

## 检测报告

编号: CANEC24012991402

日期: 2024 年 07 月 01 日

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客户名称: 建滔积层板控股有限公司  
客户地址: 香港新界沙田安耀街三号汇达大厦二十三楼

样品名称: HF-140  
型号: HF-140

以上样品及信息由客户提供。

SGS 工作编号: GZP24-019464  
样品接收时间: 2024 年 06 月 17 日  
检测周期: 2024 年 06 月 17 日 ~ 2024 年 06 月 28 日  
检测要求: 根据客户要求检测  
检测方法: 见后续页。  
检测结果: 见后续页。

检测要求	结论
欧盟 RoHS 指令 2011/65/EU 附录 II 的修正指令(EU) 2015/863-铅、汞、镉、六价铬、多溴联苯 (PBB)、多溴二苯醚 (PBDE)、邻苯二甲酸二(2-乙基己基)酯 (DEHP)、邻苯二甲酸丁苄酯 (BBP)、邻苯二甲酸二丁酯 (DBP)和邻苯二甲酸二异丁酯 (DIBP)	符合
四溴双酚 A (TBBP-A)	见检测结果
中链氯化石蜡(C14-C17) (MCCPs)	见检测结果
EN 71-9:2005+A1:2007 - 甲醛	符合
AfPS GS 2019:01 PAK-多环芳香烃 (PAHs)	见检测结果
美国环保署有毒物质控制法 (TSCA) 第 6 (h)节规定的持久性、生物累积性和毒性 (PBT) 化学物质	符合
卤素	见检测结果

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授权签名

陈江梨

Allie Chen 陈江梨  
批准签署人

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检测要求	结论
元素分析	见检测结果
红磷	见检测结果
多氯联苯(PCBs)	见检测结果
苯并三唑类紫外吸收剂	见检测结果
双酚-A	见检测结果
氯化石蜡	见检测结果
富马酸二甲酯 (DMFu)	见检测结果
六溴环十二烷(HBCDD)	见检测结果
有机锡化合物	见检测结果
邻苯二甲酸酯	见检测结果
聚氯乙烯 (PVC)	见检测结果

## 检测结果:

## 检测部件外观描述:

样品序号	样品编号	SGS 样品 ID	样品描述
SN1	A1	CAN24-0129914-0001.C001	双面覆铜板

## 备注:

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

欧盟 RoHS 指令 2011/65/EU 附录 II 的修正指令(EU) 2015/863-铅、汞、镉、六价铬、多溴联苯 (PBB)、多溴二苯醚 (PBDE)、邻苯二甲酸二(2-乙基己基)酯 (DEHP)、邻苯二甲酸丁苄酯 (BBP)、邻苯二甲酸二丁酯 (DBP)和邻苯二甲酸二异丁酯 (DIBP)

检测方法: 参考 IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015 和 IEC 62321-8:2017, 采用 ICP-OES/AAS, UV-Vis 和 GC-MS 进行分析。

检测项目	限值	单位	MDL	A1
铅 (Pb)	1000	mg/kg	2	12
汞 (Hg)	1000	mg/kg	2	ND
镉 (Cd)	100	mg/kg	2	ND
六价铬 (Cr(VI))	1000	mg/kg	8	ND



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检测项目	限值	单位	MDL	A1
多溴联苯之和 (PBB)	1000	mg/kg	-	ND
一溴联苯 (MonoBB)	-	mg/kg	5	ND
二溴联苯 (DiBB)	-	mg/kg	5	ND
三溴联苯 (TriBB)	-	mg/kg	5	ND
四溴联苯 (TetraBB)	-	mg/kg	5	ND
五溴联苯 (PentaBB)	-	mg/kg	5	ND
六溴联苯 (HexaBB)	-	mg/kg	5	ND
七溴联苯 (HeptaBB)	-	mg/kg	5	ND
八溴联苯 (OctaBB)	-	mg/kg	5	ND
九溴联苯 (NonaBB)	-	mg/kg	5	ND
十溴联苯 (DecaBB)	-	mg/kg	5	ND
多溴二苯醚之和 (PBDE)	1000	mg/kg	-	ND
一溴二苯醚 (MonoBDE)	-	mg/kg	5	ND
二溴二苯醚 (DiBDE)	-	mg/kg	5	ND
三溴二苯醚 (TriBDE)	-	mg/kg	5	ND
四溴二苯醚 (TetraBDE)	-	mg/kg	5	ND
五溴二苯醚 (PentaBDE)	-	mg/kg	5	ND
六溴二苯醚 (HexaBDE)	-	mg/kg	5	ND
七溴二苯醚 (HeptaBDE)	-	mg/kg	5	ND
八溴二苯醚 (OctaBDE)	-	mg/kg	5	ND
九溴二苯醚 (NonaBDE)	-	mg/kg	5	ND
十溴二苯醚 (DecaBDE)	-	mg/kg	5	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND

## 备注:

(1) 最大允许极限值引用自 RoHS 指令(EU) 2015/863。

(2) IEC 62321 系列等同于 EN 62321 系列。

(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。

## 四溴双酚 A (TBBP-A)

检测方法: 参考 US EPA 3550C: 2007, 采用 GC-MS 或 LC-MS 或 LC-MS/MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
四溴双酚 A(TBBP-A)	79-94-7	mg/kg	5	ND

