JOINSOON ELECTRONICS MFG. CO., LTD

承 認 書

APPROVAL SHEET

Vendor Name	建舜電子制造股份有限公司		
承認序號(APPROVAL SHEET NO.)	**APP-H190024**		
Model Description	**MIT-W102 WIFI MHF4 4L Aux (BT) antenna L=46mm**		
CUSTOMER P/N	**1750008365-01**		
JEM P/N	**1510-0137-0023**		
檔案號碼 (FILE NO.)	**IAH160120**	**JEM Rev**	**A**
Reported By	**Fengchun Yang**	**Checked By**	**Yonghong Hu**
Approved By	**Jinlong He**	發行日期 (RELEASED DATE)	**2019/4/25**

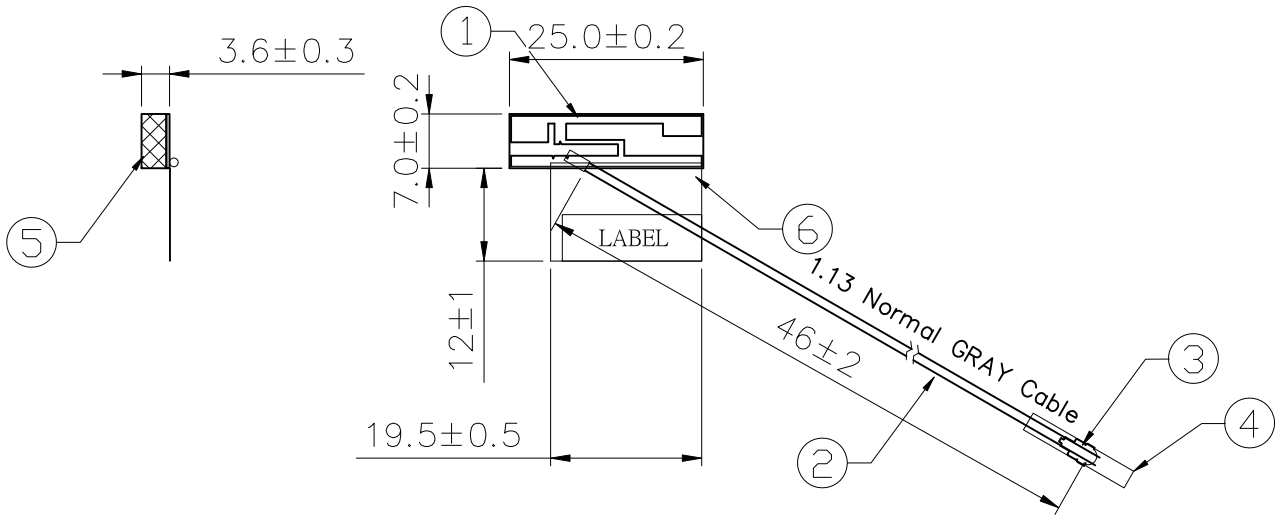
Testing Parameter

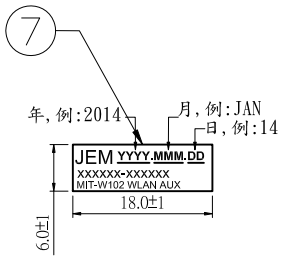
ITEM	TYPE	Remark
1	封面	**1~2**
2	圖面	**3~3**
3	規格書	**4~124**

C-DWG

REV.	ECN NO.	LOCATIONS	DESCRIPTION	DATE	DESIGN
01		△	The First Edition	06/01'16	HYH
02			焊點改爲30度	10/28'16	HYH
03			标签印字修改	4/25'19	HYH

ELECTRICAL TEST :
Frequency Range : 2.4 & 5GHz
Impedance : 50 Ohms Nomimal
Peak Gain : ≦2dBi
Radiation : Linear





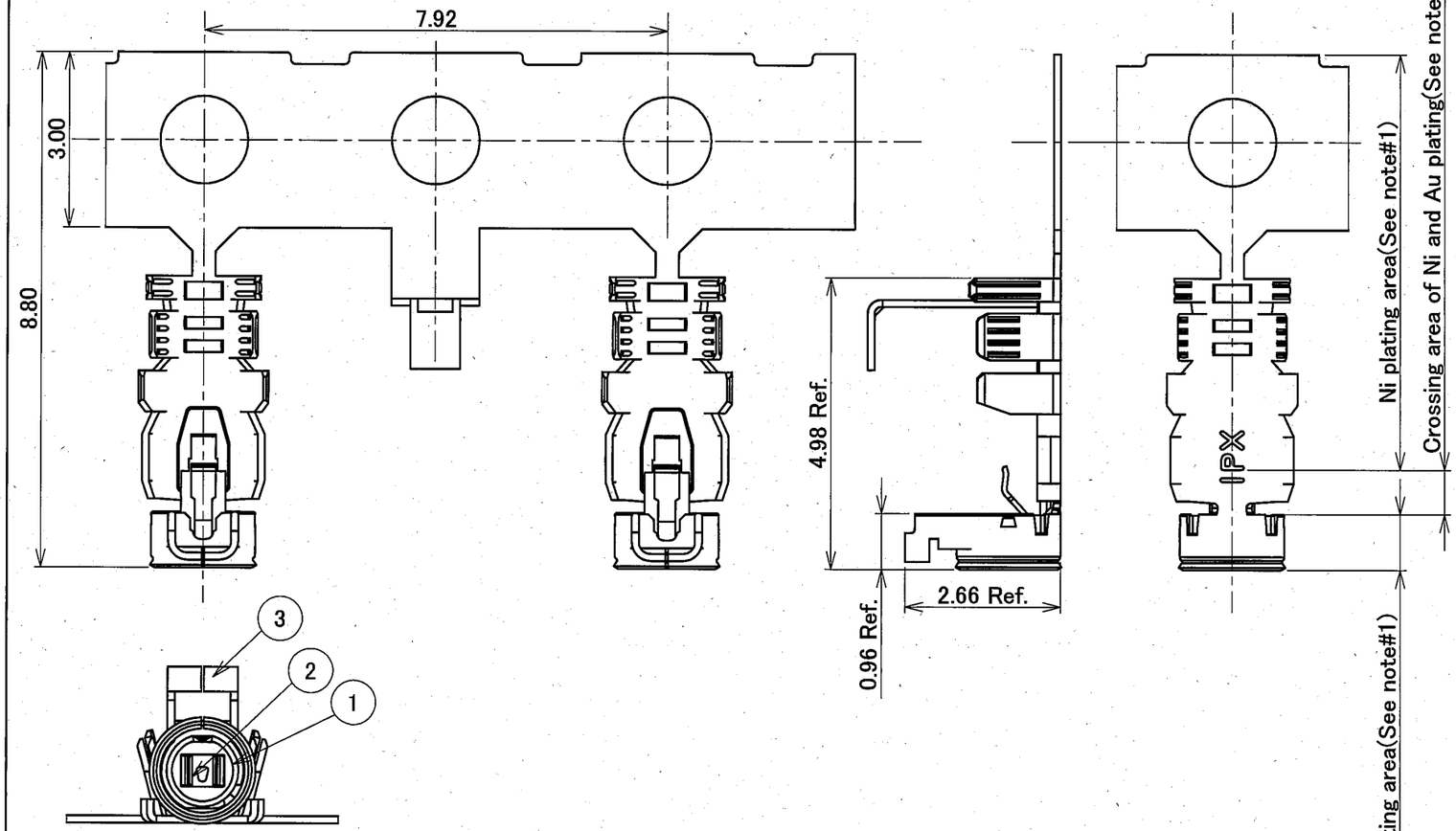
NO.	ITEM	SPECIFICATION	QTY.	REMARK
7	LABEL	SIZE:18*6mm	1	
6	FOIL	MYLAR COPPER Foil, SIZE: 19.5*12mm	1	
5	SPONGE	EVA, SIZE: 25x7x3.2mm	1	
4	TUBE	PE,PENETRABILITY SIZE:D2.5*15.0mm	1	
3	CONN	IPEX 4L Plug for Φ1.13 Cable(20565-001R-13四代)	1	
2	CABLE	RF COAXIAL 1.13mm GRAY	1	
1	ANT	ANTENNA SIZE:25.0*7 t=0.4mm	1	

建興電子		DESCRIPTION: MIT-W102 WIFI AUX ANTENNA		P/N	1750008365-01
DATE	06/01 '16	PART NO	1510-0137-0023	REV	03
DWN		FILE NO	IAH160120	UNIT	MM
CHK			SCALE: 1/1	SHEET	1/1
APP		TOLERANCES	□.X: ±0.50 □.XX: ±0.25	∠: ±1°	

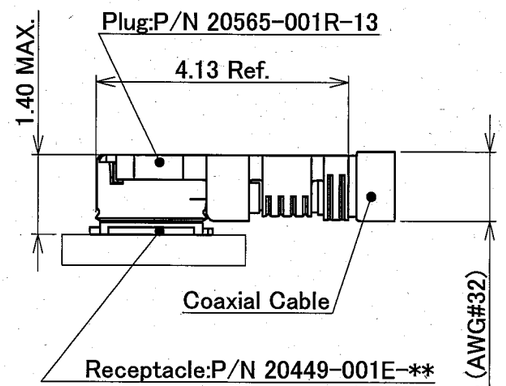
The products accord with directive and edition revised of RoHS (2011/65/EU).

CT0808A

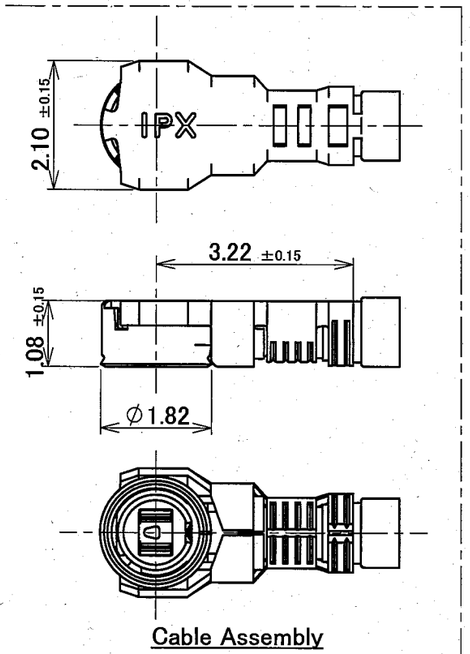
Part No.	Development status
20565-001R-13	Under development



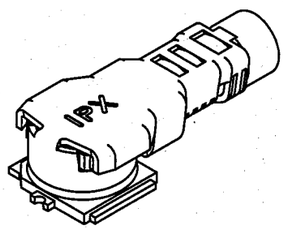
Notes
1.Material and finish(Plating)
①Housing
PBT(Black) UL94V-0
②Contact
Phosphor bronze : Au over Ni
③Ground Contact
Phosphor bronze
Au plating area : Au over Ni
Ni plating area : Ni only
2.Packing
Reel
3.Applicable cable
3-1.Description
Inner conductor
AWG#32(7/0.08)
Silver plating annealed copper wire or silver plating tin-copper alloy.
*Must not use solder coated inner conductor.
Dielectric core
Fluoro-plastics, diameter 0.68(+0.04/-0.02)mm
nominal thickness 0.22mm
Outer conductor
16/4/0.05, nominal diameter 0.93mm silver plating annealed copper wire.
*Must not use solder coated outer conductor
Jacket
Fluoro-plastics,diameter 1.13(+0.08/-0.05)mm
nominal thickness 0.10mm
3-2.Requirements
Characteristic impedance : 50(±2)ohm by TDR method
Nominal capacitance(Reference value) : 97pF/m
Conductor resistance of inner conductor(Reference value):520 ohm/km
Insulation resistance : 1500Mega-ohm. km MIN.
Dielectric with stance voltage : on breakdown at AC1000V for 1 minutes.
4.Applicable connector
P/N:20449-001E-** MHF4 Receptacle



Mating Condition



Cable Assembly



GENERAL TOLERANCE	
6 MAX.	±0.2
6 OVER MAX. 30	±0.3
30 OVER MAX. 120	±0.5
ANGLE	±2°

For Joinsoon Electronics MFG. Co.,Ltd.

REV	ECN	BY	DATE	APP
0	Z13338	S.S	Apr./19/'13	

REV.RECORD
SERIES No. R3

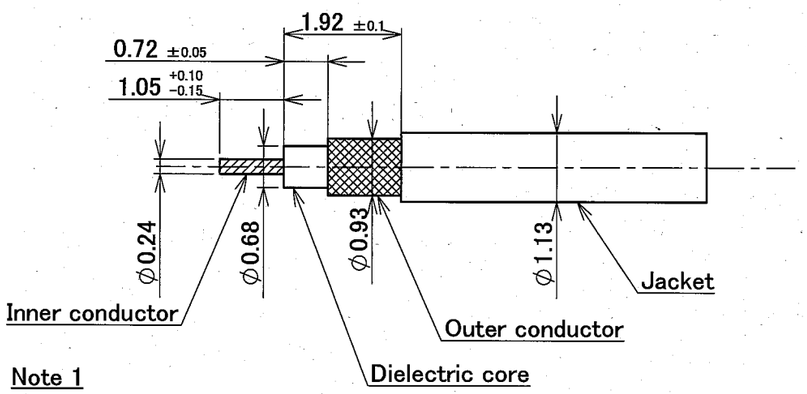
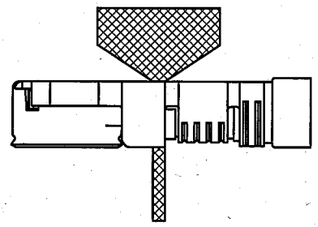
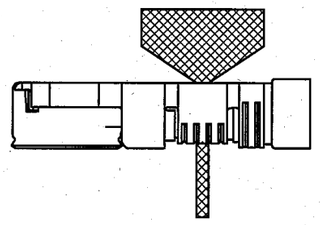
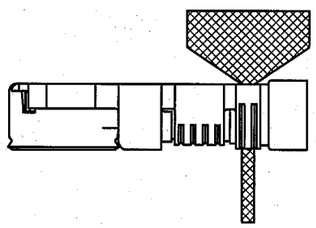
DESIGN'D BY S.Suzuki DATE Apr./19/'13
CHK'D BY DATE Apr./19/'13
APP'D BY T.Takeuchi DATE Apr./19/'13

DAI-ICHI SEIKO CO.,LTD.
I-PEX Business Company

TITLE
MHF4L PLUG CONNECTOR

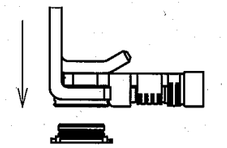
CUSTOMER COPY | PROJECTION | SCALE 10:1 | UNIT mm | DWG. No. 20565 | SHEET 1/2 | REV. 0

Confidential III C

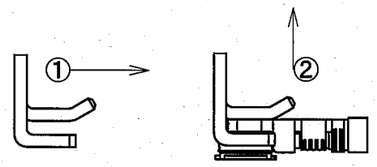
Part No.	20565-001R-13
Applicable cable strip dimension	 Note 1
Braided shield of Outer conductor	Single braided shield
P/N of semi auto termination machine	90600-013
Crimp Height	 Note 2 — CH-1(i-Fit Part) : 1.06～1.10
	 Note 2 — CH-2(Shield Part) : 0.87～0.91
	 Note 2 — CH-3(Jacket Part) : 1.05～1.09

Notes.
1.Must not use solder coated inner conductor and outer conductor
2.Use for point micrometer.
3.Mating and unmating instruction
3-1.Mating
Mate the connector verticaly as much as possible, adjusting the mating axis of plug and receptacle.
Do not slant mate.
3-2.Unmating
3-2-1.In case of unmating by pulling tool(P/N90609-0001)
Use the pulling tool as the following drawing, and pull plug to vertical direction as directly as possible.
3-2-2.In case of unmating directly by hand.
Catch the catching area of plug, and pull plug to vertical direction as directly as possible.

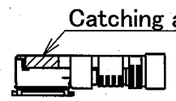
Note 3-1



Note 3-2-1



Note 3-2-2



GENERAL TOLERANCE	
6 MAX.	±0.2
6 OVER MAX. 30	±0.3
30 OVER MAX. 120	±0.5
ANGLE	±2°

Confidential III C

For Joinsoon Electronics MFG. Co.,Ltd.

REV	ECN	BY	DATE	APP
REV.RECORD				
SERIES No.				

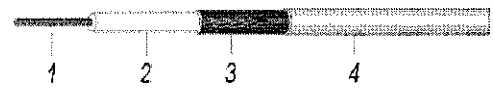
DESIGN'D BY DATE
CHK'D BY DATE
APP'D BY DATE

DAI-ICHI SEIKO CO.,LTD.
I-PEX Business Company

TITLE: MHF4L PLUG CONNECTOR

CUSTOMER COPY | PROJECTION | SCALE 10:1 | UNIT mm | DWG. No. 20565 | SHEET 2/2 | REV. 0

QKE-DFFDE06-02 REV.6

型号 Type	RF-1.13/50	料号 P/N	SY113/50-064
结构图 Structure drawing			

结构特性 Structure characteristics

结构 Structure	项目 Item	标准值 Standard value
①内导体 Inner conductor	材料 Material	镀锡铜线 Tinned copper wire
	组成:总根数/单根外径(mm) Makeup:total / O.D. of every wire(mm)	7/0.08
	(绞合)标称外径(mm) (Intertwist)NOM.O.D.(mm)	0.24±0.02
②绝缘层 Insulation	材料 Material	聚全氟乙丙烯 FEP
	颜色 Color	透明 Clarity
	标称外径(mm) NOM.O.D.(mm)	0.7±0.03
③外导体 Outer conductor	材料 Material	镀锡铜线 Tinned copper wire
	组成:总根数/单根外径(mm) Makeup:total / O.D. of every wire(mm)	4/0.05
	标称外径(mm) NOM.O.D.(mm)	0.92±0.05
	覆盖率(%) Coverage ratio(%)	90±5
④护套层 Jacket	材料 Material	聚全氟乙丙烯 FEP
	颜色 Color	
	标称外径(mm) NOM.O.D.(mm)	1.13±0.05

电性能特性 Electrical characteristics

项目 Item	标准值 Standard value	项目 Item	频率 Frequency	标准值 Standard value 单位 Unit:dB/m
电容(pF/m) Capacitance(pF/m)	98	衰减 Attenuation	1GHz	≤2.32
速率(%) Velocity(%)	70		2GHz	≤3.27
阻抗(Ω) Impedance(Ω)	50±2		3GHz	≤4.01
驻波比 Standing wave ratio	≤1.3@0~6GHz		4GHz	≤4.64
最大工作电压(V) Max.operating voltage(V)	1000		5GHz	≤5.17
最大工作频率(GHz) Max.operating frequency(GHz)	6		6GHz	≤5.69

可靠性 Dependability

项目 Item	单位 Unit	标准值 Standard value
最小弯曲半径(一次) Min.bending radius static	mm	4
最小弯曲半径(重复) Min.bending radius repeated	mm	—
工作温度范围 Operating temperature	℃	-55~+150

包装 Packing

项目 Item	单位 Unit	标准值 Standard value
包装方式 Packing mode	/	纸盘 Papery plate
每盘长度 The length of each plate	m	500
每盘接头数 Each connector plate number	/	≤3
每段最短长度 The shortest length of each root	m	≥10

使用提示 Use tips

存储环境 Storage environment	温度：30℃以下；湿度：20%~65%
最佳保存周期 The best save cycle	2个月；2个月以上作业性下降，如上锡效果变差,但电性能不受影响。夏季高温高湿环境开剥后需尽快流转
加工温度 Processing temperature	260℃的极限情况下，可短时间承受；300℃以上分子通常带有的等端基会分解；400℃以上发生显著的热分解
铁氟龙收缩 Teflon Shrink	固有材料特性。绝缘：0.2mm以下；护套：0.3mm以下
护套窜动 Jacket traverse	加工长度（护套残留长度）低于5cm易发生

其他 Other

特殊加工工艺，请与供方协商后使用

JOINSOON ELECTRONICS MFG .CO,LTO

MIT-W102 WiFi Antenna

2016/05/27

APPROVAL SHEET

客戶名稱：研華
承認序號 (APPROVAL SHEET NO.) :
品名規格 (DESCRIPTION) :MIT-W102 WiFi Antenna
檔案號碼 (FILE NO.) :
版次 (REV) : A
料號 (PART NO.) :
工程師 (ENGINEER) : Jess
品保確認 (QC. CHK.) : Jane
工程確認 (ENG. CHK.) : Jess
發行日期 (RELEASED DATE) : 2016/05/27
生產廠區名稱：蘇州建合精密電子有限公司
地址：蘇州市相城區渭塘鎮通成路118號

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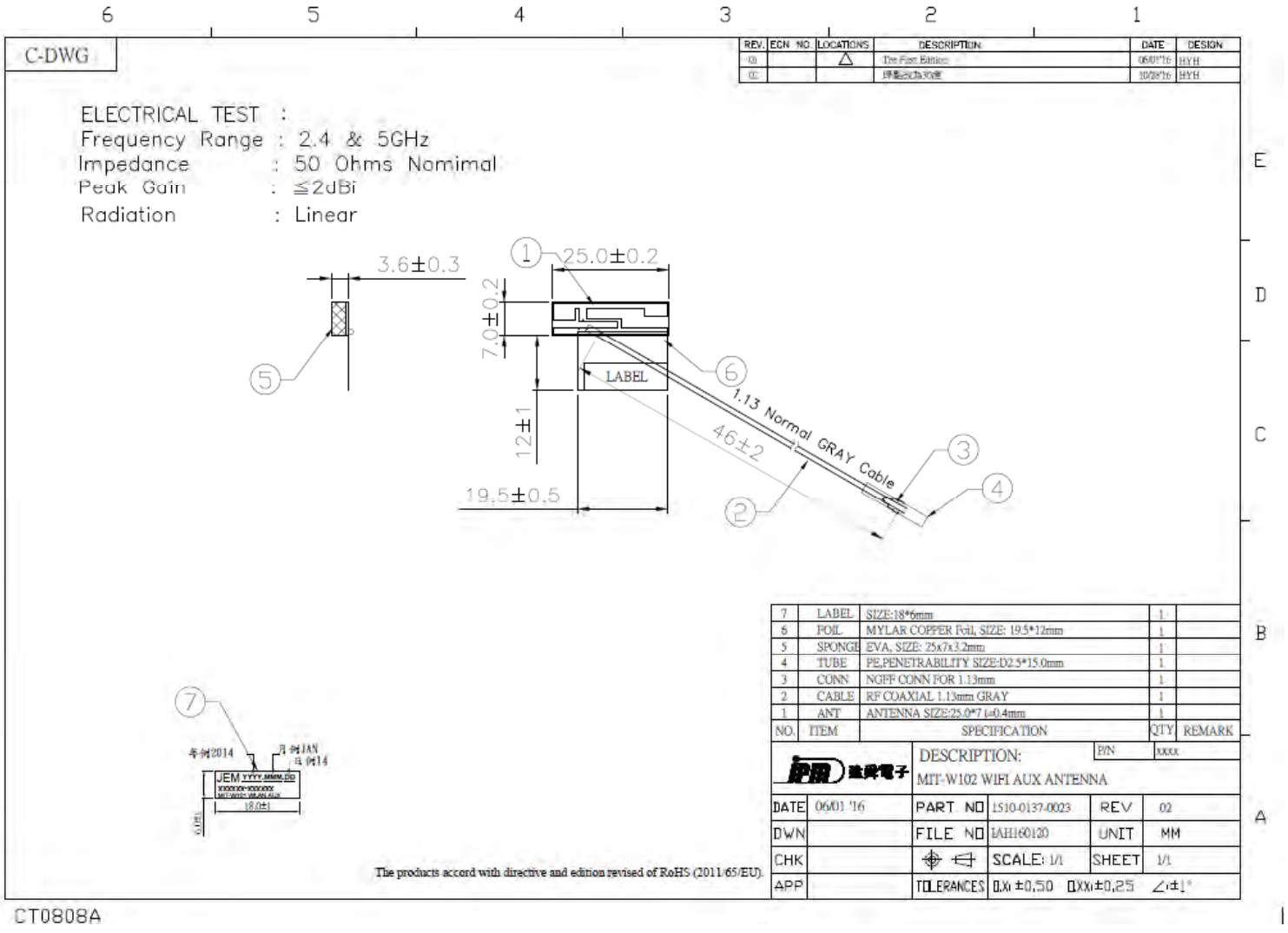
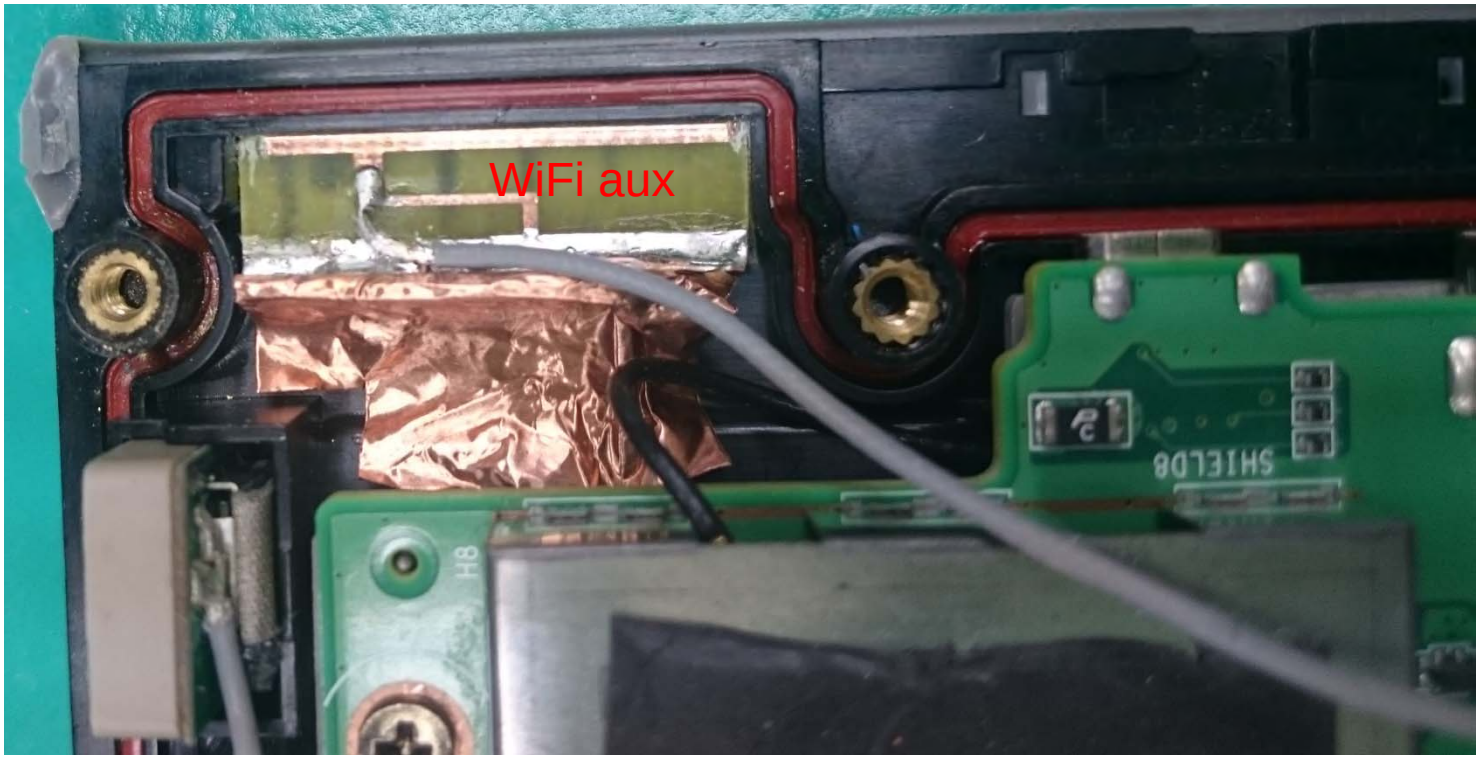
2.Antenna Drawing



