承　认　书

Approval　Sheet

客户(Customer): /

客户料号 (Cus .P/N): /

华联威料号 (HLW P/N): 216104-1092-G63018

品名规格 (PronameSpec): FPC 高度4.9 间距 0.5 14PIN

送样日期 (Delivery Date):2022/03/21

承认日期 (Acknowledge Date): 2022/03/21

Approved No:	客　户 Customer		
采 购 部 Purchasing Dept	品 质 部 QC Dept	工 程 部 Engineering Dept	确　认 Approved By
深 圳 市 华 联 威 电 子 科 技 有 限 公 司 SHEN ZHEN SHI HUA LIAN WEI ELECTRONICS TECHNOLOGY CO; LTD.			
业 务 部 Sales Dept	品　管　部 QC Dept	工　程　部 Engineering Dept	核　准 Checked By
万金菊	欠必锋	魏红	唐竹君

地址:深圳市龙华区观澜街道桂香社区观澜桂花路 307 号

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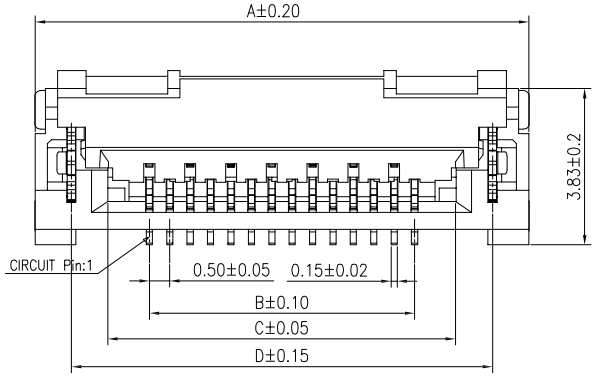
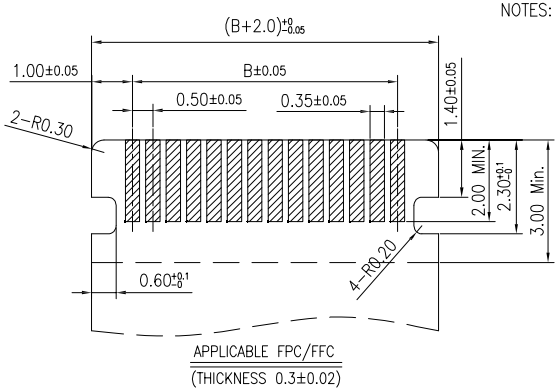
REV.	ECN.NO.	APPD.
A	EXXXXXXXXXX	yangguifeng

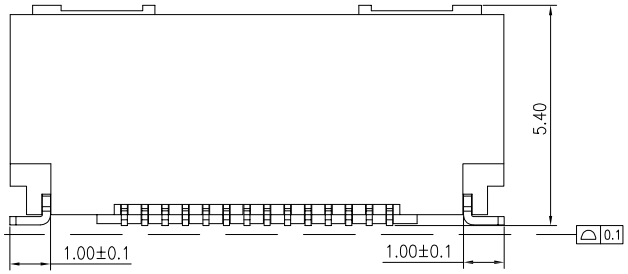
NOTES:

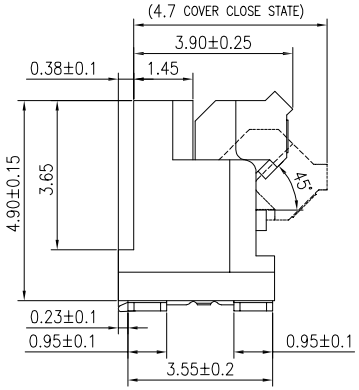
1.HUOSING: LCP HIGH-TEMP THERMOPLASTIC UL94V-0 COLOR:BEIGE
2.ACTUATOR: LCP HIGH-TEMP THERMOPLASTIC UL94V-0 COLOR:BLACK
3.TERMINAL:PHOSPHOR BRONZE
PLATING:1μ"GOLD FLASH OR 100~150μ"TIN(LEAD FREE)
OVERALL 50~100μ"NICKEL UNDER PLATED.
4.FITTING NAIL:BRASS
PLATING:100~150μ"TIN(LEAD FREE)
OVFRALL 50~100μ"NICKFL UNDFR PLATFD.

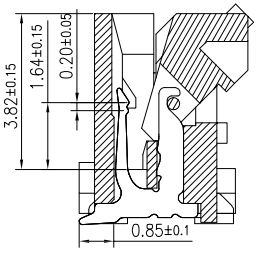




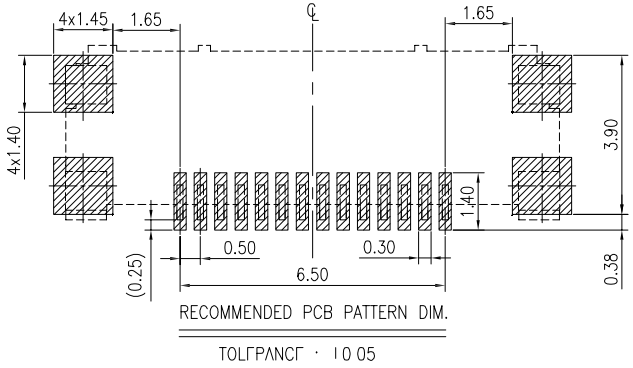
APPLICABLE FPC/FFC
(THICKNESS 0.3±0.02)



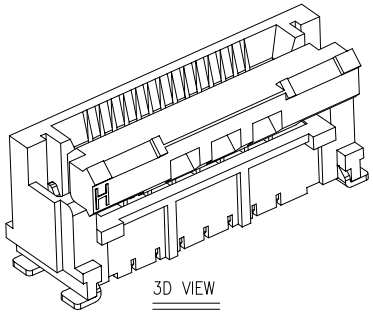




CABLE INSERT DIM.



RECOMMENDED PCB PATTERN DIM.
TOLERANCE : ±0.05


3D VIEW

216104-1092-XXX0X8

- 1:半金1u"
- 3:半金3u"
- 5:半金5u"
- G:半金G/Fu"
- 9:镀全金1u"
- 4:镀全亮锡
- 1:PA66
- 2:PBT
- 6:LCP
- 1:吸塑盒
- 2:吸塑管
- 3:载带
- 6:载带+贴麦拉
- 1:黑色
- 2:白色
- 3:米黄色

NO.of contacts	Dimensions A.	B.	C.	D.	NO.of contacts	Dimensions A.	B.	C.	D.
4	7.10	1.50	3.54	5.32	33	21.60	16.00	18.04	19.82
5	7.60	2.00	4.04	5.82	34	22.10	16.50	18.54	20.32
6	8.10	2.50	4.54	6.32	35	22.60	17.00	19.04	20.82
7	8.60	3.00	5.04	6.82	36	23.10	17.50	19.54	21.32
8	9.10	3.50	5.54	7.32	37	23.60	18.00	20.04	21.82
9	9.60	4.00	6.04	7.82	38	24.10	18.50	20.54	22.32
10	10.10	4.50	6.54	8.32	39	24.60	19.00	21.04	22.82
11	10.60	5.00	7.04	8.82	40	25.10	19.50	21.54	23.32
12	11.10	5.50	7.54	9.32	41	25.60	20.00	22.04	23.82
13	11.60	6.00	8.04	9.82	42	26.10	20.50	22.54	24.32
14	12.10	6.50	8.54	10.32	43	26.60	21.00	23.04	24.82
15	12.60	7.00	9.04	10.82	44	27.10	21.50	23.54	25.32
16	13.10	7.50	9.54	11.32	45	27.60	22.00	24.04	25.82
17	13.60	8.00	10.04	11.82	46	28.10	22.50	24.54	26.32
18	14.10	8.50	10.54	12.32	47	28.60	23.00	25.04	26.82
19	14.60	9.00	11.04	12.82	48	29.10	23.50	25.54	27.32
20	15.10	9.50	11.54	13.32	49	29.60	24.00	26.04	27.82
21	15.60	10.00	12.04	13.82	50	30.10	24.50	26.54	28.32
22	16.10	10.50	12.54	14.32	51	30.60	25.00	27.04	28.82
23	16.60	11.00	13.04	14.82	52	31.10	25.50	27.54	29.32
24	17.10	11.50	13.54	15.32	53	31.60	26.00	28.04	29.82
25	17.60	12.00	14.04	15.82	54	32.10	26.50	28.54	30.32
26	18.10	12.50	14.54	16.32	55	32.60	27.00	29.04	30.82
27	18.60	13.00	15.04	16.82	56	33.10	27.50	29.54	31.32
28	19.10	13.50	15.54	17.32	57	33.60	28.00	30.04	31.82
29	19.60	14.00	16.04	17.82	58	34.10	28.50	30.54	32.32
30	20.10	14.50	16.54	18.32	59	34.60	29.00	31.04	32.82
31	20.60	15.00	17.04	18.82	60	35.10	29.50	31.54	33.32
32	21.10	15.50	17.54	19.32	61	35.60	30.00	32.04	33.82

