

Test Report 測試報告

Applicant 申請廠商: Fort Technology Co., Ltd.
致強科技股份有限公司
No.248-21, Xincheng Rd.,
Qianzhen Dist., Kaohsiung City 80672,
Taiwan (R.O.C.)
高雄市前鎮區新生路 248 之 21 號

Number : TWNC00691030
報告號碼

Date 日期 : May 11, 2018

Sample Description 樣品敘述:

One (1) group of submitted samples said to be :

以下測試樣品乃供應商所提供及確認:

Sample Description : High Power Current Sensing Resistor-CM series

樣品名稱

Style / Item No. : 0805. 1206. 2010. 2512. 2725. 2817. 4527

產品型號

Date Sample Received : May 03, 2018

收件日期

Date Test Started : May 03, 2018

開始測試日期

Test Conducted 測試執行:

As requested by the applicant, for details please refer to attached pages.

依申請商之要求, 細節請參考附頁.

Authorized by:

On Behalf of Intertek Testing Services
Taiwan Limited



Matt Wang
Sr. Manager



Test Conducted 測試內容：

Test Result Summary 測試結果：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果	RL
			Black electronic component (mixed all parts)	
Heavy Metal 重金屬				
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	2
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	27	2
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4:2013+AMD1:2017, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4:2013+AMD 1:2017，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	2
Antimony (Sb) Content 銻含量	ppm	With reference to USEPA 3052, by microwave digestion and determined by ICP-OES. 參考 USEPA 3052，以微波消化法並用感應耦合電漿原子發射光譜儀分析。	ND	2
Chromium VI (Cr ⁶⁺) Content 六價鉻含量	ppm	With reference to IEC 62321-7-2: 2017, organic solvent was used to dissolve or swell sample matrix, followed by alkaline digestion and determined by UV-Vis Spectrophotometer. 參考 IEC 62321-7-2:2017，以有機溶劑溶解或使樣品基質膨脹，再進行鹼液消化，用紫外光-可見光分光光度計分析。	ND	8



Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果	RL
			Black electronic component (mixed all parts)	
Polybrominated Biphenyls (PBBs) 多溴聯苯				
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	5
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	5
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm		ND	5
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm		ND	5
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm		ND	5
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm		ND	5
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm		ND	5
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm		ND	5
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	5
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	5
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚				
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015，以溶劑萃取並用氣相層析質譜儀分析，必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	5
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm		ND	5
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	5
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	5
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	5
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	5
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	5
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	5



Test Conducted 測試內容：

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果	RL
			Black electronic component (mixed all parts)	
Phthalates 鄰苯二甲酸酯				
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS. 參考 IEC 62321-8:2017，以溶劑萃取並用氣相層析質譜儀分析。	ND	50
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	ppm		ND	50
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	ppm		ND	50
Di-(Iso-Nonyl) Phthalate (DINP) 鄰苯二甲酸二異壬酯	ppm		ND	50
Di-(Iso-Decyl) Phthalate (DIDP) 鄰苯二甲酸二異癸酯	ppm		ND	50
Di-(N-Octyl) Phthalate (DNOP) 鄰苯二甲酸二辛酯	ppm		ND	50
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	ppm		ND	50
Polycyclic Aromatic Hydrocarbons (PAHs) 多環芳香族化合物				
Naphthalene 萘	ppm	With reference to AfPS GS 2014:01 PAK issued by the German committee on product safety (AfPS), by solvent extraction and determined by GC-MS. 參考由 Afps 發行的文件 AfPS GS 2014:01 PAK，以溶劑萃取並以氣相層析質譜儀分析。	ND	0.2
Acenaphthylene 芴烯 (Δ)	ppm		ND	0.2
Acenaphthene 芴 (Δ)	ppm		ND	0.2
Fluorene 芴 (Δ)	ppm		ND	0.2
Phenanthrene 菲 (Δ)	ppm		ND	0.2
Anthracene 蒽 (Δ)	ppm		ND	0.2
Fluoranthene 芴蒽 (Δ)	ppm		ND	0.2
Pyrene 芘 (Δ)	ppm		ND	0.2
Chrysene 屈 (Ψ)	ppm		ND	0.2
Benzo[a]Anthracene 苯并[a]蒽 (Ψ)	ppm		ND	0.2
Benzo[b]Fluoranthene 苯并[b]芴蒽 (Ψ)	ppm		ND	0.2
Benzo[k]Fluoranthene 苯并[k]芴蒽 (Ψ)	ppm		ND	0.2
Benzo[j]Fluoranthene 苯并[j]芴蒽 (Ψ)	ppm		ND	0.2
Benzo[a]Pyrene 苯并[a]芘 (Ψ)	ppm		ND	0.2
Benzo[e]Pyrene 苯并[e]芘 (Ψ)	ppm		ND	0.2
Indeno[1,2,3-c,d]Pyrene 茛并[1,2,3-c,d]芘 (Ψ)	ppm		ND	0.2
Dibenzo[a,h]Anthracene 二苯并[a,h]蒽 (Ψ)	ppm		ND	0.2
Benzo[g,h,i]Perylene 苯并[g,h,i]芘 (Ψ)	ppm		ND	0.2
Sum of (Δ) 化合物(Δ)總和	ppm		ND	--
Sum of 18 PAHs 18 支 PAHs 總和	ppm		ND	--



