

# Test Report

Report No: KEYS23080915001RH-03

Date: August 18, 2023

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**Applicant** : Zhejiang Zhenneng Technology Co.,Ltd  
**Address** : Floor 1, No. 1818-1, South Taihu Avenue, Balidian Town, WuxingDistrict, Huzhou City,  
Zhejiang Province

The following sample(s) was /were submitted and identified on behalf of the clients as :

**Sample Name** : Portable power station  
**Trade Name** : N/A  
**Sample Model** : Apower1000, Apower2000, Apower1000Pro, Apower2000Pro,BS041  
**Sample Received Date** : August 9, 2023  
**Testing Period** : August 9, 2023 to August 18, 2023  
**Test Requested** : Selected test (s) in the selected parts as requested by client with the RoHS 2 Directive 2011/65/EU Annex II (EU) 2015/863 as last amended by Directive (EU) 2017/2102.  
**Test Method** : 1. As specified by client, to screen Lead(Pb), Cadmium(Cd), Mercury(Hg), Chromium(Cr) and Bromine(Br) in the submitted sample(s) by XRF.  
2. As specified by client, when screening results exceed the XRF screening limit in IEC 62321-3-1: 2013, further use of wet chemical methods are required to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs), Bis(2-ethylhexyl) phthalate (DEHP) ,Butyl benzyl phthalate (BBP), Dibutylphthalate (DBP) ,and Diisobutyl phthalate (DIBP)in the submitted sample(s).  
**Test Result** : Please refer to next page(s).  
**Conclusion** : **PASS** (Based on test results)

Signed for and on behalf of



**Tony Qian/Approved Signatory**

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**Summary of Test Results:**

TEST REQUEST	CONCLUSION
RoHS Directive 2011/65/EU and its subsequent amendments Directive (EU) 2015/863	--
(1) To determine Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls (PBBs) and Polybrominated DiphenylEthers (PBDEs) content by screening test and chemical test	<b>PASS</b>
(2) To determine Phthalates (DBP, BBP, DEHP, DIBP) content by chemical test	<b>PASS</b>

## Note :

The report is based on previous report with no.: KEYS23052902001RH-03 dated on June 5, 2023 issued by KEYS lab to do below amendment. Except as specified below. Others do not any change and not need to do any testing.

-Change application and manufacturer information from “Shenzhen Uapow Co., Limited / 4th Floor, Building B5B, Yingzhan Industrial Park, Longtian Street, Pingshan District, Shenzhen” to “Zhejiang Zhenneng Technology Co., Ltd / Floor 1, No. 1818-1, South Taihu Avenue, Balidian Town, Wuxing District, Huzhou City, Zhejiang Province”.

-Add model “BS041”

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**Sample Description:**

No.	Name
1	Black Plastic Case
2	Silver Plastic Case
3	White Plastic
4	Switch
5	Display Screen
6	USB Interface
7	USB-C Port
8	DC Power Port
9	Transparent Plastic
10	Silver Screw
11	Black Screw
12	Nut
13	Silver Washer
14	Spring
15	Fuse Wire
16	Battery
17	Yellow Tape
18	Silver Metal Case
19	Green PCB

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No.	Black PCB
20	Black Plastic Film
21	Copper Wire
22	Magnetic Ring
23	Cooling Silica Gel
24	Aluminum Shell
25	Electrolyte
26	Black Base
27	IC
28	Capacitance
29	Resistance
30	Inductance
31	Diode
32	Triode
33	LED
34	Connector
35	Pin
36	Black Leather
37	Red Leather
38	Black Plastic Case

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No.	Name
39	Heat Shrinkable Sleeve
40	Yellow Plastic
41	Core
42	Silver Metal Frame
43	Blue Plastic
44	Goldfinger
45	Interface Silver Metal
46	Crystal Oscillator
47	Black Plastic
48	Silver Pin
49	White Glue
50	Buzzer
51	Iron Core
52	Winding
53	Yellow Tape
54	Transformer
55	Black Plastic Sheet
56	Black Terminal
57	White Terminal Post