TOLERANCE UNLESS OTHERWISE SPECIFIED			
.XXX ±0.10	.X° ±3°	深圳市华联威电子科技有限公司	
.XX ±0.20	.XX° ±2°	HUA LIAN WEI TECHNOLOGY ELECTRONICS CO;LTD.	
.X ±0.30			
APPROVED		PART NAME:	FPC高度4.9间距0.5 14P
CHECKED		PART No:	216104-1092-G63018 C
DRAWED	yangguifeng	PROJECTION:	UNIT: mm / SCALE 1:1 / SHEET 1 OF 1 / REV. A
DATE	2021.12.01		

HLWCONN® 深圳市华联威电子科技有限公司

HUA LIAN WEI TECHNOLOGY ELECTRONICS CO.,LTD

排针排母系列技术标准

1.范围

1.1 本标准适用于间距为 2.54、2.0、1.27、1.00mm 的排针排母。

2.相关文件

2.1 当此规范与产品图发生冲突时以图面为准；当此规范与其它参考文件发生冲突时，以此规范为准。

3.产品编号

3.1 排针编号按本公司编码原则（XLC-PH-XX-G(R、SMT)-D(S)）

3.2 排母编号按本公司编码原则（XLC-FH-XX-G(R、SMT)-D(S)）

4.材料要求

4.1 排针排母的接触端子用磷铜或青铜。

4.2 排针排母的胶芯用含玻纤 30%耐高温，高绝缘以及其它综合性能优良的 PA9T、PA6T、PBT、LCP 等工程塑料。

4.3 镀层要求

依客户要求

5.引脚共面性

5.1 SMT 型排针的引脚共面性：≤0.10mm.

5.2 SMT 型排母的引脚共面性：≤0.10mm.

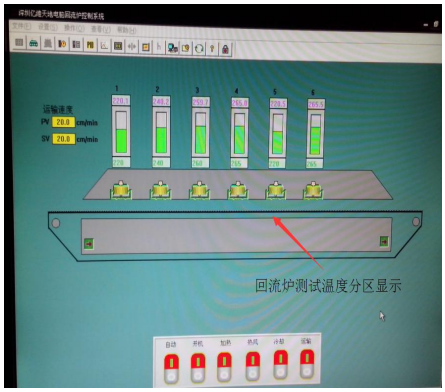
6.温度范围

工作温度为-40~105℃

7.测试程序及要求

表 1

外观与尺寸				
条款	测试项目	试验方法	技术要求	备注
7.1	外观检查	目视法或放大镜	无机械损伤、镀层脱落及变形等	
7.2	外形尺寸	用精度为 0.02mm 的卡尺及投影机	按产品图面要求	
7.3	引脚共面性	SMT 型产品顺畅通过平整度检测治具	排针：≤0.10mm 排母：≤0.10mm	
电气性能				
7.4	接触电阻	施加开路电压 20mV，电流不大于 100mA,或用小电流电阻测试仪（排针排母插合后，测试点：离胶芯基面 2mm 左右）	≤20mΩ	
7.5	绝缘电阻	施加 DC 500V 1 分钟 (测试点：相邻端子之间)	≥5000MΩ	

7.6	耐电压	施加 AC 1000V rms 50 秒（测试点：相邻端子之间）	无击穿、飞弧现象、漏电流不大于 1mA	
机械性能				
7.7	烘烤前保持力	拉拔力测试机量测	间距：2.54mm≥1.0Kgf/PIN 2.00mm≥0.8Kgf/PIN 1.27mm≥0.25Kgf/PIN 1.00mm≥0.08Kgf/PIN	
7.8	过回流炉后保持力	将回流炉升温至 260℃,产品放入回流炉入口经升温区、测试区（10S 以内）、冷却区后有出口取出(产品外观无损伤,变形,翘曲等不良)； 拉拔力测试机量测 	间距：2.54mm≥0.2Kgf/PIN 2.00mm≥0.1Kgf/PIN 1.27mm≥0.03Kgf/PIN 1.00mm≥0.02Kgf/PIN 	
7.9	插入力（排母）	以不低于 12.7mm/分的速度完成一次插拔之后，测量排针插入排母时的插入力，用拉拔力测试机量测。	间距：2.54mm≤0.30Kgf/PIN 2.00mm≤0.20Kgf/PIN 1.27mm≤0.15Kgf/PIN 1.00mm≤0.08Kgf/PIN	
7.10	拔出力（排母）	以不低于 12.7mm/分的速度完成一次插拔之后，测量排针拔出排母时的拔出力，用拉拔力测试机量测。	间距：2.54mm≥0.06Kgf/PIN 2.00mm≥0.05Kgf/PIN 1.27mm≥0.03Kgf/PIN 1.00mm≥0.015Kgf/PIN	
7.11	机械耐久(寿命)	以 15 次/分左右的频率插拔插合的排针排母，100 次后进行检测。	1.接触电阻符合 7.4 的规定。 2.插入力符合 7.9 条的规定。 3.拔出力符合 7.10 条的规定。 4.外观无机械损伤。	
环境适应性				
7.12	热冲击	排针暴露在高低温中交替循环 5 次： 低温：-40℃,0.5 小时 高温：+105℃,0.5 小时 试验后检验性能。	1．外观无机械损伤，裂纹，破碎等现象。 2．接触电阻符合 7.4 的规定。 3．绝缘电阻符合 7.5 的规定。	
7.13	温度寿命	在高温中，在不通电流情况下:85℃±5℃250 小时	1．外观无机械损伤，裂纹，破碎等现象。 2．接触电阻符合 7.4 的规定。	

7.14	盐雾试验	将排针、排母放置于温度为+35℃±2℃,盐水浓渡为 5±1％的环境中,喷雾12小时后,用自来水清洗干净,在干燥温度 35℃±2℃下保持 4 小时后，检测性能。	1．外观完好，无锈蚀。（折料带折断处不作检查要求） 2．接触电阻符合 7.4 条的规定。 3．绝缘电阻符合 7.5 条的规定。 4．耐电压符合 7.6 的规定。 5．插入力符合 7.9 条规定。 6．拔出力符合 7.10 条规定。	
7.15	可焊性	端子锡脚先沾入助焊剂中 5~10 秒，然后再沾入 260±5℃的焊槽内浸渍 5+0/-0.5 秒	测试完样品用10倍放大镜检查无损伤(如针孔、表面起泡或粗糙现象)，沾锡面积 95%以上	
7.17	耐焊锡热	引脚在260 ℃焊料槽中停留时间10秒	塑料体无损伤，变形等不良现象。	

8．逐批检查：

8.1 抽样按 GB/T19001:2008 idt ISO9001:2008 要求进行，采用特殊检验水平 S-2，一次抽样方法。

8.2 逐批检查项目及缺陷分类 AQL 值：

表 2

	检查项目	条款	AQL 值		备注
			0.65	1.5	
1	外观	7.1	/	/	全检
2	外形尺寸	7.2	/	√	
3	引脚共面性	7.3	/	/	全检
4	接触电阻	7.4	√	/	
5	插入力	7.9	√	/	
6	拔出力	7.10	√	/	

