

測試報告 Test Report

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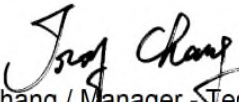
億光電子工業股份有限公司
EVERLIGHT ELECTRONICS CO., LTD.
新北市樹林區中華路6-8號
NO. 6-8, ZHONGHUA RD., SHULIN DIST., NEW TAIPEI CITY 23860, TAIWAN

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/on behalf of the applicant as):

BASIC INFORMATION	
Type of Product	PHOTO COUPLER
Supplier Company Name	EVERLIGHT
Address	NO. 6-8, ZHONGHUA RD., SHULIN DIST., NEW TAIPEI CITY 23860, TAIWAN
Tel / Fax / Email	TEL:886-2685-6688
	FAX:886-2685-6699
	E-MAIL: lindawang@everlight.com
Contact Person	LI LING WANG
EVERLIGHT REPORT NO	EVERLIGHT-PHOTO COUPLER DIP SERIES : EL81x, EL81x-G, EL82x-G, 4Nxx-G, CNY17-x-G, CNY17F-x-G, H11x-G, EL30xx-G, 6Nxxx-G, TIL1xx-G, MCT2x-G , EL4XXA-G SERIES Sampling Product : EL814(A)-SGS-13/04/2020
PRODUCT INFORMATION	
Product/component Sample	Isolation unit
Quantity (numbers or weight)	0.2368 g
EVERLIGHT P/N	PHOTO COUPLER DIP SERIES : EL81x, EL81x-G, EL82x-G, 4Nxx-G, CNY17-x-G, CNY17F-x-G, H11x-G, EL30xx-G, 6Nxxx-G, TIL1xx-G, MCT2x-G , EL4XXA-G SERIES Sampling Product : EL814(A)
Product Lot No	015147
Country of Origin	China
TEST INFORMATION	
Sample preparation	CUTTING
Test Method	RoHS: IEC 62321, Halogen: BS EN 14582
MDL	Cd, Pb, Hg: 2 mg/kg, PBBs/PBDEs: 5 mg/kg, Halogen: 50 mg/kg

送樣廠商(Sample Submitted) : 億光電子工業股份有限公司 (EVERLIGHT ELECTRONICS CO., LTD.)
 收件日期(Sample Receiving) : 2020/04/01
 測試期間(Testing Period) : 2020/04/01 to 2020/04/13

測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages).


 Troy Chang / Manager - Tech
 Signed for and behalf of
 SGS TAIWAN LTD.
 Chemical Laboratory - Taipei



PIN CODE: F5D9E4EA

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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.)
- (2) 根據客戶所提供的樣品，18項多環芳香烴測試結果符合德國產品安全委員會(AfPS) GS PAHs第3類「列於德國產品安全法之其他產品」之限值要求。(Based upon the performed tests on the submitted sample(s), the test results of PAHs (18 items) comply with the limits of PAHs requirement (Category 3)「Other products under ProdSG」 as set by German Committee on Product Safety (AfPS) GS PAHs.)

測試結果(Test Results)

- 測試部位(PART NAME)No. 1 : 本體 (BODY)
- 測試部位(PART NAME)No. 2 : 銀色金屬接腳鍍層 (PLATING LAYER OF SILVER COLORED METAL PIN)
- 測試部位(PART NAME)No. 3 : 銀色金屬接腳底材 (BASE MATERIAL OF SILVER COLORED METAL PIN)
- 測試部位(PART NAME)No. 4 : 銀色金屬接腳 (含鍍層) (SILVER COLORED METAL PIN (INCLUDING THE PLATING LAYER))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)			限值 (Limit)
				No. 1	No. 2	No. 3	
鎘 / Cadmium (Cd)	mg/kg	參考 IEC 62321-5 (2013)，以感應耦合電漿發射光譜儀檢測。 / With reference to IEC 62321-5 (2013) and performed by ICP-OES.	2	n. d.	---	---	100
鉛 / Lead (Pb)	mg/kg		2	n. d.	---	---	1000
汞 / Mercury (Hg)	mg/kg	參考 IEC 62321-4:2013+ AMD1:2017，以感應耦合電漿發射光譜儀檢測。 / With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n. d.	---	---	1000
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考 IEC 62321-7-2 (2017)，以 UV-VIS 檢測。 / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.	8	n. d.	---	---	1000

