



中国认可
国际互认
检测
TESTING
CNAS L6478



检测报告 TEST REPORT

报告编号/ Report No. : WTF24F05110467C

委托方/ Applicant : 安徽特固机电科技有限公司
Anhui Tegu Electromechanical Technology Co., Ltd

地址/ Address : 合肥市新站高新技术产业开发区铜陵北路1188号
No.,1188 Tongling North Road, Xinzhan High tech
Development Zone, Hefei City

样品名称/ Sample Name : 316不锈钢紧固件/线材/ 316 stainless steel fasteners/wire

样品材质/ Sample Material : 316不锈钢/ 316 stainless steel

检测要求/ Test Requested : 根据欧盟RoHS指令2011/65/EU及其修订指令(EU)
No.2015/863, 测试样品中10种限制物质的含量
In according to the EU RoHS Directive 2011/65/EU and its
amendment (EU) No.2015/863, to determine the 10
restricted substances content in the submitted sample.

检测方法/ Test Method : 参见报告下页/ Refer to next page (s)

检测结论/ Test Conclusion : 符合 (详情请参见下一页)
Pass (Please refer to next pages for details)

样品接收日期/ Date of Receipt sample : 2024-05-14

检测周期/ Testing period : 2024-05-14 ~ 2024-05-18

报告日期/ Date of Issue : 2024-05-18

检测结果/ Test Result : 参见报告下页 / Refer to next page (s)

报告制作/ Prepared By:

佛山市沃特测试技术服务有限公司

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佛山市沃特测试技术服务有限公司

授权签字人

Signed for and on behalf of

Waltek Testing Group (Foshan) Co., Ltd.

梁志聪

梁志聪/Swing.Liang



WTF24F05110467C

佛山市沃特测试技术服务有限公司/ Waltek Testing Group (Foshan) Co., Ltd.

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样品图片 / Sample Photo:



WALTEK



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测试结果/ Test Results:

测试方法/ Test Method:

- 参考IEC62321-5:2013, 使用ICP-OES检测铅、镉含量;
- 参考IEC62321-4:2013+AMD1:2017 CSV, 使用ICP-OES检测汞含量;
- 参考IEC62321-7-1:2015, 使用UV-Vis检测六价铬含量;
- 参考IEC62321-6:2015, 使用GC-MS检测PBBs及PBDEs含量。
- With reference to IEC62321-5:2013, determination of Lead and Cadmium by ICP-OES;
- With reference to IEC62321-4:2013+AMD1:2017 CSV, determination of Mercury by ICP-OES;
- With reference to IEC62321-7-1:2015, determination of Hexavalent Chromium by Colorimetric Method;
- With reference to IEC62321-6:2015, determination of PBBs and PBDEs by GC-MS.

测试项目 Test Item(s)	单位Unit	测试结果 Test Results	定量限 LOQ	限值 Limit
		No.2-1		
铅 Lead (Pb)	mg/kg	ND	2	1000
镉 Cadmium (Cd)	mg/kg	ND	2	100
汞 Mercury (Hg)	mg/kg	ND	2	1000
六价铬 Hexavalent Chromium (Cr ⁶⁺)	mg/kg	阴性 Negative	见备注 See Note	1000
多溴联苯总和 Sum of PBBs	mg/kg	ND	--	1000
一溴联苯 Monobromobiphenyl	mg/kg	ND	5	--
二溴联苯 Dibromobiphenyl	mg/kg	ND	5	--
三溴联苯 Tribromobiphenyl	mg/kg	ND	5	--
四溴联苯 Tetrabromobiphenyl	mg/kg	ND	5	--
五溴联苯 Pentabromobiphenyl	mg/kg	ND	5	--
六溴联苯 Hexabromobiphenyl	mg/kg	ND	5	--
七溴联苯 Heptabromobiphenyl	mg/kg	ND	5	--
八溴联苯 Octabromobiphenyl	mg/kg	ND	5	--
九溴联苯 Nonabromobiphenyl	mg/kg	ND	5	--
十溴联苯 Decabromobiphenyl	mg/kg	ND	5	--
多溴二苯醚总和 Sum of PBDEs	mg/kg	ND	--	1000
一溴二苯醚 Monobromodiphenyl ether	mg/kg	ND	5	--
二溴二苯醚 Dibromodiphenyl ether	mg/kg	ND	5	--
三溴二苯醚 Tribromodiphenyl ether	mg/kg	ND	5	--
四溴二苯醚 Tetrabromodiphenyl ether	mg/kg	ND	5	--
五溴二苯醚 Pentabromodiphenyl ether	mg/kg	ND	5	--
六溴二苯醚 Hexabromodiphenyl ether	mg/kg	ND	5	--
七溴二苯醚 Heptabromodiphenyl ether	mg/kg	ND	5	--
八溴二苯醚 Octabromodiphenyl ether	mg/kg	ND	5	--
九溴二苯醚 Nonabromodiphenyl ether	mg/kg	ND	5	--
十溴二苯醚 Decabromodiphenyl ether	mg/kg	ND	5	--
结论 Conclusion	--	符合/Pass	--	--



