



驗證報告 Verification Report

報告編號 A2260645867101001E
Report No. A2260645867101001E

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CENTRE TESTING INTERNATIONAL



報告抬頭公司名稱 萬達光電科技股份有限公司
Company Name HIGGSTEC INC.
shown on Report
地 址 宜蘭縣蘇澳鎮頂平路 22 號
Address NO. 22, DINGPING ROAD, SU'AO TOWNSHIP, YILAN COUNTY, 270, TAIWAN(R.O.C.)



結論 Conclusion

測試樣品 Tested Sample	依據標準/指令 According to standard/directive	結果 Result
提交樣品 Submitted Sample	歐盟 RoHS 指令 2011/65/EU 及其修訂指令(EU) 2015/863 RoHS Directive 2011/65/EU with amendment (EU) 2015/863	符合 PASS

符合表示檢測結果滿足歐盟 RoHS 指令 2011/65/EU 及其修訂指令(EU) 2015/863 要求的限值。

判定規則為不考慮量測不確定度。

PASS means that the results shown on the report comply with the limits set by RoHS Directive 2011/65/EU with amendment(EU) 2015/863.
The decision rule: Uncertainty is not considered.



批准
Approved by 馮智聰
實驗室經理 Laboratory Manager

日期
Date 2026.08.12

台灣華測檢測技術有限公司檢測中心

Testing Center, Centre Testing International (Taiwan) Co., Ltd.

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以下測試之樣品及樣品資訊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 applicant

產品名稱 Product Name	Touch Panel
樣品型號 Model No.	TXXXX-XDNXXXX-XXXXXX-XXXXX
樣品接收日期	2026.07.30
Sample Received Date	Jul. 30, 2026
樣品驗證日期	2026.07.30-2026.08.10
Verification Period	Jul. 30, 2026 to Aug. 10, 2026

驗證要求

1. 參考歐盟 RoHS 指令 2011/65/EU 及其修訂指令(EU) 2015/863, 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)和鄰苯二甲酸酯【鄰苯二甲酸二正丁酯(DBP)、鄰苯二甲酸丁基苄酯(BBP)、鄰苯二甲酸二(2-乙基己基)酯(DEHP)和鄰苯二甲酸二異丁酯(DIBP)】進行驗證測試。
2. 根據客戶要求, 對所提交樣品中的氯(Cl), 溴(Br)進行測試。

Verification Requested

1. With reference to RoHS Directive 2011/65/EU with amendment (EU) 2015/863, to conduct verification test for Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)), Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs) and Phthalates (Dibutyl phthalate (DBP), Benzylbutyl phthalate (BBP), Di-2-ethylhexyl phthalate (DEHP), Diisobutyl phthalate (DIBP)) in the submitted samples.
2. As specified by client, to test Chlorine (Cl), Bromine (Br) in the submitted sample(s).

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1.1 驗證依據 Verification Method

A. IEC 62321-3-1:2026 對管控元素的篩選限值

Screening limits for regulated elements according to IEC 62321-3-1:2026 (單位 Unit: mg/kg)

測試元素 Element(s)	聚合物 Polymers	金屬 Metals	合成材料 Composite material
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$
Br	$BL \leq (700-3\sigma) < X$	N/A	$BL \leq (500-3\sigma) < X$

B. 鄰苯二甲酸酯的篩選限值 Screening limits for Phthalates

測試項目 Test Item(s)	篩選限值 Screening limits (單位 Unit: mg/kg)
鄰苯二甲酸二正丁酯 Dibutyl phthalate(DBP)	$BL \leq 500 < X$
鄰苯二甲酸丁基苄酯 Benzylbutyl phthalate(BBP)	$BL \leq 500 < X$
鄰苯二甲酸二(2-乙基己基)酯 Di-2-ethylhexyl phthalate(DEHP)	$BL \leq 500 < X$
鄰苯二甲酸二異丁酯 Diisobutyl phthalate(DIBP)	$BL \leq 500 < X$

