

Product Number: AN0891-74S01BRS
Product Name: Dipole Antenna



Specification For Approval

Date: 2018 / 06 / 08

File No.: 180608006

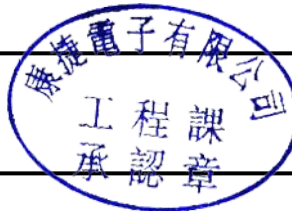
Version: 1.0

Customer : 研華股份有限公司

Customer P/N : 1750008946-01

INVAX P/N : AN0891-74S01BRS

Description : Dipole Antenna



Cortec Checked By:

R D
2018.06.08
Kenny

Customer Approved By:



INVAX System Technology Corp.
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1. Revision History

Revision	Date	Change Notification	Description
1.0	2018.06.08	初版	

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2. Specification

Sample Photo	
	
A. Electrical Characteristics	
Frequency	863 ~928 MHz
V.S.W.R.	≤ 2.0
Peak Gain	2.01 dBi
Polarization	Linear
Impedance	50 Ohm
B. Material & Mechanical Characteristics	
Material of Radiator	PCB
Material of Plastic	ABS
Cable Type	RG178U-03
Connector Type	SMA Male Reverse
C. Environmental	
Operation Temperature	- 40 °C ~ + 65 °C
Storage Temperature	- 40 °C ~ + 80 °C
Antenna Color Storage life	< 2 year

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3. Characteristics and Reliability Test

Test Items 測試項目		Test Condition and Procedure 測試方法	Requirements 要求	Result 結果
C1	V.S.W.R. 電壓駐波比	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	PASS
C2	Insertion Loss 插入損失	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	N/A
C3	Antenna Gain 天線增益	Set DUT on Antenna Chamber; make individual calibration to test 設置天線暗室參數進行測試	Directive DUT specification 符合待測物規範	PASS
C4	Voltage Breakdown 耐電壓	Test voltage should be applied between insulated portions, or between ground as specified. 在绝缘部分测试电压,或指定接地面之间	Max Voltage ≥ 500 V or directive material specification 最大電壓 ≥ 500 V 或符合材料規範	N/A
C5	Insulation Resistance 絕緣阻抗	Set Voltage: 500 ± 50 V; between the insulated portions, or between ground as specified. 設置電壓 500 ± 50 V,在绝缘部份測試或指定接地面之间	Resistance ≥ 500 M ohm or directive material specification 阻抗 ≥ 500 M ohm 或符合材料規範	N/A
C6	Contact Resistance 接觸阻抗	Air Temp: 26°C ; measured with test equipment 室溫 26°C , 指定量測設備	Directive material specification 符合材料規範	N/A
M1	Vibration 震動	GB / T2423.48-2008 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction 振幅 1.5mm ; 頻率 20~80~20Hz ; 3 個方向各 2H	1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ 無明顯外觀不良; 頻率偏移 $\leq 5\%$	PASS
M2	Random Drop 跌落	GB / T2423.8-1995 Single : Height: 1.0 Meter; 3 directions; 1 time for each direction 單支天線, 高 1m ; 3 個方向各 1 次	1. No parts separated 、 fracture 2. Frequency Tol. $\leq 5\%$ 產品無脫落、斷裂; 頻率偏移 $\leq 5\%$	PASS
		Packing : Height: 0.76 Meter; 1 corner, 3 edges, 6 surface 包裝 : 高 0.76m , 一角、三棱、六面各一次		N/A
		Antenna+Machine: Height: 0.76 Meter; 1 corner, 3 edges, 6 surface. 整機 : 高 0.76m , 一角、三棱、六面各一次		N/A
M3	Solderability	GB / T2423.28-2005	Tin evenly on full	N/A

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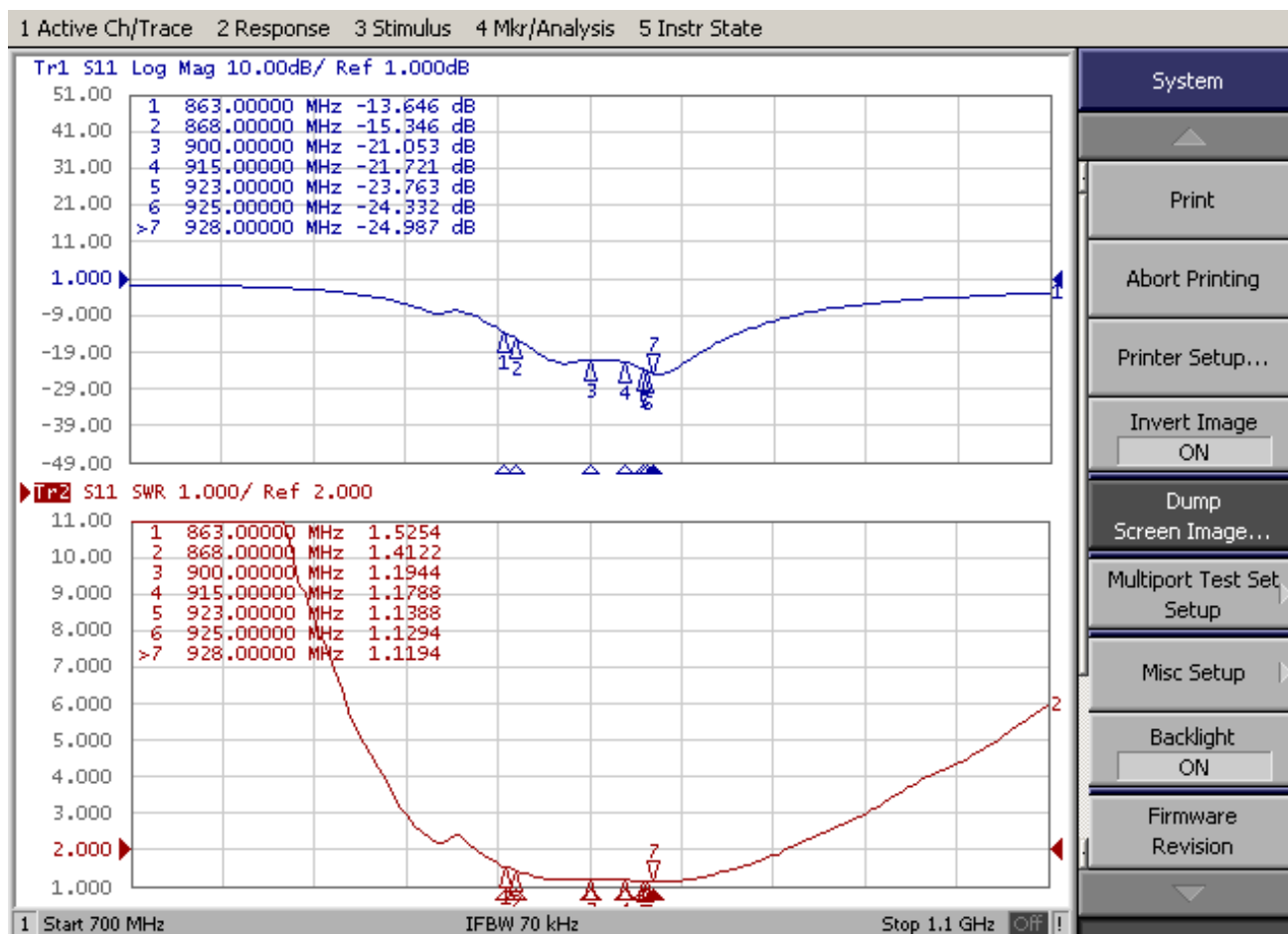
	可焊性	Temp: 260±5° C;Duration: 5 seconds 溫度 260±5° C;持續 5 秒	上錫均勻飽滿	
M4	Pull Test 拉力	Holding with individual specification; force applied to axis of terminal .單獨定義產品端子拉力	1. Directive DUT specification 2. Frequency Tol.≤5% 符合待測物規範;頻率偏移≤5%	PASS
M5	Torque Test 扭力	Holding with individual specification; applied clockwise and counterclockwise to the axis of terminal 單獨定義產品端子之順時針及逆時針扭力	1. Directive DUT specification 2. Frequency Tol.≤ 5% 符合待測物規範;頻率偏移≤5%	PASS
M6	Dimension 尺寸	Inspection of dimension, color, material, package, surface process.检查尺寸,颜色,材料,包装,表面處理	Directive DUT specification 符合待測物規範	PASS
E1	Waterproof 防水	With Reference to IEC 60529 // IP Code Definition 參考 IEC60529 IP 定義	Directive DUT specification 符合待測物規範	N/A
E2	Salt Spray 鹽霧	GB / T 2423.17-2008 Temp: 35°C; RH: ≥ 95%; NaCl solution: ≥ 5%;Time: 24H 溫度 35°C ; 濕度≥95%;鹽水濃度≥5% ; 測試 24H	1. No Visual Damage 2. Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	PASS
E3	Temperature and Humidity Chamber 恒溫恒濕	GB / T 2423.3-2006 Temp: 80°C / 12 H; -40°C / 12H RH: ≥ 90%; Time: 24H 溫度 80°C 測試 12H 轉-40°C 測試 12H;濕度≥ 90% ; 時間 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	PASS
E4	Thermal Shock 冷熱衝擊	GB / T 2423.22 - 2008 - 40°C (30 minutes) to + 80°C (30 minutes) ; Cycles: 24 - 40°C 測試 30 分轉 80°C 測試 30 分為一個週期;共 24 週期	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	PASS
E5	Aging test 老化	GB / T 2423.2 - 2008 Temp: 80°C; Time: 24 hours 溫度 80°C , 測試 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	PASS
E6	High Temp. 高溫	Temp. 270±10°C ; Times : 120 seconds 溫度 270±10°C , 測試時間 120 秒	No Visual Damage 無明顯外觀不良	N/A
R1	RoHS	With Reference to IEC 62321:2008 with flow chart 參考 IEC 62321 測試流程	Directive RoHS 2011/65/EU 符合 RoHS 2011/65/EU 標準	PASS
R2	PFOS	With Reference to USA EPA 3550C:1996 by LC/MS 參考 USA EPA 3550C 測試流程	Directive RoHS 2006/122/EC 符合 RoHS 2011/65/EU 標準	PASS

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4. Antenna - S Parameter Test Data

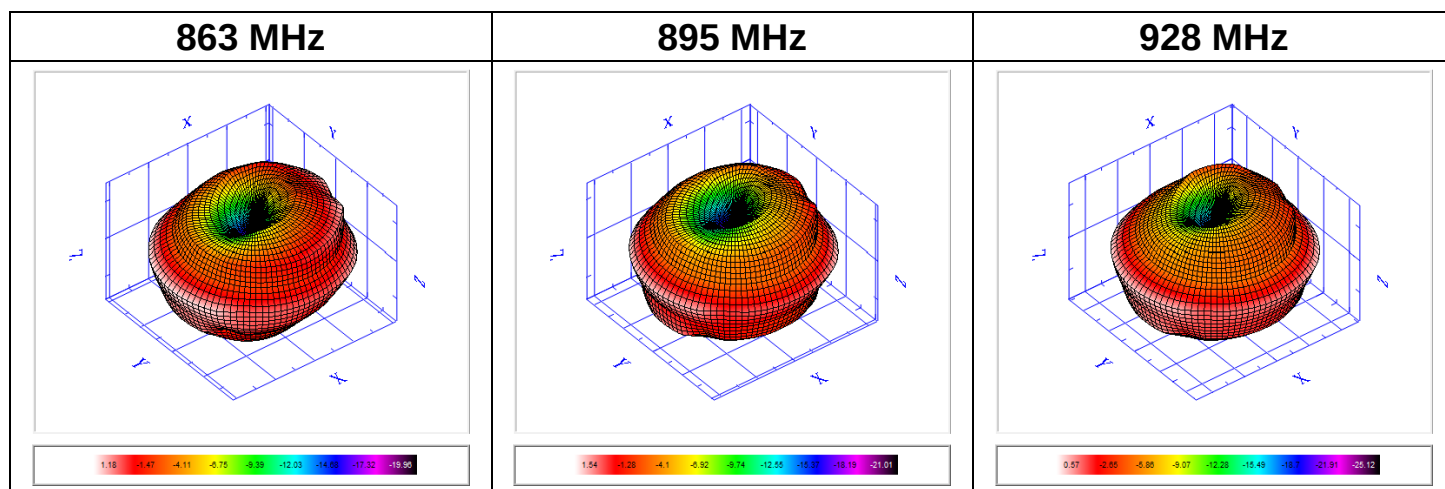


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5. Antenna - Radiation Pattern Test Data



Frequency	863	868	873	880	885	890	895	900	905	910	915	923	925	928
E-Total Peak Gain (dBi)	1.18	1.7	1.87	2.01	1.82	1.74	1.54	1.24	0.96	0.68	0.45	0.41	0.27	0.57
Efficiency (%)	64.26	66.59	66.92	67.37	65.75	65.96	62.43	56.86	52.05	50.06	49.33	49.5	47.47	50.11
Average Gain (dB)	-1.92	-1.77	-1.74	-1.72	-1.82	-1.81	-2.05	-2.45	-2.84	-3.01	-3.07	-3.05	-3.24	-3

1	2	3	4	5	6	7	8																								
HF☐ RoHS☒ REACH☐ CONFIDENTIAL					<table><tr><td>SIGN</td><td>DATE</td><td>DESCRIPTION</td><td>APPROVER</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>			SIGN	DATE	DESCRIPTION	APPROVER																				
SIGN	DATE	DESCRIPTION	APPROVER																												
Note: 1.Mark * is important dimension;"Cpk "Identify for process control(CpK≥1.33). 2.Tolerance:Unmarked tolerance refer to the standard tolerance please.																															
<table><tr><td>3</td><td>BODY-AN74S-01B</td><td>Body</td><td>ABS</td><td>Black</td><td>1</td></tr><tr><td>2</td><td>BODY1-AN67-01B</td><td>Body1</td><td>ABS</td><td>Black</td><td>1</td></tr><tr><td>1</td><td>SMA194-CCR5AN19-D</td><td>SMA公頭母針</td><td>Cu</td><td>Black</td><td>1</td></tr><tr><td>No.</td><td>Part Number</td><td>Name</td><td>Material</td><td>Finish</td><td>Q'ty</td></tr></table>								3	BODY-AN74S-01B	Body	ABS	Black	1	2	BODY1-AN67-01B	Body1	ABS	Black	1	1	SMA194-CCR5AN19-D	SMA公頭母針	Cu	Black	1	No.	Part Number	Name	Material	Finish	Q'ty
3	BODY-AN74S-01B	Body	ABS	Black	1																										
2	BODY1-AN67-01B	Body1	ABS	Black	1																										
1	SMA194-CCR5AN19-D	SMA公頭母針	Cu	Black	1																										
No.	Part Number	Name	Material	Finish	Q'ty																										
1	2	3	4	5	6	7	8																								

Invax System Group.

Cortec

Cortec Technology Inc.