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测试项目 Test Item(s)	单位Unit	测试结果 Test Results	定量限 LOQ	限值 Limit
		No.2-2		
铅 Lead (Pb)	mg/kg	ND	2	1000
镉 Cadmium (Cd)	mg/kg	ND	2	100
汞 Mercury (Hg)	mg/kg	ND	2	1000
六价铬 Hexavalent Chromium (Cr ⁶⁺)	mg/kg	阴性 Negative	见备注 See Note	1000
多溴联苯总和 Sum of PBBs	mg/kg	ND	--	1000
一溴联苯 Monobromobiphenyl	mg/kg	ND	5	--
二溴联苯 Dibromobiphenyl	mg/kg	ND	5	--
三溴联苯 Tribromobiphenyl	mg/kg	ND	5	--
四溴联苯 Tetrabromobiphenyl	mg/kg	ND	5	--
五溴联苯 Pentabromobiphenyl	mg/kg	ND	5	--
六溴联苯 Hexabromobiphenyl	mg/kg	ND	5	--
七溴联苯 Heptabromobiphenyl	mg/kg	ND	5	--
八溴联苯 Octabromobiphenyl	mg/kg	ND	5	--
九溴联苯 Nonabromobiphenyl	mg/kg	ND	5	--
十溴联苯 Decabromobiphenyl	mg/kg	ND	5	--
多溴二苯醚总和 Sum of PBDEs	mg/kg	ND	--	1000
一溴二苯醚 Monobromodiphenyl ether	mg/kg	ND	5	--
二溴二苯醚 Dibromodiphenyl ether	mg/kg	ND	5	--
三溴二苯醚 Tribromodiphenyl ether	mg/kg	ND	5	--
四溴二苯醚 Tetrabromodiphenyl ether	mg/kg	ND	5	--
五溴二苯醚 Pentabromodiphenyl ether	mg/kg	ND	5	--
六溴二苯醚 Hexabromodiphenyl ether	mg/kg	ND	5	--
七溴二苯醚 Heptabromodiphenyl ether	mg/kg	ND	5	--
八溴二苯醚 Octabromodiphenyl ether	mg/kg	ND	5	--
九溴二苯醚 Nonabromodiphenyl ether	mg/kg	ND	5	--
十溴二苯醚 Decabromodiphenyl ether	mg/kg	ND	5	--
结论 Conclusion	--	符合/Pass	--	--



