

Test Report

Report No.: AGC01978191101-002

Date: Nov.15, 2019

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Applicant:

Address:

Test site:

Report on the submitted sample(s) said to be:

Sample Name : 5000 mAh power notebook A5 with wireless charging

Model No. : P772.51

Country of origin : CHINA

Country of destination : EUROPE

Sample Receiving Date : Nov.11, 2019

Testing Period : Nov.11, 2019 to Nov.15, 2019

Test Requested : Please refer to next pages.

Test Method : Please refer to next pages.

Test Result : Please refer to next pages.

Approved by: 

Liulinwen, Lewis

Technical Director



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Test Requested:
Conclusion

As specified by client, to determine the Pb, Cd, Hg, Cr⁶⁺, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content in the submitted sample in accordance with Directive 2011/65/EU (RoHS) and its amendment directive (EU) 2015/863 on XRF and Chemical Method.

Pass
Test Methods:

A: Screening by X-ray Fluorescence Spectrometry (XRF) : With reference to IEC 62321-3-1:2013 Screening – Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry

B: Chemical test:

Test Item	Test Method	Measuring Instrument	MDL
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES	2 mg/kg
Lead (Pb)	IEC 62321-5:2013	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321-4: 2013+A1:2017	ICP-OES	2 mg/kg
Non-metal Hexavalent Chromium (Cr ⁶⁺)	IEC 62321-7-2:2017	UV-Vis	1 mg/kg
Metal Hexavalent Chromium (Cr ⁶⁺)	IEC 62321-7-1:2015	UV-Vis	/
PBBs/PBDEs	IEC 62321-6:2015	GC-MS	5 mg/kg
Di-iso-butyl phthalate (DIBP)	IEC 62321-8:2017	GC-MS	50 mg/kg
Dibutyl phthalate (DBP)		GC-MS	50 mg/kg
Butylbenzyl phthalate (BBP)		GC-MS	50 mg/kg
Di-(2-ethylhexyl) Phthalate (DEHP)		GC-MS	50 mg/kg

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Test Results:
A、EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
1	Black cloth	BL	BL	BL	BL	BL
2	paper board	BL	BL	BL	BL	BL
3	Paper board	BL	BL	BL	BL	BL
4	Black leather	BL	BL	BL	BL	BL
5	Black Velcro hook side	BL	BL	BL	BL	BL
6	Black plastic piece	BL	BL	BL	BL	BL
7	Black Velcro loop side	BL	BL	BL	BL	BL
8	Black plastic shell	BL	BL	BL	BL	BL
9	Transparent film	BL	BL	BL	BL	BL
10	Silver switch button	BL	BL	BL	BL	BL
11	Silver metal strip	BL	BL	BL	BL	N/A
12	Silver magnet	BL	BL	BL	BL	N/A
13	Black tape	BL	BL	BL	BL	BL
14	Black foam	BL	BL	BL	BL	BL
15	White foam	BL	BL	BL	BL	BL
16	Coil wire jacket(induction coil)	BL	BL	BL	X*	BL
17	Brown tape(induction coil)	BL	BL	BL	BL	BL
18	Gray ceramic sheet(induction coil)	BL	BL	BL	BL	BL
19	Enameled wire(induction coil)	BL	BL	BL	BL	N/A
20	Silver screw	BL	BL	BL	BL	N/A
21	Chip capacitor(PCB)	BL	BL	BL	BL	BL
22	Chip resistor(PCB)	BL	BL	BL	BL	BL
23	Chip diode(PCB)	BL	BL	BL	BL	BL
24	Chip triode(PCB)	BL	BL	BL	BL	BL

