentabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
六溴二苯醚 Hexabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
七溴二苯醚 Heptabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
八溴二苯醚 Octabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
九溴二苯醚 Nonabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
十溴二苯醚 Decabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg

測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	004	005	006	
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)				
一溴二苯醚 Monobromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
三溴二苯醚 Tribromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
四溴二苯醚 Tetrabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
五溴二苯醚 Pentabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
六溴二苯醚 Hexabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
七溴二苯醚 Heptabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
八溴二苯醚 Octabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
九溴二苯醚 Nonabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg
十溴二苯醚 Decabromodiphenyl ether	N.D.	N.D.	N.D.	5 mg/kg

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測試項目 Tested Item(s)	結果 Result		方法檢出限 MDL
	007		
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)			
一溴二苯醚 Monobromodiphenyl ether	N.D.		5 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.		5 mg/kg
三溴二苯醚 Tribromodiphenyl ether	N.D.		5 mg/kg
四溴二苯醚 Tetrabromodiphenyl ether	N.D.		5 mg/kg
五溴二苯醚 Pentabromodiphenyl ether	N.D.		5 mg/kg
六溴二苯醚 Hexabromodiphenyl ether	N.D.		5 mg/kg
七溴二苯醚 Heptabromodiphenyl ether	N.D.		5 mg/kg
八溴二苯醚 Octabromodiphenyl ether	N.D.		5 mg/kg
九溴二苯醚 Nonabromodiphenyl ether	N.D.		5 mg/kg
十溴二苯醚 Decabromodiphenyl ether	N.D.		5 mg/kg

測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	001	002	003	
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)				
鄰苯二甲酸二丁酯 Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	N.D.	N.D.	50 mg/kg
鄰苯二甲酸丁基苄基酯 Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	N.D.	N.D.	50 mg/kg
鄰苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	N.D.	N.D.	50 mg/kg
鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	N.D.	N.D.	50 mg/kg

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測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	004	005	006	
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)				
鄰苯二甲酸二丁酯 Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	N.D.	N.D.	50 mg/kg
鄰苯二甲酸丁基苄基酯 Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	N.D.	N.D.	50 mg/kg
鄰苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	N.D.	N.D.	50 mg/kg
鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	N.D.	N.D.	50 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	007	
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)		
鄰苯二甲酸二丁酯 Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg
鄰苯二甲酸丁基苄基酯 Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	50 mg/kg
鄰苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	50 mg/kg
鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg

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測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	001	002	003	
鄰苯二甲酸酯 Phthalates				
鄰苯二甲酸二異壬酯 Di-isononyl phthalate (DINP) CAS#:28553-12-0,68515-48-0	N.D.	N.D.	N.D.	50 mg/kg

測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	004	005	006	
鄰苯二甲酸酯 Phthalates				
鄰苯二甲酸二異壬酯 Di-isononyl phthalate (DINP) CAS#:28553-12-0,68515-48-0	N.D.	N.D.	N.D.	50 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	007	
鄰苯二甲酸酯 Phthalates		
鄰苯二甲酸二異壬酯 Di-isononyl phthalate (DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg

樣品/部位描述 Sample/Part Description

- 001 銀色金屬引腳 Silvery metal pin
- 002 銀色金屬 Silvery metal
- 003 銀色金屬 Silvery metal
- 004 銀色金屬 Silvery metal
- 005 綠色玻璃 Green glass
- 006 晶片 Wafer
- 007 黑色塑膠 Black plastic

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備註: 對於檢測鉛, 鎘, 汞之樣品已完全溶解。
-N.D. = 未檢出 (小於方法檢出限或定量限)
-mg/kg = ppm = 百萬分之一
-LOQ = 定量限, 六價鉻的定量限為 $0.10 \mu\text{g}/\text{cm}^2$
-▼六價鉻濃度小於 $0.10 \mu\text{g}/\text{cm}^2$, 樣品未檢出六價鉻。

Remark: The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.