8.3 判定：当 NG 数超过规定时，判为不合格，退回重工，再重新按规定提交逐批检查。

9．周期检验

9.1 周期检查按 GB/T19001:2008 idt ISO9001:2008 标准执行，采用判别水平Ⅱ，一次抽样方法，RQL=30。

9.2 试验时机：

A． 批量生产前；

B． 关键结构，材料更改时；

C． 生产满 100K 或半年；

D． 停产三个月以上恢复生产时；

E． 客户要求时。

9.3 试验样品经逐批检查合格的产品中随机抽取，作为周期检验用样品，样品数总共 25PCS，分成 5 组试验。试验分组及内容如下表：

表 3

测试项目	测试群					
	1	2	3	4	5	6
	测试顺序					
外观检查	1,7	1,5	1,5	1,9	1,3	1,3
接触电阻	2,5	2,4	2,4	2,6		

绝缘电阻	3,6					
耐电压						
插入力				3,7		
拔出力				4,8		
机械耐久(寿命)				5		
热冲击	4					
温度寿命		3				
盐雾试验			3			
可焊性					2	
耐焊锡热						2

9.4 判定：

当周期检查试验不合格时，应立即停产，并进行检讨分析，找出原因，经采取改进措施后，经试验合格后方能恢复生产，如为偶然因素，允许重作一次试验，周期试验合格可作为验收和交货依据。

10.包装：

用相应的管装、卷装、PE 袋包装产品，然后装入内箱再装入外箱，每步包装均要求贴标签。包装数量详见包装图。

11.储存：

包装好的产品，应储存放置在无污染、温度在-15~40℃相对湿度不超过 80％的环境仓库中，存放整齐。

12.运输：

可用任何方式运输，防止重压、严重碰撞、淋雨、雪等。

核准：唐竹君　　制作:杨桂峰

深圳市华联威电子科技有限公司

SHENZHENHUALIANWEIELECTRONICS CO., LTD.

测 試 報 告

TEST REPORT

產品名稱 Part Name	FPC 高度4.9间距0.5 14PIN	測試日期 Date of Testing	2022.03.18-2022.03.19	報告編號 Report NO.	MD20220319-01
產品型號 Part Name	216104-1092-G63018	樣品數量 Quantity	5PCS	測試環境 Date of Testing	濕　度Temp:18~21℃ 相對濕度 R.H.:49%~57%

一.電性測試 ELECTRICAL TEST

序號 NO	測試項目 Testing Item	測試條件 Testing Conditions	測試設備 Testing Equipments	規格 SPEC	測試記錄Testing Result					判定 Judge	
					1	2	3	4	5	OK	NG
1	接觸阻抗	20mA	直流低電阻測試儀	20mΩ Max	Pass	Pass	Pass	Pass	Pass	V	
2	絕緣阻抗	500 V DC/1分钟	絕緣電阻測試儀	5000 MΩ Min.	Pass	Pass	Pass	Pass	Pass	V	
3	耐壓測試	1000V AC / 0.5 mA 50秒	耐壓測試儀	No damaged	OK	OK	OK	OK	OK	V	

二.机械特性測試 MECHANICAL TEST

序號 NO	測試項目 Testing Item	測試條件 Testing Conditions	測試設備 Testing Equipments	規格 SPEC		測試記錄Testing Result					判定 Judge	
						1	2	3	4	5	OK	NG
4	插入力	每分钟12.7±3mm的速度	插拔力計	间距	插拔力	OK	OK	OK	OK	OK	V	
				2.54mm	2.94 N MAX							
				2.00mm	1.96 N MAX							
				1.27mm	1.47 N MAX							
				1.00mm	0.784N MAX							
5	拔出力	每分钟12.7±3mm的速度	插拔力計	间距	插拔力	OK	OK	OK	OK	OK	V	
				2.54mm	0.59 N MIN							
				2.00mm	0.49 N MIN							
				1.27mm	0.30 N MIN							
				1.00mm	0.15 N MIN							
6	锁口保持力	间距	插拔力	吊重測试机	不得发生物理损坏。	OK	OK	OK	OK	OK	V	
		2.54mm	9.8N MIN									
		2.00mm	7.84N MIN									
		1.27mm	2.45N MIN									
		1.00mm	0.08N MIN									

7	耐久性	测试速度：每分钟15个循环，测试次数：100次循环最少	插拔力計	不得发生物理损坏。	OK	OK	OK	OK	OK	V	

三.环境特性测试 ENVIRONMENTAL TEST

序號 NO	測試項目 Testing Item	測試條件 Testing Conditions	測試設備 Testing Equipment	規格 SPEC	測試記錄Testing Result					判定 Judge	
					1	2	3	4	5	OK	NG
9	冷热冲击	温度-40±3℃ 温度105±3℃ 持续时间0.5H	高低温试验箱	不得发生物理损坏。	OK	OK	OK	OK	OK	V	
10	湿温循环	温度85℃±5℃， 持续时间:250H	湿温循环机	最大接触阻抗20mΩ	OK	OK	OK	OK	OK	V	
11	盐雾试验	温度:35±2℃ 12小时	盐雾试验箱	最大接触阻抗20mΩ	OK	OK	OK	OK	OK	V	
12	可焊性	焊锡温度: 260±5℃	熔锡炉	沾锡面积达90%以上	OK	OK	OK	OK	OK	V	
13	焊接耐热试验	260±5℃ 10秒	工业烘烤箱	不得发生物理损坏	OK	OK	OK	OK	OK	V	
綜合判定 TEST JUDGMENT		■ 合格（Acceptable） □ 不合格（Reject）									

核准(Approver)：欠必锋　　測試(Tester)：但芬

深圳市华联威电子科技有限公司

檢驗報告

■首件檢驗 □入庫檢驗 □出貨檢驗 □客退檢驗 □退料檢驗 □其他 2022年03月21日 版次:A1

料號	216104-1092-G63018	制令單號	/	送檢單位	工程部	首件製作者	裝配
品名	FPC 高度4.9间距0.5 14PIN	客戶代號	/	批 量	/	送檢時間	/
				數 量	5PCS	確認時間	/

抽 樣 標 準	■單次 □雙次	抽样数	AQL	CRI:0	MAJ:0.4	MIN:0.6
MIL-STD-105E(II)	■正常 □加嚴 □減量	(5PCS)	ACC/RE.	0	/	/

不 良 数: CRI (/) MAJ (/) MIN (/) 不良率(%) /

NO.	檢驗項目 單位:MM/G	檢測儀器	檢 驗 記 錄 1	2	3	4	5	品管判定 AC	RE	CRI	MAJ	MIN	備注
	12.10±0.20	D	12.13	12.1	12.11	12.13	12.11	√					
尺寸測量	6.50±0.10	D	6.53	6.55	6.54	6.53	6.52	√					
	8.54±0.05	D	8.56	8.58	8.59	8.57	8.53	√					
	10.32±0.15	D	10.32	10.34	10.36	10.35	10.34	√					
	5.40±0.20	D	5.42	5.43	5.45	5.42	5.43	√					
	1.00±0.10	D	1.03	1.02	1.04	1.05	1.03	√					

檢驗依據: ■<<工程圖紙>> □<<檢驗規範>> □<<承認書>> □樣品 □其它

檢測儀器:A游標卡尺 B千分尺 C厚薄儀 D投影鏡 E放大鏡 F顯微鏡 G錫爐 H插拔力器 I間位尺 J其它

品保判定: ■合格Accept □退貨Reject □特采Waive □挑選Sort

核准：欠必锋 审核：李娟 检验员：但芬

深圳市华联威电子科技有限公司

电镀报告表

品名:FPC 高度4.9间距0.5 14PIN（端子）		
电镀规格:Ni40u″,Sn40u″,Au G/Fu″	日期:2021-12-20	页次:1/1

厂商:同华

测试设备:CMI X-射线膜厚测试仪

1、底层电镀测试（Ni）

数据	测试标准	实测值	判定	测试日期	测试时间
1	40u″MIN	50.5u″	OK	2021/12/20	10:20:15
2	40u″MIN	56.3u″	OK	2021/12/20	10:20:17
3	40u″MIN	67.5u″	OK	2021/12/20	10:20:19
4	40u″MIN	62.4u″	OK	2021/12/20	10:20:21