## 中链氯化石蜡(C14-C17) (MCCPs)

检测方法: 参考 ISO 22818:2021, 采用 GC-NCI-MS 进行分析。

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检测项目	CAS No.	单位	MDL	A1
中链氯化石蜡(C <sub>14</sub> -C <sub>17</sub> ) (MCCPs)	85535-85-9 和其它	mg/kg	50	ND

**EN 71-9:2005+A1:2007 - 甲醛**

检测方法: 参考 EN ISO 14184-1:2011, 采用 UV-Vis 进行分析。

检测项目	限值	单位	MDL	A1
甲醛	30	mg/kg	16	ND
结论	符合			

**AfPS GS 2019:01 PAK-多环芳香烃 (PAHs)**

检测方法: 参考 AfPS GS 2019:01 PAK, 采用 GC-MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
苯并(a)芘 (BaP)	50-32-8	mg/kg	0.1	ND
苯并(e)芘 (BeP)	192-97-2	mg/kg	0.1	ND
苯并(a)蒽 (BaA)	56-55-3	mg/kg	0.1	ND
苯并(b)荧蒽 (BbF)	205-99-2	mg/kg	0.1	ND
苯并(j)荧蒽 (BjF)	205-82-3	mg/kg	0.1	ND
苯并(k)荧蒽 (BkF)	207-08-9	mg/kg	0.1	ND
蒽 (CHR)	218-01-9	mg/kg	0.1	ND
二苯并(a,h)蒽 (DBA)	53-70-3	mg/kg	0.1	ND
苯并(g,h,i)芘(二苯嵌苯) (BPE)	191-24-2	mg/kg	0.1	ND
茚并(1,2,3-c,d)芘 (IPY)	193-39-5	mg/kg	0.1	ND
菲 (PHE)	85-01-8	mg/kg	0.1	ND
芘 (PYR)	129-00-0	mg/kg	0.1	ND
蒽 (ANT)	120-12-7	mg/kg	0.1	ND
荧蒽 (FLT)	206-44-0	mg/kg	0.1	ND
4 项多环芳香烃总和[菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT)]	-	mg/kg	-	ND
萘 (NAP)	91-20-3	mg/kg	0.1	ND
15 项多环芳香烃总和	-	mg/kg	-	ND
材料分类	-	-	-	-

备注:

**AfPS(德国产品安全委员会): 认证对多环芳香烃的要求**

	1 类	2 类	3 类
参数 单位: mg/kg	设计意图为放入口中的材料, 或与皮肤长期接触 (超过 30 秒) 的材料用于	不属于第 1 类, 设计意图或可预见 <sup>d</sup> 与皮肤长期接触 (超过 30 秒) 或短期重复接触 <sup>e</sup> 的材料	不属于第 1 和 2 类, 设计意图或可预见与皮肤短期接触 (不超过 30 秒) 材料

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	-2009/48/EC 定义的玩具, 或 -供 3 岁以下儿童 a,b 使用。	a.供儿童使用的产品	b.其他产品	a.供儿童使用的产品	b.其他产品
苯并(a)芘 (BaP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(e)芘 (BeP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(a)蒽 (BaA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(b)荧蒽 (BbF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(j)荧蒽 (BjF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(k)荧蒽 (BkF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
蒽 (CHR), mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
二苯并(a,h)蒽 (DBA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(g,h,i)苝(二苯并(a,h)苝) (BPE)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
茚并(1,2,3-c,d)芘 (IPY)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT)	< 1 (总和)	< 5 (总和)	< 10 (总和)	< 20 (总和)	< 50 (总和)
萘 (NAP)	< 1	< 2		< 10	
15 PAH 之和	<1	< 5	< 10	< 20	< 50

## 注释:

a 儿童是指法定年龄未满 14 周岁的人。

b 供儿童使用包括儿童的主动接触或被动接触。

c “短期重复接触”的定义摘自 REACH 附录 XVII 第 50 条修正案 (EC) No. 1272/2013)。

d 根据德国产品安全法 (ProdSG) (第一章第 2 条第 28 款) 的定义, “可预见的使用”是指将产品投放市场的人无意但可以合理预见的方式使用产品。

## 备注:

德国产品安全委员会 (AfPS) 于 2020 年 4 月 10 日发布了关于多环芳香烃 (PAHs) 的新文件 (AfPS GS 2019:01 PAK), 该文件将于 2020 年 7 月 1 日起用于 GS-MARK 认证。

## 美国环保署有毒物质控制法 (TSCA) 第 6 (h) 节规定的持久性、生物累积性和毒性 (PBT) 化学物质

检测方法: SGS 内部方法(SGS-CCL-TOP-149-07, 参考 US EPA 方法 3550C:2007), 采用 GC-MS 进行分析。

检测项目	CAS No.	限值	单位	MDL	A1
十溴二苯醚 (Deca-BDE) <sup>Δ1</sup>	1163-19-5	禁用	mg/kg	5	ND
异丙基化磷酸三苯酯 (PIP 3:1) <sup>Δ2</sup>	68937-41-7	禁用	mg/kg	5	ND
2,4,6-三叔丁基苯酚 (2,4,6-TTBP) <sup>Δ3</sup>	732-26-3	3000	mg/kg	5	ND
六氯丁二烯 (HCBD)	87-68-3	禁用	mg/kg	5	ND
五氯苯硫酚 (PCTP)	133-49-3	10000	mg/kg	5	ND

