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检测
TESTING
CNAS L6478



TEST REPORT

Report No. : WTF25F07184509C
Job No. : FSW2507241242CJ
Applicant : Mid Ocean Brands B.V.
Address : Unit 711-716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.
Manufacturer : 114768
Sample Name : TWS earbuds
Sample Model : MO6946
Test Requested : With reference to EU RoHS Directive 2011/65/EU and its amendment Directive EU 2015/863, to determine the Pb, Cd, Hg, Cr⁶⁺, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content in the submitted sample.
Test Method : Refer to next page (s)
Test Conclusion : Pass
Date of Receipt Sample : 2025-06-27 & 2025-07-08 & 2025-07-15 & 2025-07-24
Testing Period : 2025-06-27 to 2025-07-11 & 2025-07-15 to 2025-07-18 & 2025-07-24 to 2025-07-31
Date of Issue : 2025-08-01
Test Result : Refer to next page (s)

Prepared By:

Waltek Testing Group (Foshan) Co., Ltd.

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Signed for and on behalf of
Waltek Testing Group (Foshan) Co., Ltd.

Swing Liang

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Sample photo:



MO6946



MO6946

WALTEK



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Test Results:**1. Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs and PBDEs**

Test Method/Equipment:

- 1) With reference to IEC 62321-2:2021, disassembly, disjunction and mechanical sample preparation
- 2) With reference to IEC 62321-3-1:2013, screening –Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry
- 3) With reference to IEC 62321-4:2013+AMD1:2017 CSV, determination of Mercury by ICP-OES
- 4) With reference to IEC 62321-5:2013, determination of Lead and Cadmium by ICP-OES
- 5) With reference to IEC 62321-7-2: 2017 and IEC 62321-7-1: 2015, determination of Hexavalent Chromium by UV-Vis
- 6) With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)	Note
		Cd	Pb	Hg	Cr	Br		
1	White plastic shell	BL	BL	BL	BL	BL	NA	•
2	Black transparent plastic shell	BL	BL	BL	BL	BL	NA	•
3	Golden metal shell	IN	OL	BL	BL	--	Cd :38 #Pb : 2.50×10^4	•
4	Silvery metal spring	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
5	Brown transparent plastic adhesive tape	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-28
6	Black plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-57
7	Silvery metal wire	BL	BL	BL	BL	--	NA	Same WTF25F06145388A 1C-58
8	Black sponge with adhesive	BL	BL	BL	BL	BL	NA	•



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)	Note
		Cd	Pb	Hg	Cr	Br		
9	Solder	BL	IN	BL	BL	--	Pb : 176	•
10	Silvery metal sheet	BL	BL	BL	BL	--	NA	•
11	Red plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-59
12	Silvery metal screw with black surface	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
13	Black plastic core(socket)	BL	BL	BL	BL	BL	NA	•
14	Silvery metal shell(socket)	BL	BL	BL	BL	--	NA	•
15	Silvery metal pin(socket)	BL	BL	BL	BL	--	NA	•
16	Chip IC	BL	BL	BL	BL	BL	NA	•
17	Green PCB	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•
18	Chip resistor	BL	BL	BL	IN	BL	Cr ⁶⁺ : ND	•
19	Chip capacitor	BL	BL	BL	BL	BL	NA	•
20	Green PCB	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)	Note
		Cd	Pb	Hg	Cr	Br		
21	Off-white plastic shell	BL	BL	BL	BL	BL	NA	•
22	Solder	BL	IN	BL	BL	--	Pb :204	•
23	Silvery magnetic block	BL	BL	BL	IN	--	Cr ⁶⁺ : ND	•
24	Transparent plastic sheet with black surface	BL	BL	BL	BL	BL	NA	•
25	Coppery varnished wire(inductor)	BL	BL	BL	BL	BL	NA	•
26	Black magnetic core(inductor)	BL	IN	BL	IN	--	Cr ⁶⁺ : ND Pb :325	•
27	Chip IC	BL	IN	BL	BL	BL	Pb :345	•
28	Transparent dry glue	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•
29	Black PCB	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•
30	Chip IC	BL	IN	BL	BL	BL	Pb :503	•
31	Chip resistor	BL	OL	BL	BL	BL	[^] Pb : 7.14×10 ⁴	•
32	Chip resistor	BL	OL	BL	BL	BL	[^] Pb : 4.46×10 ⁴	•



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)	Note
		Cd	Pb	Hg	Cr	Br		
33	Chip capacitor	BL	OL	BL	BL	BL	^A Pb : 5.93×10^4	•
34	White plastic shell	BL	BL	BL	BL	BL	NA	•
35	Golden metal pin	IN	OL	BL	BL	--	Cd : 44 ^A Pb : 2.66×10^4	•
36	Silvery metal net with adhesive	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
37	White plastic shell	BL	BL	BL	BL	BL	NA	•
38	Silvery metal net with adhesive	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
39	White plastic shell	BL	BL	BL	BL	--	NA	•
40	Black plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-86
41	Silvery metal wire	BL	BL	BL	BL	--	NA	Same WTF25F06145388A 1C-72
42	Red plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-87
43	White plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-73
44	Blue plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-71



