检测报告
TEST REPORT

Report No./报告编号	:	WTF20F04023881A2C
Applicant.....	:	Zhuhai Sunlu Industrial Co., Ltd
申请方	:	珠海市三绿实业有限公司
Address.....	:	No.38 Yongtian Road, Trade Logistics Centre Phase Two, Qiansh an, Xiangzhou District, Zhuhai, Guangdong，China.
地址.....	:	广东省珠海市香洲区前山商贸物流中心二期永田路38号三绿工业园
Manufacturer	:	Zhuhai Sunlu Industrial Co., Ltd
制造商	:	珠海市三绿实业有限公司
Address.....	:	No.38 Yongtian Road, Trade Logistics Centre Phase Two, Qiansh an, Xiangzhou District, Zhuhai, Guangdong，China.
地址.....	:	广东省珠海市香洲区前山商贸物流中心二期永田路38号三绿工业园
Sample Receiving Date	:	2020-04-30 & 2020-05-25
样品接收日期		
Testing Period	:	2020-04-30 ~ 2020-05-28
测试日期		
Date of Issue.....	:	2020-05-29
报告日期		
Test Result.....	:	Refer to next page (s) / 参见报告下页
测试结果		

Remark :

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Sample Name	:	3D Printing-mate
样品名称.....	:	3D打印伴侣
Model No.	:	FilaDryer S1
型号		
Test Requested	:	In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863, to determine the 10 restricted substances content in the submitted sample.
测试要求		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。
Test Method.....	:	1) With Reference to IEC 62321-2:2013, disassembly, disjunction and mechanical sample preparation 参考IEC 62321-2:2013，样品的拆卸、拆解和机械拆分 2) With Reference to IEC 62321-3-1:2013, screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry 参考IEC 62321-3-1:2013，使用X射线荧光光谱仪对电子产品中的铅、汞、镉、总铬和总溴进行筛选 3) With reference to IEC 62321-4:2013+AMD1:2017 CSV, determination of Mercury by ICP-OES 参考IEC 62321-4:2013+AMD1:2017 CSV，使用电感耦合等离子体发射光谱仪（ICP-OES）检测汞含量 4) With reference to IEC 62321-5:2013, determination of Lead and Cadmium by ICP-OES 参考IEC 62321-5: 2013，使用电感耦合等离子体发射光谱仪（ICP-OES）检测铅、镉含量 5) With reference to IEC 62321-7-2: 2017 and IEC 62321-7-1:2015, determination of Hexavalent Chromium by UV-Vis 参考IEC 62321-7-2: 2017和IEC 62321-7-1:2015，使用紫外可见分光光度计（UV-Vis）检测六价铬含量 6) With reference to IEC 62321-6: 2015, determination of PBBs and PBDEs by GC-MS 参考IEC 62321-6: 2015，使用气相色谱质谱联用仪（GC-MS）检测多溴联苯及多溴联苯醚含量 7) With Reference to IEC 62321-8: 2017, determination of Phthalates content by GC-MS. 参考IEC 62321-8: 2017，使用气相色谱质谱联用仪（GC-MS）检测4种邻苯二甲酸酯的含量。
Test Conclusion	:	**Pass** (Based on the performed tests on the submitted samples, the results comply with the requirement of EU RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863)
测试结论		**符合** (根据客户提供的样品，测试结果符合RoHS指令2011/65/EU及其修订指令(EU) No.2015/863的要求)

Test Results / 测试结果:

1. Lead, Mercury, Cadmium, Hexavalent Chromium, PBBs and PBDEs
铅、镉、汞、六价铬、多溴联苯和多溴联苯醚

Part No. 部件编号	Part Description 部件描述	Result of XRF XRF测试结果					Result of Wet Chemical Testing (mg/kg) 湿化学测试结果(毫克/千克)
		Cd	Pb	Hg	Cr	Br	
1	Black semi-transparent plastic shell 黑色半透明塑料外壳	BL	BL	BL	BL	BL	NA
2	Black plastic button 黑色塑料按钮	BL	BL	BL	BL	BL	NA
3	Transparent plastic shell 透明塑料外壳	BL	BL	BL	BL	BL	NA
4	White plastic shell 白色塑料外壳	BL	BL	BL	BL	BL	NA
5	Black soft plastic foot pad 黑色软塑料脚垫	BL	BL	BL	BL	BL	NA
6	Silvery metal foil 银色金属箔	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
7	Black sponge sheet 黑色海绵片	BL	BL	BL	BL	BL	NA
8	Yellow transparent plastic sheet 黄色透明塑料片	BL	BL	BL	BL	BL	NA
9	Silvery metal sheet 银色金属片	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
10	Silvery metal holder 银色金属支架	BL	BL	BL	BL	BL	NA
11	Solder 焊锡	BL	BL	BL	BL	BL	NA
12	Black plastic wire covering 黑色塑料线皮	BL	BL	BL	BL	BL	NA
13	Red plastic wire covering 黑色塑料线皮	BL	BL	BL	BL	BL	NA
14	Silvery metal wire 银色金属线芯	BL	BL	BL	BL	BL	NA
15	White plastic shell of plug 插头的白色塑料外壳	BL	BL	BL	BL	BL	NA
16	Silvery metal pin of plug 插头的银色金属插脚	BL	BL	BL	BL	BL	NA
17	Solder of socket 插座的焊锡	BL	BL	BL	BL	BL	NA