3. Antenna Photo



3.Antenna Related Data

4.1 Frequency Range:

WiFi Antenna : 2400 / 2500~5150 / 5850 MHz

4.2 Impedance : 50Ω

4.3 V.S.W.R : ≦2 @ 2400 / 2500~5150 / 5850 MHz

4.5 Polarization : Linear

4.6 Cable : Φ1.13mm Cable

4.7 Connector : RF Mini Plug

4.8 Antenna pattern : PIFA

4. Test Result 3D

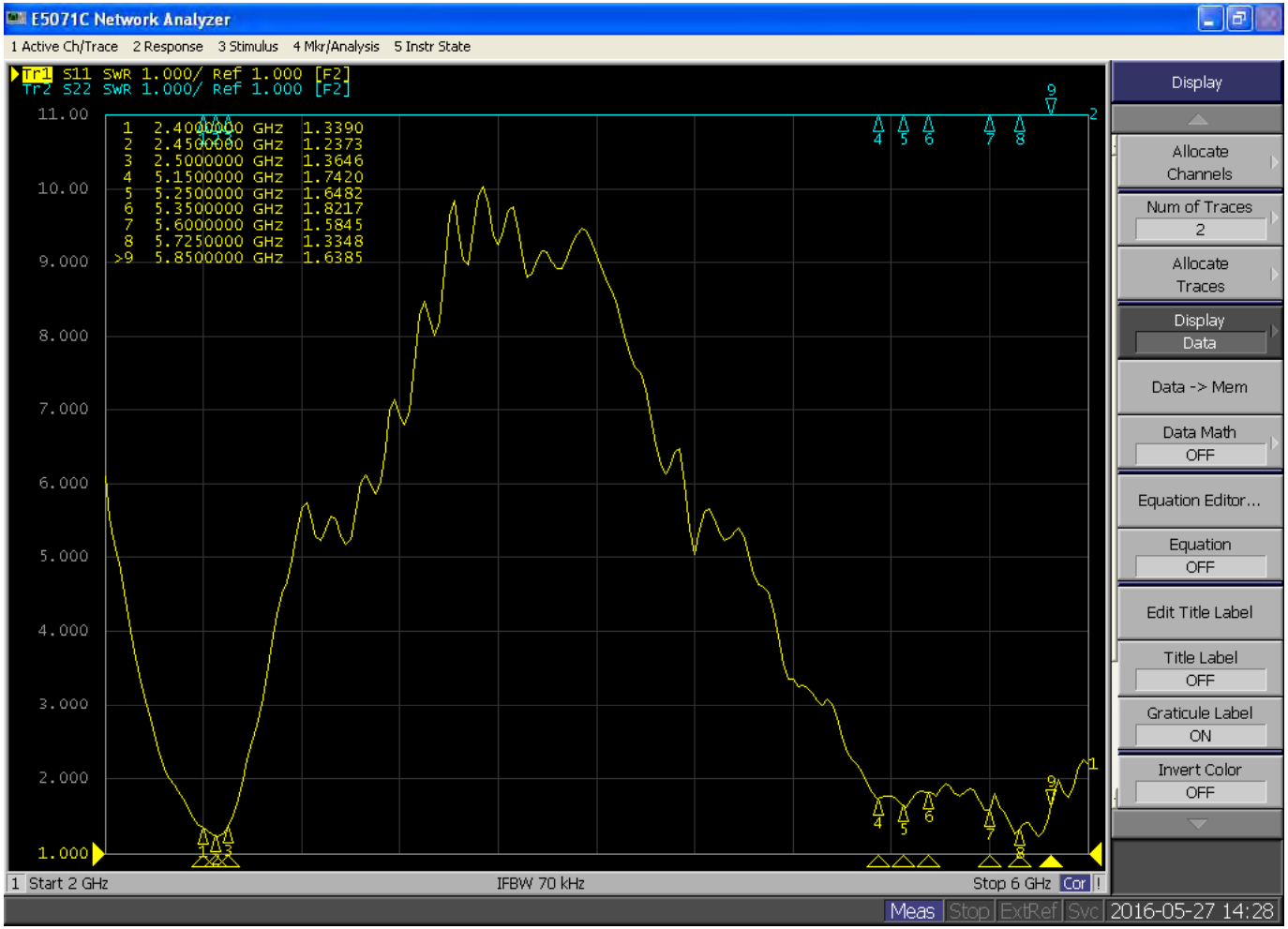
WIFI AUX

Frequency (MHz)	2400	2450	2500	5150	5250	5350	5450	5500	5670	5745	5850
Average Gain (dB)	-2.53	-2.55	-1.97	-2.3	-2.24	-2.67	-2.87	-3.3	-2.3	-2.22	-2.83
Peak Gain (dBi)	2.32	2.9	2.91	2.77	2.82	2.33	2.23	2.15	2.25	2.47	2.84
Efficiency (%)	58.36	55.6	63.59	58.91	59.77	54.09	51.62	46.82	58.83	60.03	52.1
Cable loss	0.04	0.18	0.18	0.09	0.16	0.11	0.21	0.13	0.22	0.13	0.21

Test Result 2D AUX

Gain	Peak Gain (dBi)									Avgerage Gain (dBi)								
Plane	XY Plane			ZX Plane			ZY Plane			XY Plane			ZX Plane			ZY Plane		
Pola.	H	V	H + V	H	V	H + V	H	V	H + V	H	V	H + V	H	V	H + V	H	V	H + V
2400	-2.26	0.34	0.40	-3.73	-4.42	-2.23	-2.97	-2.13	-0.44	-9.85	-4.74	-3.44	-7.59	-8.66	-4.95	-6.88	-5.12	-2.31
2450	-2.89	-0.87	-0.68	-4.99	-3.44	-2.28	0.28	-2.92	1.27	-10.72	-4.85	-3.76	-9.01	-8.31	-5.49	-5.37	-5.24	-1.79
2500	-2.58	0.28	0.52	-3.27	-5.21	-1.10	-0.07	-1.45	1.62	-9.61	-3.96	-2.83	-8.17	-7.57	-4.71	-4.76	-3.86	-0.95
5150	-5.59	0.85	1.27	0.83	-2.64	1.45	-3.02	1.69	2.64	-8.42	-4.01	-2.54	-4.81	-5.69	-2.02	-7.95	-3.19	-1.78
5250	-5.47	0.89	1.35	0.50	-2.37	1.67	-2.72	1.51	2.42	-8.49	-4.04	-2.59	-5.09	-5.61	-2.13	-7.94	-3.27	-1.85
5350	-1.76	-0.52	0.08	-1.76	-1.54	-0.08	-3.65	1.69	2.11	-8.78	-5.05	-3.13	-7.06	-5.67	-2.91	-9.21	-4.93	-3.36
5450	-1.51	-0.43	0.03	-1.51	-1.85	-0.88	-3.77	1.52	1.97	-8.82	-5.06	-3.19	-7.45	-5.93	-3.23	-9.46	-5.22	-3.60
5500	-1.16	-1.37	-0.68	-1.16	-3.56	-1.07	-6.38	-0.07	0.90	-8.21	-5.70	-3.55	-6.41	-7.10	-3.50	-9.59	-4.63	-3.25
5670	-0.09	0.45	1.05	-0.09	-1.24	0.05	-3.70	0.45	1.05	-7.05	-4.57	-2.47	-4.83	-6.19	-2.21	-9.46	-2.88	-1.94
5745	-0.24	0.70	1.34	-0.57	-1.94	-0.31	-4.62	1.32	1.59	-7.25	-4.83	-2.64	-5.29	-6.15	-2.49	-9.12	-2.74	-1.75
5850	-0.51	3.23	3.45	-1.36	-4.76	-0.90	-3.11	3.23	3.45	-7.33	-5.29	-2.96	-6.59	-8.55	-4.14	-9.82	-2.75	-1.82
5745	-0.24	0.70	1.34	-0.57	-1.94	-0.31	-4.62	1.32	1.59	-7.25	-4.83	-2.64	-5.29	-6.15	-2.49	-9.12	-2.74	-1.75

WIFI AUX Antenna



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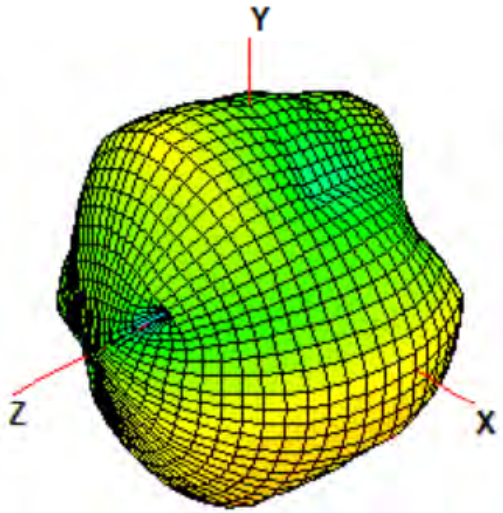
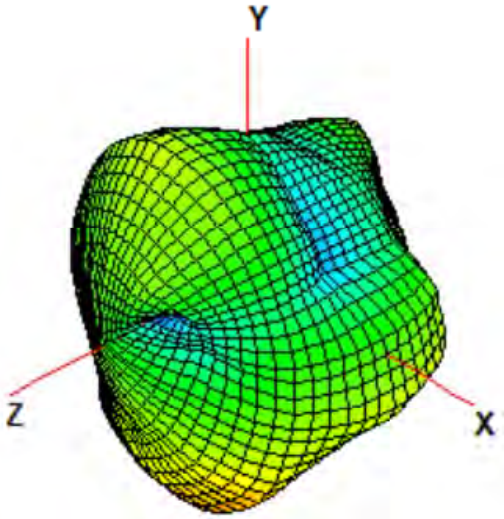
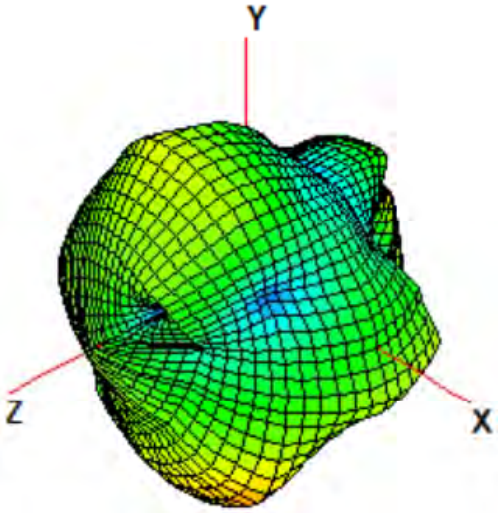
Antenna-aux