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58	Black Rubber Ring
59	Black Fan
60	Black Wind Blade
61	Silver Metal Case
62	Shaft
63	Bearing
64	Stator Winding
65	Stator Core
66	Rotor Core
67	Rotor Winding
68	Black Rubber Mat
69	Double-Sided Adhesive
70	Heat Sink
71	Aluminum Substrate
72	LED Chip
73	Switch
74	Solder
75	Power Socket
76	Cigarette Lighter Plug
77	Power Plug

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78	Plug Black Plastic
79	Plug Silver Metal
80	White Leather
81	Black Leather
82	Yellow Yarn Leather
83	Black Outer Leather
84	White Inner Leather
85	Red Inner Leather
86	Black Inner Leather
87	Core
88	Terminal
89	Heat Shrinkable Sleeve
90	Connecting Plate
91	Yellow Plastic
92	White Plastic

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## 1. XRF Test Result:

No.	XRF Result(mg/kg)					Chemical Test (mg/kg)	Conclusion
	Pb	Cd	Hg	Cr	Br		
1	BL	BL	BL	BL	BL	--	Pass
2	BL	BL	BL	BL	BL	--	Pass
3	BL	BL	BL	BL	BL	--	Pass
4	BL	BL	BL	BL	--	--	Pass
5	BL	BL	BL	BL	--	--	Pass
6	BL	BL	BL	BL	--	--	Pass
7	BL	BL	BL	BL	--	--	Pass
8	BL	BL	BL	BL	--	--	Pass
9	BL	BL	BL	BL	BL	--	Pass
10	BL	BL	BL	BL	--	--	Pass
11	BL	BL	BL	BL	--	--	Pass
12	25	BL	BL	BL	--	--	Pass
13	BL	BL	BL	BL	--	--	Pass
14	BL	BL	BL	BL	--	--	Pass
15	BL	BL	BL	BL	--	--	Pass
16	BL	BL	BL	BL	--	--	Pass
17	BL	BL	BL	BL	BL	--	Pass
18	BL	BL	BL	BL	--	--	Pass

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No.	XRF Result(mg/kg)					Chemical Test (mg/kg)	Conclusion
	Pb	Cd	Hg	Cr	Br		
19	BL	BL	BL	BL	BL	--	Pass
20	BL	BL	BL	BL	BL	--	Pass
21	BL	BL	BL	BL	BL	--	Pass
22	BL	BL	BL	BL	--	--	Pass
23	BL	BL	BL	BL	--	--	Pass
24	BL	BL	BL	BL	BL	--	Pass
25	BL	BL	BL	BL	--	--	Pass
26	BL	BL	BL	BL	BL	--	Pass
27	BL	BL	BL	BL	BL	--	Pass
28	BL	BL	BL	BL	--	--	Pass
29	BL	BL	BL	BL	--	--	Pass
30	BL	BL	BL	BL	--	--	Pass
31	BL	BL	BL	BL	--	--	Pass
32	BL	BL	BL	BL	--	--	Pass
33	BL	BL	BL	BL	--	--	Pass
34	BL	BL	BL	BL	BL	--	Pass
35	BL	BL	BL	BL	BL	--	Pass
36	BL	BL	BL	BL	--	--	Pass

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No.	XRF Result(mg/kg)					Chemical Test (mg/kg)	Conclusion
	Pb	Cd	Hg	Cr	Br		
37	BL	BL	BL	BL	BL	--	Pass
38	BL	BL	BL	BL	BL	--	Pass
39	BL	BL	BL	BL	BL	--	Pass
40	BL	BL	BL	BL	BL	--	Pass
41	BL	BL	BL	BL	--	--	Pass
42	BL	BL	BL	BL	--	--	Pass
43	BL	BL	BL	BL	BL	--	Pass
44	BL	BL	BL	BL	--	--	Pass
45	BL	BL	BL	BL	--	--	Pass
46	BL	BL	BL	BL	--	--	Pass
47	BL	BL	BL	BL	BL	--	Pass
48	BL	BL	BL	BL	--	--	Pass
49	BL	BL	BL	BL	BL	--	Pass
50	BL	BL	BL	BL	--	--	Pass
51	BL	BL	BL	BL	--	--	Pass
52	BL	BL	BL	BL	--	--	Pass
53	BL	BL	BL	BL	BL	--	Pass
54	BL	BL	BL	BL	--	--	Pass