Test Conducted 測試內容 :

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果	RL
			Black electronic component (mixed all parts)	
Halogen Content 鹵素含量				
Fluorine (F) 氟	ppm	With reference to EN 14582:2016 by combustion bomb with oxygen and determined by Ion Chromatography. 參考 EN 14582:2016，以氧彈燃燒集氣法並用離子層析儀分析。	ND	50
Chlorine (Cl) 氯	ppm		ND	50
Bromine (Br) 溴	ppm		ND	50
Iodine (I) 碘	ppm		ND	50
Others 其他				
Perfluorooctane Sulfonates Including PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE 全氟辛磺酸含 PFOS, PFOSA, N-Me-FOSA, N-Et-FOSA, N-Me-FOSE, N-Et-FOSE	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	0.01
Perfluorooctanoic Acid (PFOA) 全氟辛酸	ppm	With reference to CEN/TS 15968:2010, by solvent extraction and determined by LC-MS-MS. 參考 CEN/TS 15968:2010，以溶劑萃取並用液相層析串聯質譜儀分析。	ND	0.01

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg
備註 百萬分之一，依據測試樣品重量計算 = 毫克/公斤
ND = Not detected 未檢測出
RL = Reporting limit, quantitation limit of analyte in sample
報告極限，測試樣品之定量偵測極限

Responsibility of Chemist 分析人員 : Pelny Hsiao/ Vita Fu

Date Sample Received 樣品收件日期 : May 03, 2018
Test Period 樣品測試期間 : May 03, 2018 to May 09, 2018



Test Conducted 測試內容 :

RoHS Limit RoHS 限值

Restricted Substances 限用物質	Limits 限值
Cadmium (Cd) content 鎘含量	0.01% (100ppm)
Lead (Pb) content 鉛含量	0.1% (1000ppm)
Mercury (Hg) content 汞含量	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) content 六價鉻含量	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs) 多溴聯苯	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚	0.1% (1000ppm)
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	0.1% (1000ppm)
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	0.1% (1000ppm)
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	0.1% (1000ppm)
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	0.1% (1000ppm)

The limits were quoted from Annex II of 2011/65/EU and Amendment (EU) 2015/863 for homogeneous material.
本限值是依據歐盟指令 2011/65/EU 及其更新指令(EU) 2015/863 之附錄二針對均質材質所訂定。



Test Conducted 測試內容：

PAHs Limit PAHs 限值

Parameter 分類	Category 1 第一類	Category 2 第二類		Category 3 第三類	
Product 產品	Materials intended to be put in the mouth, or materials of toys with intended long-term skin contact (longer than 30s) 可以放入口中的材料或是可接觸皮膚超過 30 秒的玩具材料	Materials not covered by category 1, with foreseeable skin contact for longer than 30 seconds (long-term skin contact) or repeated short-term skin contact## 非歸類於第一類的材料，但是可預見使用時會接觸皮膚超過 30 秒或是短期重複跟皮膚接觸##		Materials not covered by category 1 or 2 with foreseeable skin contact up to 30 seconds (short term skin contact) 非歸類於第一、二類的材料，但是可預見接觸皮膚的時間小於 30 秒	
		A	B	A	B
Each (Ψ) 每一種化合物(Ψ)	0.2 mg/kg	0.2 mg/kg	0.5 mg/kg	0.5 mg/kg	1 mg/kg
Sum of (Δ) 化合物(Δ)總和	1 mg/kg	5 mg/kg	10 mg/kg	20 mg/kg	50 mg/kg
Naphthalene 萘	1 mg/kg	2 mg/kg		10 mg/kg	
Sum of 18 PAHs 18 支 PAHs 總和	1 mg/kg	5 mg/kg	10 mg/kg	20 mg/kg	50 mg/kg