C. 化學測試 Chemical Test

測試項目 Tested Item(s)	測試方法 Test Method	測試儀器 Measured Equipment(s)	報告限 RL	限值 Limit
鉛 Lead (Pb)	IEC 62321-5:2013	ICP-OES	10 mg/kg	1000 mg/kg
鎘 Cadmium (Cd)	IEC 62321-5:2013	ICP-OES	10 mg/kg	100 mg/kg
汞 Mercury (Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES	10 mg/kg	1000 mg/kg
六價鉻 Hexavalent Chromium (Cr(VI))	IEC 62321-7-1:2015	UV-Vis	0.10 $\mu\text{g}/\text{cm}^2$ (LOQ)	1000 mg/kg
	IEC 62321-7-2:2017		20 mg/kg	
多溴聯苯 Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS	100mg/kg	1000 mg/kg
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS	100mg/kg	1000 mg/kg
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS	50 mg/kg	單項 1000 mg/kg 1000 mg/kg for each

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備註 Remark:

- BL = 低於篩選限值 Below limit
- OL = 高於篩選限值 Over limit
- X = 需要做進一步測試的範圍 The region where further investigation is necessary
- 3σ = 分析儀器的重複性 The reproducibility of analytical instruments
- N/A = 不適用 Not applicable
- LOD = 方法檢出限 Limit of Detection
- LOQ = 定量限，六價鉻的定量限為 $0.10 \mu\text{g}/\text{cm}^2$ Limit of Quantification, The LOQ of Hexavalent chromium is $0.10 \mu\text{g}/\text{cm}^2$

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1.2 驗證結果 Verification Result(s)

CTI 樣品 ID CTI Sample ID	同材質 ID Same material ID	樣品描述 Sample Description	測試項目 Tested Items	XRF 掃描結果 XRF Screening Test (mg/kg)	鄰苯二甲酸酯 篩選結果 Phthalates Screening Test	化學測試結果 Chemical Test (mg/kg)	結論 Conclusion	樣品提交/再次提交日期 Sample Received/ Resubmitted Date
A-1	-	透明玻璃 Transparent glass	Pb	BL	/	/	符合 PASS	2026.07.30 Jul. 30, 2026
			Cd	BL	/	/		
			Hg	BL	/	/		
			Cr(Cr(VI))	BL	/	/		
			Br(PBBs)	N/A	/	/		
			Br(PBDEs)	N/A	/	/		
			DBP	N/A	/	/		
			BBP	N/A	/	/		
			DEHP	N/A	/	/		
			DIBP	N/A	/	/		
A-2	-	橘色 FPC Orange FPC	Pb	BL	/	/	符合 PASS	2026.07.30 Jul. 30, 2026
			Cd	BL	/	/		
			Hg	BL	/	/		
			Cr(Cr(VI))	BL	/	/		
			Br(PBBs)	BL	/	/		
			Br(PBDEs)	BL	/	/		
			DBP	N/A	BL	/		
			BBP	N/A	BL	/		
			DEHP	N/A	BL	/		
			DIBP	N/A	BL	/		
A-3	-	黑色油墨 Black ink	Pb	BL	/	/	符合 PASS	2026.07.30 Jul. 30, 2026
			Cd	BL	/	/		
			Hg	BL	/	/		
			Cr(Cr(VI))	BL	/	/		
			Br(PBBs)	BL	/	/		
			Br(PBDEs)	BL	/	/		
			DBP	N/A	BL	/		
			BBP	N/A	BL	/		
			DEHP	N/A	BL	/		
			DIBP	N/A	BL	/		

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CTI 樣品 ID CTI Sample ID	同材質 ID Same material ID	樣品描述 Sample Description	測試項目 Tested Items	XRF 掃描結果 XRF Screening Test (mg/kg)	鄰苯二甲酸酯 篩選結果 Phthalates Screening Test	化學測試結果 Chemical Test (mg/kg)	結論 Conclusion	樣品提交/再次提交日期 Sample Received/ Resubmitted Date
A-4	-	透明塑膠 Transparent plastic	Pb	BL	/	/	符合 PASS	2026.07.30 Jul. 30, 2026
			Cd	BL	/	/		
			Hg	BL	/	/		
			Cr(Cr(VI))	BL	/	/		
			Br(PBBs)	BL	/	/		
			Br(PBDEs)	BL	/	/		
			DBP	N/A	BL	/		
			BBP	N/A	BL	/		
			DEHP	N/A	BL	/		
			DIBP	N/A	BL	/		
A-5	-	透明塑膠 Transparent plastic	Pb	BL	/	/	符合 PASS	2026.07.30 Jul. 30, 2026
			Cd	BL	/	/		
			Hg	BL	/	/		
			Cr(Cr(VI))	BL	/	/		
			Br(PBBs)	BL	/	/		
			Br(PBDEs)	BL	/	/		
			DBP	N/A	BL	/		
			BBP	N/A	BL	/		
			DEHP	N/A	BL	/		
			DIBP	N/A	BL	/		