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检测项目	CAS No.	限值	单位	MDL	A1
结论					符合

## 备注:

(1) 法规信息请参见下链接

<https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/persistent-bioaccumulative-and-toxic-pbt-chemicals-under>(2) <sup>Δ1</sup>: 若送测样品来自于产品或物品含有十溴二苯醚的产品或物品的回收塑料, 则可豁免;(3) <sup>Δ2</sup>: 提交的样品有下列情形之一的, 不在法规的管控范围内:

- 用于航空或军事用途的液压油;
  - 润滑剂和润滑脂;
  - 汽车和航空航天车辆的新零件和替换零件;
  - 生产氰基丙烯酸酯胶粘剂的中间体;
  - 机车和船用专用发动机空气滤清器;
  - 来自于含有 PIP (3:1) 的产品或物品的回收塑料;
  - 用含有 PIP (3:1) 回收产品或物品的塑料制成的产品或物品
- (4) <sup>Δ3</sup>: 提交的样品如果不是机油或润滑油, 则不在法规的管控范围内;

## 卤素

检测方法: 参考 EN 14582:2016, 采用 IC 进行分析。

检测项目	单位	MDL	A1
氟 (F)	mg/kg	20	834
氯 (Cl)	mg/kg	50	174
溴 (Br)	mg/kg	50	ND
碘 (I)	mg/kg	50	ND

## 元素分析

检测方法: 参考 US EPA 3052:1996, 采用 ICP-OES/AAS 进行分析。

检测项目	单位	MDL	A1
砷(As)	mg/kg	10	ND
铍(Be)	mg/kg	5	ND
镍(Ni)	mg/kg	5	ND
锑(Sb)	mg/kg	10	ND

## 红磷

检测方法: SGS 内部方法 (SGS-CCL-TOP-215-01), 采用 PY-GC/MS/ ICP-OES / GC-MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
红磷	7723-14-0	mg/kg	500	ND

## 多氯联苯(PCBs)

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## 检测报告

编号: CANEC24012991402

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检测方法: SGS 内部方法 (GZTC CHEM-TOP-032-01, 参考 EPA 8082A:2007), 采用 GC-ECD/GC-MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
2,4,4'-三氯联苯(PCB28)	7012-37-5	mg/kg	0.5	ND
2,2',5,5'-四氯联苯(PCB52)	35693-99-3	mg/kg	0.5	ND
2,2',4,5,5'-五氯联苯(PCB101)	37680-73-2	mg/kg	0.5	ND
2,3',4,4',5-五氯联苯(PCB118)	31508-00-6	mg/kg	0.5	ND
2,2',3,4,4',5'-六氯联苯(PCB138)	35065-28-2	mg/kg	0.5	ND
2,2',4,4',5,5'-六氯联苯(PCB153)	35065-27-1	mg/kg	0.5	ND
2,2',3,4,4',5,5'-七氯联苯(PCB180)	35065-29-3	mg/kg	0.5	ND

## 苯并三唑类紫外吸收剂

检测方法: 参考 SGS 内部方法, 采用 GC-MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
2-苯并三唑-2-基-4,6-二叔丁基苯酚(UV 320)	3846-71-7	mg/kg	5	ND
2-(2H-苯并三唑-2-基)-4-(叔丁基)-6-(仲丁基)苯酚(UV 350)	36437-37-3	mg/kg	5	ND
2-(2H-苯并三唑-2-基)-4,6-二叔戊基苯酚(UV 328)	25973-55-1	mg/kg	5	ND
2,4-二叔丁基-6-(5-氯苯并三唑-2-基)苯酚(UV 327)	3864-99-1	mg/kg	5	ND
地莫米唑	2440-22-4	mg/kg	100	ND

## 双酚-A

检测方法: SGS 内部方法(GZTC CHEM-TOP-075-02, 参考 EPA 3550C:2007 和 EPA 8321B:2007), 采用 HPLC-DAD/MS / LC-MS/MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
双酚-A	80-05-7	mg/kg	1.0	ND

## 氯化石蜡

检测方法: 参考 ISO 22818:2021, 采用 GC-NCI-MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
短链氯化石蜡(SCCP)(C <sub>10</sub> -C <sub>13</sub> )	85535-84-8	mg/kg	50	ND

## 富马酸二甲酯 (DMFu)

检测方法: 参考 US EPA 3550C:2007, 采用 GC-MS 进行分析。



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检测项目	CAS No.	单位	MDL	A1
富马酸二甲酯 (DMFu)	624-49-7	mg/kg	0.1	ND

六溴环十二烷(HBCDD)

检测方法: 参考 IEC 62321-9:2021, 采用 GC-MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
六溴环十二烷(HBCDD)及其非对映异构体( $\alpha$ -HBCDD, $\beta$ -HBCDD, $\gamma$ -HBCDD)	134237-50-6 /134237-51-7 /134237-52-8 /25637-99-4 /3194-55-6	mg/kg	20	ND

有机锡化合物

检测方法: 参考 ISO 17353:2004, 采用 GC-MS 进行分析。

检测项目	单位	MDL	A1
二丁基锡(DBT)	mg/kg	0.02	ND
三丁基锡(TBT)	mg/kg	0.02	ND
二辛基锡(DOT)	mg/kg	0.02	ND
三苯基锡(TPhT)	mg/kg	0.02	ND
三环己基锡(TCyHT)	mg/kg	0.02	ND
三甲基锡(TMT)	mg/kg	0.02	ND
三辛基锡(TOT)	mg/kg	0.02	ND
三丙基锡(TPT)	mg/kg	0.02	ND