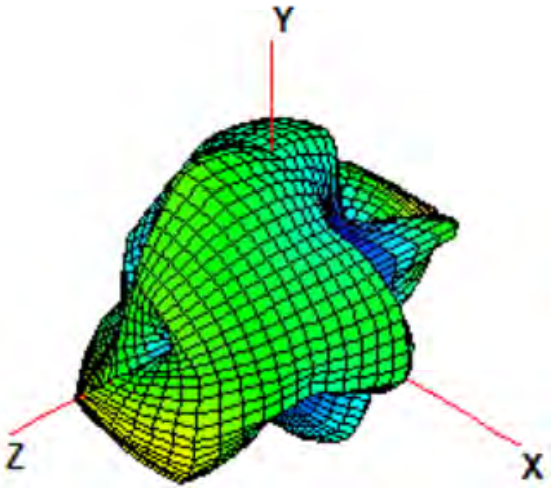
2400 MHz



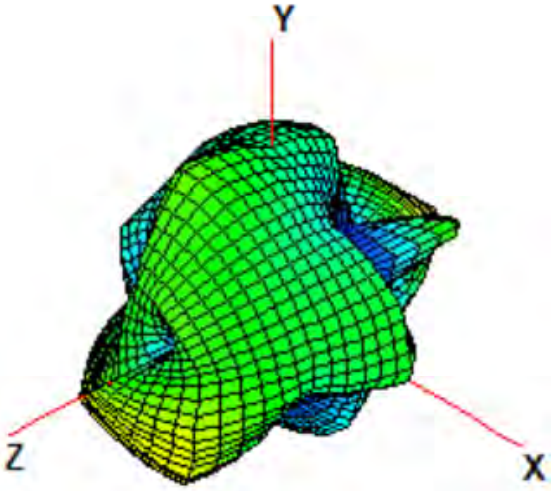
2450 MHz



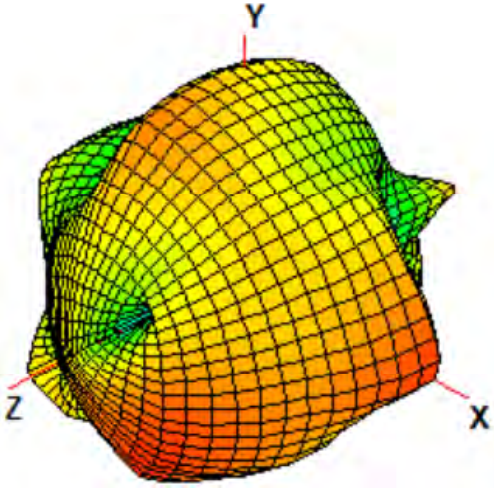
2500 MHz



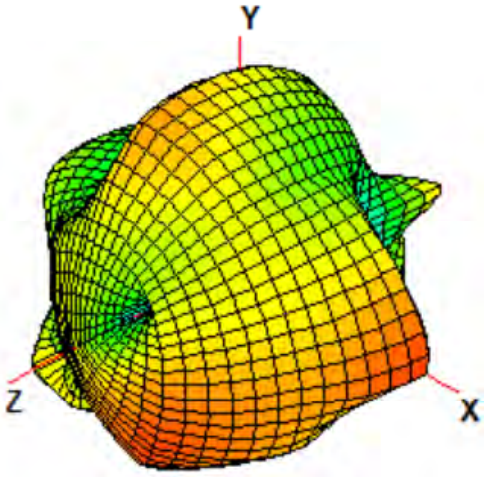
5150 MHz



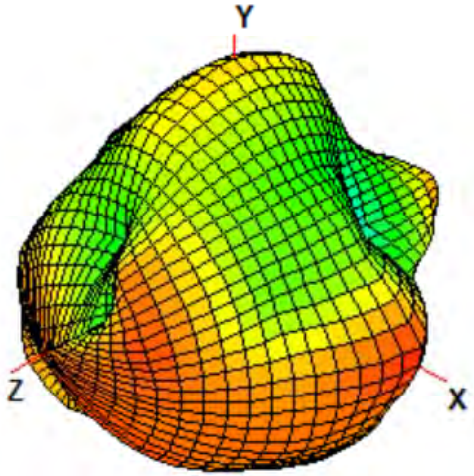
5250 MHz



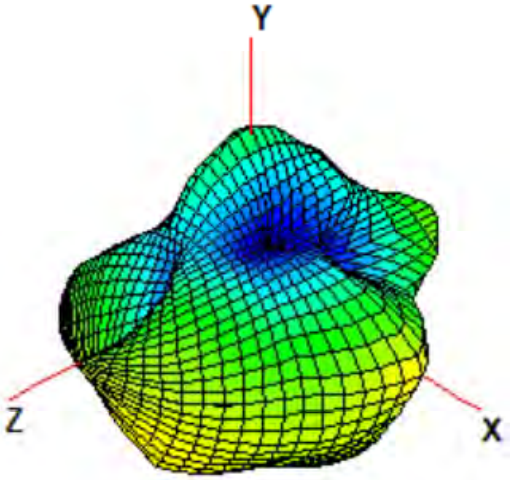
5350 MHz



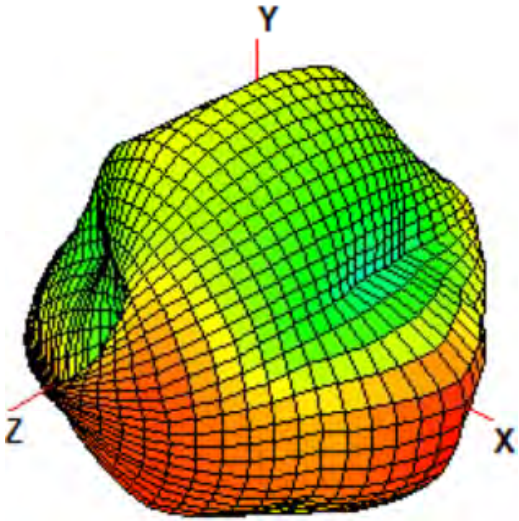
5450 MHz



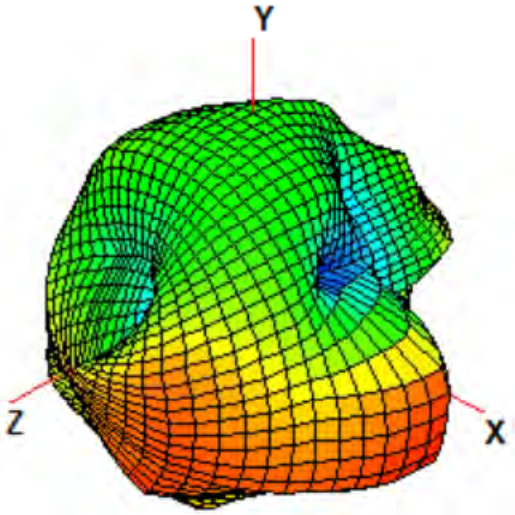
5500 MHz



5670 MHz

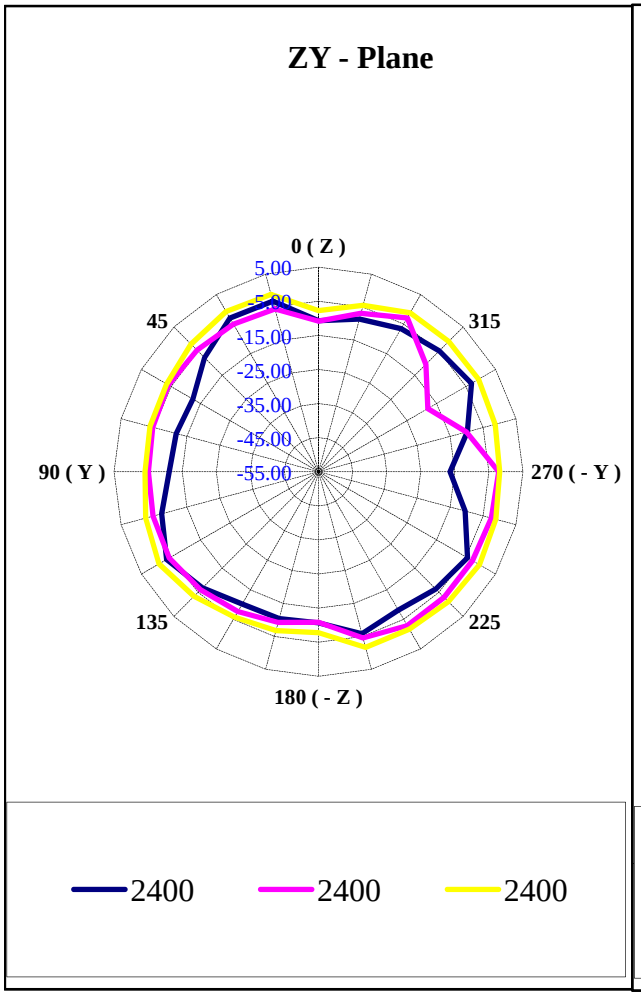


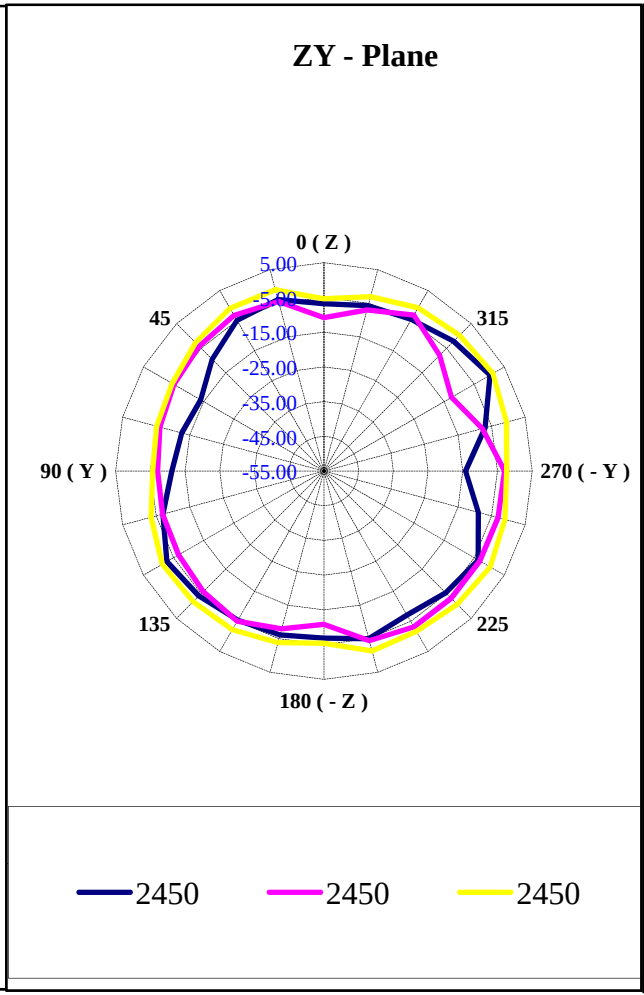
5745 MHz

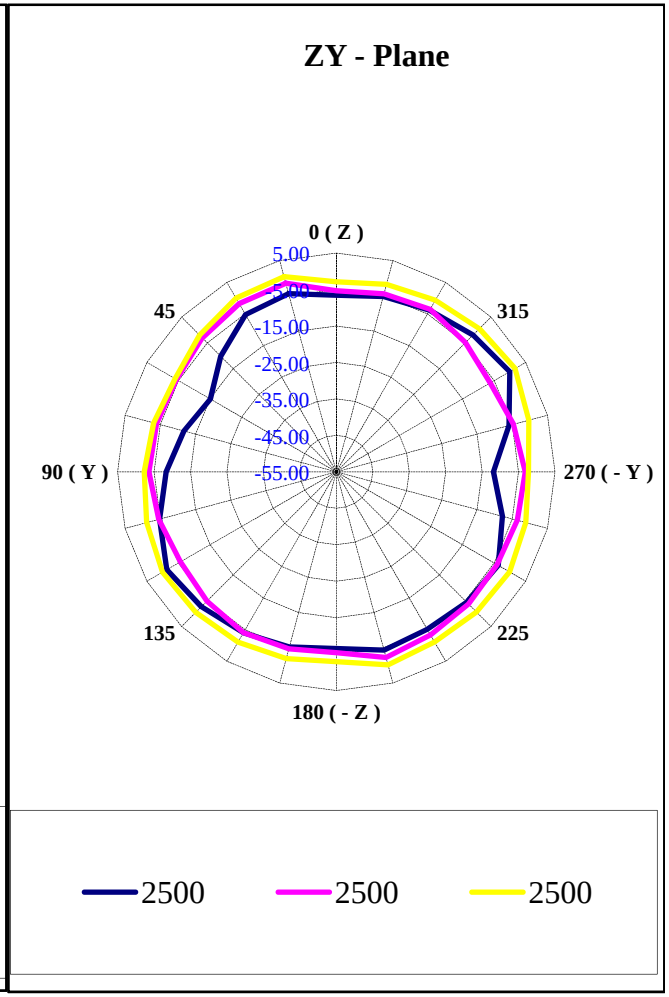


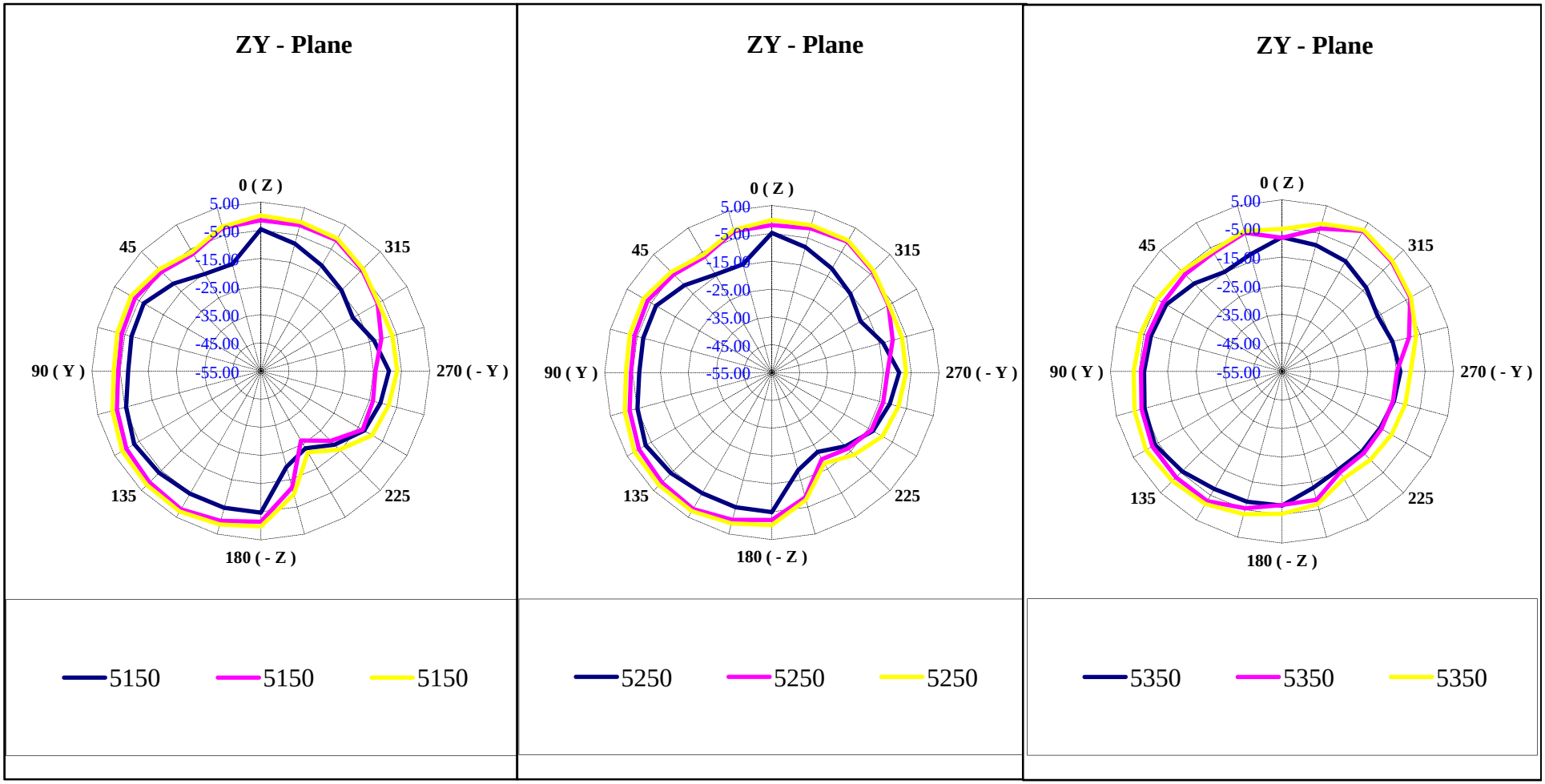
5850 MHz

2D Pattern Antenna-aux





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45
315
90 (Y)
270 (- Y)
135
225
180 (- Z)
5.00
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5150
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ZY - Plane
0 (Z)
45
315
90 (Y)
270 (- Y)
135
225
180 (- Z)
5.00
-5.00
-15.00
-25.00
-35.00
-45.00
-55.00
5250
5250
5250
ZY - Plane
0 (Z)
45
315
90 (Y)
270 (- Y)
135
225
180 (- Z)
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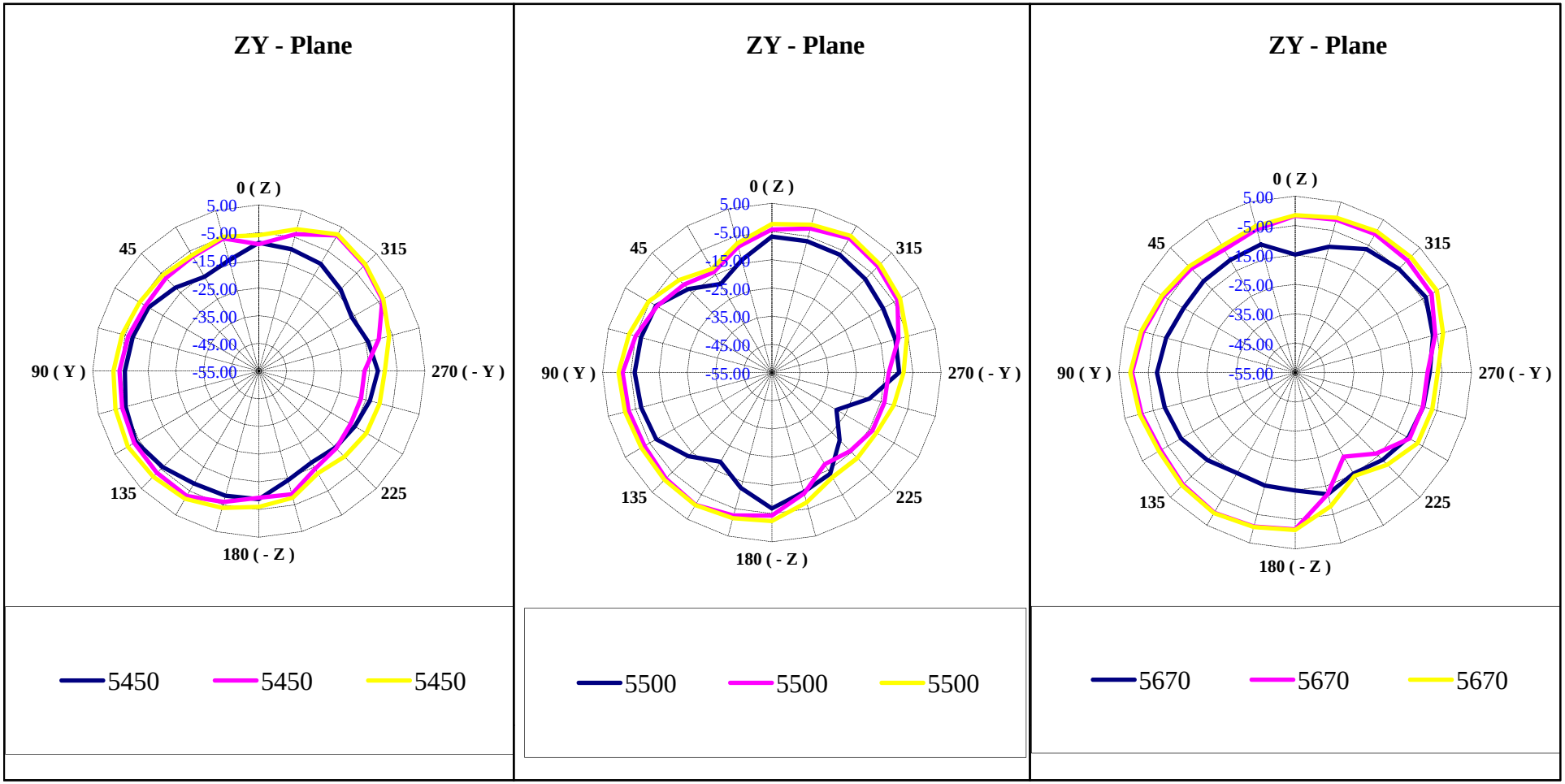
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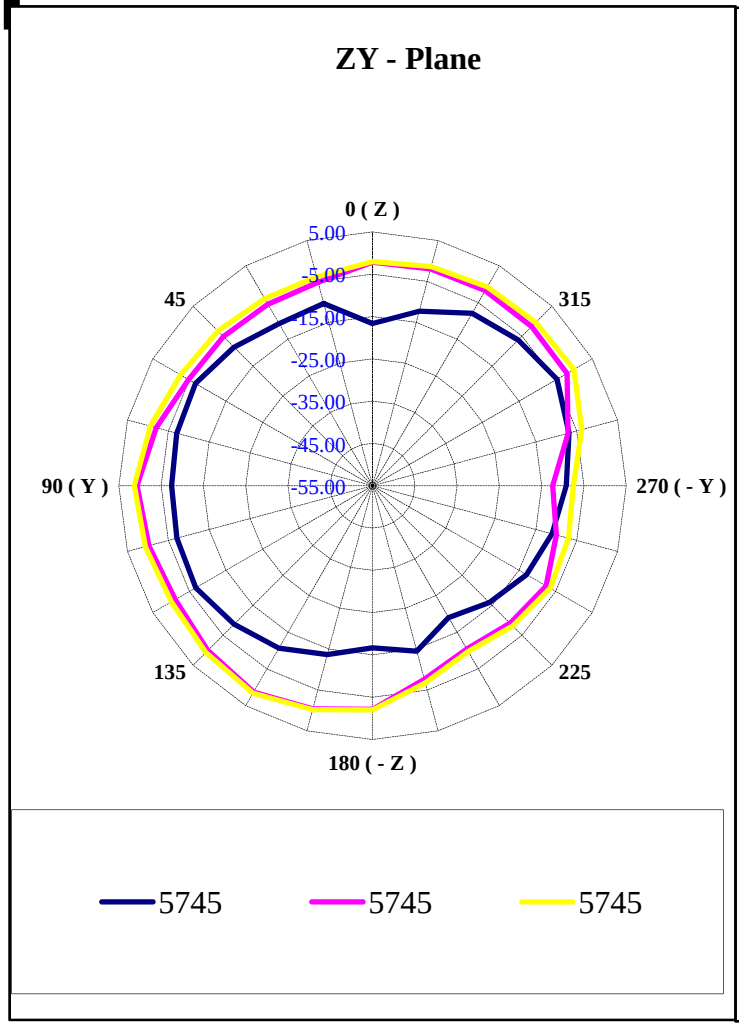
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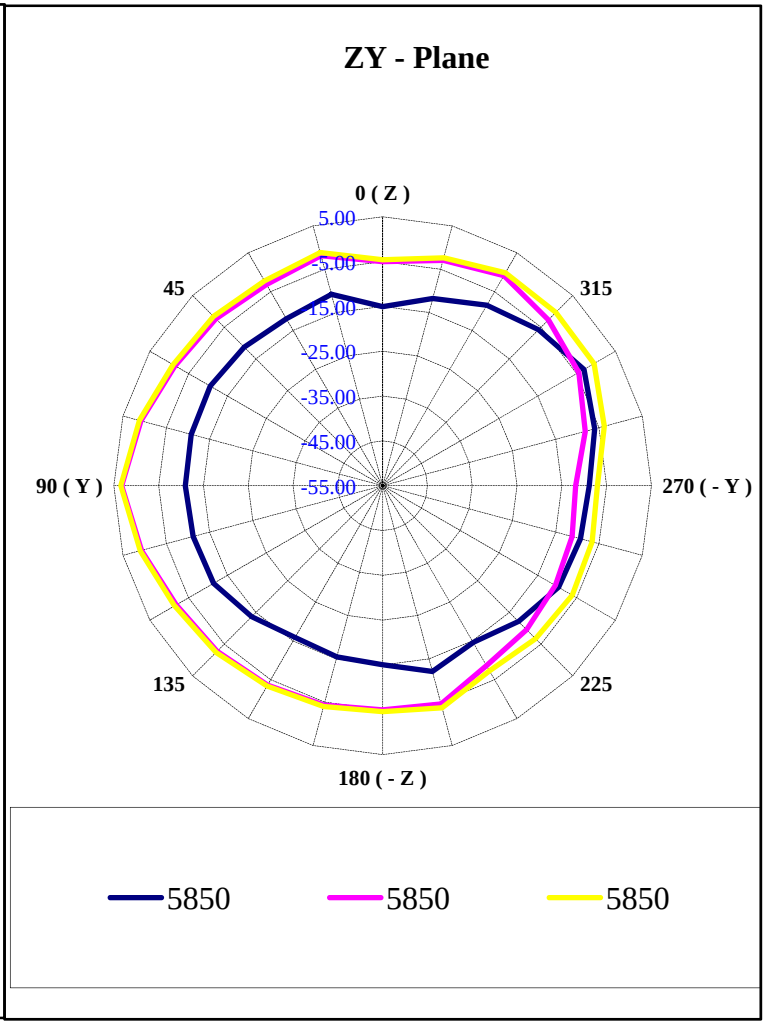
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-55.00
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5850

CTI 华测检测 CENTRE TESTING INTERNATIONAL

Test Report

Report No. A2180259581101003

Applicant DAIKIN CHEMICAL INTERNATIONAL TRADING（SHANGHAI) CO.,LTD.

Address RM.3707-3708 UNITED PLAZA, NO. 1468 NANJING RD(W), SHANGHAI , CHINA

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

Sample Name	FEP NP1105
Sample Received Date	Jan. 16, 2019
Testing Period	Jan. 16, 2019 to Jan. 19, 2019

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), Antimony(Sb), Chlorine (Cl), Bromine (Br), Phthalates, Perfluorooctane Sulfonates (PFOS), Perfluorooctanoic Acid (PFOA), Hexabromocyclododecane (HBCDD) in the submitted sample(s).

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

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

****

Conclusion

Tested Sample	According to standard/directive	Result
Submitted Sample	RoHS Directive 2011/65/EU with amendment (EU) 2015/863	Pass

****

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.

Tested by Zhou Hongxia

Approved by Chen kaimin

Chen kaimin

Lab Manager

Reviewed by Taoying

Date Jan. 19, 2019

No. R201801303

Centre Testing International Pinbiao(Shanghai) Co., Ltd.

No. 1996, Xinjinqiao Road, Pudong New District, Shanghai,China

Test Report

Report No. A2180259581101003

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+AMD1:2017 CSV	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
Antimony(Sb)	Refer to US EPA 3052:1996 & US EPA 6010D:2014	ICP-OES
Chlorine (Cl)	Refer to EN 14582:2016	IC
Bromine (Br)	Refer to EN 14582:2016	IC
Perfluorooctane Sulfonates (PFOS)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
Perfluorooctanoic Acid (PFOA)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
Hexabromocyclododecane (HBCDD)	Refer to US EPA 3550C:2007 & US EPA 8270E:2017	GC-MS
Phthalates (DNOP, DINP, DIDP, DMP, DEP, DPP, DNHP, DMEP, DIPP, DHNUP, DIHP)	Refer to EN 14372:2004(E)	GC-MS

Test Report

Report No. A2180259581101003

Test Result(s)

Tested Item(s)	Result	MDL	Limit
Lead(Pb)	N.D.	2 mg/kg	1000 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury(Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium(Cr(VI))	N.D.	8 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL	Limit
Polybrominated Biphenyls(PBBs)			
Monobromobiphenyl	N.D.	5 mg/kg	1000 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	Limit
Polybrominated Diphenyl Ethers (PBDEs)			
Monobromodiphenyl ether	N.D.	5 mg/kg	1000 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. A2180259581101003

Test Result(s)

Tested Item(s)	Result	MDL	Limit
Phthalates (DBP, BBP, DEHP, DIBP)			
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg	1000 mg/kg
Butyl benzyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg	1000 mg/kg
Di-(2-ethylhexyl) phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg	1000 mg/kg
Diisobutyl phthalate(DIBP) CAS#:84-69-5	N.D.	50 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL
Antimony(Sb)	N.D.	10 mg/kg

Tested Item(s)	Result	MDL
Chlorine(Cl)	N.D.	10 mg/kg
Bromine(Br)	N.D.	10 mg/kg

Test Report

Report No. A2180259581101003

Test Result(s)

Tested Item(s)	Result	MDL
Phthalates		
Di-n-octyl phthalate(DNOP) CAS#:117-84-0	N.D.	50 mg/kg
Di-isononyl phthalate(DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
Di-iso-decyl phthalate(DIDP) CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg
Dimethyl phthalate(DMP) CAS#:131-11-3	N.D.	50 mg/kg
Diethyl phthalate(DEP) CAS#:84-66-2	N.D.	50 mg/kg
Dipentyl phthalate(DPP) CAS#:131-18-0	N.D.	50 mg/kg
Di-n-hexyl phthalate(DNHP) CAS#:84-75-3	N.D.	50 mg/kg
Bis(2-methoxyethyl) phthalate(DMEP) CAS#:117-82-8	N.D.	50 mg/kg
Diisopentylphthalate(DIPP) CAS#:605-50-5	N.D.	50 mg/kg
*1,2-Benzenedicarboxylic acid, di-(C7-11)-branched and linear alkyl esters(DHNUP) CAS#:68515-42-4	N.D.	100 mg/kg
*1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich(DIHP) CAS#:71888-89-6	N.D.	100 mg/kg

Tested Item(s)	Result	MDL
Perfluorooctane Sulfonates(PFOS)	N.D.	5 mg/kg

Tested Item(s)	Result	MDL
Perfluorooctanoic Acid(PFOA)	N.D.	5 mg/kg

Tested Item(s)	Result	MDL
Hexabromocyclododecane(HBCDD)	N.D.	5 mg/kg

Test Report

Report No. A2180259581101003

Tested Sample/Part Description Colorless transparent plastic particle

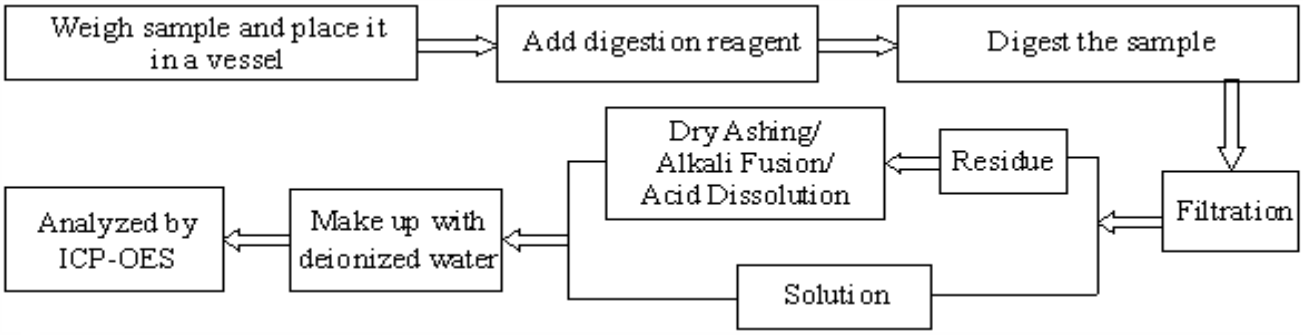
Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury, Antimony.**
-*=In view of the substances are established as UVCB substances (substances of unknown or variable composition, complex reaction products or biological materials) consisting of different and variable constituents, the test results are calculated based on the main constituents of the representative compounds for substances.

-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million
-1000 mg/kg = 0.1%

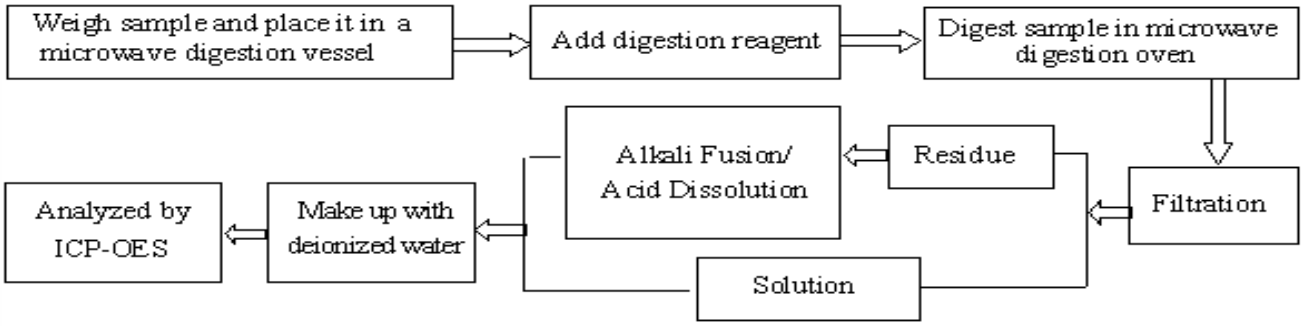
Test Report

Test Process

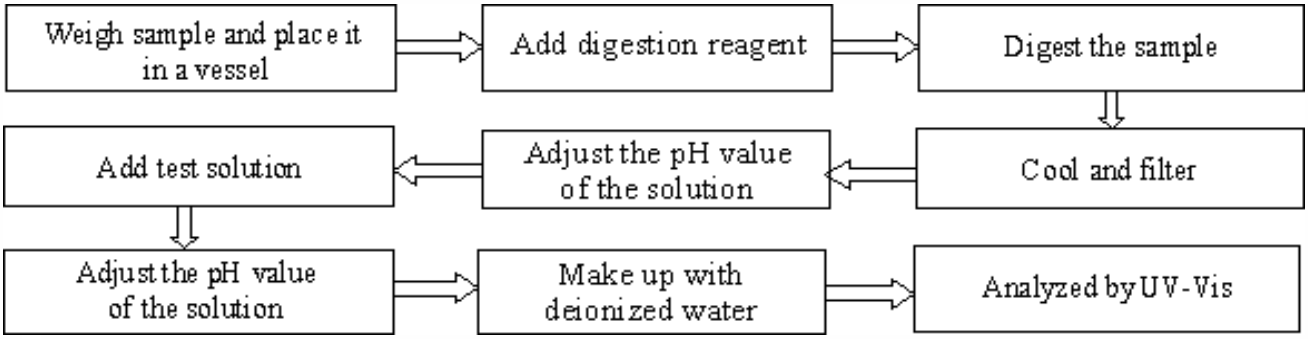
1. Lead(Pb), Cadmium(Cd), Chromium(Cr)



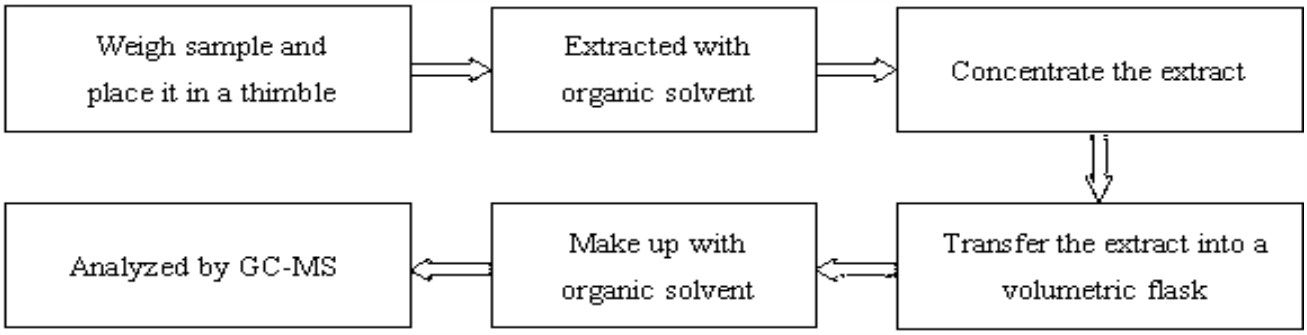
2. Mercury(Hg)



3. Hexavalent Chromium(Cr(VI))

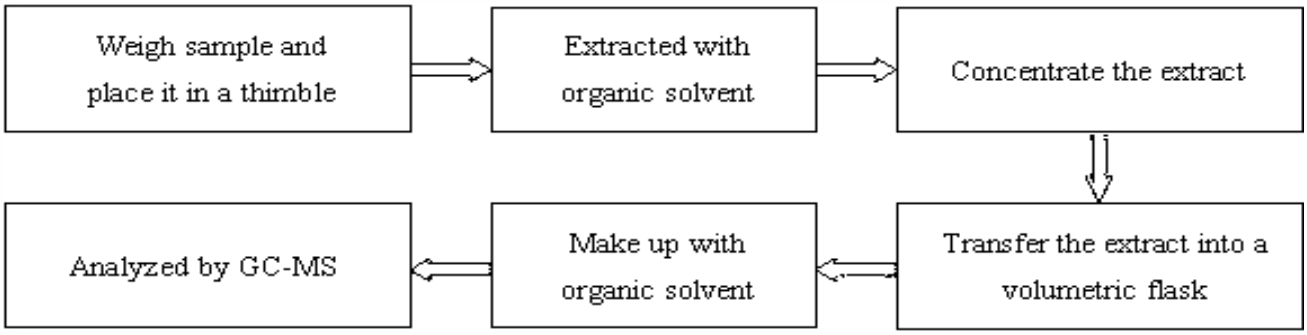


4. Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs)

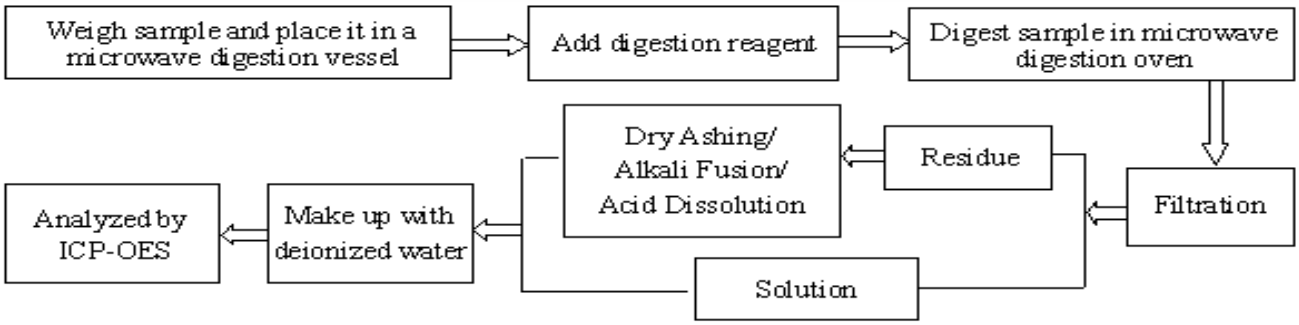


Test Report

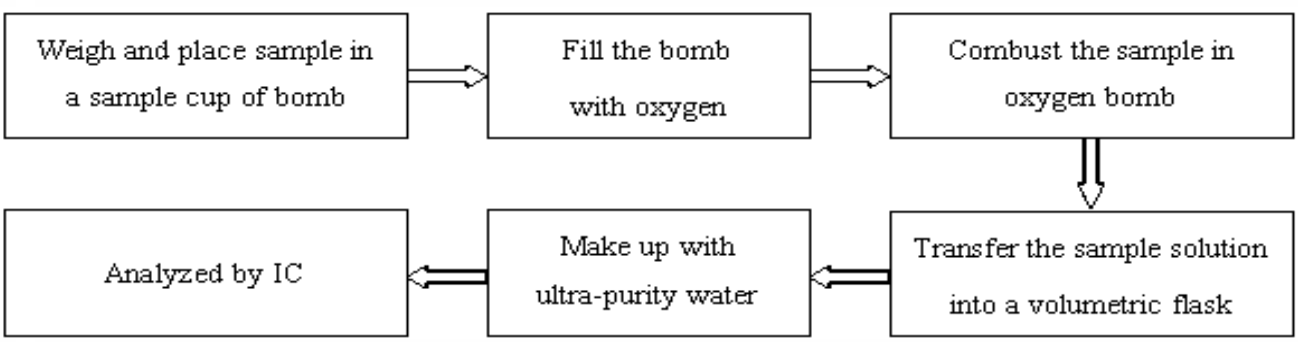
5. Phthalates



6. Antimony(Sb)

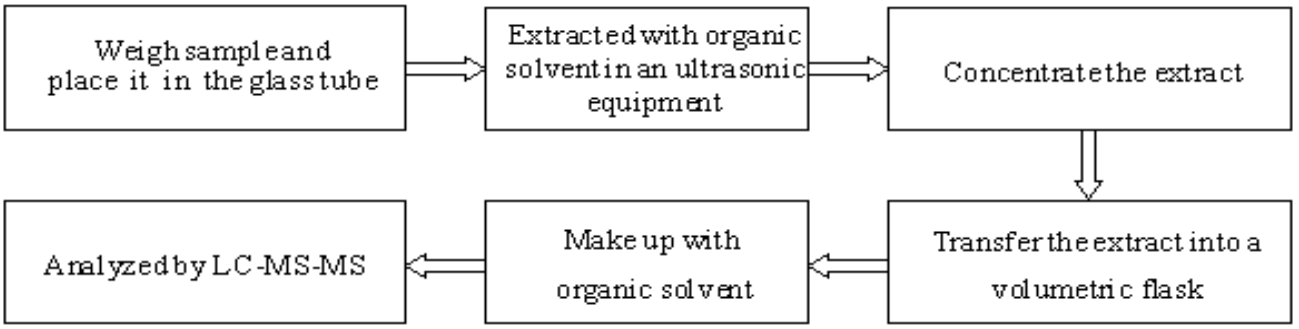


7. Chlorine (Cl), Bromine (Br)

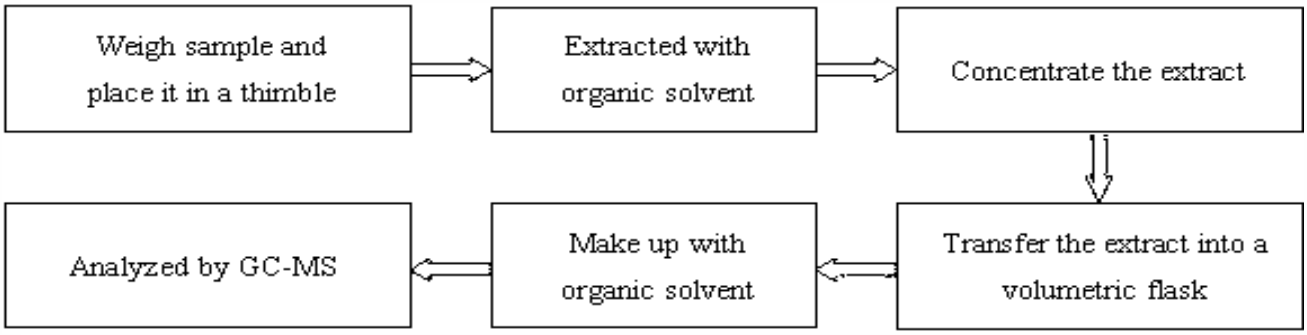


Test Report

8. Perfluorooctane Sulfonates (PFOS), Perfluorooctanoic Acid (PFOA)



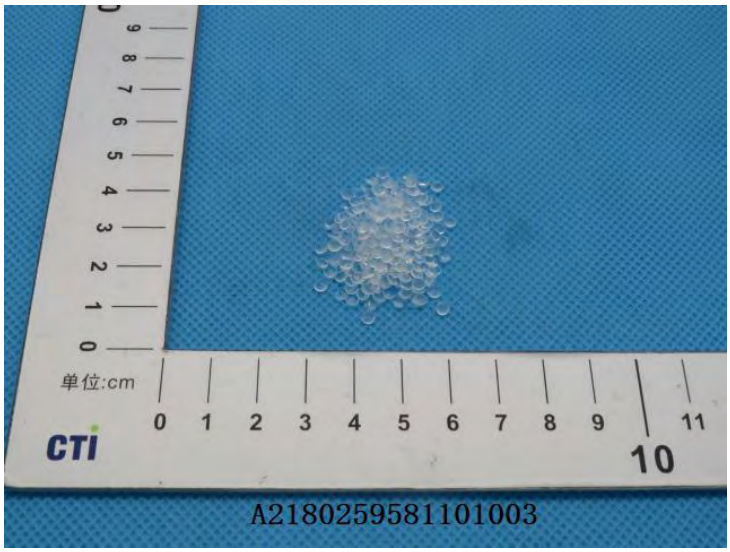
9. Hexabromocyclododecane (HBCDD)



Test Report

Report No. A2180259581101003

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 autenticity 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;
5. In case of any discrepancy between the English version and Chinese version of the testing reports (if genrated), the Chinese version shall prevail.