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)	Note
		Cd	Pb	Hg	Cr	Br		
45	White plastic adhesive tape	BL	BL	BL	BL	BL	NA	•
46	Silvery metal shell	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
47	Green PCB	BL	BL	BL	BL	BL	NA	•
48	Solder	BL	IN	BL	BL	--	Pb : 175	•
49	Yellow dry glue	BL	BL	BL	BL	BL	NA	•
50	Transparent plastic film	BL	BL	BL	BL	BL	NA	•
51	Red-coppery metal wire	BL	BL	BL	BL	--	NA	•
52	Silvery magnetic block	BL	BL	BL	IN	--	Cr ⁶⁺ : ND	•
53	White double faced adhesive tape	BL	BL	BL	BL	BL	NA	•
54	Chip crystal oscillator	BL	BL	BL	BL	BL	NA	•
55	Green PCB	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•
56	Solder	BL	BL	BL	BL	--	NA	•



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)	Note
		Cd	Pb	Hg	Cr	Br		
57	Chip MIC	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•
58	Chip IC	BL	BL	BL	BL	BL	NA	•
59	Chip EC	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•
60	Silvery magnetic block	BL	BL	BL	IN	--	Cr ⁶⁺ : ND	•
61	Chip LED	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	•
62	Chip resistor	BL	BL	BL	BL	BL	NA	•
63	Chip capacitor	BL	BL	BL	BL	BL	NA	•
64	Silvery metal shell(USB plug)	BL	BL	BL	BL	--	NA	Same WTF25F06145388A 1C-101
65	White plastic jacket(USB plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-100
66	White plastic wire jacket	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-99
67	Silvery metal pin(USB plug)	BL	BL	BL	BL	--	NA	Same WTF25F06145388A 1C-104
68	Solder(USB plug)	BL	IN	BL	BL	--	Pb :248	Same WTF25F06145388A 1C-103



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)	Note
		Cd	Pb	Hg	Cr	Br		
69	White plastic core(USB plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-102
70	Red plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-105
71	Coppery metal wire	BL	BL	BL	BL	--	NA	Same WTF25F06145388A 1C-107
72	Black plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-106
73	White plastic jacket(Type-C plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-108
74	Silvery metal shell(Type-C plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	Same WTF25F06145388A 1C-109
75	Solder(Type-C plug)	BL	BL	BL	BL	--	NA	Same WTF25F06145388A 1C-110
76	Black plastic core(Type-C plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145388A 1C-111
77	Green PCB(Type-C plug)	BL	BL	BL	BL	IN	PBBS : ND PBDEs : ND	Same WTF25F06145388A 1C-113
78	Silvery metal pin(Type-C plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	Same WTF25F06145388A 1C-112
79	Chip EC(Type-C plug)	BL	OL	BL	BL	BL	*Pb : 1195	Same WTF25F06145388A 1C-114



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2. Phthalates

Test Method/Equipment:

1) With reference to IEC 62321-8:2017, determination of DBP, BBP, DEHP, DIBP by GC-MS

Serial No.	Part No.	Result (mg/kg)				Note
		DBP	BBP	DEHP	DIBP	
T01	1+2+13+21+24 [△]	ND	ND	126	ND	•
T02	8	ND	ND	ND	ND	•
T03	16+18+19+27+30 [△]	ND	ND	ND	ND	•
T04	17+20+29+47+55 [△]	ND	ND	ND	ND	•
T05	25	ND	ND	ND	ND	•
T06	28+49 [△]	ND	ND	ND	ND	•
T07	31+32+33+54+57 [△]	ND	ND	ND	ND	•
T08	34+37+39 [△]	ND	ND	ND	ND	•
T09	45	ND	ND	ND	ND	•
T10	50	ND	ND	ND	ND	•
T11	53	ND	ND	ND	ND	•
T12	58+59+61+62+63 [△]	ND	ND	ND	ND	•
T13	5	--	--	--	--	Same WTF25F06145388A1C-28
T14	6	--	--	--	--	Same WTF25F06145388A1C-57
T15	11	--	--	--	--	Same WTF25F06145388A1C-59
T16	40	--	--	--	--	Same WTF25F06145388A1C-86
T17	43	--	--	--	--	Same WTF25F06145388A1C-73
T18	44	--	--	--	--	Same WTF25F06145388A1C-71
T19	42	--	--	--	--	Same WTF25F06145388A1C-87
T20	65	--	--	--	--	Same WTF25F06145388A1C-100
T21	66	--	--	--	--	Same WTF25F06145388A1C-99
T22	69	--	--	--	--	Same WTF25F06145388A1C-102
T23	70	--	--	--	--	Same WTF25F06145388A1C-105
T24	72	--	--	--	--	Same WTF25F06145388A1C-106
T26	73	--	--	--	--	Same WTF25F06145388A1C-108
T27	76	--	--	--	--	Same WTF25F06145388A1C-111
T28	77	--	--	--	--	Same WTF25F06145388A1C-113
T29	79	ND	ND	ND	ND	Same WTF25F06145388A1C-114
T30	3	--	--	--	--	•
T31	4	--	--	--	--	•
T32	7	--	--	--	--	Same WTF25F06145388A1C-58
T33	9	--	--	--	--	•
T34	10	--	--	--	--	•
T35	12	--	--	--	--	•