Part No. 部件 编号	Part Description 部件描述	Result of XRF XRF测试结果					Result of Wet Chemical Testing (mg/kg) 湿化学测试结果(毫克/千克)
		Cd	Pb	Hg	Cr	Br	
18	Brown plastic sheet of socket 插座的棕色塑料片	BL	BL	BL	BL	BL	NA
19	Black plastic shell of socket 插座的黑色塑料外壳	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 114 多溴联苯：未检出 多溴联苯醚：114
20	Silvery metal pin of socket 插座的银色金属插脚	BL	BL	BL	BL	BL	NA
21	Silvery metal sheet of socket 插座的银色金属片	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
22	Silvery metal screw 银色金属螺丝	BL	BL	BL	BL	BL	NA
23	Silvery metal screw 银色金属螺丝	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
24	Semi-transparent soft plastic washer 半透明软塑料垫圈	BL	BL	BL	BL	BL	NA
25	White soft plastic sheet 白色软塑料片	BL	BL	BL	BL	BL	NA
26	Silvery metal strip 银色金属条	BL	BL	BL	BL	BL	NA
27	White plastic sheet 白色塑料片	BL	BL	BL	BL	BL	NA
28	White plastic sheet 白色塑料片	BL	BL	BL	BL	BL	NA
29	Transparent adhesive tape 透明胶带	BL	BL	BL	BL	BL	NA
30	Silvery plastic adhesive tape 银色塑料胶带	BL	BL	BL	BL	BL	NA
31	Transparent plastic sheet 透明塑料板	BL	BL	BL	BL	BL	NA
32	White-black plastic adhesive tape 黑白色塑料胶带	BL	BL	BL	BL	BL	NA
33	Transparent body of LED 发光二极管的透明本体	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND 多溴联苯：未检出 多溴联苯醚：未检出
34	Black transparent plastic film 黑色透明塑料薄膜	BL	BL	BL	BL	BL	NA

Part No. 部件 编号	Part Description 部件描述	Result of XRF XRF测试结果					Result of Wet Chemical Testing (mg/kg) 湿化学测试结果(毫克/千克)
		Cd	Pb	Hg	Cr	Br	
35	Transparent plastic film 透明塑料薄膜	BL	BL	BL	BL	BL	NA
36	Transparent glass sheet 透明玻璃板	BL	BL	BL	BL	BL	NA
37	Silvery metal pin 银色金属插脚	BL	BL	BL	BL	BL	NA
38	Silvery metal sheet of bearing 轴承的银色金属片	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
39	Black soft plastic sheet of bearing 轴承的黑色软塑料片	BL	BL	BL	BL	BL	NA
40	Silvery metal shell of bearing 轴承的银色金属外壳	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
41	Silvery metal bead of bearing 轴承的银色金属珠	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
42	Silvery metal holder of bearing 轴承的银色金属支架	BL	BL	BL	BL	BL	NA
43	Black plastic wire covering 黑色塑料线	BL	BL	BL	BL	BL	NA
44	Silvery metal wire 银色金属线芯	BL	BL	BL	BL	BL	NA
45	Black heat-shrinkable tube 黑色热缩套管	BL	BL	BL	BL	BL	NA
46	Black body of resistor 电阻的黑色本体	BL	BL	BL	BL	BL	NA
47	Red metal wire 红色金属线	BL	BL	BL	BL	BL	NA
48	White plastic shell of plug 插头的白色塑料外壳	BL	BL	BL	BL	BL	NA
49	Solder 焊锡	BL	BL	BL	BL	BL	NA
50	Beige plastic shell of socket 插座的米黄色塑料外壳	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND 多溴联苯：未检出 多溴联苯醚：未检出
51	Silvery metal pin of socket 插座的银色金属插脚	BL	BL	BL	BL	BL	NA
52	Chip audion 贴片三极管	BL	BL	BL	BL	BL	NA

Part No. 部件 编号	Part Description 部件描述	Result of XRF XRF测试结果					Result of Wet Chemical Testing (mg/kg) 湿化学测试结果(毫克/千克)
		Cd	Pb	Hg	Cr	Br	
53	Chip IC 贴片集成电路	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND 多溴联苯：未检出 多溴联苯醚：未检出
54	Chip resistor 贴片电阻	BL	***OL**	BL	IN	BL	Cr^{6+} : ND 六价铬：未检出
55	White plastic shell of socket 插座的白色塑料外壳	BL	BL	BL	BL	BL	NA
56	Silvery metal pin of socket 插座的银色金属插脚	BL	BL	BL	BL	BL	NA
57	Chip resistor 贴片电阻	BL	BL	BL	BL	BL	NA
58	Solder 焊锡	BL	BL	BL	BL	BL	NA
59	Chip resistor 贴片电阻	BL	IN	BL	BL	BL	Pb :247 铅：247
60	Green PCB 绿色电路板	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND 多溴联苯：未检出 多溴联苯醚：未检出
61	Solder 焊锡	BL	BL	BL	BL	BL	NA
62	Chip capacitor 贴片电容	BL	BL	BL	BL	BL	NA
63	Chip audion 贴片三极管	BL	BL	BL	BL	BL	NA
64	Chip diode 贴片二极管	BL	BL	BL	BL	BL	NA
65	Chip audion 贴片三极管	BL	BL	BL	BL	BL	NA
66	Chip capacitor 贴片电容	BL	BL	BL	BL	BL	NA
67	Black plastic base of button 按钮的黑色塑料底座	BL	BL	BL	BL	BL	NA
68	Silvery metal pin of button 按钮的银色金属插脚	BL	BL	BL	BL	BL	NA
69	Silvery metal shell of button 按钮的银色金属外壳	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性

Part No. 部件编号	Part Description 部件描述	Result of XRF XRF测试结果					Result of Wet Chemical Testing (mg/kg) 湿化学测试结果(毫克/千克)
		Cd	Pb	Hg	Cr	Br	
70	Black plastic key of button 按钮的黑色塑料按键	BL	BL	BL	BL	BL	NA
71	Silvery metal sheet of button 按钮的银色金属片	BL	BL	BL	IN	BL	Cr^{6+} : Negative 六价铬：阴性
72	Yellow transparent plastic adhesive tape of button 按钮的黄色透明塑料胶带	BL	BL	BL	BL	BL	NA

Remark / 备注:

(1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr^{6+}) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1: 2013 (unit: mg/kg).
EDXRF所得的测试结果只作初步筛选，如果XRF结果超出IEC 62321-3-1: 2013所规定的警戒范围，建议客户用更精确的化学测试方法测试，如: 用ICP 测试Cd、Pb、Hg，用UV-VIS测试Cr^{6+}，用GS/MS测试PBBs和PBDEs（单位:mg/kg）。

