



检测报告

Test Report

报告编号 A2240780167101E
Report No. A2240780167101E

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报告抬头公司名称 广东风华高新科技股份有限公司利华电解电容器分公司
Company Name GUANGDONG FENGHUA ADVANCE TECHNOLOGY (HOLDING) CO., LTD.
shown on Report LIHUA ELECTROLYTIC CAPACITOR BRANCH
地 址 肇庆市端州区端州八路大棠三路祥和高端电容基地 2#厂房
Address BUILDING 2 OF XIANGHE HIGH END CAPACITOR BASE, DUANZHOU EIGHTH ROAD, DATANG THIRD ROAD, DUANZHOU DISTRICT, ZHAOQING CITY

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 applicant

样品名称 铝电解电容器
Sample Name(s) Aluminum Electrolytic Capacitor
样品接收日期 2024.12.12
Sample Received Date Dec. 12, 2024
样品检测日期 2024.12.12-2024.12.19
Testing Period Dec. 12, 2024 to Dec. 19, 2024

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).

批 准

Approved by

文利

授权签字人 Lab Authorized

Signatory

日 期

Date

2024.12.19

No. R158929596

广东省深圳市宝安区新安街道兴东社区华测检测大楼

华测检测认证集团股份有限公司

Centre Testing International Group Co., Ltd.

CTI Building, Xing Dong Community, Xin'an Sub-district, Bao'an District, Shenzhen City, Guangdong Province, P.R. China

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结论 Conclusion

测试样品 Tested Sample	依据标准/指令 According to standard/directive	结果 Result
提交样品 Submitted Sample	欧盟 RoHS 指令 2011/65/EU 及其修订指令 (EU) 2015/863 RoHS Directive 2011/65/EU with amendment (EU) 2015/863	符合 PASS

符合表示检测结果满足欧盟RoHS指令2011/65/EU及其修订指令(EU) 2015/863要求的限值。

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.

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检测依据 Test Method

测试项目 Tested 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 62321-7-1:2015	UV-Vis
	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 62321-12:2023	GC-MS
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-12:2023	GC-MS
邻苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-12:2023	GC-MS

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检测结果 Test Result(s)

测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	1	2	3		
铅 Lead (Pb)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
镉 Cadmium (Cd)	N.D.	N.D.	N.D.	10 mg/kg	100 mg/kg
汞 Mercury (Hg)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
六价铬 Hexavalent Chromium (Cr(VI))	--	N.D.▼	--	0.10 µg/cm ² (LOQ)	1000 mg/kg
	N.D.	--	N.D.	20 mg/kg	1000 mg/kg

测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	4	5	6		
铅 Lead (Pb)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
镉 Cadmium (Cd)	N.D.	N.D.	N.D.	10 mg/kg	100 mg/kg
汞 Mercury (Hg)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
六价铬 Hexavalent Chromium (Cr(VI))	--	--	N.D.▼	0.10 µg/cm ² (LOQ)	1000 mg/kg
	N.D.	N.D.	--	20 mg/kg	1000 mg/kg

测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	7	8	9		
铅 Lead (Pb)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
镉 Cadmium (Cd)	N.D.	N.D.	N.D.	10 mg/kg	100 mg/kg
汞 Mercury (Hg)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
六价铬 Hexavalent Chromium (Cr(VI))	N.D.▼	N.D.▼	N.D.▼	0.10 µg/cm ² (LOQ)	1000 mg/kg
	--	--	--	20 mg/kg	1000 mg/kg

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测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	10	11	12		
铅 Lead (Pb)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
镉 Cadmium (Cd)	N.D.	N.D.	N.D.	10 mg/kg	100 mg/kg
汞 Mercury (Hg)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
六价铬 Hexavalent Chromium (Cr(VI))	--	--	N.D.▼	0.10 µg/cm ² (LOQ)	1000 mg/kg
	N.D.	N.D.	--	20 mg/kg	1000 mg/kg