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Serial No.	Part No.	Result (mg/kg)				Note
		DBP	BBP	DEHP	DIBP	
T36	14	--	--	--	--	•
T37	15	--	--	--	--	•
T38	22	--	--	--	--	•
T39	23	--	--	--	--	•
T40	26	--	--	--	--	•
T41	35	--	--	--	--	•
T42	36	--	--	--	--	•
T43	38	--	--	--	--	•
T44	41	--	--	--	--	Same WTF25F06145388A1C-72
T45	46	--	--	--	--	•
T46	48	--	--	--	--	•
T47	51	--	--	--	--	•
T48	52	--	--	--	--	•
T49	56	--	--	--	--	•
T50	60	--	--	--	--	•
T51	64	--	--	--	--	Same WTF25F06145388A1C-101
T52	67	--	--	--	--	Same WTF25F06145388A1C-104
T53	68	--	--	--	--	Same WTF25F06145388A1C-103
T54	71	--	--	--	--	Same WTF25F06145388A1C-107
T55	74	--	--	--	--	Same WTF25F06145388A1C-109
T56	75	--	--	--	--	Same WTF25F06145388A1C-110
T57	78	--	--	--	--	Same WTF25F06145388A1C-112

**Remark:**

(1) Results are obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr⁶⁺) 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)

Element	Polymer	Metal	Composite Materials
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

OL= Over Limit

LOD = Limit of Detection

(2) "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.

(3) The XRF screening test for RoHS elements – the reading may be different to the actual content in the sample because of non-uniformity composition.

(4) mg/kg = milligram per kilogram=ppm, µg/cm²= Micrograms per square centimetre.

(5) ND = Not Detected or lower than limit of quantitation.

(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.

(7) -- = Not Regulated

(8) LOQ = Limit of quantitation.

Test Items	Pb	Cd	Hg	Cr ⁶⁺		PBB	PBDE	DBP	BBP	DEHP	DIBP
Units	mg/kg	mg/kg	mg/kg	mg/kg	µg/cm ²	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOQ	2	2	2	8	0.1	5	5	50	50	50	50

The LOQ for single compound of PBBs and PBDEs is 5mg/kg, LOQ of Cr⁶⁺ for polymer and composite sample is 8mg/kg and LOQ of Cr⁶⁺ for metal sample is 0.1µg/cm².

(9) According to IEC 62321-7-1:2015, determined of Cr⁶⁺ on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.

Boiling water extraction:

Negative = Absence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is less than 0.10µg/cm².

Positive = Presence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is greater than 0.13µg/cm².

Information on storage conditions and production date of the tested sample is unavailable and thus Cr⁶⁺ results represent status of the sample at the time of testing.



(10) RoHS Requirement

Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

(11) Abbreviation:

"Pb" denotes Lead, "Cd" denotes Cadmium, "Hg" denotes Mercury, "Cr" denotes Chromium, "Cr⁶⁺" denotes Hexavalent Chromium, "Br" denotes Bromine, "PBBs" denotes Total Polybrominated Biphenyls, "PBDEs" denotes Total Polybrominated Diphenyl Ethers.

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

(12) "Δ"=As per applicant's requirement, the testing was conducted based on mixed components by weight in equal ratio, results are calculated by the minimum weight of mixed components.