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備註 Remark:

- N.D. = 未檢出 (小於方法檢出限或報告限或定量限) Not Detected (<MDL or RL or LOQ)
- MDL = Method Detection Limit
- RL = Report Limit
- mg/kg = ppm = 百萬分之一 parts per million
- 1000 mg/kg = 0.1%
- / = 未檢測 Not tested
- IN = 不確定，需要進一步化學測試確認 Inconclusive, need further chemical test
- N/A = 不適用 Not applicable
- BL = 低於篩選限值 Below limit
- OL = 高於篩選限值，需進一步化學測試確認 Further chemical test will be conducted while the result is over limit
- ▼六價鉻濃度小於 0.10 $\mu\text{g}/\text{cm}^2$ ，樣品未檢出六價鉻。由於未獲知樣品的存儲條件和生產日期，樣品的六價鉻測試結果僅能代表測試時樣品含六價鉻的狀態。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. Information on storage conditions and production date of the tested sample is unavailable and thus Cr(V) results represent status of the sample at the time of testing.
- 對於多溴聯苯 (PBBs) 和多溴二苯醚 (PBDEs)，XRF 篩選時其結果顯示的是總溴含量；對於六價鉻，XRF 篩選時其結果顯示的是總鉻含量。When conducting the test for PBBs&PBDEs, XRF was introduced to screen Br Exclusively; When conducting the test for Hexavalent Chromium, XRF was introduced to screen Chromium exclusively.

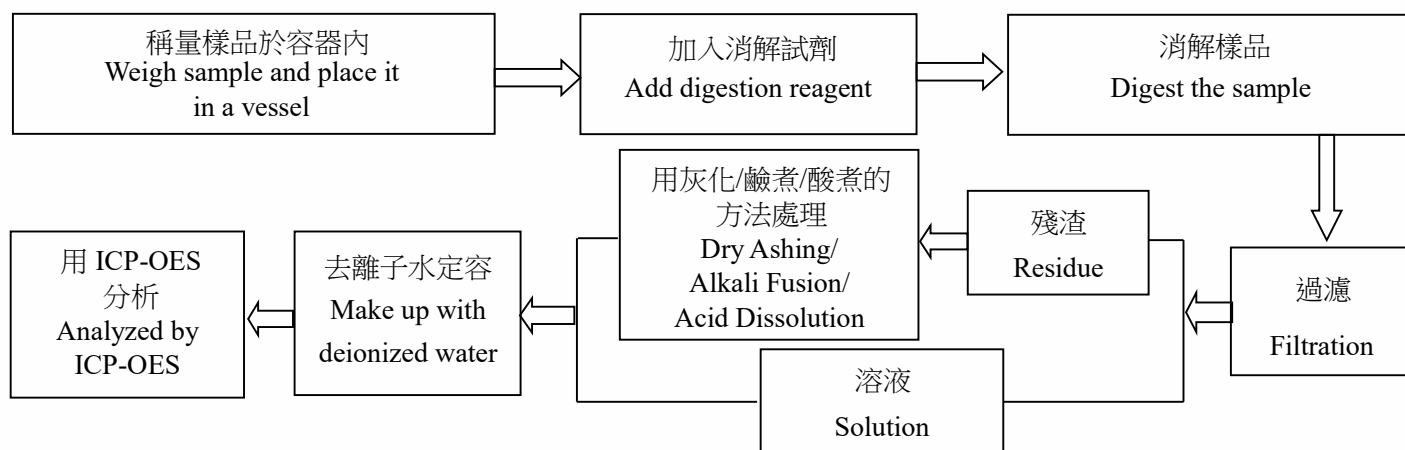
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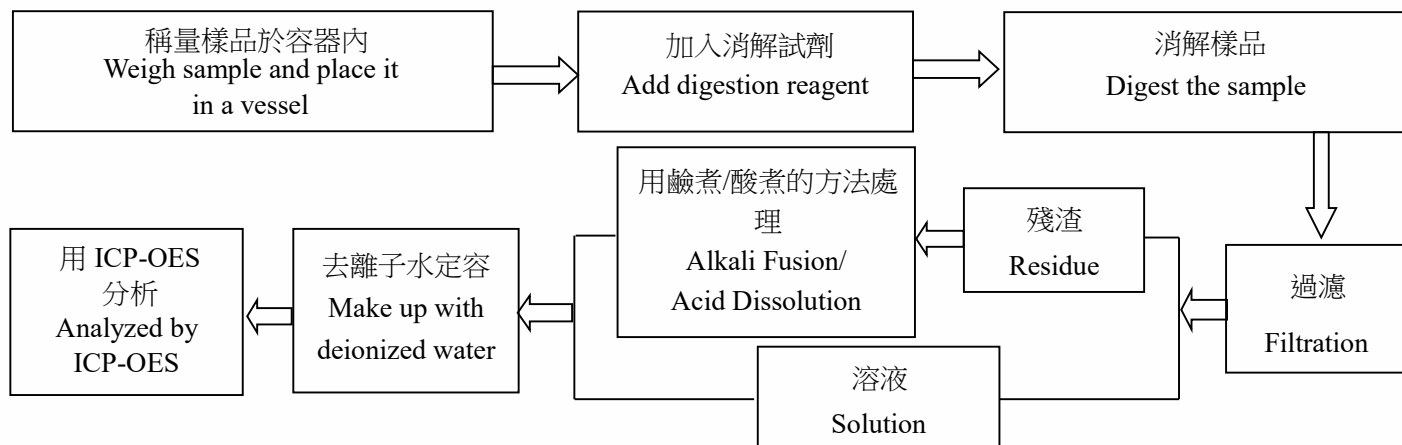
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1.3 檢測流程 Test Process

