

检测报告 编号: SHAEC23000366206 日期: 2023年02月03日 第1页,共20页

客户名称: 扬州扬杰电子科技股份有限公司 客户地址: 扬州市经济开发区新甘泉路 68号

样品名称: 小信号(含铅)

客户参考信息: 铜银框架;铁镍框架;铜线;镀钯铜线;包金镀钯铜线;银浆;无卤塑封料2;

无卤塑封料 5; 无卤塑封料 6; 无卤塑封料 7; 锡球; 铝线/铝带; 锡膏/焊片/焊

以上样品及信息由客户提供。

SP23-000791 SGS 工作编号:

样品接收时间: 2023年01月10日

检测周期: 2023年01月10日-2023年01月30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(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸二丁酯 (DBP)、邻苯	符合
二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁	17 百
酯(DIBP)	

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Tom Ni 倪俊 批准签署人





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#### 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	A2	SHA23-0003662-0001.C002	银色金属
SN2	A8	SHA23-0003662-0001.C008	黑色固体
SN3	A15	SHA23-0003662-0001.C015	银色金属丝
SN4	A27	SHA23-0003662-0001.C027	银色金属丝
SN5	A28	SHA23-0003662-0001.C028	铜色金属丝
SN6	A29	SHA23-0003662-0001.C029	灰色金属丝
SN7	A30	SHA23-0003662-0001.C030	灰色金属丝
SN8	A31	SHA23-0003662-0001.C031	银色膏体
SN9	A32	SHA23-0003662-0001.C032	铜色/银色金属
SN10	A33	SHA23-0003662-0001.C033	银色金属
SN11	A34	SHA23-0003662-0001.C034	黑色固体
SN12	A36	SHA23-0003662-0001.C036	黑色固体
SN13	A37	SHA23-0003662-0001.C037	黑色固体

### 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(PBBs)、多 溴二苯醚(PBDEs)、邻苯二甲酸二丁酯 (DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基已基)酯 (DEHP)和邻苯二甲酸二异丁酯(DIBP)

参考 IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 检测方法: 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	A2	A15	A28
镉 (Cd)	100	mg/kg	2	ND	ND	ND
铅 (Pb)	1000	mg/kg	2	41	ND	ND
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
六价铬(Cr(VI))▼	-	μg/cm²	0.10	ND	ND	ND



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检测项目	限值	单位	MDL	A2	A15	A28
多溴联苯之和(PBBs)	1000	mg/kg	-	ND	ND	ND
一溴联苯(MonoBB)	-	mg/kg	5	ND	ND	ND
二溴联苯(DiBB)	-	mg/kg	5	ND	ND	ND
三溴联苯(TriBB)	-	mg/kg	5	ND	ND	ND
四溴联苯(TetraBB)	-	mg/kg	5	ND	ND	ND
五溴联苯(PentaBB)	-	mg/kg	5	ND	ND	ND
六溴联苯(HexaBB)	-	mg/kg	5	ND	ND	ND
七溴联苯(HeptaBB)	-	mg/kg	5	ND	ND	ND
八溴联苯(OctaBB)	-	mg/kg	5	ND	ND	ND
九溴联苯(NonaBB)	-	mg/kg	5	ND	ND	ND
十溴联苯(DecaBB)	-	mg/kg	5	ND	ND	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND	ND	ND
一溴二苯醚(MonoBDE)	-	mg/kg	5	ND	ND	ND
二溴二苯醚(DiBDE)	-	mg/kg	5	ND	ND	ND
三溴二苯醚(TriBDE)	-	mg/kg	5	ND	ND	ND
四溴二苯醚(TetraBDE)	-	mg/kg	5	ND	ND	ND
五溴二苯醚(PentaBDE)	-	mg/kg	5	ND	ND	ND
六溴二苯醚(HexaBDE)	-	mg/kg	5	ND	ND	ND
七溴二苯醚(HeptaBDE)	-	mg/kg	5	ND	ND	ND
八溴二苯醚(OctaBDE)	-	mg/kg	5	ND	ND	ND
九溴二苯醚(NonaBDE)	-	mg/kg	5	ND	ND	ND
十溴二苯醚(DecaBDE)	-	mg/kg	5	ND	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND	ND