Remarks : A = Toys in the scope of 2009/48/EC
備註 2009/48/EC 中適用的玩具

B = Other products in the scope of ProdSG
產品安全法涉及的其他產品

Ψ = Benzo[a]Pyrene 苯并[a]芘, Benzo[e]Pyrene 苯并[e]芘, Benzo[a]Anthracene 苯并[a]蒽, Benzo[b]Fluoranthene 苯并[b]芴, Benzo[j]Fluoranthene 苯并[j]芴, Benzo[k]Fluoranthene 苯并[k]芴, Chrysene 屈, Dibenzo[a,h]Anthracene 二苯并[a,h]蒽, Benzo[g,h,i]Perylene 苯并[g,h,i]芘, Indeno [1,2,3-c,d]Pyrene 茚并[1,2,3-c,d]芘

Δ = Acenaphthylene 芴, Acenaphthene 芴, Fluorene 芴, Phenanthrene 菲, Pyrene 芘, Anthracene 蒽, Fluoranthene 芴

= "repeated short-term skin contact" according to REACH Annex XVII No. 50 addition regulation (EC) No. 1272/2013
"短期重複與皮膚接觸" 是依據 REACH 法規(EC) No.1272/2013 附錄 XVII 第 50 項

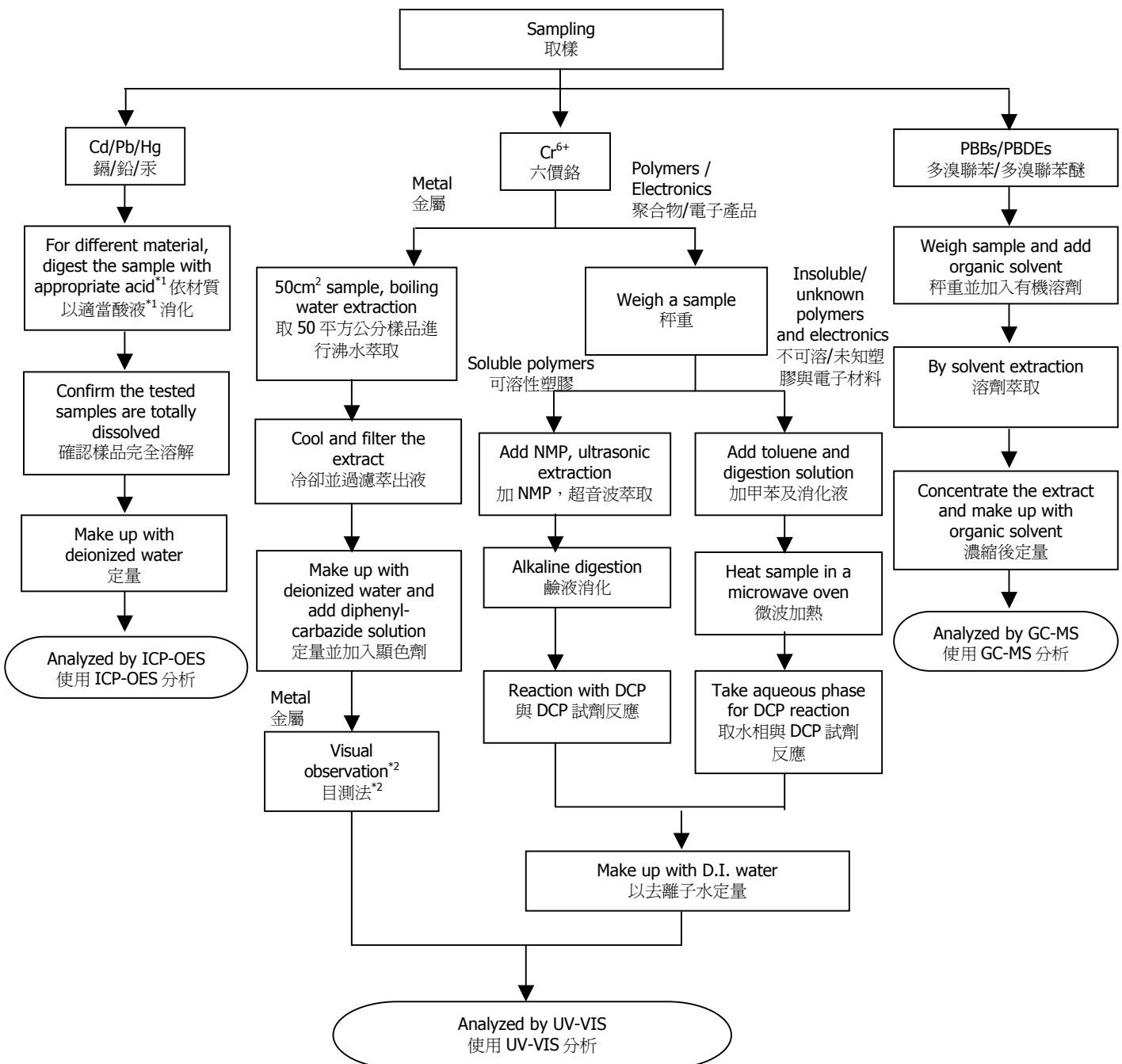


Test Conducted 測試內容：

Measurement Flowchart 測試流程圖：

Test for Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Content RoHS 六項測試

