

## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第1页,共32页

江阴新顺微电子有限公司  
江苏省江阴市长山大道78号

以下测试之样品是由申请者所提供及确认: 外延PNP芯片

SGS工作编号: SHIN1810072181PC - SH  
样品接收日期: 2018年10月11日  
测试周期: 2018年10月11日 - 2018年10月23日  
测试要求: 根据客户要求测试  
测试方法: 请参见下一页  
测试结果: 请参见下一页  
结论: 基于所送样品的指定部位 进行的测试, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)的测试结果不超过欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

通标标准技术服务(上海)有限公司  
授权签名

Serena Wang 王璟  
批准签署人



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测试结果:

### 测试样品描述:

样品编号	SGS样品ID	描述
SN1	SHA18-227762.001	彩色固体件

备注:

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

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

测试方法: 参考IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017和IEC 62321-6:2015, 采用ICP-OES, AAS, UV-Vis和GC-MS进行分析。

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



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第3页,共32页

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

备注:

(1) 最大允许限值引用自RoHS指令(EU) 2015/863。

IEC 62321系列等同于 EN 62321 系列

[http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1258637,25](http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)

(2) 2015年6月4号发表在欧盟官方杂志(官方公报)上的RoHS指令(EU) 2015/863附录II限值中还包括邻苯二甲酸酯BBP, DBP, DEHP和DIBP。新的指令限制了电子电器产品的每一个均一材质中邻苯二甲酸酯含量不得超过0.1%。

(3) 2021年7月22号开始, DEHP, BBP, DBP 和 DIBP的限制适用于医疗器械, 包括体外医疗器械, 监控仪表, 包括工业监测和控制仪器。

(4) DEHP, BBP, DBP 和 DIBP的限制不适用于2019年7月22日前投放市场的电缆及电子电气产品中用于维修、重复利用、功能更新及容量提升的备用配件以及2021年7月22日前投放市场的医疗器械, 包括体外医疗器械, 监控仪表, 包括工业监测和控制仪器。

(5) DEHP、BBP 和 DBP的限制不适用于玩具产品, 因为No.1907/2006附录XVII第51条已对玩具产品中的DEHP、BBP 和 DBP含量进行了限制。

## 卤素

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

测试项目	单位	MDL	001
氯 (Cl)	mg/kg	50	ND
溴 (Br)	mg/kg	50	ND

## 元素

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



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测试项目	单位	MDL	001
铍 (Be)	mg/kg	5	ND
砷 (As)	mg/kg	10	ND
镍 (Ni)	mg/kg	5	983
锑 (Sb)	mg/kg	10	ND

## 放射性元素

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

测试项目	单位	MDL	001
铯 (Cs)	mg/kg	1	ND
锶 (Sr)	mg/kg	1	ND
铀 (U)	mg/kg	1	ND
钍 (Th)	mg/kg	1	ND

备注: 用盖氏计数器未检测到放射性

## 卤素

测试方法: 参照EN 14582:2007方法测定,采用IC进行分析.

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

## 多氯萘(PCNs)

测试方法: 参照US EPA 8081B: 2007, 采用 GC-MS进行分析.

测试项目	单位	MDL	001
2-氯萘	mg/kg	5	ND
1,4-二氯萘	mg/kg	5	ND
1,5-二氯萘	mg/kg	5	ND



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No. SHAMPLP1822776202

日期: 2018年11月03日 第5页,共32页

测试项目	单位	MDL	001
2-一氯萘	mg/kg	5	ND
1,4-二氯萘	mg/kg	5	ND
1,5-二氯萘	mg/kg	5	ND
1,2-二氯萘	mg/kg	5	ND
1,8-二氯萘	mg/kg	5	ND
1,2,3-三氯萘	mg/kg	5	ND
1,2,3,4-四氯萘	mg/kg	5	ND
1,2,3,4,6-五氯萘	mg/kg	5	ND
八氯萘	mg/kg	5	ND
1-氯萘	mg/kg	5	ND

## 有机锡化合物

测试方法: 参照ISO 17353: 2004 方法测定, 使用二乙基二硫代氨基甲基钠, 采用 GC-MS 进行分析。

测试项目	单位	MDL	001
三丁基锡 (TBT)	mg/kg	0.02	ND
三丁基锡氧化物 (TBTO) ♦	mg/kg	0.02	ND
三丙基锡 (TPT)	mg/kg	0.02	ND

备注:

(1) ♦ 三丁基锡氧化物(TBTO): 由三丁基锡(TBT)含量换算得之。

## 臭氧破坏物质(ODS)

测试方法: 参考US EPA 5021A: 2014, 采用HS-GC-MS 进行分析。

测试项目	CAS NO.	单位	MDL	001
<b>CFC</b>				
六氟化硫	2551-62-4	µg/g	0.1	ND
CFC-11	75-69-4	µg/g	0.1	ND
CFC-12	75-71-8	µg/g	0.1	ND
CFC-113	76-13-1	µg/g	0.1	ND
CFC-114	76-14-2	µg/g	0.1	ND
CFC-13	75-72-9	µg/g	0.1	ND
CFC-111	354-56-3	µg/g	0.1	ND
CFC-112	76-11-9	µg/g	0.1	ND



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日期: 2018年11月03日 第6页,共32页

测试项目	CAS NO.	单位	MDL	001
CFC-112	76-12-0	µg/g	0.1	ND
CFC-113	354-58-5	µg/g	0.1	ND
CFC-114	374-07-2	µg/g	0.1	ND
CFC-115	76-15-3	µg/g	0.1	ND
CFC-211	422-78-6	µg/g	0.1	ND
CFC-212	661-96-1	µg/g	0.1	ND
CFC-213	1652-89-7	µg/g	0.1	ND
CFC-214	677-68-9	µg/g	0.1	ND
CFC-215	1599-41-3	µg/g	0.1	ND
CFC-215	76-17-5	µg/g	0.1	ND
CFC-216	661-97-2	µg/g	0.1	ND
CFC-216	1652-80-8	µg/g	0.1	ND
CFC-217	422-86-6	µg/g	0.1	ND
<b>HCFC</b>				
HCFC-21	75-43-4	µg/g	0.1	ND
HCFC-22	75-45-6	µg/g	0.1	ND
HCFC-123	306-83-2	µg/g	0.1	ND
HCFC-124	2837-89-0	µg/g	0.1	ND
HCFC-141b	1717-00-6	µg/g	0.1	ND
HCFC-142b	75-68-3	µg/g	0.1	ND
HCFC-31	593-70-4	µg/g	0.1	ND
HCFC-121	354-14-3	µg/g	0.1	ND
HCFC-122	354-21-2	µg/g	0.1	ND
HCFC-123a	354-23-4	µg/g	0.1	ND
HCFC-124a	354-25-6	µg/g	0.1	ND
HCFC-131	359-28-4	µg/g	0.1	ND
HCFC-131a	811-95-0	µg/g	0.1	ND
HCFC-132a	471-43-2	µg/g	0.1	ND
HCFC-132b	1649-08-7	µg/g	0.1	ND
HCFC-133a	75-88-7	µg/g	0.1	ND
HCFC-221	422-26-4	µg/g	0.1	ND
HCFC-222	422-30-0	µg/g	0.1	ND
HCFC-223	422-52-6	µg/g	0.1	ND
HCFC-225ca	422-56-0	µg/g	0.1	ND
HCFC-225cb	507-55-1	µg/g	0.1	ND
HCFC-226	431-87-8	µg/g	0.1	ND
HCFC-231	421-94-3	µg/g	0.1	ND
HCFC-232	460-89-9	µg/g	0.1	ND
HCFC-233	7125-84-0	µg/g	0.1	ND
HCFC-234	425-94-5	µg/g	0.1	ND