1.3.1. 鉛 Lead (Pb), 鎘 Cadmium (Cd)

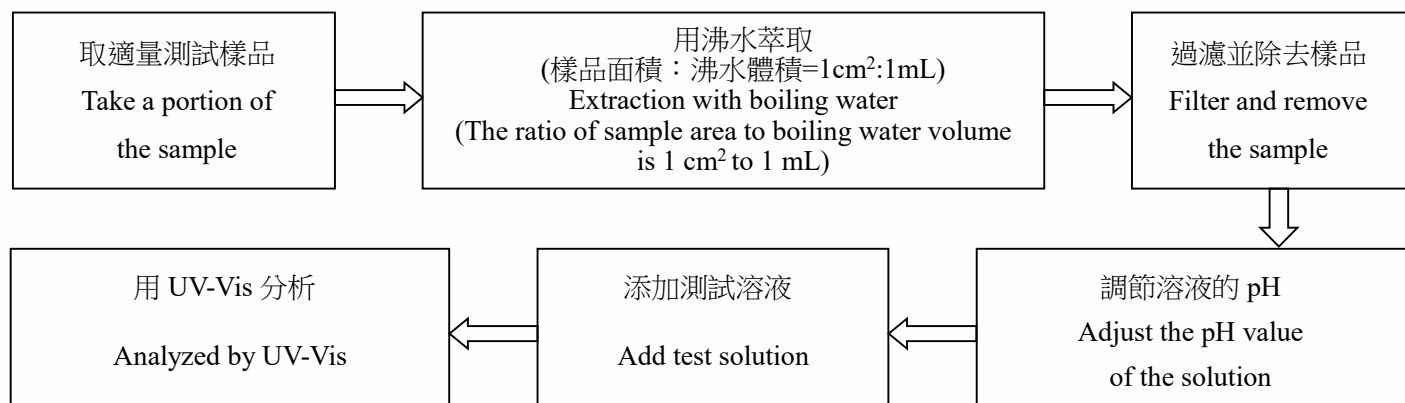


1.3.2. 汞 Mercury(Hg)



1.3.3. 六價鉻 Hexavalent Chromium (Cr(VI))