Reference Method 參考方法: Cd/Pb: IEC 62321-5:2013; Hg: IEC 62321-4:2013+AMD1:2017;
Chromium (VI): IEC 62321-7-1:2015 (boiling water extraction);
Chromium (VI): IEC 62321-7-2:2017 (solvent and alkaline extraction);
PBBs/PBDEs: IEC 62321-6:2015



Test Conducted 測試內容：

Remark 備註：

*1: List of Appropriate Acid 各材質添加酸液如下表：

Material 材質	Acid Added for Digestion 添加酸液種類
Polymers 聚合物	HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃ 硝酸、鹽酸、氫氟酸、雙氧水、硼酸
Metals 金屬	HNO ₃ , HCl, HF 硝酸、鹽酸、氫氟酸
Electronics 電子產品	HNO ₃ , HCl, H ₂ O ₂ , HBF ₄ 硝酸、鹽酸、雙氧水、氟硼酸

*2: If sample solution is significantly more intense than 0.13 µg/cm² equivalent comparison standard, Chromium VI would be determined as detected, the result of visual observation is positive.
當待測樣品溶液顏色明顯比 0.13 µg/cm² 深，採用目測法判定六價鉻結果為陽性。

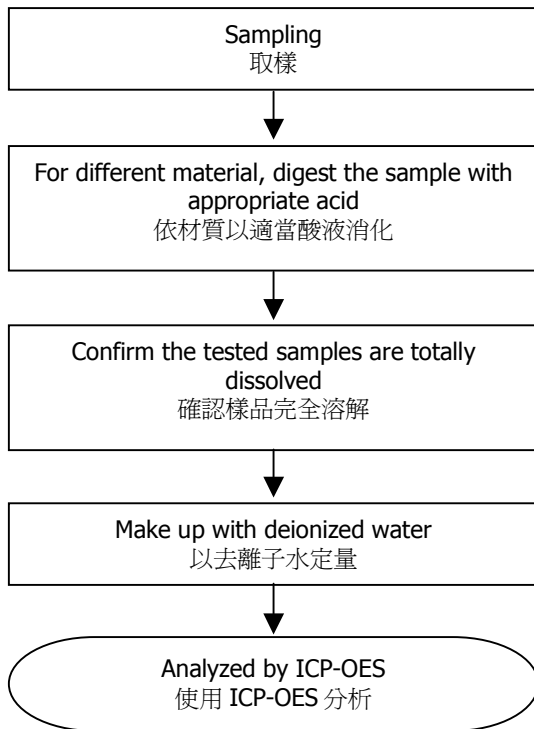


Test Conducted 測試內容：

Measurement Flowchart 測試流程圖：

Test for Heavy Metal (Sb) Content 重金屬(銻)