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测试项目 Test Item(s)	单位Unit	测试结果 Test Results	定量限 LOQ	限值 Limit
		No.2-3		
铅 Lead (Pb)	mg/kg	ND	2	1000
镉 Cadmium (Cd)	mg/kg	ND	2	100
汞 Mercury (Hg)	mg/kg	ND	2	1000
六价铬 Hexavalent Chromium (Cr ⁶⁺)	mg/kg	阴性 Negative	见备注 See Note	1000
多溴联苯总和 Sum of PBBs	mg/kg	ND	--	1000
一溴联苯 Monobromobiphenyl	mg/kg	ND	5	--
二溴联苯 Dibromobiphenyl	mg/kg	ND	5	--
三溴联苯 Tribromobiphenyl	mg/kg	ND	5	--
四溴联苯 Tetrabromobiphenyl	mg/kg	ND	5	--
五溴联苯 Pentabromobiphenyl	mg/kg	ND	5	--
六溴联苯 Hexabromobiphenyl	mg/kg	ND	5	--
七溴联苯 Heptabromobiphenyl	mg/kg	ND	5	--
八溴联苯 Octabromobiphenyl	mg/kg	ND	5	--
九溴联苯 Nonabromobiphenyl	mg/kg	ND	5	--
十溴联苯 Decabromobiphenyl	mg/kg	ND	5	--
多溴二苯醚总和 Sum of PBDEs	mg/kg	ND	--	1000
一溴二苯醚 Monobromodiphenyl ether	mg/kg	ND	5	--
二溴二苯醚 Dibromodiphenyl ether	mg/kg	ND	5	--
三溴二苯醚 Tribromodiphenyl ether	mg/kg	ND	5	--
四溴二苯醚 Tetrabromodiphenyl ether	mg/kg	ND	5	--
五溴二苯醚 Pentabromodiphenyl ether	mg/kg	ND	5	--
六溴二苯醚 Hexabromodiphenyl ether	mg/kg	ND	5	--
七溴二苯醚 Heptabromodiphenyl ether	mg/kg	ND	5	--
八溴二苯醚 Octabromodiphenyl ether	mg/kg	ND	5	--
九溴二苯醚 Nonabromodiphenyl ether	mg/kg	ND	5	--
十溴二苯醚 Decabromodiphenyl ether	mg/kg	ND	5	--
结论 Conclusion	--	符合/Pass	--	--



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测试项目 Test Item(s)	单位Unit	测试结果 Test Results	定量限 LOQ	限值 Limit
		No.2-4		
铅 Lead (Pb)	mg/kg	ND	2	1000
镉 Cadmium (Cd)	mg/kg	ND	2	100
汞 Mercury (Hg)	mg/kg	ND	2	1000
六价铬 Hexavalent Chromium (Cr ⁶⁺)	mg/kg	阴性 Negative	见备注 See Note	1000
多溴联苯总和 Sum of PBBs	mg/kg	ND	--	1000
一溴联苯 Monobromobiphenyl	mg/kg	ND	5	--
二溴联苯 Dibromobiphenyl	mg/kg	ND	5	--
三溴联苯 Tribromobiphenyl	mg/kg	ND	5	--
四溴联苯 Tetrabromobiphenyl	mg/kg	ND	5	--
五溴联苯 Pentabromobiphenyl	mg/kg	ND	5	--
六溴联苯 Hexabromobiphenyl	mg/kg	ND	5	--
七溴联苯 Heptabromobiphenyl	mg/kg	ND	5	--
八溴联苯 Octabromobiphenyl	mg/kg	ND	5	--
九溴联苯 Nonabromobiphenyl	mg/kg	ND	5	--
十溴联苯 Decabromobiphenyl	mg/kg	ND	5	--
多溴二苯醚总和 Sum of PBDEs	mg/kg	ND	--	1000
一溴二苯醚 Monobromodiphenyl ether	mg/kg	ND	5	--
二溴二苯醚 Dibromodiphenyl ether	mg/kg	ND	5	--
三溴二苯醚 Tribromodiphenyl ether	mg/kg	ND	5	--
四溴二苯醚 Tetrabromodiphenyl ether	mg/kg	ND	5	--
五溴二苯醚 Pentabromodiphenyl ether	mg/kg	ND	5	--
六溴二苯醚 Hexabromodiphenyl ether	mg/kg	ND	5	--
七溴二苯醚 Heptabromodiphenyl ether	mg/kg	ND	5	--
八溴二苯醚 Octabromodiphenyl ether	mg/kg	ND	5	--
九溴二苯醚 Nonabromodiphenyl ether	mg/kg	ND	5	--
十溴二苯醚 Decabromodiphenyl ether	mg/kg	ND	5	--
结论 Conclusion	--	符合/Pass	--	--