(1) IEC 62321-7-1:2015

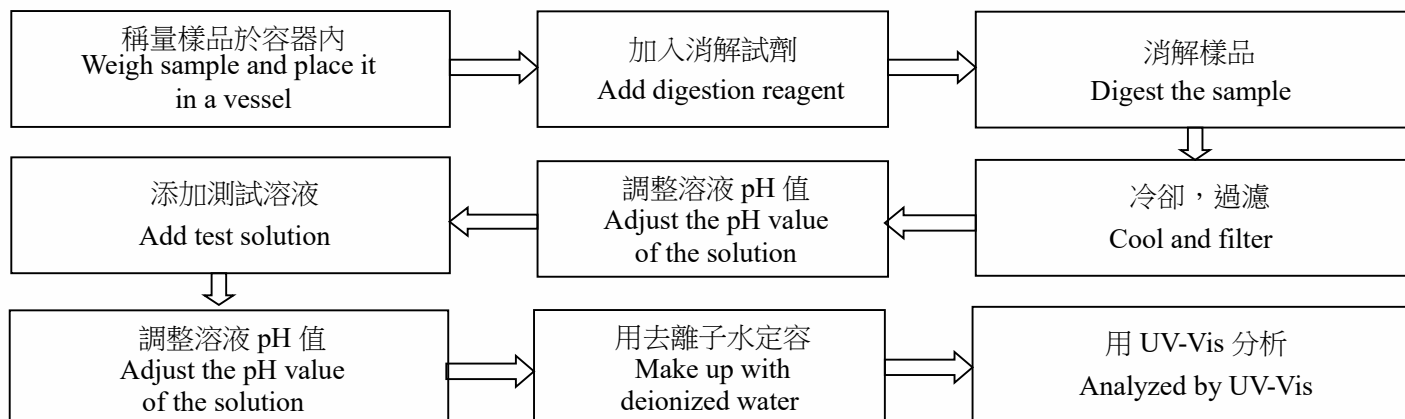


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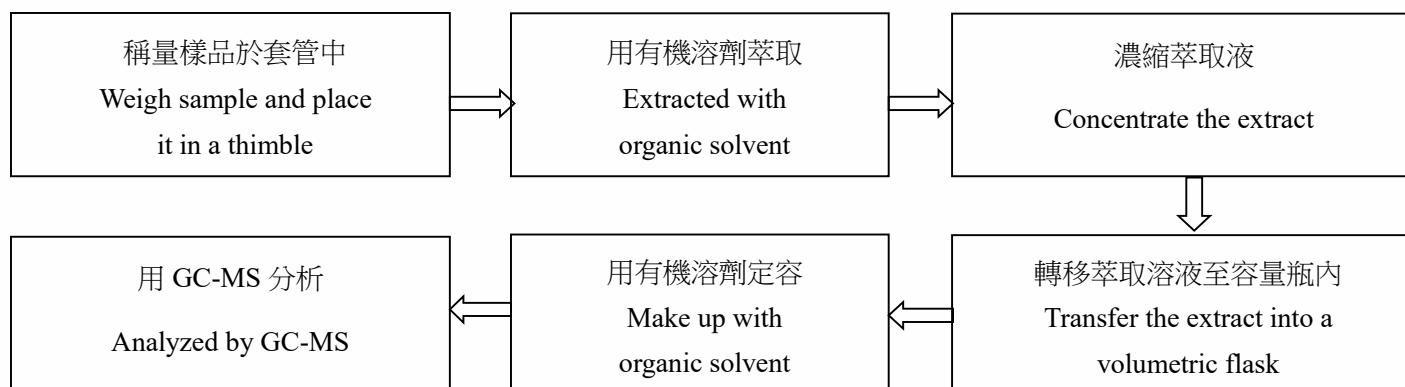
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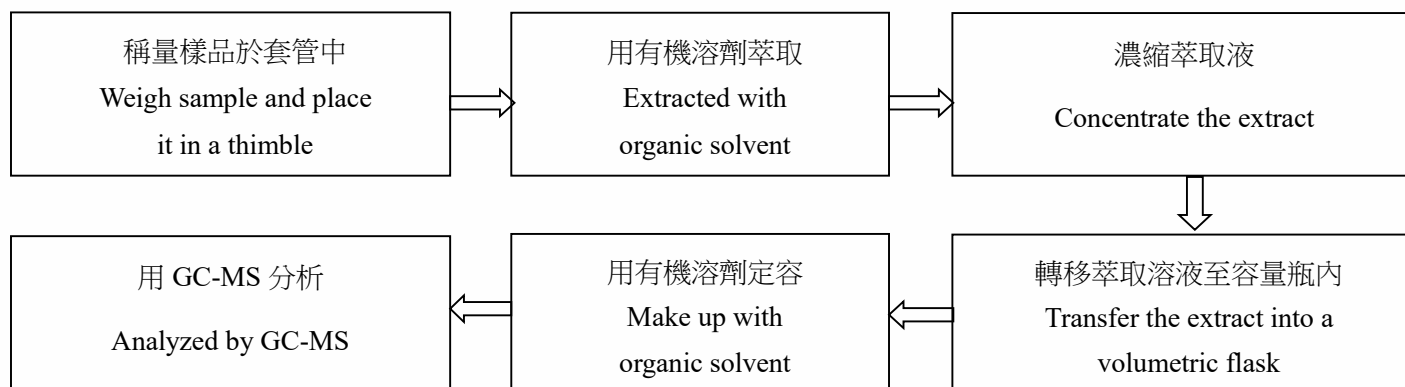
(2) IEC62321-7-2:2017