邻苯二甲酸酯

检测方法: 参考 IEC 62321-8:2017, 采用 GC-MS 进行分析。

检测项目	CAS No.	单位	MDL	A1
邻苯二甲酸二丁酯 (DBP)	84-74-2	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯(DEHP)	117-81-7	mg/kg	50	ND
邻苯二甲酸丁苄酯(BBP)	85-68-7	mg/kg	50	ND
邻苯二甲酸二异壬酯(DINP)	28553-12-0 /68515-48-0	mg/kg	50	ND
邻苯二甲酸二辛酯(DNOP)	117-84-0	mg/kg	50	ND
邻苯二甲酸二异癸酯(DIDP)	26761-40-0 /68515-49-1	mg/kg	50	ND
邻苯二甲酸二异丁酯(DIBP)	84-69-5	mg/kg	50	ND
邻苯二甲酸二(2-甲氧基乙基)酯(DMEP)	117-82-8	mg/kg	50	ND
邻苯二甲酸二正己酯(DnHP)	84-75-3	mg/kg	50	ND
邻苯二甲酸二戊酯 (DPENP/ DnPP)	131-18-0	mg/kg	50	ND

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检测项目	CAS No.	单位	MDL	A1
邻苯二甲酸二苯酯(DPhP)	84-62-8	mg/kg	50	ND
邻苯二甲酸双十一酯(DUDP)	3648-20-2	mg/kg	50	ND
邻苯二甲酸二甲酯(DMP)	131-11-3	mg/kg	50	ND
邻苯二甲酸二乙酯(DEP)	84-66-2	mg/kg	50	ND
邻苯二甲酸二丙酯(DPrP)	131-16-8	mg/kg	50	ND
邻苯二甲酸二环己酯(DCHP)	84-61-7	mg/kg	50	ND
邻苯二甲酸二苯甲酯(DBzP)	523-31-9	mg/kg	50	ND
邻苯二甲酸二壬酯(DNP)	84-76-4	mg/kg	50	ND
邻苯二甲酸二异辛酯(DIOP)	27554-26-3	mg/kg	50	ND
邻苯二甲酸二丙烯酯(DAP)	131-17-9	mg/kg	50	ND
1,2-苯二甲酸癸基辛基酯(nDnOP)	119-07-3	mg/kg	50	ND
邻苯二甲酸二癸酯(DnDP)	84-77-5	mg/kg	50	ND
邻苯二甲酸二异戊酯(DiPP)	605-50-5	mg/kg	50	ND
邻苯二甲酸正戊基异戊基酯(nPiPP)	776297-69-9	mg/kg	50	ND
邻苯二甲酸二(2-丁氧基)乙酯(DBEP)	117-83-9	mg/kg	50	ND
邻苯二甲酸二(4-甲基-2-戊基)酯(BMPP)	146-50-9	mg/kg	50	ND
邻苯二甲酸二(2-乙氧基)乙酯(DEEP)	605-54-9	mg/kg	50	ND
邻苯二甲酸二 C6-C8 支链烷基酯(DIHP)	71888-89-6	mg/kg	50	ND
邻苯二甲酸二正庚酯(DnHpP)	3648-21-3	mg/kg	50	ND
邻苯二甲酸二(C7,C9,C11)烷基酯(DHNUP)	68515-42-4	mg/kg	50	ND
邻苯二甲酸二(支链与直链)戊基酯(DPP)	84777-06-0	mg/kg	50	ND
邻苯二甲酸双十三烷基酯(DTDP)	119-06-2	mg/kg	50	ND
邻苯二甲酸二(支链与直链)己基酯(DHxP)	68515-50-4	mg/kg	50	ND
己二酸二(2-乙基己基)酯(DEHA)	103-23-1	mg/kg	50	ND
对苯二甲酸二(2-乙基己基)酯(DOTP)	6422-86-2	mg/kg	50	ND
己二酸二异壬酯(DINA)	33703-08-1	mg/kg	50	ND
邻苯二甲酸二(2-丙基庚基)酯(DPHpP)	53306-54-0	mg/kg	50	ND
乙酰柠檬酸三丁酯(ATBC)	77-90-7	mg/kg	50	ND
偏苯三酸三(2-乙基己基)酯(TOTM)	3319-31-1	mg/kg	50	ND