Test Report

Applicant ZHEJIANG ZHENGDAO OPTOELECTRONICS CO.,LTD
Address NO.8 ZHENGDAO ROAD LIANSHI TOWN HUZHOU CITY ZHEJIANG PROVINCE

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

Sample Name	Tin-coated copper wire
Material	Copper、Tin
Sample Received Date	Jun. 27, 2018
Testing Period	Jun. 27, 2018 to Jul. 3, 2018
Test Requested	As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonates (PFOS) in the submitted sample(s).
Test Method/Test Result(s)	Please refer to the following page(s).

Tested by Cherry Reviewed by Dong Yong min

Approved by Su Hongwei Date Jul. 3, 2018

Su Hongwei
Senior Laboratory Manager

No. R201803424

Test Report

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Conclusion

Tested Sample	According to standard/directive	Result
Submitted Sample	RoHS Directive 2011/65/EU with amendment (EU) 2015/863	Pass

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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.

Test Report

Test Method

Tested Item(s)	Test Method	Measured Equipment(s)
Lead(Pb)	IEC 62321-5:2013	ICP-OES
	Refer to IEC 62321-5:2013	
Cadmium(Cd)	IEC 62321-5:2013	ICP-OES
	Refer to IEC 62321-5:2013	
Mercury(Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
	Refer to IEC 62321-4:2013+AMD1:2017 CSV	
Hexavalent Chromium(Cr(VI))	IEC 62321-7-1:2015	UV-Vis
Fluorine (F)	Refer to EN 14582:2016*	IC
Chlorine (Cl)	Refer to EN 14582:2016*	IC
Bromine (Br)	Refer to EN 14582:2016*	IC
Iodine (I)	Refer to EN 14582:2016*	IC
Perfluorooctanoic Acid (PFOA)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
Perfluorooctane Sulfonates (PFOS)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS

Test Result(s)

Tested Item(s)	**Result**		**MDL**	**Limit**
	001	**002**		
Lead (Pb)	N.D.	46 mg/kg	2 mg/kg	1000 mg/kg
Cadmium (Cd)	N.D.	N.D.	2 mg/kg	100 mg/kg
Mercury (Hg)	N.D.	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium (Cr(VI))	N.D.▼	N.D.▼	0.10 μg/cm² (LOQ)	1000 mg/kg

Tested Item(s)	**Result**	**MDL**
	002	
Fluorine (F)	N.D.	1 μg/cm²
Chlorine (Cl)	N.D.	1 μg/cm²
Bromine (Br)	N.D.	1 μg/cm²
Iodine (I)	N.D.	1 μg/cm²

Test Report

Tested Item(s)	Result	MDL
	002	
Perfluorooctanoic Acid (PFOA)	N.D.	0.5 μg/m²
Perfluorooctane Sulfonates (PFOS)	N.D.	0.5 μg/m²

Tested Sample/Part Description

001 Metal base

002 Silvery plating

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

-MDL = Method Detection Limit

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

-mg/kg = ppm = parts per million

-1000 mg/kg = 0.1%

-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm^2

-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm^2. The coating is considered a non-Cr(VI) based coating.

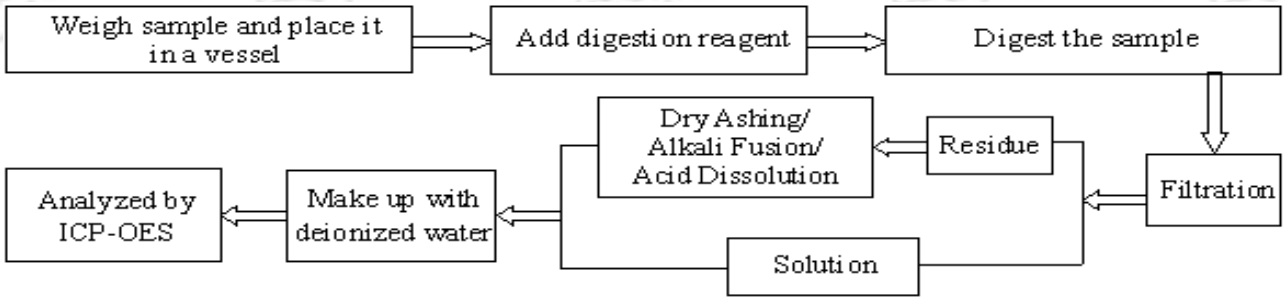
-*=The specified area sample is extracted by an ultrasonic bath in ultra-pure water, and then the extracted liquid is analyzed by IC.

Test Report

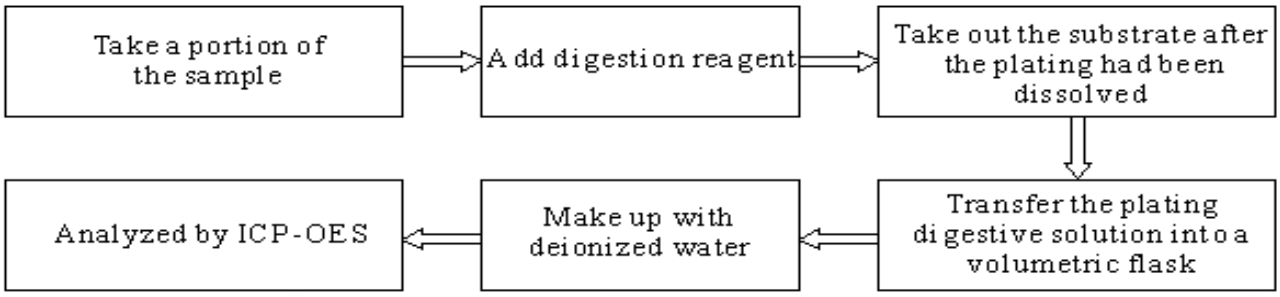
Test Process

1. Lead(Pb),Cadmium(Cd)

(1) IEC 62321-5:2013

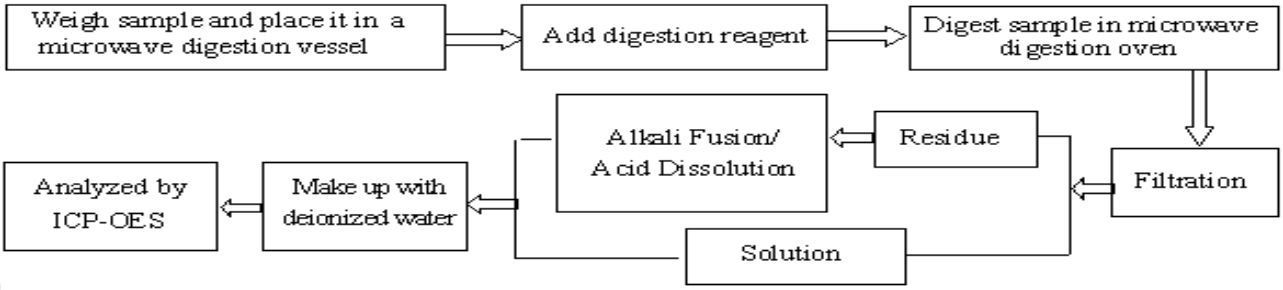


(2) Refer to IEC 62321-5:2013

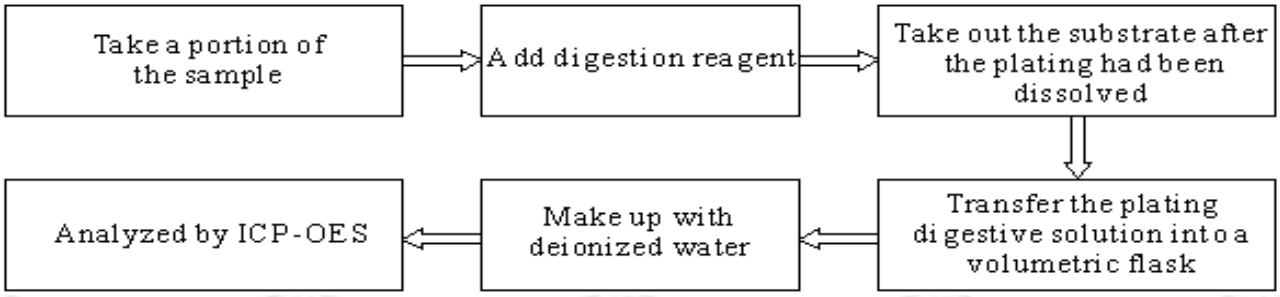


2. Mercury(Hg)

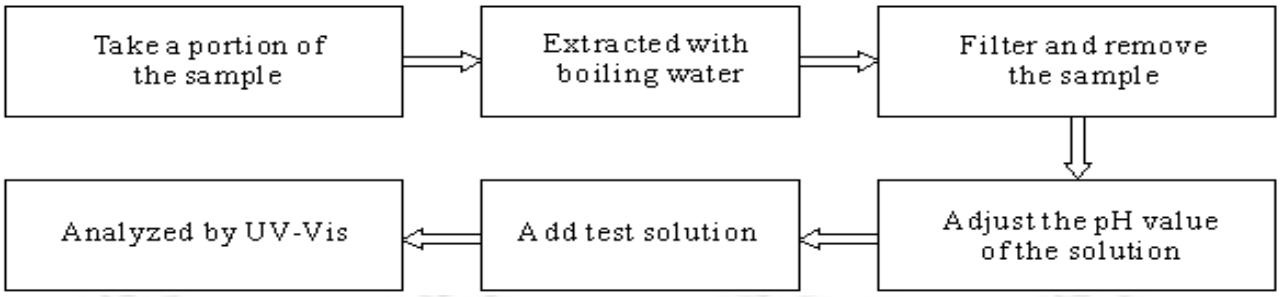
(1) IEC 62321-4:2013+AMD1:2017 CSV



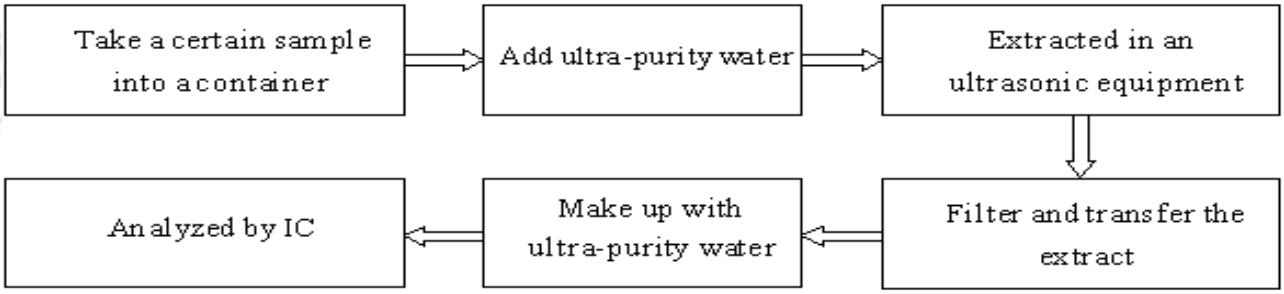
(2) Refer to IEC 62321-4:2013+AMD1:2017 CSV



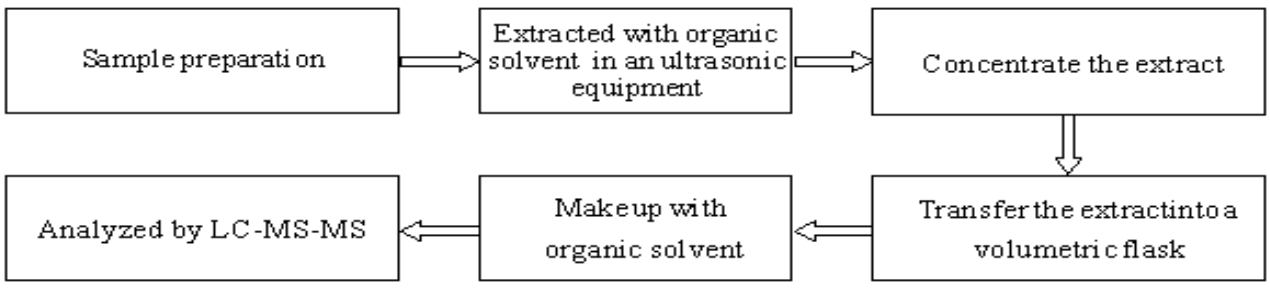
3. Hexavalent Chromium(Cr(VI))



4. Fluorine (F),Chlorine (Cl), Bromine (Br),Iodine (I)

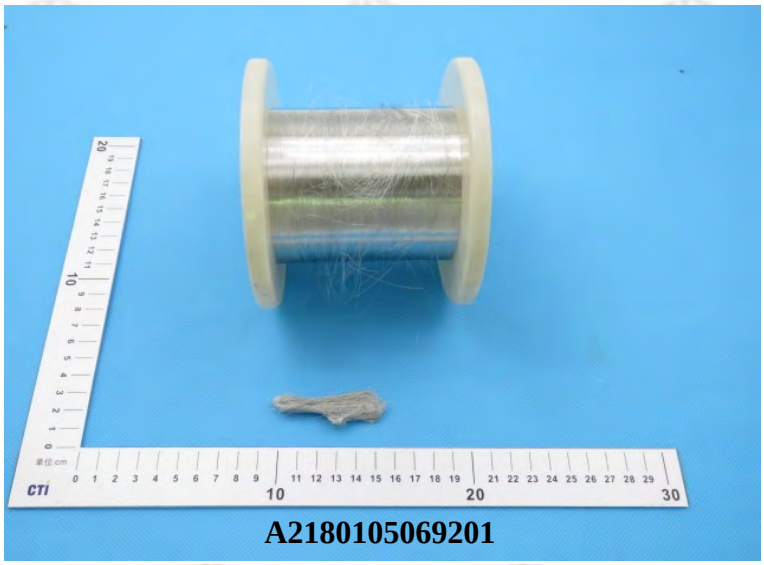


5. Perfluorooctanoic Acid (PFOA),Perfluorooctane Sulfonates (PFOS)



Test Report

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;
5. In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

COLORANT CHROMATICS TRADING(SHANGHAI)CO.,LTD

2F,BLOCK C,VI-HUB@JINQIAO,200 JINSU ROAD,PUDONG,SHANGHAI

The following sample(s) was/were submitted and identified on behalf of the clients as : FEP Colormasterbatch

SGS Job No. :	SP18-006609 - SH
Lot No. :	5763809
Date of Sample Received :	08 Mar 2018
Testing Period :	08 Mar 2018 - 14 Mar 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 Cadmium, Lead, Mercury, 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 (Shanghai) Co., Ltd.

Helen Liu
Approved Signatory

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA18-042268.001	Black solid pellet

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+AMD1:2017, 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	*001*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	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	1000	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

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Test Item(s)	Limit	Unit	MDL	*001*
Pentabromodiphenyl ether	-	mg/kg	5	ND
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
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl 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

(2)On 4 June 2015, Commission Directive (EU) 2015/863 was published in the Official Journal of the European Union (OJEU) to include the phthalates BBP, DBP, DEHP and DIBP into ANNEX II of the Rohs Recast Directive. The new law restricts each phthalate to no more than 0.1% in each homogeneous material of an electrical product.

(3)The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

(4)The restriction of DEHP, BBP, DBP and DIBP shall not apply to cables or spare parts for the repair, the reuse, the updating of functionalities or upgrading of capacity of EEE placed on the market before 22 July 2019, and of medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, placed on the market before 22 July 2021.

(5)The restriction of DEHP, BBP and DBP shall not apply to toys which are already subject to the restriction of DEHP, BBP and DBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

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

Test Item(s)	Unit	MDL	*001*
Fluorine (F)	mg/kg	50	>100000
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND

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Test Item(s)	Unit	MDL	*001*
Iodine (I)	mg/kg	50	ND

Element(s)

Test Method : With reference to ASTM D 4004-06(2012), analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	*001*
Antimony (Sb)	mg/kg	50	ND

Hexabromocyclododecane (HBCDD)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	*001*
Hexabromocyclododecane (HBCDD)	25637-99-4, 3194- 55-6	mg/kg	10	ND

Phthalates Content

Test Method : With reference to EN 14372:2004, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	*001*
Diisononyl Phthalate (DINP)	28553-12-0 /68515-48-0	%	0.01	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 /68515-49-1	%	0.01	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%	0.003	ND

Notes :

(1) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EC) No 552/2009 amending

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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

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

Test Item(s)	Limit	Unit	MDL	001
Perfluorooctanesulfonate (PFOS)^	1000	mg/kg	10	ND
Perfluorooctanoic Acid (PFOA)	-	mg/kg	10	ND

Notes :

(1) Max. limit specified by commission regulation (EU) No. 757/2010 amending regulation (EC) No 850/2004

(2)^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.

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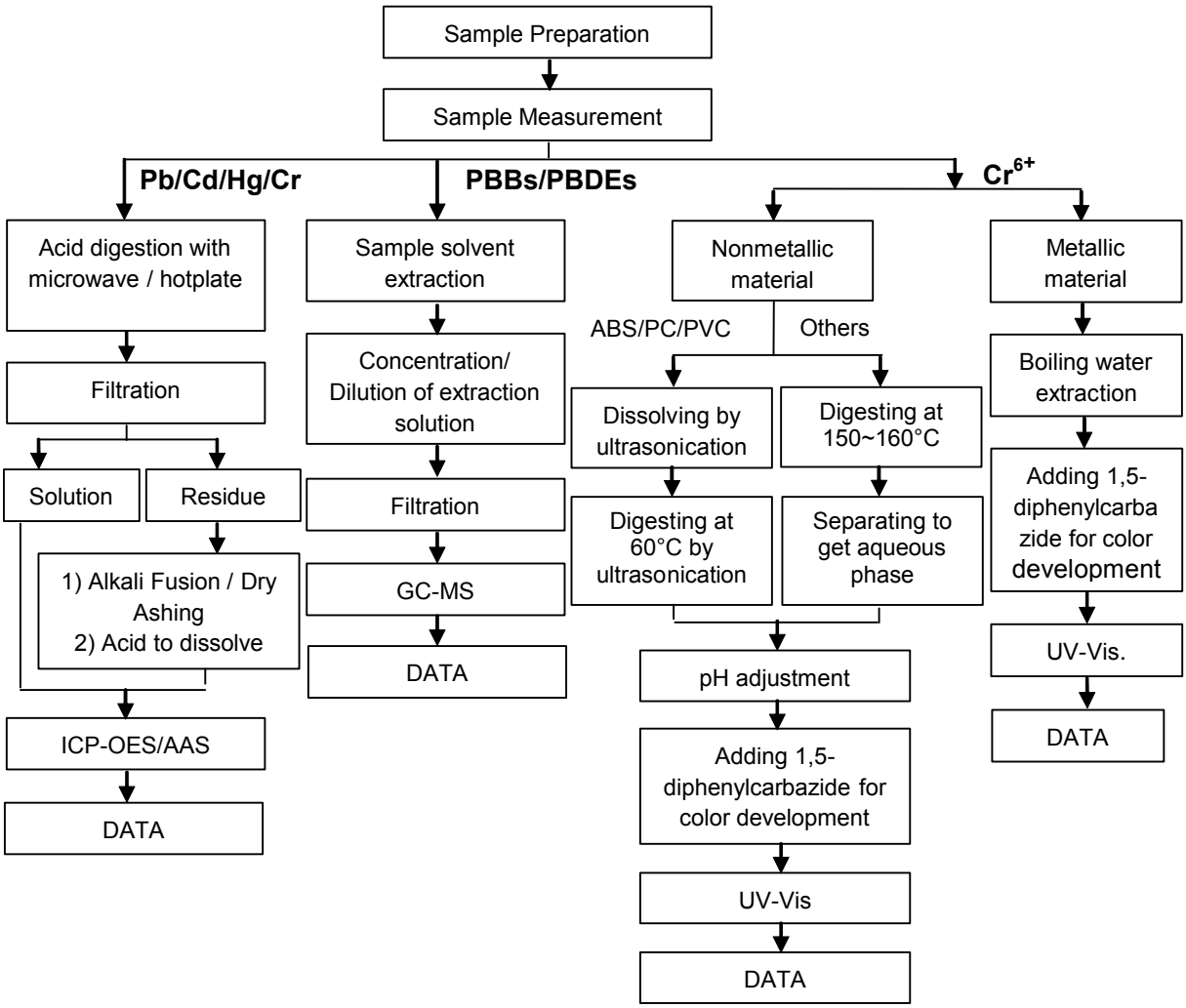
ATTACHMENTS

Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

1) Name of the person who made testing: Meria Jin/Gary Xu/ Xiaolong Yang/Sielina Song
2) Name of the person in charge of testing: Jan Shi/Myra Ma/Luna Xu/Shara Wang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



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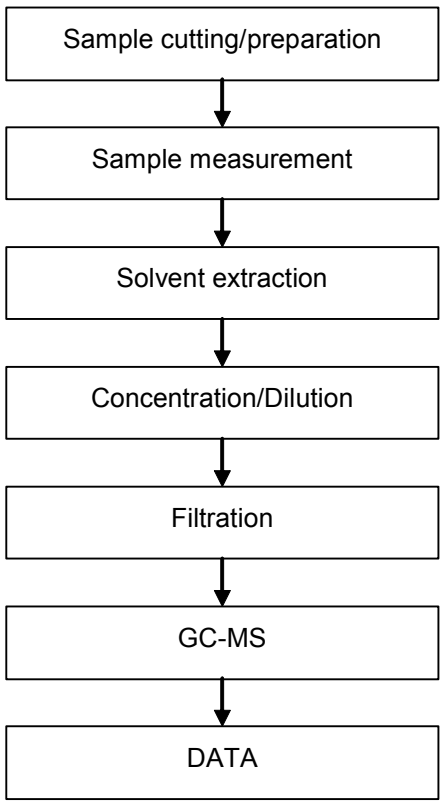
ATTACHMENTS

Phthalates Testing Flow Chart

1) Name of the person who made testing: Sherlock Gao
2) Name of the person in charge of testing: Jessy Huang



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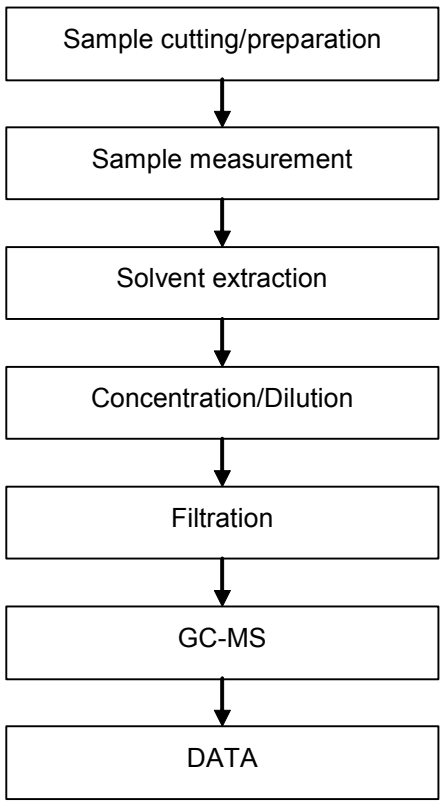
ATTACHMENTS

HBCDD Testing Flow Chart

1) Name of the person who made testing: Gary Xu
2) Name of the person in charge of testing: Myra ma



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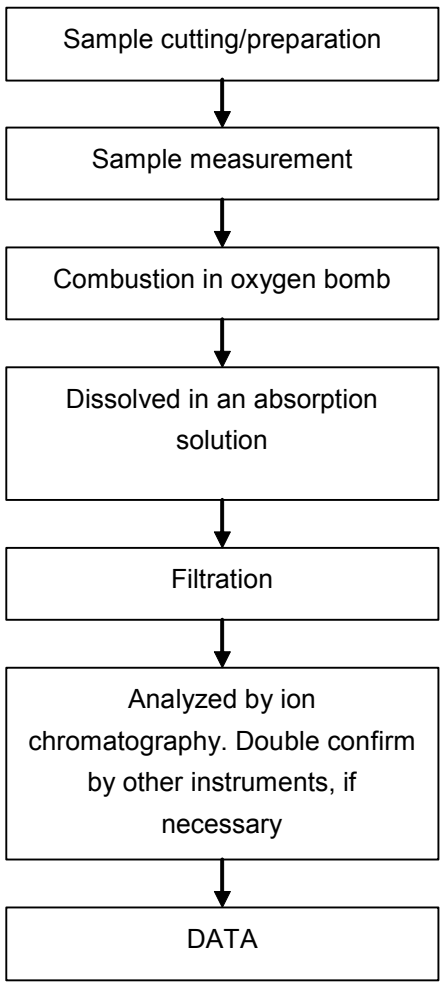
ATTACHMENTS

Halogen Testing (oxygen bomb) Flow Chart

1) Name of the person who made testing: Kevin Xu
2) Name of the person in charge of testing: Sisily Yin



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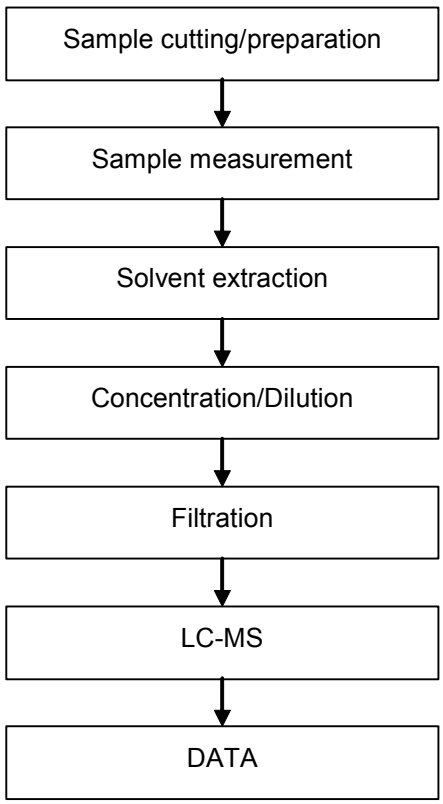
ATTACHMENTS

PFOS/PFOA Testing Flow Chart

1) Name of the person who made testing: Jane Yang
2) Name of the person in charge of testing: Judy Li



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Sample photo:

SHA18-042268.001

SGS authenticate the photo on original report only

*** End of Report ***

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測試報告
Test Report

號碼(No.) : CE/2018/55837　　日期(Date) : 2018/06/04　　

東莞華道電子材料有限公司 / DONGGUAN HUADAO ELECTRONIC MATERIALS CO., LTD.
(昆山永榮化學材料有限公司 / EVERCHEM TECHNOLOGY CO., LTD.)
東莞市大嶺山鎮大塘村興塘大街一號裕豐工業區D棟一樓 / YUFENG INDUSTRIAL XINGTANG STREET DALINGSHAN TOWN DONGGUAN CITY
(江蘇省昆山市開發區前進東路1008-139號 / ROOM 1008-139# QIANJIN EAST ROAD, KUNSHAN CITY)

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):

送樣廠商(Sample Submitted By)	:	東莞華道電子材料有限公司 (DONGGUAN HUADAO ELECTRONIC MATERIALS CO., LTD.)
樣品名稱(Sample Description)	:	ORGANIC SOLDERABILITY PRESERVATIVES (銅有機保護劑)
樣品型號(Style/Item No.)	:	Cucoat HT II
收件日期(Sample Receiving Date)	:	2018/05/28
測試期間(Testing Period)	:	2018/05/28 TO 2018/06/04

==========

測試需求(Test Requested):

(1) 依據客戶指定，參考RoHS 2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP. (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).)

