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检测
TESTING
CNAS L6478



TEST REPORT

Report No. : WTF25F06169656A1C
Job No. : FSW2506271395CJ
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 : MO2079
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 & 2025-07-15
Testing Period : 2025-06-27 to 2025-07-08 & 2025-07-15 ~ 2025-07-18
Date of Issue : 2025-07-18
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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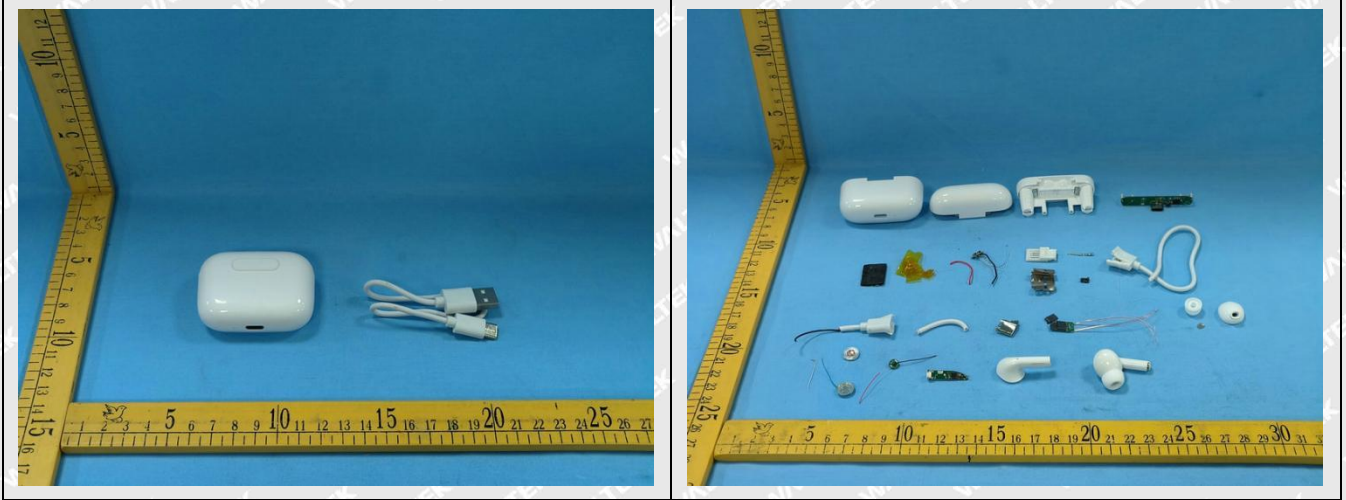
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Sample photo:



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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	Silvery metal axle	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
3	Silvery magnetic block	BL	BL	BL	BL	--	NA	•
4	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND	•
5	Red plastic wire covering	BL	BL	BL	BL	BL	NA	•
6	Black plastic wire covering	BL	BL	BL	BL	BL	NA	•
7	Black sponge adhesive tape	BL	BL	BL	BL	BL	NA	•
8	Brown plastic adhesive tape	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	Silvery metal wire	BL	BL	BL	BL	--	NA	•
10	Chip EC	BL	OL	BL	BL	BL	*Pb : 2814	•
11	Chip IC	BL	BL	BL	BL	BL	NA	•
12	Chip capacitor	BL	BL	BL	BL	BL	NA	•
13	Silvery metal sheet	BL	BL	BL	BL	--	NA	•
14	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND	•
15	Solder	BL	IN	BL	IN	--	Cr ⁶⁺ : Negative Pb :183	•
16(R1)	Solder	BL	IN	BL	BL	--	Pb :176	•
17	Silvery metal screw with black surface	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
18	Chip IC	BL	BL	BL	BL	BL	NA	•
19	Chip LED	BL	BL	BL	BL	BL	NA	•
20	Black plastic core(socket)	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		
21	Silvery metal shell(socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
22	Silvery metal pin(socket)	BL	BL	BL	BL	--	NA	•
23	Coppery varnished wire(inductor)	BL	BL	BL	BL	BL	NA	•
24	Black magnetic core(inductor)	BL	BL	BL	IN	--	Cr ⁶⁺ : ND	•
25	Off-white plastic shell	BL	BL	BL	BL	BL	NA	•
26	Golden metal pin	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
27	Chip resistor	BL	BL	BL	BL	BL	NA	•
28	Chip capacitor	BL	BL	BL	BL	BL	NA	•
29	White soft plastic part	BL	BL	BL	BL	BL	NA	•
30	Silvery metal pin	BL	BL	BL	BL	--	NA	Same WTF25F06145 388A1C 66
31	White plastic shell	BL	BL	BL	BL	BL	NA	•
32	Silvery metal net with adhesive	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•