-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL or LOQ)
-mg/kg = ppm = parts per million
-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is $0.10 \mu\text{g}/\text{cm}^2$
-▼The sample is negative for Cr(VI) – The Cr(VI) concentration is below $0.10 \mu\text{g}/\text{cm}^2$. The coating is considered a non-Cr(VI) based coating.

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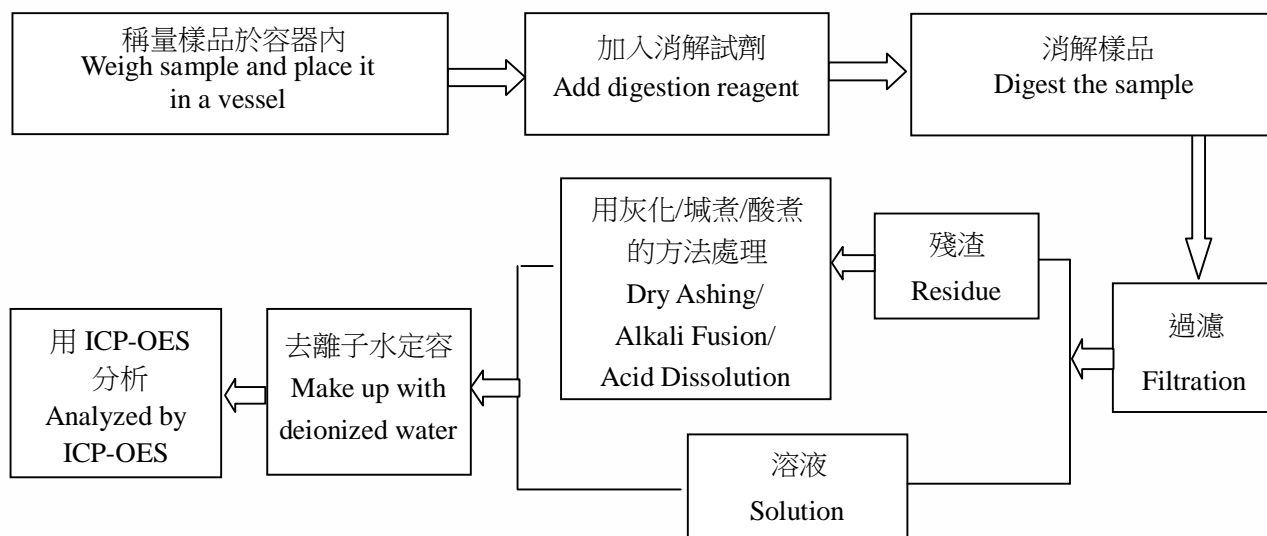
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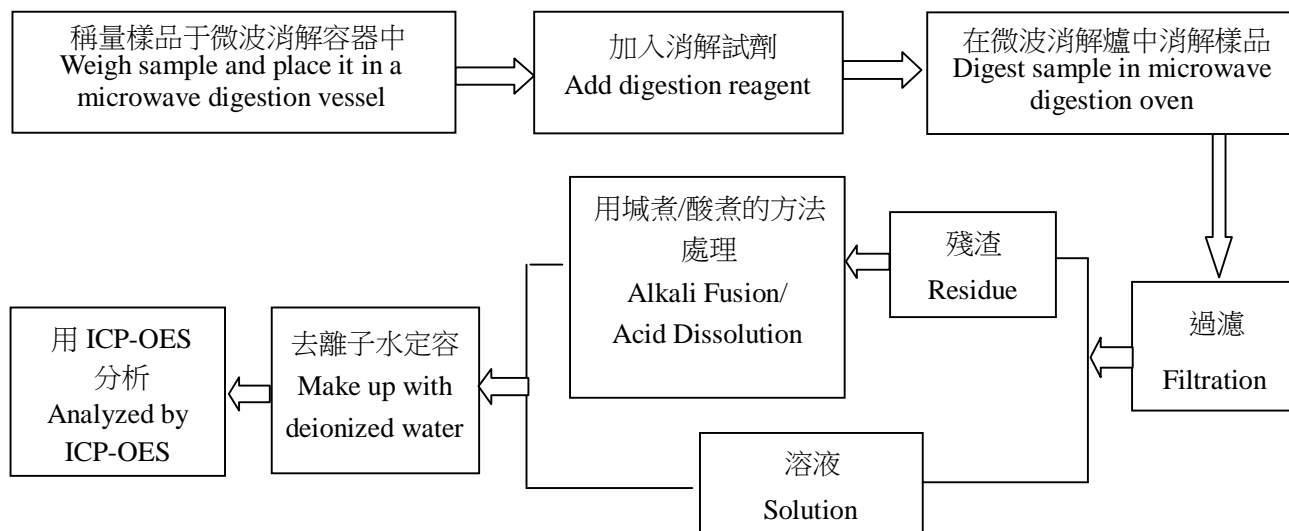
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檢測流程 Test Process