(2) 其他測試項目請見下一頁 . (Please refer to next pages for the other item(s).)

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

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

測試報告
Test Report

東莞華道電子材料有限公司 / DONGGUAN HUADAO ELECTRONIC MATERIALS CO., LTD.
(昆山永榮化學材料有限公司 / EVERCHEM TECHNOLOGY CO., LTD.)
東莞市大嶺山鎮大塘村興塘大街一號裕豐工業區D棟一樓 / YUFENG INDUSTRIAL XINGTANG STREET DALINGSHAN TOWN DONGGUAN CITY
(江蘇省昆山市開發區前進東路1008-139號 / ROOM 1008-139# QIANJIN EAST ROAD, KUNSHAN CITY)

測試結果(Test Results)

測試部位(PART NAME)No.1 : 透明液體 (TRANSPARENT LIQUID)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI) (◆)	mg/kg	參考IEC 62321-7-2 (2017)，以UV-VIS檢測；參考IEC 62321-5 (2013)，以ICP-AES檢測. / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS. ；With reference to IEC 62321-5 (2013) and performed by ICP-AES.	8	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)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n.d.

測試報告
Test Report

號碼(No.) : CE/2018/55837　　日期(Date) : 2018/06/04　　

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6 (2015)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
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.
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.

測試報告
Test Report

號碼(No.) : CE/2018/55837　　日期(Date) : 2018/06/04　　頁數(Page): 4 of 11

東莞華道電子材料有限公司 / DONGGUAN HUADAO ELECTRONIC MATERIALS CO., LTD.
(昆山永榮化學材料有限公司 / EVERCHEM TECHNOLOGY CO., LTD.)
東莞市大嶺山鎮大塘村興塘大街一號裕豐工業區D棟一樓 / YUFENG INDUSTRIAL XINGTANG STREET DALINGSHAN TOWN DONGGUAN CITY
(江蘇省昆山市開發區前進東路1008-139號 / ROOM 1008-139# QIANJIN EAST ROAD, KUNSHAN CITY)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result)
				No.1
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di-(2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	參考IEC 62321-8 (2017)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	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.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	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.
鄰苯二甲酸二環己酯 / DCHP (Di-cyclohexyl phthalate) (CAS No.: 84-61-7)	mg/kg		50	n.d.

測試報告
Test Report

號碼(No.) : CE/2018/55837　　日期(Date) : 2018/06/04　　頁數(Page): 5 of 11

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
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	n.d.
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.

備註(Note):

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. (◆):
   若鉻含量小於六價鉻之方法偵測極限值，則六價鉻為n.d.，不須再測試六價鉻。
   The result of Cr(VI) is "n.d." as the result of Chromium (Cr) is less than the MDL of Cr(VI), and confirmation test of Cr(VI) is not required.
   若鉻含量未小於六價鉻之方法偵測極限值，需進行六價鉻測試。
   If the Chromium (Cr) content is not less than the MDL of Cr(VI), confirmation test of Cr(VI) is required.

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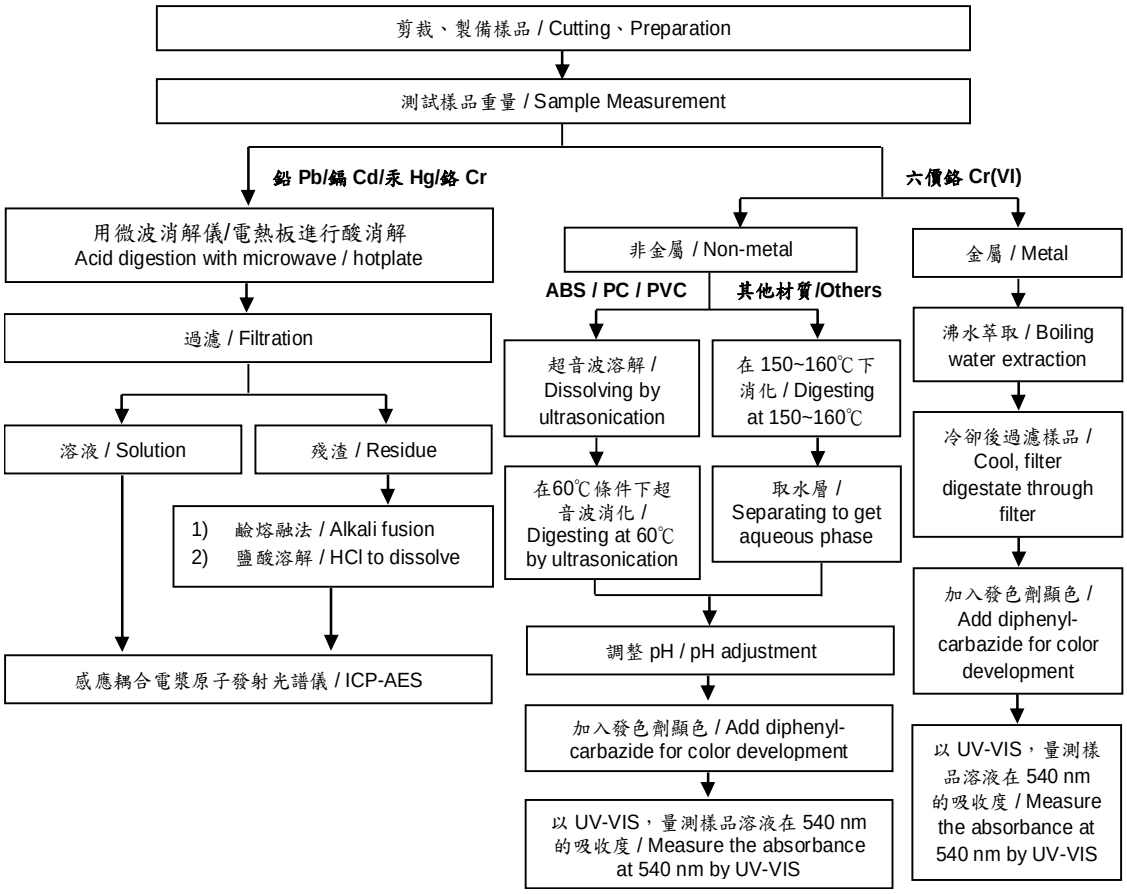
重金屬流程圖 / Analytical flow chart of Heavy Metal

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.（Cr^{6+} test method excluded）

- 測試人員：陳恩臻 / Technician : Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang



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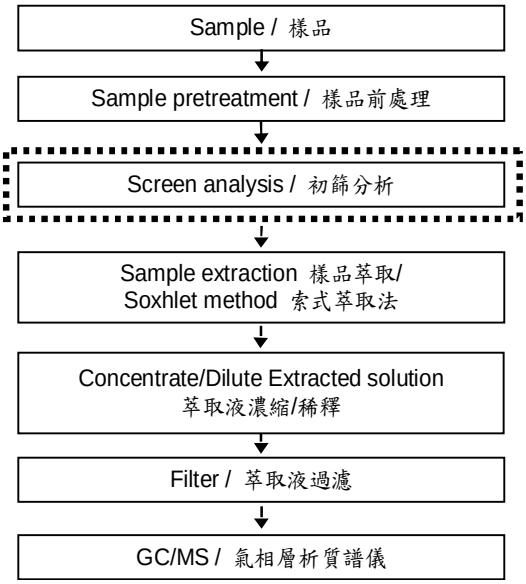
多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

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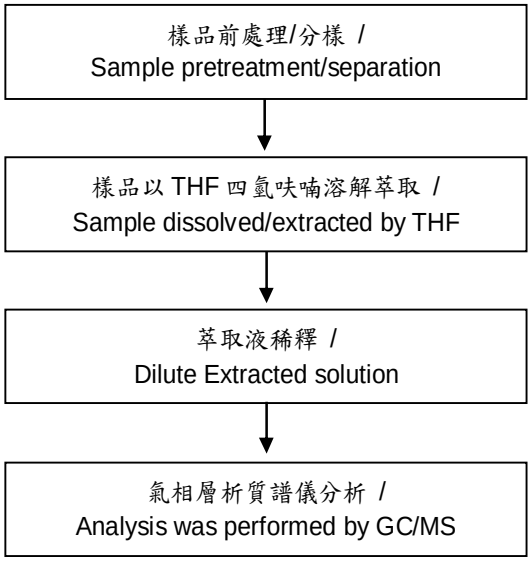
可塑劑分析流程圖 / Analytical flow chart - Phthalate

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

【測試方法/Test method: IEC 62321-8】



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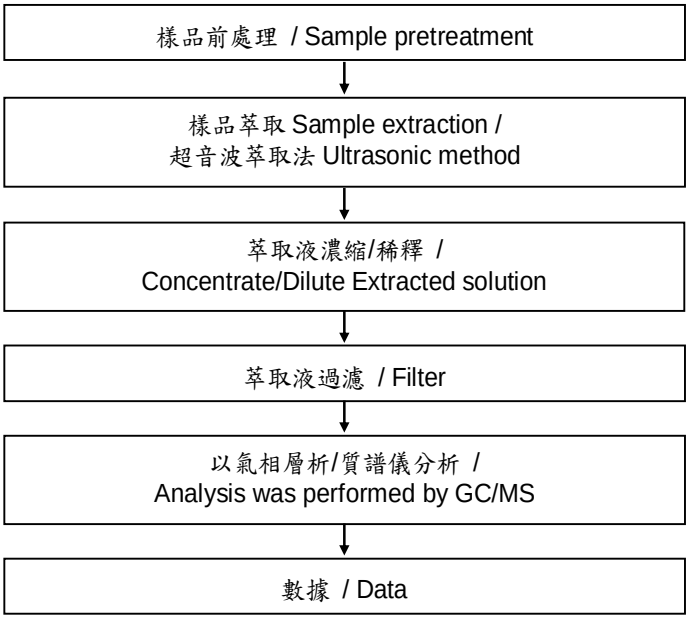
六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang



測試報告
Test Report

東莞華道電子材料有限公司 / DONGGUAN HUADAO ELECTRONIC MATERIALS CO., LTD.
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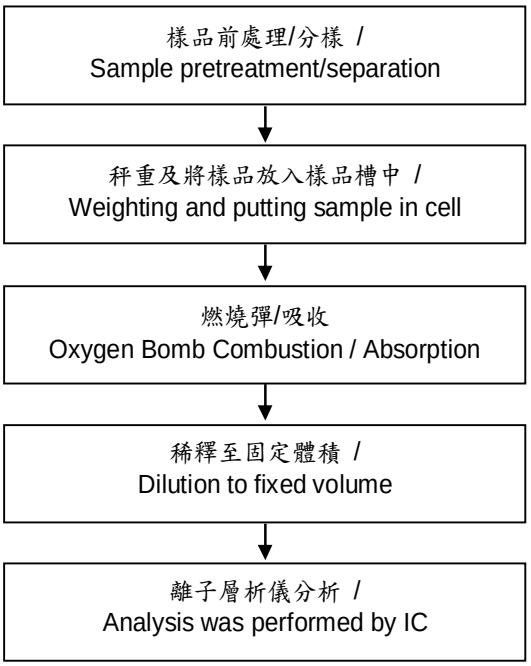
鹵素分析流程圖 / Analytical flow chart - Halogen

- 測試人員：陳恩臻 / Technician: Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang



測試報告
Test Report

號碼(No.) : CE/2018/55837　　日期(Date) : 2018/06/04　　

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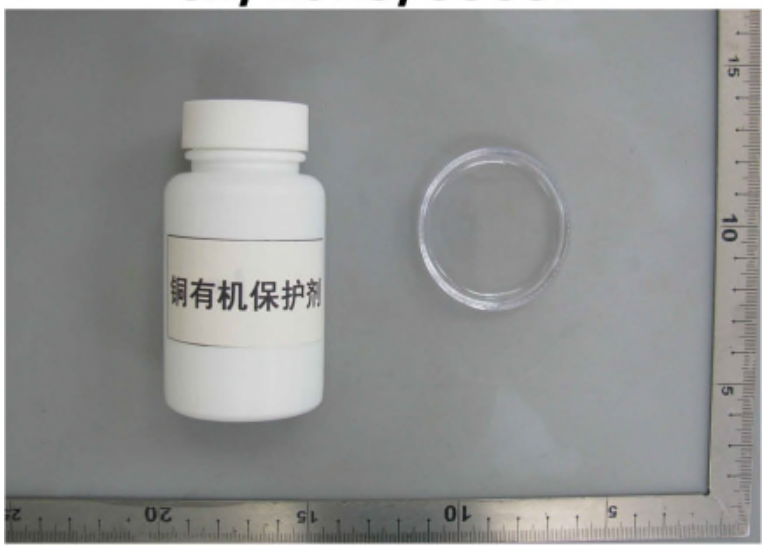
＊ 照片中如有箭頭標示，則表示為實際檢測之樣品/部位. ＊
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2018/55837



** 報告結尾 (End of Report) **

CTI 华测检测 CENTRE TESTING INTERNATIONAL

CMA 150900341277

检测报告
Test Report

报告编号 A2180078646401001E
Report No. A2180078646401001E

申请单位 新东方油墨有限公司
Applicant NEWEAST PRINTING INK CO.,LTD
地 址 浙江桐乡市梧桐街道崇福大道2320号
Address 2320 CHONGFU AVENUE,TONGXIANG CITY,ZHEJIANG

以下测试之样品及样品信息由申请者提供并确认
The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

样品名称	油墨
Sample Name	Ink
样品型号	NS-411/W
Part No.	NS-411/W
客户参考信息	NS-411/（502）/W/W2/WM/GY/（NSR-9000M1F/W（NS-411））/W1（NS-411）/W2（NS-411）/W3（NS-411）/W6（NS-411）/G（NS-411）+HD70（HF）/NSR-9000H1/NSR-9000H1F
Client Reference Information	NS-411/（502）/W/W2/WM/GY/（NSR-9000M1F/W（NS-411））/W1（NS-411）/W2（NS-411）/W3（NS-411）/W6（NS-411）/G（NS-411）+HD70（HF）/NSR-9000H1/NSR-9000H1F
样品颜色	白色
Color	白色
样品接收日期	2018.05.24
Sample Received Date	May 24, 2018
样品检测日期	2018.05.24-2018.05.28
Testing Period	May 24, 2018 to May 28, 2018

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。

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).

检测依据/检测结果 请参见下页。
Test Method/Test Result(s) Please refer to the following page(s).

主 检 Tested by 李正苏
批 准 Approved by 苏红伟
苏红伟
实验室高级经理 Senior Laboratory Manager

审 核 Reviewed by 董拥民
日 期 Date 2018.05.28

检验检测专用章 CENTRE TESTING INTERNATIONAL PINBIAO(SHANGHAI) CO., LTD.

No. R270335619

检验检测品标检测技术有限公司
Centre Testing International Pinbiao(Shanghai) Co., Ltd.
上海市浦东新区新金桥路 1996 号
No.1996, Xinjinqiao Road, Pudong New District,Shanghai,China

检测报告
Test Report

检测依据 Test Method

测试项目 Test Item(s)	测试方法 Test Method	测试仪器 Measured Equipment(s)
铅 Lead(Pb)	IEC 62321-5:2013	ICP-OES
镉 Cadmium(Cd)	IEC 62321-5:2013	ICP-OES
汞 Mercury(Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
六价铬 Hexavalent Chromium(Cr(VI))	IEC 62321-7-2:2017和/或IEC 62321-5:2013 测试总铬含量 IEC 62321-7-2:2017 and/or determination of Total Chromium by IEC 62321-5:2013	UV-Vis/ICP-OES
多溴联苯 Polybrominated Biphenyls(PBBs)	IEC 62321-6:2015	GC-MS
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
邻苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS

检测报告
Test Report

检测结果 Test Result(s)

测试项目 Tested Item(s)	结果 Result	方法检出限 MDL
铅 Lead(Pb)	N.D.	2 mg/kg
镉 Cadmium(Cd)	N.D.	2 mg/kg
汞 Mercury(Hg)	N.D.	2 mg/kg
六价铬 Hexavalent Chromium(Cr(VI))	N.D.	8 mg/kg

测试项目 Tested Item(s)	结果 Result	方法检出限 MDL
多溴联苯 Polybrominated Biphenyls(PBBs)		
一溴联苯 Monobromobiphenyl	N.D.	5 mg/kg
二溴联苯 Dibromobiphenyl	N.D.	5 mg/kg
三溴联苯 Tribromobiphenyl	N.D.	5 mg/kg
四溴联苯 Tetrabromobiphenyl	N.D.	5 mg/kg
五溴联苯 Pentabromobiphenyl	N.D.	5 mg/kg
六溴联苯 Hexabromobiphenyl	N.D.	5 mg/kg
七溴联苯 Heptabromobiphenyl	N.D.	5 mg/kg
八溴联苯 Octabromobiphenyl	N.D.	5 mg/kg
九溴联苯 Nonabromobiphenyl	N.D.	5 mg/kg
十溴联苯 Decabromobiphenyl	N.D.	5 mg/kg

测试项目 Tested Item(s)	结果 Result	方法检出限 MDL
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)		
一溴二苯醚 Monobromodiphenyl ether	N.D.	5 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.	5 mg/kg
三溴二苯醚 Tribromodiphenyl ether	N.D.	5 mg/kg
四溴二苯醚 Tetrabromodiphenyl ether	N.D.	5 mg/kg
五溴二苯醚 Pentabromodiphenyl ether	N.D.	5 mg/kg
六溴二苯醚 Hexabromodiphenyl ether	N.D.	5 mg/kg
七溴二苯醚 Heptabromodiphenyl ether	N.D.	5 mg/kg
八溴二苯醚 Octabromodiphenyl ether	N.D.	5 mg/kg
九溴二苯醚 Nonabromodiphenyl ether	N.D.	5 mg/kg
十溴二苯醚 Decabromodiphenyl ether	N.D.	5 mg/kg

检测报告
Test Report

检测结果 Test Result(s)

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

测试样品/部位描述 白色油墨
Tested Sample/Part Description White ink

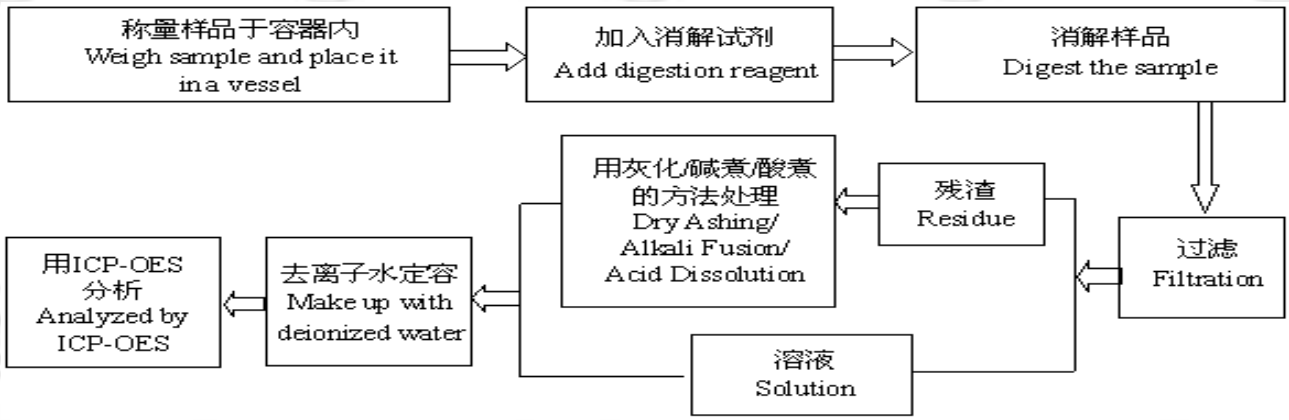
备注: 对于检测铅，镉，汞之样品已完全溶解。
-N.D. = 未检出（小于方法检出限）
-mg/kg = ppm = 百万分之一

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

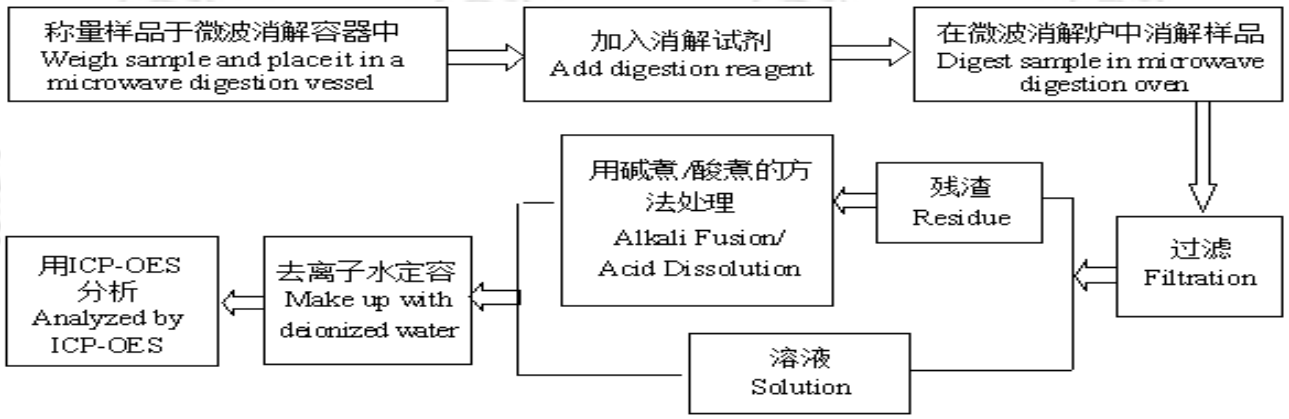
检测报告
Test Report

检测流程 Test Process

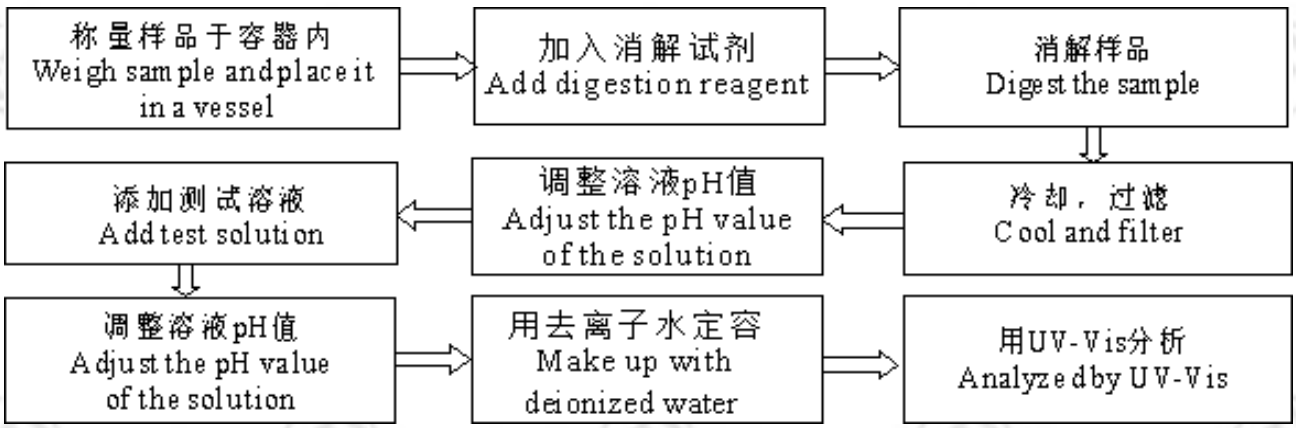
1. 铅(Pb)，镉(Cd)，铬(Cr)
   Lead(Pb), Cadmium(Cd), Chromium(Cr)



2. 汞(Hg)
   Mercury(Hg)

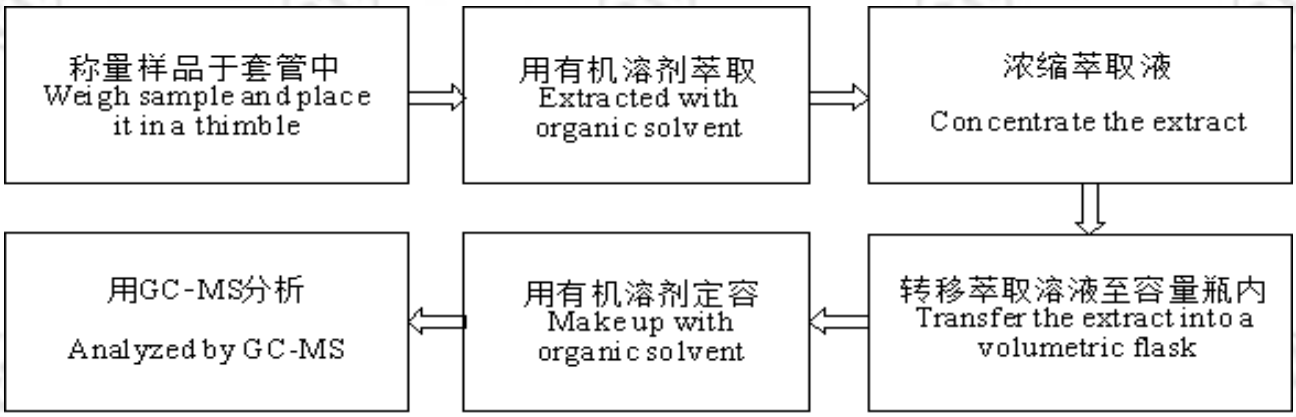


3. 六价铬(Cr(VI))
   Hexavalent Chromium(Cr(VI))



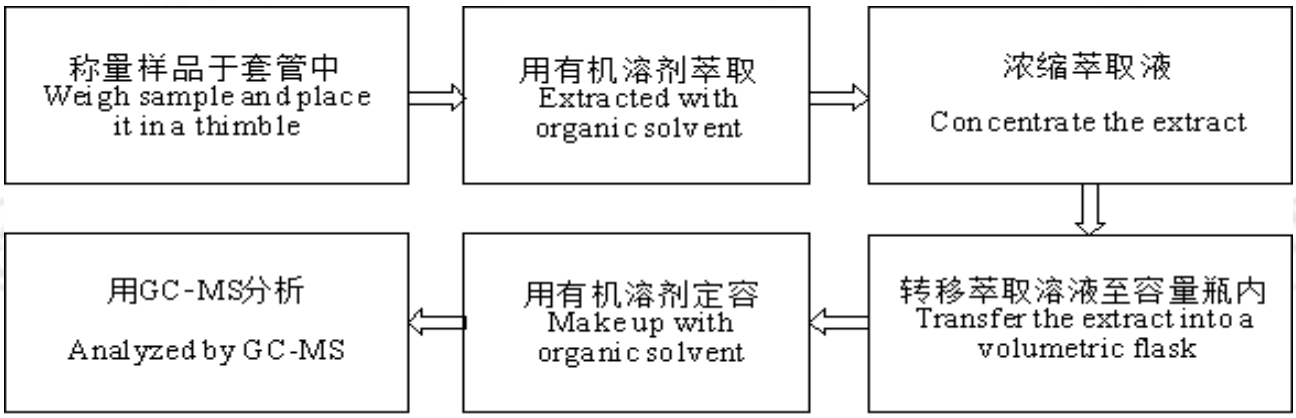
4. 多溴联苯(PBBs)， 多溴二苯醚(PBDEs)

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



5. 邻苯二甲酸酯(DBP， BBP， DEHP， DIBP)

Phthalates (DBP, BBP, DEHP, DIBP)



检测报告
Test Report

样品图片
Photo(s) of the sample(s)

报告结束

*** End of report ***

声明Statement：

1. 检测报告无批准人签字、“专用章”及报告骑缝章无效；
   This report is considered invalidated without approval signature, special seal and the seal on the perforation;
2. 样品及样品信息由申请者提供，申请者应对其真实性负责，CTI未核实其真实性；
   The sample(s) and sample information was/were provided by the client who should be responsible for the autenticity which CTI hasn’t verified;
3. 本报告检测结果仅对送测样品负责；
   The result(s) shown in this report refer(s) only to the sample(s) tested;
4. 未经CTI书面同意，不得部分复制本报告；
   Without written approval of CTI, this report can’t be reproduced except in full;
5. 如检测报告中的英文内容与中文内容有差异，以中文为准。
   In case of any discrepancy between the English version and Chinese version of the testing reports (if genrated), the Chinese version shall prevail.