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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	White double faced adhesive tape	BL	BL	BL	BL	BL	NA	•
34	Silvery metal shell	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
35	Red plastic wire covering	BL	BL	BL	BL	BL	NA	•
36	Black plastic wire covering	BL	BL	BL	BL	BL	NA	•
37	White plastic wire covering	BL	BL	BL	BL	BL	NA	•
38	Blue plastic wire covering	BL	BL	BL	BL	BL	NA	•
39	Yellow dry glue	BL	BL	BL	BL	BL	NA	•
40	Green PCB	BL	BL	BL	BL	BL	NA	•
41(R1)	Solder	BL	IN	BL	BL	--	Pb : 171	•
42	Black plastic adhesive tape	BL	BL	BL	BL	BL	NA	•
43	Silvery magnetic block	BL	BL	BL	BL	--	NA	•
44	Copperty varnished wire	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		
45	Transparent plastic film	BL	BL	BL	BL	BL	NA	•
46	Chip EC	BL	OL	BL	BL	IN	PBBs : ND PBDEs : ND *Pb : 3061	•
47	Chip capacitor	BL	BL	BL	BL	BL	NA	•
48	Chip IC	BL	BL	BL	BL	BL	NA	•
49	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND	•
50	Solder	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	•
51	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND	•
52	Chip MIC	BL	BL	BL	BL	BL	NA	•
53	Chip crystal oscillator	BL	BL	BL	BL	BL	NA	•
54	Solder	BL	BL	BL	BL	--	NA	•
55	Golden metal pin	IN	OL	BL	BL	--	Cd :25 #Pb : 2.67×10⁴	•
56	Chip EC	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		
57	Chip LED	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND	•
58	Chip LED	BL	BL	BL	BL	BL	NA	•
59	Chip IC	BL	BL	BL	BL	BL	NA	•
60	White plastic wire jacket	BL	BL	BL	BL	BL	NA	Same WTF25F06145 388A1C 99
61	White plastic jacket(USB plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145 388A1C 100
62	Silvery metal shell(USB plug)	BL	BL	BL	BL	--	NA	Same WTF25F06145 388A1C 101
63	Silvery metal pin(USB plug)	BL	BL	BL	BL	--	NA	Same WTF25F06145 388A1C 104
64	White plastic core(USB plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145 388A1C 102
65	Solder(USB plug)	BL	IN	BL	BL	--	Pb :248	Same WTF25F06145 388A1C 103
66	Black plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145 388A1C 106
67	Red plastic wire covering	BL	BL	BL	BL	BL	NA	Same WTF25F06145 388A1C 105
68	White plastic jacket(Type-C plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145 388A1C 108



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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	Silvery metal shell(Type-C plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	Same WTF25F06145 388A1C 109
70	Coppery metal wire	BL	BL	BL	BL	--	NA	Same WTF25F06145 388A1C 107
71	Green PCB(Type-C plug)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND	Same WTF25F06145 388A1C 113
72	Black plastic core(Type-C plug)	BL	BL	BL	BL	BL	NA	Same WTF25F06145 388A1C 111
73	Solder(Type-C plug)	BL	BL	BL	BL	--	NA	Same WTF25F06145 388A1C 110
74	Silvery metal pin(Type-C plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	Same WTF25F06145 388A1C 112
75	Chip EC(Type-C plug)	BL	OL	BL	BL	BL	*Pb : 1195	Same WTF25F06145 388A1C 114