## 聚氯乙烯 (PVC)

检测方法: SGS 内部方法 (SGS-CCL-TOP-066-01), 采用 FTIR/HATR 进行分析。

检测项目	A1
聚氯乙烯 (PVC)	阴性

## 备注:

(1) 阴性=未检测到, 阳性= 已检测到。

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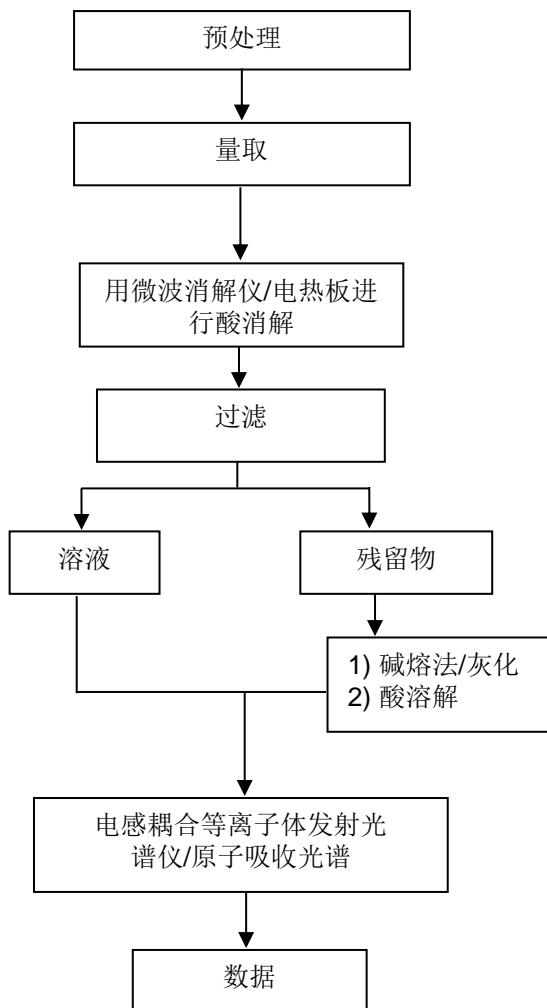
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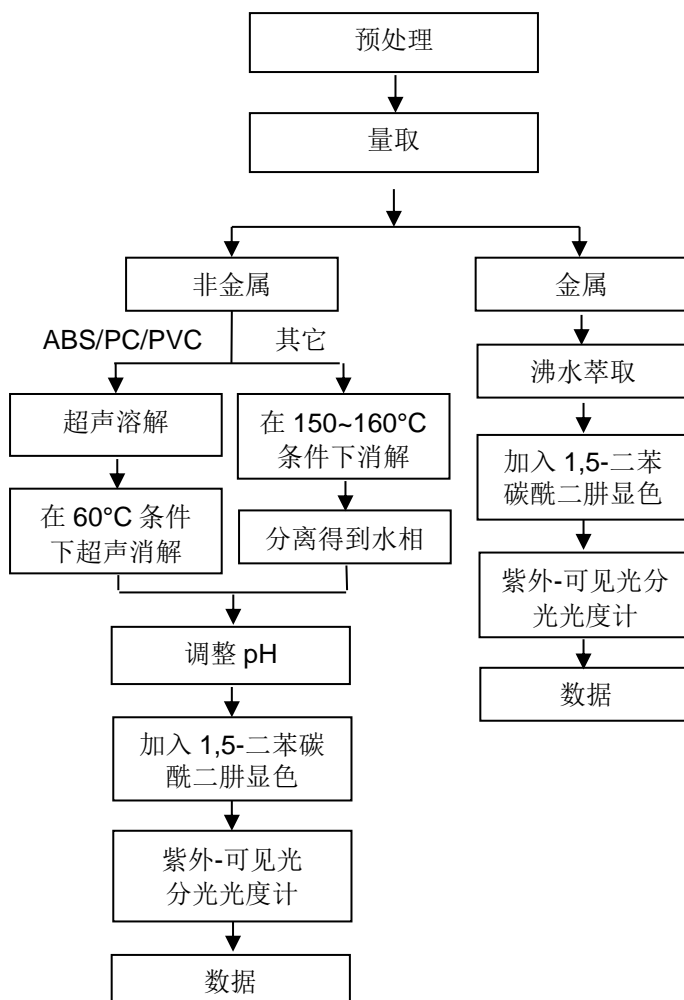
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## 元素检测流程图