Test Report

No. SHAEC1827348601 Date: 15 Dec 2018

NANYA NEW MATERIAL TECHNOLOGY CO.,LTD

NO.158 CHANGXIANG ROAD NANXIANG JIADING SHANGHAI P.R.CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : NY3150HF

SGS Job No. :	SP18-040451 - SH
Date of Sample Received :	07 Dec 2018
Testing Period :	07 Dec 2018 - 15 Dec 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 Cadmium, Lead, Mercury, 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 (Shanghai) Co., Ltd.

Dora Hu

Dora Hu
Approved Signatory

3rd Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA18-273486.001	Copper clad board

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+AMD1:2017, 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	*001*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	6
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	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	1000	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

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Test Item(s)	Limit	Unit	MDL	*001*
Pentabromodiphenyl ether	-	mg/kg	5	ND
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
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl 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

(2)On 4 June 2015, Commission Directive (EU) 2015/863 was published in the Official Journal of the European Union (OJEU) to include the phthalates BBP, DBP, DEHP and DIBP into ANNEX II of the Rohs Recast Directive. The new law restricts each phthalate to no more than 0.1% in each homogeneous material of an electrical product.

(3)The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

(4)The restriction of DEHP, BBP, DBP and DIBP shall not apply to cables or spare parts for the repair, the reuse, the updating of functionalities or upgrading of capacity of EEE placed on the market before 22 July 2019, and of medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, placed on the market before 22 July 2021.

(5)The restriction of DEHP, BBP and DBP shall not apply to toys which are already subject to the restriction of DEHP, BBP and DBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

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

Test Item(s)	Unit	MDL	*001*
Fluorine (F)	mg/kg	50	220
Chlorine (Cl)	mg/kg	50	141
Bromine (Br)	mg/kg	50	ND

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Test Item(s)	Unit	MDL	*001*
Iodine (I)	mg/kg	50	ND

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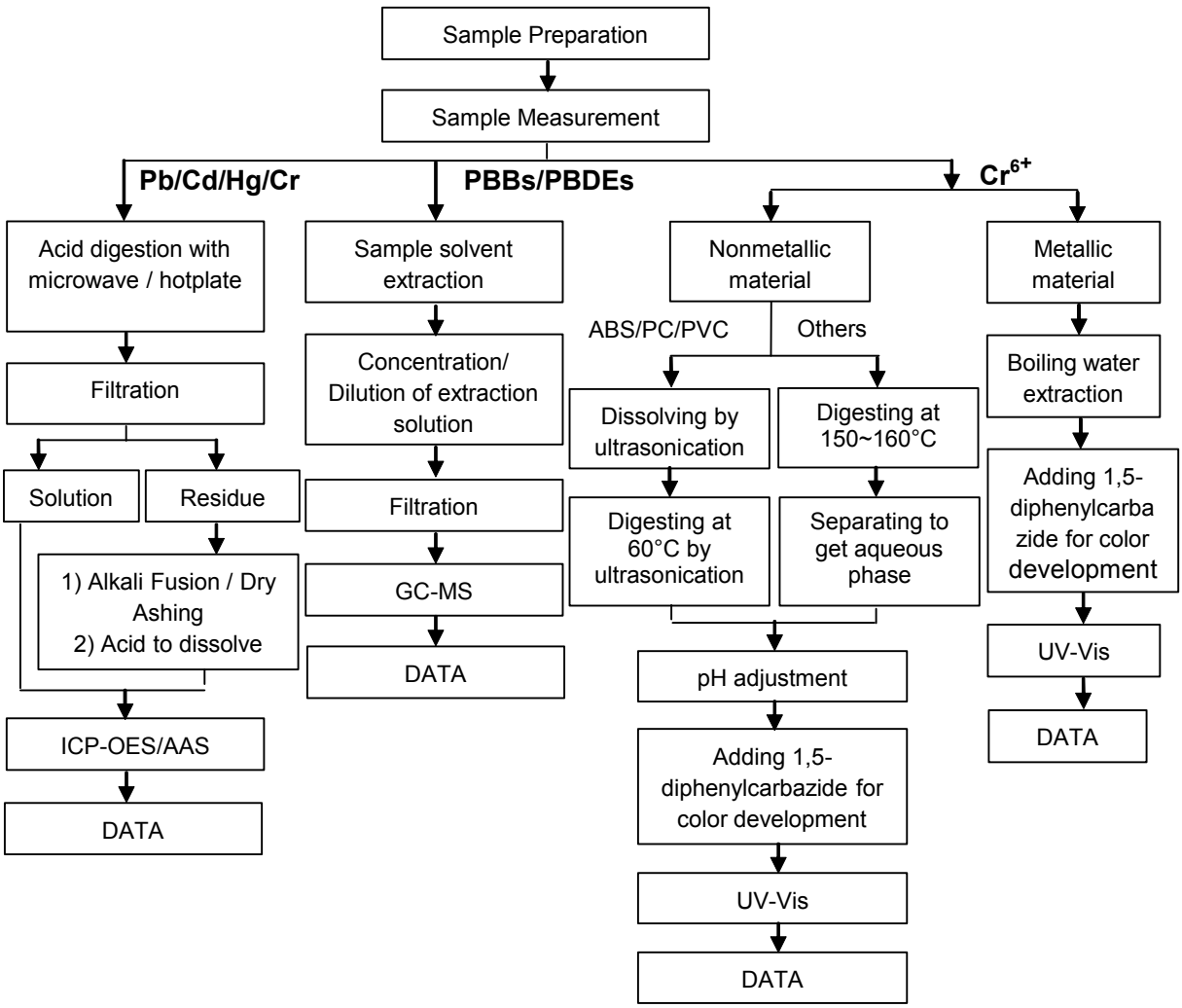
ATTACHMENTS

Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



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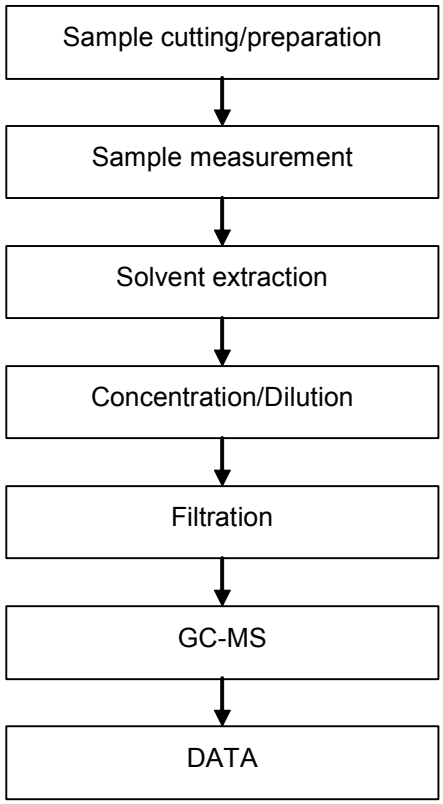
ATTACHMENTS

Phthalates Testing Flow Chart



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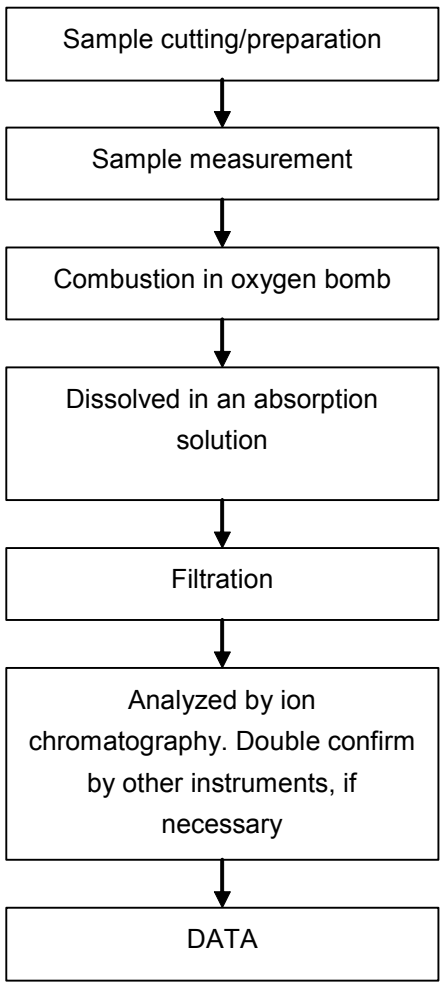
ATTACHMENTS

Halogen Testing (oxygen bomb) Flow Chart



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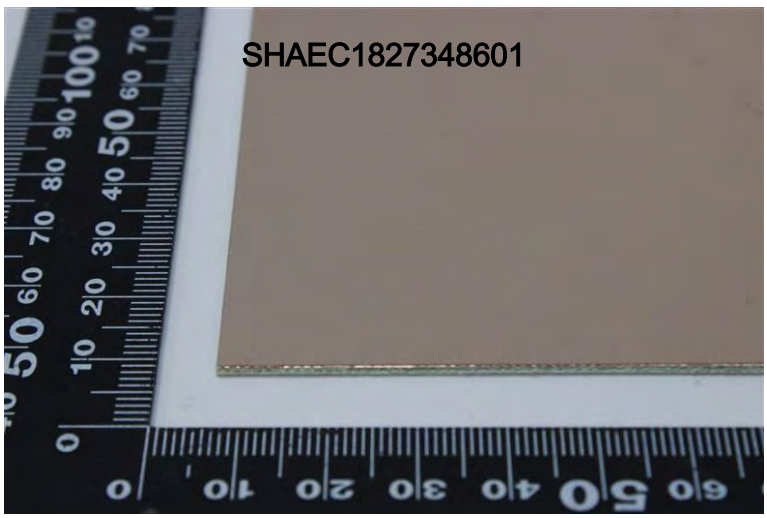
Sample photo:



SHA18-273486.001

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No. : CE/2018/24608 Date : 2018/02/27

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By	:	DAI-ICHI SEIKO CO., LTD.
Sample Description	:	PLATING(1568-0003)
Style/Item No.	:	PLATING14(Au/Ni)
Sample Receiving Date	:	2018/02/21
Testing Period	:	2018/02/21 TO 2018/02/27

==========

Test Requested : (1) As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI) contents in the submitted sample(s).

(2) As specified by client, to test PFOS contents in the submitted sample.

Test Result(s) : Please refer to following pages.

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

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

Test Result(s)

PART NAME No.1 : PLATING LAYER OF GOLDEN COLORED METAL

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	20.6
Mercury (Hg)	mg/kg	IEC 62321-4 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)(#2)	μg/cm²	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	μg/m²	With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	1	n.d.

Note：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

PFOS Reference Information : POPs - (EU) 757/2010

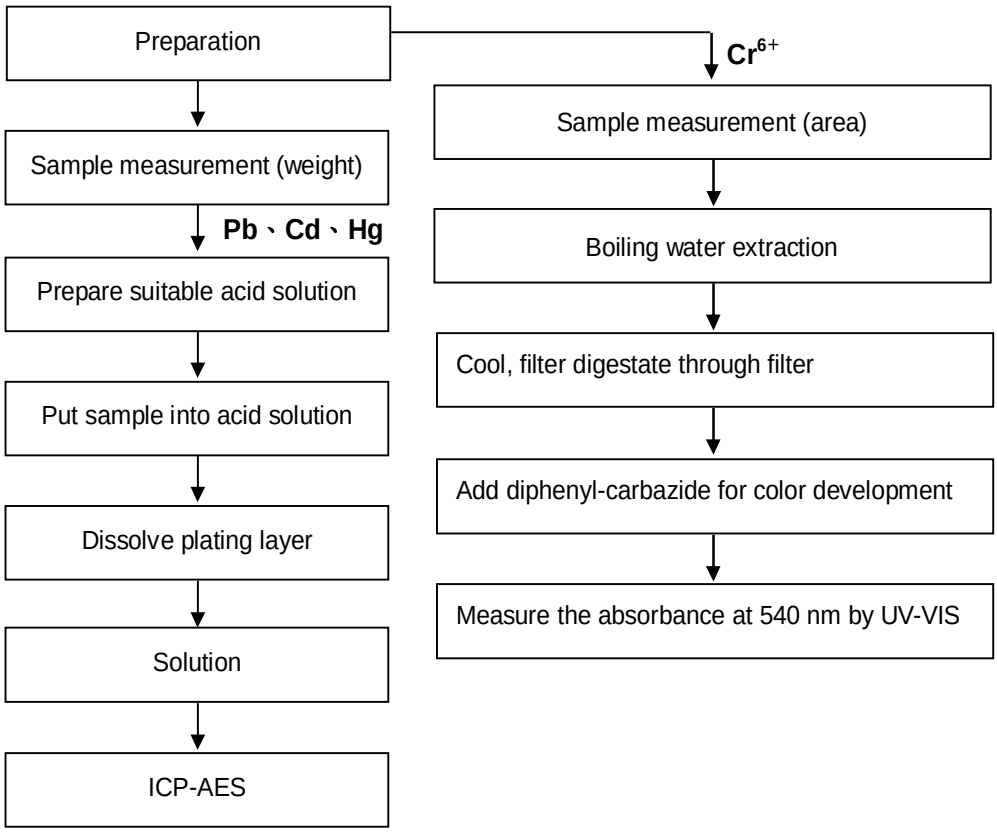
Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

- Technician: JR Wang
- Supervisor: Troy Chang

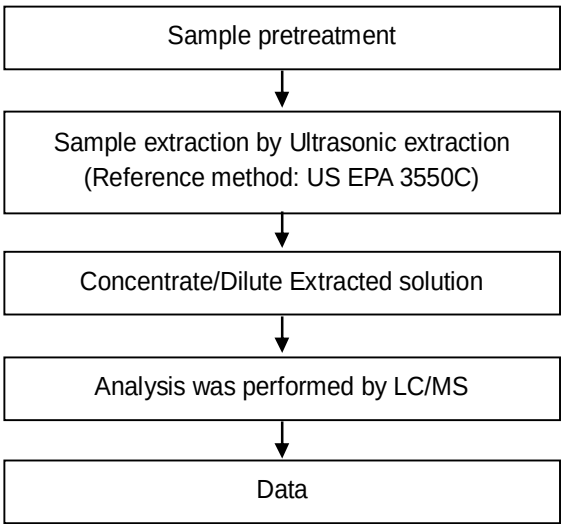
Flow Chart of Stripping method for metal analysis



DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

Analytical flow chart - PFOS

- Technician: Yaling Tu
- Supervisor: Troy Chang



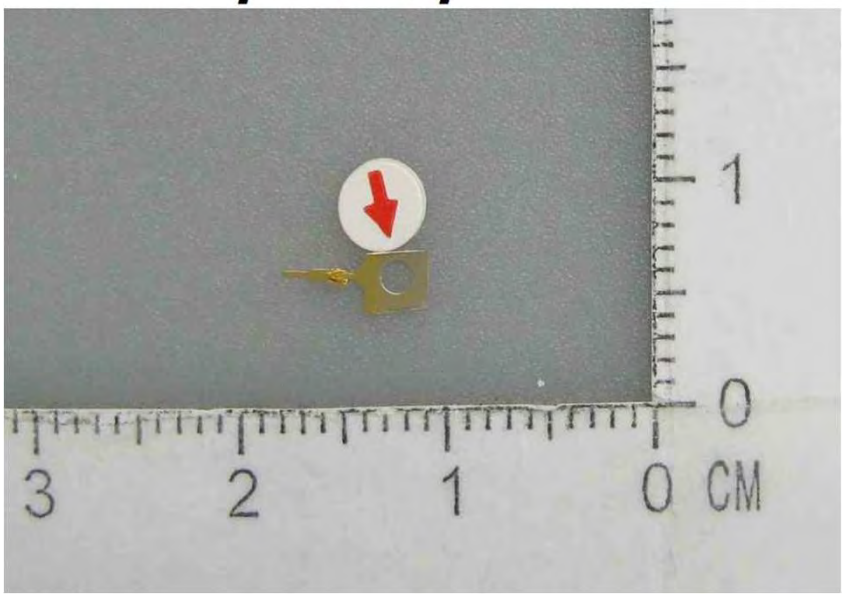
Test Report

No. : CE/2018/24608 Date : 2018/02/27

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

CE/2018/24608



** End of Report **

Test Report

No.: CE/2018/20648 Date: 2018/02/08

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R.O.C.

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By	:	DAI-ICHI SEIKO CO., LTD.
Sample Description	:	METAL (2893-002)
Style/Item No.	:	C5210R
Sample Receiving Date	:	2018/02/02
Testing Period	:	2018/02/02 TO 2018/02/08

Test Requested : As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI) contents in the submitted sample(s).

Test Method : Please refer to following pages.

Test Result(s) : Please refer to following pages.

JR Wang / Asst. Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

Test Report

No.: CE/2018/20648 Date: 2018/02/08

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD., JUNG-HE CITY, TAIPEI 235, TAIWAN, R.O.C.

Test Result(s)

PART NAME No.1 : COPPER COLORED METAL

Test Item(s)	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	15.2
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)(#2)	$\mu g/cm^2$	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.

Note:

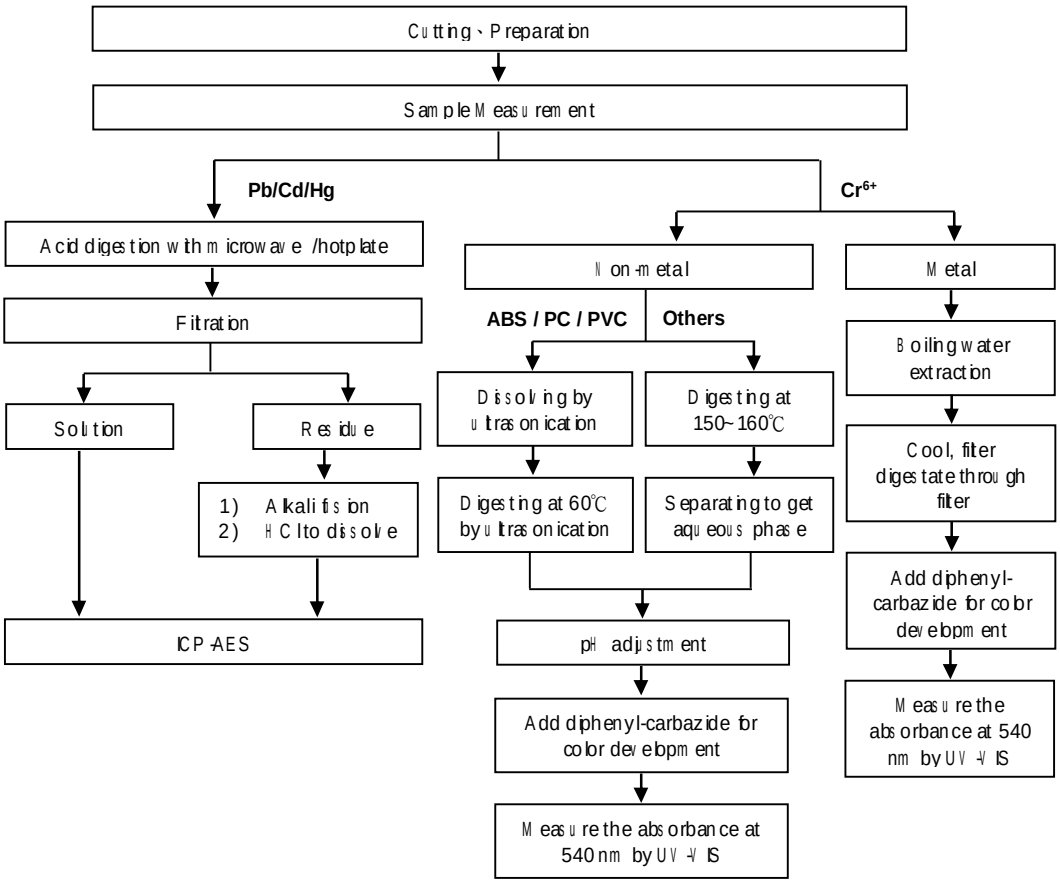
1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. (#2):
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 $\mu g/cm^2$. The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 $\mu g/cm^2$). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 $\mu g/cm^2$ and 0.13 $\mu g/cm^2$ is considered to be inconclusive - unavoidable coating variations may influence the determination.

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD., JUNG-HE CITY, TAIPEI 235, TAIWAN, R.O.C.

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)

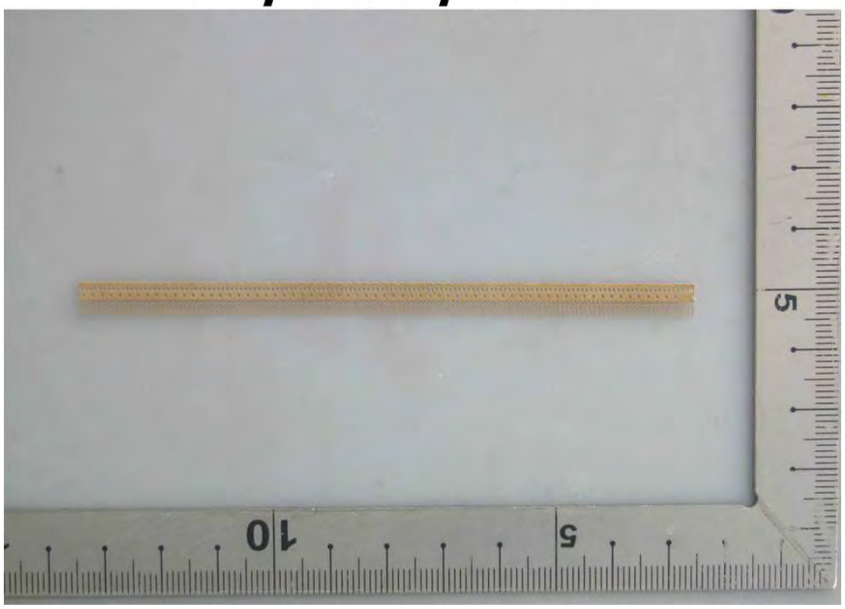
- Technician: JR Wang
- Supervisor: Troy Chang



DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD., JUNG-HE CITY, TAIPEI 235, TAIWAN, R.O.C.

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

CE/2018/20648



** End of Report **

Test Report

No.: CE/2018/20647 Date: 2018/02/08

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R.O.C.

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By	:	DAI-ICHI SEIKO CO., LTD.
Sample Description	:	METAL (2927-0001)
Style/Item No.	:	C5191R
Sample Receiving Date	:	2018/02/02
Testing Period	:	2018/02/02 TO 2018/02/08

Test Requested	:	As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI) contents in the submitted sample(s).
Test Method	:	Please refer to following pages.
Test Result(s)	:	Please refer to following pages.

JR Wang / Asst. Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

Test Report

No.:CE/2018/20647 Date:2018/02/08

DAI-ICHI SEIKO CO.,LTD.
7F-5,NO.700,JUNG-JENG RD.,JUNG-HE CITY,TAIPEI 235,TAIWAN,R.O.C.

Test Result(s)

PART NAME No.1 : COPPER COLORED METAL

Test Item(s)	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	7.34
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)(#2)	$\mu g/cm^2$	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.

Note:

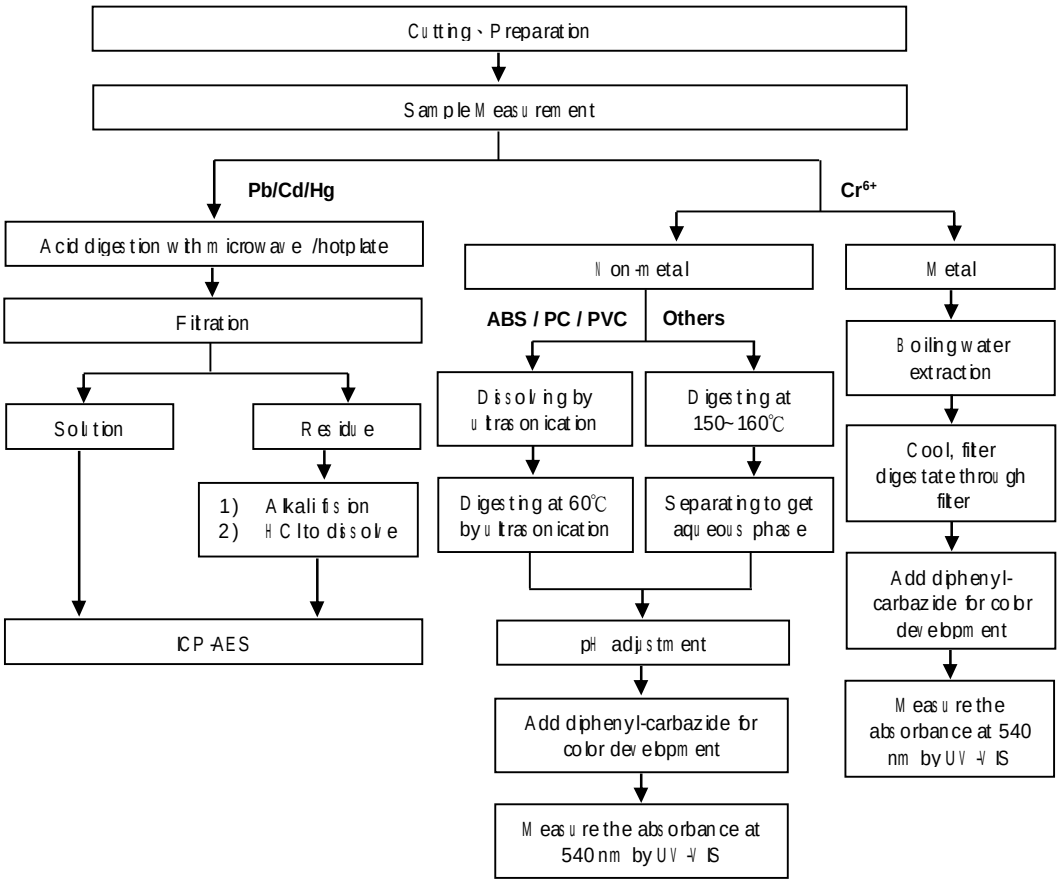
1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. (#2):
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 $\mu g/cm^2$. The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 $\mu g/cm^2$). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 $\mu g/cm^2$ and 0.13 $\mu g/cm^2$ is considered to be inconclusive - unavoidable coating variations may influence the determination.

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD., JUNG-HE CITY, TAIPEI 235, TAIWAN, R.O.C.