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Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
25	Chip LED(PCB)	BL	BL	BL	BL	BL
26	Gray inductance(PCB)	BL	BL	BL	BL	BL
27	IC body(PCB)	BL	BL	BL	BL	BL
28	Tin plating(PCB)	BL	BL	BL	BL	N/A
29	PCB board(PCB)	BL	BL	BL	BL	X*
30	Tin solder(PCB)	BL	BL	BL	BL	N/A
31	USB metal joint(USB joint)(PCB)	BL	BL	BL	BL	N/A
32	Grey plastic joint(USB joint)(PCB)	BL	BL	BL	BL	BL
33	Contact pin(USB joint)(PCB)	BL	BL	BL	BL	N/A
34	Micro metal joint(Micro joint)(PCB)	BL	BL	BL	BL	N/A
35	Grey plastic joint(Micro joint)(PCB)	BL	BL	BL	X*	BL
36	Contact pin(Micro joint)(PCB)	BL	BL	BL	BL	N/A
37	Black plastic switch(switch)(PCB)	BL	BL	BL	BL	BL
38	Metal shell(switch)(PCB)	BL	BL	BL	X*	N/A
39	Metal shrapnel(switch)(PCB)	BL	BL	BL	X*	N/A
40	White plastic seat(switch)(PCB)	BL	BL	BL	BL	BL
41	Black foam(battery)	BL	BL	BL	BL	BL
42	Tin solder(battery)	BL	BL	BL	BL	N/A
43	Black crepe paper(battery)	BL	BL	BL	BL	BL
44	Red wire jacket(battery)	BL	BL	BL	BL	BL
45	Black wire jacket(battery)	BL	BL	BL	BL	BL
46	Wire core(battery)	BL	BL	BL	BL	N/A
47	Brown tape(battery)	BL	BL	BL	X*	BL
48	Yellow glue(battery)	BL	BL	BL	BL	BL

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Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70-3\sigma < X$ $< 130+3\sigma \leq OL$	$BL \leq 70-3\sigma < X$ $< 130+3\sigma \leq OL$	$BL \leq 50-3\sigma < X$ $< 150+3\sigma \leq OL$
Pb	mg/kg	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 500-3\sigma < X$ $< 1500+3\sigma \leq OL$
Hg	mg/kg	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 500-3\sigma < X$ $< 1500+3\sigma \leq OL$
Cr	mg/kg	$BL \leq 700-3\sigma < X$	$BL \leq 700-3\sigma < X$	$BL \leq 500-3\sigma < X$
Br	mg/kg	$BL \leq 300-3\sigma < X$	N/A	$BL \leq 250-3\sigma < X$

Note: BL= Below Limit

OL= Over limited

X= Inconclusive

“N/A”= Not applicable

*= Scanning by XRF and detected by chemical method. The test results of chemical method please refer to next pages.

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Remark:

- i Results were obtained by XRF for primary scanning, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the above warning value according to IEC 62321-3-1:2013.
- ii The XRF scanning test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- iii The maximum permissible limit is quoted from RoHS directive 2011/65/EU and its amendment directive (EU) 2015/863:

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominateddiphenylethers (PBDEs)	1000
Di-iso-butyl phthalate (DIBP)	1000
Dibutyl phthalate (DBP)	1000
Butylbenzyl phthalate (BBP)	1000
Di-(2-ethylhexyl) Phthalate (DEHP)	1000

Disclaimers:

This XRF Scanning report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF scanning report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

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B、The Test Results of Chemical Method:

 1) The Test Results of non-metal Cr⁶⁺

Test Item(s)	Unit	Result(s)			Limit
		16	35	47	
Hexavalent Chromium(Cr ⁶⁺)	mg/kg	N.D.	N.D.	N.D.	1000

Note: N.D. = Not Detected or less than MDL
 mg/kg = parts per million
 MDL = Method Detection Limit

 2)The Test Results of metalCr⁶⁺

Test Item(s)	MDL	Result(s)		Limit
		38	39	
Hexavalent Chromium (Cr ⁶⁺)	See note	Negative	Negative	#

Note:

- Negative = Absence of Cr(VI) on the tested areas
- MDL = Method Detection Limit
- Boiling-water-extraction:

Number	Colorimetric result (Cr(VI) concentration)	Qualitative result
1	The sample solution is < the 0,10 µg/cm ² equivalent comparison standard solution	The sample is negative for Cr(VI) – The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
2	The sample solution is ≥ the 0,10 µg/cm ² and ≤ the 0,13 µg/cm ² equivalent comparison standard solutions	The result is considered to be inconclusive – Unavoidable coating variations may influence the determination.
3	The sample solution is > the 0,13 µg/cm ² equivalent comparison standard solution	The sample is positive for Cr(VI) – The Cr(VI) concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

- # = Negative indicates the absence of Cr(VI) on the tested areas concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
- Uncertainty indicates the absence of Cr(VI) on the tested areas unavoidable coating variations may influence the determination.
- Positive indicates the presence of Cr(VI) on the tested areas concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

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Storage conditions and production date of the tested sample are unavailable and thus result of Cr(VI) represent status of the sample at the time of testing.

3) The Test Results of PBBs & PBDEs

Unit:mg/kg

Item(s)	MDL	Result(s)	Limit
		29	
Polybrominated Biphenyls (PBBs)			
Monobromobiphenyl	5	N.D.	Total PBBs Content <1000
Dibromobiphenyl	5	N.D.	
Tribromobiphenyl	5	N.D.	
Tetrabromobiphenyl	5	N.D.	
Pentabromobiphenyl	5	N.D.	
Hexabromobiphenyl	5	N.D.	
Heptabromobiphenyl	5	N.D.	
Octabromobiphenyl	5	N.D.	
Nonabromodiphenyl	5	N.D.	
Decabromodiphenyl	5	N.D.	
Total content	/	N.D.	
PolybrominatedDiphenylethers (PBDEs)			
Monobromodiphenyl ether	5	N.D.	Total PBDEs Content <1000
Dibromodiphenyl ether	5	N.D.	
Tribromodiphenyl ether	5	N.D.	
Tetrabromodiphenyl ether	5	N.D.	
Pentabromodiphenyl ether	5	N.D.	
Hexabromodiphenyl ether	5	N.D.	
Heptabromodiphenyl ether	5	N.D.	
Octabromodiphenyl ether	5	N.D.	
Nonabromodiphenyl ether	5	N.D.	
Decabromodiphenyl ether	5	N.D.	
Total content	/	N.D.	
Conclusion	/	Pass	/

Note: N.D. = Not Detected or less than MDL
 mg/kg = parts per million
 MDL = Method Detection Limit

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4)Test result of DBP, BBP, DEHP, DIBP content

Unit: mg/kg

Limit Seq. No.	Test item	DIBP	DBP	BBP	DEHP	Conclusion
		1000	1000	1000	1000	
1		N.D.	N.D.	N.D.	N.D.	Pass
2		N.D.	N.D.	N.D.	N.D.	Pass
3		N.D.	N.D.	N.D.	N.D.	Pass
4		N.D.	N.D.	N.D.	N.D.	Pass
5		N.D.	N.D.	N.D.	N.D.	Pass
6		N.D.	N.D.	N.D.	N.D.	Pass
7		N.D.	N.D.	N.D.	N.D.	Pass
8		N.D.	N.D.	N.D.	N.D.	Pass
9		N.D.	N.D.	N.D.	N.D.	Pass
10		N.D.	N.D.	N.D.	N.D.	Pass
13		N.D.	N.D.	N.D.	N.D.	Pass
14		N.D.	N.D.	N.D.	N.D.	Pass
15		N.D.	N.D.	N.D.	N.D.	Pass
16		N.D.	N.D.	N.D.	N.D.	Pass
17		N.D.	N.D.	N.D.	N.D.	Pass
18		N.D.	N.D.	N.D.	N.D.	Pass
21		N.D.	N.D.	N.D.	N.D.	Pass
22		N.D.	N.D.	N.D.	N.D.	Pass
23		N.D.	N.D.	N.D.	N.D.	Pass
24		N.D.	N.D.	N.D.	N.D.	Pass
25		N.D.	N.D.	N.D.	N.D.	Pass
26		N.D.	N.D.	N.D.	N.D.	Pass
27		N.D.	N.D.	N.D.	N.D.	Pass
29		N.D.	N.D.	N.D.	N.D.	Pass
32		N.D.	N.D.	N.D.	N.D.	Pass
35		N.D.	N.D.	N.D.	N.D.	Pass