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+20+25+31) [△]	ND	ND	ND	ND	•
T02	(4+14+40+49+51) [△]	ND	ND	ND	ND	•
T03	(5+6+29) [△]	ND	ND	ND	ND	•
T04	7	ND	ND	ND	ND	•
T05	(8+42) [△]	ND	ND	ND	ND	•
T06	(10+11+12+18+19) [△]	ND	ND	ND	ND	•
T07	(23+44) [△]	ND	ND	ND	ND	•
T08	(27+28+46+47+48) [△]	ND	ND	ND	ND	•
T09	33	ND	ND	ND	ND	•
T10	(35+36+37) [△]	ND	ND	ND	ND	•



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Serial No.	Part No.	Result (mg/kg)				Note
		DBP	BBP	DEHP	DIBP	
T11	38	ND	ND	ND	ND	•
T12	39	ND	ND	ND	ND	•
T13	45	ND	ND	ND	ND	•
T14	(52+53+56+57+58) ^Δ	ND	ND	ND	ND	•
T15	59	ND	ND	ND	ND	•
T16	60	--	--	--	--	Same WTF25F06145388A1C 99
T17	61	--	--	--	--	Same WTF25F06145388A1C 100
T18	64	--	--	--	--	Same WTF25F06145388A1C 102
T19	(66+67+68) ^Δ	ND	ND	ND	ND	•
T20	66	--	--	--	--	Same WTF25F06145388A1C 106
T21	67	--	--	--	--	Same WTF25F06145388A1C 105
T22	68	--	--	--	--	Same WTF25F06145388A1C 108
T23	71	--	--	--	--	Same WTF25F06145388A1C 113
T24	72	--	--	--	--	Same WTF25F06145388A1C 111
T25	75	ND	ND	ND	ND	Same WTF25F06145388A1C 114
T26	2	--	--	--	--	•
T27	3	--	--	--	--	•
T28	9	--	--	--	--	•
T29	13	--	--	--	--	•
T30	15	--	--	--	--	•
T31	16(R1)	--	--	--	--	•
T32	17	--	--	--	--	•
T33	21	--	--	--	--	•
T34	22	--	--	--	--	•
T35	24	--	--	--	--	•
T36	26	--	--	--	--	•
T37	30	--	--	--	--	Same WTF25F06145388A1C 66
T38	32	--	--	--	--	•
T39	34	--	--	--	--	•
T40	41(R1)	--	--	--	--	•



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Serial No.	Part No.	Result (mg/kg)				Note
		DBP	BBP	DEHP	DIBP	
T41	43	--	--	--	--	•
T42	50	--	--	--	--	•
T43	54	--	--	--	--	•
T44	55	--	--	--	--	•
T45	62	--	--	--	--	Same WTF25F06145388A1C 101
T46	63	--	--	--	--	Same WTF25F06145388A1C 104
T47	65	--	--	--	--	Same WTF25F06145388A1C 103
T48	69	--	--	--	--	Same WTF25F06145388A1C 109
T49	70	--	--	--	--	Same WTF25F06145388A1C 107
T50	73	--	--	--	--	Same WTF25F06145388A1C 110
T51	74	--	--	--	--	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 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)

Element	Polymer	Metal	Composite Materials
Cd	$\text{BL} \leq (70-3\sigma) < \text{IN} < (130+3\sigma) \leq \text{OL}$	$\text{BL} \leq (70-3\sigma) < \text{IN} < (130+3\sigma) \leq \text{OL}$	$\text{LOD} < \text{IN} < (150+3\sigma) \leq \text{OL}$
Pb	$\text{BL} \leq (700-3\sigma) < \text{IN} < (1300+3\sigma) \leq \text{OL}$	$\text{BL} \leq (700-3\sigma) < \text{IN} < (1300+3\sigma) \leq \text{OL}$	$\text{BL} \leq (500-3\sigma) < \text{IN} < (1500+3\sigma) \leq \text{OL}$
Hg	$\text{BL} \leq (700-3\sigma) < \text{IN} < (1300+3\sigma) \leq \text{OL}$	$\text{BL} \leq (700-3\sigma) < \text{IN} < (1300+3\sigma) \leq \text{OL}$	$\text{BL} \leq (500-3\sigma) < \text{IN} < (1500+3\sigma) \leq \text{OL}$
Cr	$\text{BL} \leq (700-3\sigma) < \text{IN}$	$\text{BL} \leq (700-3\sigma) < \text{IN}$	$\text{BL} \leq (500-3\sigma) < \text{IN}$
Br	$\text{BL} \leq (300-3\sigma) < \text{IN}$	--	$\text{BL} \leq (250-3\sigma) < \text{IN}$

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.