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



1.3.5. 鄰苯二甲酸酯 Phthalates(DBP, BBP, DEHP, DIBP)



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2.1 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)
氯 Chlorine (Cl)	參考 BS EN 14582:2016 Refer to BS EN 14582:2016	IC
溴 Bromine (Br)	參考 BS EN 14582:2016 Refer to BS EN 14582:2016	IC

2.2 檢測結果 Test Result(s)

測試項目 Tested Item(s)	結果 Result			方法檢出限 MDL
	A-1	A-2	A-3	
氯 Chlorine (Cl)	N.D.	133 mg/kg	N.D.	50 mg/kg
溴 Bromine (Br)	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
	A-4	A-5	
氯 Chlorine (Cl)	N.D.	N.D.	50 mg/kg
溴 Bromine (Br)	N.D.	N.D.	50 mg/kg

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樣品/部位描述 Sample/Part Description

序號	CTI 樣品 ID	描述
No.	CTI Sample ID	Description
1	A-1	透明玻璃 Transparent glass
2	A-2	橘色 FPC Orange FPC
3	A-3	黑色油墨 Black ink
4	A-4	透明塑膠 Transparent plastic
5	A-5	透明塑膠 Transparent plastic

備註: -N.D. = 未檢出 (小於方法檢出限)
-mg/kg = ppm = 百萬分之一
-本報告中樣品測試結果引自於報告 A2260646033101001E。

Remark: -MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million
-The test result(s) of sample is(are) presented in reference to the result(s) that reported in No. A2260646033101001E.

注釋: 本報告中的資料結果供科研、教學、企業內部品質控制、企業產品研發等目的用。

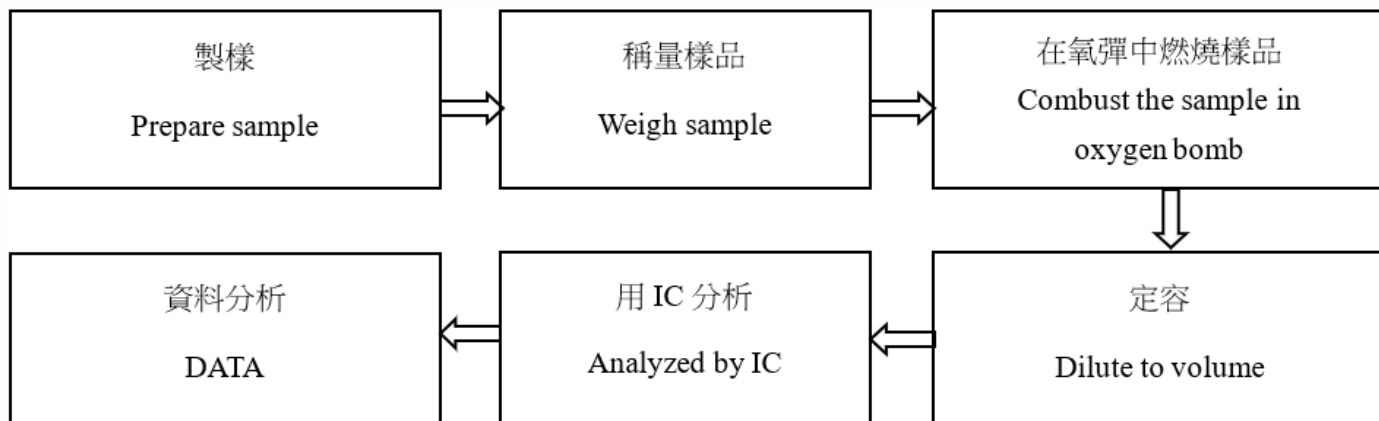
Note: The testing data and result(s) in this report is(are) just for scientific research, education, internal quality control and product development etc.