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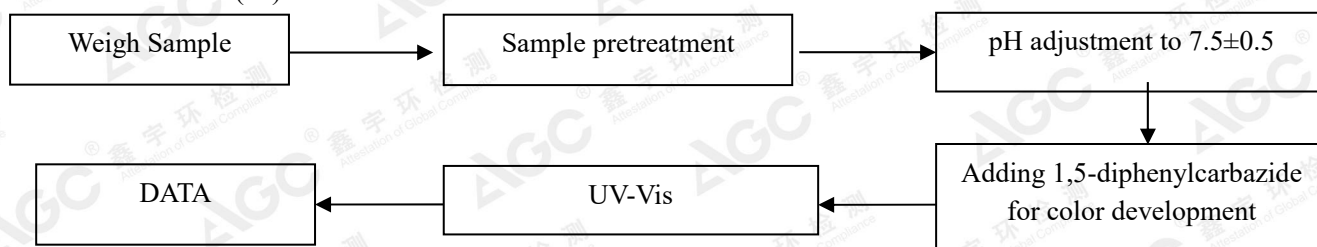
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Limit Seq. No.	Test item	DIBP	DBP	BBP	DEHP	Conclusion
		1000	1000	1000	1000	
37		N.D.	N.D.	N.D.	N.D.	Pass
40		N.D.	N.D.	N.D.	N.D.	Pass
41		N.D.	N.D.	N.D.	N.D.	Pass
43		N.D.	N.D.	N.D.	N.D.	Pass
44		N.D.	N.D.	N.D.	N.D.	Pass
45		N.D.	N.D.	N.D.	N.D.	Pass
47		N.D.	N.D.	N.D.	N.D.	Pass
48		N.D.	N.D.	N.D.	N.D.	Pass

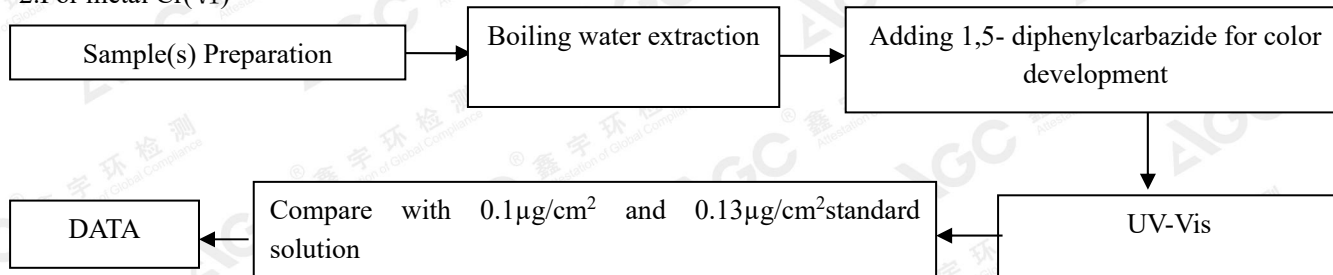
Note: 1. MDL=Method Detection Limit
2. N.D.=Not Detected(less than method detection limit)

Test Flow Chart

1.For non-metal Cr(VI)



2.For metal Cr(VI)



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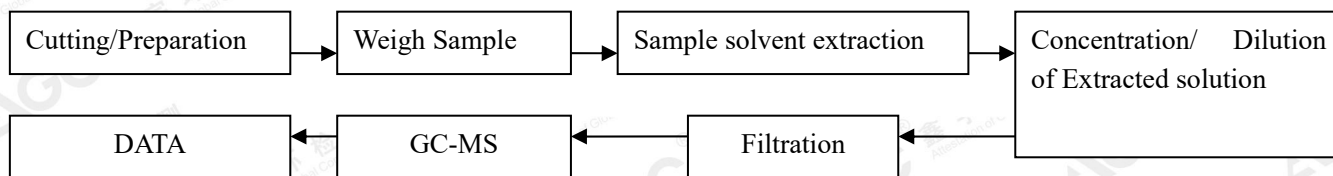
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3.For PBBs, PBDEs, DBP, BBP, DEHP, DIBP