Http://www.invaxsystem.com

E-mail:info@invax.com.tw

Tel :886-2-27885218

Fax:886-2-27831658

TITLE: 861~915MHz Antenna

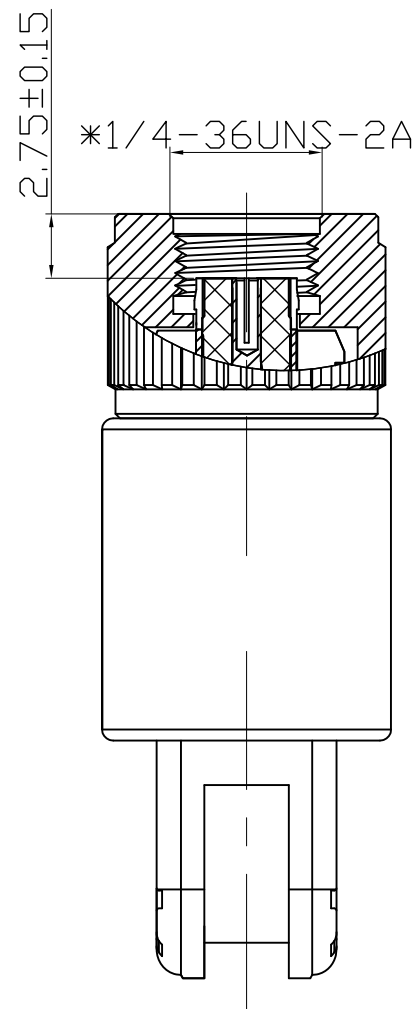
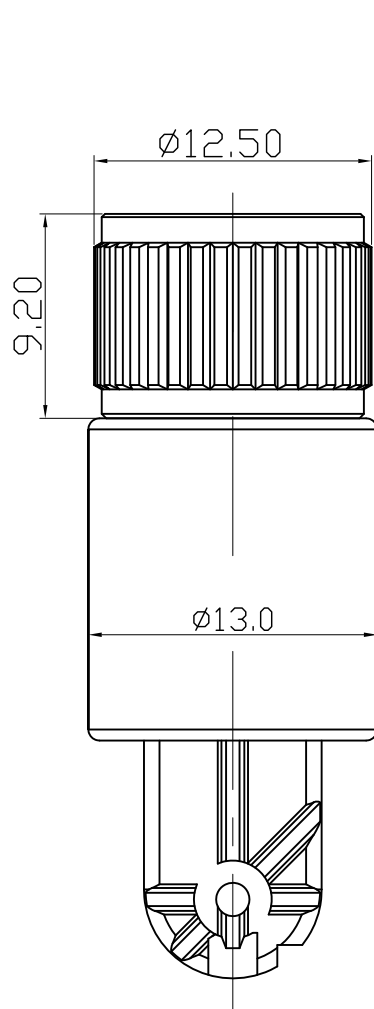
PART NO.: AN0891-74S01BRS

CUSTOMER P/N: /

APP BY	CHK BY	RF BY	DES BY		Tolerance
Grant	Kenny	TW	LJF	UNITS: mm	X.X ±0.5
2018/05/11	2018/05/11	2018/05/11	2018/05/11	SCALE: 1/1	X.XX ±0.2
REVISION: A					X° ±1

RoHS

Compatible



SIGN	DATE	DESCRIPTION	APPROVER
△			
△			
△			

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Tel.:886-2-27885218
Fax:886-2-27831658

TITLE: SMA 公頭母針 FOR AN92

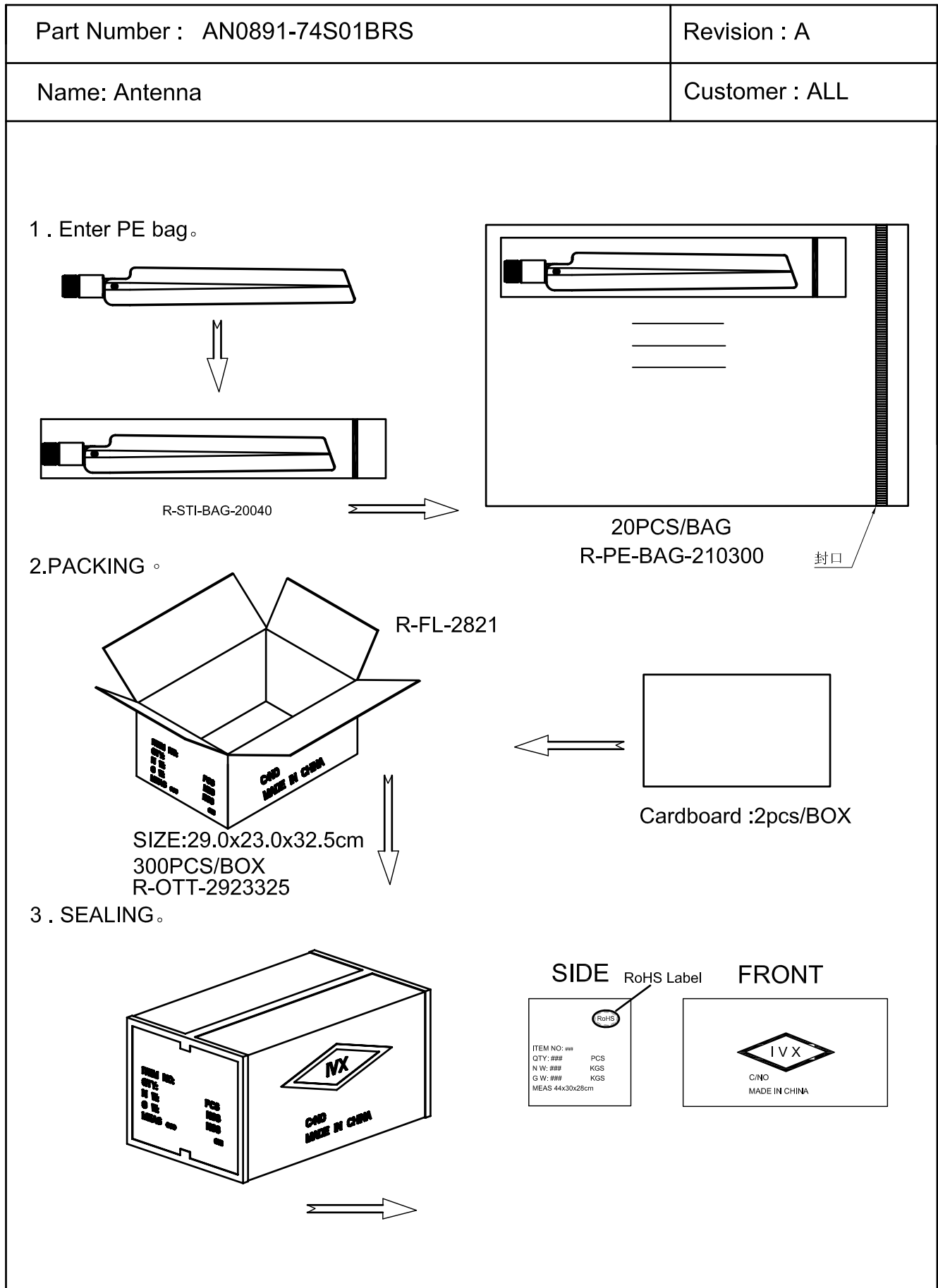
PART NO.: SMA194-CCR5AN19-D

CUSTOMER P/N: /

APP BY	CHK BY	RF BY	DES BY		Tolerance
Grant 2015/04/27	LHC 2015/04/27	Grant 2015/04/27	李禹岐 2015/04/27	UNITS: mm SCALE: 1/1 REVISION: A	X.X ±0.30 X.XX ±0.15 X° ±2°

Date: 2018.05.11

Page: 1 of 1

APPROVED BY : GrantCHECKED BY : KennyDESIGNED BY : HC

SGS 台灣網站 → http://twap.sgs.com/sgsrsts/chn/cheres_tw.asp
SGS 大陸網站 → http://rsts.cn.sgs.com/chn/cheres_cn.asp
SGS 韓國網站 → http://rohs.kr.sgs.com/sgsrsts/en/cheres_en.asp

COR/F-G-47a

請輸入以下報告正確資料及檢查碼以便查核

1. 報告編號
2. 報告日期 (YYYY/MM/DD)
3. 產品名稱 (輸入前 10 個字不含空白)
4. 圖示檢查碼 (依指示畫面)



物料中HSF對象物質含量調查表

康捷電子有限公司	
填表：	時麗
部門：	研發部
職務：	文員

物料名稱：AN0891-74S01BRS

序號	物料型號	物料各構成名稱	各構成物料的材料	測試報告裡RoHS對應物質測試結果						檢測報告編號	測試日期	測試名稱	測試機構名稱
				Cd	Pb	Hg	Cr(VI)	PBBs	PBDEs				
1	BODY1-AN74S-01B	Body1	ABS	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	0114071849p6 001	2017.12.01	POLYLAC® PA-757	TuvRheinland
2	BODY1-AN67-01B	Body	ABS	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	0114071849p6 001	2017.12.01	POLYLAC® PA-757	TuvRheinland
3	/	Body	黑色色母	N.D.	26	N.D.	N.D.	N.D.	N.D.	A2180011207101001	2018.01.30	Black masterbatch	SGS
4	PB-AN74S-891	PCB	FR4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	CANEC1802593318	2018.02.09	The Halogen	SGS
5	SMA194-CCR5AN19-D	SMA Male Reverse	銅	10	26674	N.D.	N.D.	N.D.	N.D.	SHAHG1802222802	2018.02.02	有色金屬棒 C3604	SGS
6	R-RG-178U-03	Cable	FEP	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	NGBML1800155002	2018.01.17	聚全氟乙烯树脂.	SGS
7			PTFE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	NGBML1800151702	2018.01.16	聚四氟乙烯分散树脂.	SGS
8			镀银铜	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	SHAEC1728677802	2018.01.04	镀银铜丝	SGS
9			鍍錫銅	N.D.	11	N.D.	N.D.	N.D.	N.D.	A2180042511101001C	2018.04.10	镀锡圆铜线	CTI

根據測試報告如實填寫鉛、鎘、汞、六價鉻、PBBs和PBDEs六項禁用物質的含量

包裝材料中鉛、鎘、汞、六價鉻總含量不超過100ppm，鎘的允許濃度為5ppm

歐盟ROHS指令豁免條款2009/95/BC、鋼中合金元素中的鉛含量達0.35%、鋁含量達0.4%、銅合金中的鉛含量達4%

Prüfbericht - Nr.: 0114071849p6 001 <i>Test Report No.:</i>			Seite 1 von 6 <i>Page 1 of 6</i>														
Auftraggeber: Chi Mei Corporation <i>Client:</i> 59-1, San Chia, Jen Te, Tainan City 71702, Taiwan, R.O.C.																	
Gegenstand der Prüfung: ACRYLONITRILE-BUTADIENE-STYRENE COPOLYMER <i>Test Item:</i>																	
Bezeichnung: POLYLAC® PA-757 <i>Identification:</i>																	
Anlieferungszustand: apparent good <i>Delivery condition:</i>		Eingangsdatum: 2017-12-01 <i>Date of Receipt:</i>															
Prüfart: TÜV Rheinland (Shanghai) Co., Ltd. <i>Testing location:</i>																	
Prüfgrundlage: According to RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU last amended by (EU) 2015/863: Total Content of Lead, Cadmium, Mercury, Chromium VI, Polybrominated Biphenyls, Polybrominated Diphenyl Ethers; and Benzylbutyl phthalate (BBP), Dibutyl phthalate (DBP), Bis(2-ethylhexyl) phthalate (DEHP), Diisobutyl phthalate (DIBP) and Halogen (Fluorine, Chlorine, Bromine, Iodine) <i>Test specification:</i>																	
Prüfergebnis: The test results are the measurements, stated in the test report. <i>Test result:</i>																	
geprüft: tested by:  2018-01-02 Anne Chen /Coordinator kontrolliert: checked by:  2018-01-02 Carl Chang /Department Manager																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Datum <i>Date</i></th> <th style="width: 30%;">Name/Stellung <i>Name/Position</i></th> <th style="width: 30%;">Unterschrift <i>Signature</i></th> <th style="width: 15%;">Datum <i>Date</i></th> <th style="width: 30%;">Name/Stellung <i>Name/Position</i></th> <th style="width: 30%;">Unterschrift <i>Signature</i></th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>						Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>						
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>												
Sonstiges/ Other Aspects: Test period: 2017-12-01 – 2018-01-02																	
<table style="width: 100%;"> <tr> <td style="width: 50%;"> Abkürzungen: ok / P = entspricht Prüfgrundlage fail / F = entspricht nicht Prüfgrundlage n.a. / N = nicht anwendbar </td> <td style="width: 50%;"> Abbreviations: ok / P = passed fail / F = failed n.a. / N = not applicable </td> </tr> </table>						Abkürzungen: ok / P = entspricht Prüfgrundlage fail / F = entspricht nicht Prüfgrundlage n.a. / N = nicht anwendbar	Abbreviations: ok / P = passed fail / F = failed n.a. / N = not applicable										
Abkürzungen: ok / P = entspricht Prüfgrundlage fail / F = entspricht nicht Prüfgrundlage n.a. / N = nicht anwendbar	Abbreviations: ok / P = passed fail / F = failed n.a. / N = not applicable																
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>																	



Test Report No. : 0114071849p6 001
 Customer : Chi Mei Corporation
 Test Method : Total Cadmium, Lead, Mercury, Chromium
 - Ref. to IEC 62321-4:2013 and IEC 62321-5:2013
 Chromium (VI)
 - For Metal material - Ref. to IEC 62321-7-1:2015
 - For Plastic or Electronic material - Ref. to IEC 62321-7-2:2017
 - For Leather material - Ref. to ISO 17075:2007
 PBBs, PBDEs - Ref. to IEC 62321-6:2015

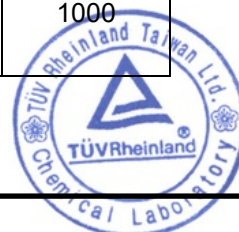
2018-01-02

Sample Material Lab.-No.		LoD	POLYLAC® PA-757 plastic/off white TCL171201-35
Cadmium (Cd)	mg/kg	2	n.d.
Lead (Pb)	mg/kg	2	n.d.
Mercury (Hg)	mg/kg	2	n.d.
Chromium VI (Cr VI)	mg/kg	2	n.d.
Sum of Polybrominated biphenyls (PBBs)	mg/kg	-	n.d.
Monobromobiphenyl	mg/kg	5	n.d.
Dibromobiphenyl	mg/kg	5	n.d.
Tribromobiphenyl	mg/kg	5	n.d.
Tetrabromobiphenyl	mg/kg	5	n.d.
Pentabromobiphenyl	mg/kg	5	n.d.
Hexabromobiphenyl	mg/kg	5	n.d.
Heptabromobiphenyl	mg/kg	5	n.d.
Octabromobiphenyl	mg/kg	5	n.d.
Nonabromobiphenyl	mg/kg	5	n.d.
Decabromobiphenyl	mg/kg	5	n.d.
Sum of Polybrominated diphenyl ethers (PBDEs)	mg/kg	-	n.d.
Monobromodiphenyl ether	mg/kg	5	n.d.
Dibromodiphenyl ether	mg/kg	5	n.d.
Tribromodiphenyl ether	mg/kg	5	n.d.
Tetrabromodiphenyl ether	mg/kg	5	n.d.
Pentabromodiphenyl ether	mg/kg	5	n.d.
Hexabromodiphenyl ether	mg/kg	5	n.d.
Heptabromodiphenyl ether	mg/kg	5	n.d.
Octabromodiphenyl ether	mg/kg	5	n.d.
Nonabromodiphenyl ether	mg/kg	5	n.d.
Decabromodiphenyl ether	mg/kg	5	n.d.

Notes:

- n.d. - not detected
- n.a. - not applicable
- LoD - Limit of Detection
- mg/kg is equal to ppm (parts per million)

	Cd	Cr(VI)	Pb	Hg	PBBs	PBDEs
Maximum permissible Limit acc. to 2011/65/EU (mg/kg)	100	1000	1000	1000	1000	1000



Test Report No. : 0114071849p6 001
Customer : Chi Mei Corporation
Test Method : BBP/DBP/DEHP/DIBP - Ref. to IEC 62321-8:2017
Halogen - Following EN 14582; determination by I.C.