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日期: 2018年11月03日 第7页,共32页

测试项目	CAS NO.	单位	MDL	001
HCFC-235	460-92-4	µg/g	0.1	ND
HCFC-241	666-27-3	µg/g	0.1	ND
HCFC-242	460-63-9	µg/g	0.1	ND
HCFC-243	338-75-0	µg/g	0.1	ND
HCFC-244	679-85-6	µg/g	0.1	ND
HCFC-251	421-41-0	µg/g	0.1	ND
HCFC-252	819-00-1	µg/g	0.1	ND
HCFC-253	460-35-5	µg/g	0.1	ND
HCFC-261	7799-56-6	µg/g	0.1	ND
HCFC-261	420-97-3	µg/g	0.1	ND
HCFC-271	430-55-7	µg/g	0.1	ND
HCFC-262	102738-79-4	µg/g	0.1	ND
HCFC-262	420-99-5	µg/g	0.1	ND
<b>Halon</b>				
Halon 1211	353-59-3	µg/g	0.1	ND
Halon 1301	75-63-8	µg/g	0.1	ND
Halon 2402	124-73-2	µg/g	0.1	ND
<b>HBFC</b>				
CHF2Br	1511-62-2	µg/g	0.1	ND
CH2FBr	373-52-4	µg/g	0.1	ND
C <sub>2</sub> HFBr <sub>4</sub>		µg/g	0.1	ND
C <sub>2</sub> HF <sub>2</sub> Br <sub>3</sub>		µg/g	0.1	ND
C <sub>2</sub> H <sub>2</sub> F <sub>3</sub> Br <sub>2</sub>	354-04-1	µg/g	0.1	ND
C <sub>2</sub> HF <sub>4</sub> Br		µg/g	0.1	ND
C <sub>2</sub> H <sub>2</sub> FBr <sub>3</sub>		µg/g	0.1	ND
C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>2</sub>	75-82-1	µg/g	0.1	ND
C <sub>2</sub> H <sub>2</sub> F <sub>3</sub> Br	421-06-7	µg/g	0.1	ND
C <sub>2</sub> H <sub>3</sub> FBr <sub>2</sub>		µg/g	0.1	ND
C <sub>2</sub> H <sub>3</sub> F <sub>2</sub> Br	359-07-9	µg/g	0.1	ND
C <sub>2</sub> H <sub>4</sub> FBr	762-49-2	µg/g	0.1	ND
C <sub>3</sub> HFBr <sub>6</sub>		µg/g	0.1	ND
C <sub>3</sub> HF <sub>2</sub> Br <sub>5</sub>		µg/g	0.1	ND
C <sub>3</sub> HF <sub>3</sub> Br <sub>4</sub>		µg/g	0.1	ND
C <sub>3</sub> HF <sub>4</sub> Br <sub>3</sub>		µg/g	0.1	ND
C <sub>3</sub> HF <sub>5</sub> Br <sub>2</sub>		µg/g	0.1	ND
C <sub>3</sub> HF <sub>6</sub> Br		µg/g	0.1	ND
C <sub>3</sub> H <sub>2</sub> FBr <sub>5</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>4</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>2</sub> F <sub>3</sub> Br <sub>3</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> Br <sub>2</sub>		µg/g	0.1	ND



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## 测试报告

No. SHAMLP1822776202

日期: 2018年11月03日 第8页,共32页

测试项目	CAS NO.	单位	MDL	001
C <sub>3</sub> H <sub>2</sub> F <sub>5</sub> Br		µg/g	0.1	ND
C <sub>3</sub> H <sub>3</sub> FBr <sub>4</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>3</sub> F <sub>2</sub> Br <sub>3</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>3</sub> F <sub>3</sub> Br <sub>2</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>3</sub> F <sub>4</sub> Br		µg/g	0.1	ND
C <sub>3</sub> H <sub>4</sub> FBr <sub>3</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>4</sub> F <sub>2</sub> Br <sub>2</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>4</sub> F <sub>3</sub> Br		µg/g	0.1	ND
C <sub>3</sub> H <sub>5</sub> FBr <sub>2</sub>		µg/g	0.1	ND
C <sub>3</sub> H <sub>5</sub> F <sub>2</sub> Br		µg/g	0.1	ND
C <sub>3</sub> H <sub>6</sub> FBr		µg/g	0.1	ND
<b>Others</b>				
二溴氟甲烷	1868-53-7	µg/g	0.1	ND
溴甲烷	74-83-9	µg/g	0.1	ND
溴氯甲烷	74-97-5	µg/g	0.1	ND
<b>HFC</b>				
HFC-23	75-46-7	µg/g	0.1	ND
HFC-32	75-10-5	µg/g	0.1	ND
HFC-41	593-53-3	µg/g	0.1	ND
HFC-43-10mee		µg/g	0.1	ND
HFC-125	354-33-6	µg/g	0.1	ND
HFC-134	359-35-3	µg/g	0.1	ND
HFC-134a	811-97-2	µg/g	0.1	ND
HFC-152a	75-37-6	µg/g	0.1	ND
HFC-143	420-46-2	µg/g	0.1	ND
HFC-143a	430-66-0	µg/g	0.1	ND
HFC-227ea		µg/g	0.1	ND
HFC-236cb		µg/g	0.1	ND
HFC-236ea	431-63-0	µg/g	0.1	ND
HFC-236fa	690-39-1	µg/g	0.1	ND
HFC-245ca	679-86-7	µg/g	0.1	ND
HFC-245fa		µg/g	0.1	ND
HFC-365mfc		µg/g	0.1	ND
<b>PFC</b>				
全氟甲烷	75-73-0	µg/g	0.1	ND
全氟乙烷	76-16-4	µg/g	0.1	ND
全氟丙烷	76-19-7	µg/g	0.1	ND
全氟丁烷	355-25-9	µg/g	0.1	ND
全氟戊烷	678-26-2	µg/g	0.1	ND
全氟己烷	355-42-0	µg/g	0.1	ND