1. 鉛 Lead(Pb), 鎘 Cadmium(Cd)



2. 汞 Mercury(Hg)



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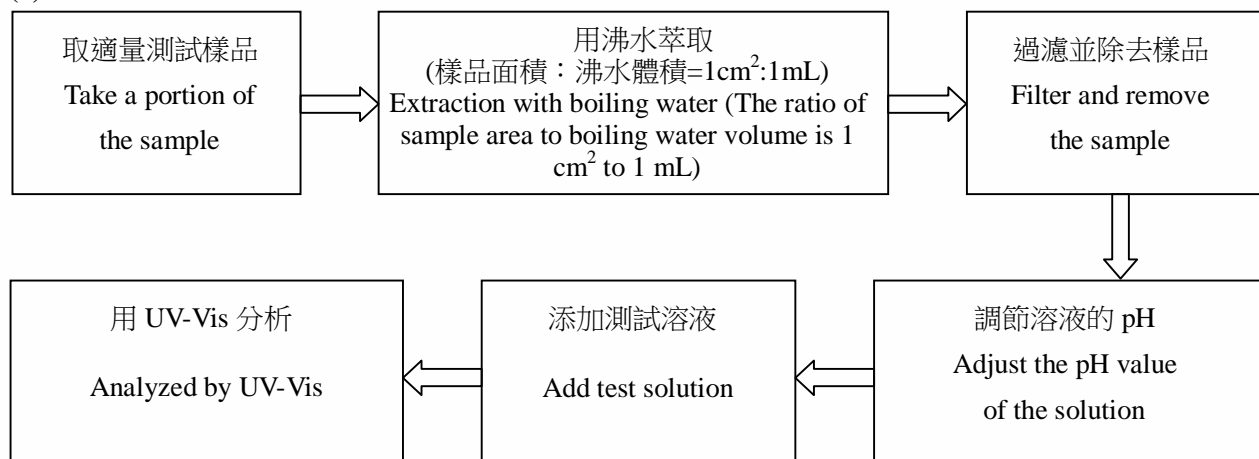
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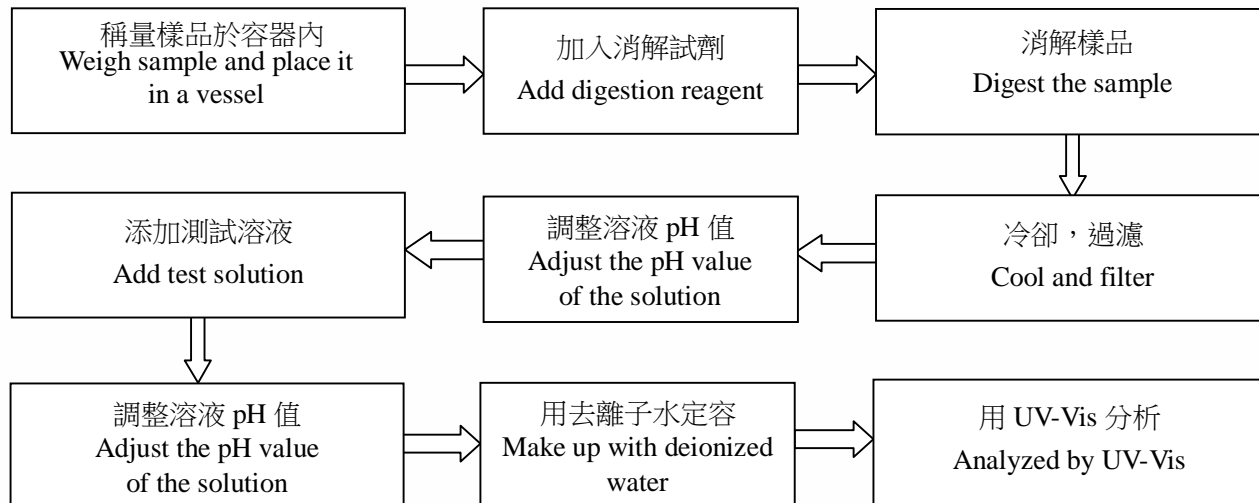
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3. 六價鉻 Hexavalent Chromium(Cr(VI))