2018-01-02

Sample Material Lab.-No.	LoD	POLYLAC® PA-757 plastic/off white TCL171201-35
Benzylbutylphthalate (BBP) mg/kg	50	n.d.
Dibutylphthalate (DBP) mg/kg	50	n.d.
Diethylhexylphthalate (DEHP) mg/kg	50	n.d.
Diisobutylphthalate (DIBP) mg/kg	50	n.d.

	BBP	DBP	DEHP	DIBP
Maximum permissible Limit acc. to (EU) 2015/863 (mg/kg)	1000	1000	1000	1000

Sample Material Lab.-No.		LoD	POLYLAC® PA-757 plastic/off white TCL171201-35
Halogen	Unit	LoD	Result
Fluorine (F)	mg/kg	50	n.d.
Chlorine (Cl)	mg/kg	50	n.d.
Bromine (Br)	mg/kg	50	n.d.
Iodine (I)	mg/kg	50	n.d.

- n.d. - not detected
- n.a. - not applicable
- LoD - Limit of Detection
- mg/kg is equal to ppm (parts per million)

Test Sample

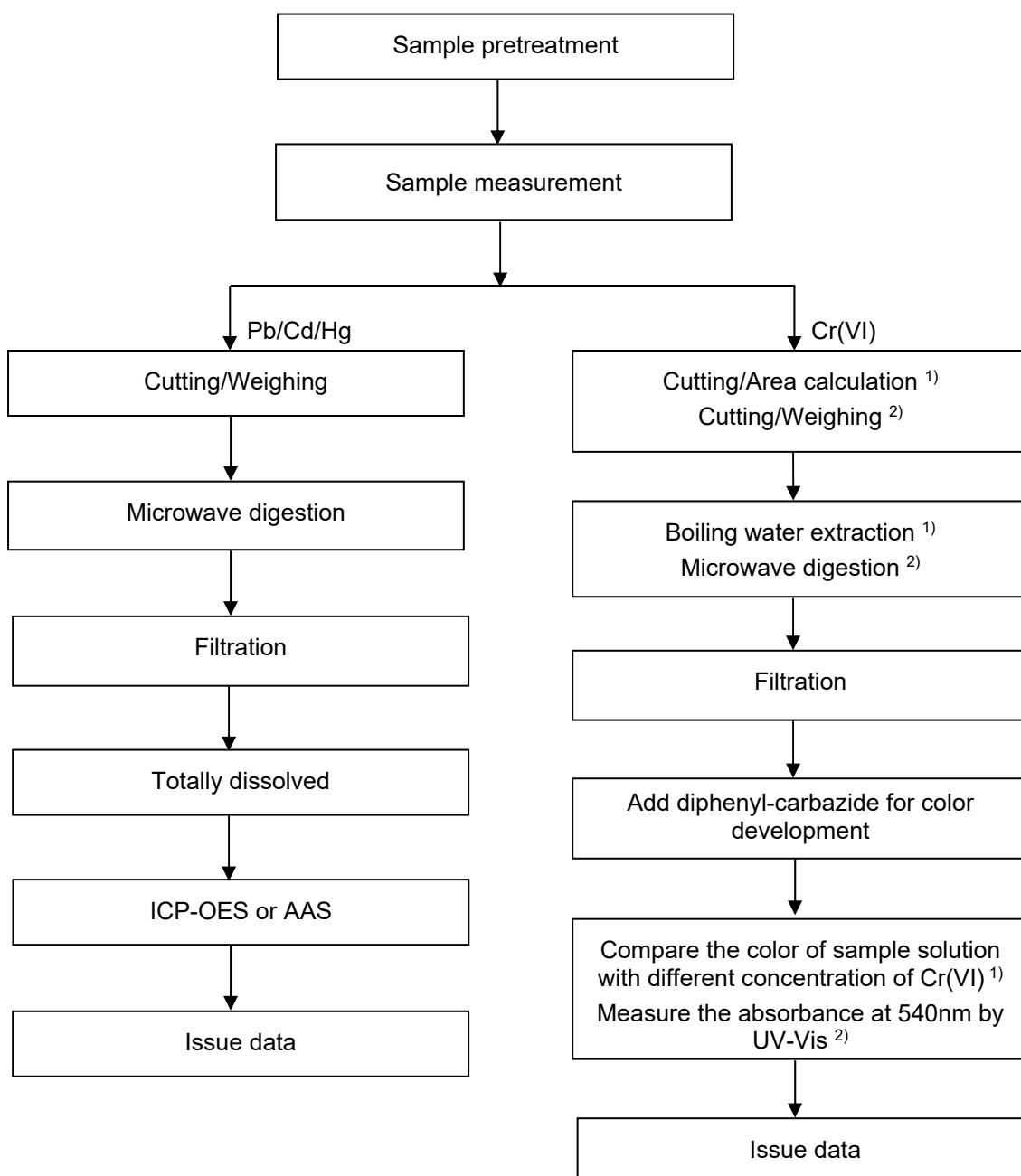


Test Report No. : 0114071849p6 001
Customer : Chi Mei Corporation

2018-01-02

Testing procedure:

RoHS (Pb, Cd, Hg, Cr(VI))



Notes: ¹⁾ For metallic material
²⁾ For non-metallic material

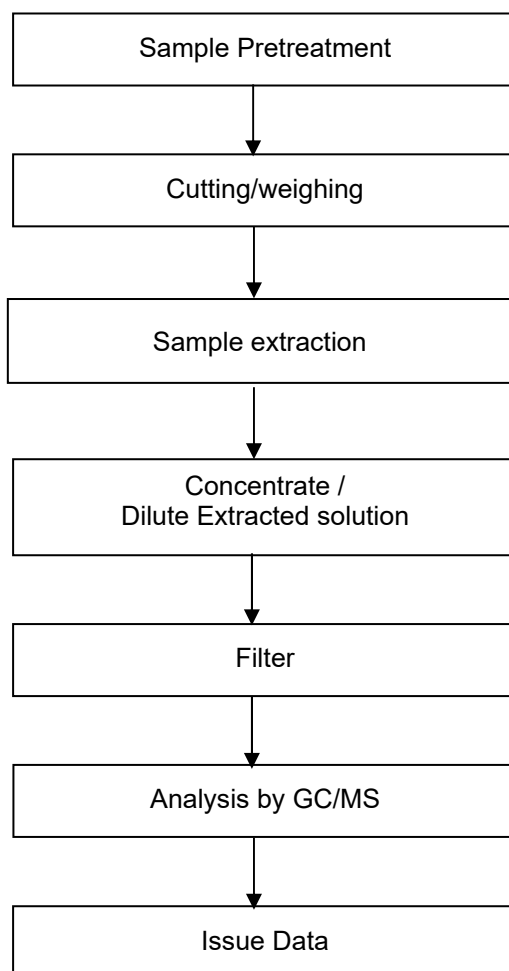


Test Report No. : 0114071849p6 001
Customer : Chi Mei Corporation

2018-01-02

Testing procedure:

RoHS (PBBs/PBDEs, DEHP/DBP/BBP/DIBP)

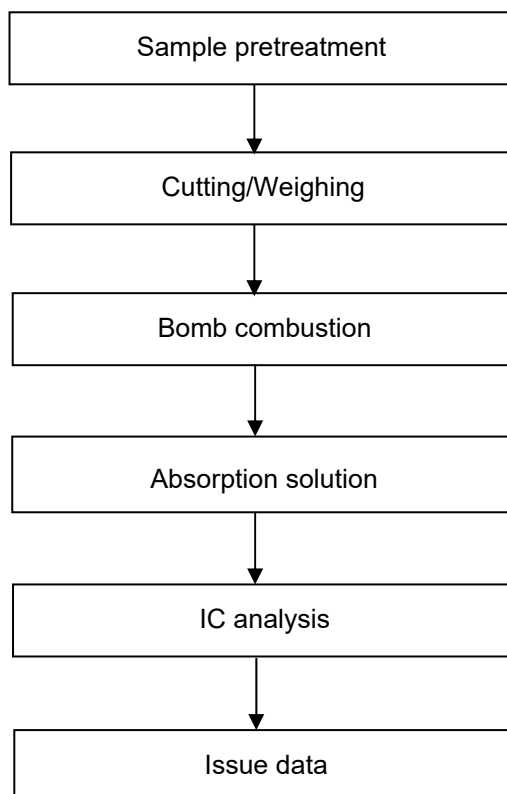


Test Report No. : 0114071849p6 001
Customer : Chi Mei Corporation

2018-01-02

Testing procedure:

Halogen



--- End of Test-Report ---



Test Report

Report No. A2180011207101001

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Applicant DONGGUAN TENG-ZHI HARDWARE PRODUCTS CO.,LTD

Address 1ST FLOOR, NO. 1 XIANGHE STREET XINMIN COMMUNITY, CHANG'AN TOWN,
DONGGUAN PROVINCE, CHINA

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

Sample Name Black masterbatch

Sample Received Date Jan. 26, 2018

Testing Period Jan. 26, 2018 to Jan. 30, 2018

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 (DBP, BBP, DEHP, DIBP) in the submitted sample(s).

Test Method Please refer to the following page(s).

Test Result(s) Please refer to the following page(s).

Tested By

Wing Huang

Approved By

Hill Zheng

Technical Manager

Reviewed By

Jori Xia

Date

Jan. 30, 2018

No. R294341621

Centre Testing International Group Co.,Ltd.

CTI Building, No.4, Liuxian 3rd road, Xin'an Street, Bao'an District, Shenzhen, P.R.China

Test Report

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Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead(Pb)	IEC 62321-5:2013	ICP-OES
Cadmium(Cd)	IEC 62321-5:2013	ICP-OES
Mercury(Hg)	IEC 62321-4:2013	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321-7-2:2017 and/or determination of Total Chromium by IEC 62321-5:2013	UV-Vis/ICP-OES
Polybrominated Biphenyls(PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS

Test Report

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Test Result(s)

Tested Item(s)	Result	MDL
Lead(Pb)	N.D.	2 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg
Mercury(Hg)	N.D.	2 mg/kg
Hexavalent Chromium(Cr(VI))	N.D.	8 mg/kg
Tested Item(s)	Result	MDL
Polybrominated Biphenyls(PBBs)		
Monobromobiphenyl	N.D.	5 mg/kg
Dibromobiphenyl	N.D.	5 mg/kg
Tribromobiphenyl	N.D.	5 mg/kg
Tetrabromobiphenyl	N.D.	5 mg/kg
Pentabromobiphenyl	N.D.	5 mg/kg
Hexabromobiphenyl	N.D.	5 mg/kg
Heptabromobiphenyl	N.D.	5 mg/kg
Octabromobiphenyl	N.D.	5 mg/kg
Nonabromobiphenyl	N.D.	5 mg/kg
Decabromobiphenyl	N.D.	5 mg/kg
Tested Item(s)	Result	MDL
Polybrominated Diphenyl Ethers (PBDEs)		
Monobromodiphenyl ether	N.D.	5 mg/kg
Dibromodiphenyl ether	N.D.	5 mg/kg
Tribromodiphenyl ether	N.D.	5 mg/kg
Tetrabromodiphenyl ether	N.D.	5 mg/kg
Pentabromodiphenyl ether	N.D.	5 mg/kg
Hexabromodiphenyl ether	N.D.	5 mg/kg
Heptabromodiphenyl ether	N.D.	5 mg/kg
Octabromodiphenyl ether	N.D.	5 mg/kg
Nonabromodiphenyl ether	N.D.	5 mg/kg
Decabromodiphenyl ether	N.D.	5 mg/kg

Test Report

Report No. A2180011207101001

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Test Result(s)

Tested Item(s)	Result	MDL
Phthalates (DBP, BBP, DEHP, DIBP)		
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg
Butyl benzyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-(2-ethylhexyl) phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg
Diisobutyl phthalate(DIBP) CAS#:84-69-5	N.D.	50 mg/kg

Tested Sample/Part Description Black solid grains

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

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

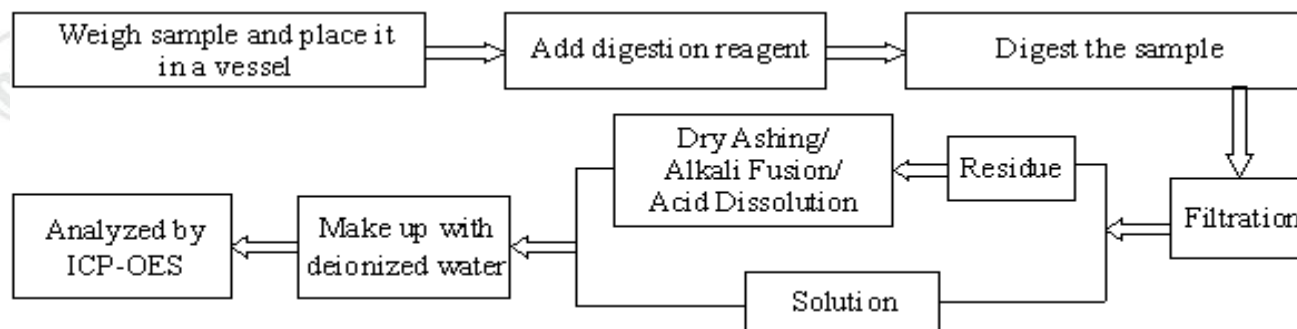
Test Report

Report No. A2180011207101001

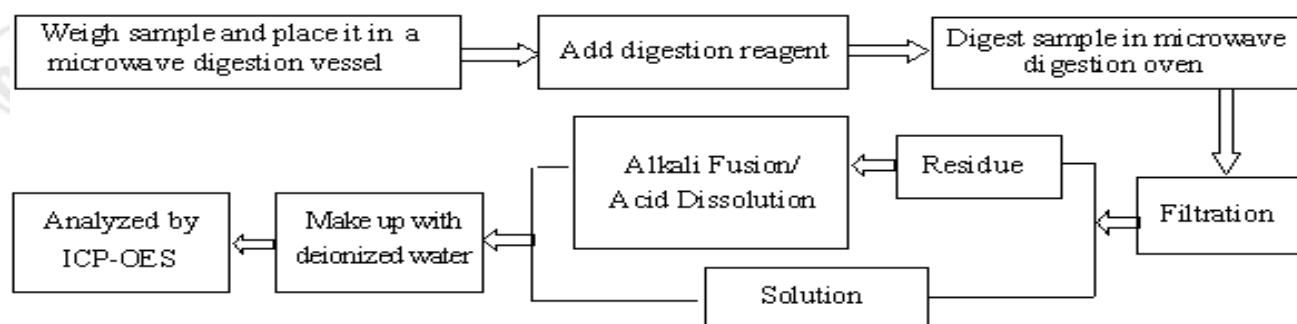
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Test Process

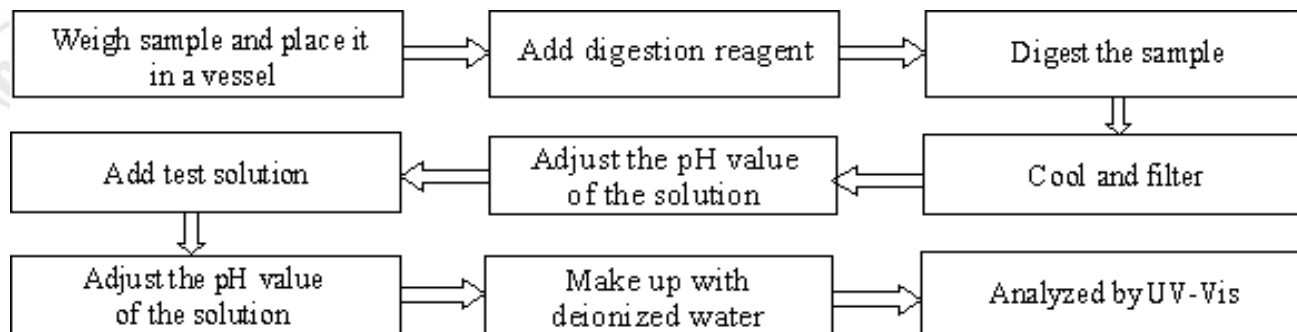
1. Lead(Pb), Cadmium(Cd), Chromium(Cr)