Element 元素	Polymer 聚合物	Metal 金属	Composite Materials 复合材料
Cd	BL ≤ (70-3σ) < IN < (130+3σ) ≤ OL	BL ≤ (70-3σ) < IN < (130+3σ) ≤ OL	LOD < IN < (150+3σ) ≤ OL
Pb	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL
Hg	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL
Cr	BL ≤ (700-3σ) < IN	BL ≤ (700-3σ) <IN	BL ≤ (500-3σ) < IN
Br	BL ≤ (300-3σ) < IN	--	BL ≤ (250-3σ) < IN

BL= Below Limit/低于限值 OL= Over Limit/高于限值 LOD = Limit of Detection/检出限
-- = Not Regulated /未规定

(2) "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.
"IN" 表示为未确定区域，需进一步化学测试判断是否符合RoHS指令的要求。

(3) The XRF screening test for RoHS elements – the reading may be different to the actual content in the sample be of non-uniformity composition.
XRF筛选测试RoHS元素 – 物质的不均一性导致测试结果和实际值可能存在差异。

(4) mg / kg =milligram per kilogram(毫克每千克) = ppm (百万分之一), μg/cm^2= Micrograms per square centimetre(微克每平方厘米).

(5) ND = Not Detected or lower than limit of quantitation.
未检出 = 检测值小于定量限。

(6) NA = Not Applicable, as the XRF screening test result was below the limit or as the XRF screening directly determine that test result was over the limit, it was not need to conduct the wet chemical testing.
不适用, XRF筛选测试的结果低于限值或通过XRF扫描直接判定测试结果大于限值,不需要进行化学测试.

(7) LOQ = Limit of quantitation.
LOQ =定量限。

Test Items 测试项目	Pb	Cd	Hg	Cr^{6+}		PBB	PBDE
Units 单位	mg/kg	mg/kg	mg/kg	mg/kg	$\mu g/cm^2$	mg/kg	mg/kg
LOQ 定量限	2	2	2	8	0.1	5	5

The LOQ for single compound of PBBs and PBDEs is 5mg/kg, LOQ of Cr^{6+} for polymer and composite sample is 8mg/kg and LOQ of Cr^{6+} for metal sample is 0.1μg/cm^2.
对于单一化合物的PBB和PBDE，LOQ为5mg/kg。对于聚合物和复合样品的Cr^{6+}，LOQ为8mg/kg。对于金属样品的Cr^{6+}，LOQ为0.1μg/cm^2。

(8) RoHS Requirement
RoHS要求

Restricted Substances 限制物质	Limits 限值
Cadmium (Cd) 镉 (Cd)	0.01% (100 mg/kg)
Lead (Pb) 铅 (Pb)	0.1% (1000 mg/kg)
Mercury (Hg) 汞 (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr^{6+}) 六价铬 (Cr^{6+})	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs) 多溴联苯 (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs) 多溴联苯醚 (PBDEs)	0.1% (1000 mg/kg)

(9) According to IEC 62321-7-1:2015, determined of Cr^{6+} on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.
Boiling water extraction:
Negative = Absence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is less than 0.10ug/cm^2.
Positive = Presence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is greater than 0.13ug/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.
根据IEC 62321-7-1:2015电子电器产品中限用物质含量的测定程序，金属样品中的Cr^{6+}用沸水萃取方法来测定，其测试结果显示为阳性/阴性。
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0.10ug/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0.13ug/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+}。

(10) Abbreviation:

"Pb" denotes Lead, "Cd" denotes Cadmium, "Hg" denotes Mercury, "Cr" denotes Chromium, "Cr (VI)" denotes Hexavalent Chromium, "Br" denotes Bromine, "PBBs" denotes Total Polybrominated Biphenyls, "PBDEs" denotes Total Polybrominated Diphenyl Ethers.

英文字符含义:

"Pb"表示铅，"Cd"表示镉，"Hg"表示汞，"Cr"表示铬，"Cr (VI)"表示六价铬，"Br"表示溴，"PBBs"表示总多溴联苯，"PBDEs"表示总多溴联苯醚。

(11) * = According to the declaration from client, the source of lead in test sample is from the glass or ceramic material of that electronic component which is exempted by Directive 2011/65/EU.

* =依据客户申明，铅含量来源于玻璃或陶瓷的电子材料，根据指令2011/65/EU，玻璃或陶瓷电子元器件中铅含量豁免。

2. Phthalates/邻苯二甲酸酯

Serial No. 序号	Part No. 部件编号	Result (mg/kg) 测试结果（毫克/千克）			
		DBP	BBP	DEHP	DIBP
T01	1+2+3+4+8△	<50	<50	<50	<50
T02	5	105	<50	<50	<50
T03	7	<50	<50	<50	<50
T04	12	<50	<50	<50	<50
T05	13	<50	<50	<50	<50
T06	15+18+19△	<50	<50	<50	<50
T07	24	<50	<50	<50	<50
T08	25	<50	<50	<50	<50
T09	27+28△	<50	<50	<50	<50
T10	29	95	<50	150	<50
T11	30	<50	<50	<50	<50
T12	32	<50	<50	<50	<50
T13	31+48+50+55△	<50	<50	<50	<50
T14	33	<50	<50	<50	<50
T15	34	<50	<50	<50	<50
T16	35	<50	<50	<50	<50
T17	36+59+60+62+63△	<50	<50	<50	<50
T18	39	<50	<50	<50	<50
T19	43	<50	<50	<50	<50
T20	45	<50	<50	<50	<50
T21	46+52+53+54+57△	<50	<50	<50	<50
T22	64+65+66△	<50	<50	<50	<50
T23	67+70△	<50	<50	<50	<50
T24	72	<50	<50	<50	<50

Remark / 备注:

(1) "<" = less than/小于

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

(3) Abbreviation:

"DBP" denotes Dibutyl phthalate, "BBP" denotes Benzyl butyl phthalate (BBP), "DEHP" denotes Bis(2-ethylhexyl)-phthalate, "DIBP" denotes Diisobutyl phthalate, "PHT" denotes Phthalates.