检测项目	限值	单位	MDL	A29	A30	A32
镉 (Cd)	100	mg/kg	2	ND	ND	ND
铅 (Pb)	1000	mg/kg	2	ND	ND	ND
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
六价铬(Cr(VI))▼	-	μg/cm²	0.10	ND	ND	ND
多溴联苯之和(PBBs)	1000	mg/kg	•	ND	ND	ND
一溴联苯(MonoBB)	-	mg/kg	5	ND	ND	ND
二溴联苯(DiBB)	-	mg/kg	5	ND	ND	ND
三溴联苯(TriBB)	-	mg/kg	5	ND	ND	ND
四溴联苯(TetraBB)	-	mg/kg	5	ND	ND	ND
五溴联苯(PentaBB)	-	mg/kg	5	ND	ND	ND
六溴联苯(HexaBB)	-	mg/kg	5	ND	ND	ND
七溴联苯(HeptaBB)	-	mg/kg	5	ND	ND	ND
八溴联苯(OctaBB)	-	mg/kg	5	ND	ND	ND
九溴联苯(NonaBB)	-	mg/kg	5	ND	ND	ND
十溴联苯(DecaBB)	-	mg/kg	5	ND	ND	ND



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检测项目	限值	单位	MDL	A29	A30	A32
多溴二苯醚之和(PBDEs)	1000	mg/kg	1	ND	ND	ND
一溴二苯醚(MonoBDE)	-	mg/kg	5	ND	ND	ND
二溴二苯醚(DiBDE)	-	mg/kg	5	ND	ND	ND
三溴二苯醚(TriBDE)	-	mg/kg	5	ND	ND	ND
四溴二苯醚(TetraBDE)	-	mg/kg	5	ND	ND	ND
五溴二苯醚(PentaBDE)	-	mg/kg	5	ND	ND	ND
六溴二苯醚(HexaBDE)	-	mg/kg	5	ND	ND	ND
七溴二苯醚(HeptaBDE)	-	mg/kg	5	ND	ND	ND
八溴二苯醚(OctaBDE)	-	mg/kg	5	ND	ND	ND
九溴二苯醚(NonaBDE)	-	mg/kg	5	ND	ND	ND
十溴二苯醚(DecaBDE)	-	mg/kg	5	ND	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND	ND

检测项目	限值	单位	MDL	A33
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1000	mg/kg	2	ND
汞 (Hg)	1000	mg/kg	2	ND
六价铬(Cr(VI))▼	-	μg/cm²	0.10	ND
多溴联苯之和(PBBs)	1000	mg/kg	•	ND
一溴联苯(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(PBDEs)	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



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检测项目	限值	单位	MDL	A33
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND

#### 备注:

- (1) 最大允许极限值引用自RoHS指令(EU) 2015/863。
- (2) IEC 62321系列等同于 EN 62321系列。
- (3) ▼ = a. 当六价铬的浓度高于0.13 µg/cm²时,样品为阳性,即含有六价铬;
  - b. 当六价铬的浓度为ND(低于0.10 μg/cm²)时,样品为阴性,即未检测到六价铬;
  - c. 当六价铬的浓度介于0.10 μg/cm<sup>2</sup>与0.13 μg/cm<sup>2</sup>之间时,无法直接判定是否检测到六价铬,因不同个体 的样品表面差异可能会影响测定结果。

由于未获知样品的存储条件和生产日期,样品的六价铬检测结果仅能代表测试时样品含六价铬的状态。

检测方法: 参考滴定法, IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 和 IEC 62321-8:2017, 采用 ICP-OES, UV-Vis 和 GC-MS 进行分析。