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)			限值 (Limit)
				No. 1	No. 2	No. 3	
鎘 / Cadmium (Cd)	mg/kg	酸洗脫鍍層，參考IEC 62321-5 (2013)，以感應耦合電漿發射光譜儀檢測。 / IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-OES.	2	---	n. d.	---	100
鉛 / Lead (Pb)	mg/kg		2	---	23.8	---	1000
汞 / Mercury (Hg)	mg/kg	酸洗脫鍍層，參考IEC 62321-4:2013+ AMD1:2017，以感應耦合電漿發射光譜儀檢測。 / IEC 62321-4:2013+ AMD1:2017 application of modified digestion by surface etching and performed by ICP-OES.	2	---	n. d.	---	1000
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿發射光譜儀檢測。 / With reference to IEC 62321-5 (2013) and performed by ICP-OES.	2	---	---	n. d.	100
鉛 / Lead (Pb)	mg/kg		2	---	---	6.39	1000
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4:2013+ AMD1:2017，以感應耦合電漿發射光譜儀檢測。 / With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	---	---	n. d.	1000
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	µg/cm ²	參考IEC 62321-7-1 (2015)，以UV-VIS檢測。 / With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	---	n. d.	n. d.	-

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 新北市樹林區中華路6-8號
 NO. 6-8, ZHONGHUA RD., SHULIN DIST., NEW TAIPEI CITY 23860, TAIWAN

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)			限值 (Limit)
				No. 1	No. 2	No. 3	
多溴聯苯總和 / Sum of PBBs	mg/kg	參考 IEC 62321-6 (2015), 以氣相層析/質譜儀檢測。 / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	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	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.	---	---	-
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		-	n. d.	---	---	1000
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	mg/kg		5	n. d.	---	---	-
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n. d.	---	---	-
七溴聯苯醚 / Heptabromodiphenyl ether	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.	---	---	-	

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)			限值 (Limit)
				No. 1	No. 2	No. 3	
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No. : 85-68-7)	mg/kg	參考 IEC 62321-8 (2017), 以氣相層析/質譜儀檢測。 / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n. d.	---	---	1000
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No. : 84-74-2)	mg/kg		50	n. d.	---	---	1000
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di-(2-ethylhexyl) phthalate) (CAS No. : 117-81-7)	mg/kg		50	n. d.	---	---	1000
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No. : 84-69-5)	mg/kg		50	n. d.	---	---	1000
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No. : 26761-40-0; 68515-49-1)	mg/kg		50	n. d.	---	---	-
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No. : 28553-12-0; 68515-48-0)	mg/kg		50	n. d.	---	---	-
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No. : 117-84-0)	mg/kg		50	n. d.	---	---	-
鄰苯二甲酸二戊酯 / DNPP (Di-n-pentyl phthalate) (CAS No. : 131-18-0)	mg/kg		50	n. d.	---	---	-
鄰苯二甲酸二正己酯 / DNHP (Di-n-hexyl phthalate) (CAS No. : 84-75-3)	mg/kg		50	n. d.	---	---	-
鄰苯二甲酸二(2-甲氧基乙基)酯 / DMEP (Bis (2-methoxyethyl) phthalate) (CAS No. : 117-82-8)	mg/kg		50	n. d.	---	---	-
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α -HBCDD, β -HBCDD, γ -HBCDD) (CAS No. : 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	參考 IEC 62321 (2008), 以氣相層析/質譜儀檢測。 / With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n. d.	---	---	-

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				No. 1	No. 2	No. 3	
鹵素 / Halogen							
鹵素 (氟) / Halogen-Fluorine (F) (CAS No. : 14762-94-8)	mg/kg	參考BS EN 14582 (2016), 以離子層析儀分析. / With reference to BS EN 14582 (2016). Analysis was performed by IC.	50	n. d.	---	---	-
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No. : 22537-15-1)	mg/kg		50	143	---	---	-
鹵素 (溴) / Halogen-Bromine (Br) (CAS No. : 10097-32-2)	mg/kg		50	n. d.	---	---	-
鹵素 (碘) / Halogen-Iodine (I) (CAS No. : 14362-44-8)	mg/kg		50	n. d.	---	---	-
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考CEN/TS 15968 (2010), 以液相層析/質譜儀檢測. / With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MS.	0.01	n. d.	---	---	-
全氟辛酸 / PFOA (CAS No. : 335-67-1)	mg/kg		0.01	n. d.	---	---	-
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3052 (1996), 以感應耦合電漿發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-OES.	2	n. d.	---	---	-
銻 / Antimony (Sb)	mg/kg	參考US EPA 3052 (1996), 以感應耦合電漿發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-OES.	2	n. d.	---	---	-