英文字符含义:

"DBP"表示邻苯二甲酸二丁酯，"BBP"表示邻苯二甲酸丁苄酯，"DEHP"表示邻苯二甲酸二(2-乙基己基)酯，"DIBP"表示邻苯二甲酸二异丁酯，"PHT"表示邻苯二甲酸酯。

(4) RoHS requirement

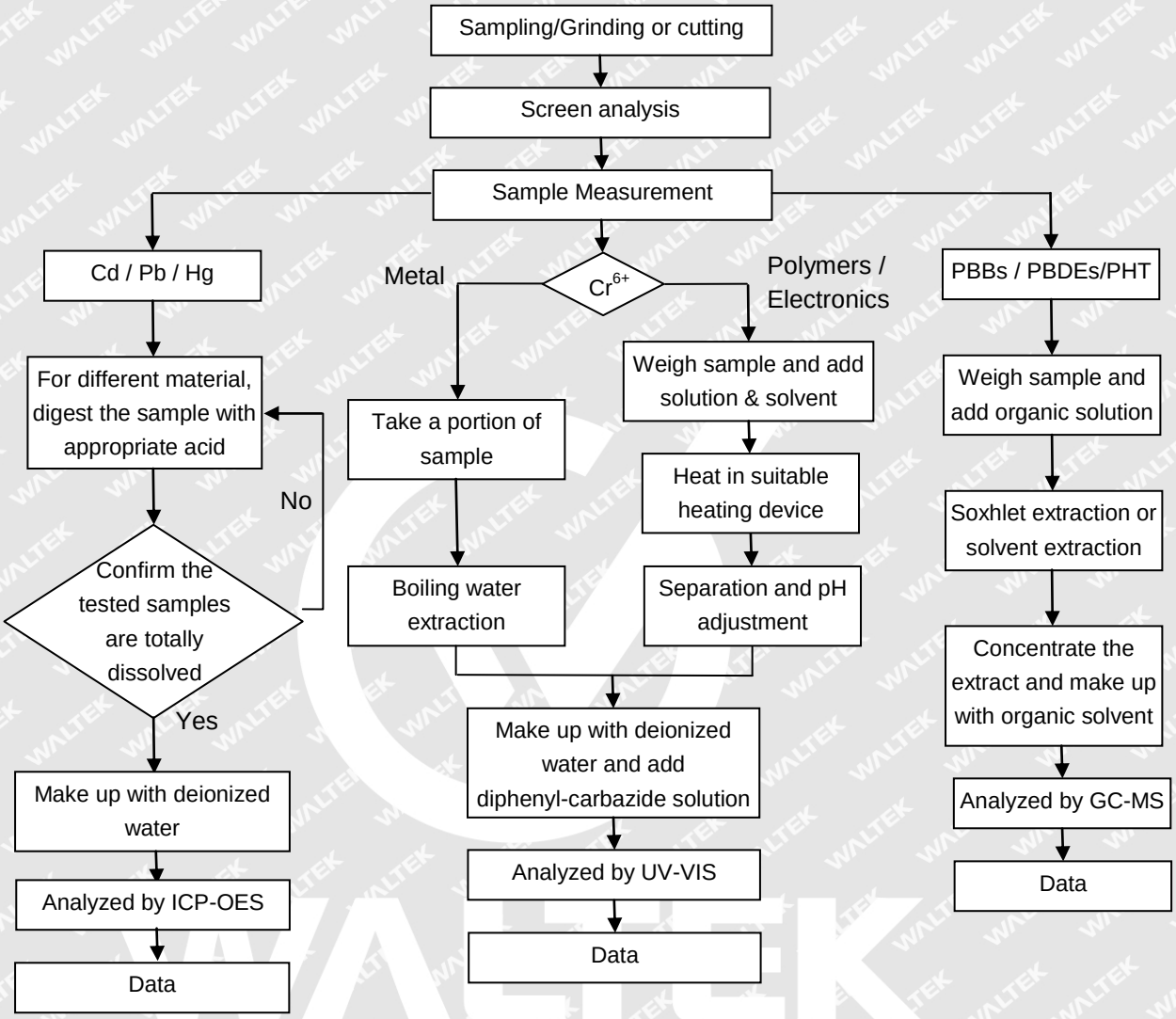
RoHS要求

Restricted Substances 限制物质	Limits 限值
Dibutyl phthalate (DBP) 邻苯二甲酸二丁酯 (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP) 邻苯二甲酸丁苄酯 (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP) 邻苯二甲酸二(2-乙基己基)酯 (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP) 邻苯二甲酸二异丁酯 (DIBP)	0.1% (1000 mg/kg)