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- (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.
- (4) mg/kg = milligram per kilogram = ppm, $\mu\text{g}/\text{cm}^2$ = 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	$\mu\text{g}/\text{cm}^2$	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 Cr^{6+} for polymer and composite sample is 8mg/kg and LOQ of Cr^{6+} for metal sample is $0.1\mu\text{g}/\text{cm}^2$.

- (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 $0.10\mu\text{g}/\text{cm}^2$.

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

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.

(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)



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(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) "△" = 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 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).

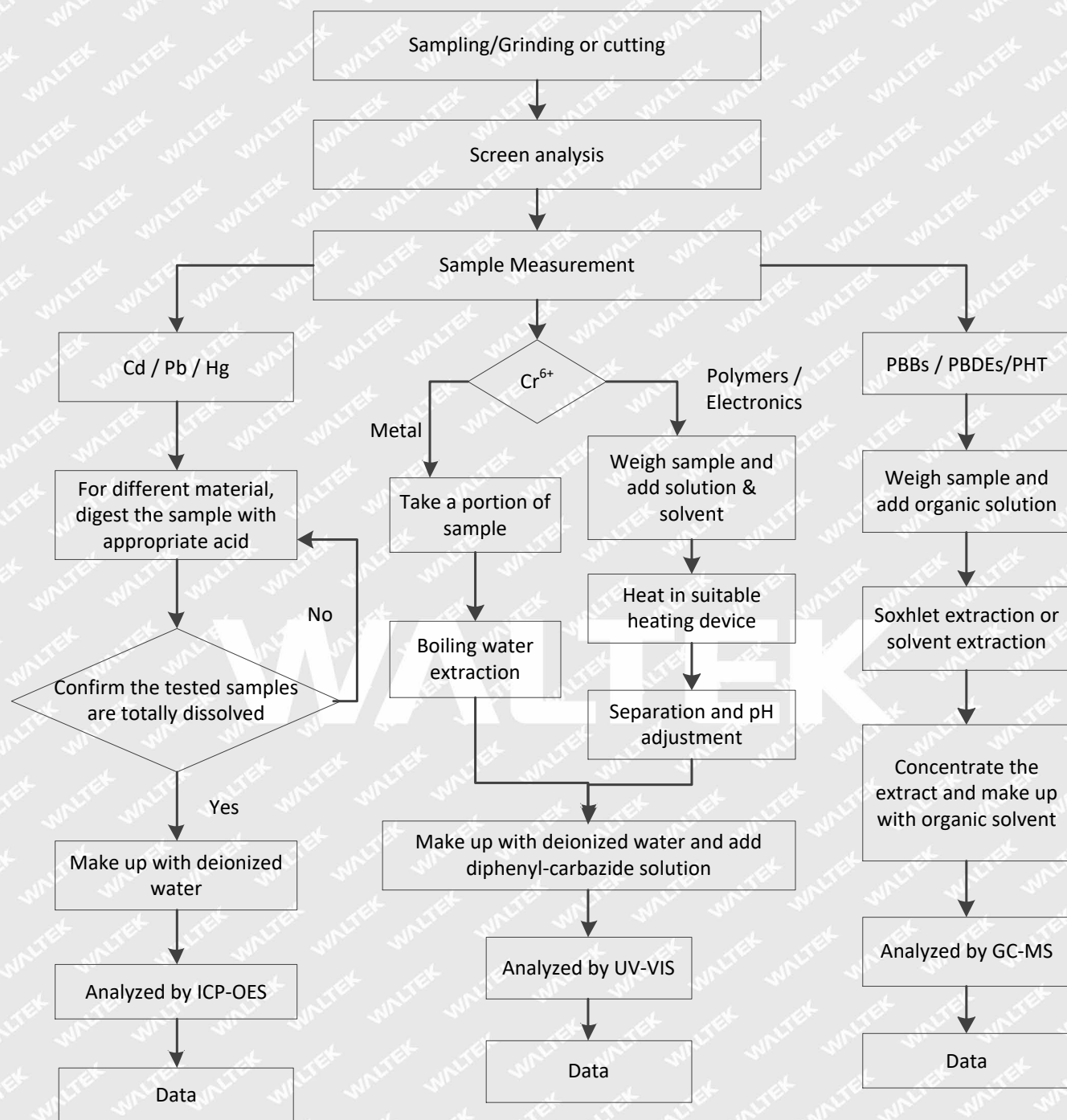
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Testing Flow chart:

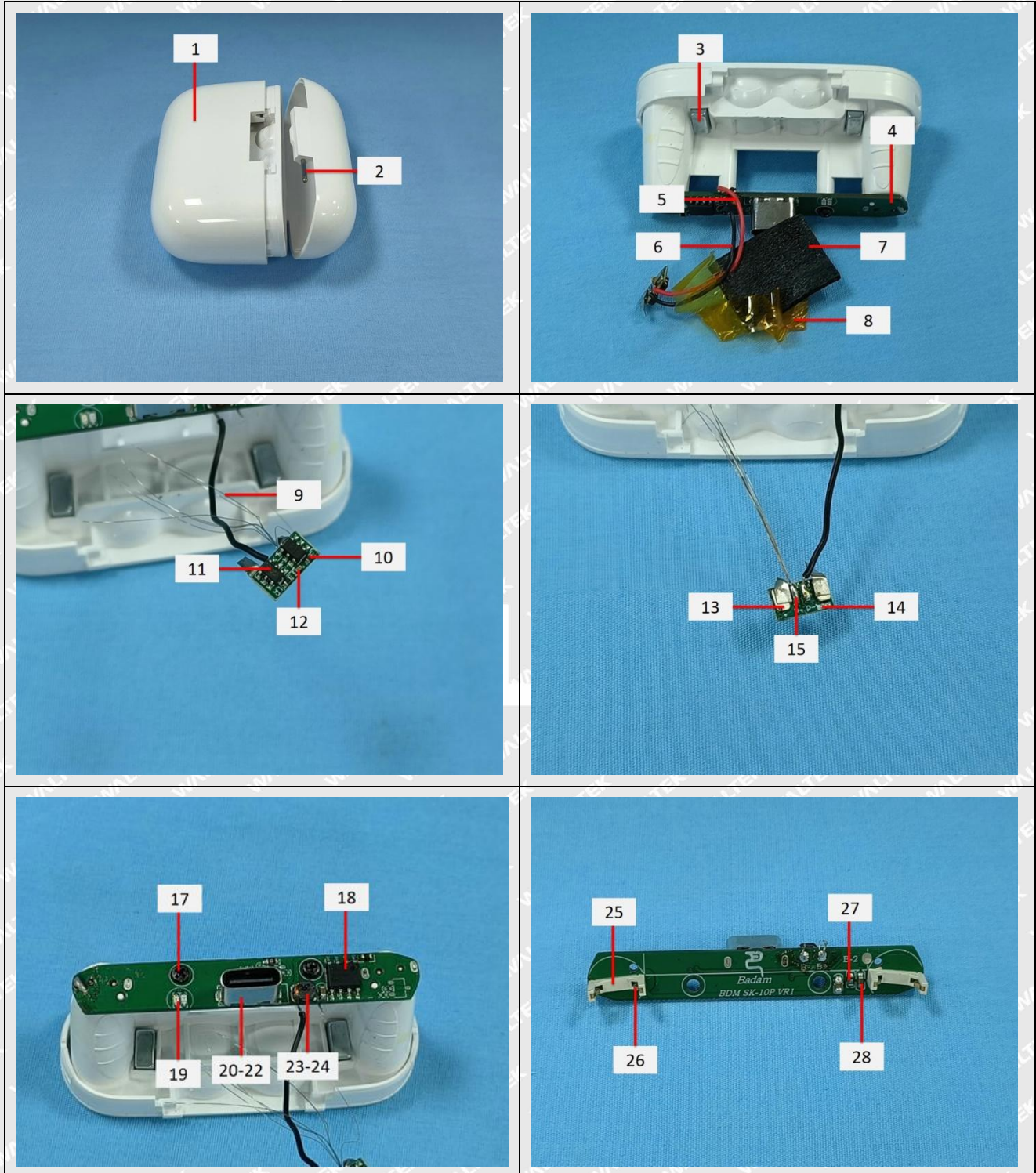




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