The photo of the sample



1



2



3



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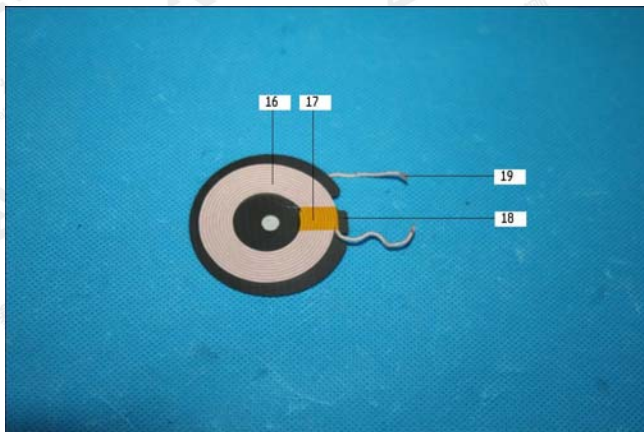
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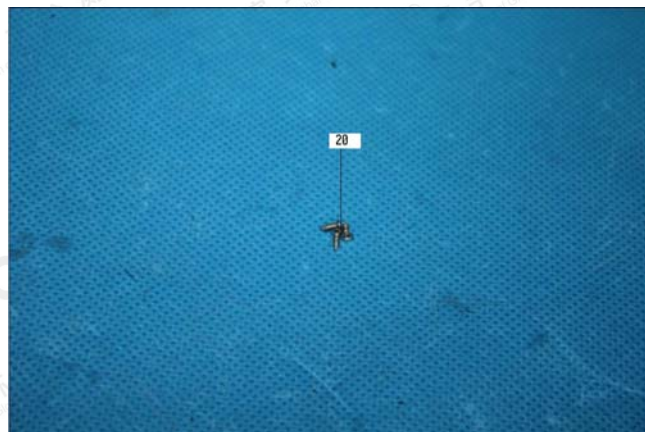
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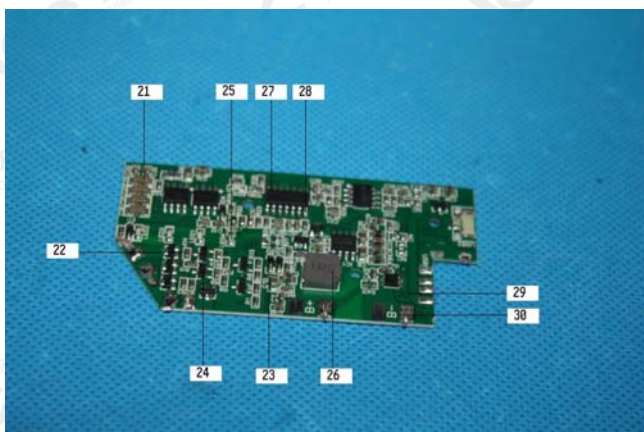
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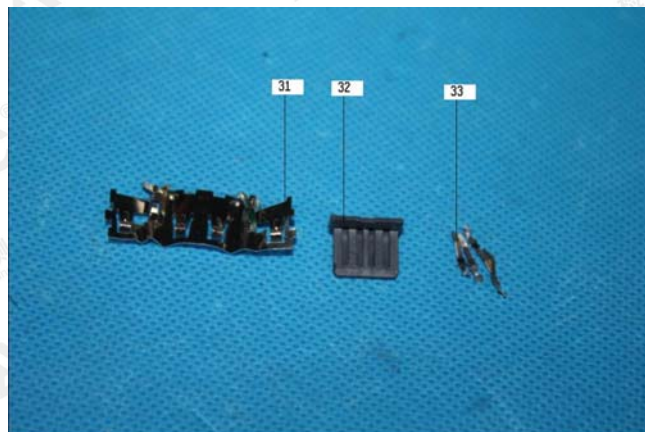