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测试项目 Test Item(s)	单位Unit	测试结果 Test Results	定量限 LOQ	限值 Limit
		No.2-5		
铅 Lead (Pb)	mg/kg	ND	2	1000
镉 Cadmium (Cd)	mg/kg	ND	2	100
汞 Mercury (Hg)	mg/kg	ND	2	1000
六价铬 Hexavalent Chromium (Cr ⁶⁺)	mg/kg	阴性 Negative	见备注 See Note	1000
多溴联苯总和 Sum of PBBs	mg/kg	ND	--	1000
一溴联苯 Monobromobiphenyl	mg/kg	ND	5	--
二溴联苯 Dibromobiphenyl	mg/kg	ND	5	--
三溴联苯 Tribromobiphenyl	mg/kg	ND	5	--
四溴联苯 Tetrabromobiphenyl	mg/kg	ND	5	--
五溴联苯 Pentabromobiphenyl	mg/kg	ND	5	--
六溴联苯 Hexabromobiphenyl	mg/kg	ND	5	--
七溴联苯 Heptabromobiphenyl	mg/kg	ND	5	--
八溴联苯 Octabromobiphenyl	mg/kg	ND	5	--
九溴联苯 Nonabromobiphenyl	mg/kg	ND	5	--
十溴联苯 Decabromobiphenyl	mg/kg	ND	5	--
多溴二苯醚总和 Sum of PBDEs	mg/kg	ND	--	1000
一溴二苯醚 Monobromodiphenyl ether	mg/kg	ND	5	--
二溴二苯醚 Dibromodiphenyl ether	mg/kg	ND	5	--
三溴二苯醚 Tribromodiphenyl ether	mg/kg	ND	5	--
四溴二苯醚 Tetrabromodiphenyl ether	mg/kg	ND	5	--
五溴二苯醚 Pentabromodiphenyl ether	mg/kg	ND	5	--
六溴二苯醚 Hexabromodiphenyl ether	mg/kg	ND	5	--
七溴二苯醚 Heptabromodiphenyl ether	mg/kg	ND	5	--
八溴二苯醚 Octabromodiphenyl ether	mg/kg	ND	5	--
九溴二苯醚 Nonabromodiphenyl ether	mg/kg	ND	5	--
十溴二苯醚 Decabromodiphenyl ether	mg/kg	ND	5	--
结论 Conclusion	--	符合/Pass	--	--



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测试项目 Test Item(s)	单位 Unit	测试方法/测试仪器 Test Method & Test Equipment	结果 Results	定量限 LOQ	限值 Limit
			No.2-1		
邻苯二甲酸二(2-乙基己基)酯 (DEHP) Bis (2-ethylhexyl)- phthalate (DEHP)	mg/kg	IEC 62321-8:2017, GC-MS	ND	50	1000
邻苯二甲酸二丁酯(DBP) Dibutyl phthalate (DBP)	mg/kg		ND	50	1000
邻苯二甲酸丁苄酯(BBP) Benzylbutyl phthalate (BBP)	mg/kg		ND	50	1000
邻苯二甲酸二异丁酯(DIBP) Diisobutyl phthalate (DIBP)	mg/kg		ND	50	1000
结论 / Conclusion	--	--	符合/ Pass	--	--

测试项目 Test Item(s)	单位 Unit	测试方法/测试仪器 Test Method & Test Equipment	结果 Results	定量限 LOQ	限值 Limit
			No.2-2		
邻苯二甲酸二(2-乙基己基)酯 (DEHP) Bis (2-ethylhexyl)- phthalate (DEHP)	mg/kg	IEC 62321-8:2017, GC-MS	ND	50	1000
邻苯二甲酸二丁酯(DBP) Dibutyl phthalate (DBP)	mg/kg		ND	50	1000
邻苯二甲酸丁苄酯(BBP) Benzylbutyl phthalate (BBP)	mg/kg		ND	50	1000
邻苯二甲酸二异丁酯(DIBP) Diisobutyl phthalate (DIBP)	mg/kg		ND	50	1000
结论 / Conclusion	--	--	符合/ Pass	--	--