2、表层电镀测试（Sn）

数据	测试标准	实测值	判定	测试日期	测试时间
1	40u″MIN	65.3u″	OK	2021/12/20	10:25:10
2	40u″MIN	74.7u″	OK	2021/12/20	10:25:12
3	40u″MIN	75.9u″	OK	2021/12/20	10:25:14
4	40u″MIN	70.4u″	OK	2021/12/20	10:25:16

3、表层电镀测试（Au）

数据	测试标准	实测值	判定	测试日期	测试时间
1	0.5u″MIN	0.56u″	OK	2021/12/20	10:30:32
2	0.5u″MIN	0.54u″	OK	2021/12/20	10:30:34
3	0.5u″MIN	0.57u″	OK	2021/12/20	10:30:36
4	0.5u″MIN	0.55u″	OK	2021/12/20	10:30:38

核准：欠必锋　　审核:李娟　　检验员：但芬

深圳市华联威电子科技有限公司

盐水喷雾实验报告

试验方法	盐水喷雾腐蚀试验法	参考资料	MIL-STD-1216
METHOD	NEUTRL SALT SPRAY CORROSION TEST	REF	
客户	/	试验起始日期	2022年03月18日 20:00 时起
		DATE	2022年03月19日 08:00 时止
样品名称	FPC 高度4.9间距0.5 14PIN	试验数量	5PCS
P/N	216104-1092-G63018		

试验条件 （TEST CONDDITION）

1、盐水溶解（SALT SOLUTION：浓度50±10g/L，PH值6.5-7.2.

2、试验室温度（TEMP.IT THE SPRAY DHAMBR):35±1℃.

3、盐水桶温度（TEMP.OF SALE SOL′N TANK)：35±1℃.

4、 压力桶温度 （TEMP.OF SAR SUPPLIERY）：47±1℃.

5、 试验室相对湿度（R.H IN THE CHAMBER ）85%.

6、 压缩空气压力（COMPRESSED AIR PRESSURE）：1.00±0.01Kg/cm^2.

7、 样品放置位置（SPECIMEN SUPPORTED ANGLE ）：尼龙绳吊挂70°-90°.

8、 喷雾收集量（COLLECT RATE OF SALT SOL′N）1-2mL/(8 cm^2hr).

9、盐雾测试时间： 12小时 （H）

判定方法（ADFUSGD METHOD ）

试验后以20倍放大镜观察、无蓝、绿色腐蚀物之现象（不包含折弯处），即判定合格.(Inspext the ecimen at 20 xmagnification no blue or green corrosion products are acceptable)

样品序号	试验后现象 PHENOMENON AFTER TEST	判定 COMMENT
1	无蓝、绿色腐蚀物之现象	OK
2	无蓝、绿色腐蚀物之现象	OK
3	无蓝、绿色腐蚀物之现象	OK
4	无蓝、绿色腐蚀物之现象	OK
5	无蓝、绿色腐蚀物之现象	OK

核准:欠必锋　　审核：李娟　　试验员:但芬

钜鼎銅材廠檢驗報告單

公司名稱 Customer	钜鼎銅材廠檢驗報告單				重量 Weight(kg)	1078	出貨日期 Date		2021/11/23	
品名 Article	標准 Standard No				尺寸 Dimension		狀態 Tenper		銅卷編號 Coil No	
C2680	JISH3100:2017				0.18*400		EH		1021-C-08	
化學成分Chemical Compositions(%)										
元素 Element	Cu %	Zn%	Pb%	Fe%	\	\	\	\	化學成分	雜質
規範 Spec	64.0-68.0	餘量	<0.05	<0.05	\	\	\	\	合格	合格
實測 Actual	64.32	餘量	0.0036	0.0136	\	\	\	\	合格	合格

機械性質子Mechanical Properties								
項目 Item	結晶粒度 Grain Size Mm	硬度 Hardness Hv	抗拉強度 TensionStrength Mpa	伸長度 Elongation %	導電率 Electrical Conduc %IACS	彎曲試驗 Bending Test 180	表面粗度 Surface Roughness Ra(u m)	彎曲度 Camber mm\n
規範MAX Spec	\	170-190	490-610	\	\	\	\	\
實測 Actual	\	178	574	5	\	\	\	\

品質部

聯系電話:0755-28111847
傳真: 0755-28110077

东莞市海嵘兴塑胶有限公司

LCP材质分析报告

品　名	比 例	用　途
杜邦LCP树脂	0.68	构成材料主要成份
抗氧剂	0.003	抗氧化
日本住友TAP	0.002	润滑及增加流动性
大洋安定剂	0.005	稳定机械性能，方便重复使用
玻纤	0.30	增强
色母	0.01	着色

注：以上数据真实可靠，但并非绝对值，并不做任何商业依据。

Test Report

SHENZHEN HUALIANWEI ELECTRONICS TECHNOLOGY CO.,LTD

101, 201, PLANT 1, NO.307, GUANLAN GUIHUA ROAD, GUIXIANG COMMUNITY, GUANLAN SUB-DISTRICT, LONGHUA DISTRICT, SHENZHEN CITY, GUANGDONG PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : C2680 Terminal

SGS Job No. :	CP21-055214 - GZ
Model No. :	C2680 terminal after plating
Client Ref. Info. :	Used for USB series, HDMI series, RJ series, 1394 series, MICRO series, MINI series, DISPLAYPORT series, VGA series, DVI series, TYPE-C series, JACK series
Date of Sample Received :	18 Oct 2021
Testing Period :	18 Oct 2021 - 22 Oct 2021
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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

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94BEAB15

Allie Chen

Allie Chen
Approved Signatory

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

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN21-191742.001	Silver-grey/brassy metal

Remarks :

(1) 1 mg/kg = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

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

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, analyzed by ICP-OES and UV-Vis .

Test Item(s)	Limit	Unit	MDL	*001*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	44
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▾	-	µg/cm²	0.10	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.

(2) IEC 62321 series is equivalent to EN 62321 series https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(3) ▾= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI

b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI 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