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No.	XRF Result(mg/kg)					Chemical Test (mg/kg)	Conclusion
	Pb	Cd	Hg	Cr	Br		
55	BL	BL	BL	BL	BL	--	Pass
56	BL	BL	BL	BL	BL	--	Pass
57	BL	BL	BL	BL	BL	--	Pass
58	BL	BL	BL	BL	BL	--	Pass
59	BL	BL	BL	BL	BL	--	Pass
60	BL	BL	BL	BL	BL	--	Pass
61	BL	BL	BL	BL	--	--	Pass
62	BL	BL	BL	BL	--	--	Pass
63	BL	BL	BL	BL	--	--	Pass
64	BL	BL	BL	BL	--	--	Pass
65	BL	BL	BL	BL	--	--	Pass
66	BL	BL	BL	BL	--	--	Pass
67	BL	BL	BL	BL	--	--	Pass
68	BL	BL	BL	BL	BL	--	Pass
69	BL	BL	BL	BL	BL	--	Pass
70	BL	BL	BL	BL	--	--	Pass
71	BL	BL	BL	BL	--	--	Pass
72	BL	BL	BL	BL	BL	--	Pass

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	Pb	Cd	Hg	Cr	Br		
73	BL	BL	BL	BL	--	--	Pass
74	BL	BL	BL	BL	--	--	Pass
75	BL	BL	BL	BL	BL	--	Pass
76	BL	BL	BL	BL	--	--	Pass
77	BL	BL	BL	BL	--	--	Pass
78	BL	BL	BL	BL	BL	--	Pass
79	BL	BL	BL	BL	BL	--	Pass
80	BL	BL	BL	BL	BL	--	Pass
81	BL	BL	BL	BL	BL	--	Pass
82	BL	BL	BL	BL	BL	--	Pass
83	BL	BL	BL	BL	BL	--	Pass
84	BL	BL	BL	BL	BL	--	Pass
85	BL	BL	BL	BL	BL	--	Pass
86	BL	BL	BL	BL	BL	--	Pass
87	BL	BL	BL	BL	--	--	Pass
88	BL	BL	BL	BL	--	--	Pass
89	BL	BL	BL	BL	BL	--	Pass
90	BL	BL	BL	BL	--	--	Pass

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No.	XRF Result(mg/kg)					Chemical Test (mg/kg)	Conclusion
	Pb	Cd	Hg	Cr	Br		
91	BL	BL	BL	BL	BL	--	Pass
92	BL	BL	BL	BL	BL	--	Pass

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**Remark:**

1. It is the result on total Br while test item on restricted substances in PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

2. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC 62321-3-1: 2013 Annex A.

Element	Polymer Material	Metallic Material	Composite Material
Pb	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma \leq X < 1500 + 3\sigma \leq OL$
Cd	$BL \leq 70 - 3\sigma \leq X < 130 + 3\sigma \leq OL$	$BL \leq 70 - 3\sigma \leq X < 130 + 3\sigma \leq OL$	$LOD < X < 150 + 3\sigma \leq OL$
Hg	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma \leq X < 1500 + 3\sigma \leq OL$
Cr	$BL \leq 700 - 3\sigma < X$	$BL \leq 700 - 3\sigma < X$	$BL \leq 500 - 3\sigma < X$
Br	$BL \leq 300 - 3\sigma < X$	--	$BL \leq 250 - 3\sigma < X$

**XRF detection limits in mg/kg for regulated elements in various material**

Element	Polymer Material	Metallic Material	Composite Material
Pb	10	50	50
Cd	10	50	50
Hg	10	50	50
Cr	10	50	50
Br	10	50	50

- Note:**
- BL = Under the XRF screening limit
  - OL = Future chemical test will be conducted while result is above the screening limit
  - X = The symbol "X" marks the region where further investigation is necessary
  - 3σ = The reproducibility of analytical instruments
  - LOD = Detection limit