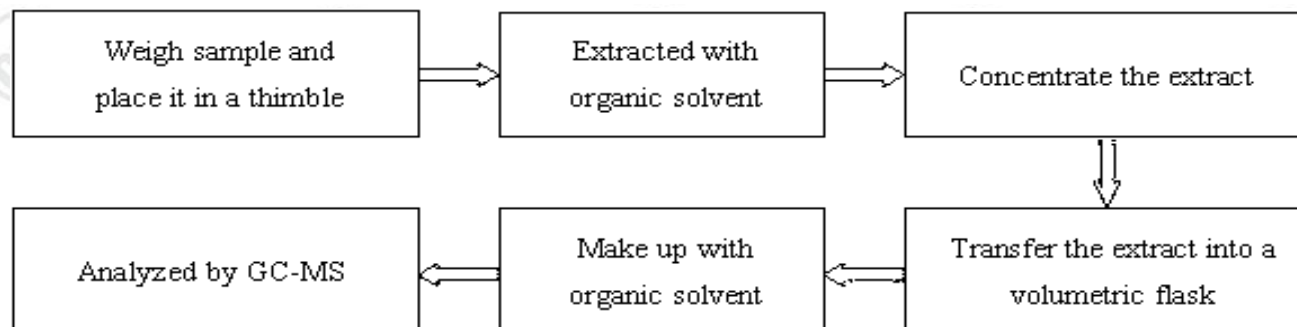
2. Mercury(Hg)



3. Hexavalent Chromium(Cr(VI))



4. Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs)

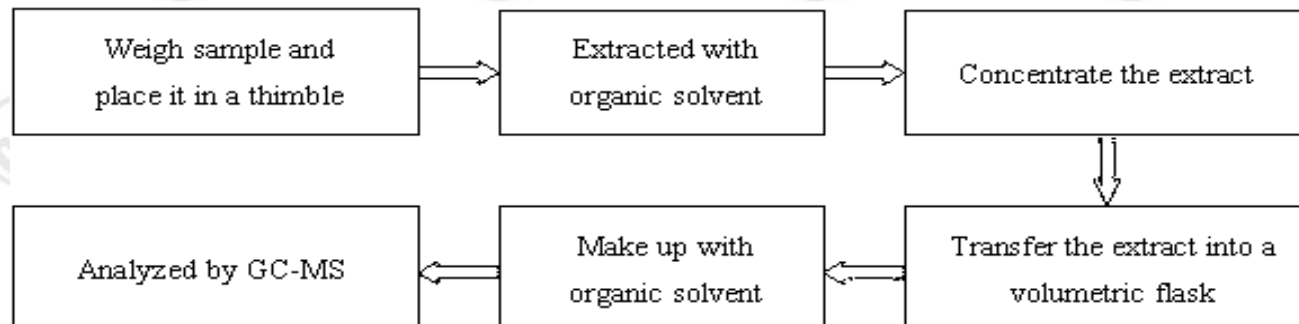


Test Report

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5. Phthalates (DBP, BBP, DEHP, DIBP)

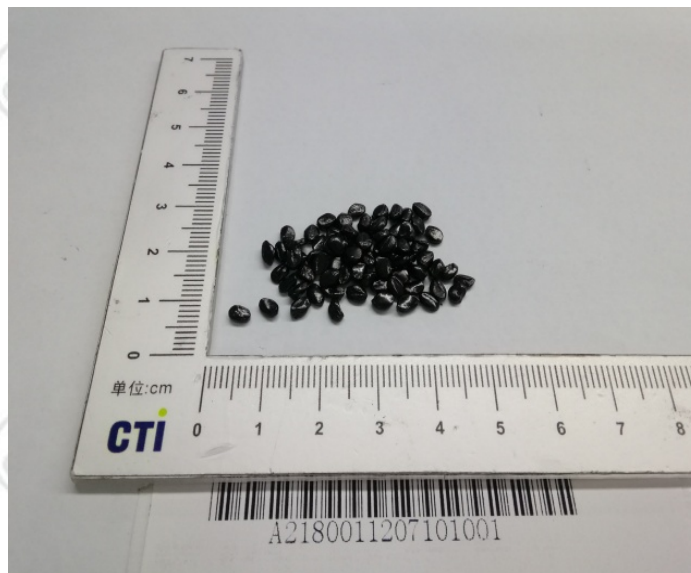


Test Report

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Photo(s) of the sample(s)



*** End of report ***

Statement:

1. This report is considered invalidated without approval signature, special seal and the seal on the perforation;
2. The sample(s) and sample information was/were provided by the client who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Without written approval of CTI, this report can't be reproduced except in full;
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Test Report

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SHENGYI TECHNOLOGY CO., LTD.

5 WESTERN INDUSTRY ROAD, SONGSHAN LAKE, DONGGUAN CITY, GUANGDONG, P.R. CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : The Halogen Free Copper Clad Laminate

SGS Job No. : CP18-005274 - GZ

Model No. : S1150G

Date of Sample Received : 02 Feb 2018

Testing Period : 02 Feb 2018 - 08 Feb 2018

Test Requested : Selected test(s) as requested by client.

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Violet Shi

Violet, Shi
Approved Signatory



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center Chemical Laboratory.

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN18-025933.010	Double-side copper-clad laminate

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC62321-5:2013, IEC62321-7-2:2017 , IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES , UV-Vis and GC-MS .

Test Item(s)	Limit	Unit	MDL	010
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	11
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND



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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>010</u>
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

Halogen

Test Method : With reference to EN 14582:2016, analysis was performed by IC.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>010</u>
Fluorine (F)	mg/kg	50	841
Chlorine (Cl)	mg/kg	50	302
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Elementary Analysis

Test Method : SGS In-house method (GZTC CHEM-TOP-004-01, with reference to US EPA Method 3052:1996), analysis was performed by ICP-OES.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>010</u>
Antimony (Sb)	mg/kg	10	ND
Beryllium (Be)	mg/kg	5	ND

Hexabromocyclododecane (HBCDD)



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Test Method : With reference to IEC 62321:2008, analysis was performed by GC-MS.

Test Item(s)	Unit	MDL	010
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND

Phthalate

Test Method : With reference to EN14372: 2004. Analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	010
Dibutyl Phthalate (DBP)	84-74-2	%(w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	85-68-7	%(w/w)	0.003	ND
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	%(w/w)	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.010	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%(w/w)	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.010	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%(w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%(w/w)	0.010	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	%(w/w)	0.010	ND
Diisopentyl Phthalate (DIPP)	605-50-5	%(w/w)	0.003	ND
n-pentyl Isopentyl Phthalate (nPIPP)	776297-69-9	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, dipentyl ester, branched and linear (DPP)	84777-06-0	%(w/w)	0.010	ND
Di-n-pentyl Phthalate (DnPP)	131-18-0	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear(DHP)	68515-50-4	%(w/w)	0.010	ND

Notes :

(1)DBP,BBP,DEHP Reference information: Entry 51 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC):

i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.

ii) Toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.



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Please refer to Regulation (EC) No 552/2009 to get more detail information

(2) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC).

i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles which can be placed in the mouth by children.

ii) Such toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.

Please refer to Regulation (EC) No 552/2009 to get more detail information

PFOA & PFOS (Perfluorooctanoic acid & Perfluorooctane sulfonates)

Test Method : With reference to CEN/TS15968:2010, analysis was performed by LC-MS.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>010</u>
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	10	ND
Perfluorooctane Sulfonates (PFOS)^	-	mg/kg	10	ND

Notes :

(1) ^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.



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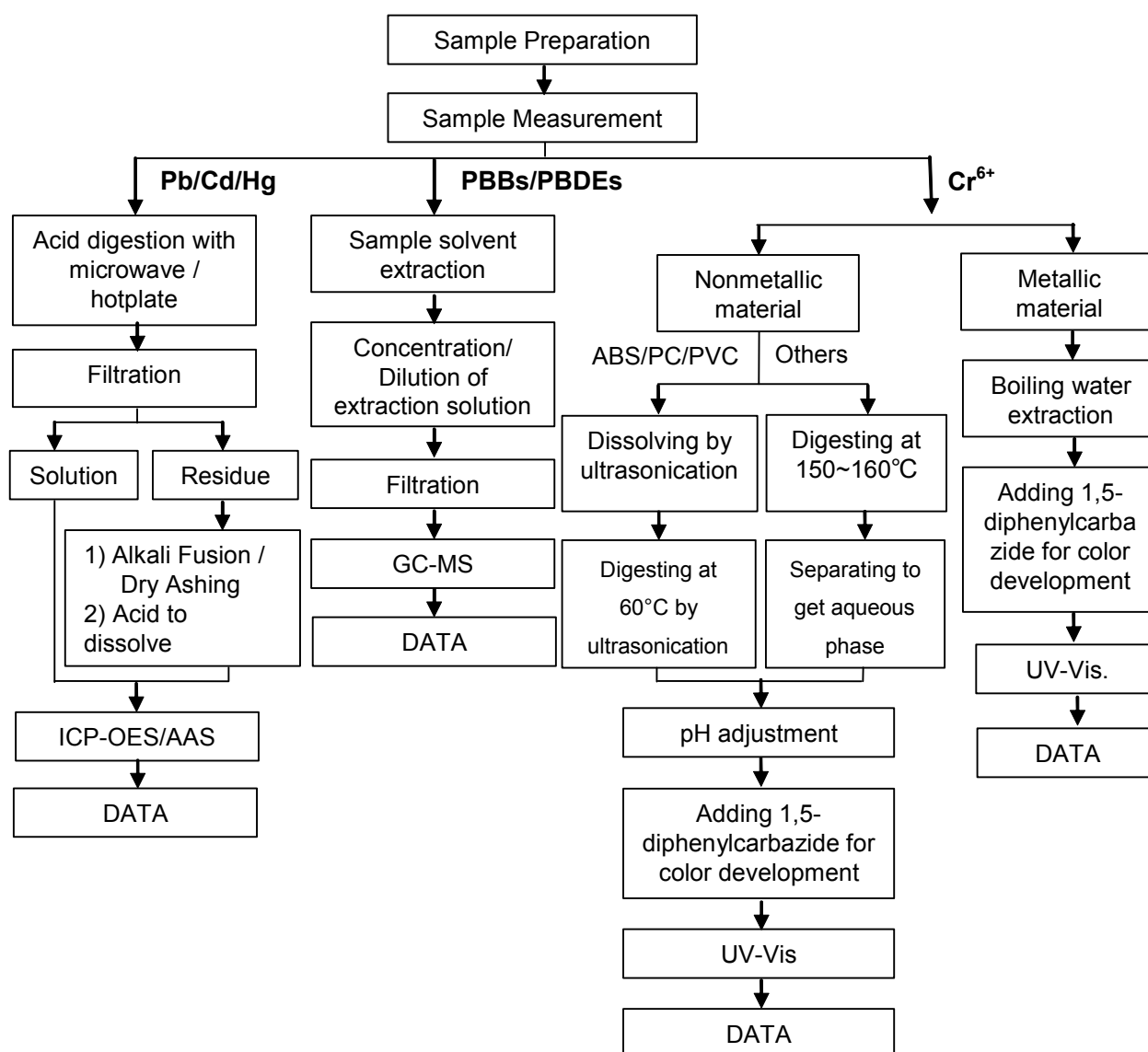
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Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs Testing Flow Chart

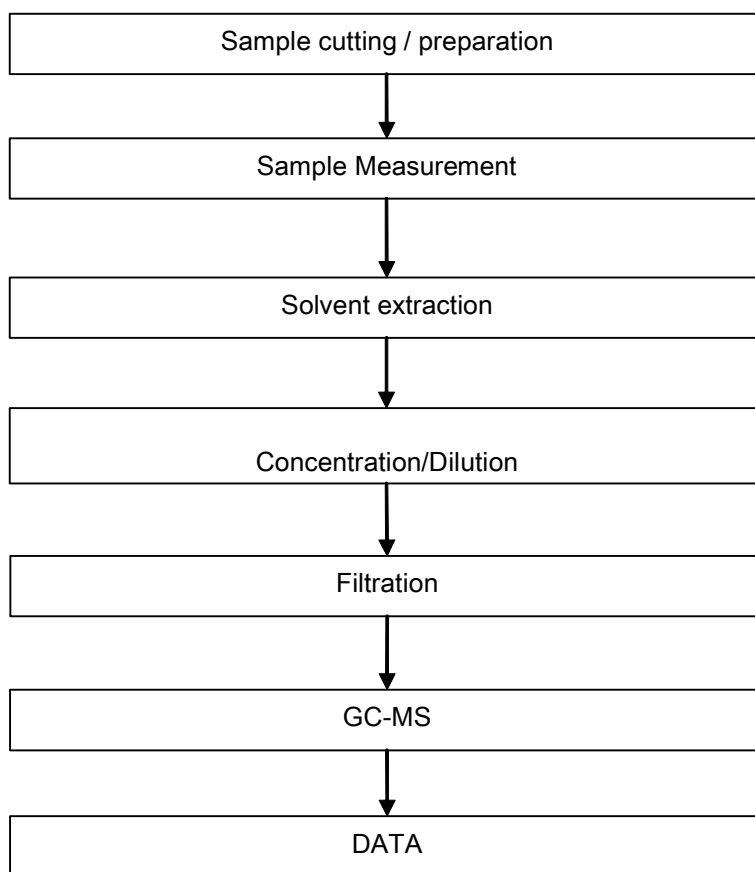
- 1) Name of the person who made testing: Edith Zhang / Sunny Hu
- 2) Name of the person in charge of testing: Bella Wang / Qiong Liu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr⁶⁺ and PBBs/PBDEs test method excluded).