测试项目 Test Item(s)	单位 Unit	测试方法/测试仪器 Test Method & Test Equipment	结果 Results	定量限 LOQ	限值 Limit
			No.2-3		
邻苯二甲酸二(2-乙基己基)酯 (DEHP) Bis (2-ethylhexyl)- phthalate (DEHP)	mg/kg	IEC 62321-8:2017, GC-MS	ND	50	1000
邻苯二甲酸二丁酯(DBP) Dibutyl phthalate (DBP)	mg/kg		ND	50	1000
邻苯二甲酸丁苄酯(BBP) Benzylbutyl phthalate (BBP)	mg/kg		ND	50	1000
邻苯二甲酸二异丁酯(DIBP) Diisobutyl phthalate (DIBP)	mg/kg		ND	50	1000
结论 / Conclusion	--	--	符合/ Pass	--	--



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测试项目 Test Item(s)	单位 Unit	测试方法/测试仪器 Test Method & Test Equipment	结果 Results	定量限 LOQ	限值 Limit
			No.2-4		
邻苯二甲酸二(2-乙基己基)酯 (DEHP) Bis (2-ethylhexyl)- phthalate (DEHP)	mg/kg	IEC 62321-8:2017, GC-MS	ND	50	1000
邻苯二甲酸二丁酯(DBP) Dibutyl phthalate (DBP)	mg/kg		ND	50	1000
邻苯二甲酸丁苄酯(BBP) Benzylbutyl phthalate (BBP)	mg/kg		ND	50	1000
邻苯二甲酸二异丁酯(DIBP) Diisobutyl phthalate (DIBP)	mg/kg		ND	50	1000
结论 / Conclusion	--	--	符合/ Pass	--	--

测试项目 Test Item(s)	单位 Unit	测试方法/测试仪器 Test Method & Test Equipment	结果 Results	定量限 LOQ	限值 Limit
			No.2-5		
邻苯二甲酸二(2-乙基己基)酯 (DEHP) Bis (2-ethylhexyl)- phthalate (DEHP)	mg/kg	IEC 62321-8:2017, GC-MS	ND	50	1000
邻苯二甲酸二丁酯(DBP) Dibutyl phthalate (DBP)	mg/kg		ND	50	1000
邻苯二甲酸丁苄酯(BBP) Benzylbutyl phthalate (BBP)	mg/kg		ND	50	1000
邻苯二甲酸二异丁酯(DIBP) Diisobutyl phthalate (DIBP)	mg/kg		ND	50	1000
结论 / Conclusion	--	--	符合/ Pass	--	--



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备注/ Note:

(1) ND =未检出, 检测值小于定量限/ Not Detected or lower than limit of quantitation

(2) mg/kg =毫克每千克 (milligram per kilogram)= 百万分之一 (ppm)

(3) LOQ =定量限/ Limit of quantitation

(4) “--” =未规定/ Not regulated

(5) 根据IEC 62321-7-1: 2015沸水萃取:

阴性 = 表示涂层不存在 Cr^{6+} , 即在沸水萃取溶液中六价铬浓度小于 $0.10\text{ug}/\text{cm}^2$

不确定 = 即在沸水萃取溶液中六价铬浓度大于或等于 $0.10\text{ug}/\text{cm}^2$ 和小于或等于 $0.13\text{ug}/\text{cm}^2$

阳性 = 表示涂层存在 Cr^{6+} , 即在沸水萃取溶液中六价铬浓度大于 $0.13\text{ug}/\text{cm}^2$

关于金属样品的保存条件和生产日期将不能被采用, 其测试结果只能证明当下方法测试下样品是否存在/不存在 Cr^{6+} 。

According to IEC 62321-7-1:2015, boiling water extraction:

Negative = Absence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is less than $0.10\text{ug}/\text{cm}^2$.