测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	13	14	15		
铅 Lead (Pb)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
镉 Cadmium (Cd)	N.D.	N.D.	N.D.	10 mg/kg	100 mg/kg
汞 Mercury (Hg)	N.D.	N.D.	N.D.	10 mg/kg	1000 mg/kg
六价铬 Hexavalent Chromium (Cr(VI))	--	N.D.▼	N.D.▼	0.10 µg/cm ² (LOQ)	1000 mg/kg
	N.D.	--	--	20 mg/kg	1000 mg/kg

测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	1	3	4		
多溴联苯 Polybrominated Biphenyls (PBBs)					
一溴联苯 Monobromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	1000 mg/kg
二溴联苯 Dibromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
三溴联苯 Tribromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
四溴联苯 Tetrabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
五溴联苯 Pentabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
六溴联苯 Hexabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
七溴联苯 Heptabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
八溴联苯 Octabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
九溴联苯 Nonabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
十溴联苯 Decabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	

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测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	5	10	11		
多溴联苯 Polybrominated Biphenyls (PBBs)					
一溴联苯 Monobromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	1000 mg/kg
二溴联苯 Dibromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
三溴联苯 Tribromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
四溴联苯 Tetrabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
五溴联苯 Pentabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
六溴联苯 Hexabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
七溴联苯 Heptabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
八溴联苯 Octabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
九溴联苯 Nonabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	
十溴联苯 Decabromobiphenyl	N.D.	N.D.	N.D.	100 mg/kg	

测试项目 Tested Item(s)	结果 Result	方法检出限 MDL	限值 Limit
	13		
多溴联苯 Polybrominated Biphenyls (PBBs)			
一溴联苯 Monobromobiphenyl	N.D.	100 mg/kg	1000 mg/kg
二溴联苯 Dibromobiphenyl	N.D.	100 mg/kg	
三溴联苯 Tribromobiphenyl	N.D.	100 mg/kg	
四溴联苯 Tetrabromobiphenyl	N.D.	100 mg/kg	
五溴联苯 Pentabromobiphenyl	N.D.	100 mg/kg	
六溴联苯 Hexabromobiphenyl	N.D.	100 mg/kg	
七溴联苯 Heptabromobiphenyl	N.D.	100 mg/kg	
八溴联苯 Octabromobiphenyl	N.D.	100 mg/kg	
九溴联苯 Nonabromobiphenyl	N.D.	100 mg/kg	
十溴联苯 Decabromobiphenyl	N.D.	100 mg/kg	

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测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	1	3	4		
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)					
一溴二苯醚 Monobromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	1000 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
三溴二苯醚 Tribromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
四溴二苯醚 Tetrabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
五溴二苯醚 Pentabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
六溴二苯醚 Hexabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
七溴二苯醚 Heptabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
八溴二苯醚 Octabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
九溴二苯醚 Nonabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
十溴二苯醚 Decabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	

测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	5	10	11		
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)					
一溴二苯醚 Monobromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	1000 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
三溴二苯醚 Tribromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
四溴二苯醚 Tetrabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
五溴二苯醚 Pentabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
六溴二苯醚 Hexabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
七溴二苯醚 Heptabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
八溴二苯醚 Octabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
九溴二苯醚 Nonabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	
十溴二苯醚 Decabromodiphenyl ether	N.D.	N.D.	N.D.	100 mg/kg	

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测试项目 Tested Item(s)	结果 Result		方法检出限 MDL	限值 Limit
	13			
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)				
一溴二苯醚 Monobromodiphenyl ether	N.D.		100 mg/kg	1000 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.		100 mg/kg	
三溴二苯醚 Tribromodiphenyl ether	N.D.		100 mg/kg	
四溴二苯醚 Tetrabromodiphenyl ether	N.D.		100 mg/kg	
五溴二苯醚 Pentabromodiphenyl ether	N.D.		100 mg/kg	
六溴二苯醚 Hexabromodiphenyl ether	N.D.		100 mg/kg	
七溴二苯醚 Heptabromodiphenyl ether	N.D.		100 mg/kg	
八溴二苯醚 Octabromodiphenyl ether	N.D.		100 mg/kg	
九溴二苯醚 Nonabromodiphenyl ether	N.D.		100 mg/kg	
十溴二苯醚 Decabromodiphenyl ether	N.D.		100 mg/kg	