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Phthalates Testing Flow Chart

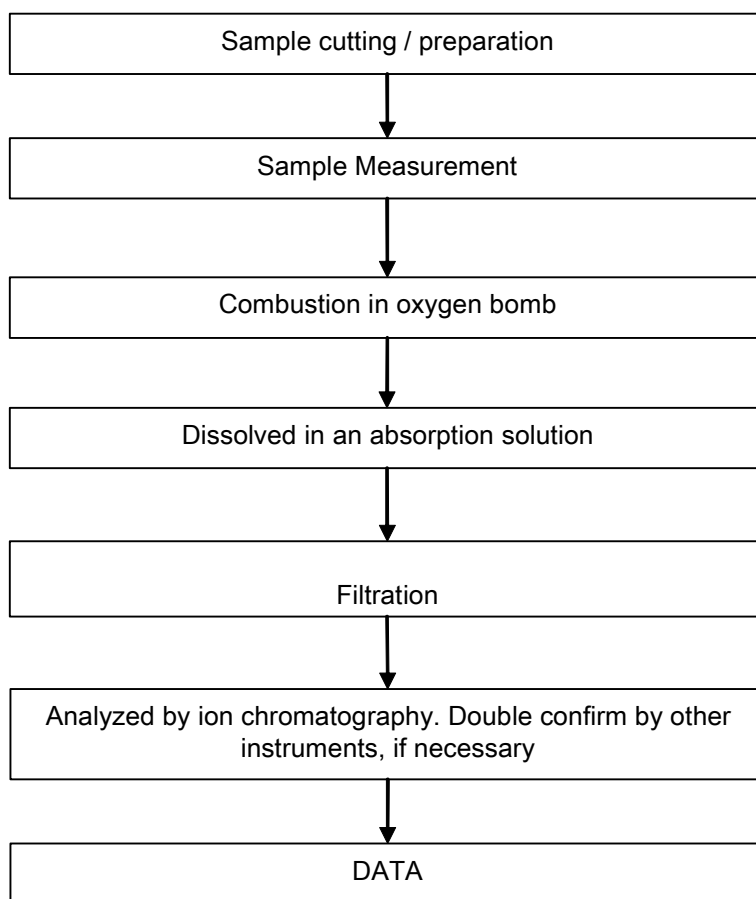
- 1) Name of the person who made testing: Sunny Hu
- 2) Name of the person in charge of testing: Qiong Liu



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Halogen Testing Flow Chart

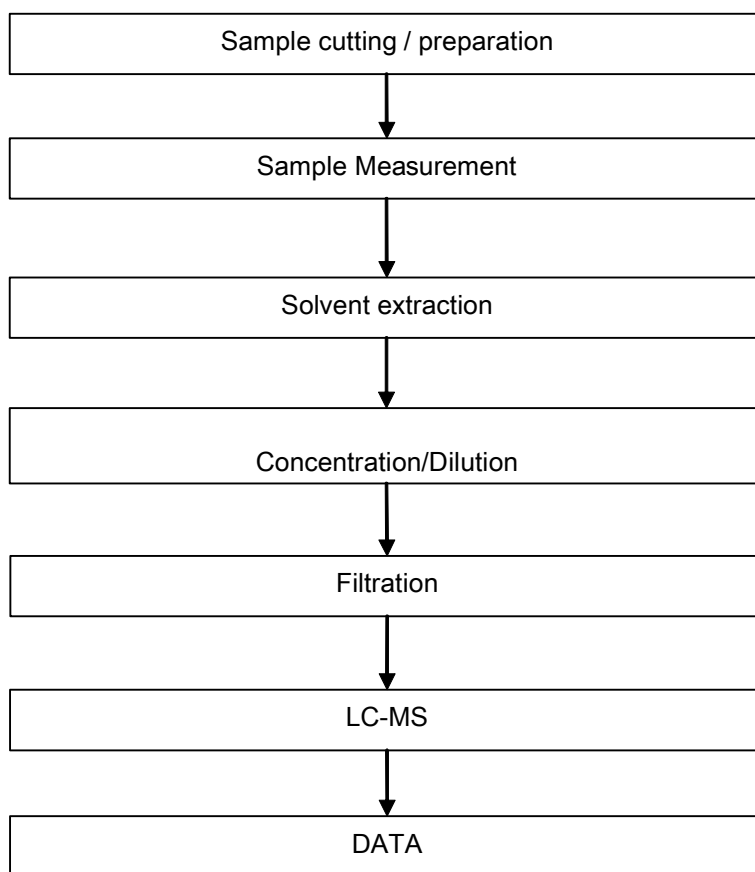
- 1) Name of the person who made testing: Bruce Xiao
- 2) Name of the person in charge of testing: Bella Wang



ATTACHMENTS

PFOA / PFOS Testing Flow Chart

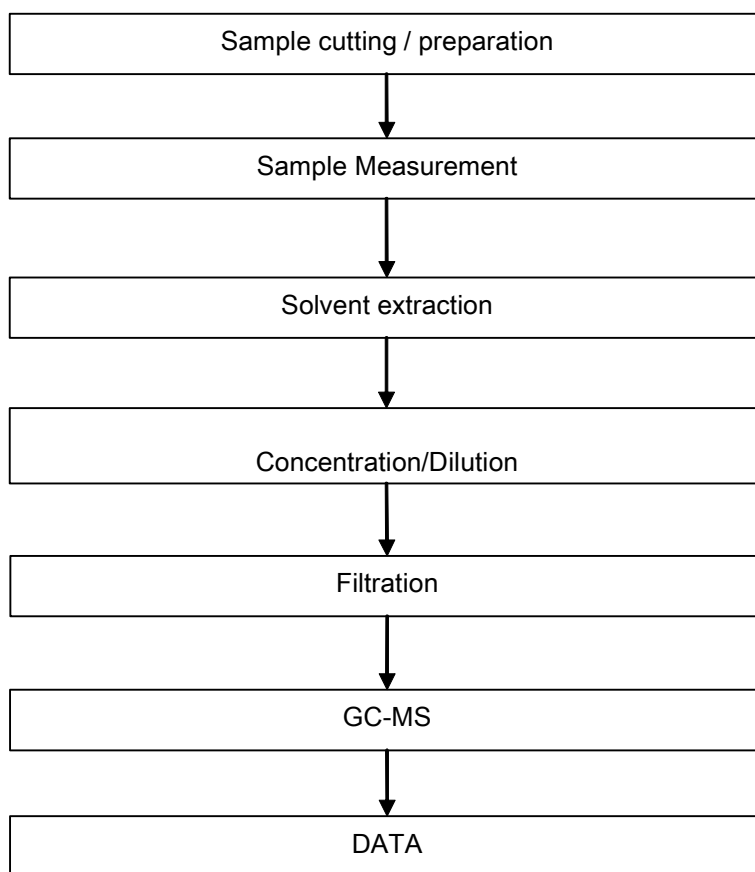
- 1) Name of the person who made testing: Zhihong Wang
- 2) Name of the person in charge of testing: Qiong Liu



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HBCDD Testing Flow Chart

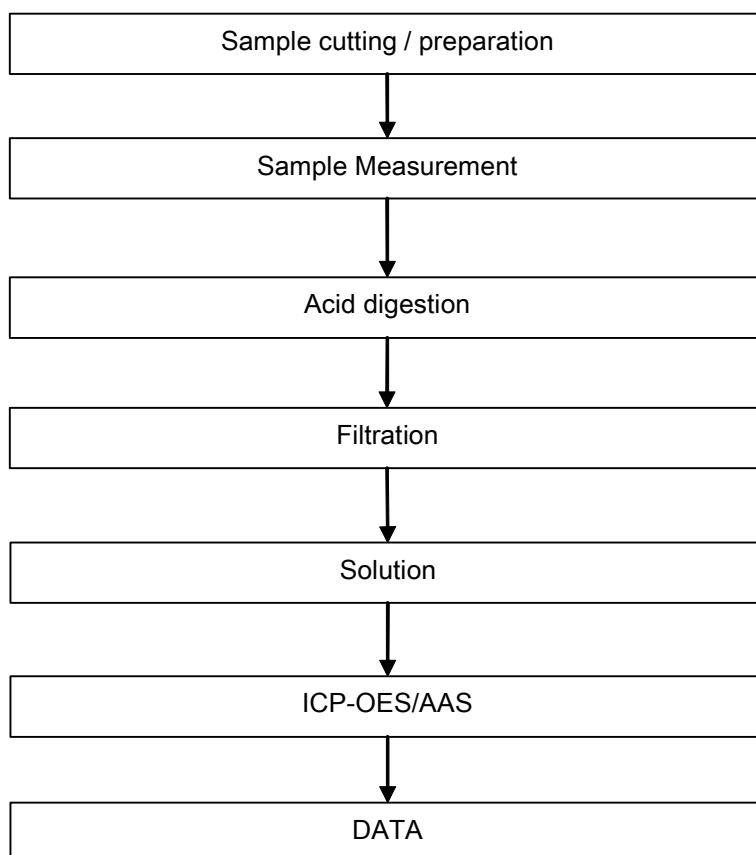
- 1) Name of the person who made testing: Sunny Hu
- 2) Name of the person in charge of testing: Qiong Liu



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Elementary Testing Flow Chart

- 1) Name of the person who made testing: Edith Zhang
- 2) Name of the person in charge of testing: Bella Wang



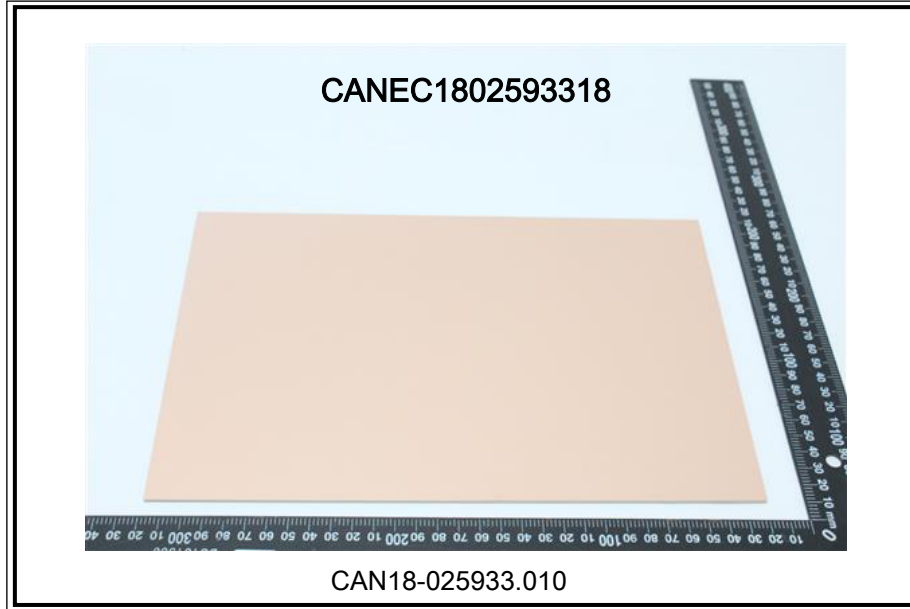
Test Report

No. CANEC1802593318

Date: 09 Feb 2018

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Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***



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Guangzhou Branch Testing Center Chemical Laboratory

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测试报告

No. NGBML1800155002

日期: 2018年01月17日

第1页,共16页

浙江巨化股份有限公司
浙江省衢州市柯城区巨化

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样品接收日期: 2018年01月10日
测试周期: 2018年01月10日 - 2018年01月16日
测试要求: 根据客户要求测试
测试方法: 请参见下一页
测试结果: 请参见下一页

通标标准技术服务有限公司宁波分公司
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Tony Li 李覃刚
批准签署人

本报告是编号为NGBML1800155001报告的中文版本



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测试报告

No. NGBML1800155002

日期: 2018年01月17日

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测试结果:

测试样品描述:

样品编号	SGS样品ID	描述
SN1	NGB18-001550.001	透明固体颗粒

备注:

- (1) 1 mg/kg = 0.0001%
- (2) MDL = 方法检测限
- (3) ND = 未检出 (< MDL)
- (4) "-" = 未规定

RoHS 指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 参考IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015和IEC 62321-8:2017, 采用ICP-OES,UV-Vis和GC-MS进行分析.

测试项目	限值	单位	MDL	001
镉(Cd)	100	mg/kg	2	ND
铅(Pb)	1000	mg/kg	2	ND
汞(Hg)	1000	mg/kg	2	ND
六价铬 (Cr(VI))	1000	mg/kg	8	ND
多溴联苯(PBBs)之和	1000	mg/kg	-	ND
一溴联苯	-	mg/kg	5	ND
二溴联苯	-	mg/kg	5	ND
三溴联苯	-	mg/kg	5	ND
四溴联苯	-	mg/kg	5	ND
五溴联苯	-	mg/kg	5	ND
六溴联苯	-	mg/kg	5	ND
七溴联苯	-	mg/kg	5	ND
八溴联苯	-	mg/kg	5	ND
九溴联苯	-	mg/kg	5	ND
十溴联苯	-	mg/kg	5	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND
一溴二苯醚	-	mg/kg	5	ND
二溴二苯醚	-	mg/kg	5	ND
三溴二苯醚	-	mg/kg	5	ND
四溴二苯醚	-	mg/kg	5	ND
五溴二苯醚	-	mg/kg	5	ND
六溴二苯醚	-	mg/kg	5	ND



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测试报告

No. NGBML1800155002

日期: 2018年01月17日

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测试项目	限值	单位	MDL	001
七溴二苯醚	-	mg/kg	5	ND
八溴二苯醚	-	mg/kg	5	ND
九溴二苯醚	-	mg/kg	5	ND
十溴二苯醚	-	mg/kg	5	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯(BBP)	1000	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯(DEHP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯(DIBP)	1000	mg/kg	50	ND

备注:

(1) 最大允许极限值引用自RoHS指令(EU) 2015/863。

IEC 62321系列等同于 EN 62321系列

http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

红磷以磷计

测试方法: 参照US EPA 方法3052:1996测定, 采用ICP-OES进行分析。

测试项目	单位	MDL	001
红磷以磷计	mg/kg	20	ND

备注:

(1) 报告中的红磷含量是基于总磷的测试结果将所有总磷考虑为红磷。

卤素

测试方法: 参照EN 14582: 2016方法 测定, 采用 IC进行分析。

测试项目	单位	MDL	001
氟 (F)	mg/kg	50	>100000
氯 (Cl)	mg/kg	200	ND
溴 (Br)	mg/kg	50	ND
碘 (I)	mg/kg	50	ND

四溴双酚-A



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测试报告

No. NGBML1800155002

日期: 2018年01月17日

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测试方法: 参照 US EPA 3540C: 1996方法测定, 采用GC-MS进行分析.

测试项目	单位	MDL	001
四溴双酚-A	mg/kg	10	ND

六溴环十二烷(HBCDD)

测试方法: 参照US EPA 3550C: 2007方法测定, 采用GC-MS进行分析.

测试项目	CAS NO.	单位	MDL	001
六溴环十二烷 (HBCDD)	25637-99-4, 3194- 55-6	mg/kg	10	ND

全氟辛烷磺酸 (PFOS)^和全氟辛酸(PFOA)

测试方法: 参照US EPA 3550C: 2007. 采用HPLC-MS测试.

测试项目	单位	MDL	001
全氟辛烷磺酸(PFOS)及衍生物^	mg/kg	10	ND
全氟辛酸 (PFOA)	mg/kg	10	ND

备注:

(1) ^=全氟辛烷磺酸(PFOS)及其衍生物包含全氟辛烷磺酸(PFOS)、全氟辛基磺酰胺(PFOSA)、2- (N-乙基全氟辛基磺酰胺) 乙醇(EtFOSE)、N-甲基全氟辛烷磺酰胺(MeFOSA)、N-乙基全氟辛烷磺酰胺(EtFOSA)和2- (N-甲基全氟辛基磺酰胺) 乙醇(MeFOSE)。

多环芳香烃(PAHs)

测试方法: 参考AfPS GS 2014:01 PAK方法测试, 采用 GC-MS进行分析.