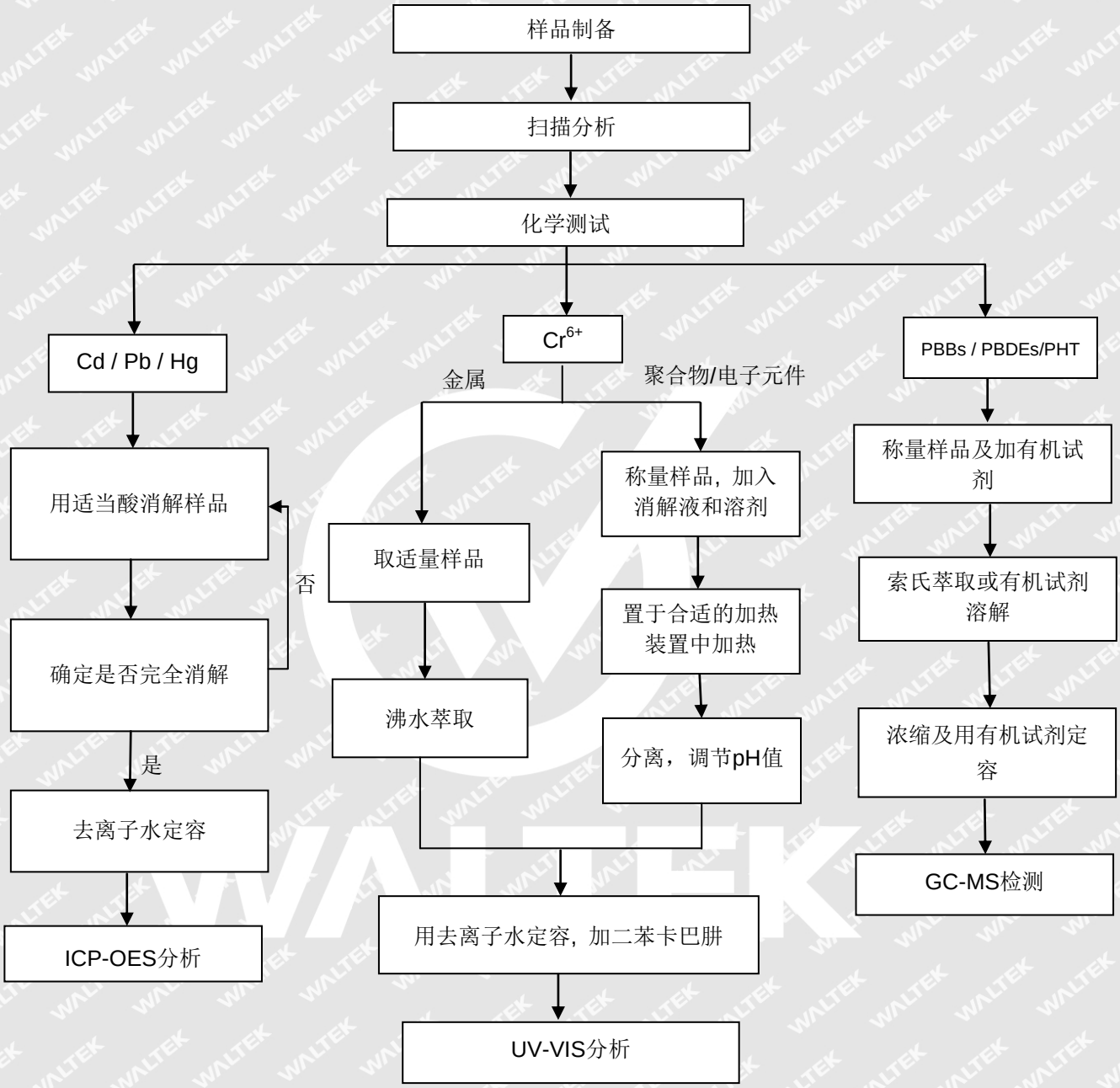
(5) "△"= As client's requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

"△"=依据申请方要求，对样品进行混合测试。基于混合测试部件中的最小样品质量计算测试结果。

Measurement Flowchart:

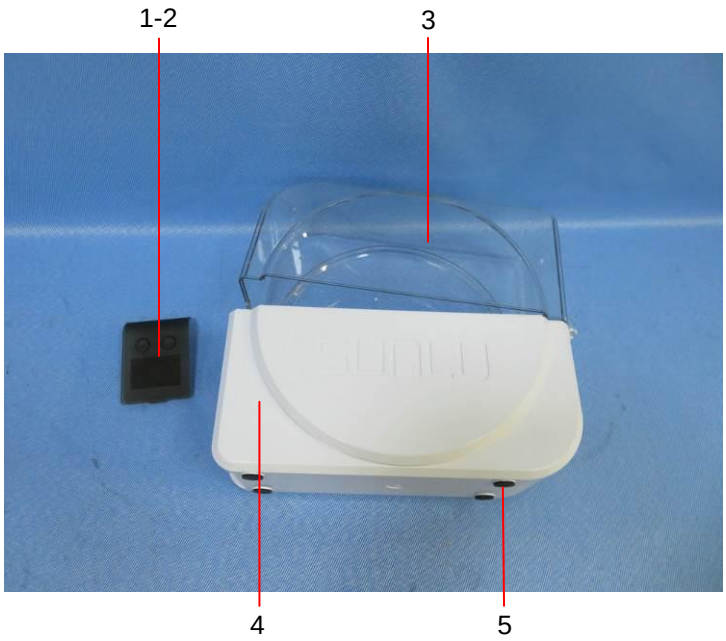


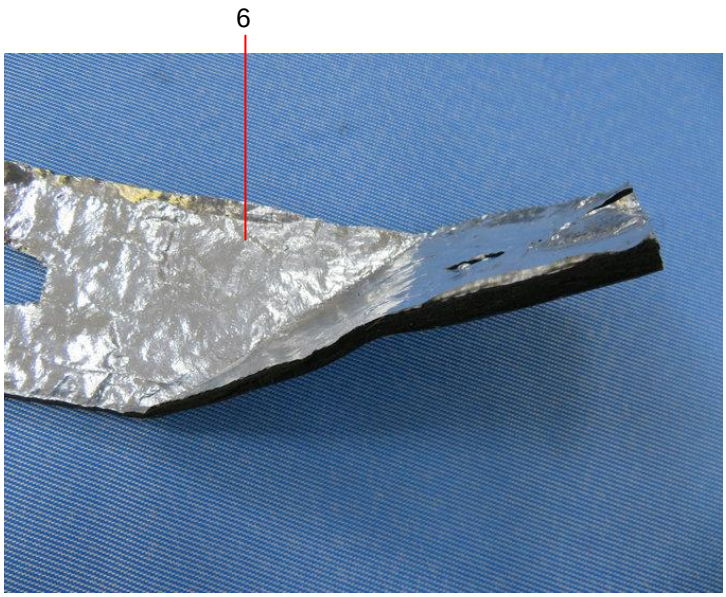
测试流程图:

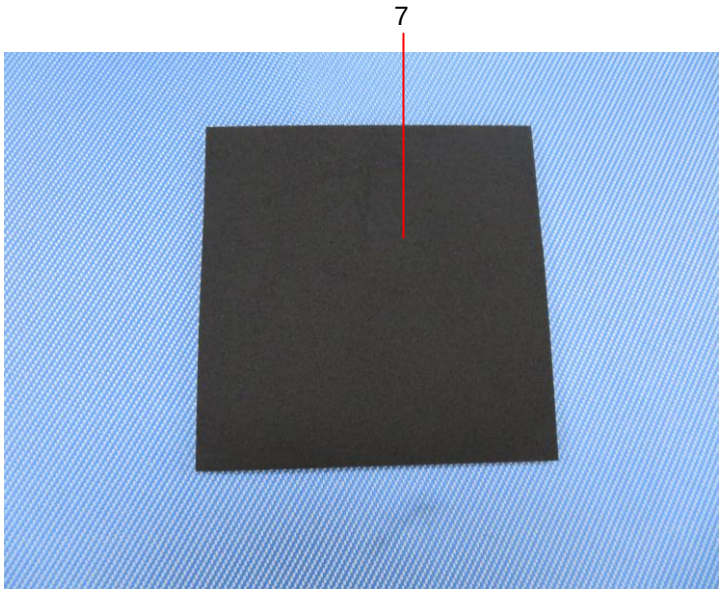

样品制备
扫描分析
化学测试
Cd / Pb / Hg
Cr6+
PBBs / PBDEs/PHT
金属
聚合物/电子元件
用适当酸消解样品
否
确定是否完全消解
是
去离子水定容
ICP-OES分析
取适量样品
沸水萃取
称量样品，加入消解液和溶剂
置于合适的加热装置中加热
分离，调节pH值
用去离子水定容，加二苯卡巴肼
UV-VIS分析
称量样品及加有机试剂
索氏萃取或有机试剂溶解
浓缩及用有机试剂定容
GC-MS检测