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第9页,共32页

测试项目	CAS NO.	单位	MDL	001
全氟环丁烷	115-25-3	µg/g	0.1	ND
<b>CHC</b>				
1,3-二氯丙烷	142-28-9	µg/g	0.1	ND
2,2-二氯丙烷	594-20-7	µg/g	0.1	ND
四氯化碳	56-23-5	µg/g	0.1	ND
氯乙烷	75-00-3	µg/g	0.1	ND
三氯甲烷	67-66-3	µg/g	0.1	ND
一氯甲烷	74-87-3	µg/g	0.1	ND
顺1,2-二氯乙烯	156-59-2	µg/g	0.1	ND
顺1,3-二氯丙烯	10061-01-5	µg/g	0.1	ND
六氯丁二烯	87-68-3	µg/g	0.1	ND
二氯甲烷	75-09-2	µg/g	0.1	ND
四氯乙烯	127-18-4	µg/g	0.1	ND
反1,2-二氯乙烯	156-60-5	µg/g	0.1	ND
反1,3-二氯丙烯	10061-02-6	µg/g	0.1	ND
三氯乙烯	79-01-6	µg/g	0.1	ND
1,1,1,2-四氯乙烷	630-20-6	µg/g	0.1	ND
甲基氯仿	71-55-6	µg/g	0.1	ND
1,1,2,2-四氯乙烷	79-34-5	µg/g	0.1	ND
1,1,2-三氯乙烷	79-00-5	µg/g	0.1	ND
1,1-二氯乙烷	75-34-3	µg/g	0.1	ND
1,1-二氯乙烯	75-35-4	µg/g	0.1	ND
1,1-二氯丙烷	563-58-6	µg/g	0.1	ND
1,2,3-三氯丙烷	96-18-4	µg/g	0.1	ND
1,2-二氯乙烷	107-06-2	µg/g	0.1	ND
1,2-二氯丙烷	78-87-5	µg/g	0.1	ND

## 灭蚊灵

测试方法: 参照US EPA 8081B: 2007方法测定, 采用GC-MS进行分析.

测试项目	CAS NO.	单位	MDL	001
灭蚊灵	2385-85-5	mg/kg	5	ND

## 溶剂残留



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## 测试报告

No. SHAMLP1822776202

日期: 2018年11月03日 第10页,共32页

测试方法: 参照US EPA 方法8260D: 2017和US EPA 方法 5000:1996, 采用GC-MS进行分析。

测试项目	单位	MDL	001
五氯乙烷	mg/kg	5	ND

## 石棉

测试方法: 参考NIOSH 9000:2015, ISO 22262-1:2012, 用X射线衍射仪(XRD), 偏光显微镜(PLM)测定。

测试项目	CAS NO.	单位	MDL	001
阳起石	77536-66-4	%	0.1	阴性
铁石棉	12172-73-5	%	0.1	阴性
直闪石	77536-67-5	%	0.1	阴性
温石棉	12001-29-5 132207-32-0	%	0.1	阴性
青石棉	12001-28-4	%	0.1	阴性
透闪石	77536-68-6	%	0.1	阴性

备注:

(1) 阴性=未检出石棉, 阳性=检出石棉

## 红磷

测试方法: SGS内部方法(SHTC- CHEM- SOP -342-T), 采用ICP-OES和热裂解GC-MS进行分析。

测试项目	单位	MDL	001
红磷	mg/kg	500	ND

备注:

阳性测试结果基于最坏情况考虑, 并经热裂解GC-MS确认。



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第11页,共32页

### 六溴环十二烷 (HBCDD/HBCD)

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

测试项目	单位	MDL	001
六溴环十二烷 (HBCDD/HBCD)	mg/kg	10	ND

### 阻燃剂-三-(2,3-二溴丙基)-磷酸酯(TDBPP/TRIS)和二-(2,3-二溴丙基)-磷酸酯(BDBPP)

测试方法: 内部方法 (SHTC- CHEM - SOP -102 -T). 采用 LC-MS进行测试.

测试项目	CAS NO.	单位	MDL	001
二-(2,3-二溴丙基)-磷酸酯(BDBPP)	5412-25-9	mg/kg	5	ND
三-(2,3-二溴丙基)-磷酸酯(TDBPP/TRIS)	126-72-7	mg/kg	5	ND

备注:

- (1)磷酸三(2,3-二溴丙基)酯参考信息: 1907/2006/EC Reach 附录XVII的修正指令——552/2009/EC第4条(前身为79/663/EEC):  
磷酸三(2,3-二溴丙基)酯不可用于纺织品, 例如服装、内衣及被单等会与皮肤发生接触的产品。  
详细信息请参见Regulation (EC) No 552/2009

### 短链氯化石蜡(SCCP)

测试方法: 参照US EPA 3550C: 2007, 采用GC-ECD / GC-NCI-MS 进行分析.

测试项目	单位	MDL	001
短链氯化石蜡(SCCP) (C <sub>10</sub> -C <sub>13</sub> )	mg/kg	50	ND

### 甲醛



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第12页,共32页

测试方法: 参照ISO 17226-1: 2008 方法测定, 采用HPLC-DAD进行分析.

测试项目	单位	MDL	001
甲醛	mg/kg	16	ND

## 双酚-A

测试方法: 采用有机溶剂进行萃取, 采用HPLC-MS进行分析.

测试项目	单位	MDL	001
双酚A	mg/kg	1	ND

## 表面离子

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

测试项目	单位	MDL	001
DTDMAC、DODMAC/DSDMAC、DHTDMAC	mg/kg	40	ND
二牛油基二甲基氯化铵(DTDMAC)	mg/kg	20	ND
二硬脂基二甲基氯化铵(DODMAC/DSDMAC)	mg/kg	10	ND
二(硬化牛油脂基)二甲基氯化铵(DHTDMAC)	mg/kg	10	ND

## 三氯生

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

测试项目	单位	MDL	001
三氯生	mg/kg	10	ND
	-	-	A

## 十溴二苯乙烷(DeBDethane)

测试方法: 参照US EPA 8270D:2014/3550C: 2007 方法测定, 采用GC-MS进行分析.



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第13页,共32页

测试项目	CAS NO.	单位	MDL	001
十溴二苯乙烷(DeBDethane)	84852-53-9	mg/kg	25	ND

### 聚氯乙烯(PVC)

测试方法: SGS内定方法 (SHTC- CHEM- SOP -115-T), 采用FTIR-HATR进行分析.

测试项目	CAS NO.	单位	MDL	001
聚氯乙烯(PVC)	9002-86-2	-	-	阴性

备注:

(1) 阴性=未检测到, 阳性=已检测到

### 四溴双酚-A

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

测试项目	单位	MDL	001
四溴双酚-A	mg/kg	10	ND

### 多氯三联苯(PCTs)

测试方法: 参照EPA 8082A: 2007 方法测定, 采用GC-MS进行分析.

测试项目	单位	MDL	001
Aroclor 5432	mg/kg	5	ND
Aroclor 5442	mg/kg	5	ND

### 二甲苯麝香和麝香酮

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



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第14页,共32页

测试项目	单位	MDL	001
二甲苯麝香	mg/kg	10	ND
麝香酮	mg/kg	10	ND

### 感官测试-气味试验

测试方法: 参照PV3900-2000标准.