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)			限值 (Limit)
				No. 1	No. 2	No. 3	
多環芳香煙 / Polycyclic Aromatic Hydrocarbons (PAHs)							
芴 / Acenaphthene (CAS No. : 83-32-9)	mg/kg	參考AfPS GS 2014:01 PAK, 以氣相層析/質譜儀檢測。 / With reference to AfPS GS 2014:01 PAK. Analysis was performed by GC/MS.	0.2	n. d.	---	---	-
芴烯 / Acenaphthylene (CAS No. : 208-96-8)	mg/kg		0.2	n. d.	---	---	-
蔥 / Anthracene (CAS No. : 120-12-7)	mg/kg		0.2	n. d.	---	---	-
苯駢蔥 / Benzo[a]anthracene (CAS No. : 56-55-3)	mg/kg		0.2	n. d.	---	---	-
苯駢(a)芘 / Benzo[a]pyrene (CAS No. : 50-32-8)	mg/kg		0.2	n. d.	---	---	-
苯(b)苯駢芴 / Benzo[b]fluoranthene (CAS No. : 205-99-2)	mg/kg		0.2	n. d.	---	---	-
苯駢芘 / Benzo[g,h,i]perylene (CAS No. : 191-24-2)	mg/kg		0.2	n. d.	---	---	-
苯駢(k)螢蔥 / Benzo[k]fluoranthene (CAS No. : 207-08-9)	mg/kg		0.2	n. d.	---	---	-
Chrysene (CAS No. : 218-01-9)	mg/kg		0.2	n. d.	---	---	-
二苯駢蔥 / Dibenzo[a,h]anthracene (CAS No. : 53-70-3)	mg/kg		0.2	n. d.	---	---	-
苯駢芴 / Fluoranthene (CAS No. : 206-44-0)	mg/kg		0.2	n. d.	---	---	-
芴 / Fluorene (CAS No. : 86-73-7)	mg/kg		0.2	n. d.	---	---	-
茚酮芘 / Indeno[1,2,3-c,d] pyrene (CAS No. : 193-39-5)	mg/kg		0.2	n. d.	---	---	-
萘 / Naphthalene (CAS No. : 91-20-3)	mg/kg		0.2	n. d.	---	---	-
菲 / Phenanthrene (CAS No. : 85-01-8)	mg/kg		0.2	n. d.	---	---	-
芘 / Pyrene (CAS No. : 129-00-0)	mg/kg		0.2	n. d.	---	---	-
苯(j)苯駢芴 / Benzo[j]fluoranthene (CAS No. : 205-82-3)	mg/kg		0.2	n. d.	---	---	-
苯駢(e)芘 / Benzo[e]pyrene (CAS No. : 192-97-2)	mg/kg		0.2	n. d.	---	---	-
多環芳香煙18項總和 / Sum of 18 PAHs	mg/kg	-	n. d.	---	---	△	

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測試報告

Test Report

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 新北市樹林區中華路6-8號
 NO. 6-8, ZHONGHUA RD., SHULIN DIST., NEW TAIPEI CITY 23860, TAIWAN

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result)	限值 (Limit)
				No. 4	
鉍 / Beryllium (Be)	mg/kg	參考US EPA 3050B (1996), 以感應耦合電漿發射光譜儀檢測。 / With reference to US EPA 3050B (1996). Analysis was performed by ICP-OES.	2	n. d.	-

備註(Note) :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n. d. = Not Detected (未檢出)
4. "-" = Not Regulated (無規格值)
5. "---" = Not Conducted (未測項目)
6. (#2) =
 - a. 當六價鉻結果大於0.13 $\mu\text{g}/\text{cm}^2$, 表示樣品表層含有六價鉻。 / The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 $\mu\text{g}/\text{cm}^2$. The sample coating is considered to contain Cr(VI).
 - b. 當六價鉻結果為n. d. (濃度小於0.10 $\mu\text{g}/\text{cm}^2$), 表示表層不含六價鉻。 / The sample is negative for Cr(VI) if Cr(VI) is n. d. (concentration less than 0.10 $\mu\text{g}/\text{cm}^2$). The coating is considered a non-Cr(VI) based coating
 - c. 當六價鉻結果介於 0.10 及 0.13 $\mu\text{g}/\text{cm}^2$ 時, 無法確定塗層是否含有六價鉻。 / The result between 0.10 $\mu\text{g}/\text{cm}^2$ and 0.13 $\mu\text{g}/\text{cm}^2$ is considered to be inconclusive - unavoidable coating variations may influence the determination.