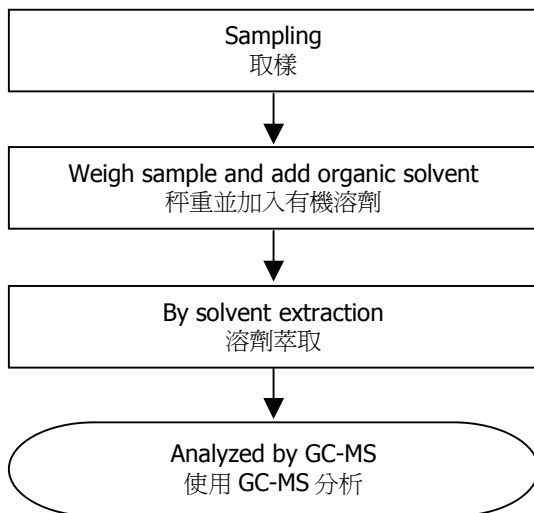
Reference Method 參考方法：USEPA 3052



Test Conducted 測試內容 :

Measurement Flowchart 測試流程圖:

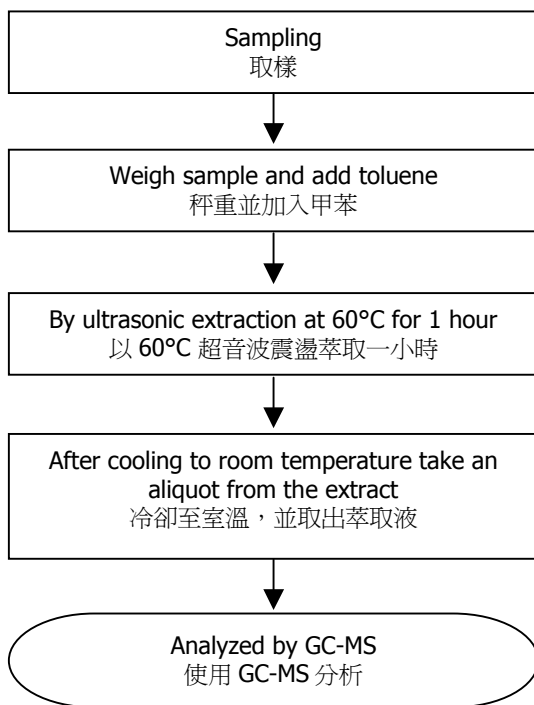
Test for Phthalates Content 鄰苯二甲酸酯測試
Reference Method 參考方法: IEC 62321-8:2017



Test Conducted 測試內容 :

Measurement Flowchart 測試流程圖:

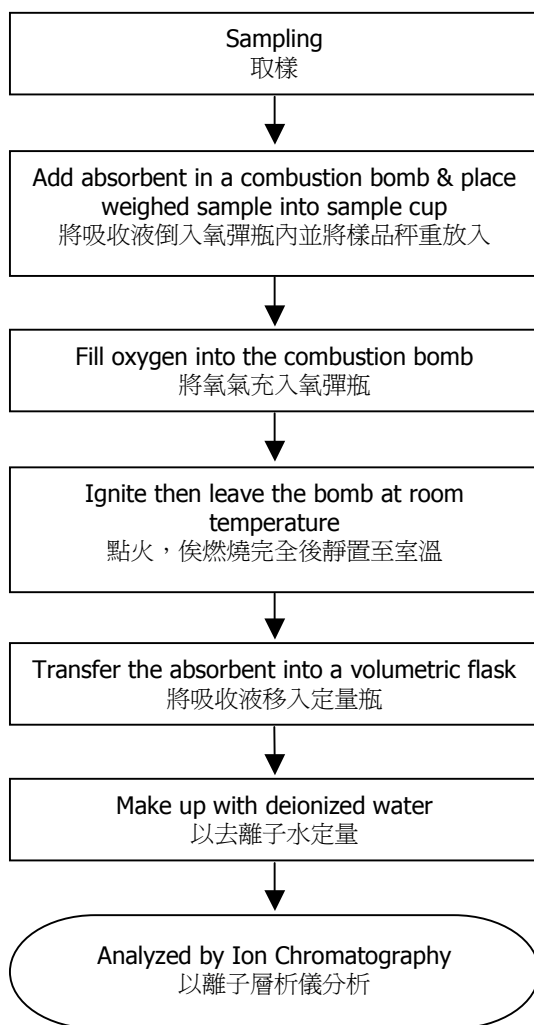
Test for Polycyclic Aromatic Hydrocarbons (PAHs) Content 多環芳香族化合物測試
Reference Method 參考方法 : AfPS GS 2014:01 PAK