### 样品 001:

测试样品应用范围类型:

A

储存条件类型	储存条件1	储存条件2	储存条件3
1	2.0 级	2.0 级	3.0 级
2	2.0 级	2.0 级	3.0 级
3	2.0 级	2.0 级	3.0 级
4	2.0 级	2.5 级	3.0 级
5	2.0 级	2.5 级	3.5 级
平均值	2.0 级	2.0 级	3.0 级

#### 1) 评分级别:

评分级别	描述
1 级	不易感觉到
2 级	可感觉到, 不令人讨厌
3 级	可明显感觉到, 但也不令人讨厌
4 级	令人讨厌
5 级	非常令人讨厌
6 级	无法忍受

#### 2) 试样应用范围:

类型	应用范围
A	弹簧夹头, 栓塞, 金属扣眼, 及其他小零件
B	扶手, 烟灰缸, 握柄, 变速排档杆及其他中等程度大小的零件
C	绝缘材料, 薄膜, 皮革, 覆盖材料, 泡沫, 地毯及其他大幅使用的材料

#### 3) 储存条件:

类型	温度	老化时间
1	(23 ± 2)°C	(24 ± 1) h
2	(40 ± 2)°C	(24 ± 1) h
3	(80 ± 2)°C	2h ± 10 min.

### 多氯联苯(PCBs)

测试方法: 参考US EPA 8082A: 2007, 采用 GC-MS进行分析.

测试项目

CAS NO.

单位

MDL

001



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第15页,共32页

测试项目	CAS NO.	单位	MDL	001
2,4,4'-三氯联苯 (PCB 28)	7012-37-5	mg/kg	0.5	ND
2,2',5,5'-四氯联苯 (PCB 52)	35693-99-3	mg/kg	0.5	ND
2,2',4,5,5'-五氯联苯(PCB 101)	37680-73-2	mg/kg	0.5	ND
2,3',4,4',5-五氯联苯(PCB 118)	31508-00-6	mg/kg	0.5	ND
2,2',3,4,4',5'-六氯联苯 (PCB 138)	35065-28-2	mg/kg	0.5	ND
2,2',4,4',5,5'-六氯联苯 (PCB 153)	35065-27-1	mg/kg	0.5	ND
2,2',3,4,4',5,5'-七氯联苯 (PCB 180)	35065-29-3	mg/kg	0.5	ND

## 偶氮染料

测试方法: 参考EN 14362-1:2012 - 采用GC-MS/HPLC-DAD 进行分析.

测试项目	CAS NO.	单位	MDL	001
4-氨基联苯	92-67-1	mg/kg	5	ND
对二氨基联苯	92-87-5	mg/kg	5	ND
4-氯邻甲苯	95-69-2	mg/kg	5	ND
2-萘胺	91-59-8	mg/kg	5	ND
邻氨基二甲基偶氮苯	97-56-3	mg/kg	5	ND
2-氨基-4-硝基甲苯	99-55-8	mg/kg	5	ND
对氯苯胺	106-47-8	mg/kg	5	ND
2, 4-二氨基苯甲醚	615-05-4	mg/kg	5	ND
4,4'-二氨基二苯甲烷	101-77-9	mg/kg	5	ND
3,3'-二氯联苯胺	91-94-1	mg/kg	5	ND
3,3'-二甲氧基联苯胺	119-90-4	mg/kg	5	ND
3,3'-二甲基联苯胺	119-93-7	mg/kg	5	ND
3,3'-二甲基-4,4'-二氨基二苯甲烷	838-88-0	mg/kg	5	ND
3-氨基对甲苯甲醚 (p-克利酚)	120-71-8	mg/kg	5	ND
4,4'-次甲基-双-(2-氯苯胺)	101-14-4	mg/kg	5	ND
4,4'-二氨基二苯醚	101-80-4	mg/kg	5	ND
4,4'-二氨基二苯硫醚	139-65-1	mg/kg	5	ND
邻甲苯胺	95-53-4	mg/kg	5	ND
2,4-二氨基甲苯	95-80-7	mg/kg	5	ND
2,4,5-三甲苯胺	137-17-7	mg/kg	5	ND
4-氨基偶氮苯	60-09-3	mg/kg	5	ND
邻甲氧基苯胺	90-04-0	mg/kg	5	ND
2, 4-二甲苯代胺	95-68-1	mg/kg	5	ND
2, 6-二甲代苯胺	87-62-7	mg/kg	5	ND

结论

##



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第16页,共32页

测试项目  
结论

CAS NO.

单位

MDL

001  
##

备注:

- (1) EN 14362-1:2012 方法使4-氨基偶氮苯(CAS No:60-09-3)在本实验条件下进一步裂解为非禁用的胺:苯胺或1,4-苯二胺. 如果如果经上述测试方法没有检出苯胺和/或1,4-苯二胺(i.e. <5mg/kg), 则认为 4-氨基偶氮苯(CAS No:60-09-3) “未检出” (i.e. <5mg/kg). 否则, 将采用EN 14362-3:2012 方法验证4-氨基偶氮苯的存在.
- (2) ## =对于纺织品, 要求相关苯胺含量不超过30mg/kg, 此测试方法仅适用于纺织品, 测试结果仅供客户参考.
- (3) 4 氨基联苯(CAS No. 92-67-1), 2 萘胺(CAS number 91-59-8), 2,4 二氨基苯甲醚(CAS No. 615-05-4) 有检出时, 如果没有进一步的信息(如染料的化学结构)提供, 并不能确认使用了禁用的偶氮染料.
- (4) 当样品中含有聚氨酯材料(如含PU泡沫、PU涂层和PU胶印)时, 某些胺类, 若4,4' 二氨基二苯甲烷(MDA, CAS No. 101-77-9) 和 2,4 二氨基甲苯(TDA, CAS No. 95-80-7) 有检出, 并不能确认其来自PU材料而非禁用偶氮染料.
- (5) 当样品中含有胶印时, 若4,4' 二氨基二苯甲烷(MDA, CAS No. 101-77-9) 有检出, 需要注意该物质可能不是来源于禁用的偶氮染料, 而是来源于其它物料, 如化学固色剂.
- (6) 这项测试由宁波SGS化学实验室检测.

### 邻苯二甲酸盐(或酯)

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

测试项目	CAS NO.	单位	MDL	001
邻苯二甲酸二丁酯(DBP)	84-74-2	%	0.003	ND
邻苯二甲酸丁苄酯 (BBP)	85-68-7	%	0.003	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	117-81-7	%	0.003	ND
邻苯二甲酸二异壬酯 (DINP)	28553-12-0/ 68515-48-0	%	0.01	ND
邻苯二甲酸二正辛酯 (DNOP)	117-84-0	%	0.003	ND
邻苯二甲酸二异癸酯 (DIDP)	26761-40-0 /68515-49-1	%	0.01	ND
邻苯二甲酸二异丁酯(DIBP)	84-69-5	%	0.003	ND
邻苯二甲酸二正己酯(DnHP)	84-75-3	%	0.003	ND

备注:

- (1) DBP, BBP, DEHP 参考信息: 1907/2006/EC Reach 附录XVII的修正指令——552/2009/EC 第51条 (前身为2005/84/EC) 的要求:
  - i) 不允许DBP, BBP, DEHP 质量浓度高于0.1%的可塑性物料用于玩具和儿童护理品
  - ii) 当玩具和儿童护理品中的可塑性物料含DBP, BBP, DEHP 质量浓度高于0.1%时,不得投放市场  
详细信息请参见Regulation (EC) No 552/2009
- DINP, DNOP, DIDP 参考信息: 1907/2006/EC Reach 附录XVII的修正指令——552/2009/EC 第52条 (前身为2005/84/EC) 的要求:



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## 测试报告

No. SHAMPLP1822776202

日期: 2018年11月03日 第17页,共32页

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

详细信息请参见Regulation (EC) No 552/2009

### 苯并三唑类紫外吸收剂

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

测试项目	单位	MDL	001
2-(2'-羟基-3',5'-二叔丁基苯基)-苯并三唑(CAS No: 3846-71-7)	mg/kg	5	ND
2-(2'-羟基-3',5'-二叔丁基苯基)-5-氯代苯并三唑(CAS No: 3864-99-1)	mg/kg	5	ND
2-(2'-羟基-3',5'-二叔戊基苯基)苯并三唑(CAS No: 25973-55-1)	mg/kg	5	ND
2-(2'-羟基-3'-异丁基-5'-叔丁基苯基)苯并三唑(CAS No: 36437-37-3)	mg/kg	5	ND

### 五氯苯酚 (PCP)

测试方法: 参照LFGB § 64 BVL B 82.02.8 - 2001, 采用GC-ECD或GC-MS进行分析.

测试项目	单位	MDL	001
五氯苯酚	mg/kg	0.05	ND

### VOC

测试方法: 参照US EPA 5021A:2014 方法测定, 采用HS-GC-MS进行分析.

测试项目	CAS NO.	单位	MDL	001
1,1,2,2-四氯乙烷	79-34-5	µg/g	1	ND
1,1,1,2-四氯乙烷	630-20-6	µg/g	1	ND
1,1-二氯乙烯	75-35-4	µg/g	1	ND
二氯甲烷	75-09-2	µg/g	1	ND
1,1-二氯乙烷	75-34-3	µg/g	1	ND
四氯化碳	56-23-5	µg/g	1	ND
氯仿	67-66-3	µg/g	1	ND
三氯乙烯	79-01-6	µg/g	1	ND
四氯乙烯	127-18-4	µg/g	1	ND

### 全氟辛烷磺酸 (PFOS)及衍生物和全氟辛酸(PFOA)

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



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## 测试报告

No. SHMLP1822776202

日期: 2018年11月03日 第18页,共32页

测试项目	限值	单位	MDL	001
全氟辛烷磺酸(PFOS)及衍生物 <sup>^</sup>	1000	mg/kg	10	ND
全氟辛酸 (PFOA)	-	mg/kg	10	ND

备注:

- (1) 最大允许限制引用自(EC) No. 850/2004 的修订指令欧盟决议(EU) No. 757/2010.
- (2) <sup>^</sup>= PFOS 包含全氟辛烷磺酸(PFOS), 全氟辛基磺酰胺(PFOSA), 2-(N-乙基全氟辛基磺酰胺)乙醇(EtFOSE), N-甲基全氟辛烷磺酰胺(MeFOSA), N-乙基全氟辛烷磺酰胺(EtFOSA)和2-(N-甲基全氟辛基磺酰胺)乙醇(MeFOSE)。

### 多环芳香烃(PAH)

测试方法: 参照ZEK-01.4-08 及其后续指令, 采用 GC-MS 进行分析.

测试项目	单位	MDL	001
18项多环芳香烃总和	mg/kg	-	ND
萘 (NAP)	mg/kg	0.1	ND
苊烯(ANY)	mg/kg	0.1	ND
苊(萘嵌戊烷) (ANA)	mg/kg	0.1	ND
芴 (FLU)	mg/kg	0.1	ND
菲 (PHE)	mg/kg	0.1	ND
蒽 (ANT)	mg/kg	0.1	ND
荧蒽 (FLT)	mg/kg	0.1	ND
芘 (PYR)	mg/kg	0.1	ND
苯并(a)蒽 (BaA)	mg/kg	0.1	ND
屈 (CHR)	mg/kg	0.1	ND
苯并(b)荧蒽 (BbF)和苯并(j)荧蒽 (BjF)	mg/kg	0.1	ND
苯并(k)荧蒽 (BkF)	mg/kg	0.1	ND
苯并(a)芘 (BaP)	mg/kg	0.1	ND
苯并(e)芘 (BeP)	mg/kg	0.1	ND
茚并(1,2,3-c,d)芘 (IPY)	mg/kg	0.1	ND
二苯并(a,h)蒽(DBA)	mg/kg	0.1	ND
苯并(g,h,i)芘(二萘嵌苯) (BPE)	mg/kg	0.1	ND

备注:

上面8种多环芳烃(BaA,CHR,BbF,BjF,BkF,BeP,BaP,DBA) 是列于 REACH的法规(EC)第1907/2006中的附录XVII修正指令1272/2013 (EU):

- (1) 为了保护消费者的健康, 避免产品中多环芳香烃引起的危害, 需限定产品中可接触塑料或橡胶部件的多环芳香烃含量, 投放于市场的产品中这些部件如含有以上任意多环芳香烃浓度大于1mg/kg时应被禁止。



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(2) 考虑到儿童更易受伤害, 需制定更低的下限。因此投放于市场的玩具与儿童产品中可接触的塑料或橡胶部分含有以上任意多环芳香烃浓度大于0.5mg/kg的产品应该被禁止。

2014年8月4日, 德国产品安全委员会 (AfPS) 发布了关于多环芳香烃 (PAHs) 新文件, 该文件已被GS认证机构对于进行GS标志认证所考虑。之前的PAK文件 (ZEK 01.4-08, 英文版本) 于2015年6月30日废除。

### ZEK 01.4-08: 产品最大控制值

参数	1 类	2 类	3 类
	设计意图为放入口中的材料, 以及 36 个月以下幼儿的玩具上与皮肤接触的材料	未在 1 类规定中涵盖的材料, 且可能与皮肤长期接触的材料(接触时间大于 30 秒)	未在 1 和 2 类规定中涵盖的材料, 且可能与皮肤短期接触的材料(接触时间小于等于 30 秒)
BaP 含量(mg/kg)	< 0.2**	1	20
18 种 PAHs 总量(mg/kg)*	< 0.2**	10	200

备注:

\* = 仅物质浓度大于 0.1 mg/kg 时才用于计算 18 项 PAHs 总量

\*\* = 若设计意图为放入口中的材料的测试结果大于 1 类限值但不超过 2 类限值, 需再依据 DIN EN 1186ff 及§64 LFGB 80.30-1 进行 PAH 的迁移性测试并根据相关食品法规进行判定。