Sample Photo(s) / 样品照片：

Photograph(s) of parts tested / 测试部位图片：



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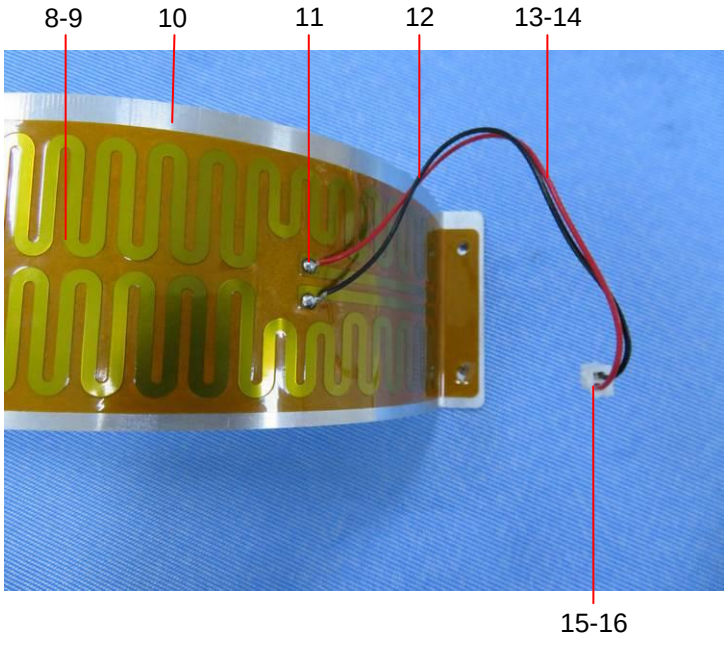
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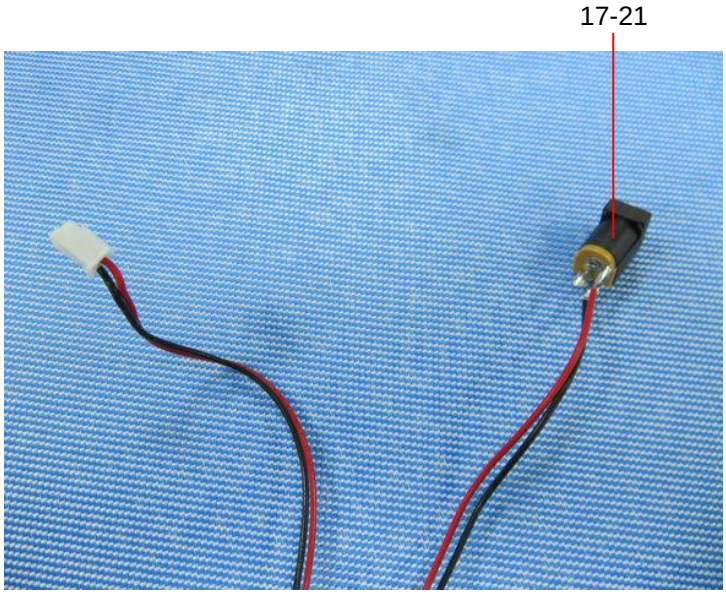
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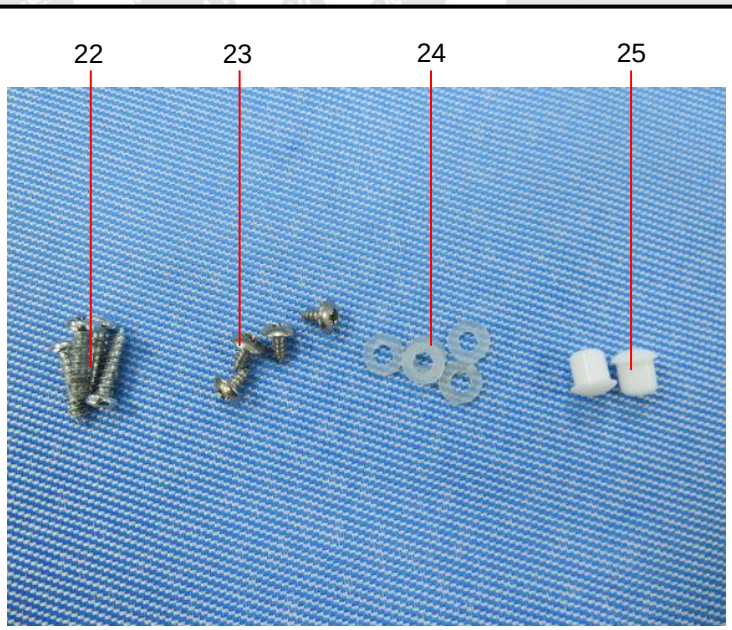
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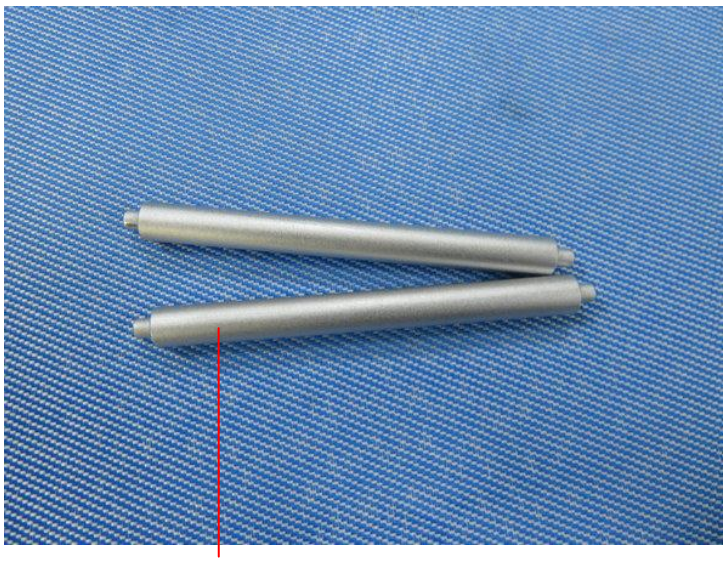
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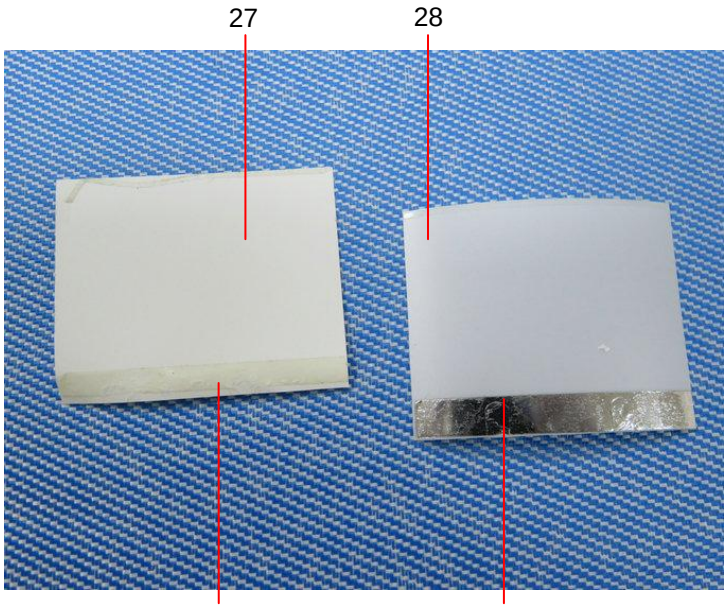