样品按照下述流程被完全消解

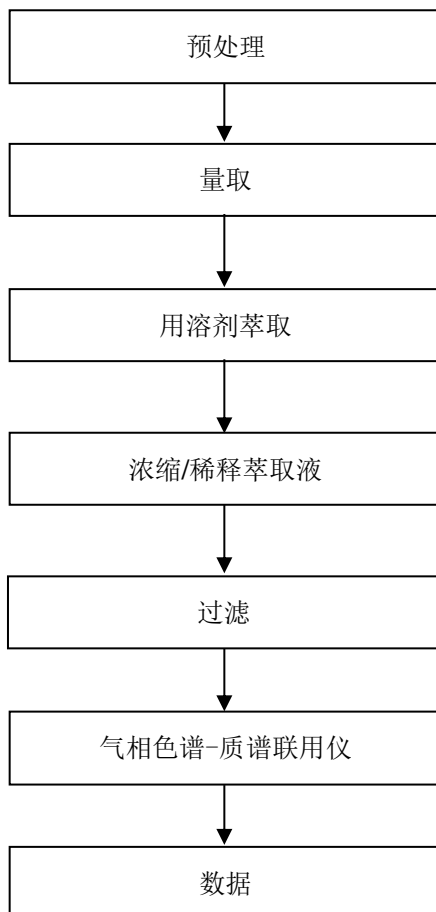


## 六价铬检测流程图

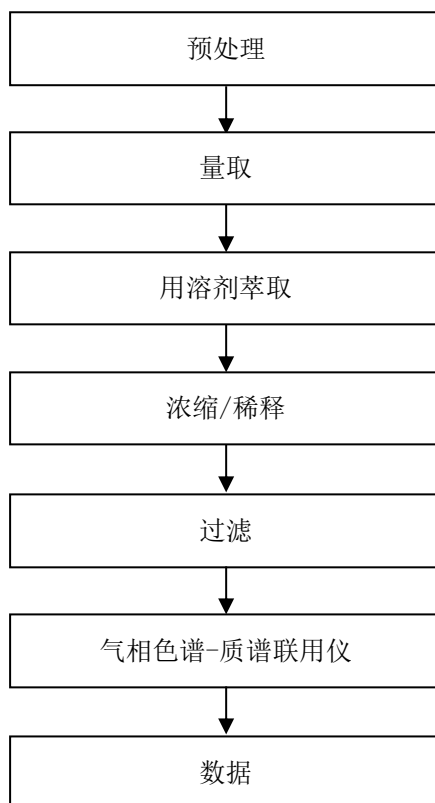




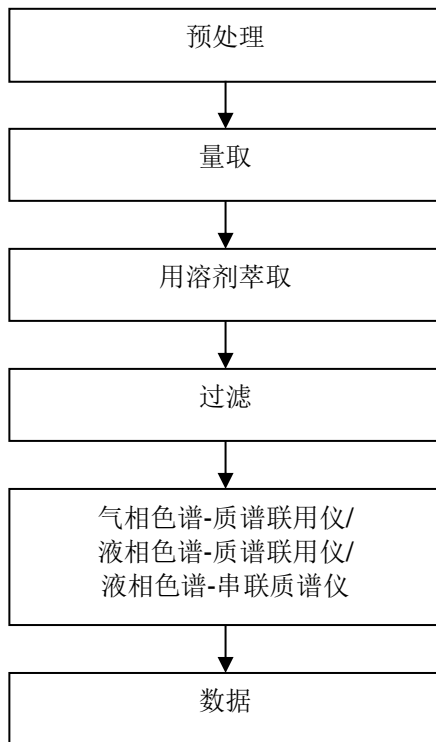
## PBB/PBDE 检测流程图



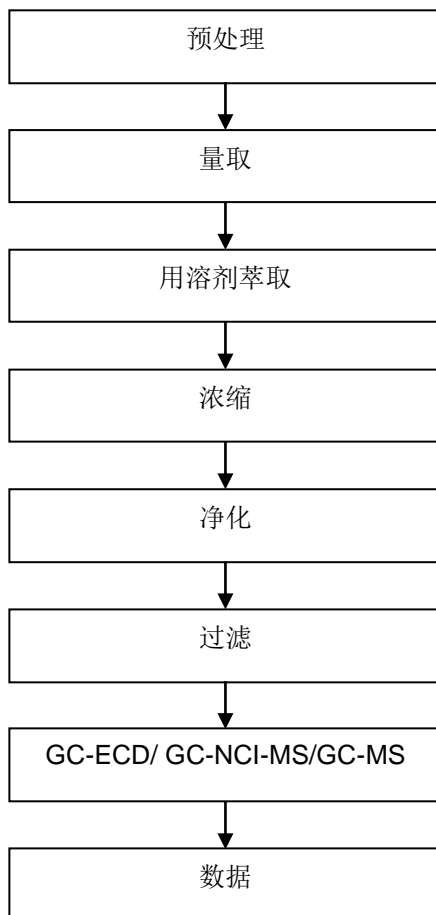
## Phthalates 检测流程图



## TBBP-A 检测流程图

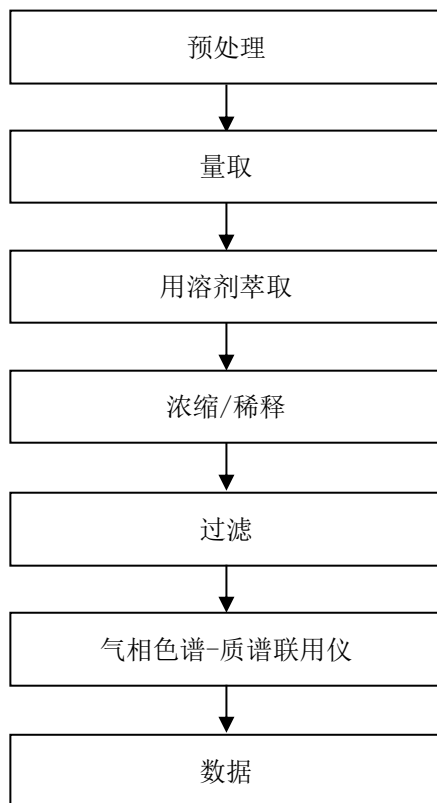


## 氯化石蜡检测流程图

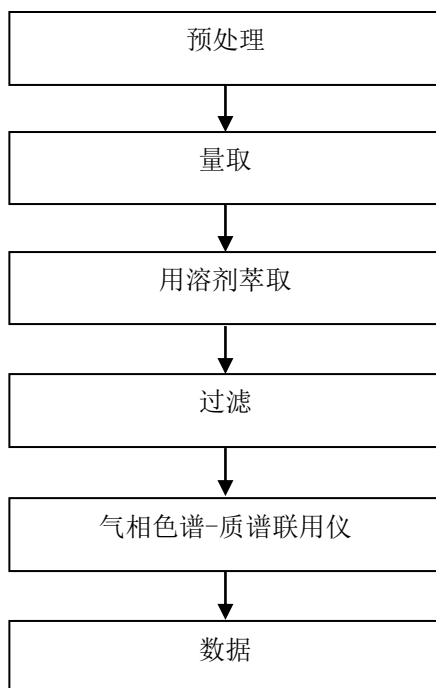