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PFOS參考資訊(Reference Information) : 持久性有機污染物 POPs - (EU) 2019/1021

PFOS濃度在物質或製備中不得超過0.001%(10ppm)，在半成品、成品或零部件中不得超過0.1%(1000ppm)，在紡織品或塗層材料中不得超過 $1\mu\text{g}/\text{m}^2$ 。

(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above $1\mu\text{g}/\text{m}^2$.)

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△ 德國產品安全委員會(AfPS) GS PAHs 要求 /
AfPS (German commission for Product Safety): GS PAHs requirements

項目 (Parameter)	第1類(Category 1)	第2類(Category 2)		第3類(Category 3)	
	意圖放入嘴內的材料或玩具會與皮膚有所接觸(超過30秒)。 (Material indented to be put in the mouth or toys with intended skin contact (longer than 30 s).)	不屬於第1類的材料並可預見與皮膚接觸逾30秒(長期或經常與皮膚接觸)。 (Materials not falling under category 1 with foreseeable contact to skin for longer than 30 seconds (long-term skin or frequent contact).)	列於2009/48/EC之玩具 (Toy under 2009/48/EC)	列於德國產品安全法之其他產品 (Other products under ProdSG)	列於2009/48/EC之玩具 (Toy under 2009/48/EC)
Naphthalene	< 1	< 2		< 10	
Acenaphthylene	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Acenaphthene					
Fluorene					
Phenanthrene					
Anthracene					
Fluoranthene					
Pyrene					
Benzo[a]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[b]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[j]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[k]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[a]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[e]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno[1, 2, 3-c, d] pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo[a, h]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[g, h, i]perylene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
18項PAH總濃度 (Sum of 18 PAH)	< 1	< 5	< 10	< 20	< 50

單位(Unit) : mg/kg

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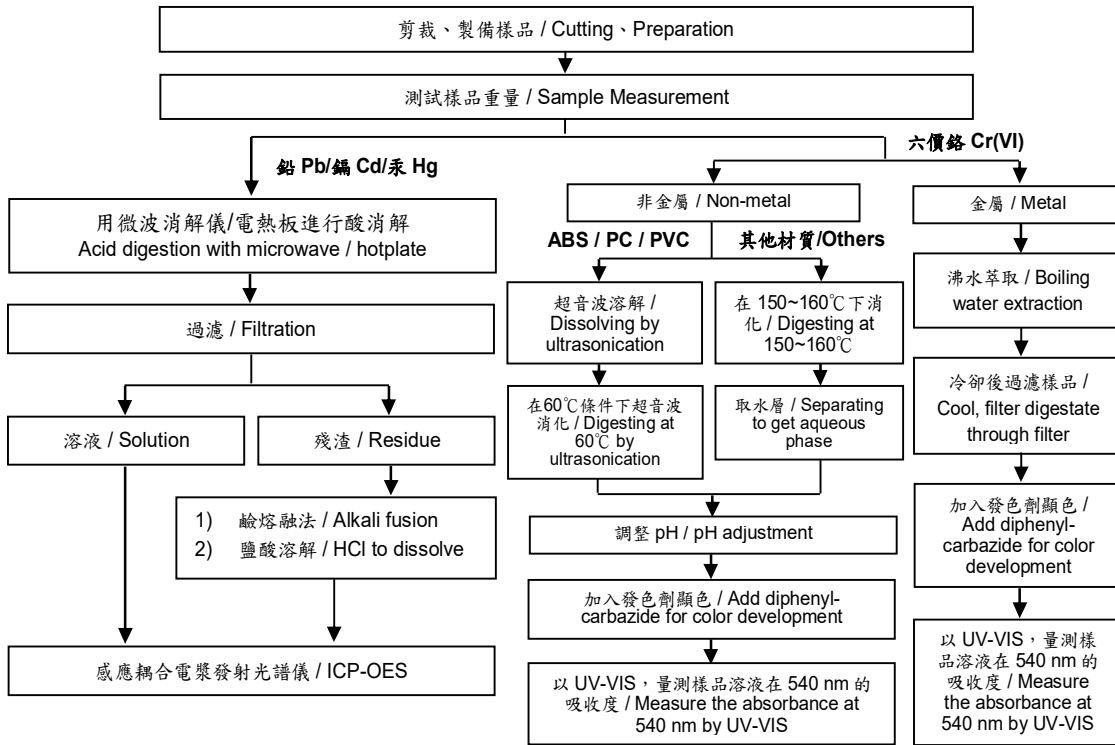
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No. 1, 3