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

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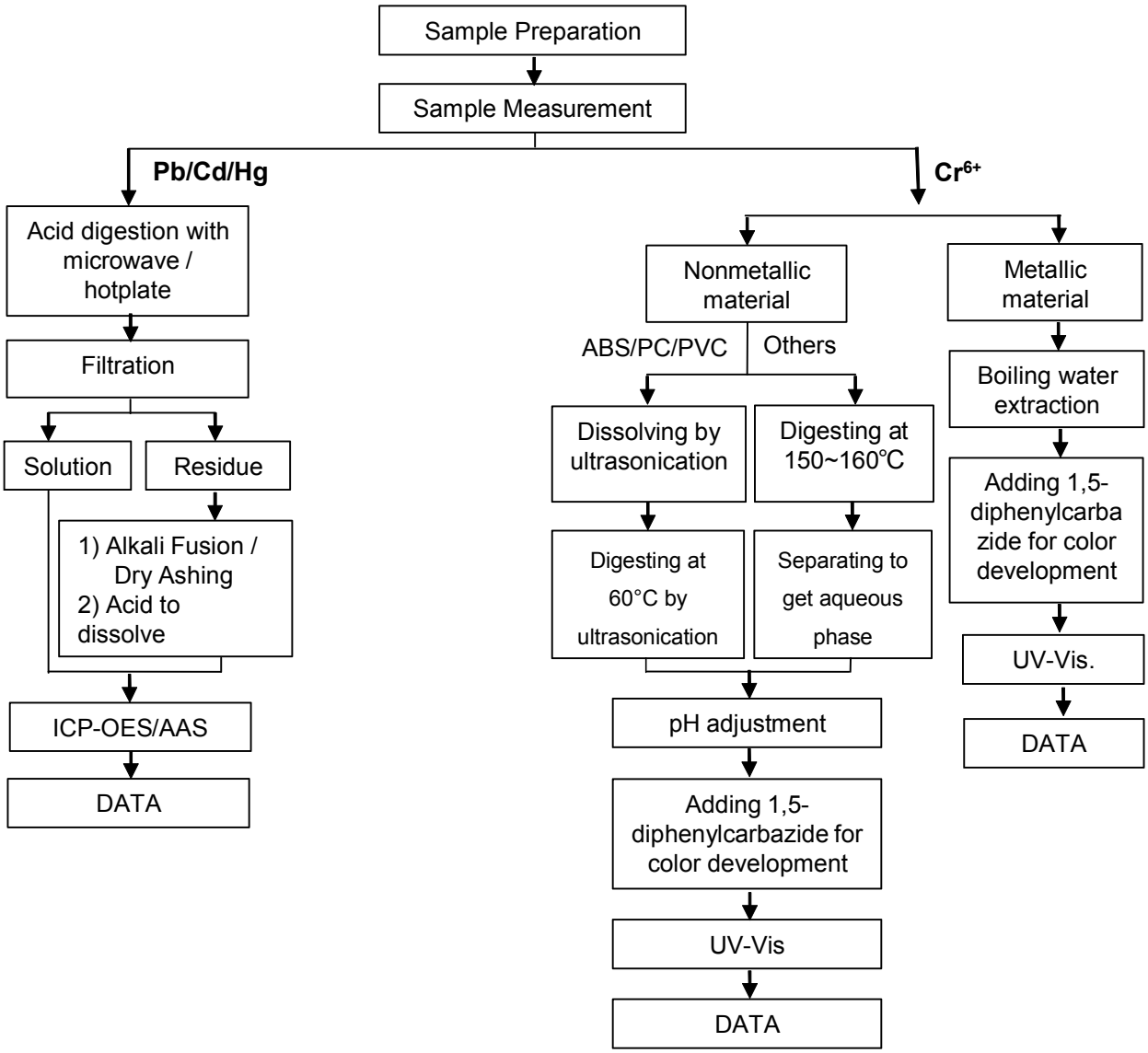
ATTACHMENTS

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

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



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Sample photo:

CAN21-191742.001

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No. CANEC2119174207 Date: 22 Oct 2021 Page 1 of 6

SHENZHEN HUALIANWEI ELECTRONICS TECHNOLOGY CO.,LTD

101, 201, PLANT 1, NO.307, GUANLAN GUIHUA ROAD, GUIXIANG COMMUNITY, GUANLAN SUB-DISTRICT, LONGHUA DISTRICT, SHENZHEN CITY, GUANGDONG PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : LCP plastic natural color

SGS Job No. :	CP21-055214 - GZ
Model No. :	LCP Plastic
Client Ref. Info. :	Used for USB series, HDMI series, RJ series, 1394 series, MICRO series, MINI series, DISPLAYPORT series, VGA series, DVI series, TYPE-C series, JACK series
Date of Sample Received :	18 Oct 2021
Testing Period :	18 Oct 2021 - 22 Oct 2021
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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

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A6779AE3

Allie Chen

Allie Chen
Approved Signatory

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

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN21-191742.007	Beige plastic

Remarks :

(1) 1 mg/kg = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

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

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

Test Item(s)	Limit	Unit	MDL	*007*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	8
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND

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Test Item(s)	Limit	Unit	MDL	*007*
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1,000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1,000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1,000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1,000	mg/kg	50	ND

Notes :

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

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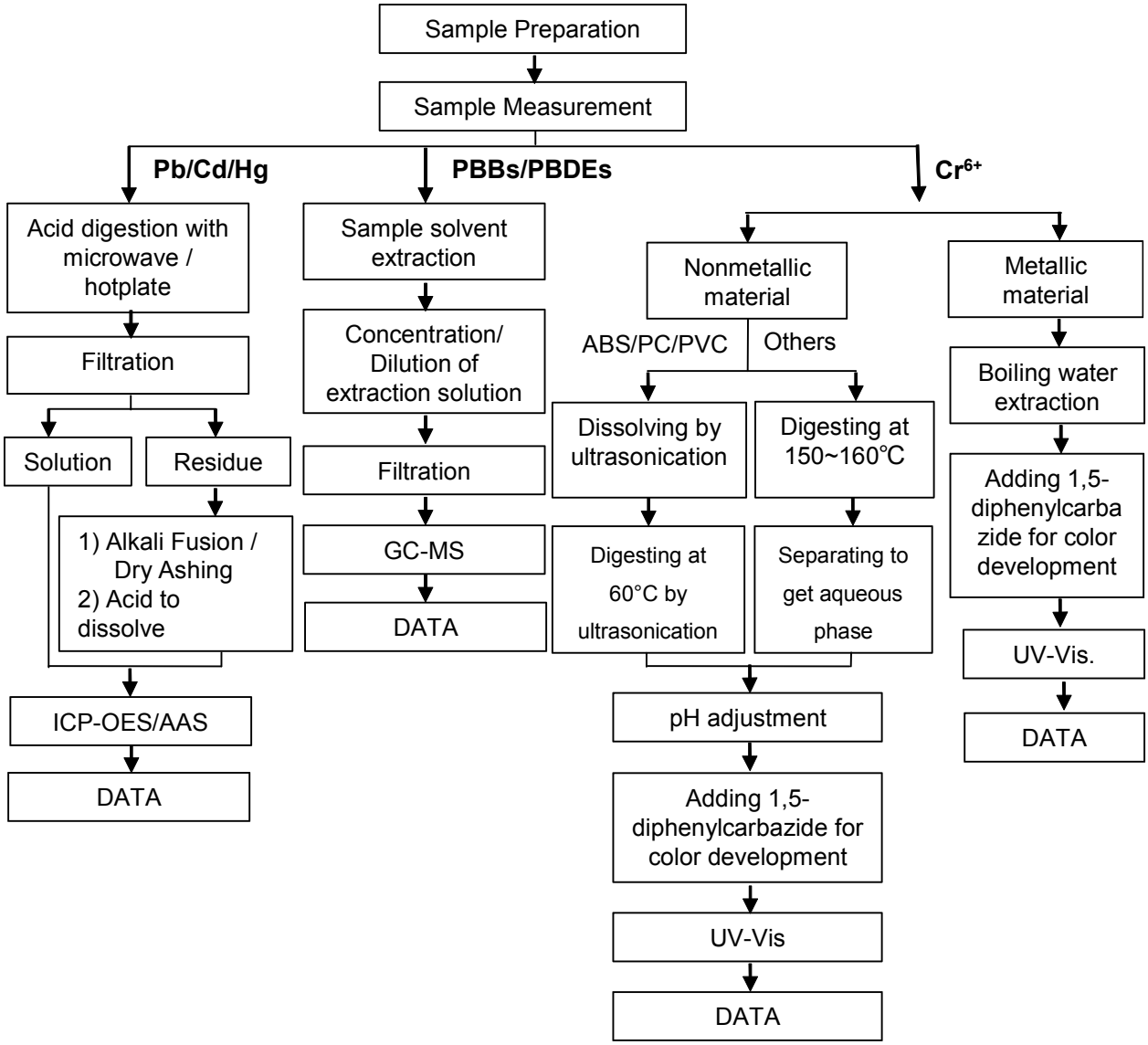
Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