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## 2. Wet Chemical Test

Test Item(s)	Test Method/ Test Equipment	Unit	Limit	MDL
Cadmium(Cd)	IEC 62321-5:2013, ICP-OES	mg/kg	100	2
Lead(Pb)	IEC 62321-5:2013, ICP-OES	mg/kg	1000	2
Mercury(Hg)	IEC 62321-4:2013+AMD1:2017, ICP-OES	mg/kg	1000	2
Hexavalent Chromium(CrVI) (Metal)	IEC 62321-7-1:2015, UV-Vis	µg/cm <sup>2</sup>	0.13	0.1
Hexavalent Chromium(CrVI) (Nonmetal)	IEC 62321-7-2:2017, UV-Vis	mg/kg	1000	8
PBBs (Next form)	IEC 62321-6:2015, GC-MS	mg/kg	1000	5
PBDEs (Next form)	IEC 62321-6:2015, GC-MS	mg/kg	1000	5
Dibutyl Phthalate(DBP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30
Butyl benzyl phthalate (BBP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30
Di-(2-ethylhexyl) Phthalate(DEHP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30
Diisobutyl phthalate (DIBP)	IEC 62321-8:2017, GC-MS	mg/kg	1000	30

PBBs		PBDEs	
Monobromobiphenyl	Hexabromobiphenyl	Monobromodiphenyl ether	Hexabromodiphenyl ether
Dibromobiphenyl	Heptabromobiphenyl	Dibromodiphenyl ether	Heptabromodiphenyl ether
Tribromobiphenyl	Octabromobiphenyl	Tribromodiphenyl ether	Octabromodiphenyl ether
Tetrabromobiphenyl	Nonabromobiphenyl	Tetrabromodiphenyl ether	Nonabromodiphenyl ether
Pentabromobiphenyl	Decabromobiphenyl	Pentabromodiphenyl ether	Decabromodiphenyl ether

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**Note:**

1. mg/kg= ppm=0.0001%
2. N.D.= Not Detected(<MDL)
3. MDL = Method Detection Limit
4. -- = No Testing
5. When Cr (VI) in a sample is detected below the 0.10  $\mu\text{g}/\text{cm}^2$  LOQ (limit of quantification), the sample is considered to be negative for Cr (VI). Since Cr (VI) may not be uniformly distributed in the coating even within the same sample batch, a "grey zone" between 0.10  $\mu\text{g}/\text{cm}^2$  and 0.13  $\mu\text{g}/\text{cm}^2$  has been established as "inconclusive" to reduce inconsistent results due to unavoidable coating variations. In this case, additional testing may be necessary to confirm the presence of Cr (VI). When Cr (VI) is detected above 0.13  $\mu\text{g}/\text{cm}^2$ , the sample is considered to be positive for the presence of Cr (VI) in the coating layer. Unavoidable coating variations may influence the determination 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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### 3. Phthalate Test Result:

Test Item(s)	No.1	No.2	No.3	No.9	No.17
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Test Item(s)	No.19	No.20	No.21	No.24	No.26
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Test Item(s)	No.27	No.34	No.35	No.37	No.38
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Test Item(s)	No.39	No.40	No.43	No.47	No.49
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.

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Test Item(s)	No.53	No.55	No.56	No.57	No.58
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Test Item(s)	No.59	No.60	No.68	No.69	No.72
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Test Item(s)	No.75	No.78	No.80	No.81	No.82
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Test Item(s)	No.83	No.84	No.85	No.86	No.89
Dibutyl Phthalate (DBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Butyl benzyl phthalate (BBP)	N.D.	N.D.	N.D.	N.D.	N.D.
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	N.D.	N.D.	N.D.
Diisobutyl phthalate (DIBP)	N.D.	N.D.	N.D.	N.D.	N.D.

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Test Item(s)	No.91	No.92	--	--	--
Dibutyl Phthalate (DBP)	N.D.	N.D.	--	--	--
Butyl benzyl phthalate (BBP)	N.D.	N.D.	--	--	--
Di-(2-ethylhexyl) Phthalate(DEHP)	N.D.	N.D.	--	--	--
Diisobutyl phthalate (DIBP)	N.D.	N.D.	--	--	--

- Note:**
1. mg/kg= ppm=0.0001%
  2. N.D.= Not Detected(<MDL)