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2.3 檢測流程 Test Process



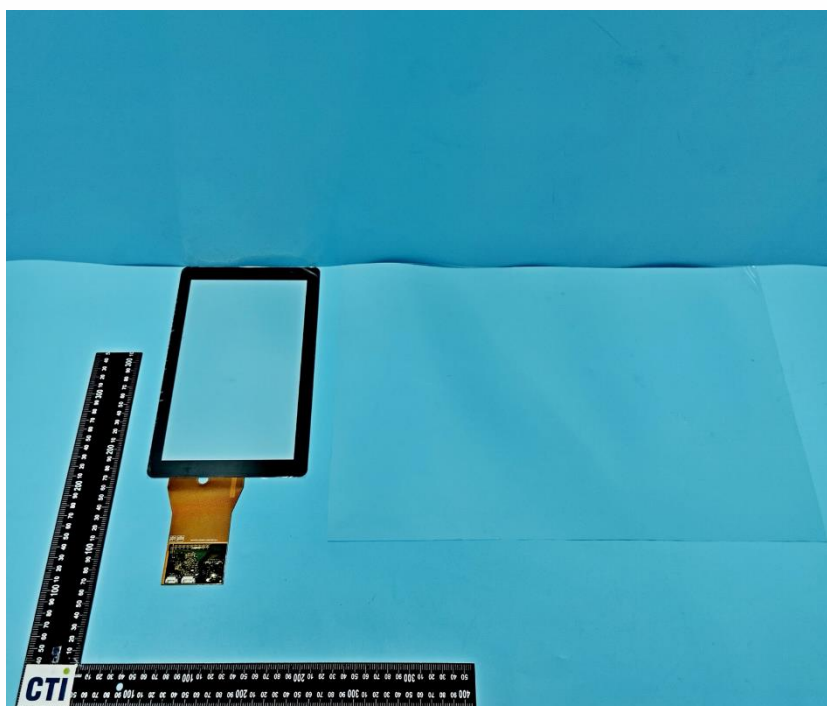
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樣品圖片

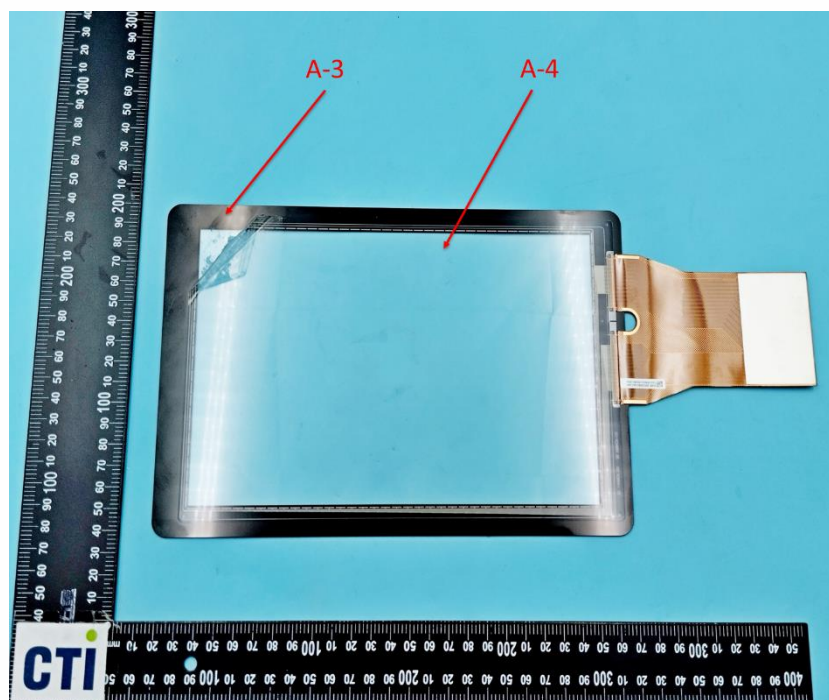
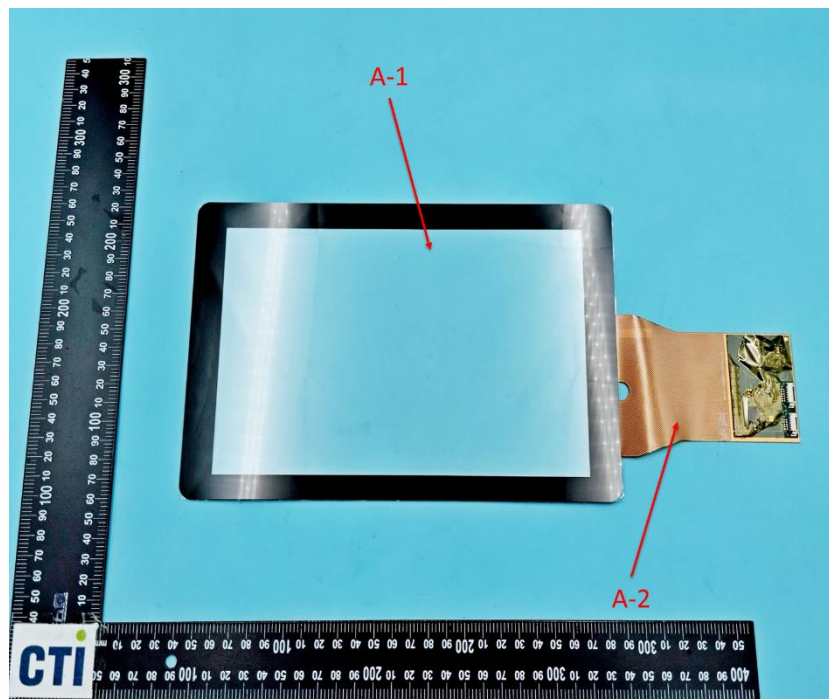
Photo(s) of the sample(s)