检测项目	限值	单位	MDL	A27
镉 (Cd)	100	mg/kg	2	ND
铅(Pb)	0.1	%	-	92.4▲
汞 (Hg)	1000	mg/kg	2	ND
六价铬(Cr(VI))▼	-	μg/cm²	0.10	ND
多溴联苯之和(PBBs)	1000	mg/kg	-	ND
一溴联苯(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)	1	mg/kg	5	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND
一溴二苯醚(MonoBDE)	1	mg/kg	5	ND
二溴二苯醚(DiBDE)	1	mg/kg	5	ND
三溴二苯醚(TriBDE)	1	mg/kg	5	ND
四溴二苯醚(TetraBDE)	1	mg/kg	5	ND
五溴二苯醚(PentaBDE)	1	mg/kg	5	ND
六溴二苯醚(HexaBDE)	1	mg/kg	5	ND
七溴二苯醚(HeptaBDE)	1	mg/kg	5	ND
八溴二苯醚(OctaBDE)	-	mg/kg	5	ND
九溴二苯醚(NonaBDE)	-	mg/kg	5	ND



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检测项目	限值	单位	MDL	A27
十溴二苯醚(DecaBDE)	-	mg/kg	5	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND

#### 备注:

- (1) 最大允许极限值引用自RoHS指令(EU) 2015/863。
- (2)IEC 62321系列等同于 EN 62321系列
- (3) ▼ = a. 当六价铬的浓度高于0.13 μg/cm²时,样品为阳性,即含有六价铬;
- b. 当六价铬的浓度为ND(低于 $0.10 \mu g/cm^2$ )时,样品为阴性,即未检测到六价铬;
- c. 当六价铬的浓度介于0.10 μg/cm²与0.13 μg/cm²之间时,无法直接判定是否检测到六价铬,因不同个体的样品表面差异可能会影 响测定结果;
- 由于未获知样品的存储条件和生产日期,样品的六价铬检测结果仅能代表检测时样品含六价铬的状态。
- (4) ▲根据客户提供的声明,编号A1中的铅(Pb)被欧盟RoHS指令2011/65/EU豁免,相应豁免条文(请以英文原文为准) |ANNEX III 7(a)|: 高熔点型焊料中的铅(即铅含量等于或大于85%的铅基合金焊料)。

## 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(PBBs)、多 <u>溴二苯醚(PBDEs)、邻苯二甲酸二丁酯 (DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基己基)酯</u> (DEHP)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,UV-Vis 和 GC-MS 进行分析。

检测项目	限值	单位	MDL	A8	A31	A34
镉 (Cd)	100	mg/kg	2	ND	ND	ND
铅 (Pb)	1000	mg/kg	2	ND	ND	ND
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
六价铬(Cr(VI))	1000	mg/kg	8	ND	ND	ND
多溴联苯之和(PBBs)	1000	mg/kg	-	ND	ND	ND
一溴联苯(MonoBB)	-	mg/kg	5	ND	ND	ND
二溴联苯(DiBB)	-	mg/kg	5	ND	ND	ND
三溴联苯(TriBB)	-	mg/kg	5	ND	ND	ND
四溴联苯(TetraBB)	-	mg/kg	5	ND	ND	ND
五溴联苯(PentaBB)	-	mg/kg	5	ND	ND	ND
六溴联苯(HexaBB)	-	mg/kg	5	ND	ND	ND
七溴联苯(HeptaBB)	-	mg/kg	5	ND	ND	ND
八溴联苯(OctaBB)	-	mg/kg	5	ND	ND	ND
九溴联苯(NonaBB)	-	mg/kg	5	ND	ND	ND
十溴联苯(DecaBB)	-	mg/kg	5	ND	ND	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND	ND	ND
一溴二苯醚(MonoBDE)	-	mg/kg	5	ND	ND	ND
二溴二苯醚(DiBDE)	-	mg/kg	5	ND	ND	ND
三溴二苯醚(TriBDE)	-	mg/kg	5	ND	ND	ND