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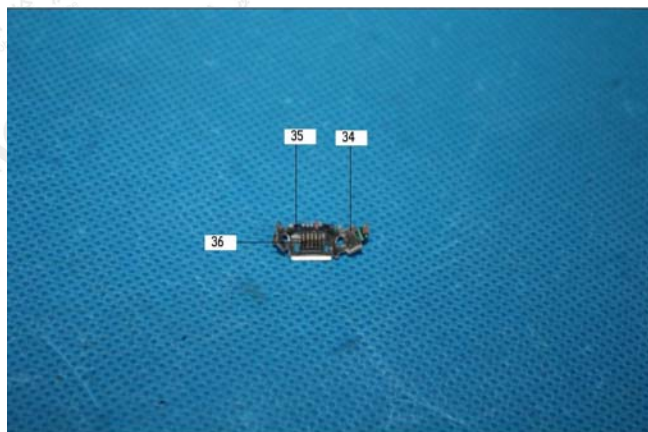
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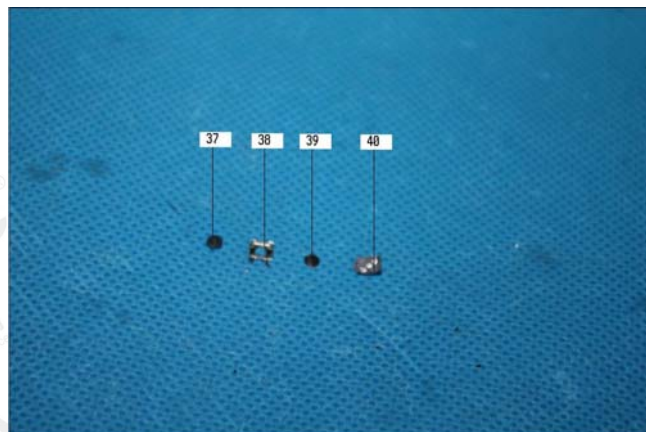
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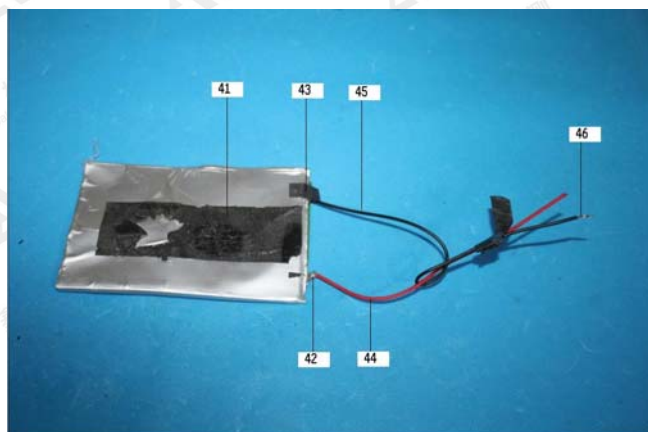
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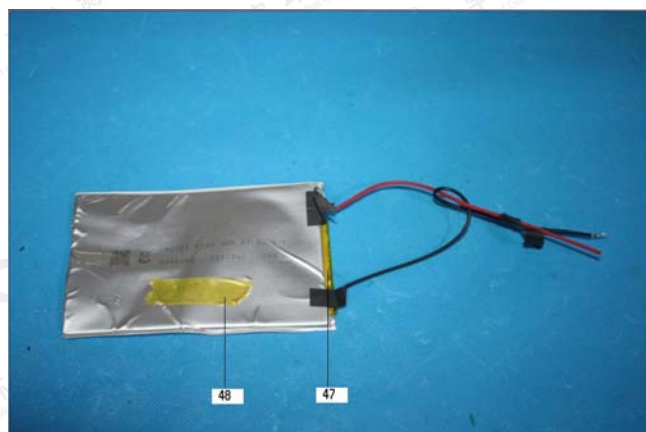
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