测试项目	单位	MDL	001
苊烯(ANY)	mg/kg	0.1	ND
苊(蔡嵌戊烷)(ANA)	mg/kg	0.1	ND
芴(FLU)	mg/kg	0.1	ND
菲(PHE)	mg/kg	0.1	ND
蒽(ANT)	mg/kg	0.1	ND
荧蒽(FLT)	mg/kg	0.1	ND
芘(PYR)	mg/kg	0.1	ND



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测试报告

No. NGBML1800155002

日期: 2018年01月17日

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测试项目	单位	MDL	001
苯并(a)芘 (BaP)	mg/kg	0.1	ND
苯并(e)芘(BeP)	mg/kg	0.1	ND
苯并(a)蒽(BaA)	mg/kg	0.1	ND
苯并(b)荧蒽(BbF)	mg/kg	0.1	ND
苯并(j)荧蒽(BjF)	mg/kg	0.1	ND
苯并(k)荧蒽 (BkF)	mg/kg	0.1	ND
屈(CHR)	mg/kg	0.1	ND
二苯并(a,h)蒽(DBA)	mg/kg	0.1	ND
苯并(g,h,i)花(二苯并(a,h)蒽)(BPE)	mg/kg	0.1	ND
茚并(1,2,3-c,d)芘(IPY)	mg/kg	0.1	ND
7项多环芳香烃总和[苊烯(ANY), 苊(苯并(a)荧蒽) (ANA), 苊 (FLU), 菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT)]	mg/kg	-	ND
萘(NAP)	mg/kg	0.1	ND
18项多环芳香烃总和	mg/kg	-	ND



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AlPS(德国产品安全委员会):GS认证对多环芳香烃的要求

参数	1 类	2 类		3 类	
	设计意图为放入口中的材料或者玩具上与皮肤接触的材料(接触时间大于30秒)	未在1类规定中涵盖的材料,且可能与皮肤接触时间大于30秒的材料(长时间接触皮肤)或频繁接触皮肤		未在1和2类规定中涵盖的材料,且可能与皮肤接触的少于30秒的材料(短期接触皮肤)	
		2009/48/EC中适用的玩具	产品安全法涉及的其他产品	2009/48/EC中适用的玩具	产品安全法涉及的其他产品
苯并(a)芘 (BaP) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(e)芘 (BeP) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(a)蒽 (BaA) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(b)荧蒽 (BbF) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(j)荧蒽 (BjF) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(k)荧蒽 mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
屈 (CHR) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
二苯并(a,h)蒽 (DBA) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(g,h,i)花(二苯嵌苯) (BPE)n mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
茚并(1,2,3-c,d)芘 (IPY) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
萘烯(ANY), 萘(蒽嵌戊烷) (ANA), 芴 (FLU), 菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT)之和 mg/kg	< 1 (总和)	< 5 (总和)	< 10 (总和)	< 20 (总和)	< 50 (总和)
萘 (NAP) mg/kg	< 1	< 2		< 10	
18 PAH之和	< 1	< 5	< 10	< 20	< 50

邻苯二甲酸盐(或酯)

测试方法: 参照EN 14372: 2004的方法测定, 采用GC-MS进行分析。



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测试报告

No. NGBML1800155002

日期: 2018年01月17日

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测试项目	CAS NO.	单位	MDL	001
邻苯二甲酸二异壬酯 (DINP)	28553-12-0/ 68515-48-0	%	0.01	ND
邻苯二甲酸二正辛酯 (DNOP)	117-84-0	%	0.003	ND
邻苯二甲酸二异癸酯 (DIDP)	26761-40-0/ 68515-49-1	%	0.01	ND

备注:

(1) DINP, DNOP, DIDP参考信息: 1907/2006/EC Reach附录XVII的修正指令——552/2009/EC第52条

(前身为2005/84/EC)的要求:

- i) 不允许DINP, DNOP, DIDP质量浓度高于0.1%的可塑性物料用于可放入儿童口中的玩具和儿童护理品.
- ii) 当可放入儿童口中的玩具和儿童护理品中的可塑性物料含DINP, DNOP, DIDP质量浓度高于0.1%时,不得投放市场.

详细信息请参见Regulation (EC) No 552/2009

检测报告仅用于客户科研、教学、内部质量控制、产品研发等目的, 仅供内部参考。



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Ningbo Branch Chemical Laboratory

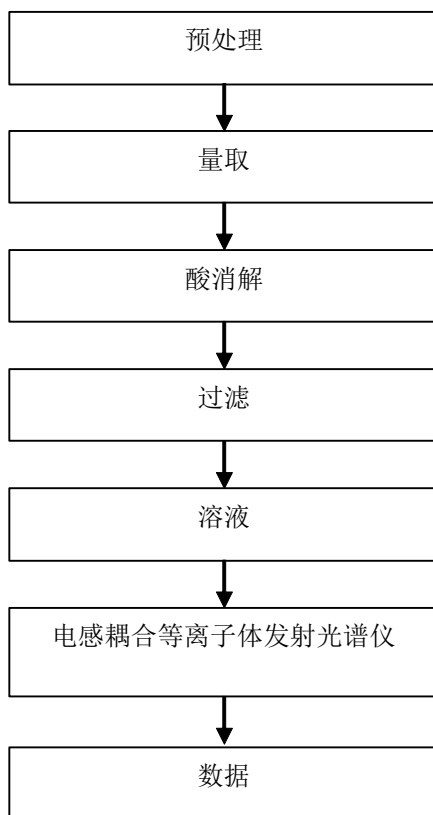
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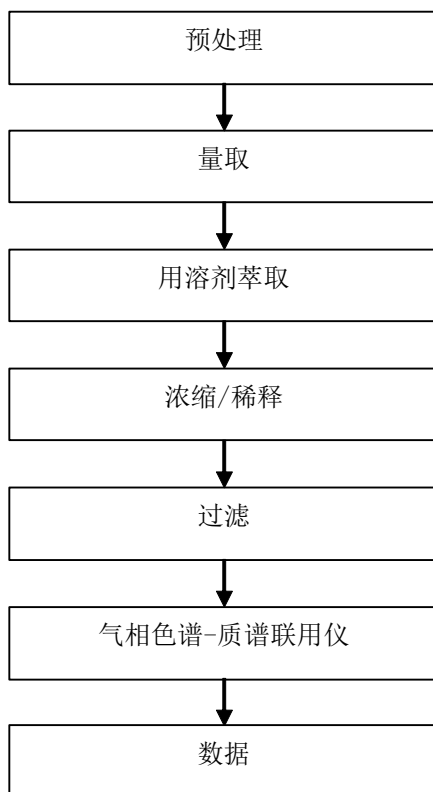
元素测试流程图



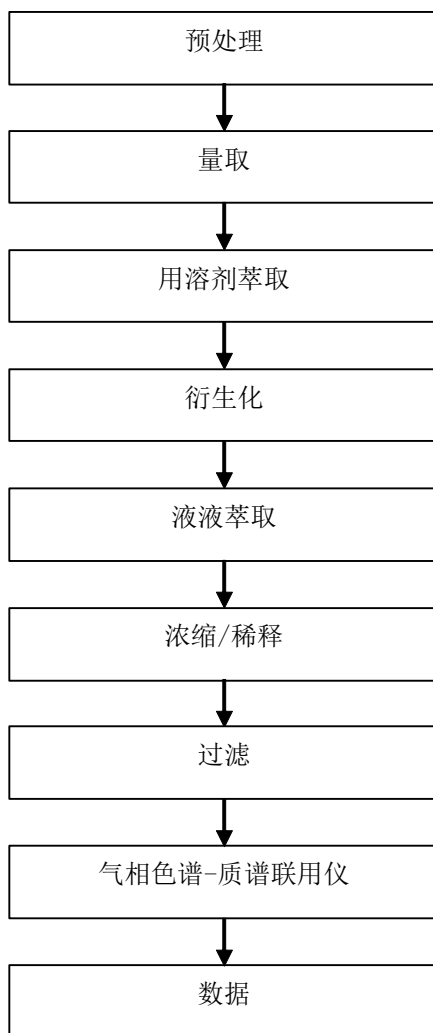
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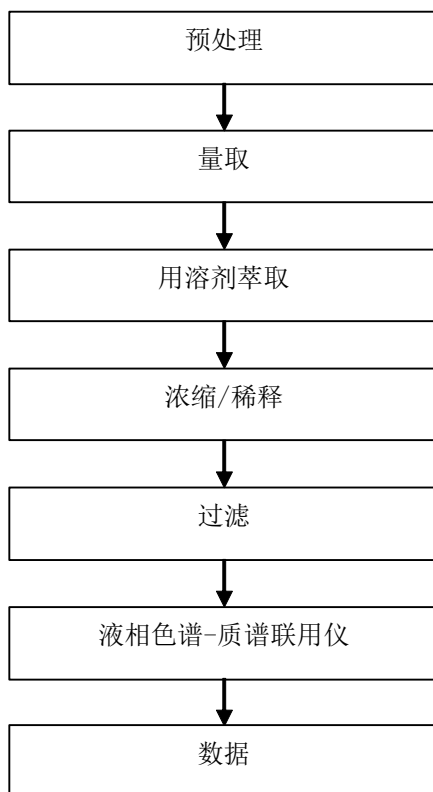
六溴环十二烷测试流程图



四溴双酚 A 测试流程图



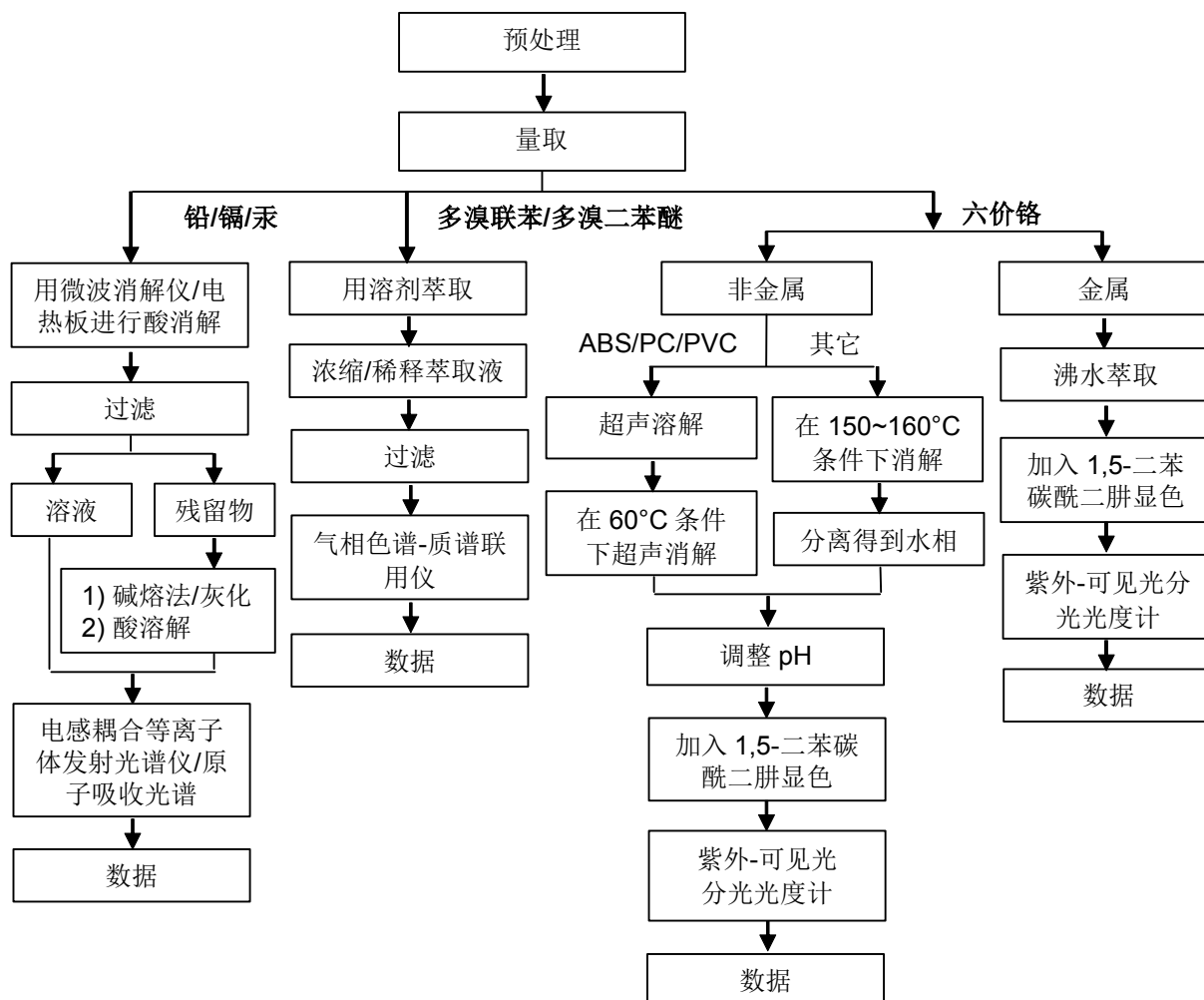
全氟辛烷磺酰基化合物/全氟辛酸测试流程图



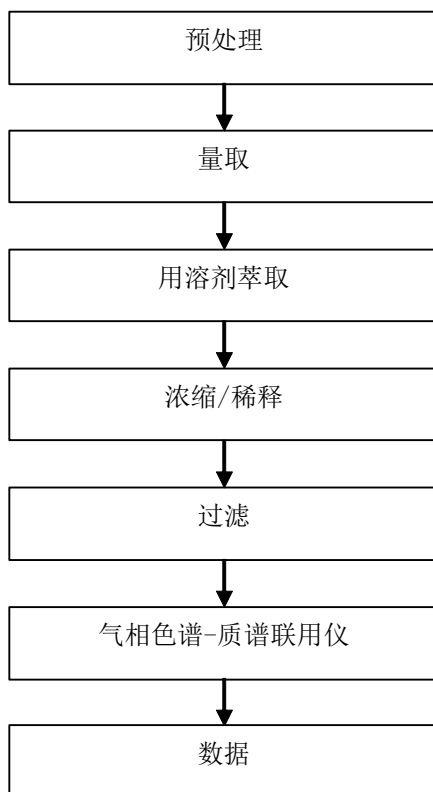
附件

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 测试流程图

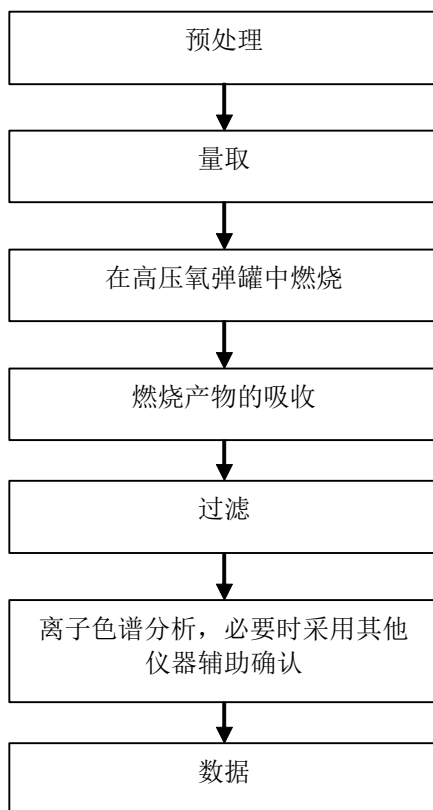
1) 样品按照下述流程被完全消解（六价铬和多溴联苯/多溴二苯醚测试除外）。



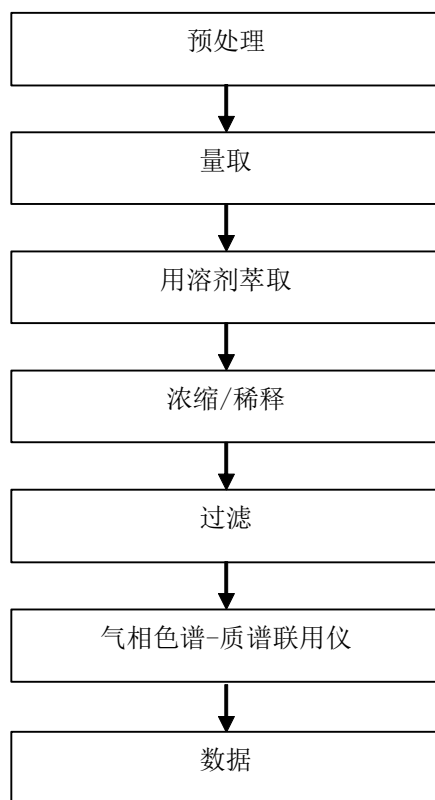
邻苯测试流程图



卤素测试流程图



多环芳香烃测试流程图



测试报告

No. NGBML1800155002

日期: 2018年01月17日

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样品照片:



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测试报告

No. NGBML1800151702

日期: 2018年01月16日

第1页,共8页

浙江巨化股份有限公司
浙江省衢州市柯城区巨化

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SGS工作编号: NBIN1801000444PC - NB
样品接收日期: 2018年01月10日
测试周期: 2018年01月10日 - 2018年01月16日
测试要求: 根据客户要求测试
测试方法: 请参见下一页
测试结果: 请参见下一页

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Tony Li 李覃刚
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测试报告

No. NGBML1800151702

日期: 2018年01月16日

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测试结果:

测试样品描述:

样品编号	SGS样品ID	描述
SN1	NGB18-001517.001	白色粉末

备注:

- (1) 1 mg/kg = 0.0001%
- (2) MDL = 方法检测限
- (3) ND = 未检出 (< MDL)
- (4) "-" = 未规定

RoHS 指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 参考IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015和IEC 62321-8:2017, 采用ICP-OES,UV-Vis和GC-MS进行分析.