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)

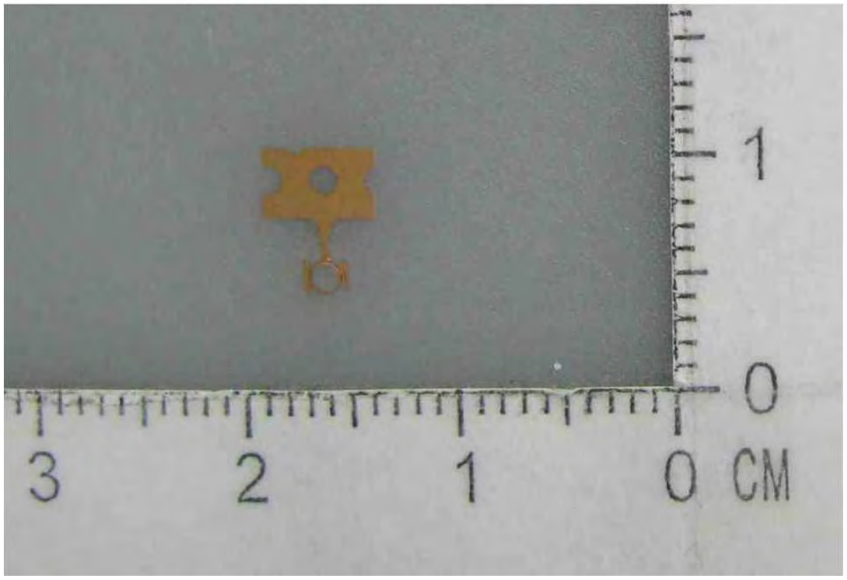
- Technician: JR Wang
- Supervisor: Troy Chang



DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD., JUNG-HE CITY, TAIPEI 235, TAIWAN, R.O.C.

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

CE/2018/20647



** End of Report **

Test Report

No. : CE/2018/31619 Date : 2018/03/12

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By	:	DAI-ICHI SEIKO CO., LTD.
Sample Description	:	PLATING(2578-0001)
Style/Item No.	:	PLATING15 (Au/Ni)
Sample Receiving Date	:	2018/03/06
Testing Period	:	2018/03/06 TO 2018/03/12

==========

Test Requested : (1) As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI) contents in the submitted sample(s).

(2) As specified by client, to test PFOS contents in the submitted sample.

Test Result(s) : Please refer to following pages.

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

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

Test Result(s)

PART NAME No.1 : PLATING LAYER OF SILVER/COPPER COLORED METAL SHEET

Test Item(s)	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	IEC 62321-4 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)(#2)	μg/cm²	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	μg/m²	With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	1	n.d.

Note：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

PFOS Reference Information : POPs - (EU) 757/2010

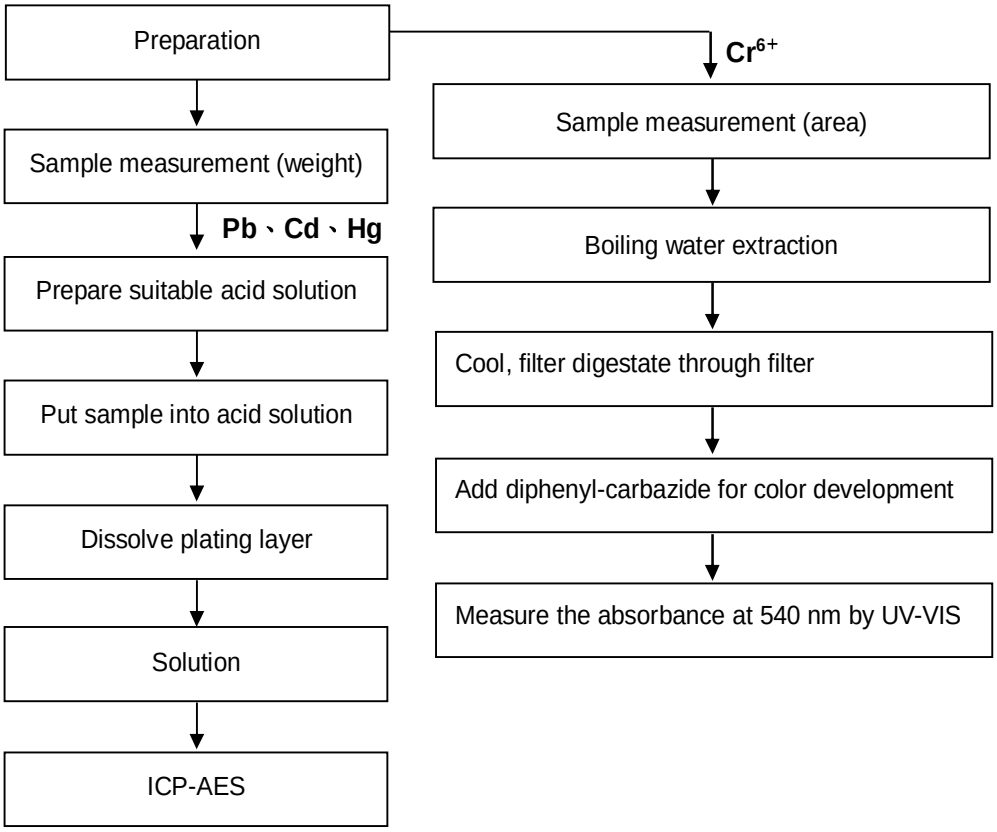
Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

- Technician: JR Wang
- Supervisor: Troy Chang

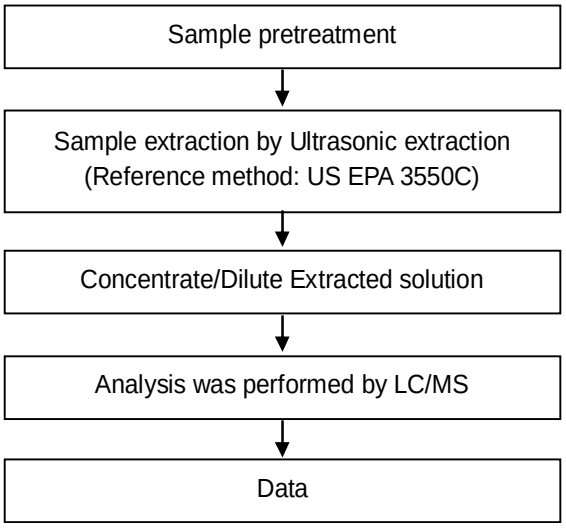
Flow Chart of Stripping method for metal analysis



DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

Analytical flow chart - PFOS

- Technician: Yaling Tu
- Supervisor: Troy Chang



Test Report

No. : CE/2018/31619 Date : 2018/03/12

DAI-ICHI SEIKO CO., LTD.
7F-5, NO. 700, JUNG-JENG RD, JUNG-HE CITY, TAIPEI 235, TAIWAN, R. O. C.

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

** End of Report **

Chemical Laboratory - Kao., SGS Taiwan Ltd.

Test Report

No. : KA/2018/50624 Date : 2018/05/22

POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Description	:	PBT
Style/Item No.	:	310NF ED3002 / Lot No.7374770
Color	:	ED3002
Sample Receiving Date	:	2018/5/10
Testing Period	:	2018/5/10 TO 2018/05/22
Sample Submitted By	:	POLYPLASTICS TAIWAN CO., LTD.

==========

Test Requested :

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample.

(2) Please refer to next page(s).

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

Ray Chang

Ray Chang Ph.D. / Manager - Tech
Signed for and on behalf of
SGS Taiwan Limited

POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Test Result(s)

PART NAME No.1 : ED3002 PBT

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321-7-2:2017 and performed by UV-VIS.	8	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.
Monobromobiphenyl			5	n.d.
Dibromobiphenyl			5	n.d.
Tribromobiphenyl			5	n.d.
Tetrabromobiphenyl			5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl			5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl			5	n.d.
Sum of PBDEs	mg/kg	With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			5	n.d.
Pentabromodiphenyl ether			5	n.d.
Hexabromodiphenyl ether			5	n.d.
Heptabromodiphenyl ether			5	n.d.
Octabromodiphenyl ether			5	n.d.
Nonabromodiphenyl ether			5	n.d.
Decabromodiphenyl ether			5	n.d.

POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Test Item(s)	Unit	Method	MDL	Result
				No.1
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)			50	n.d.
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)			50	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)			50	n.d.
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	930
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)			50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)			50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.

POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Note：

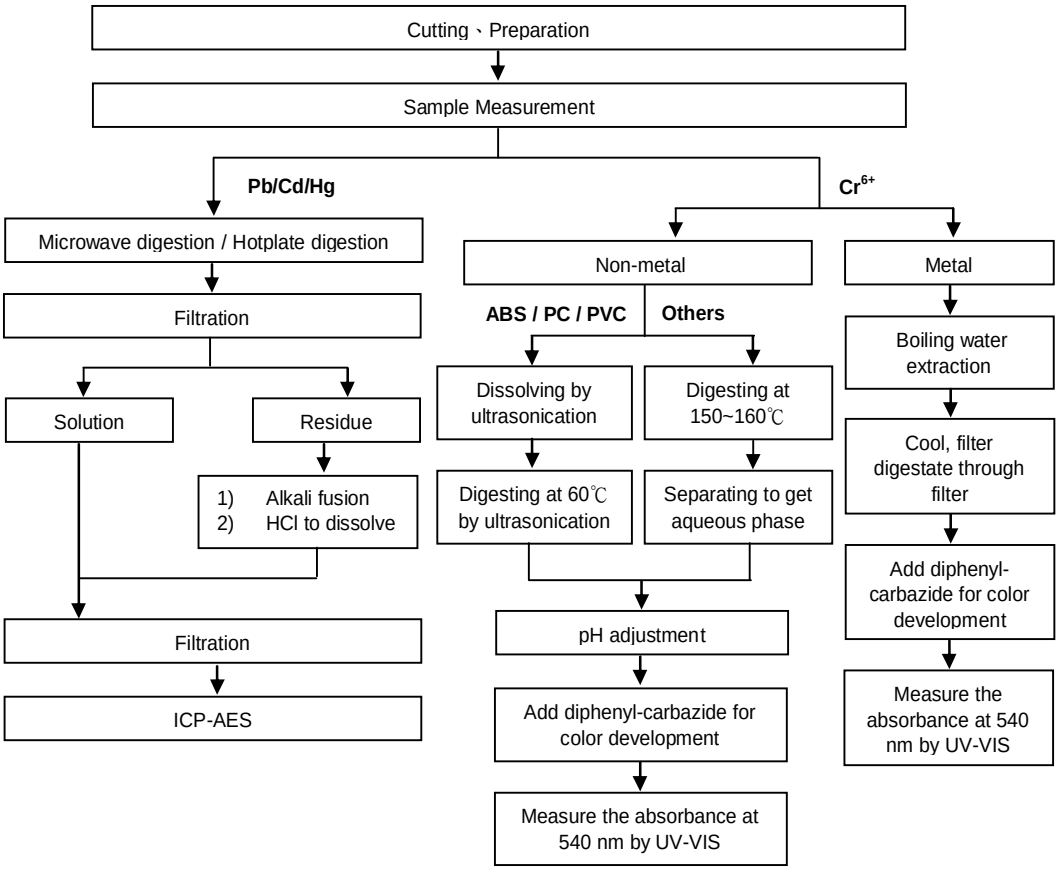
1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated

POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. （Cr^{6+} test method excluded）

- Technician : Jony Liu
- Supervisor: Ray Chang

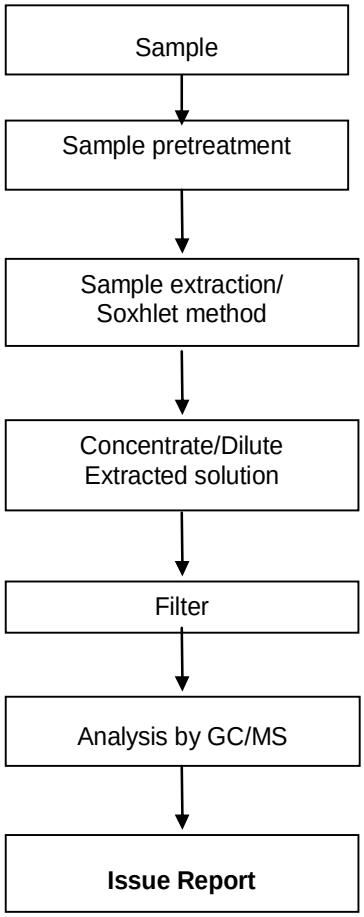


POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

PBB/PBDE analytical FLOW CHART

1) Name of the person who made measurement: Dorothy Chen

2) Name of the person in charge of measurement: Ray Chang

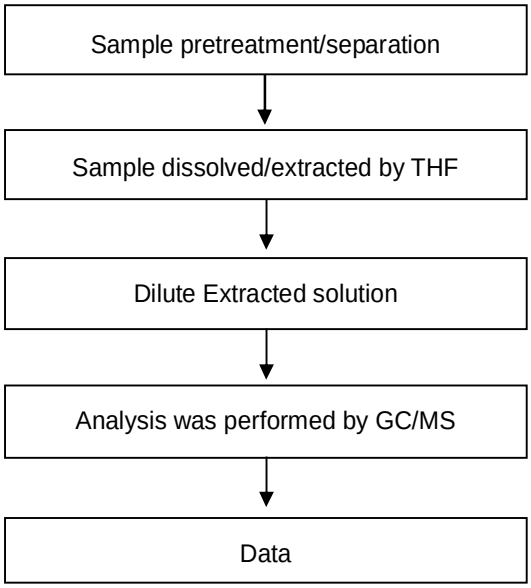


POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Analytical flow chart of phthalate content

- Name of the person who made measurement: Dorothy Chen
- Name of the person in charge of measurement: Ray Chang

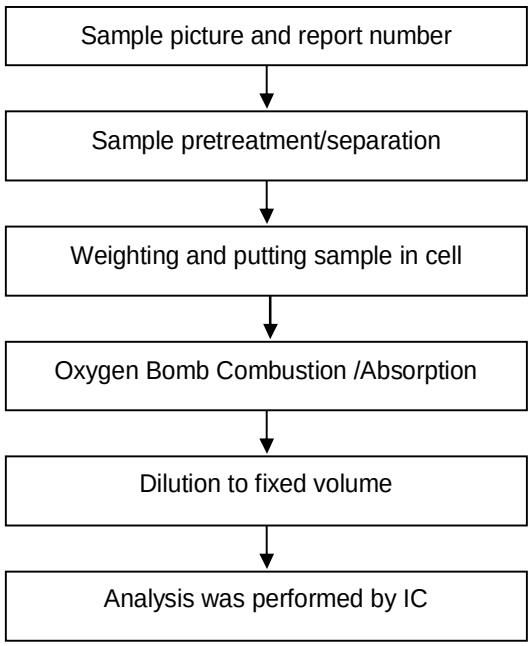
【Test method: IEC 62321-8】



POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

Analytical flow chart of halogen content

1) Name of the person who made measurement: Jean Hung
2) Name of the person in charge of measurement: Ray Chang



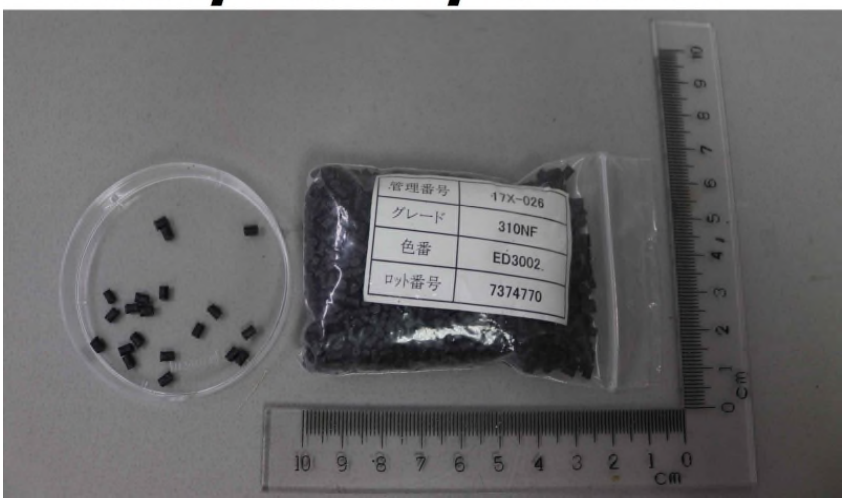
Test Report

No. : KA/2018/50624 Date : 2018/05/22

POLYPLASTICS TAIWAN CO., LTD.
NO. 13, JIANYE RD., DALIAO DIST., KAOHSIUNG CITY 831, TAIWAN (R.O.C.)

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

KA/2018/50624



** End of Report **

检测报告

报告编号 A2180021264102010C

申请单位 深圳市沃尔核材股份有限公司

地　　址 深圳市坪山新区兰景北路沃尔工业园

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	透明无卤环保热缩套管
样品接收日期	2018.03.03
样品检测日期	2018.03.03-2018.03.08
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)，氟(F)，氯(Cl)，溴(Br)，碘(I)进行测试。
检测依据	请参见下页。
检测结果	请参见下页。

主　检 李尉岭　　审　核 尹丹娜

批　准 郑晴涛　　日　期 2018.03.08

郑晴涛
技术经理

检验检测专用章
华测检测认证集团股份有限公司

No. R179751952

深圳市宝安区新安街道留仙三路4号华测检测大楼

检测报告

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 62321-7-2:2017和/或IEC 62321-5:2013 测试总铬含量	UV-Vis/ICP-OES
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
氟(F)	参考EN 14582:2016	IC
氯(Cl)	参考EN 14582:2016	IC
溴(Br)	参考EN 14582:2016	IC
碘(I)	参考EN 14582:2016	IC

检测报告

检测结果

测试项目	结果	方法检出限
铅(Pb)	N.D.	2 mg/kg
镉(Cd)	N.D.	2 mg/kg
汞(Hg)	N.D.	2 mg/kg
六价铬(Cr(VI))	N.D.	8 mg/kg

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

检测结果

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

测试项目	结果	方法检出限
氟(F)	N.D.	10 mg/kg
氯(Cl)	N.D.	10 mg/kg
溴(Br)	N.D.	10 mg/kg
碘(I)	N.D.	10 mg/kg

测试部位/部位描述 透明塑料套管

备注： **对于检测铅，镉，汞之样品已完全溶解。**

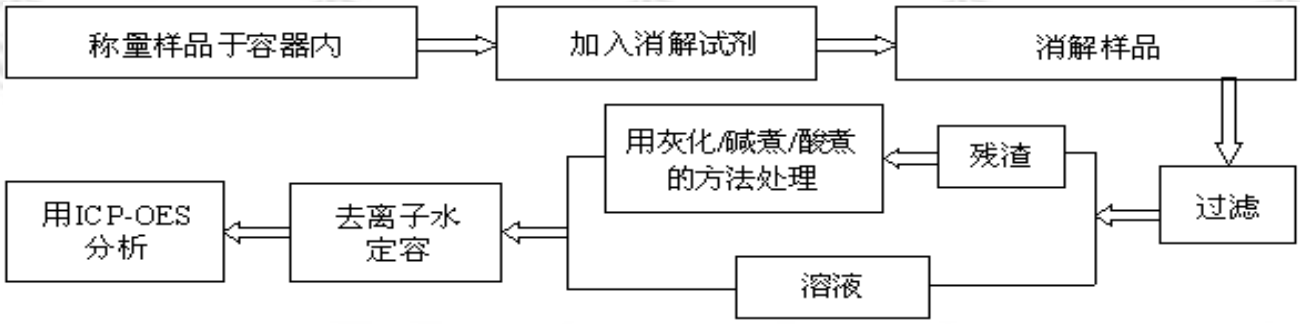
-N.D. = 未检出 (小于方法检出限)

-mg/kg = ppm = 百万分之一

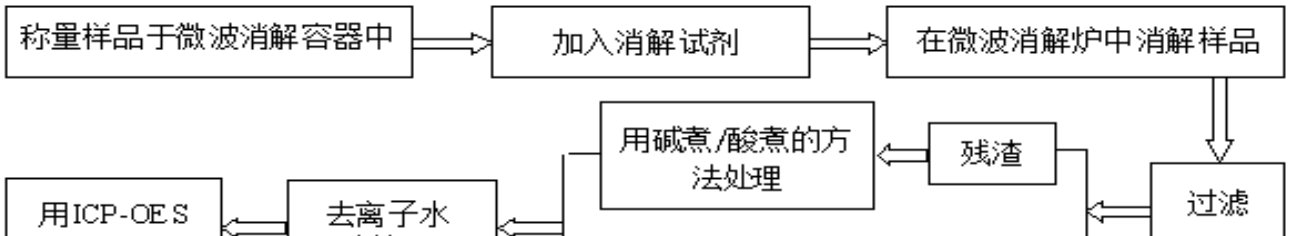
检测报告

检测流程

1. 铅(Pb)，镉(Cd)，铬(Cr)



2. 汞(Hg)

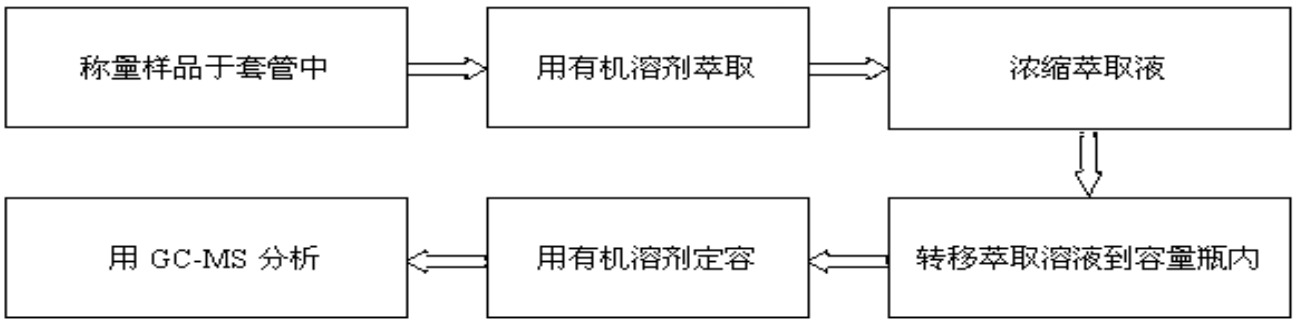


3. 六价铬(Cr(VI))

4. 多溴联苯(PBBs)， 多溴二苯醚(PBDEs)

检测报告

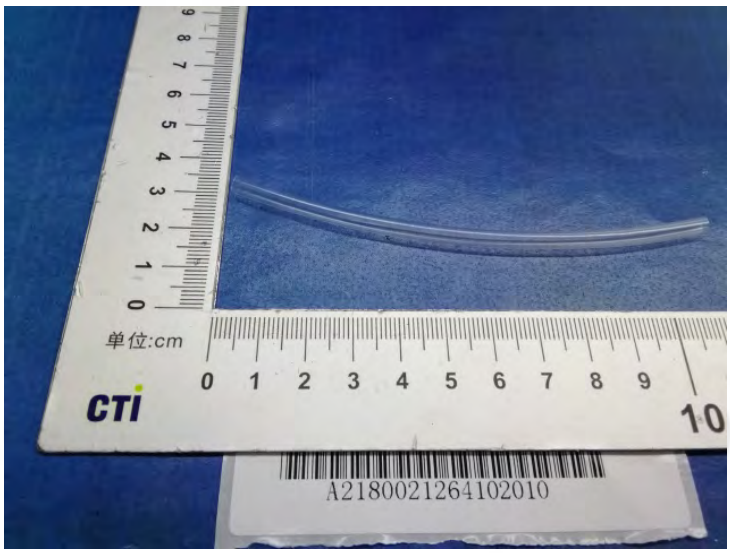
5. 邻苯二甲酸酯(DBP, BBP, DEHP, DIBP)



6. 氟(F)， 氯(Cl)， 溴(Br)， 碘(I)

检测报告

样品图片



*** 报告结束 ***

声明：

1. 检测报告无批准人签字、“专用章”及报告骑缝章无效；
2. 样品及样品信息由申请者提供，申请者应对其真实性负责，CTI未核实其真实性；
3. 本报告检测结果仅对送测样品负责；
4. 未经CTI书面同意，不得部分复制本报告。

CTI 华测检测 CENTRE TESTING INTERNATIONAL

Test Report

Report No. A2180248503101001

Applicant KUNSHAN SHI XING ELECTRONIC MATERIAL CO., LTD

Address NO.89 BAOYI ROAD GAOXIN KUNSHAN CITY

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

Sample Name	Foam
Client Reference Information	CR2300/CR4382/CR1015/EVA
Color	Black
Sample Received Date	Dec. 14, 2018
Testing Period	Dec. 14, 2018 to Dec. 19, 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), Arsenic(As), Cobalt(Co), Beryllium(Be), Antimony(Sb), Hexabromocyclododecane (HBCDD), Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), Dimethyl fumarate (DMF) in the submitted sample(s).

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

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

****

Conclusion

Tested Sample	According to standard/directive	Result
Submitted Sample	RoHS Directive 2011/65/EU with amendment (EU) 2015/863	Pass

****

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.