(1) IEC 62321-7-1:2015



(2) IEC 62321-7-2:2017



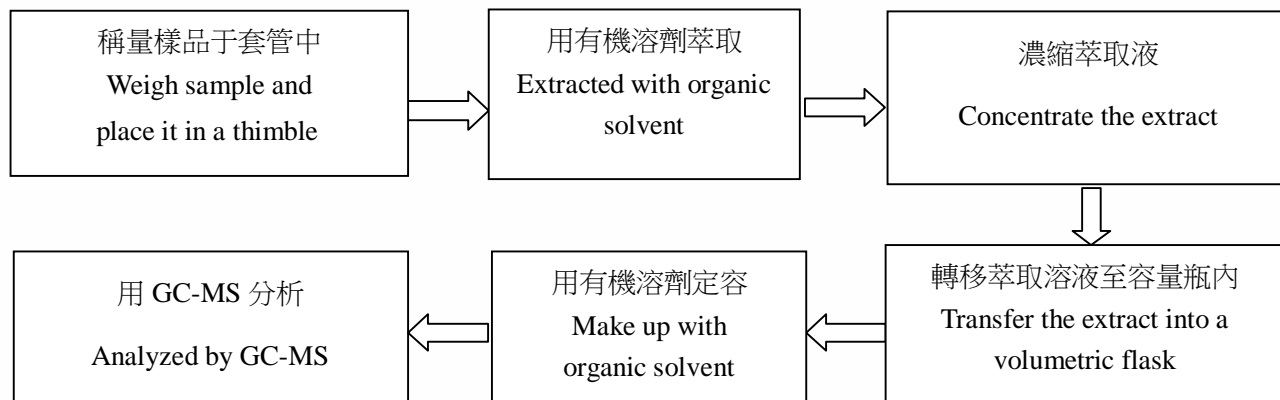
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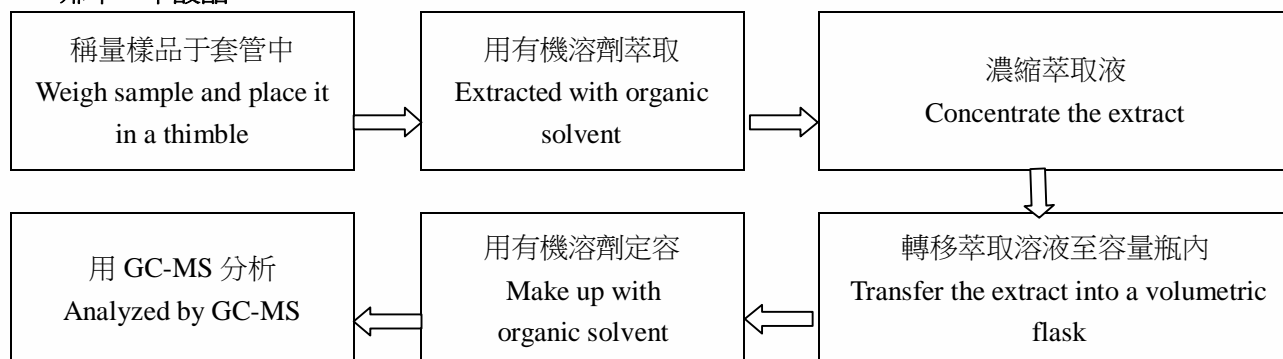
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4. 多溴聯苯 Polybrominated Biphenyls(PBBs), 多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)