测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	1	3	4		
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.	N.D.	N.D.	50 mg/kg	1000 mg/kg
邻苯二甲酸丁基苄基酯 Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	N.D.	N.D.	50 mg/kg	1000 mg/kg
邻苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	N.D.	N.D.	50 mg/kg	1000 mg/kg
邻苯二甲酸二异丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	N.D.	N.D.	50 mg/kg	1000 mg/kg

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测试项目 Tested Item(s)	结果 Result			方法检出限 MDL	限值 Limit
	5	10	11		
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.	N.D.	N.D.	50 mg/kg	1000 mg/kg
邻苯二甲酸丁基苄基酯 Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	N.D.	N.D.	50 mg/kg	1000 mg/kg
邻苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	N.D.	N.D.	50 mg/kg	1000 mg/kg
邻苯二甲酸二异丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	N.D.	N.D.	50 mg/kg	1000 mg/kg

测试项目 Tested Item(s)	结果 Result	方法检出限 MDL	限值 Limit
	13		
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	1000 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	1000 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	1000 mg/kg
邻苯二甲酸二异丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg	1000 mg/kg

样品/部位描述 Sample/Part Description

序号 No.	CTI 样品 ID CTI Sample ID	描述 Description
1	1	有灰色印字的绿色塑料 Green plastic with grey printing
2	2	银白色金属 Silvery white metal
3	3	黑色橡胶 Black rubber

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4	4	透明胶带 Transparent adhesive tape
5	5	棕色纸 Brown paper
6	6	银灰色金属箔 Silvery grey metal foil
7	7	灰色金属箔 Grey metal foil
8	8	银色金属 Silvery metal
9	9	银色金属引脚 Silvery metal pin
10	10	黑色塑料 Black plastic
11	11	黑色橡胶 Black rubber
12	12	银白色金属 Silvery white metal
13	13	棕色板 Brown board
14	14	银白色金属 Silvery white metal
15	15	银白色金属 Silvery white metal

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备注: 对于检测铅, 镉, 汞之样品已消解完全。

-N.D. = 未检出 (小于方法检出限或定量限)

-mg/kg = ppm = 百万分之一

-1000 mg/kg = 0.1%

-LOQ = 定量限, 六价铬的定量限为 $0.10 \mu\text{g}/\text{cm}^2$

-▼六价铬浓度小于 $0.10 \mu\text{g}/\text{cm}^2$, 样品未检出六价铬。由于未获知样品的存储条件和生产日期, 样品的六价铬测试结果仅能代表测试时样品含六价铬的状态。

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 $0.10 \mu\text{g}/\text{cm}^2$

-▼The sample is negative for Cr(VI) – The Cr(VI) concentration is below $0.10 \mu\text{g}/\text{cm}^2$. The coating is considered a non-Cr(VI) based coating. 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.