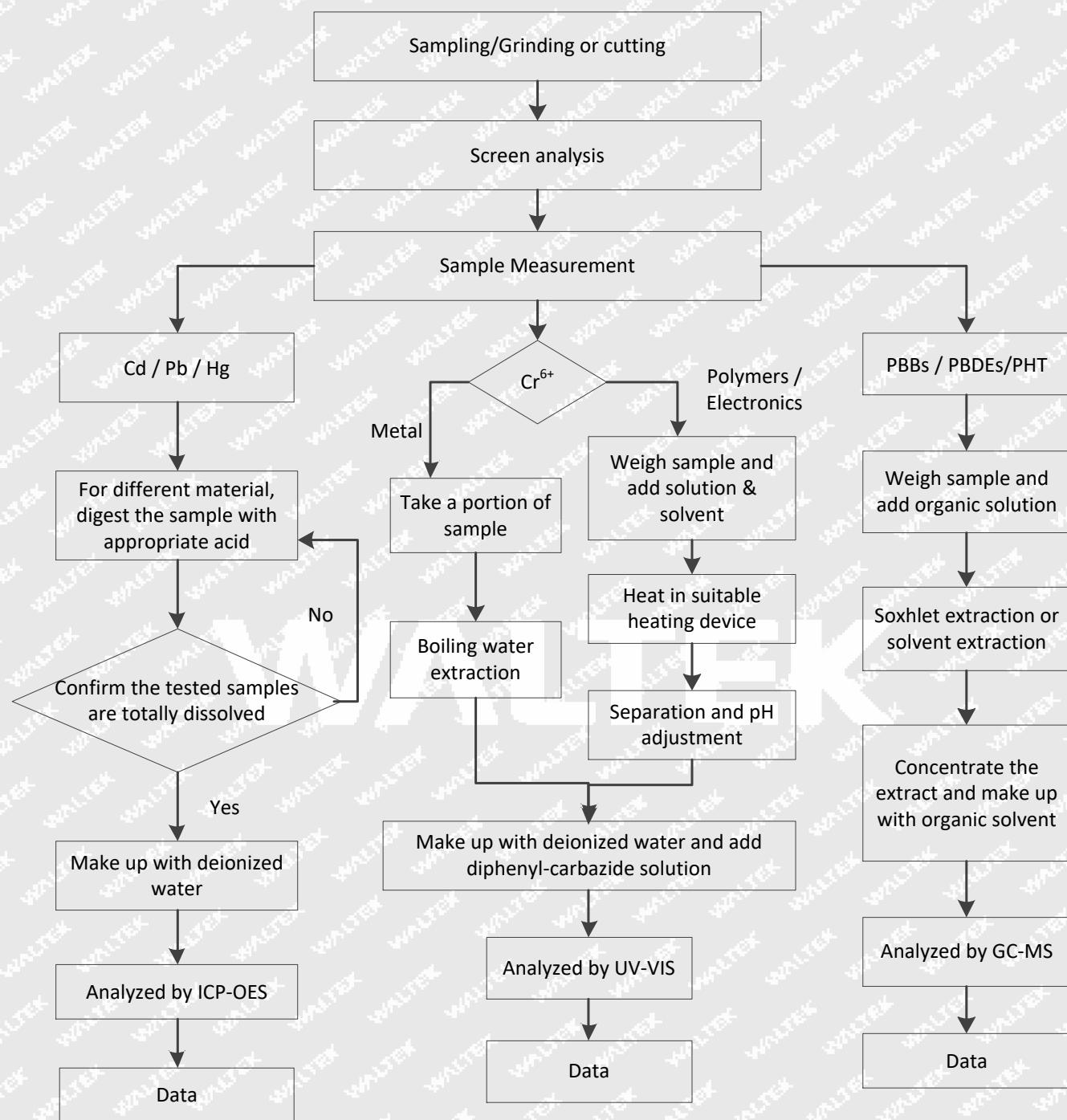
(13) "●"=Actual tested sample. Chemical tests were performed for the samples indicated by the photo in this report.