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检测项目	限值	单位	MDL	A8	A31	A34
四溴二苯醚(TetraBDE)	-	mg/kg	5	ND	ND	ND
五溴二苯醚(PentaBDE)	-	mg/kg	5	ND	ND	ND
六溴二苯醚(HexaBDE)	-	mg/kg	5	ND	ND	ND
七溴二苯醚(HeptaBDE)	-	mg/kg	5	ND	ND	ND
八溴二苯醚(OctaBDE)	-	mg/kg	5	ND	ND	ND
九溴二苯醚(NonaBDE)	-	mg/kg	5	ND	ND	ND
十溴二苯醚(DecaBDE)	-	mg/kg	5	ND	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND	ND

检测项目	限值	单位	MDL	A36	A37
镉 (Cd)	100	mg/kg	2	ND	ND
铅 (Pb)	1000	mg/kg	2	ND	ND
汞 (Hg)	1000	mg/kg	2	ND	ND
六价铬(Cr(VI))	1000	mg/kg	8	ND	ND
多溴联苯之和(PBBs)	1000	mg/kg	-	ND	ND
一溴联苯(MonoBB)	-	mg/kg	5	ND	ND
二溴联苯(DiBB)	-	mg/kg	5	ND	ND
三溴联苯(TriBB)	-	mg/kg	5	ND	ND
四溴联苯(TetraBB)	-	mg/kg	5	ND	ND
五溴联苯(PentaBB)	-	mg/kg	5	ND	ND
六溴联苯(HexaBB)	-	mg/kg	5	ND	ND
七溴联苯(HeptaBB)	-	mg/kg	5	ND	ND
八溴联苯(OctaBB)	-	mg/kg	5	ND	ND
九溴联苯(NonaBB)	-	mg/kg	5	ND	ND
十溴联苯(DecaBB)	-	mg/kg	5	ND	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	1	ND	ND
一溴二苯醚(MonoBDE)	-	mg/kg	5	ND	ND
二溴二苯醚(DiBDE)	-	mg/kg	5	ND	ND
三溴二苯醚(TriBDE)	-	mg/kg	5	ND	ND
四溴二苯醚(TetraBDE)	-	mg/kg	5	ND	ND
五溴二苯醚(PentaBDE)	-	mg/kg	5	ND	ND
六溴二苯醚(HexaBDE)	-	mg/kg	5	ND	ND
七溴二苯醚(HeptaBDE)	-	mg/kg	5	ND	ND
八溴二苯醚(OctaBDE)	-	mg/kg	5	ND	ND
九溴二苯醚(NonaBDE)	-	mg/kg	5	ND	ND
十溴二苯醚(DecaBDE)	-	mg/kg	5	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND



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#### 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。

除非另有说明,参照 ILAC-G8:09/2019,使用简单接受(w=0)的二元判定规则进行符合性判定。 除非另有说明,此报告结果仅对检测的样品负责。本报告未经本公司书面许可,不可部分复制。 检测报告仅用于客户科研、教学、内部质量控制、产品研发等目的,仅供内部参考。



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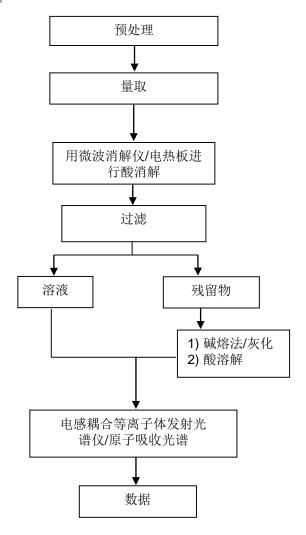
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附件

### 元素 (IEC62321) 检测流程图

样品按照下述流程被完全消解





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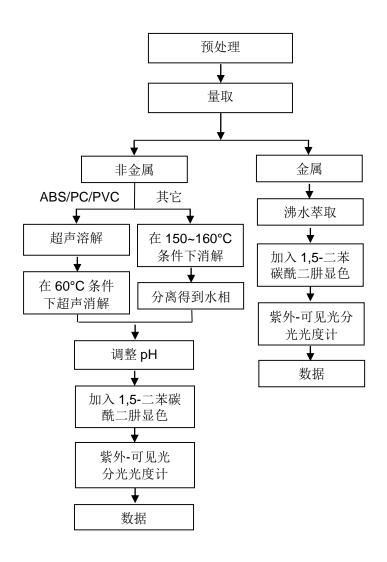