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. (Cr⁶⁺ test method excluded)



測試報告 Test Report

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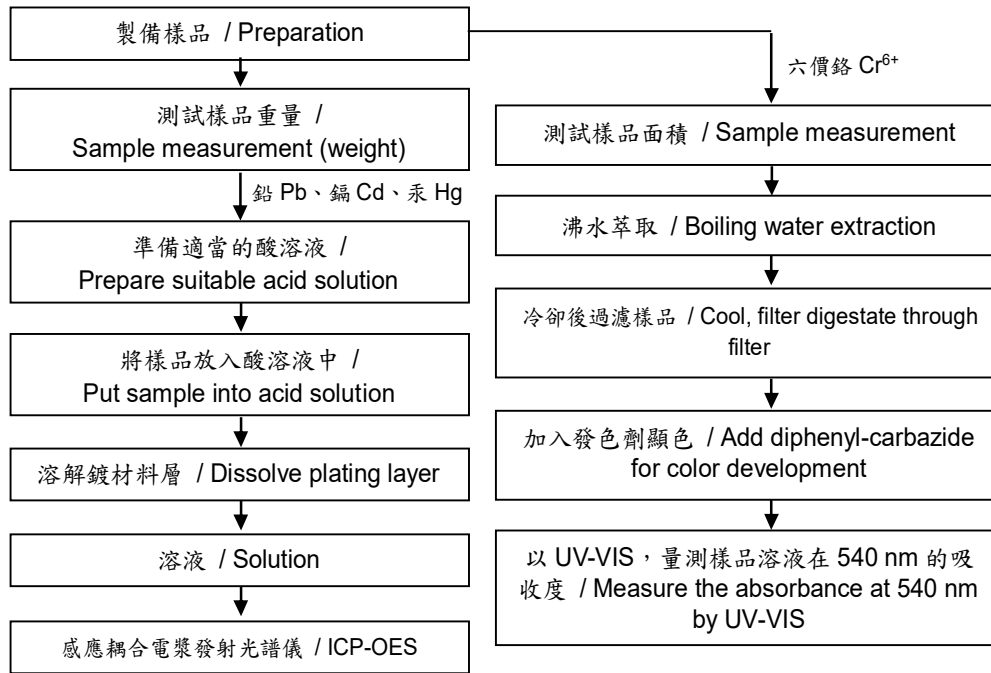
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No. 2

鍍層重金屬測試流程圖 / Flow Chart of Stripping method for metal analysis

根據以下的流程圖之條件，樣品之外部鍍層已完全溶解。(六價鉻測試方法除外) / The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)



測試報告 Test Report

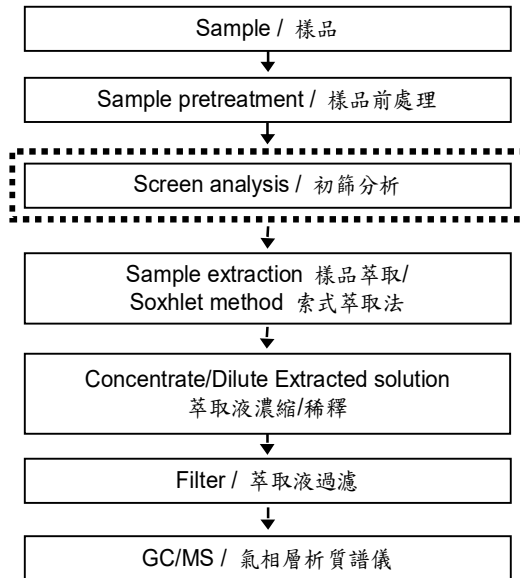
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