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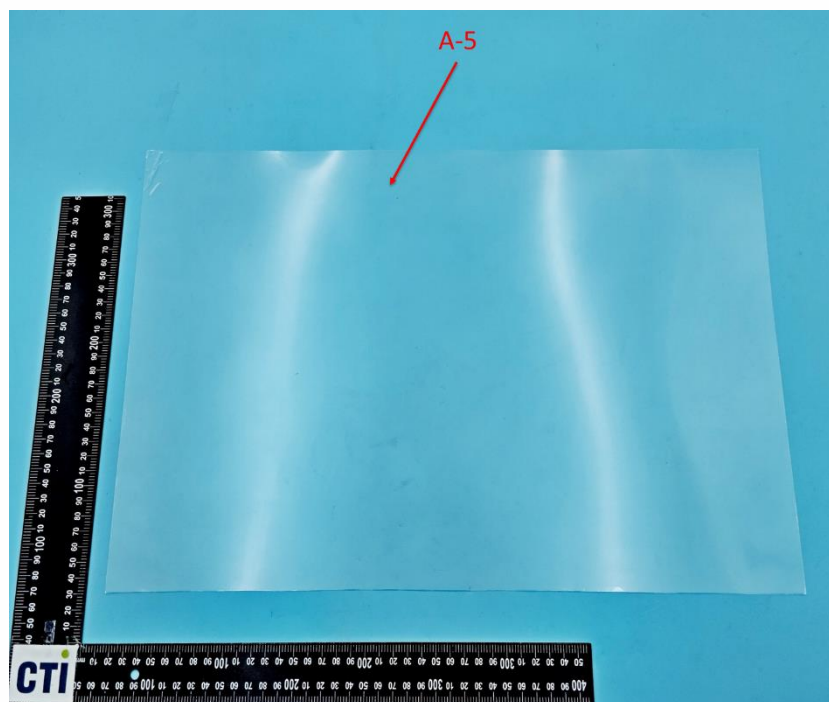
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聲明 Statement :

1. 檢測報告無批准人簽字、“專用章”及報告騎縫章無效；
This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. 報告抬頭公司名稱及位址、樣品及樣品資訊由申請者提供，申請者應對其真實性負責，CTI 未核實其真實性；
The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. 本報告檢測結果僅對受測樣品負責；
The result(s) shown in this report refer(s) only to the sample(s) tested;
4. 未經 CTI 書面同意，不得部分複製本報告；
Without written approval of CTI, this report can't be reproduced except in full;
5. 如檢測報告中的英文內容與中文內容有差異，以中文為準。
In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

*** 報告結束 ***
*** End of Report ***