5. 鄰苯二甲酸酯 Phthalates



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樣品圖片

Photo(s) of the sample(s)

成品(客戶參考圖片(非測試樣品))

Final Product

(Client Reference Photo (Non-tested sample))



001(客戶參考圖片(非測試樣品))

Client Reference Photo(Non-tested sample))



002(客戶參考圖片(非測試樣品))

Client Reference Photo(Non-tested sample))



003(客戶參考圖片(非測試樣品))

Client Reference Photo(Non-tested sample))



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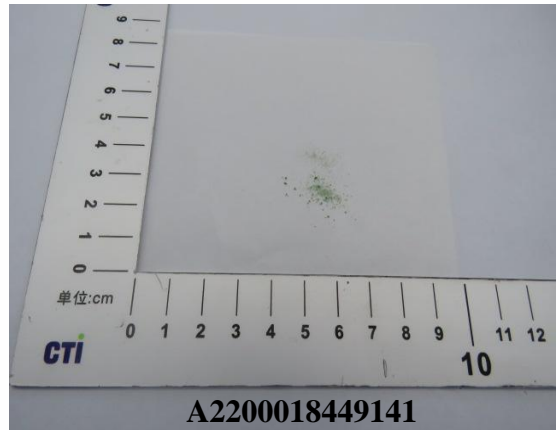
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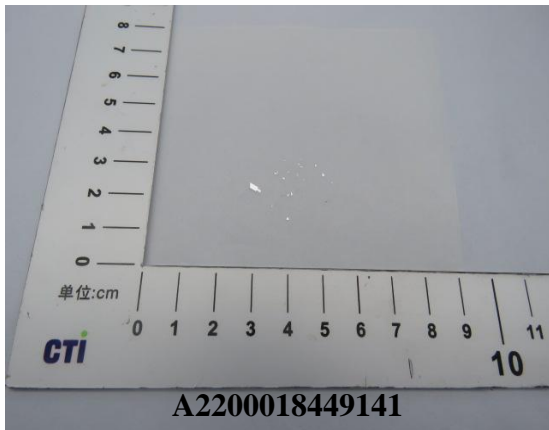
004(客户参考图片(非测试样品))
Client Reference Photo(Non-tested sample))



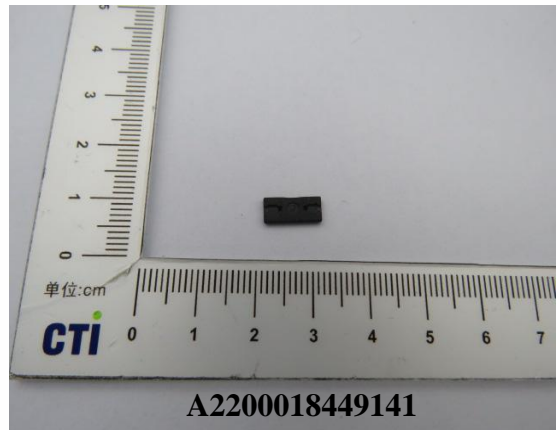
005(客户参考图片(非测试样品))
Client Reference Photo(Non-tested sample))



006(客户参考图片(非测试样品))
Client Reference Photo(Non-tested sample))



007



*** 報告結束 ***
*** End of Report ***

檢測報告

Test Report

報告編號 A220001844914101E
Report No. A220001844914101E

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