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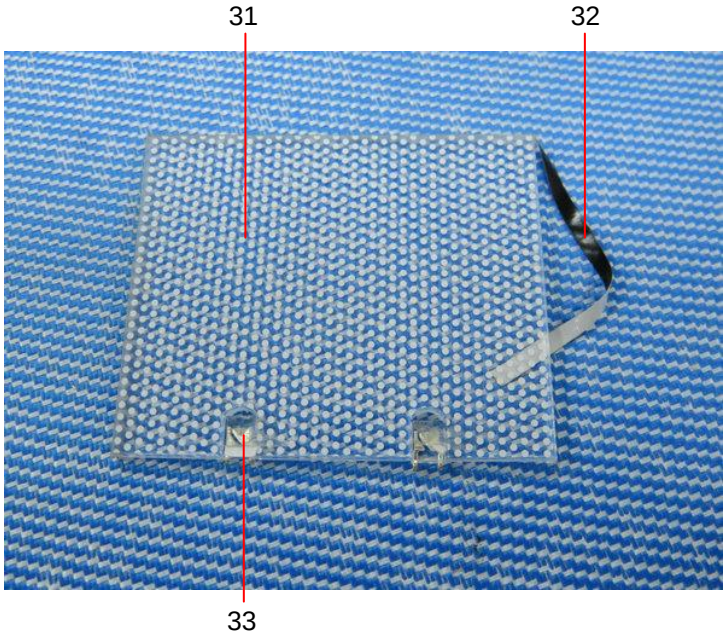
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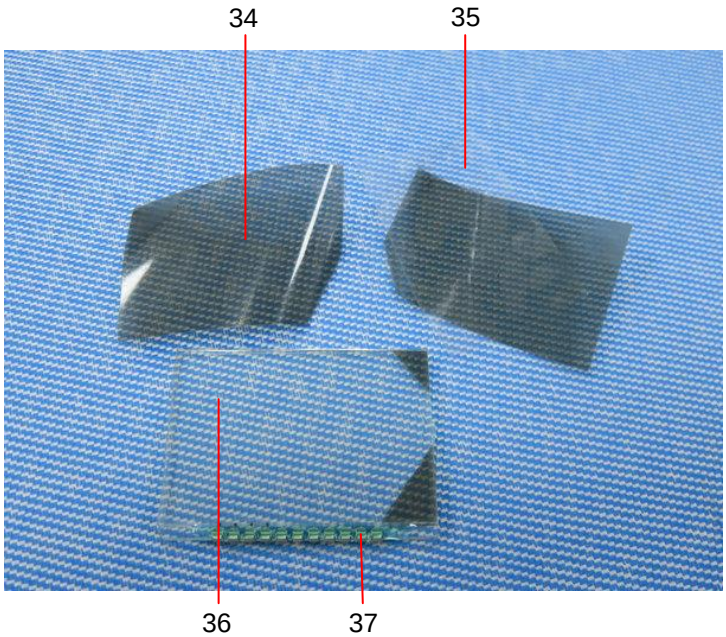
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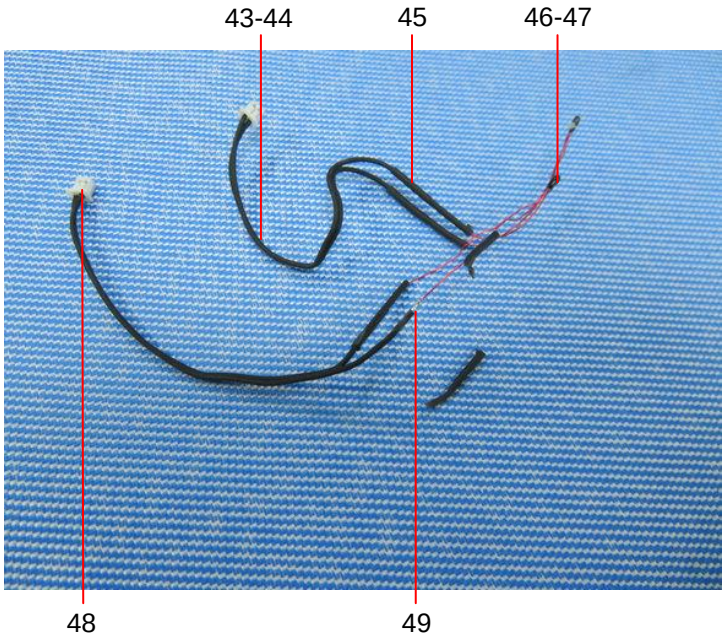
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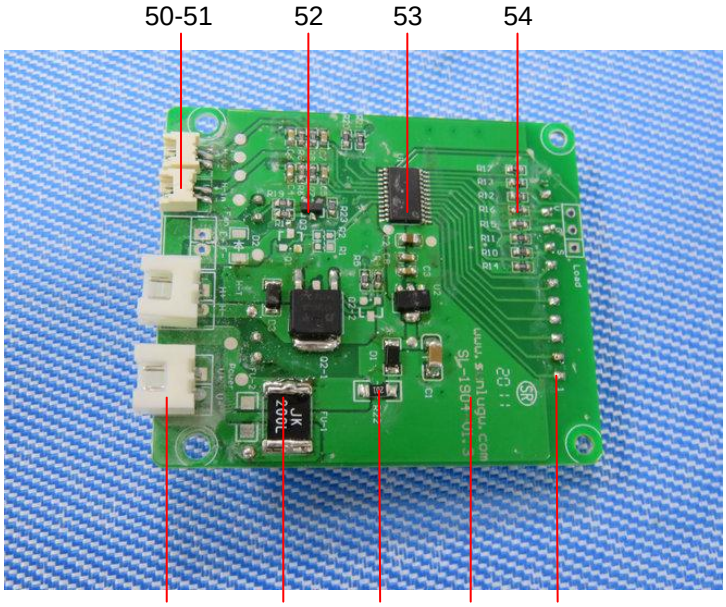
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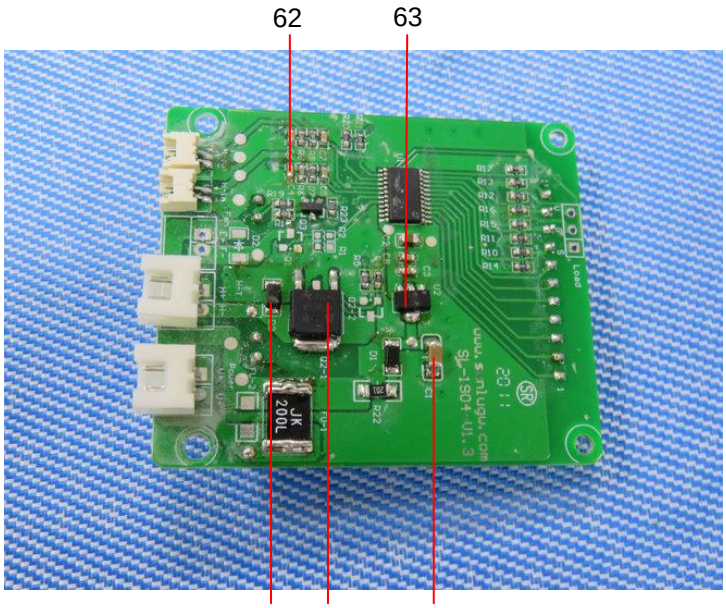
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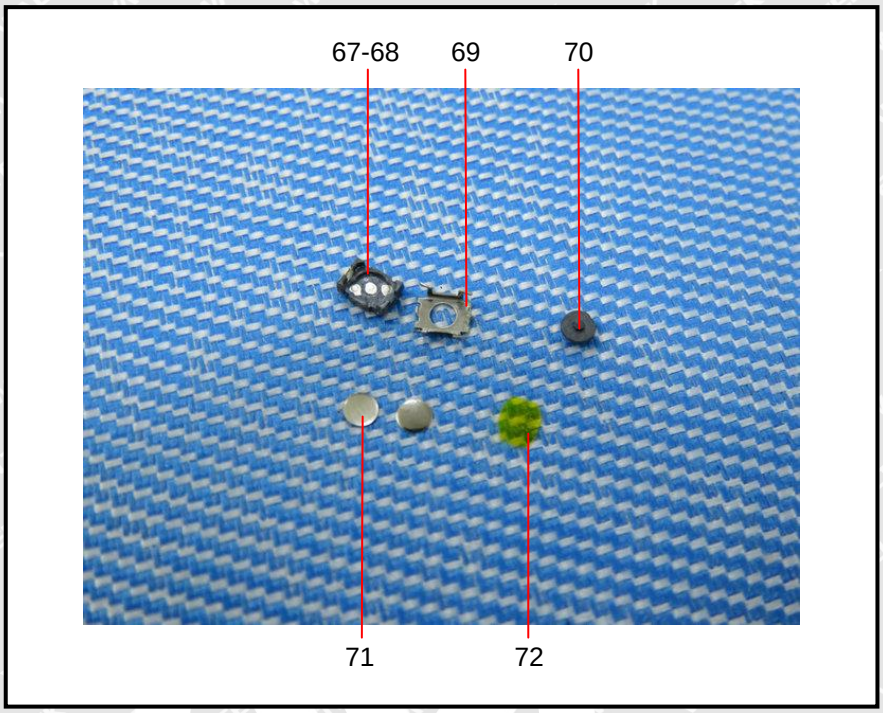

====== End of Report 报告结束 ======