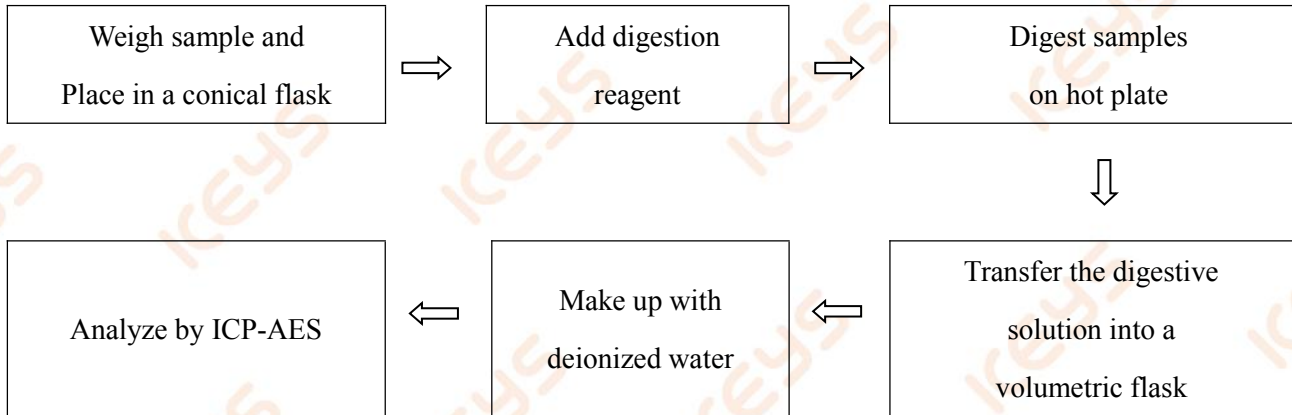
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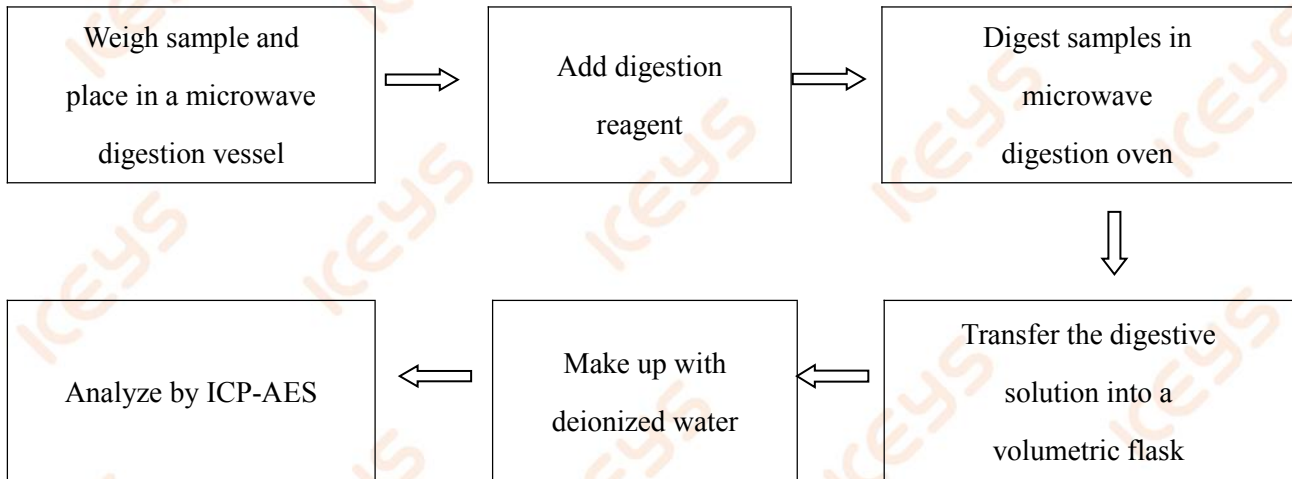
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**Test Process:**