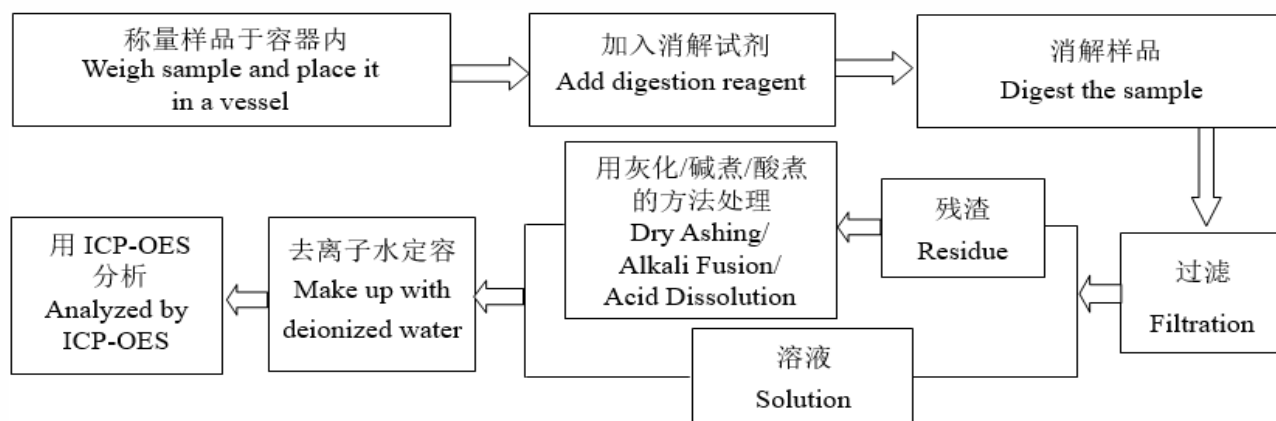
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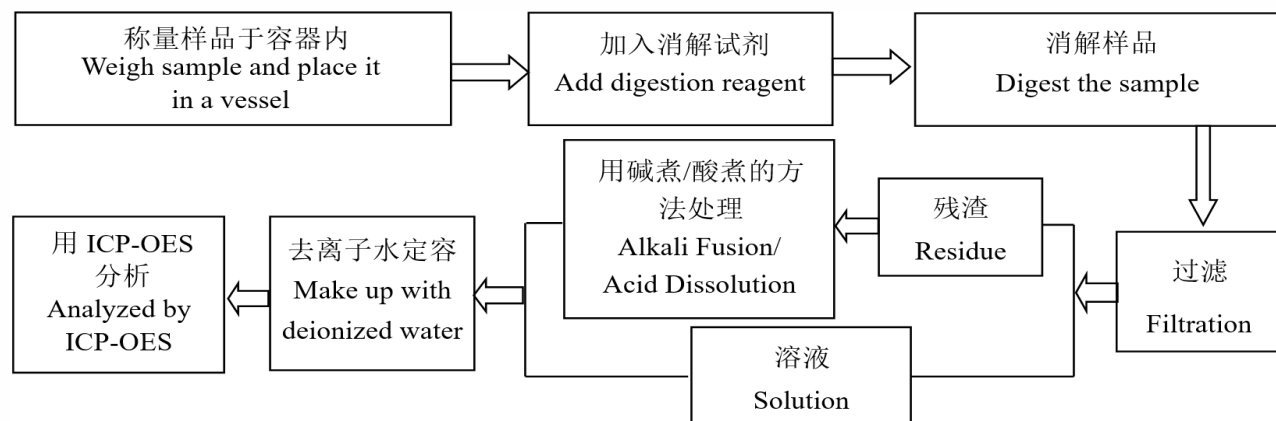
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检测流程 Test Process

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

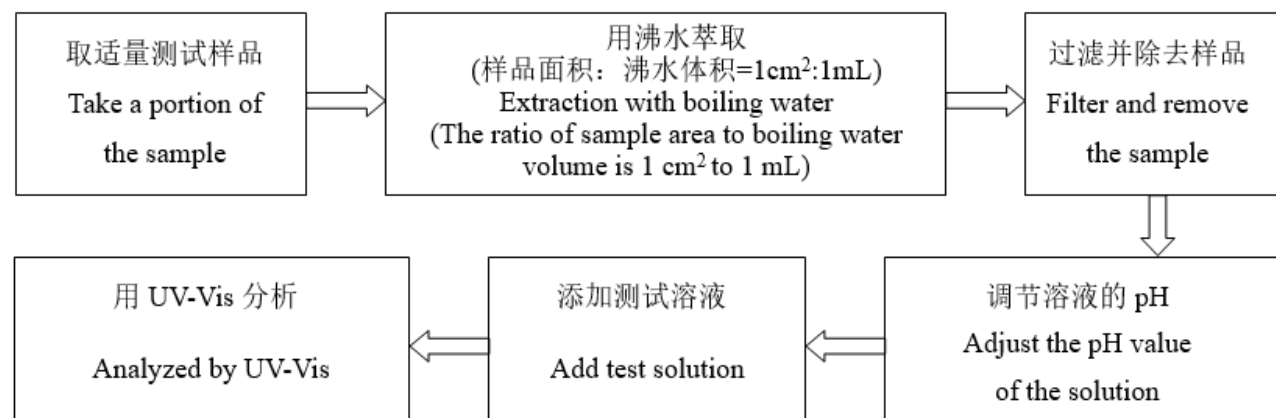


2. 汞 Mercury (Hg)