Inconclusive = the detected concentration in boiling water extraction solution is greater than or equal to $0.10\text{ug}/\text{cm}^2$ and less than or equal to $0.13\text{ug}/\text{cm}^2$.

Positive = Presence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is greater than $0.13\text{ug}/\text{cm}^2$.

Information on storage conditions and production date of the tested sample is unavailable and thus Cr^{6+} results represent status of the sample at the time of testing.

样品描述 / Specimen Description:

编号 Specimen No.	样品描述 Specimen Description	备注 Note
2-1	银色金属螺丝 Silvery metal screw	●
2-2	银色金属螺丝 Silvery metal screw	同(Same) 2-1
2-3	银色金属环 Silvery metal ring	同(Same) 2-1
2-4	银色金属垫片 Silvery metal gasket	同(Same) 2-1
2-5	银色金属螺母 Silvery metal nut	同(Same) 2-1

备注/ Note:

(1) “●” =对本报告图片中标识的样品进行化学检测。

“●” = Actual tested sample. Chemical tests were performed for the samples indicated by the photo in this report.

(2) “同” = 表示根据客户要求, 该样品与实际检测样品为同材质 (或结果均引用自对应编号的报告), 未测试。

“Same” = It means that as per client's requirement, the sample and the actual tested sample are of the same material (or results of the sample are quoted from corresponding number report) and have not been tested.

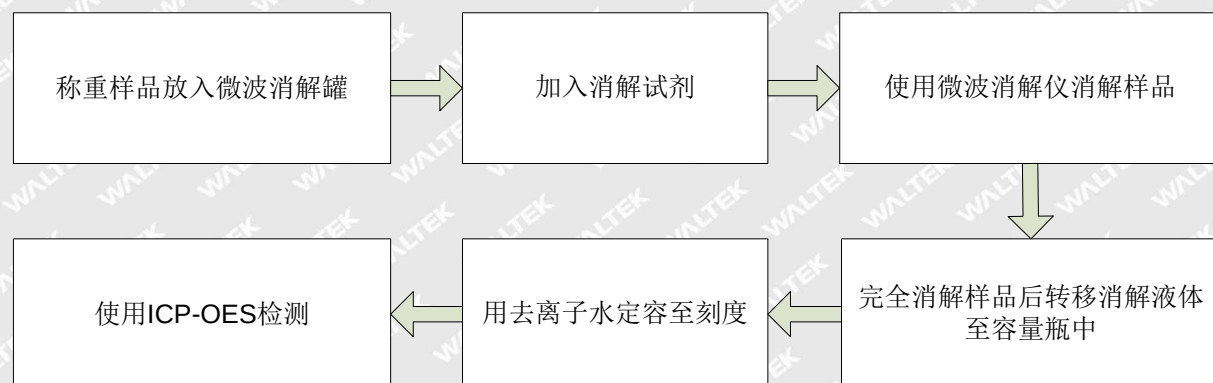


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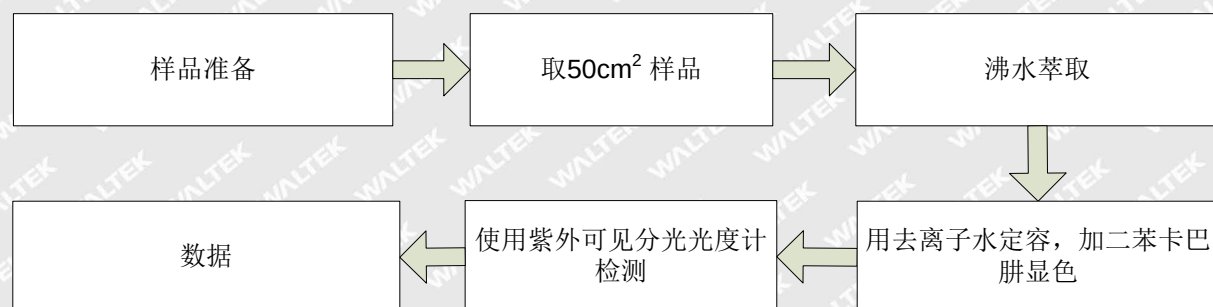
任务号/Job No.: FSW2024051559396CJ