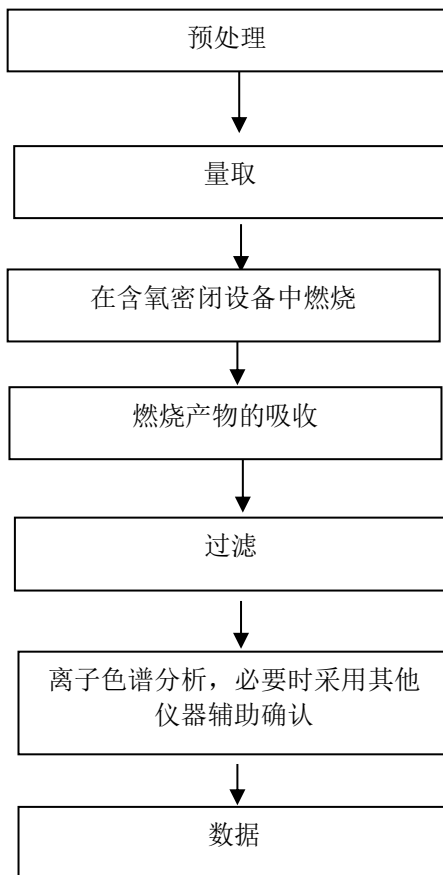
## PAHs 检测流程图



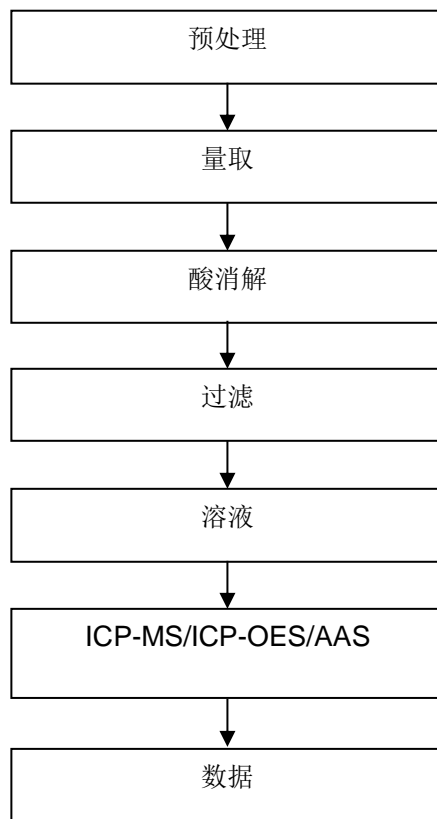
持久性、生物累积性和毒性 (PBT) 化学物质检测流程图



## 卤素检测流程图



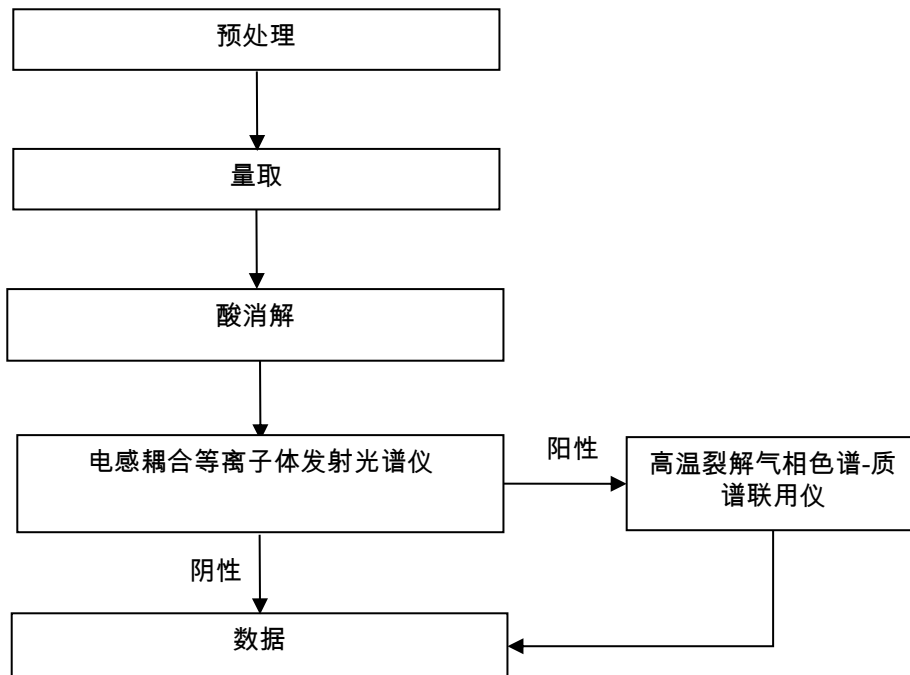
## 元素检测流程图





附件

红磷检测流程图



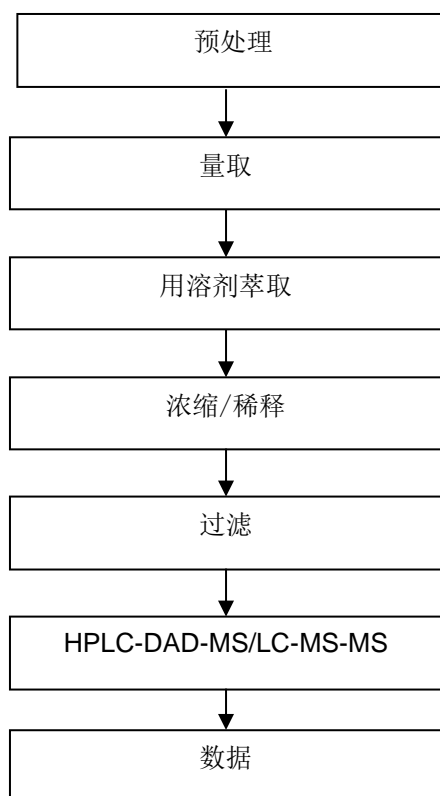
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## BPA 检测流程图