## 1. Test for Cd/Pb Content

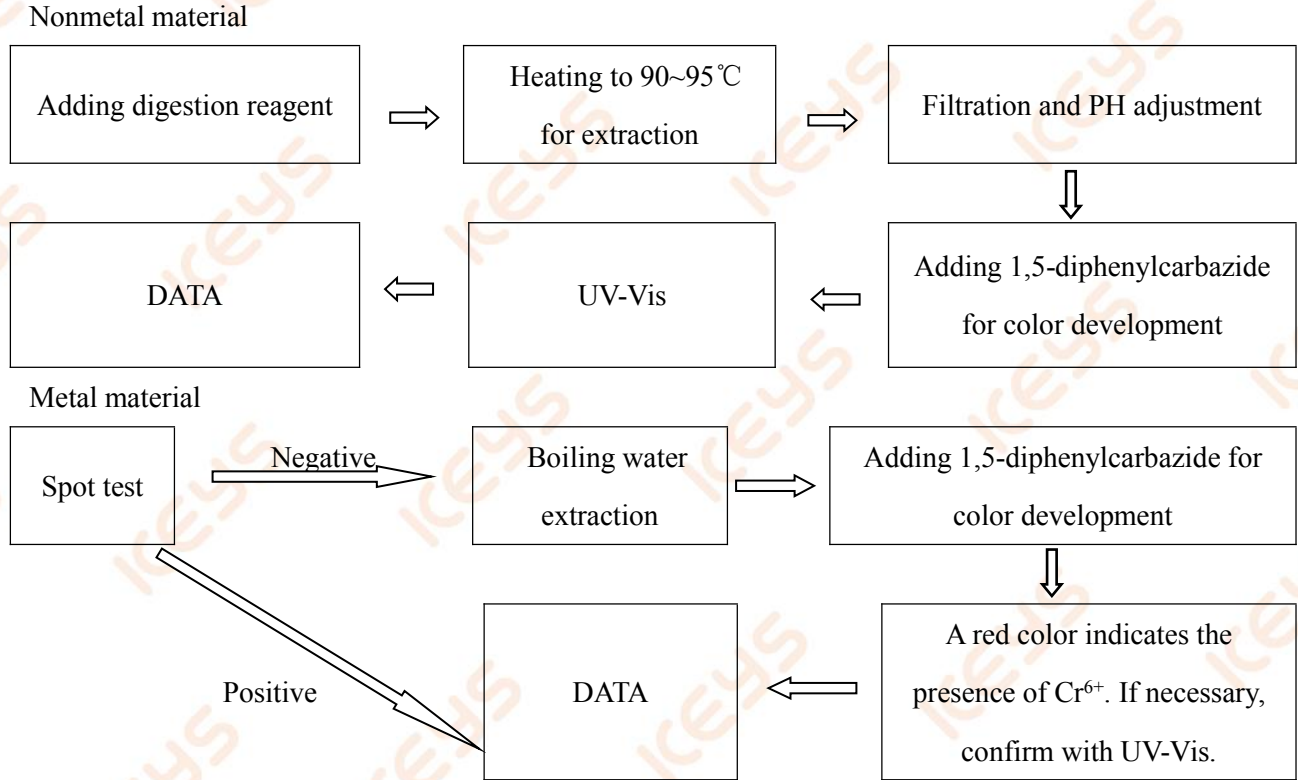


## 2. Test for Hg Content

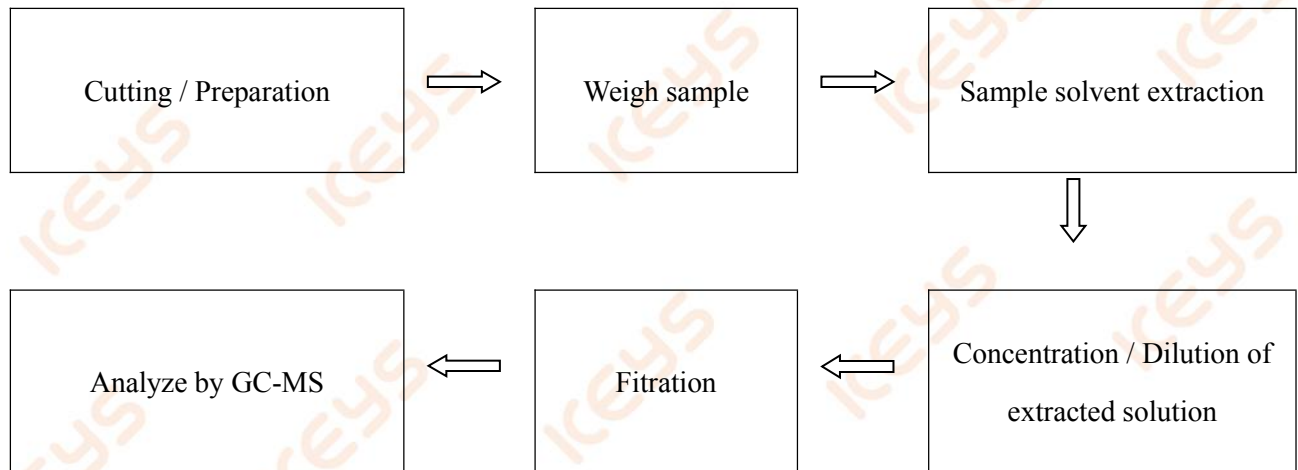


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### 3. Test for Chromium (VI) Content