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



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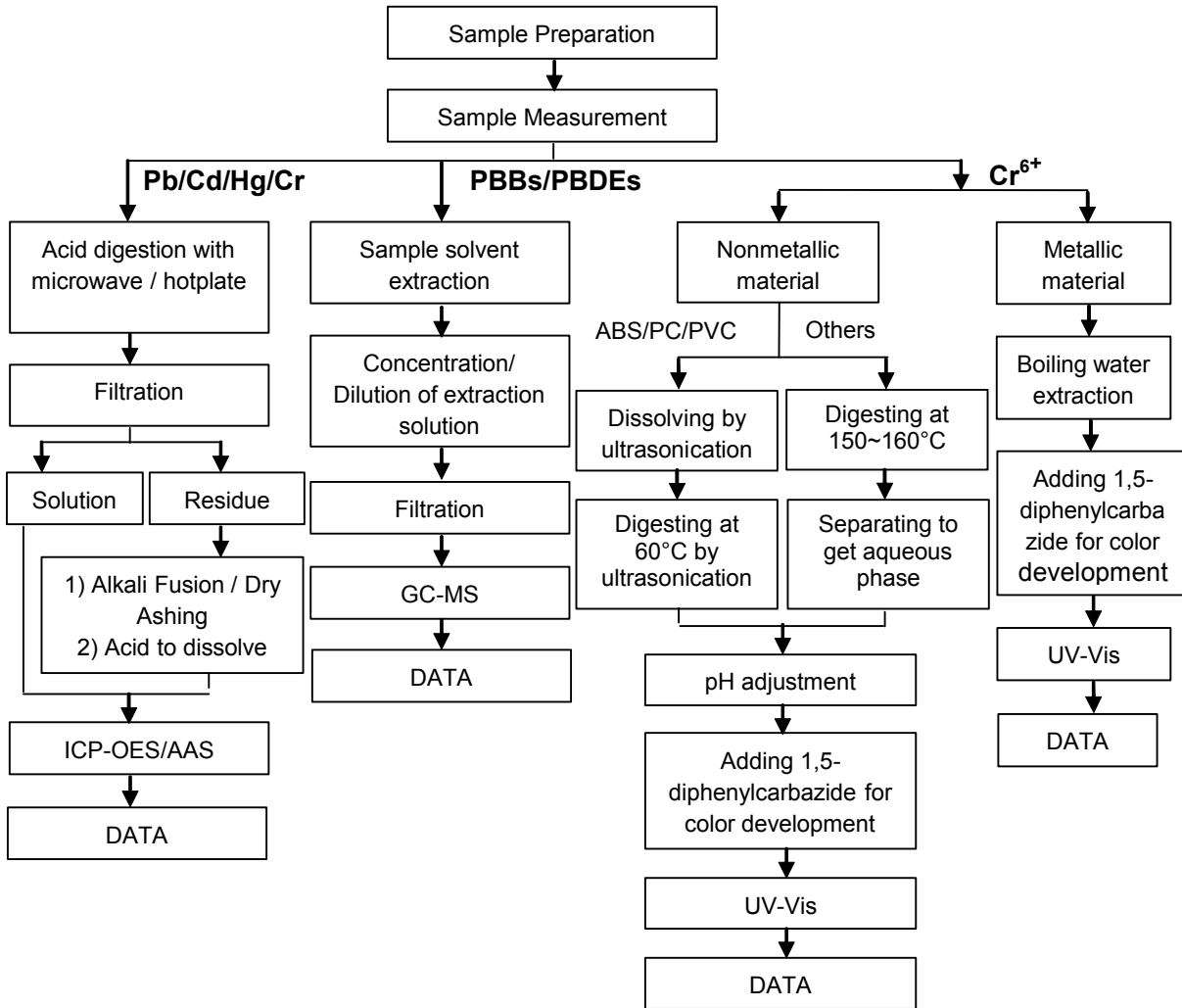
t HL (86-21) 61402594 f HL (86-21) 61156899

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**Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs Testing Flow Chart**

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



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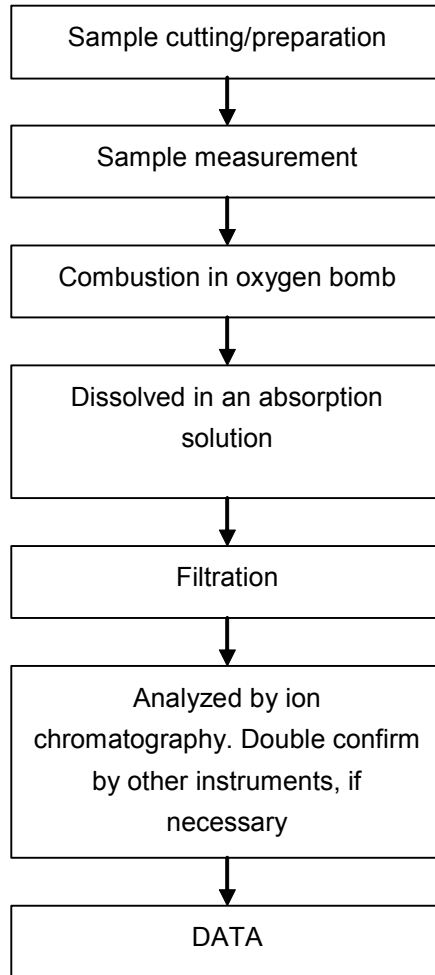
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Halogen Testing (oxygen bomb) Flow Chart

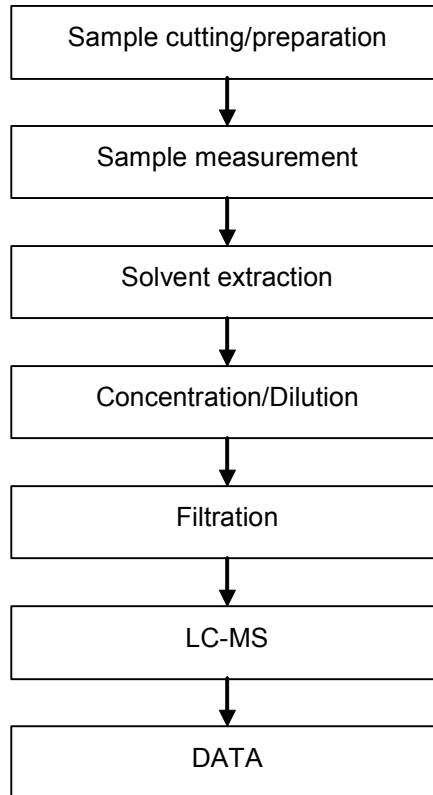


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### PFOS/PFOA Testing Flow Chart