3. 六价铬 Hexavalent Chromium (Cr(VI))

(1) IEC 62321-7-1:2015

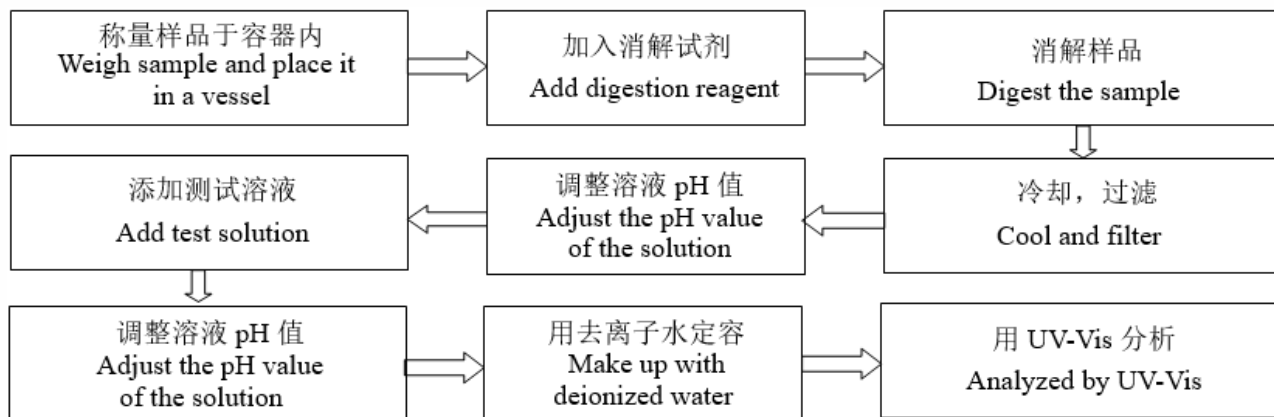


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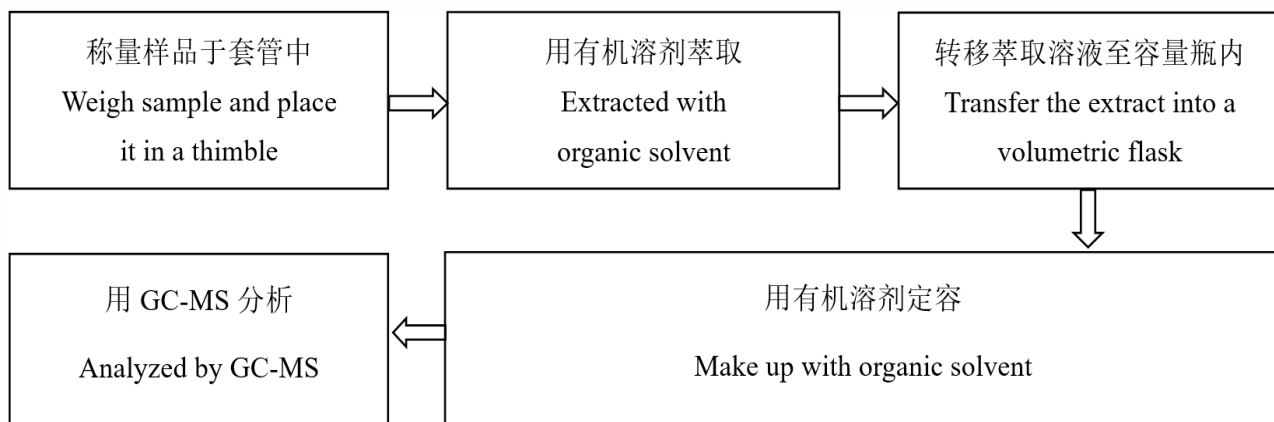
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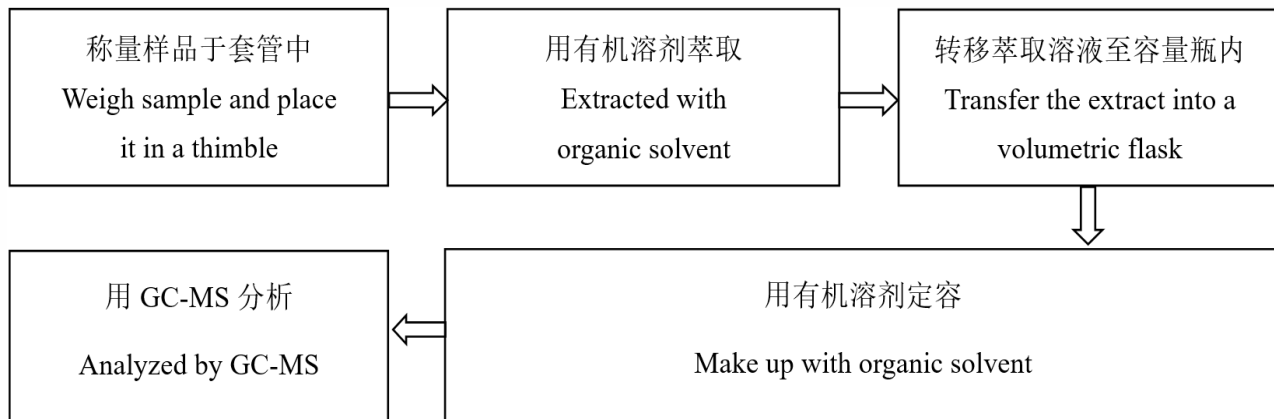
(2) IEC 62321-7-2:2017