初次測試程序 / First testing process —————>
 選擇性篩檢程序 / Optional screen process>
 確認程序 / Confirmation process - - - .>



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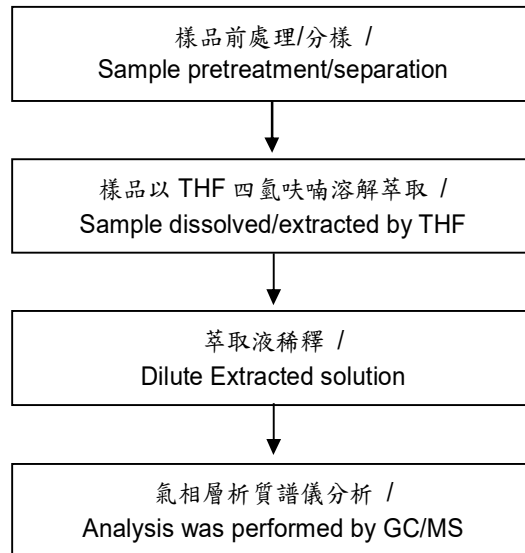
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



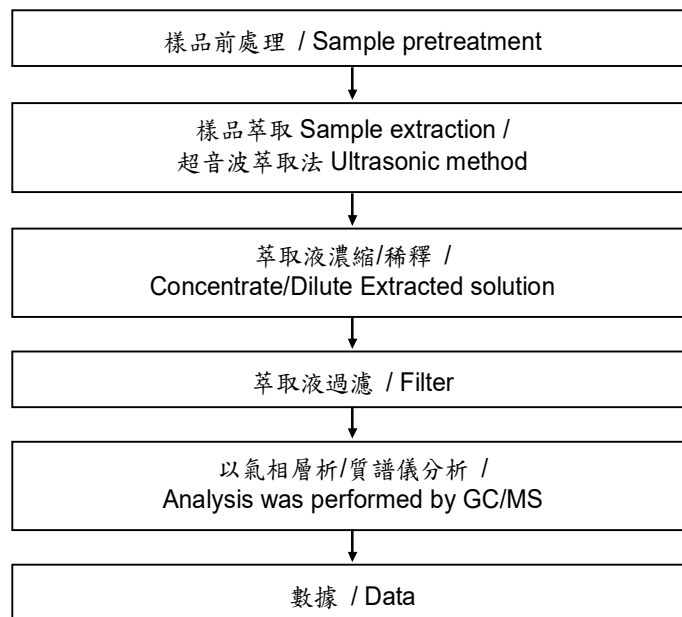
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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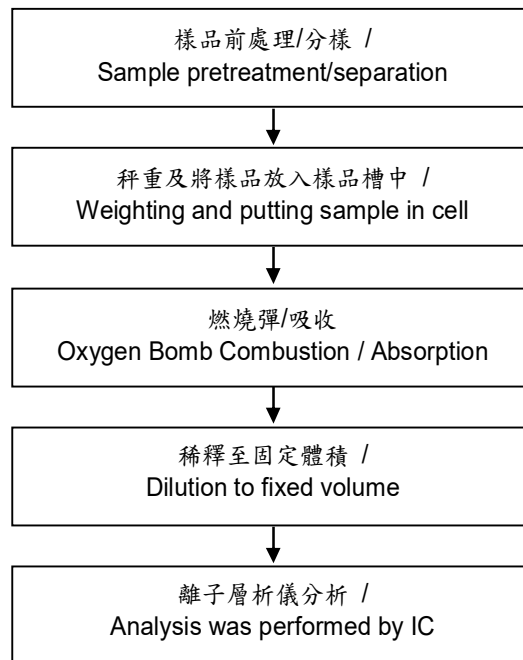
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鹵素分析流程圖 / Analytical flow chart - Halogen