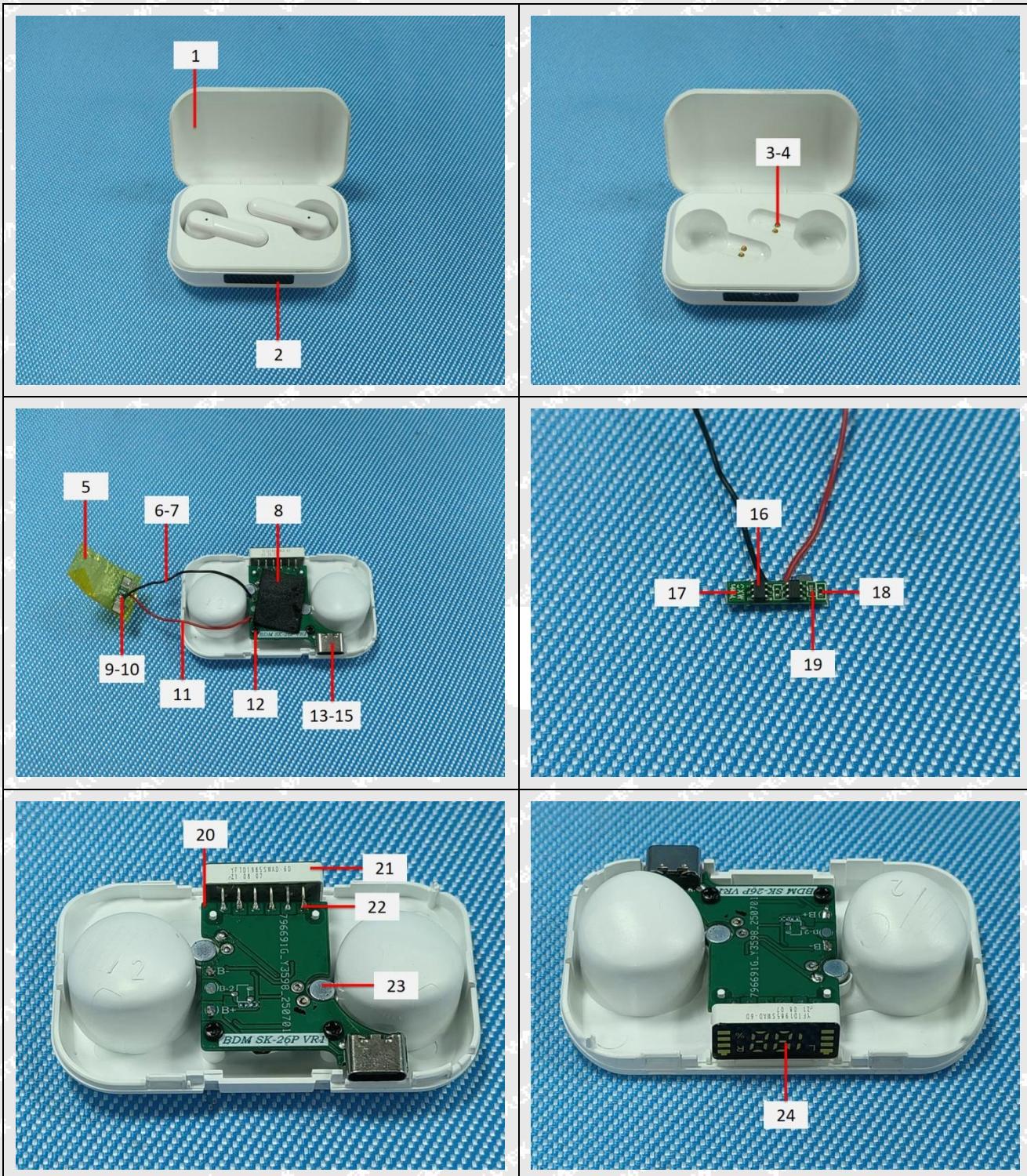
(14) "Same" = It means that as per client's requirement, the sample and the actual tested sample are of the same material (or results of the sample are quoted from corresponding number report) and have not been tested.