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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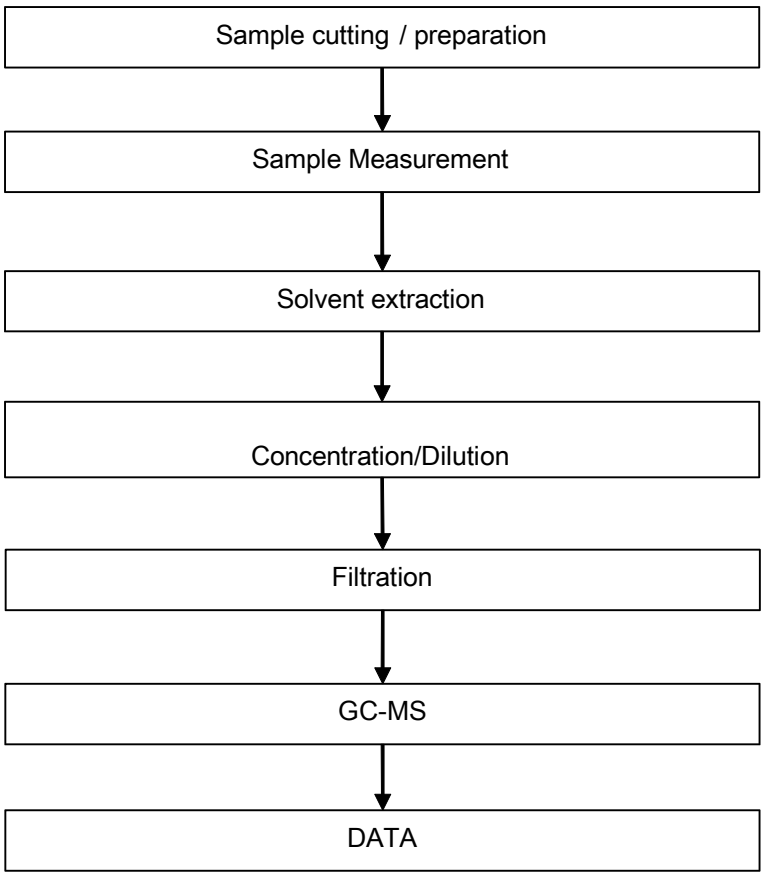
Phthalates Testing Flow Chart



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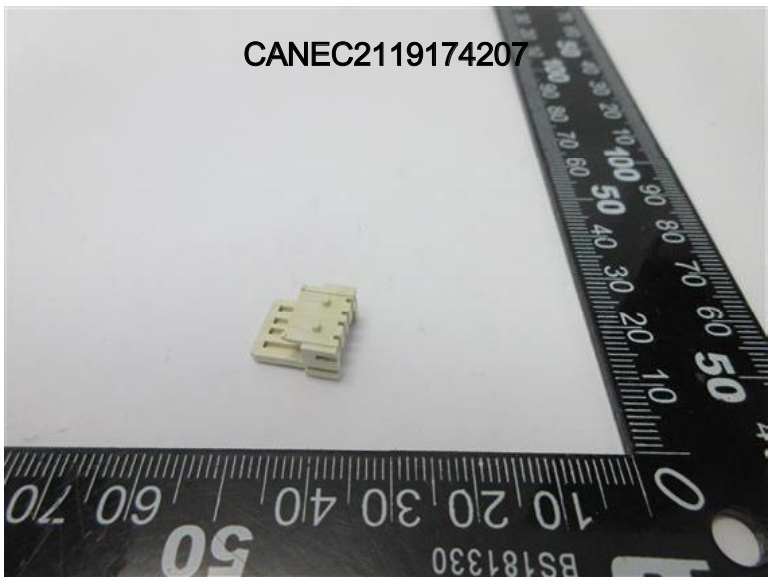
Sample photo:



CAN21-191742.007

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

SHENZHEN CITY TONGHUA INDUSTRY CO.,LTD

TONGHUA MANSIN TONGLE XINBU VILLANG TOWN SHENZHEN CITY CHINA

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

SGS Job No. :	CP21-051017 - SZ
Date of Sample Received :	18 Sep 2021
Testing Period :	18 Sep 2021 - 27 Sep 2021
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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

scan to see the report

CANEC2117633803

Allie Chen

Allie Chen
Approved Signatory

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN21-176338.003	Silver-gray plated metal

Remarks :

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

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

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015 , IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES , UV-Vis and GC-MS .

Test Item(s)	Limit	Unit	MDL	*003*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	37
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▾	-	µg/cm²	0.10	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND

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Test Item(s)	Limit	Unit	MDL	003
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.

(2) IEC 62321 series is equivalent to EN 62321 series https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(3) ▾= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 μg/cm². The sample coating is considered to contain CrVI

b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 μg/cm²). The coating is considered a non-CrVI 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

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives

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

Test Item(s)	CAS NO.	Unit	MDL	003
Perfluorooctanoic acid (PFOA) and its salts+	335-67-1	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) ^	1763-23-1	mg/kg	0.010	ND
Perfluorooctane Sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide(MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol(MeFOSE)	24448-09-7	mg/kg	0.010	ND
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol(EtFOSE)	1691-99-2	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its derivatives	-	mg/kg	-	ND

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Notes :

(1) + PFOA and its salts including PFOA-Na (CAS No.: 335-95-5), PFOA-K (CAS No.: 2395-00-8), PFOA-Ag (CAS No.: 335-93-3), PFOA-F (CAS No.: 335-66-0) and APFO (CAS No.: 3825-26-1);
(2) ^ PFOS including PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), $PFOS\text{-}NH_4$ (CAS No.: 29081-56-9), $PFOS\text{-}NH(OH)_2$ (CAS No.: 70225-14-8), $PFOS\text{-}N(C_2H_5)_4$ (CAS No.: 56773-42-3), PFOS-DDA(CAS No.:251099-16-8) and POSF (CAS No.: 307-35-7)

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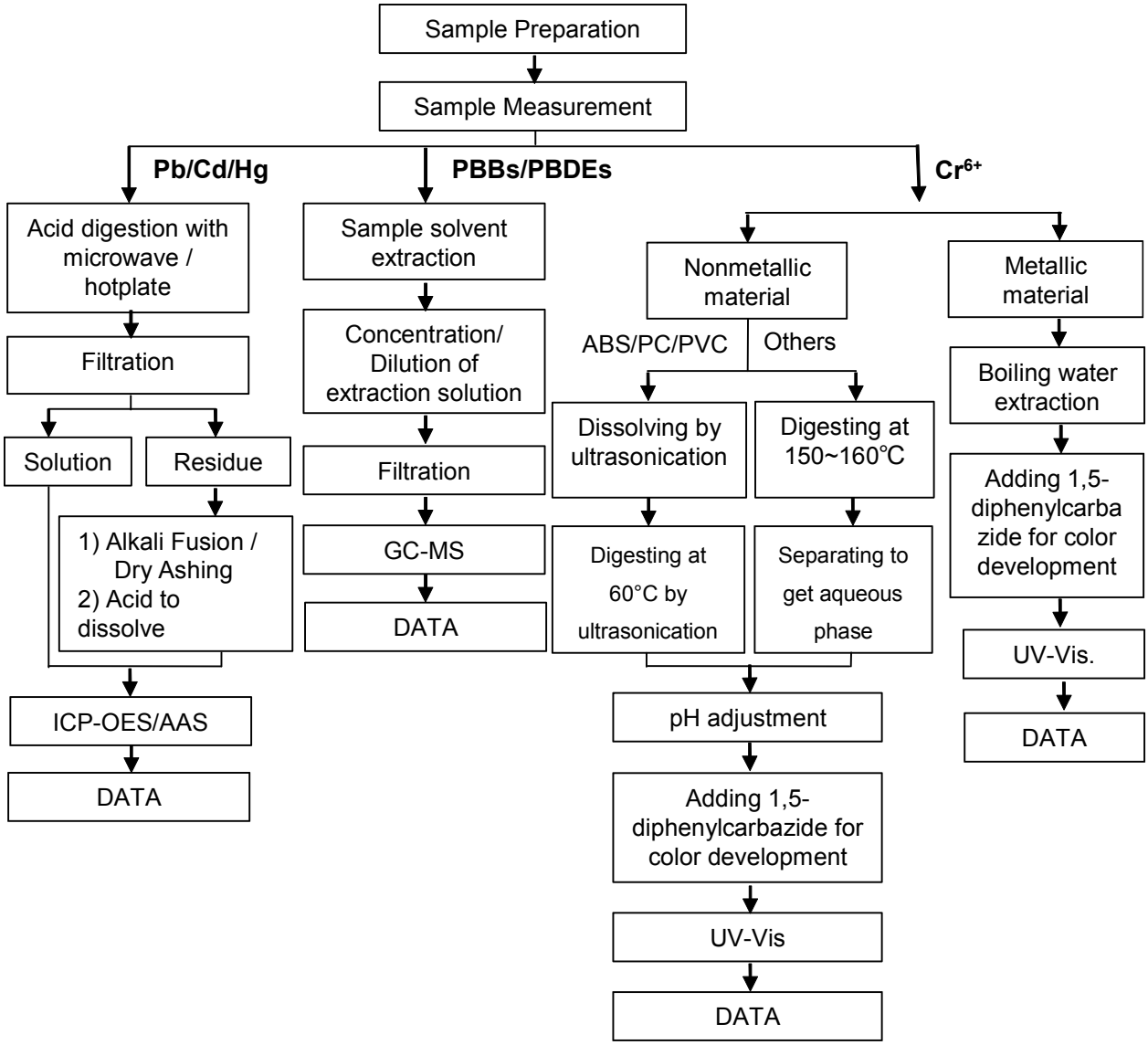
Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