### 4. Test for DBP, BBP, DEHP, DIBP, PBB, PBDE Content



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**Sample Photo:**



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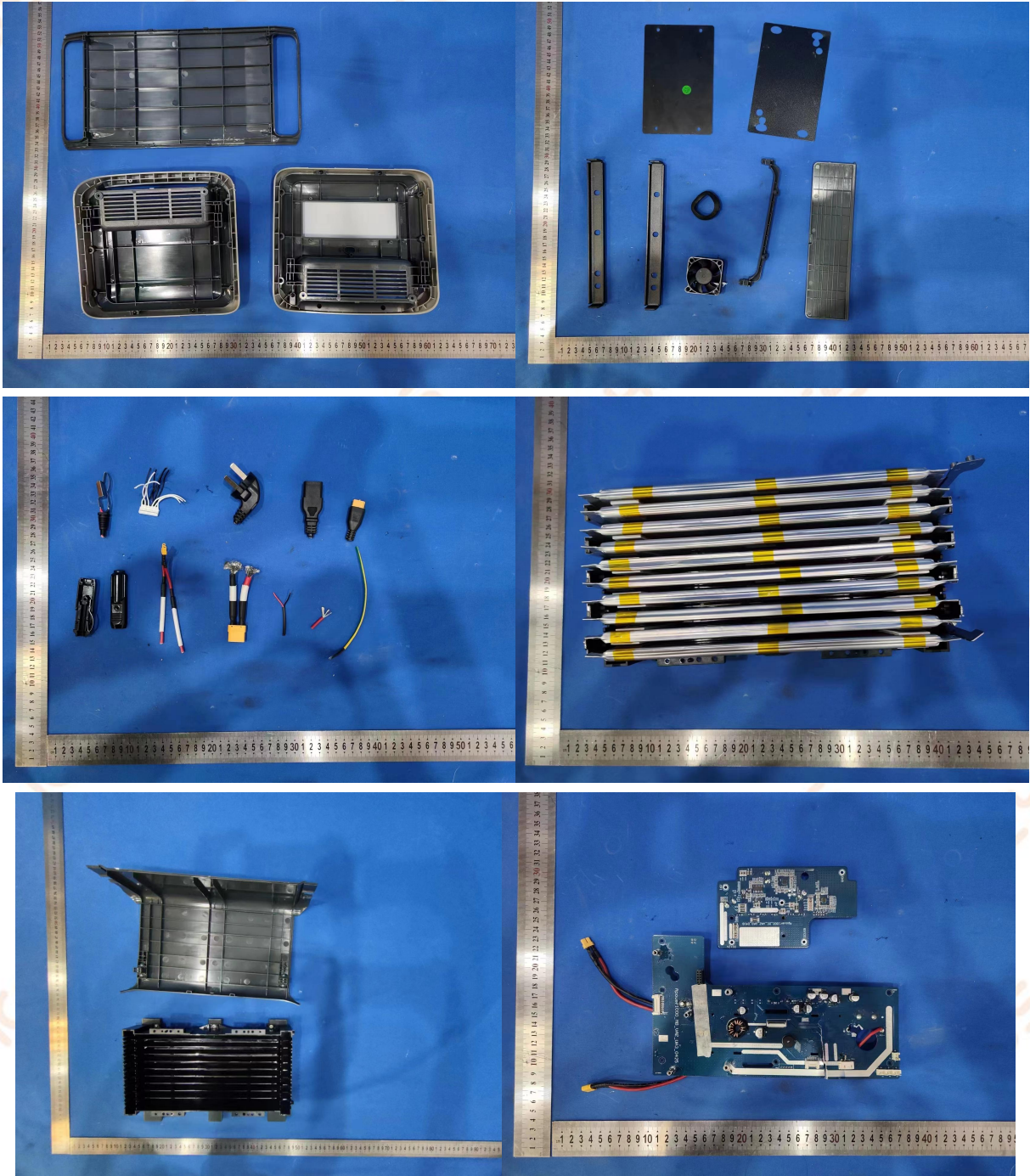
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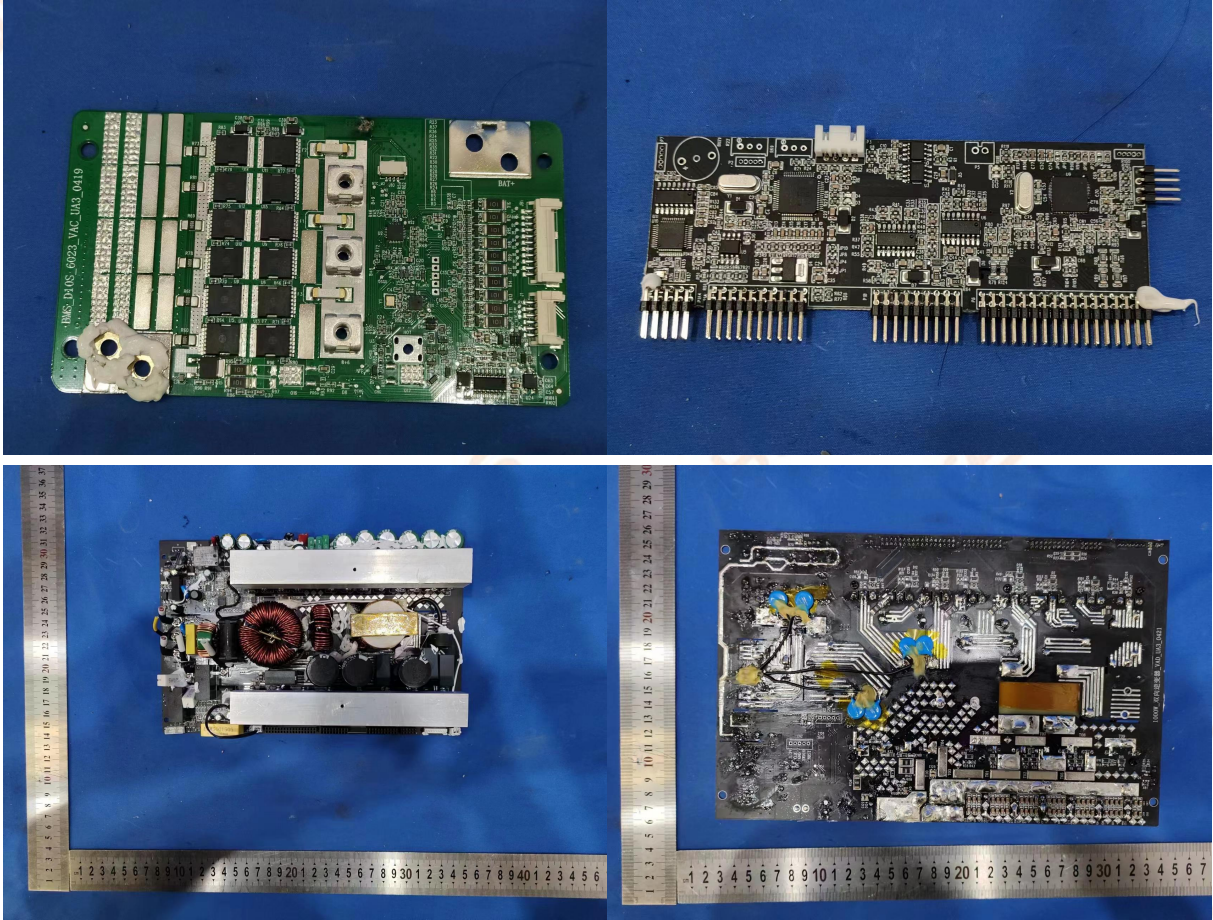
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