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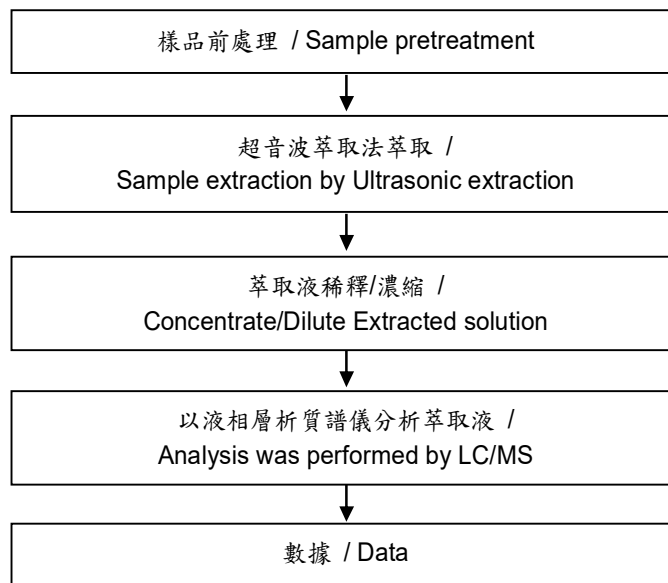
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全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS



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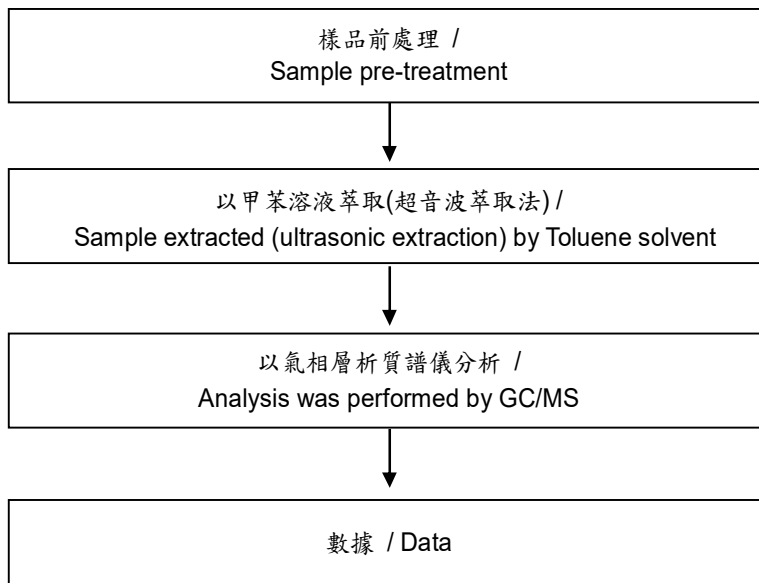
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多環芳香烴分析流程圖 / Analytical flow chart - PAHs (Polycyclic Aromatic Hydrocarbons)



測試報告 Test Report

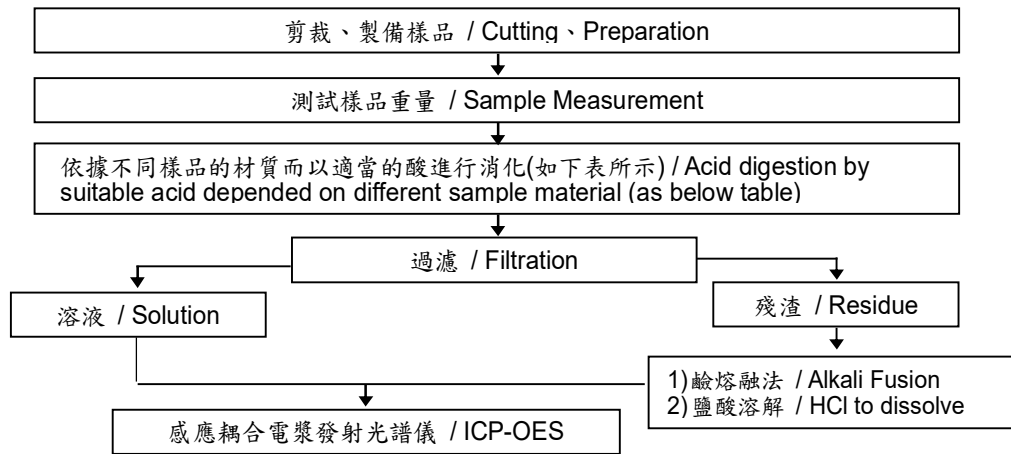
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元素以 ICP-OES 分析的消化流程圖 (Flow Chart of digestion for the elements analysis performed by ICP-OES)

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.