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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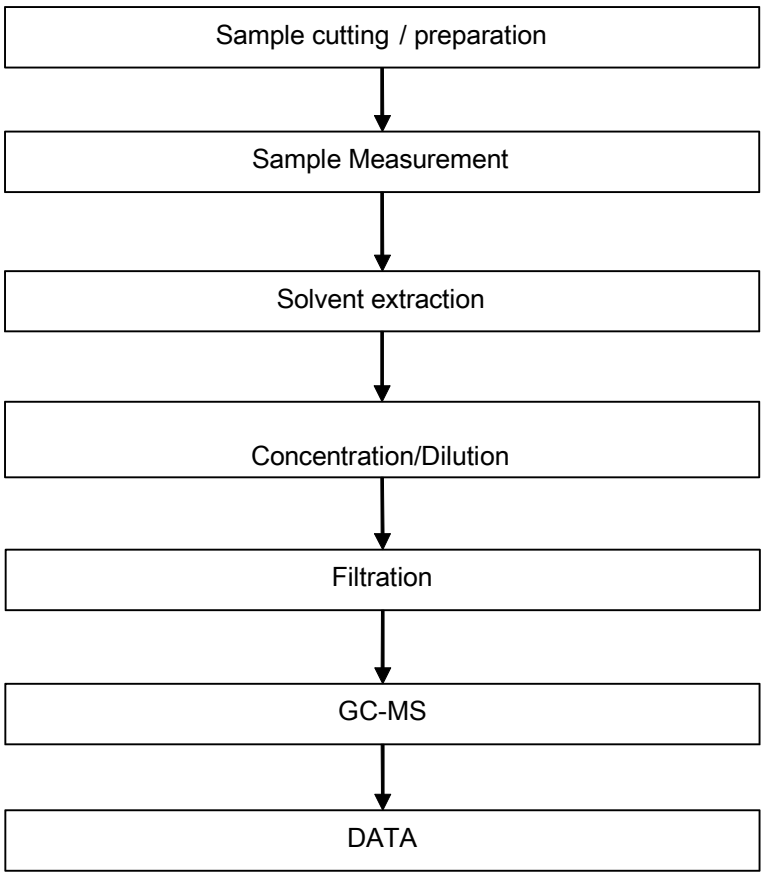
Phthalates Testing Flow Chart



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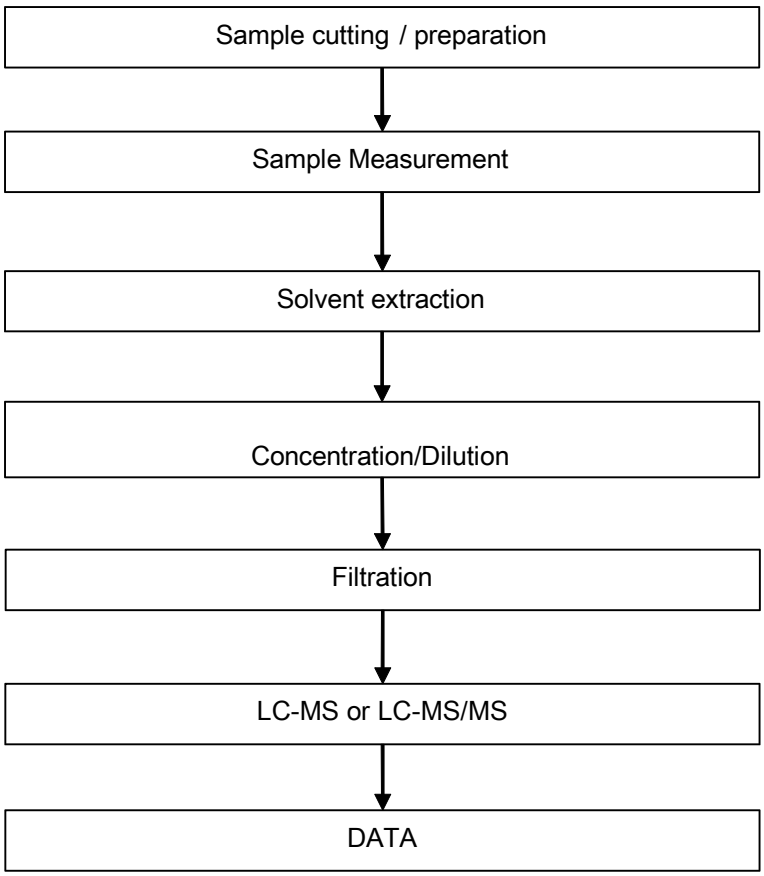
PFOA / PFOS Testing Flow Chart



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Sample photo:

CAN21-176338.003

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Test Report

SHENZHEN CITY TONGHUA INDUSTRY CO.,LTD

TONGHUA MANSIN TONGLE XINBU VILLANG TOWN SHENZHEN CITY CHINA

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

SGS Job No. :	CP21-051017 - SZ
Date of Sample Received :	18 Sep 2021
Testing Period :	18 Sep 2021 - 27 Sep 2021
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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

scan to see the report

CANEC2117633802

Allie Chen

Allie Chen
Approved Signatory

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

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN21-176338.002	Silver-gray plated metal

Remarks :

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

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

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015 , IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES , UV-Vis and GC-MS .

Test Item(s)	Limit	Unit	MDL	*002*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	29
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▾	-	µg/cm²	0.10	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND

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Test Item(s)	Limit	Unit	MDL	*002*
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.

(2) IEC 62321 series is equivalent to EN 62321 series https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(3) ▾= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 μg/cm². The sample coating is considered to contain CrVI

b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 μg/cm²). The coating is considered a non-CrVI 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

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives

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

Test Item(s)	CAS NO.	Unit	MDL	002
Perfluorooctanoic acid (PFOA) and its salts+	335-67-1	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) ^	1763-23-1	mg/kg	0.010	ND
Perfluorooctane Sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide(MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol(MeFOSE)	24448-09-7	mg/kg	0.010	ND
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol(EtFOSE)	1691-99-2	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its derivatives	-	mg/kg	-	ND

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Notes :

(1) + PFOA and its salts including PFOA-Na (CAS No.: 335-95-5), PFOA-K (CAS No.: 2395-00-8), PFOA-Ag (CAS No.: 335-93-3), PFOA-F (CAS No.: 335-66-0) and APFO (CAS No.: 3825-26-1);
(2) ^ PFOS including PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), PFOS-NH_4 (CAS No.: 29081-56-9), PFOS-$NH(OH)_2$ (CAS No.: 70225-14-8), PFOS-$N(C_2H_5)_4$ (CAS No.: 56773-42-3), PFOS-DDA(CAS No.:251099-16-8) and POSF (CAS No.: 307-35-7)