Tested by

Approved by Chen kaimin

Lab Manager

Reviewed by Wendy Gong

Date Dec. 19, 2018

No. R264041070

Test Report

Report No. A2180248503101001

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+AMD1:2017 CSV	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
Arsenic(As)	Refer to US EPA 3052:1996 & US EPA 6010D:2014	ICP-OES
Cobalt(Co)	Refer to US EPA 3052:1996 & US EPA 6010D:2014	ICP-OES
Beryllium(Be)	Refer to US EPA 3052:1996 & US EPA 6010D:2014	ICP-OES
Antimony(Sb)	Refer to US EPA 3052:1996 & US EPA 6010D:2014	ICP-OES
Hexabromocyclododecane (HBCDD)	Refer to US EPA 3550C:2007 & US EPA 8270E:2017	GC-MS
Fluorine (F)	Refer to EN 14582:2016	IC
Chlorine (Cl)	Refer to EN 14582:2016	IC
Bromine (Br)	Refer to EN 14582:2016	IC
Iodine (I)	Refer to EN 14582:2016	IC
Dimethyl fumarate (DMF)	Refer to US EPA 3550C:2007 & US EPA 8270E:2017	GC-MS

Test Report

Report No. A2180248503101001

Test Result(s)

Tested Item(s)	Result	MDL	Limit
Lead(Pb)	12 mg/kg	2 mg/kg	1000 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury(Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium(Cr(VI))	N.D.	8 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL	Limit
Polybrominated Biphenyls(PBBs)			
Monobromobiphenyl	N.D.	5 mg/kg	1000 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	Limit
Polybrominated Diphenyl Ethers (PBDEs)			
Monobromodiphenyl ether	N.D.	5 mg/kg	1000 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. A2180248503101001

Test Result(s)

Tested Item(s)	Result	MDL	Limit
Phthalates (DBP, BBP, DEHP, DIBP)			
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg	1000 mg/kg
Butyl benzyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg	1000 mg/kg
Di-(2-ethylhexyl) phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg	1000 mg/kg
Diisobutyl phthalate(DIBP) CAS#:84-69-5	N.D.	50 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL
Arsenic(As)	N.D.	10 mg/kg
Cobalt(Co)	N.D.	2 mg/kg
Beryllium(Be)	N.D.	10 mg/kg
Antimony(Sb)	N.D.	10 mg/kg

Tested Item(s)	Result	MDL
Hexabromocyclododecane(HBCDD)	N.D.	5 mg/kg

Tested Item(s)	Result	MDL
Fluorine(F)	N.D.	10 mg/kg
Chlorine(Cl)	112 mg/kg	10 mg/kg
Bromine(Br)	N.D.	10 mg/kg
Iodine(I)	N.D.	10 mg/kg

Tested Item(s)	Result	MDL
Dimethyl fumarate(DMF)	N.D.	0.1 mg/kg

Tested Sample/Part Description Black foam

Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury, Arsenic, Cobalt, Beryllium, Antimony.**

-MDL = Method Detection Limit

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

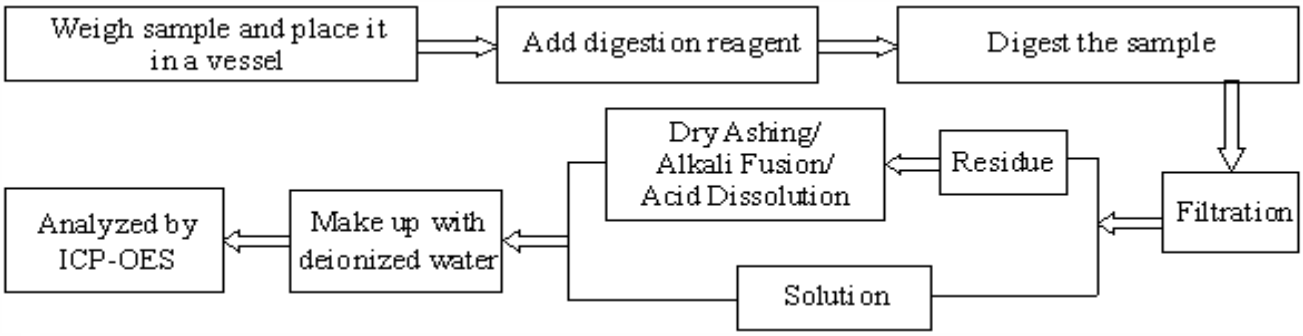
-mg/kg = ppm = parts per million

-1000 mg/kg = 0.1%

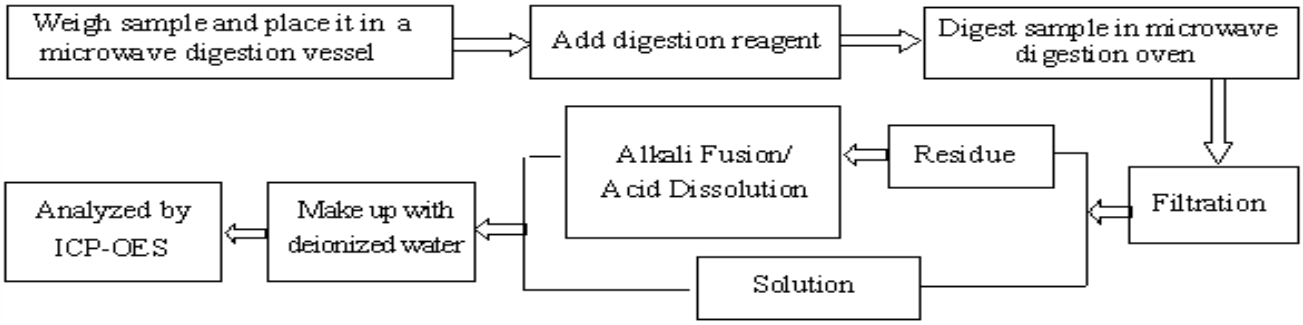
Test Report

Test Process

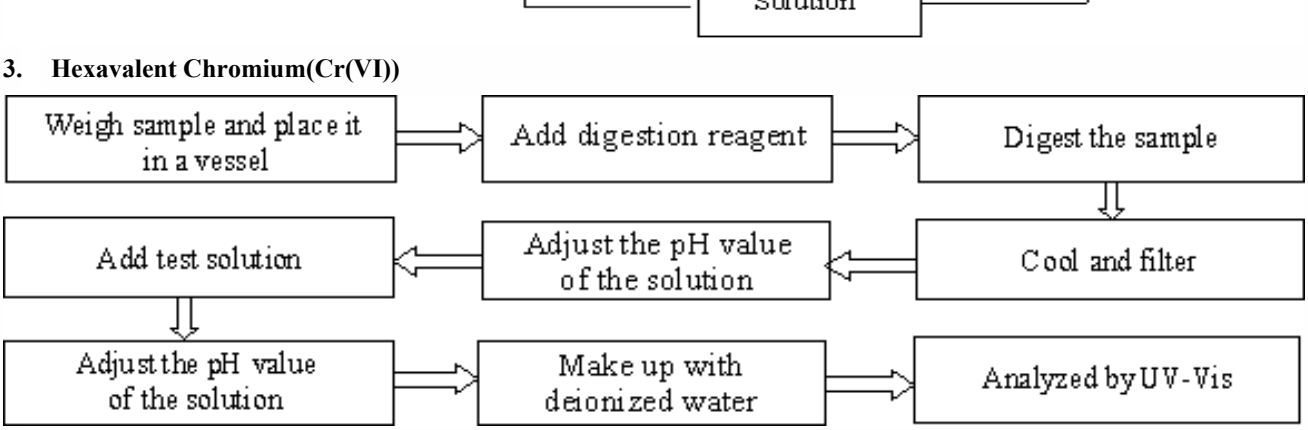
1. Lead(Pb), Cadmium(Cd), Chromium(Cr)



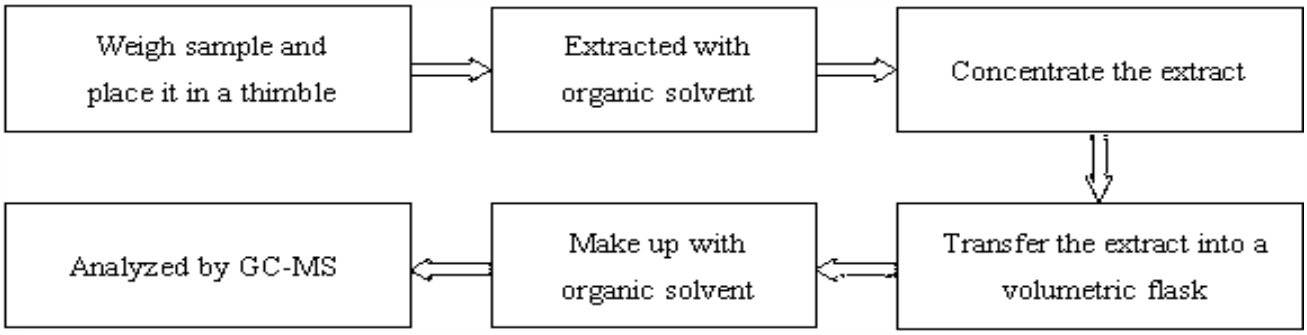
2. Mercury(Hg)



3. Hexavalent Chromium(Cr(VI))

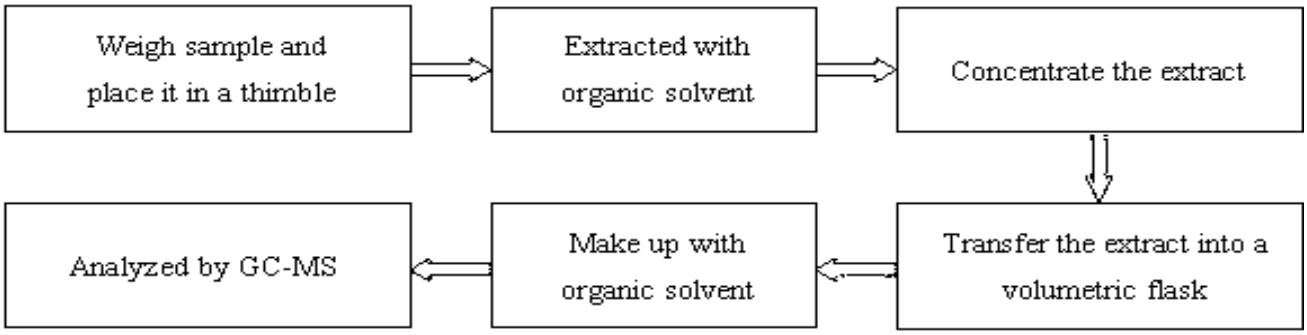


4. Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs)

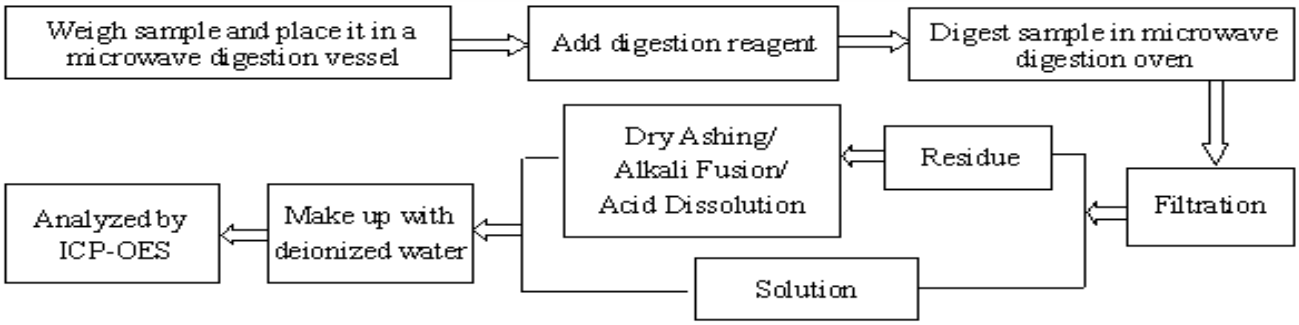


Test Report

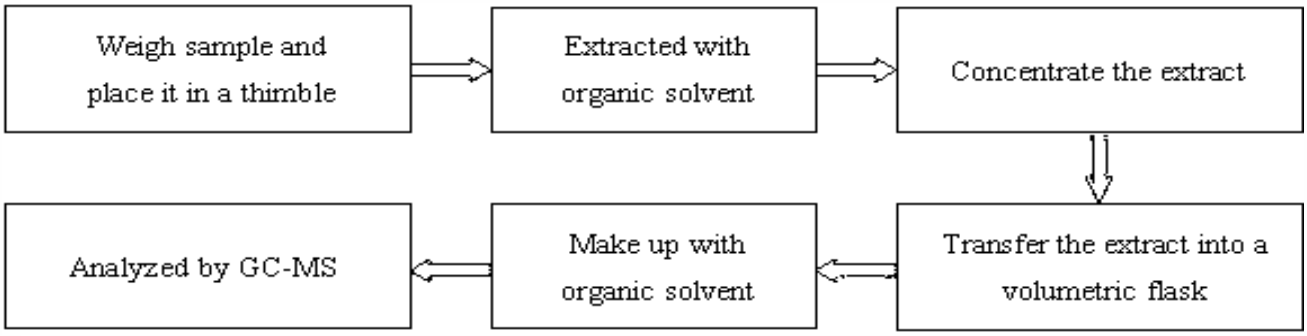
5. Phthalates (DBP, BBP, DEHP, DIBP)



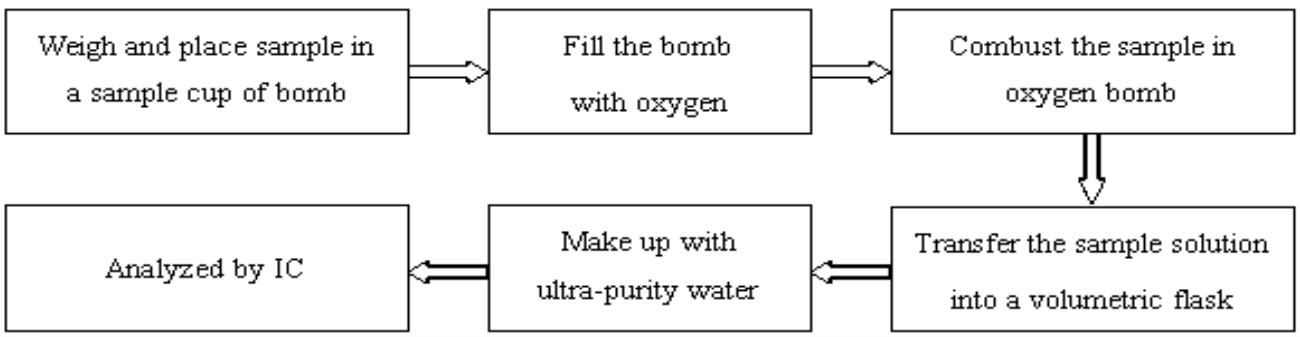
6. Arsenic(As), Cobalt(Co), Beryllium(Be), Antimony(Sb)



7. Hexabromocyclododecane (HBCDD)

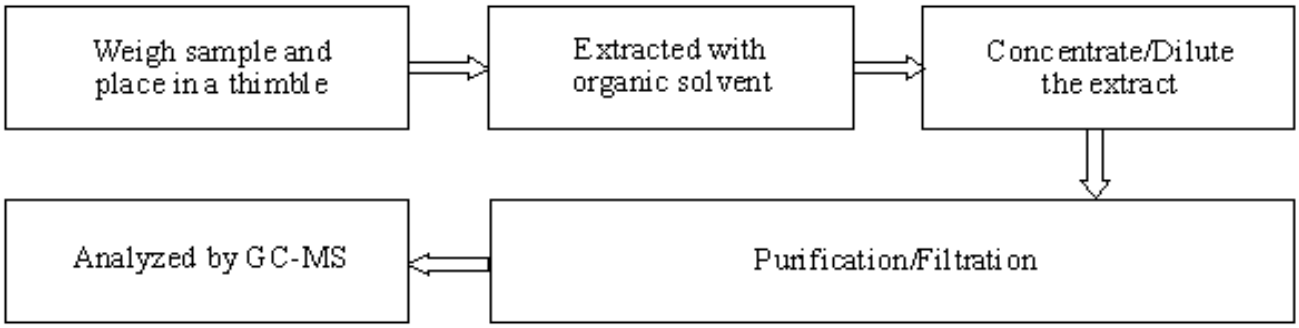


8. Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I)



Test Report

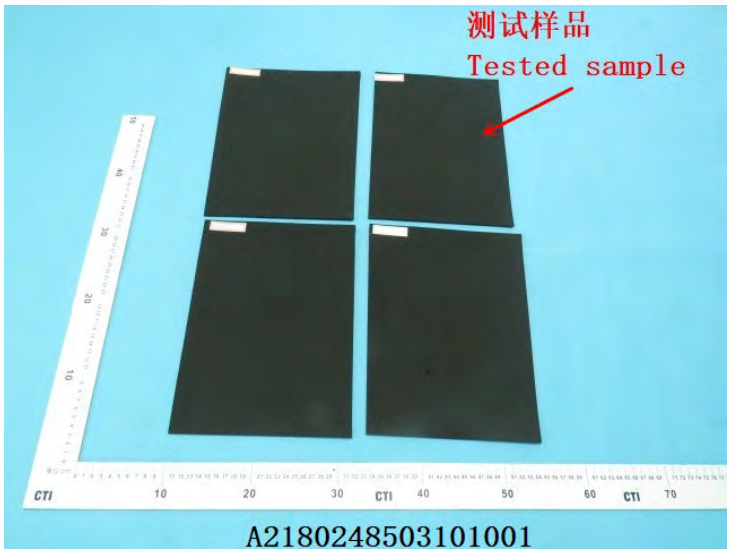
9. Dimethyl fumarate (DMF)



Test Report

Report No. A2180248503101001

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 autenticity 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;
5. In case of any discrepancy between the English version and Chinese version of the testing reports (if genrated), the Chinese version shall prevail.

Test Report

Report No. A2180164088101001

Applicant KUNSHAN RICH&CROWN ELELTRONIC MATERIALS CO.,LTD

Address NO. 9 ORIGINAL TYPE BASE, QIANDENG TOWN, KUNSHAN CITY, JIANGSU PROVINCE

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

Sample Name	Pure copper foil
Client Reference Information	FCC-09、FCD-09、FCC-12、FCD-12、FCC-15、FCD-15、FCC-18、FCD-18、FCC-25、FCD-25、FCC-30、FCD-30、FCC-35、FCD-35、FCC-45、FCD-45、FCC-50、FCD-50、FCC-75、FCD-75、FCC-85、FCD-85、FCC-100、FCD-100、FCC-125、FCD-125、FCC-150、FCD-150、FCC-200、FCD-200、FCC-300、FCD-300
Color	copper
Material	Pure copper
Sample Received Date	Sep. 5, 2018
Testing Period	Sep. 5, 2018 to Sep. 8, 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), Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I) in the submitted sample(s).

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

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

****

Conclusion

Tested Sample	According to standard/directive	Result
Submitted Sample	RoHS Directive 2011/65/EU with amendment (EU) 2015/863	Pass

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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.

Tested by Lizheng Su

Reviewed by Taoying

Approved by Su Hongwei

Date Sep. 8, 2018

Su Hongwei
Senior Laboratory Manager

No. R264041961

Test Report

Report No. A2180164088101001

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+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321-7-1:2015	UV-Vis
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
Fluorine (F)	Refer to EN 14582:2016	IC
Chlorine (Cl)	Refer to EN 14582:2016	IC
Bromine (Br)	Refer to EN 14582:2016	IC
Iodine (I)	Refer to EN 14582:2016	IC

Test Report

Report No. A2180164088101001

Test Result(s)

Tested Item(s)	Result	MDL	Limit
Lead(Pb)	N.D.	2 mg/kg	1000 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury(Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium(Cr(VI))	N.D. ▼	0.10 μg/cm² (LOQ)	1000 mg/kg

Tested Item(s)	Result	MDL	Limit
Polybrominated Biphenyls(PBBs)			
Monobromobiphenyl	N.D.	5 mg/kg	1000 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	Limit
Polybrominated Diphenyl Ethers (PBDEs)			
Monobromodiphenyl ether	N.D.	5 mg/kg	1000 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. A2180164088101001

Test Result(s)

Tested Item(s)	Result	MDL	Limit
Phthalates (DBP, BBP, DEHP, DIBP)			
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg	1000 mg/kg
Butyl benzyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg	1000 mg/kg
Di-(2-ethylhexyl) phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg	1000 mg/kg
Diisobutyl phthalate(DIBP) CAS#:84-69-5	N.D.	50 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL
Fluorine(F)	N.D.	10 mg/kg
Chlorine(Cl)	N.D.	10 mg/kg
Bromine(Br)	N.D.	10 mg/kg
Iodine(I)	N.D.	10 mg/kg

Tested Sample/Part Description Copper foil

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

-MDL = Method Detection Limit

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

-mg/kg = ppm = parts per million

-1000 mg/kg = 0.1%

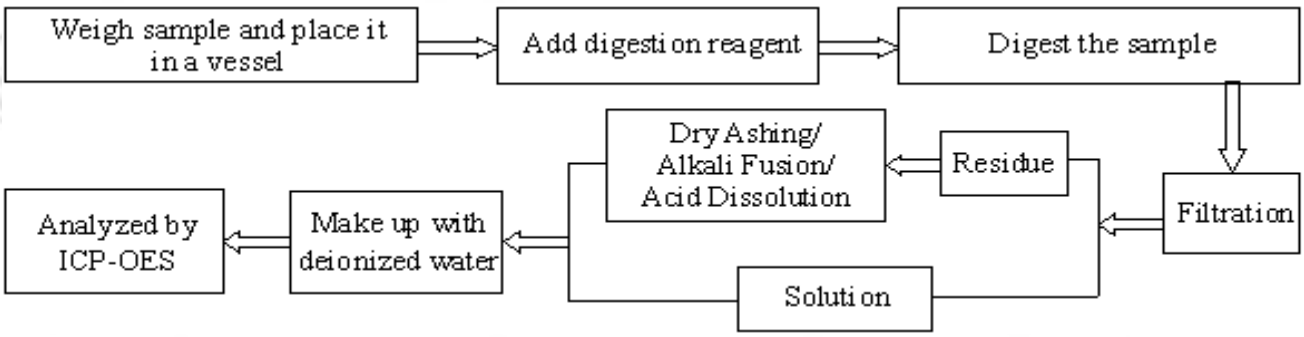
-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm²

-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm². The coating is considered a non-Cr(VI) based coating.

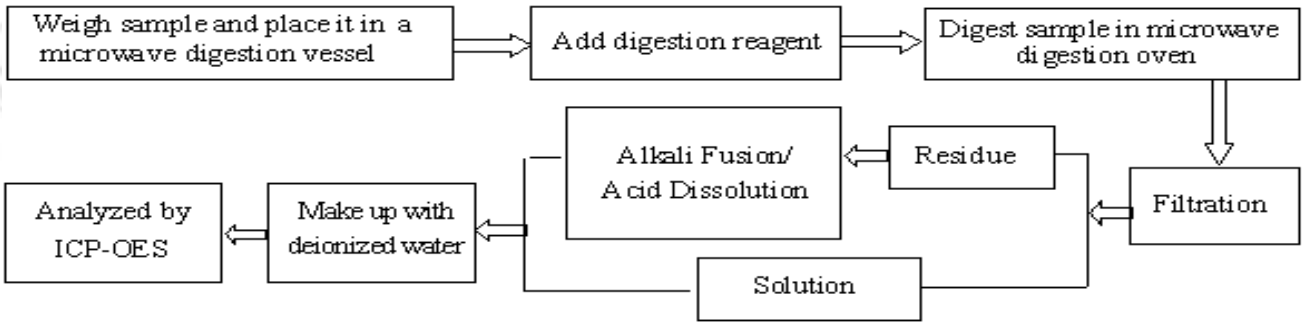
Test Report

Test Process

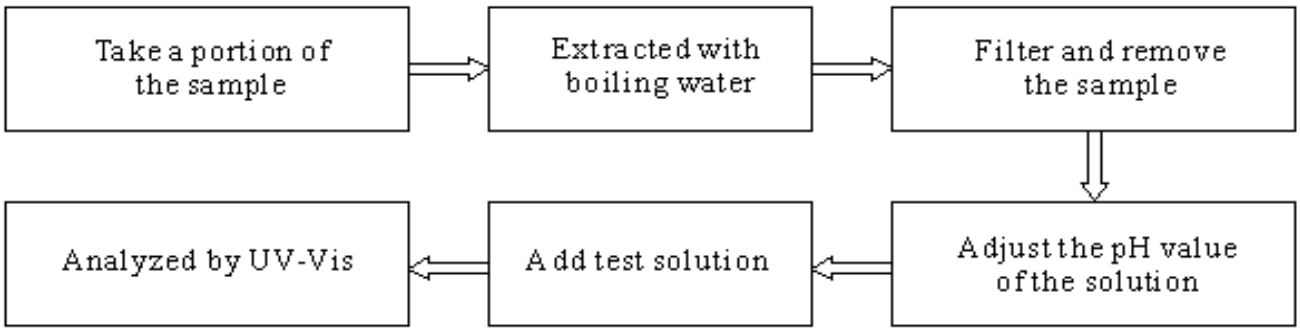
1. Lead(Pb), Cadmium(Cd)



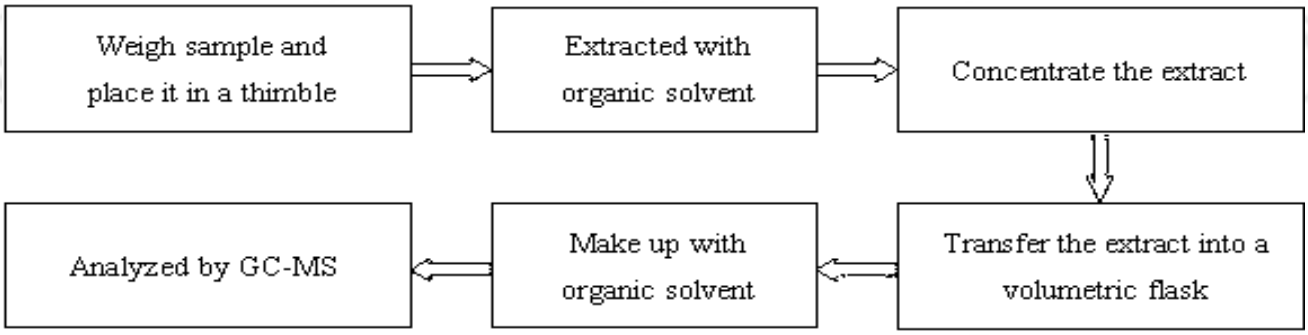
2. Mercury(Hg)



3. Hexavalent Chromium(Cr(VI))

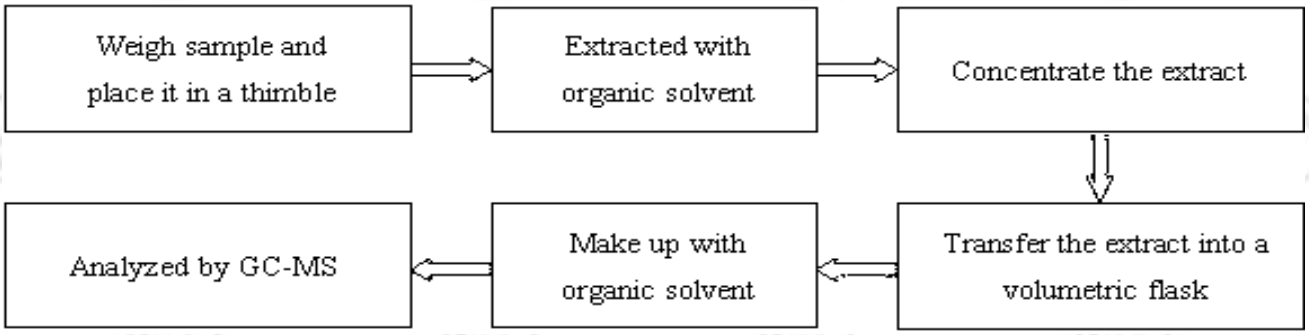


4. Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs)

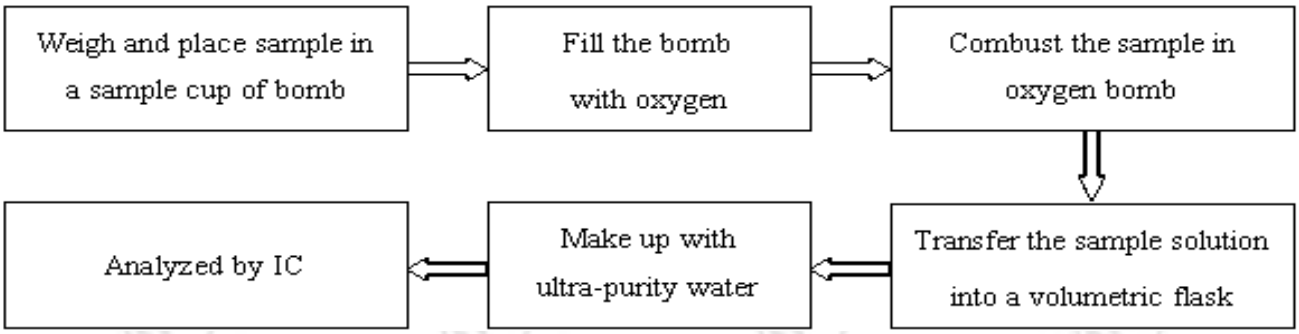


Test Report

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



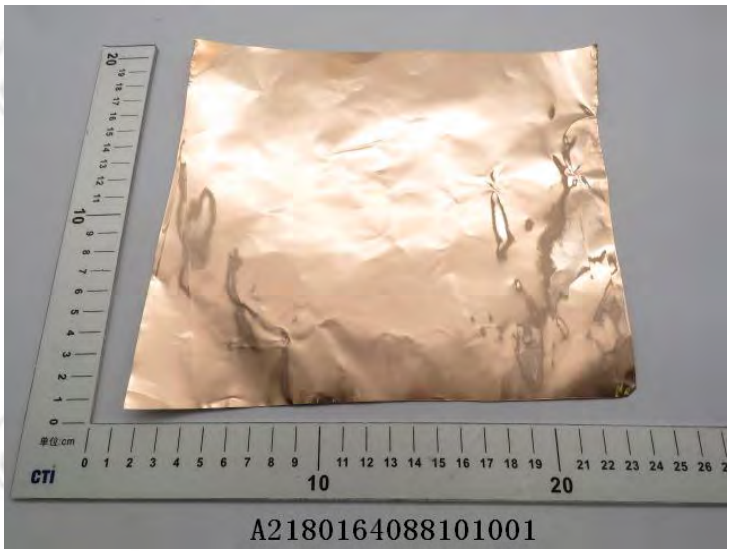
6. Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I)



Test Report

Report No. A2180164088101001

Photo(s) of the sample(s)



*** End of report ***

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