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
玻璃 / Glass	硝酸,氫氟酸 / HNO ₃ /HF
金,鈷,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO ₃
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion

測試報告

Test Report

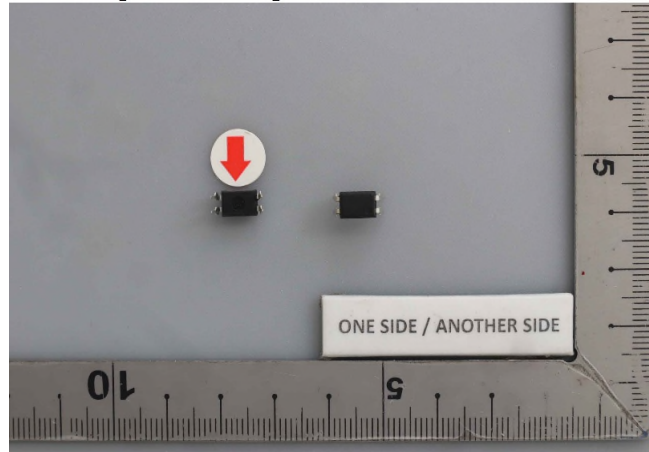
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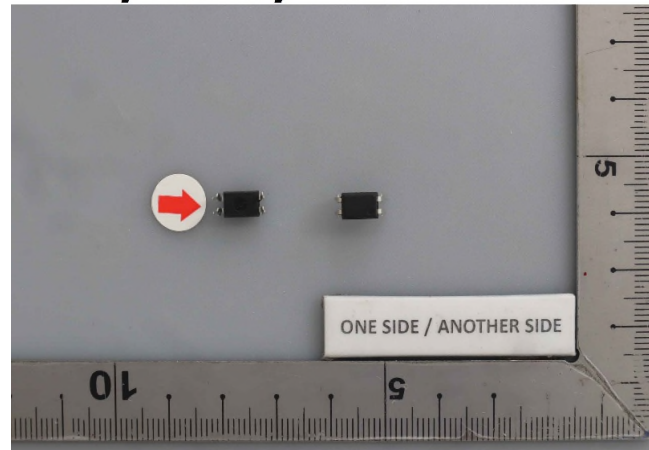
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* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2020/40285 NO.1



CE/2020/40285 NO.2



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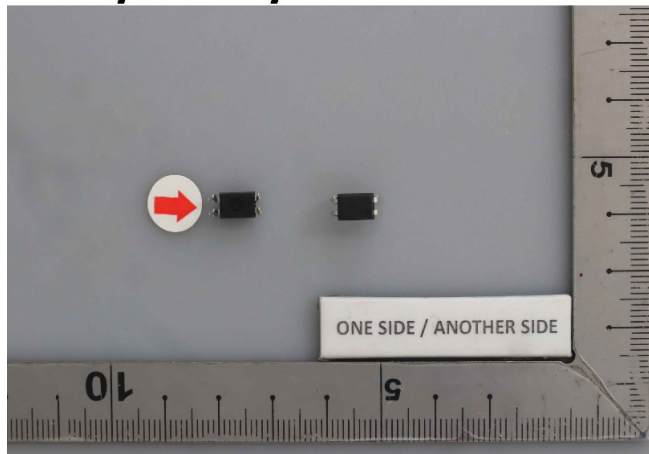
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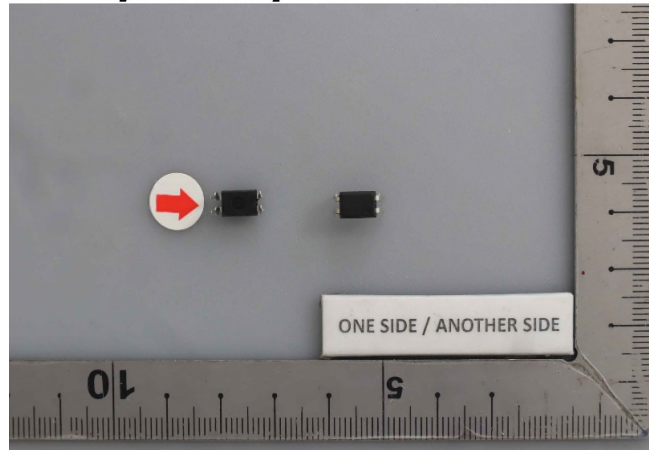
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CE/2020/40285 NO.3



CE/2020/40285 NO.4



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