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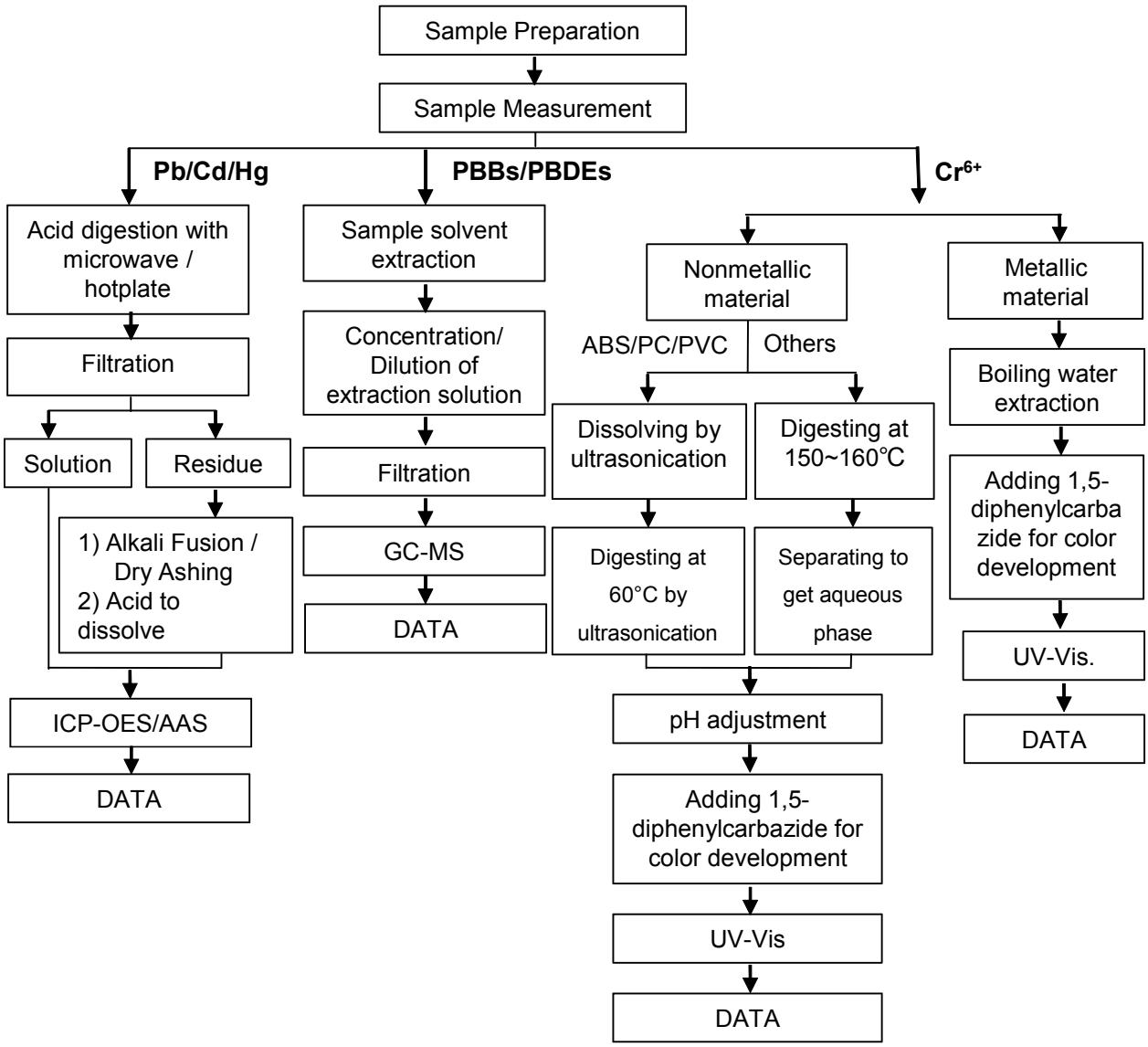
Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

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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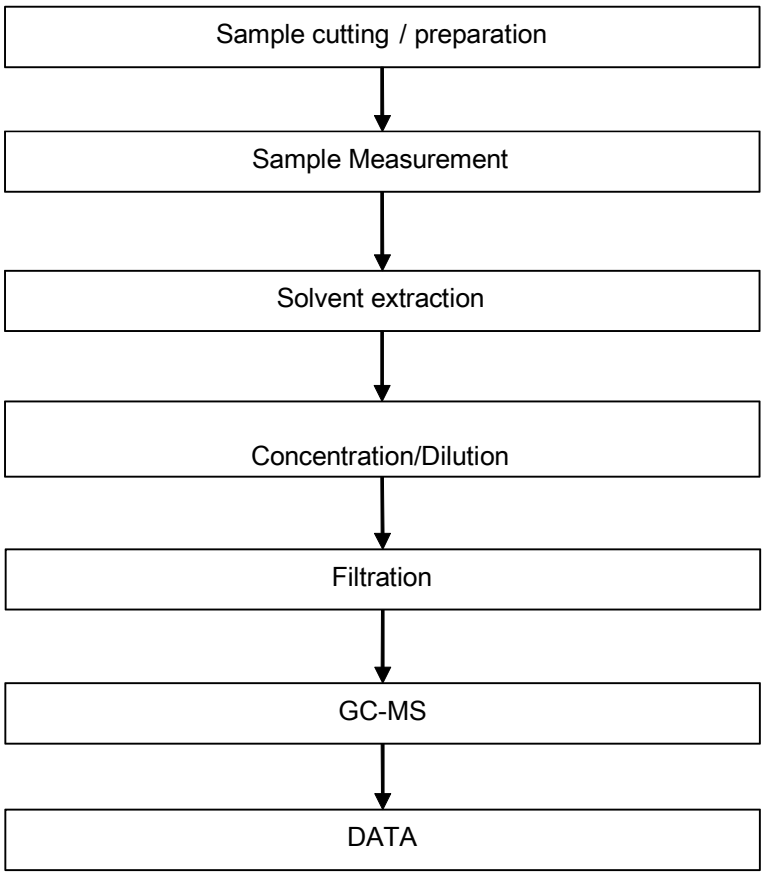
Phthalates Testing Flow Chart



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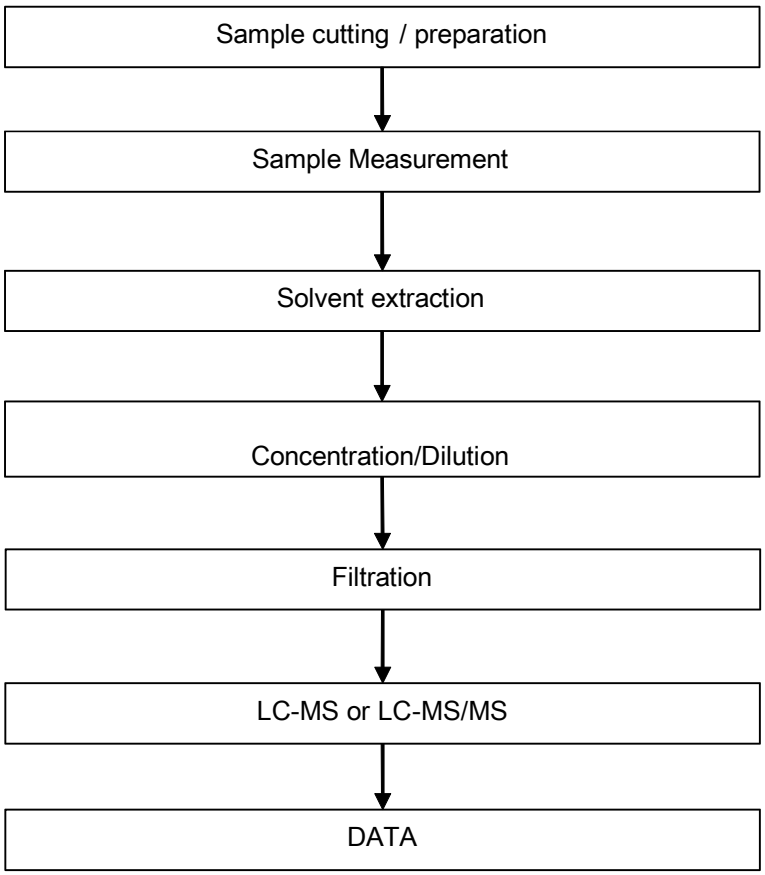

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