4. 多溴联苯 Polybrominated Biphenyls (PBBs), 多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)



5. 邻苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)



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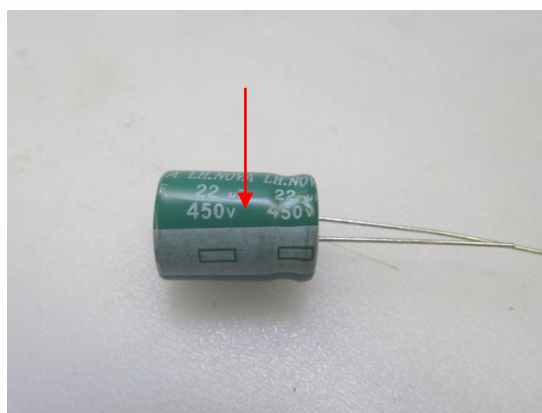
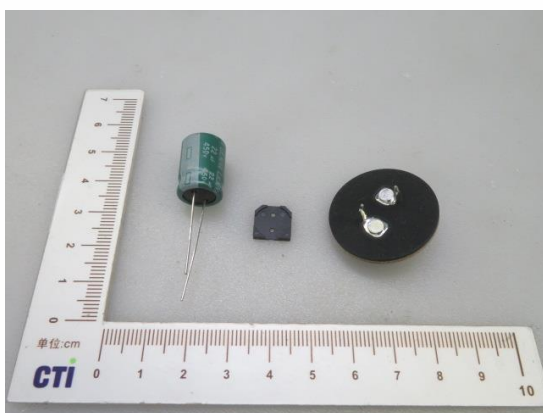
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样品图片

Photo(s) of the sample(s)