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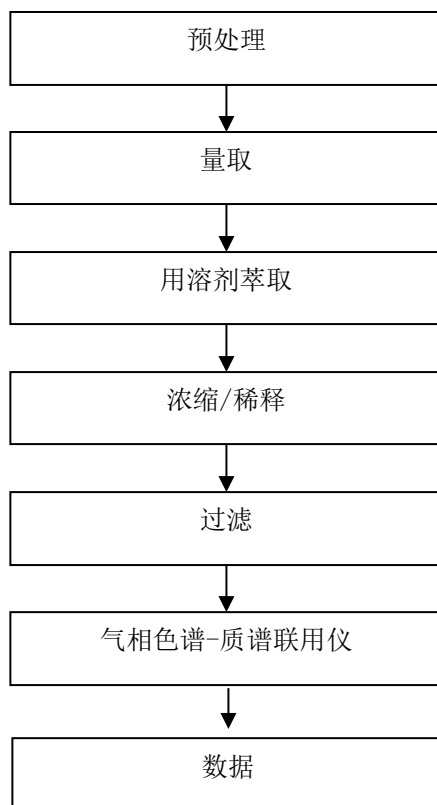
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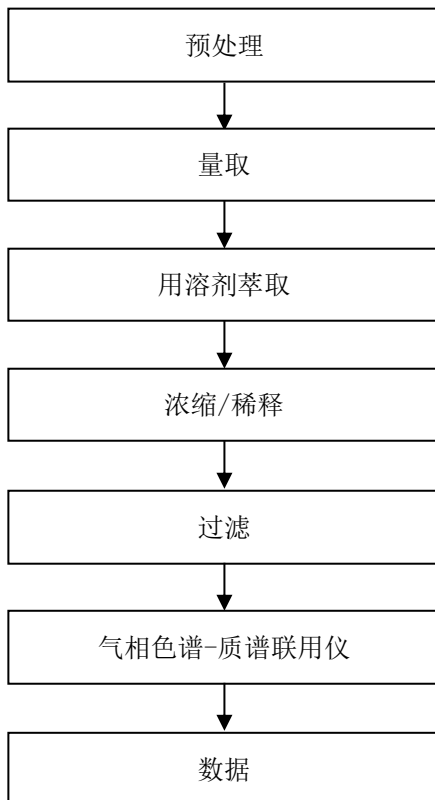
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## DMF(富马酸二甲酯)检测流程图



## HBCDD 检测流程图



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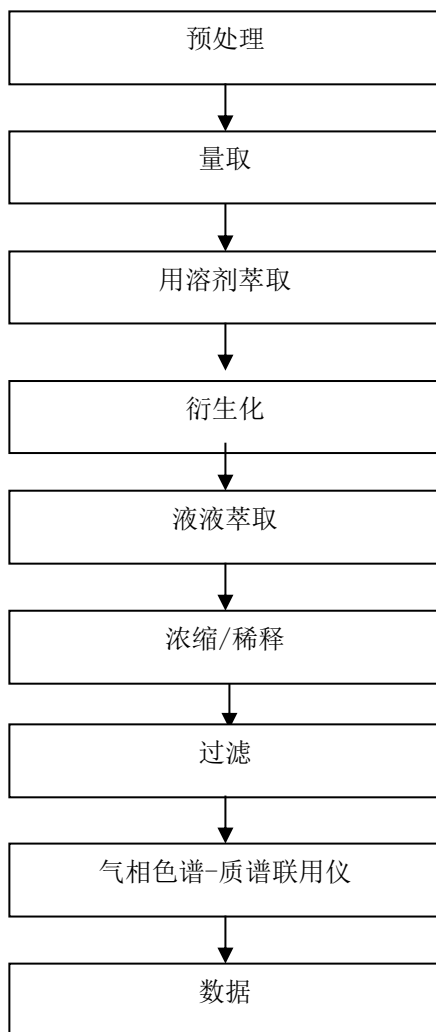
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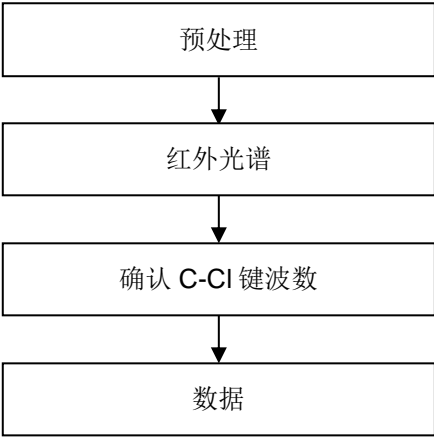
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## 有机锡检测流程图



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## 检测报告

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