测试流程图:

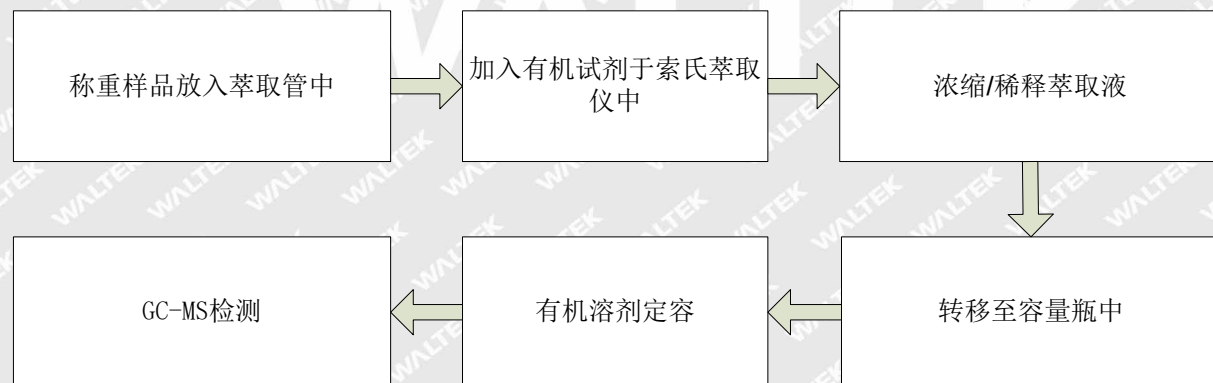
1. 铅、镉、汞测试流程图

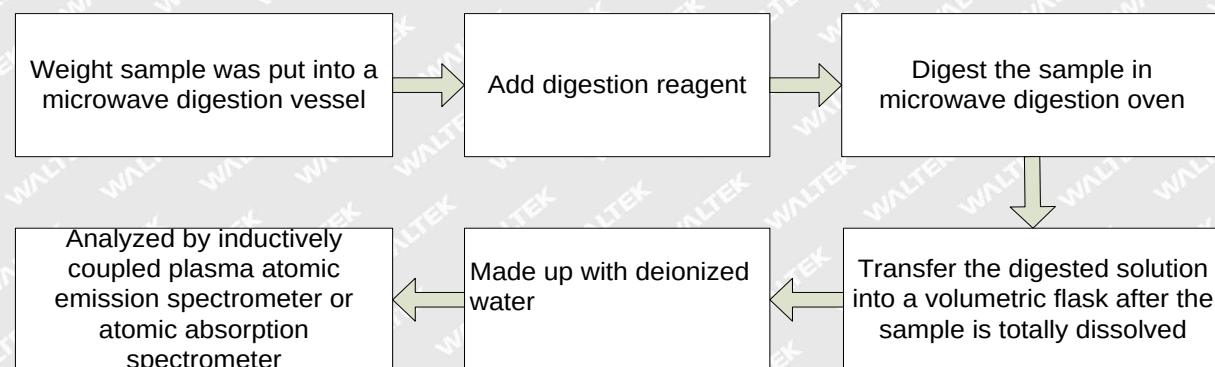
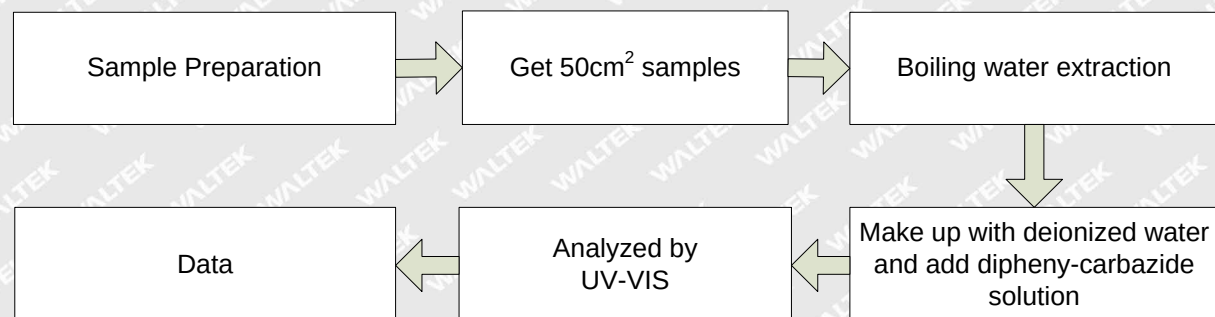
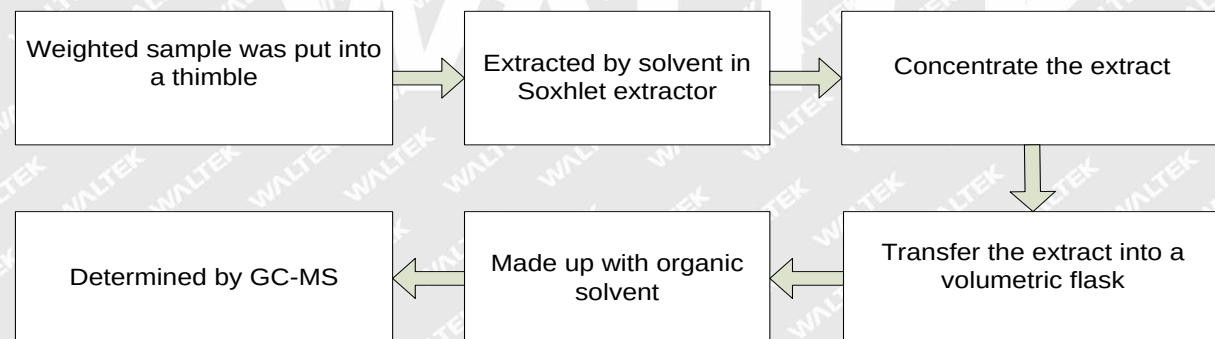


2. 六价铬测试流程图



3. 多溴联苯、多溴二苯醚、邻苯二甲酸酯测试流程图



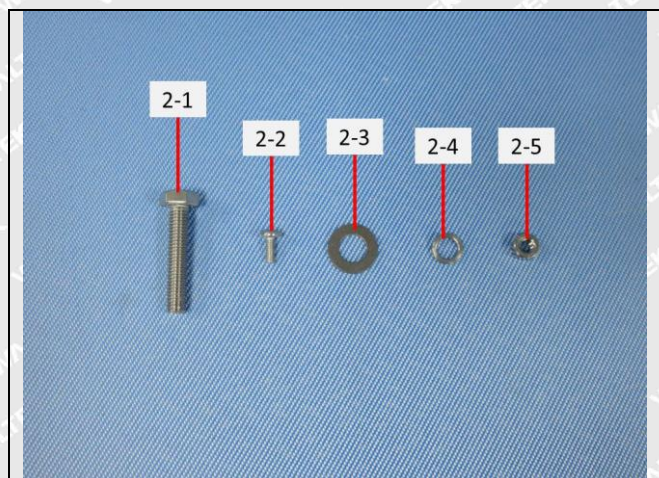
**Testing Flow chart:****1. Test for Cd/ Pb/ Hg contents****2. Test for Cr⁶⁺ content****3. Test for PBBs/ PBDEs/ DIBP/ DEHP/ DBP/ BBP contents**



报告编号/ Report No.: WTF24F05110467C

任务号/Job No.: FSW2024051559396CJ

测试部位图片 / Photograph of parts tested:



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