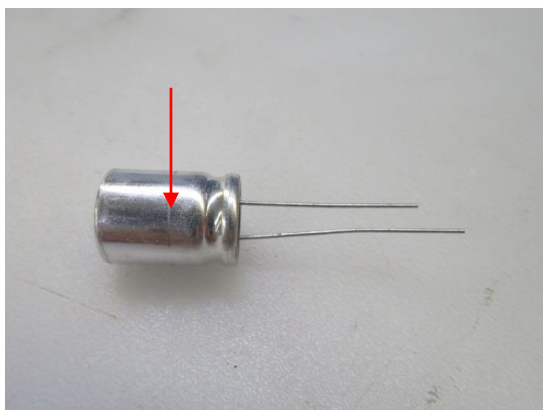
成品 Final Product

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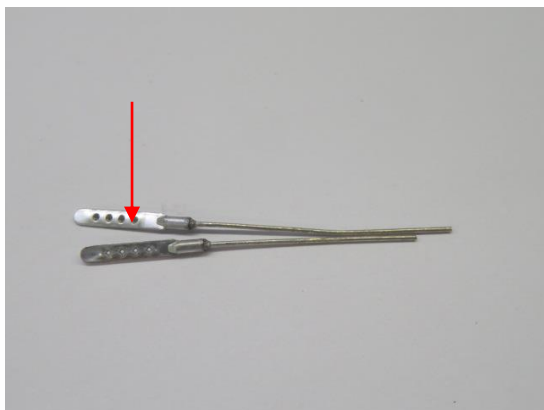
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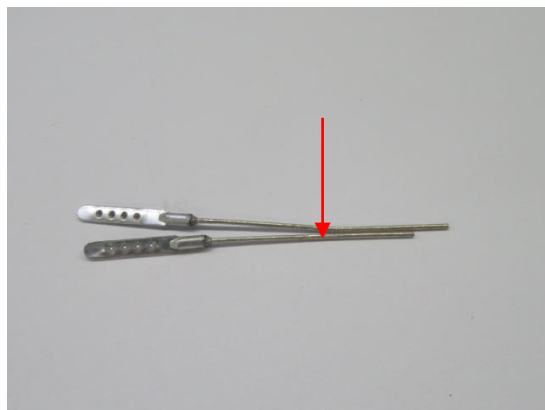
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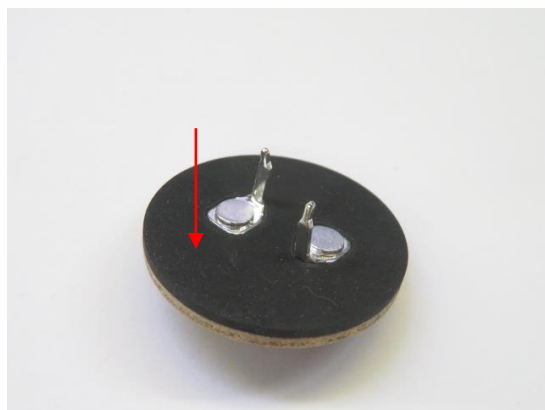
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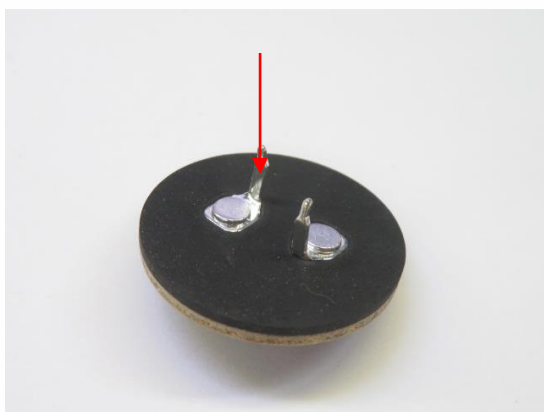


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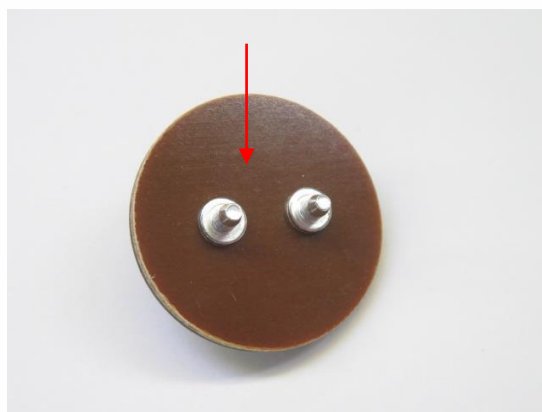
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声明 Statement:

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 invalid without approved signature, special seal and the seal on the perforation;
2. 报告抬头公司名称及地址、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 Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. 本报告检测结果仅对受测样品负责;
The result(s) shown in this report refer(s) only to the sample(s) tested;
4. 除非另有说明, 报告参照 ILAC-G8:09/2019 / CNAS-GL015:2022 使用简单接受 (w=0) 二元判定规则进行符合性判定; Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019 / CNAS-GL015:2022;
5. 未经 CTI 书面同意, 不得部分复制本报告;
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In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

*** 报告结束 ***
*** End of Report ***