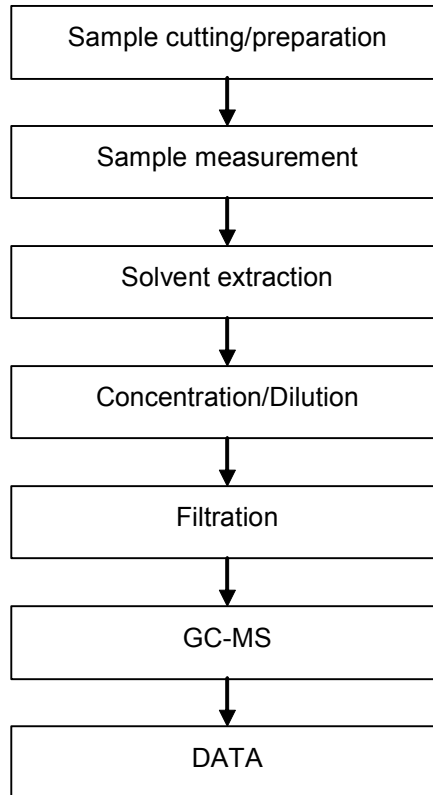


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### PAHs Testing Flow Chart

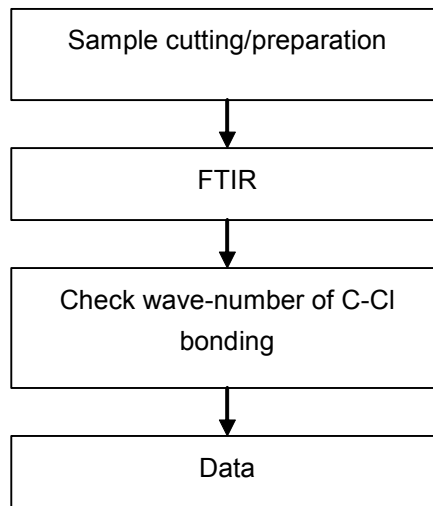


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### PVC Testing Flow Chart



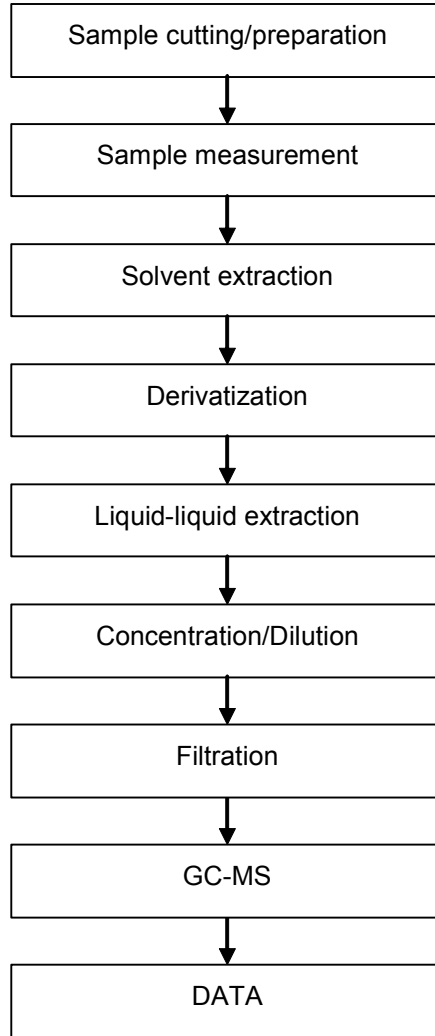
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**TBBP-A Testing Flow Chart**



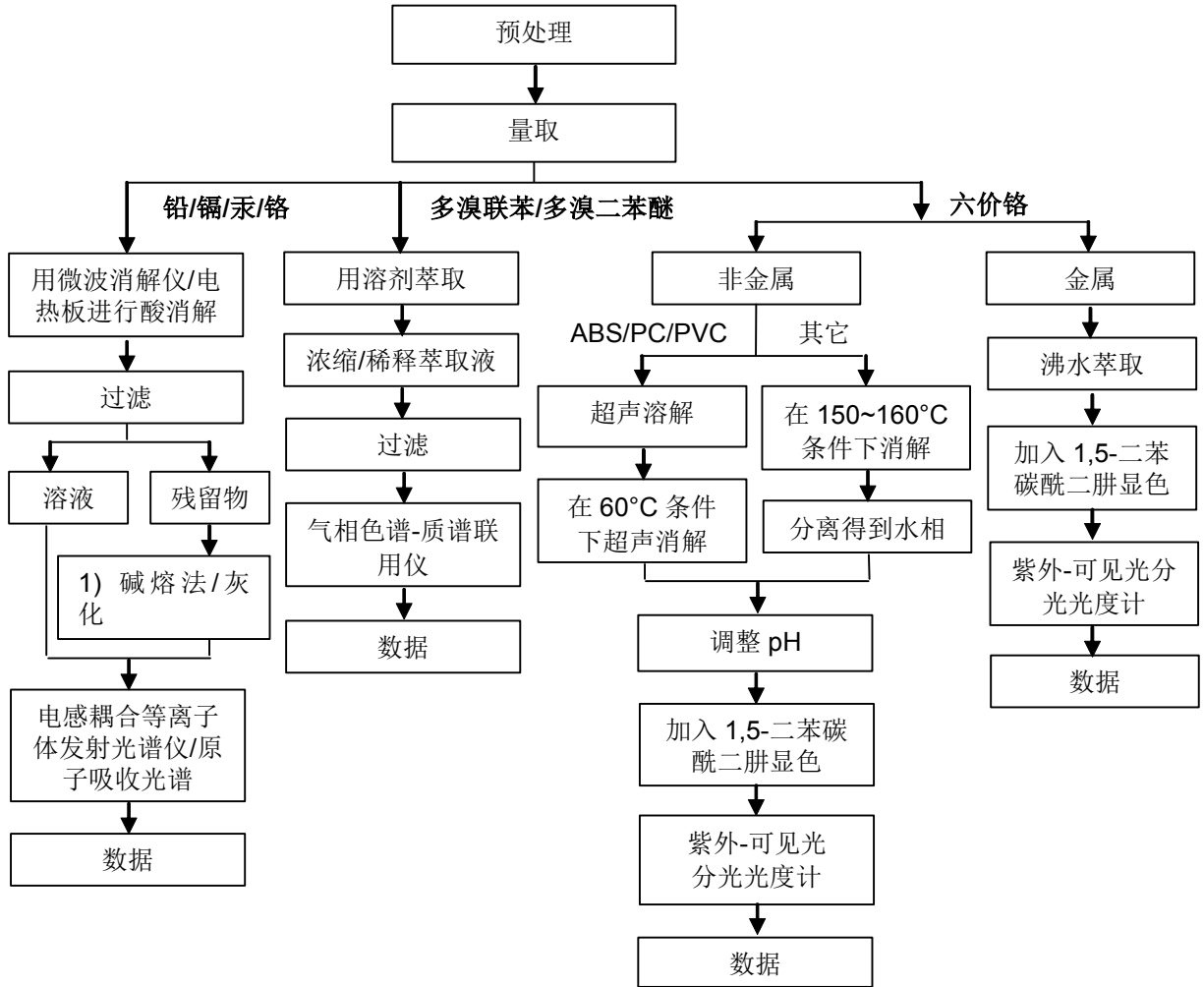
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附件

## Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs 测试流程图

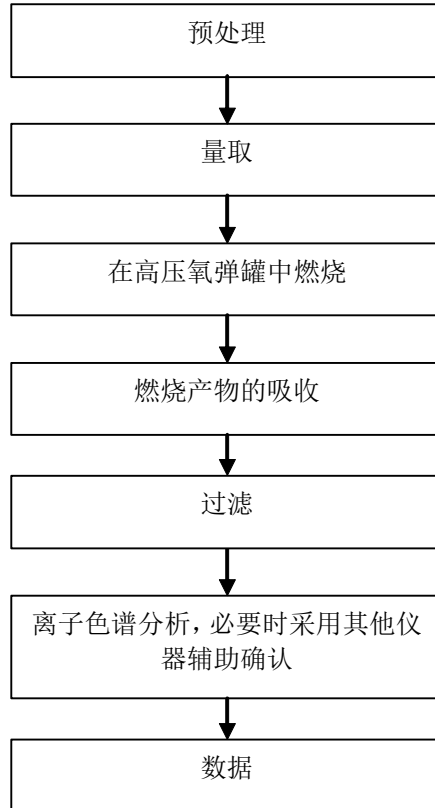
1)样品按照下述流程被完全消解（六价铬和多溴联苯/多溴二苯醚测试除外）。



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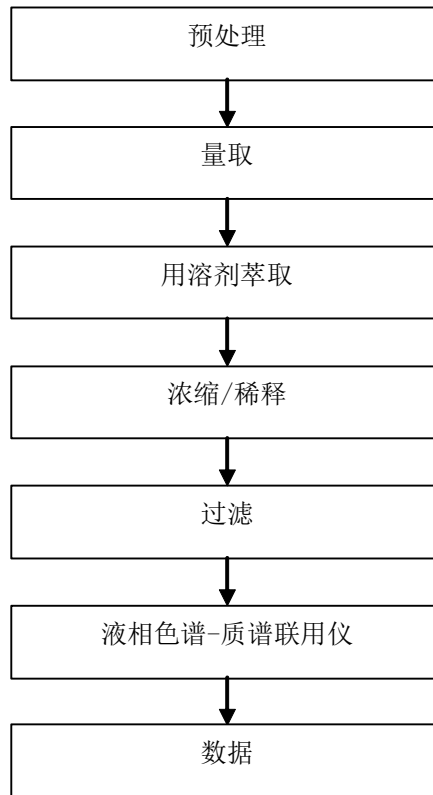
## Halogen(氧弹法)测试流程图



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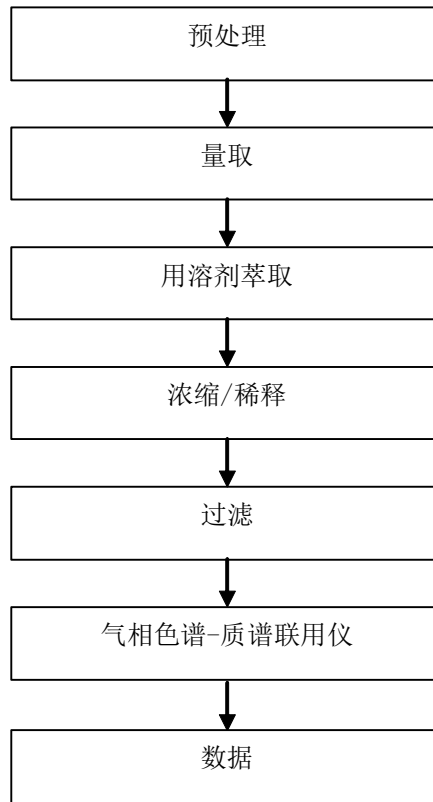
## PFOS/PFOA 测试流程图



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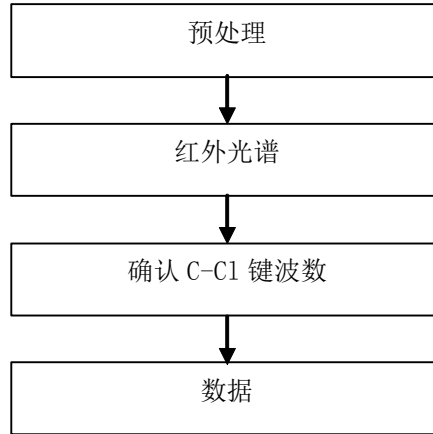
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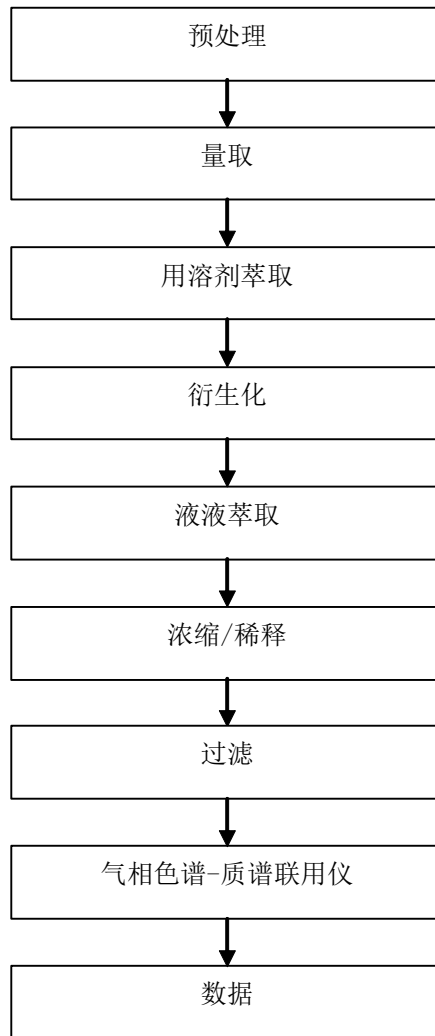
## PVC 测试流程图



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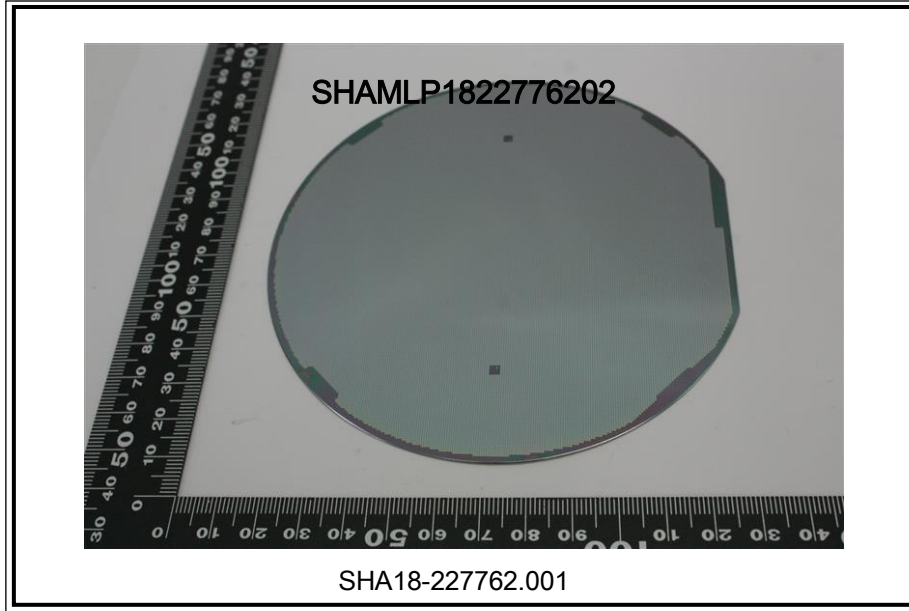
### TBBP-A 测试流程图



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