测试项目	限值	单位	MDL	001
镉(Cd)	100	mg/kg	2	ND
铅(Pb)	1000	mg/kg	2	ND
汞(Hg)	1000	mg/kg	2	ND
六价铬 (Cr(VI))	1000	mg/kg	8	ND
多溴联苯(PBBs)之和	1000	mg/kg	-	ND
一溴联苯	-	mg/kg	5	ND
二溴联苯	-	mg/kg	5	ND
三溴联苯	-	mg/kg	5	ND
四溴联苯	-	mg/kg	5	ND
五溴联苯	-	mg/kg	5	ND
六溴联苯	-	mg/kg	5	ND
七溴联苯	-	mg/kg	5	ND
八溴联苯	-	mg/kg	5	ND
九溴联苯	-	mg/kg	5	ND
十溴联苯	-	mg/kg	5	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND
一溴二苯醚	-	mg/kg	5	ND
二溴二苯醚	-	mg/kg	5	ND
三溴二苯醚	-	mg/kg	5	ND
四溴二苯醚	-	mg/kg	5	ND
五溴二苯醚	-	mg/kg	5	ND
六溴二苯醚	-	mg/kg	5	ND



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测试报告

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测试项目	限值	单位	MDL	001
七溴二苯醚	-	mg/kg	5	ND
八溴二苯醚	-	mg/kg	5	ND
九溴二苯醚	-	mg/kg	5	ND
十溴二苯醚	-	mg/kg	5	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯(BBP)	1000	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯(DEHP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯(DIBP)	1000	mg/kg	50	ND

备注:

(1) 最大允许极限值引用自RoHS指令(EU) 2015/863。

IEC 62321系列等同于 EN 62321系列

http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

六溴环十二烷(HBCDD)

测试方法: 参照US EPA 3550C: 2007方法测定, 采用GC-MS进行分析.

测试项目	CAS NO.	单位	MDL	001
六溴环十二烷 (HBCDD)	25637-99-4,	mg/kg	10	ND

全氟辛烷磺酸 (PFOS)^和全氟辛酸(PFOA)

测试方法: 参照US EPA 3550C: 2007. 采用HPLC-MS测试.

测试项目	单位	MDL	001
全氟辛烷磺酸(PFOS)及衍生物^	mg/kg	10	ND
全氟辛酸 (PFOA)	mg/kg	10	ND

备注:

(1) ^= PFOS包含全氟辛烷磺酸(PFOS), 全氟辛基磺酰胺(PFOSA), 2-(N-乙基全氟辛基磺酰胺)乙醇(EtFOSE), N-甲基全氟辛烷磺酰胺(MeFOSA), N-乙基全氟辛烷磺酰胺(EtFOSA)和2-(N-甲基全氟辛基磺酰胺)乙醇(MeFOSE)。

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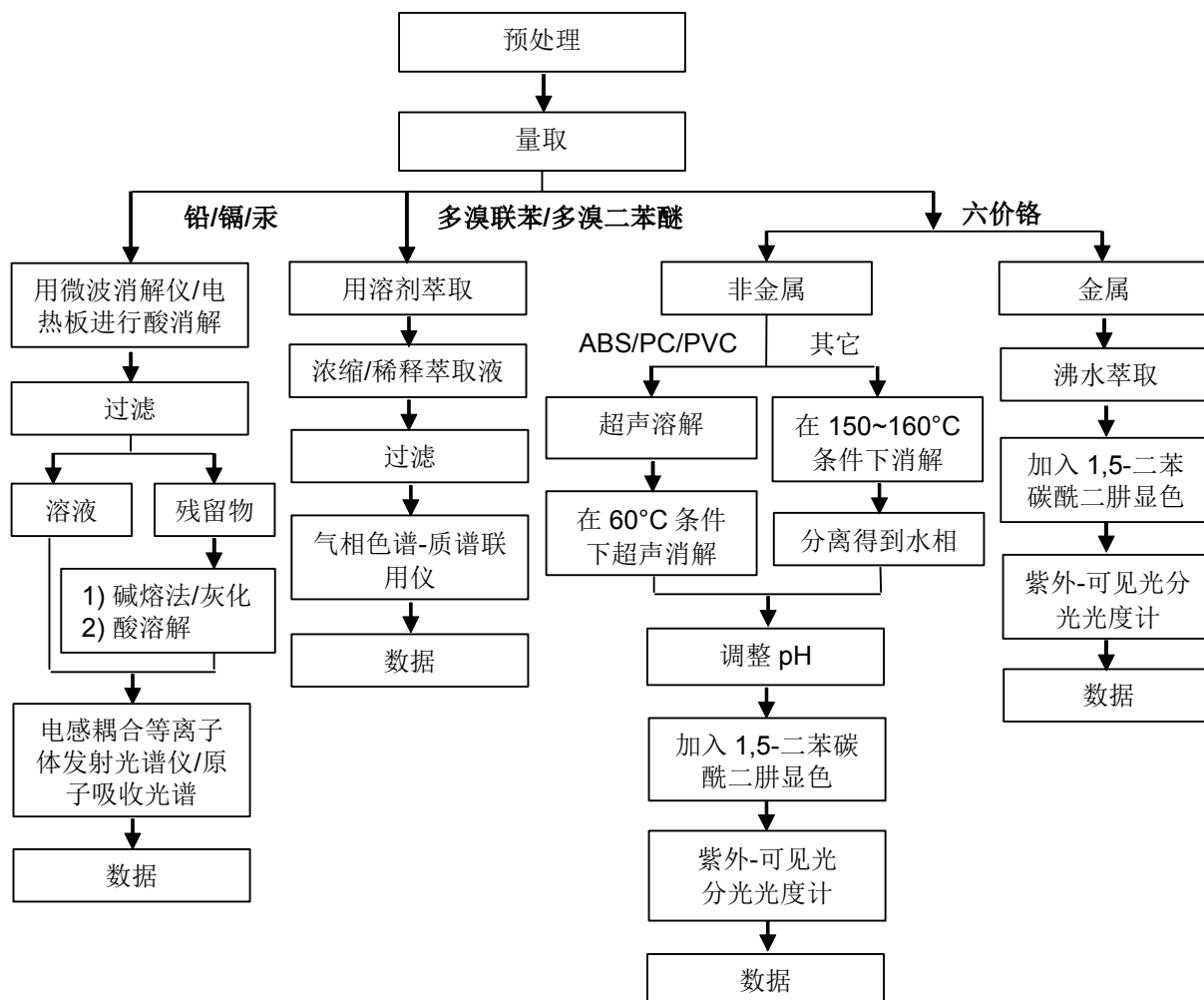
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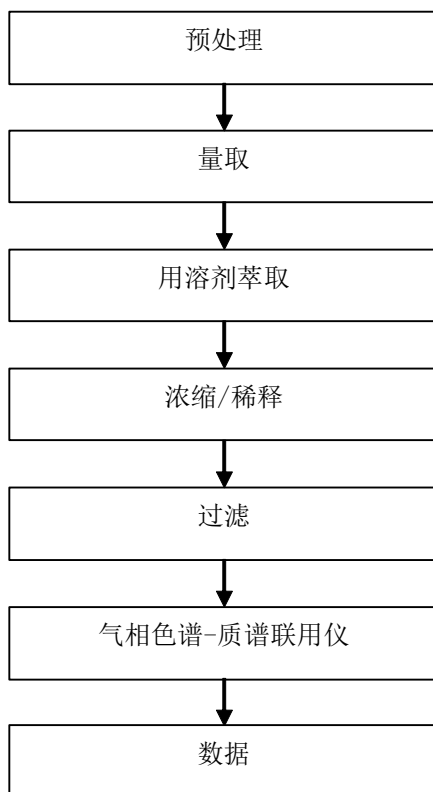
附件

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 测试流程图

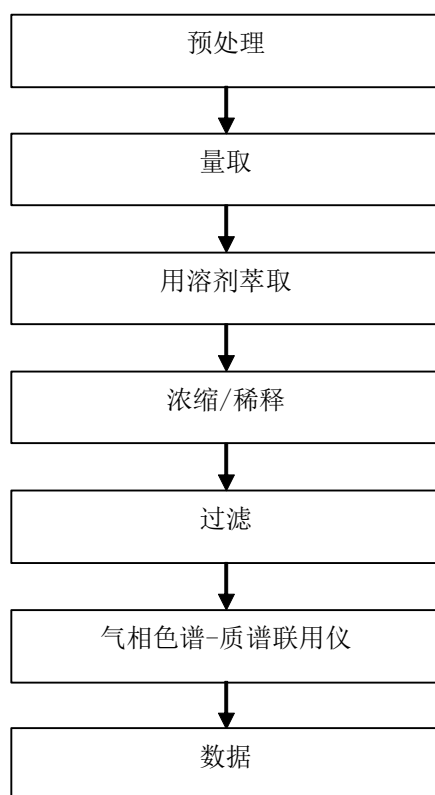
1) 样品按照下述流程被完全消解（六价铬和多溴联苯/多溴二苯醚测试除外）。



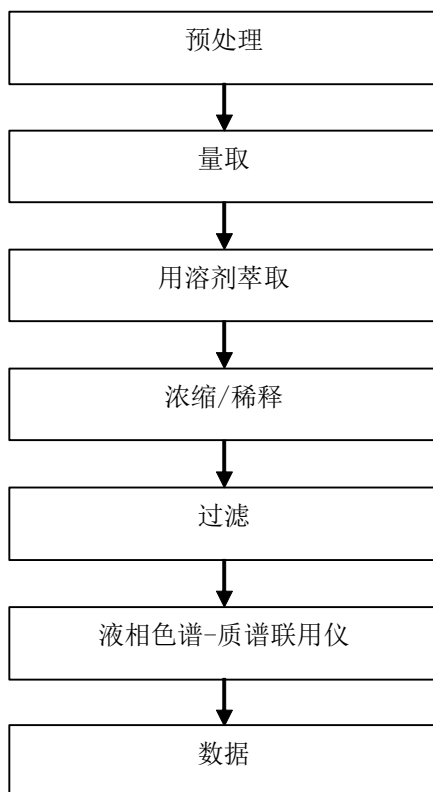
邻苯测试流程图



六溴环十二烷测试流程图



全氟辛烷磺酰基化合物/全氟辛酸测试流程图



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测试报告

No. SHAEC1728677802

日期: 2018年01月04日 第1页,共5页

上海添创线缆科技发展有限公司

上海金山区亭林工业区亭华路333号

以下测试之样品是由申请者所提供及确认: 镀银铜丝

SGS工作编号: SP17-043910 - SH

样品接收日期: 2017年12月28日

测试周期: 2017年12月28日 - 2018年01月04日

测试要求: 根据客户要求测试

测试方法: 请参见下一页

测试结果: 请参见下一页

结论: 基于所送样品进行的测试, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)的测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

通标标准技术服务(上海)有限公司
授权签名

马广媛

Marry Ma 马广媛
批准签署人

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测试报告

No. SHAEC1728677802

日期: 2018年01月04日 第2页,共5页

测试结果:

测试样品描述:

样品编号	SGS样品ID	描述
SN1	SHA17-286778.001	银色金属丝

备注:

- (1) 1 mg/kg = 0.0001%
- (2) MDL = 方法检测限
- (3) ND = 未检出 (< MDL)
- (4) "-" = 未规定

RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 参考IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015和IEC 62321-6:2015, 采用ICP-OES, AAS,UV-Vis和GC-MS进行分析。

测试项目	限值	单位	MDL	001
镉 (Cd)	100	mg/kg	2	ND
铅(Pb)	1000	mg/kg	2	ND
汞 (Hg)	1000	mg/kg	2	ND
六价铬(Cr(VI))▼	-	µg/cm²	0.10	ND
多溴联苯之和(PBBs)	1000	mg/kg	-	ND
一溴联苯	-	mg/kg	5	ND
二溴联苯	-	mg/kg	5	ND
三溴联苯	-	mg/kg	5	ND
四溴联苯	-	mg/kg	5	ND
五溴联苯	-	mg/kg	5	ND
六溴联苯	-	mg/kg	5	ND
七溴联苯	-	mg/kg	5	ND
八溴联苯	-	mg/kg	5	ND
九溴联苯	-	mg/kg	5	ND
十溴联苯	-	mg/kg	5	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND
一溴二苯醚	-	mg/kg	5	ND
二溴二苯醚	-	mg/kg	5	ND
三溴二苯醚	-	mg/kg	5	ND
四溴二苯醚	-	mg/kg	5	ND



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测试报告

No. SHAEC1728677802

日期: 2018年01月04日 第3页,共5页

测试项目	限值	单位	MDL	001
五溴二苯醚	-	mg/kg	5	ND
六溴二苯醚	-	mg/kg	5	ND
七溴二苯醚	-	mg/kg	5	ND
八溴二苯醚	-	mg/kg	5	ND
九溴二苯醚	-	mg/kg	5	ND
十溴二苯醚	-	mg/kg	5	ND

备注:

(1) 最大允许极限值引用自RoHS指令(EU) 2015/863。

IEC 62321 系列等同于 EN 62321 系列

http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(2) ▼ = a. 当六价格的浓度高于0.13 µg/cm²时, 样品为阳性, 即含有六价格;

b. 当六价格的浓度为ND(低于0.10 µg/cm²)时, 样品为阴性, 即未检测到六价格;

c. 当六价格的浓度介于0.10 µg/cm²与0.13 µg/cm²之间时, 无法直接判定是否检测到六价格, 因不同个体的样品表面差异可能会影响测定结果;