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### 六价铬检测流程图





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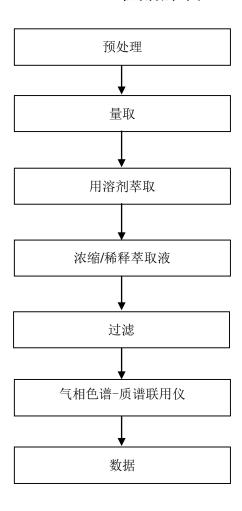


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### PBBs/PBDEs 检测流程图





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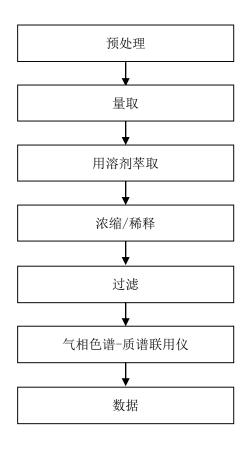


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### Phthalates 检测流程图





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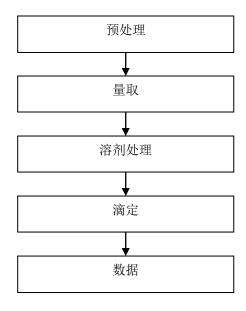


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### 滴定检测流程图





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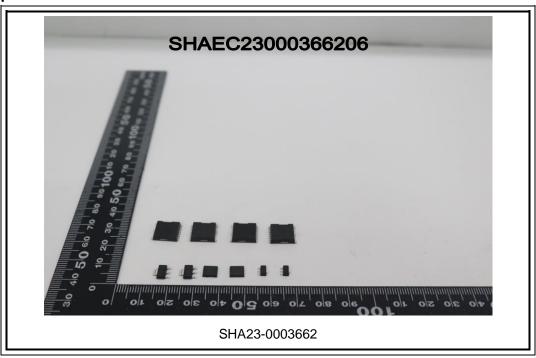
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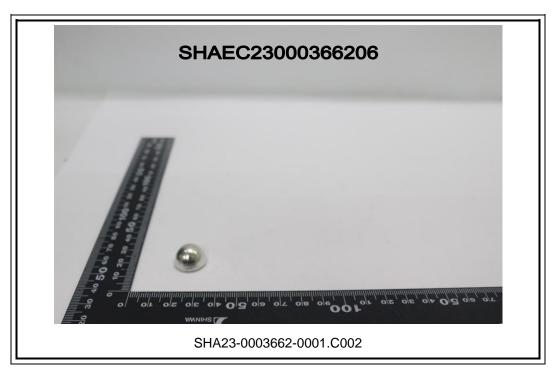


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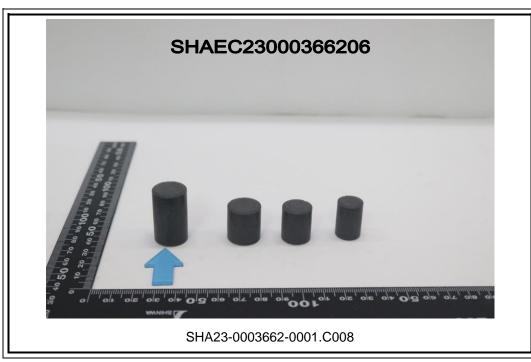
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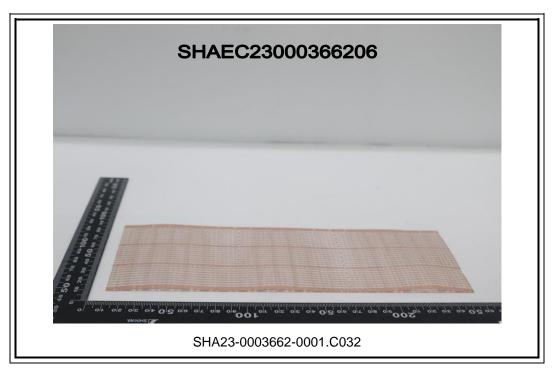


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