Test Conducted 測試內容：

Measurement Flowchart 測試流程圖：

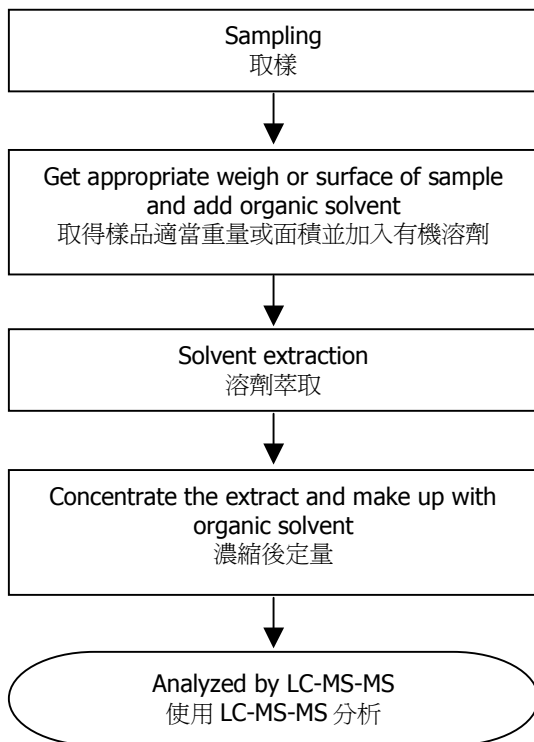
Test for Halogen Content 鹵素測試
Reference Method 參考方法：EN 14582

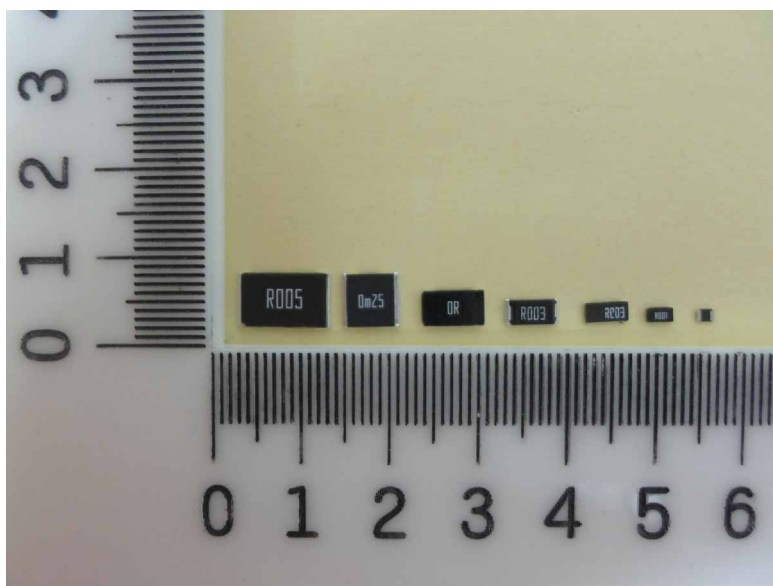


Test Conducted 測試內容 :

Measurement Flowchart 測試流程圖:

Test for Perfluorooctane Sulfonates (PFOS) / Perfluorooctanoic Acid (PFOA) Content 全氟辛磺酸 / 全氟辛酸測試
Reference Method 參考方法: CEN/TS 15968:2010





End of Report

Except where explicitly agreed in writing, all work and services performed by Intertek is subject to our standard Terms and Conditions which can be obtained at our website: <http://www.intertek-twn.com/terms/>. Intertek's responsibility and liability are limited to the terms and conditions of the agreement.

This report is made solely on the basis of your instructions and / or information and materials supplied by you and provide no warranty on the tested sample(s) be truly representative of the sample source. The report is not intended to be a recommendation for any particular course of action, you are responsible for acting as you see fit on the basis of the report results. Intertek is under no obligation to refer to or report upon any facts or circumstances which are outside the specific instructions received and accepts no responsibility to any parties whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works. This report does not discharge or release you from your legal obligations and duties to any other person. You are the only one authorized to permit copying or distribution of this report (and then only in its entirety). Any such third parties to whom this report may be circulated rely on the content of the report solely at their own risk.