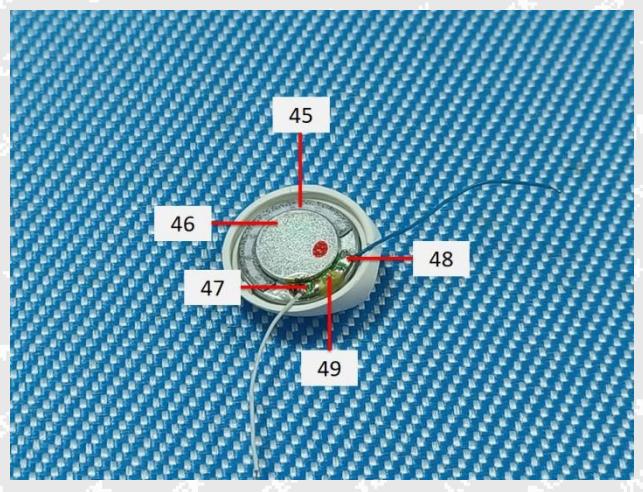
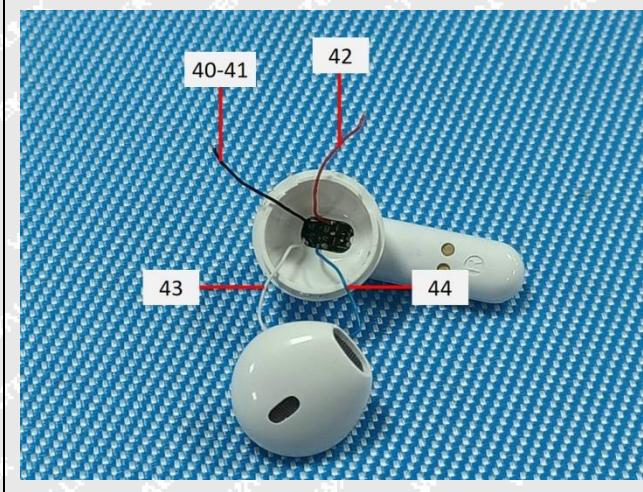
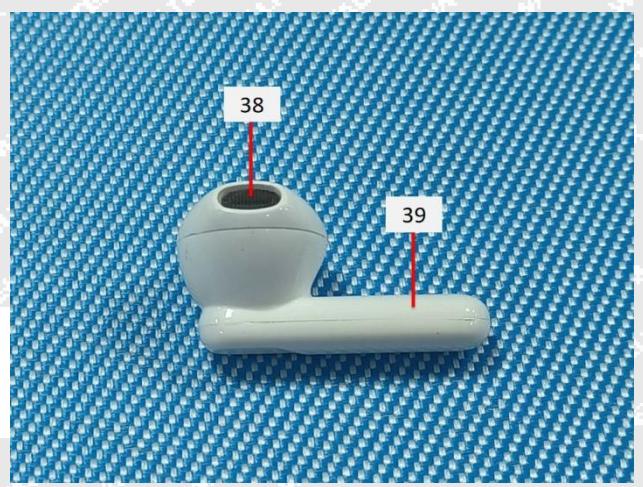
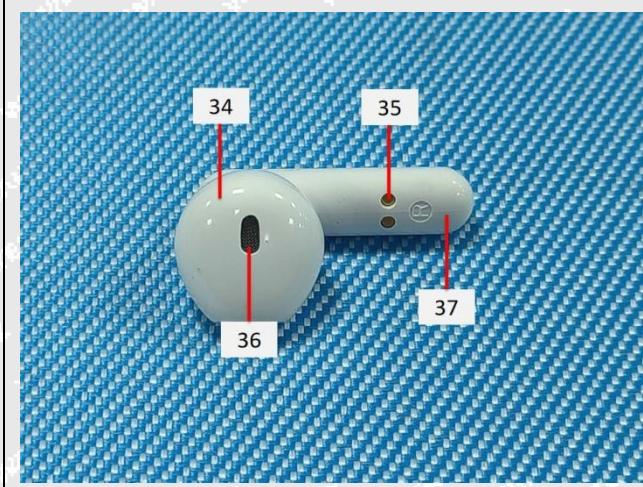
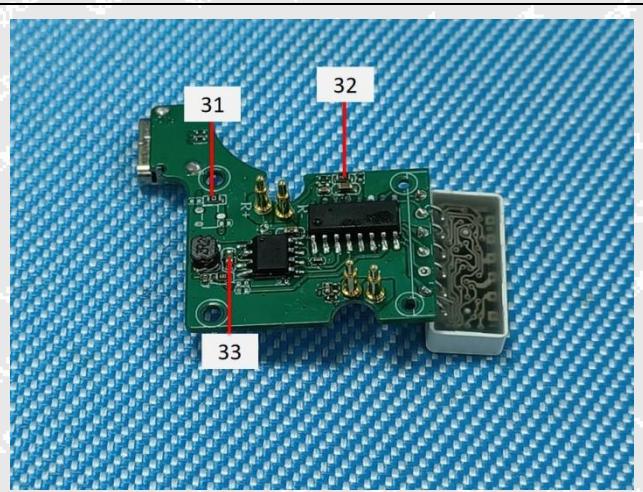
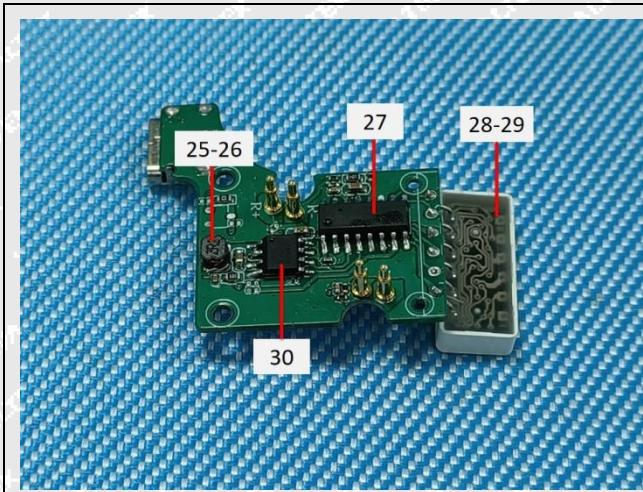
(15)*= According to the declaration from client, the source of lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages is exempted by Directive 2011/65/EU ANNEX III-15.

(16)^ = 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 ANNEX III-7(c)-I.

(17)^= According to the declaration from client, the source of lead in test sample is from copper alloy while lead as copper alloy containing up to 4% lead by weight is exempted by Directive 2011/65/EU ANNEX III-6(c).

Testing Flow chart:


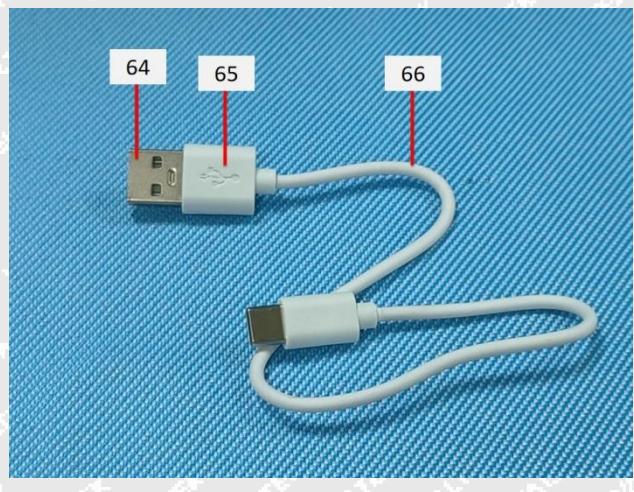
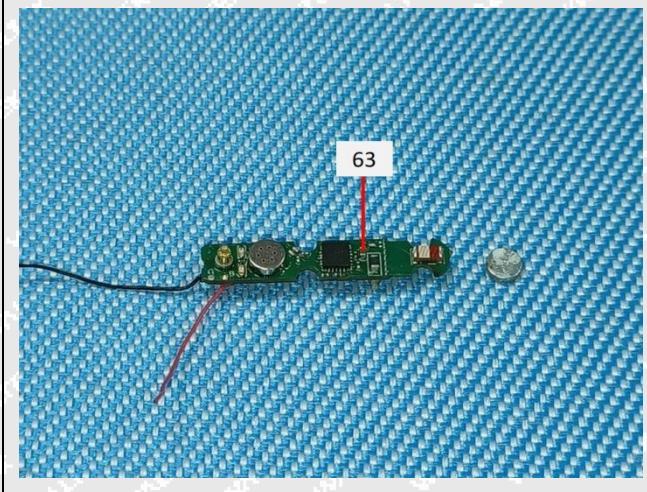
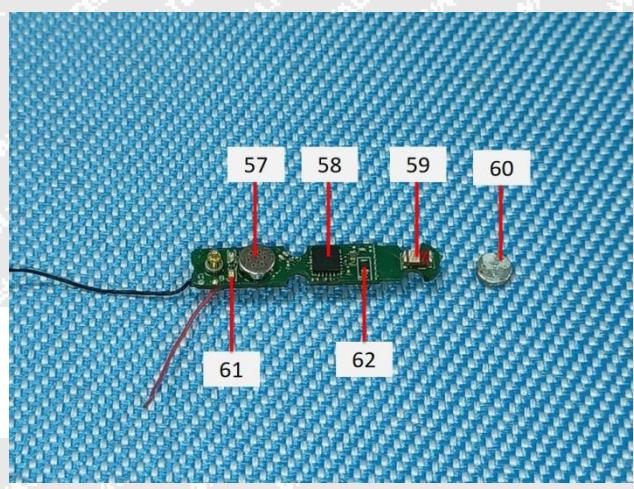
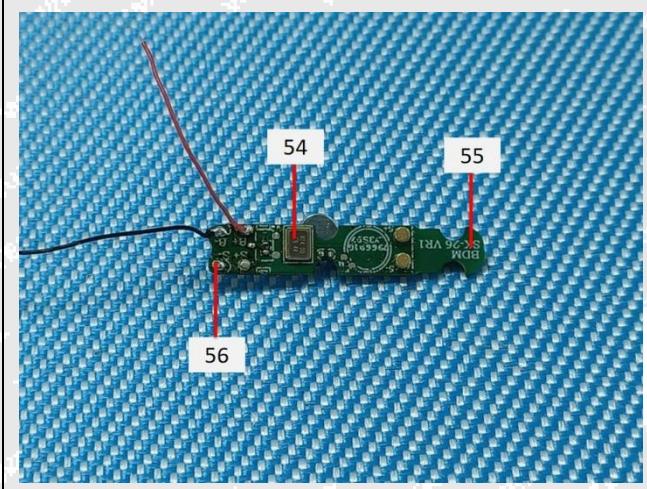
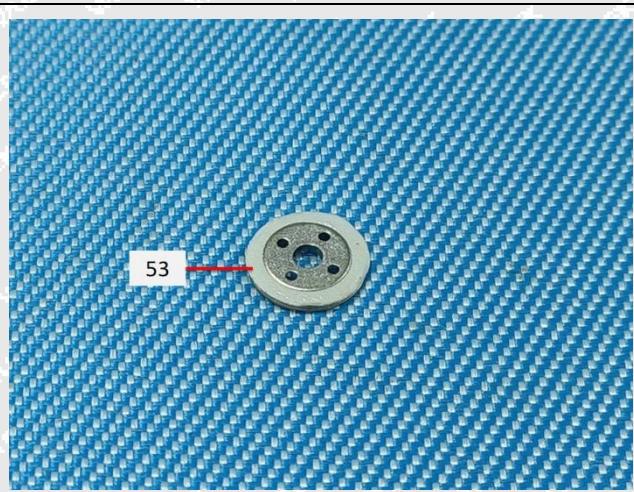
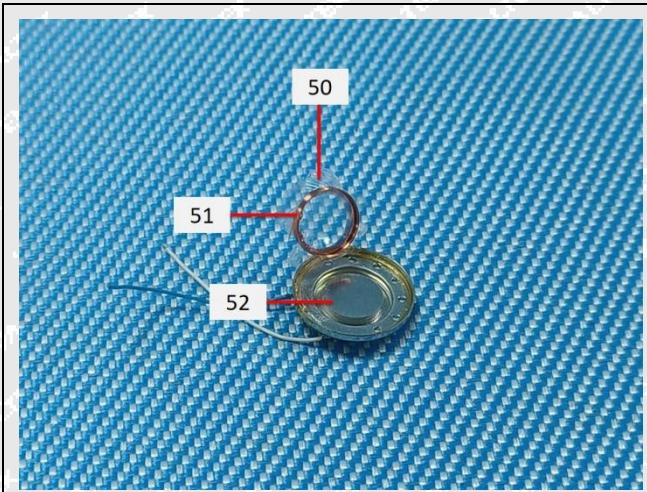
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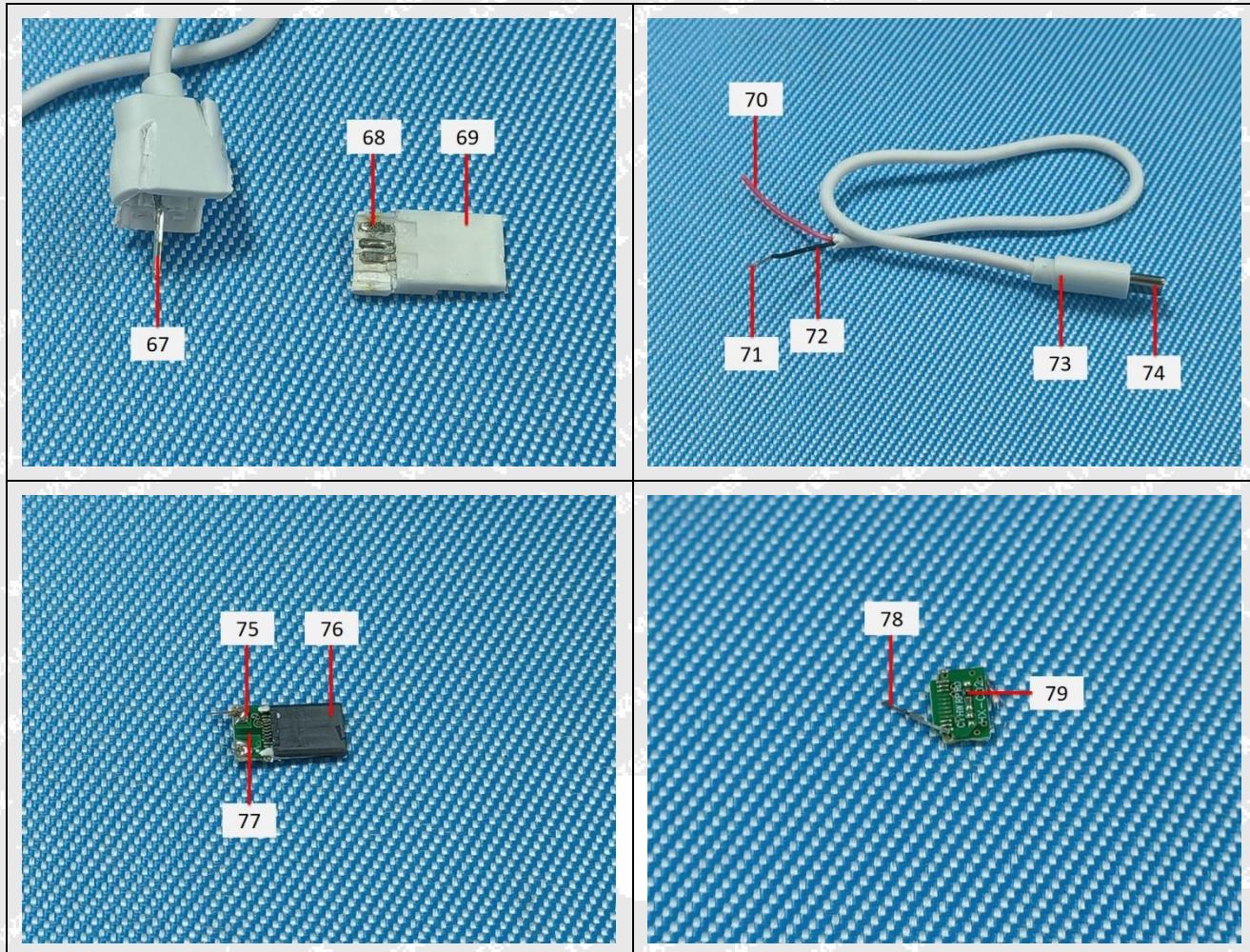




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**Remarks:**

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6. The sample material information (Model No. information) is provided by client, not verified by test laboratory. The samples of reference Model No. are not tested. Test laboratory not responsible for the accuracy, appropriateness, completeness and authenticity of the information provided by client.

===== End of Report =====