由于未获知样品的存储条件和生产日期, 样品的六价格测试结果仅能代表测试时样品含六价格的状态。

检测报告仅用于客户科研、教学、内部质量控制、产品研发等目的, 仅供内部参考。



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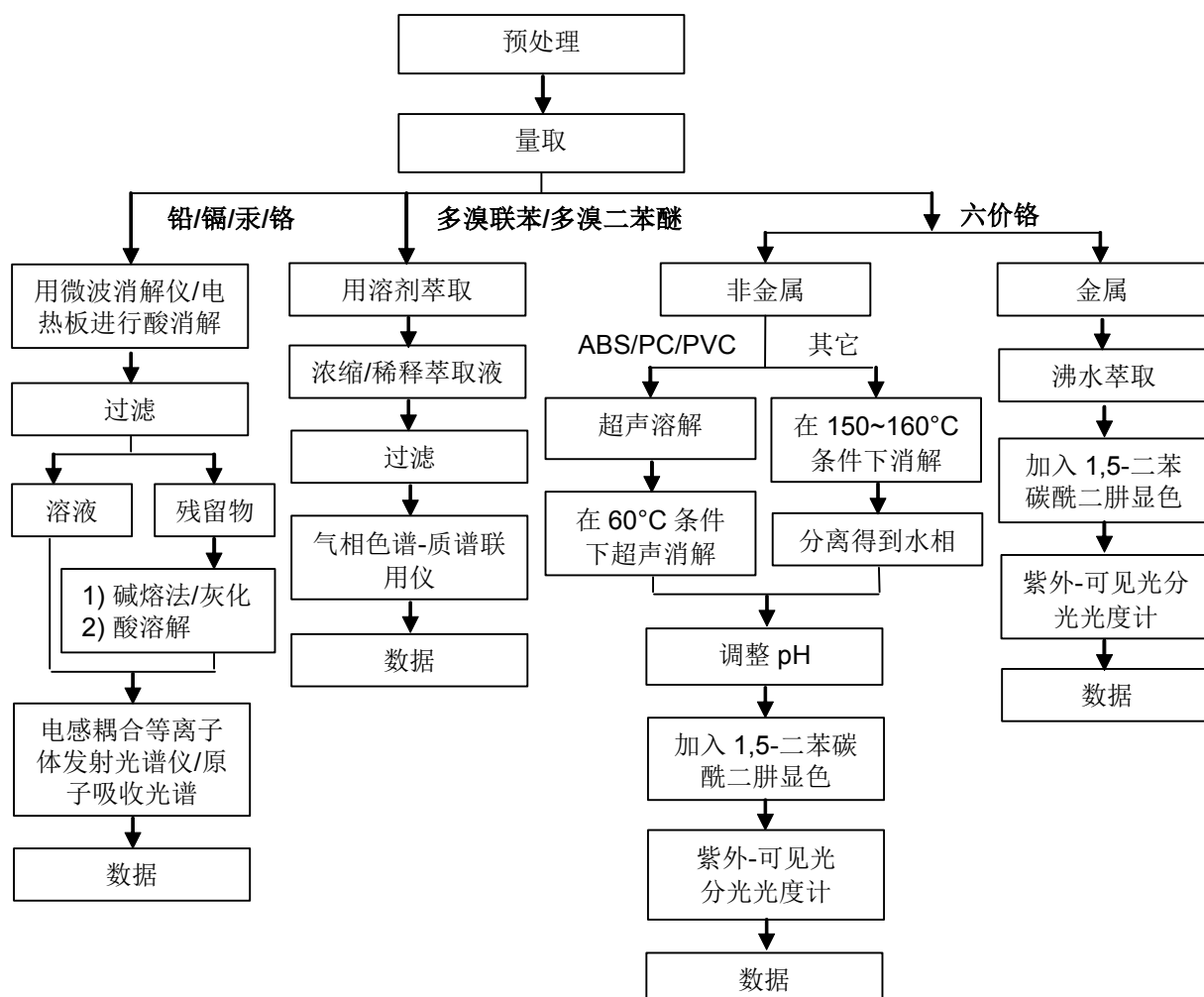
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附件

Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 测试流程图

- 1) 分析人员: 金叶/徐刚/杨小龙 /宋珂静
- 2) 项目负责人: 施青/黄婷/徐亮/王晓艳
- 3) 样品按照下述流程被完全消解 (六价铬和多溴联苯/多溴二苯醚测试除外)。



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测试报告

No. SHAEC1728677802

日期: 2018年01月04日 第5页,共5页

样品照片:



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*** 报告完 ***



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检测报告

报告编号 A2180042511101001C

第 1 页 共 7 页

申请单位 苏州嘉尚金属材料科技有限公司

地址 苏州市相城区阳澄湖镇石田路7号

以下测试之样品及样品信息由申请者提供并确认

样品名称 镀锡圆铜线

样品颜色 银白色

材料名称 铜、锡

样品接收日期 2018. 04. 03

样品检测日期 2018. 04. 03-2018. 04. 10

检测要求 根据客户要求, 对所提交样品中的铅 (Pb), 镉 (Cd), 汞 (Hg), 六价铬 (Cr (VI)), 多溴联苯 (PBBs), 多溴二苯醚 (PBDEs), 邻苯二甲酸酯 (DBP, BBP, DEHP, DIBP) 进行测试。

检测依据 请参见下页。

检测结果 请参见下页。



邵华

宋岩

宋岩
技术经理

审核
日期

王伟

2018. 04. 10

No. R301692935

江苏省苏州市相城区澄阳路 3286 号

检测报告

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检测依据

测试项目	测试方法	测试仪器
铅 (Pb)	IEC 62321-5:2013	ICP-OES
镉 (Cd)	IEC 62321-5:2013	ICP-OES
汞 (Hg)	IEC 62321-4:2013	ICP-OES
六价铬 (Cr(VI))	IEC 62321-7-1:2015	UV-vis
多溴联苯 (PBBs)	IEC 62321-6:2015	GC-MS
多溴二苯醚 (PBDEs)	IEC 62321-6:2015	GC-MS
邻苯二甲酸酯 (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS

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检测结果

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测试项目	结果	方法检出限
铅 (Pb)	11 mg/kg	2 mg/kg
镉 (Cd)	N. D.	2 mg/kg
汞 (Hg)	N. D.	2 mg/kg
六价铬 (Cr(VI))	N. D. ▼	0.10 μg/cm ² (LOQ)

测试项目	结果	方法检出限
多溴联苯 (PBBs)		
一溴联苯	N. D.	5 mg/kg
二溴联苯	N. D.	5 mg/kg
三溴联苯	N. D.	5 mg/kg
四溴联苯	N. D.	5 mg/kg
五溴联苯	N. D.	5 mg/kg
六溴联苯	N. D.	5 mg/kg
七溴联苯	N. D.	5 mg/kg
八溴联苯	N. D.	5 mg/kg
九溴联苯	N. D.	5 mg/kg
十溴联苯	N. D.	5 mg/kg

测试项目	结果	方法检出限
多溴二苯醚 (PBDEs)		
一溴二苯醚	N. D.	5 mg/kg
二溴二苯醚	N. D.	5 mg/kg
三溴二苯醚	N. D.	5 mg/kg
四溴二苯醚	N. D.	5 mg/kg
五溴二苯醚	N. D.	5 mg/kg
六溴二苯醚	N. D.	5 mg/kg
七溴二苯醚	N. D.	5 mg/kg
八溴二苯醚	N. D.	5 mg/kg
九溴二苯醚	N. D.	5 mg/kg
十溴二苯醚	N. D.	5 mg/kg

检测报告

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检测结果

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测试项目	结果	方法检出限
邻苯二甲酸酯 (DBP, BBP, DEHP, DIBP)		
邻苯二甲酸二丁酯 (DBP) CAS#:84-74-2	N. D.	50 mg/kg
邻苯二甲酸丁基苄基酯 (BBP) CAS#:85-68-7	N. D.	50 mg/kg
邻苯二甲酸二 (2-乙基) 己酯 (DEHP) CAS#:117-81-7	N. D.	50 mg/kg
邻苯二甲酸二异丁酯 (DIBP) CAS#:84-69-5	N. D.	50 mg/kg

测试部位/部位描述 有银白色镀层的金属

备注: 对于检测铅, 镉, 汞之样品已完全溶解。

-N.D. = 未检出 (小于方法检出限或定量限)

-mg/kg = ppm = 百万分之一

-LOQ = 定量限, 六价铬的定量限为0.10 µg/cm²

-▼六价铬浓度小于0.10 µg/cm², 样品未检出六价铬

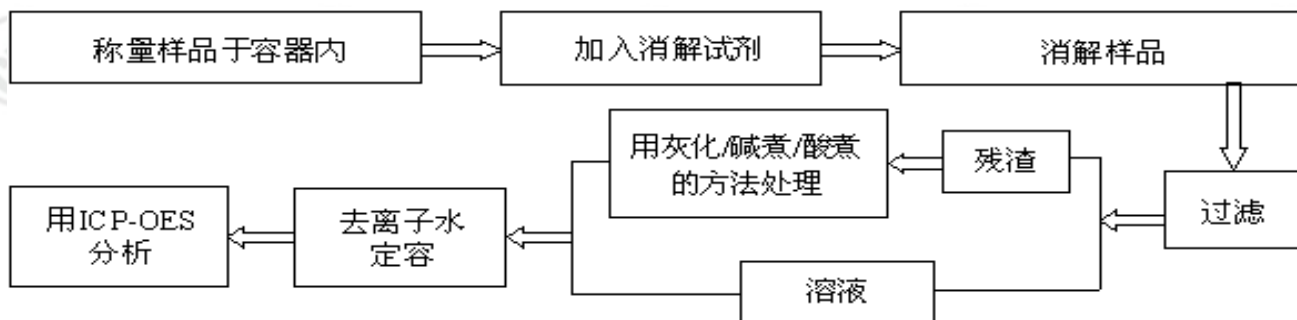
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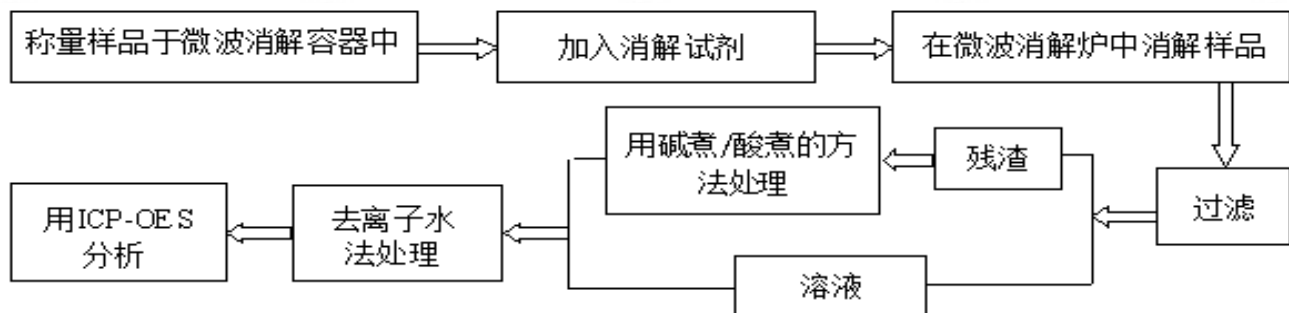
第 5 页 共 7 页

检测流程

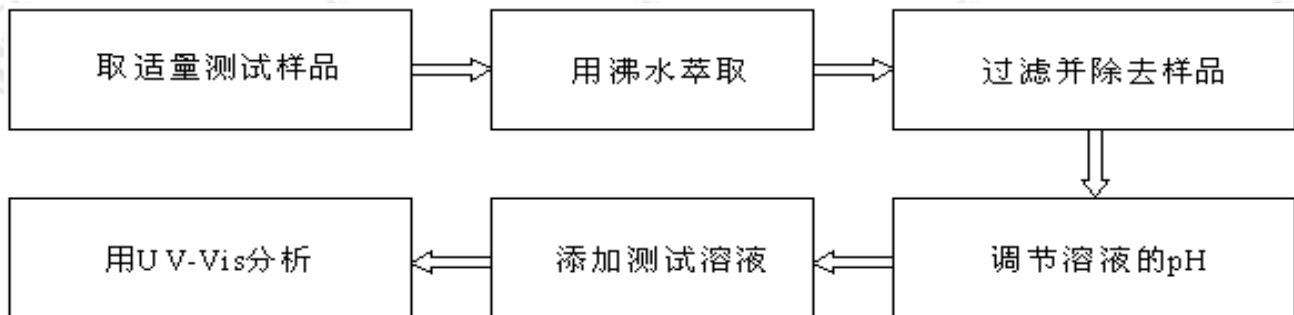
1. 铅(Pb)， 镉(Cd)



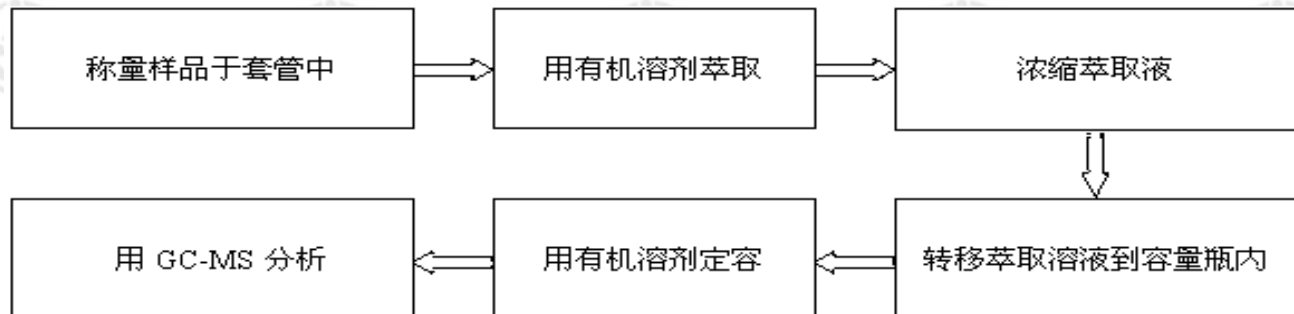
2. 汞(Hg)



3. 六价铬(Cr(VI))



4. 多溴联苯(PBBs)， 多溴二苯醚(PBDEs)

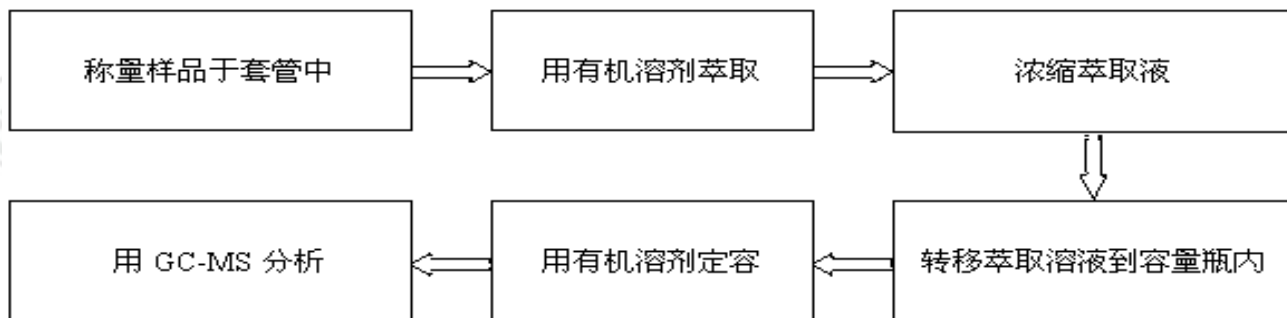


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5. 邻苯二甲酸酯 (DBP, BBP, DEHP, DIBP)

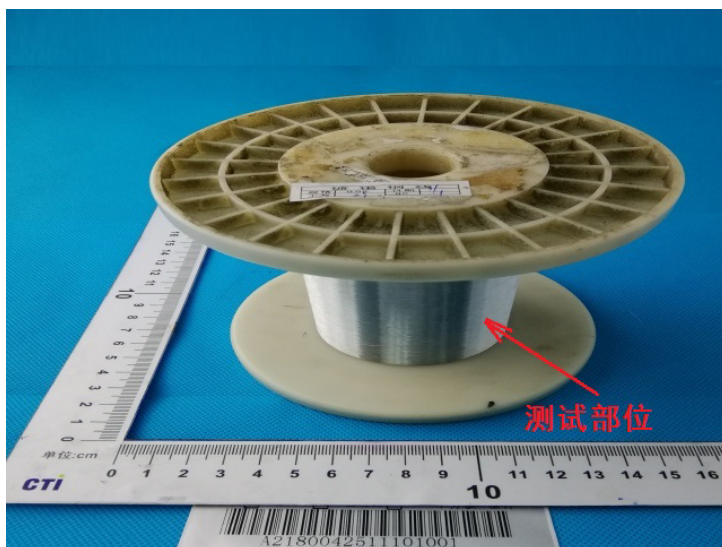


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样品图片



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