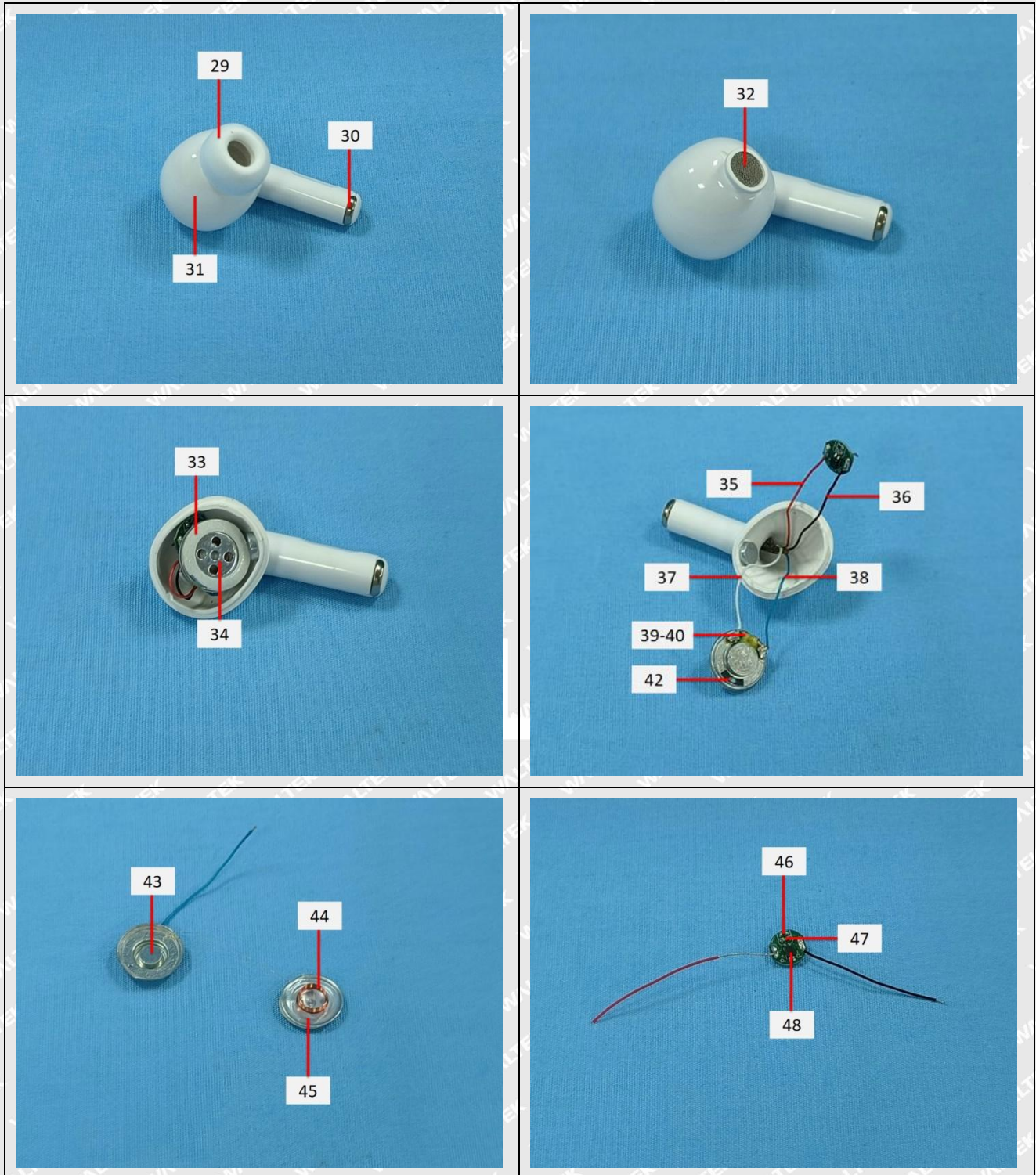
Photograph of parts tested:





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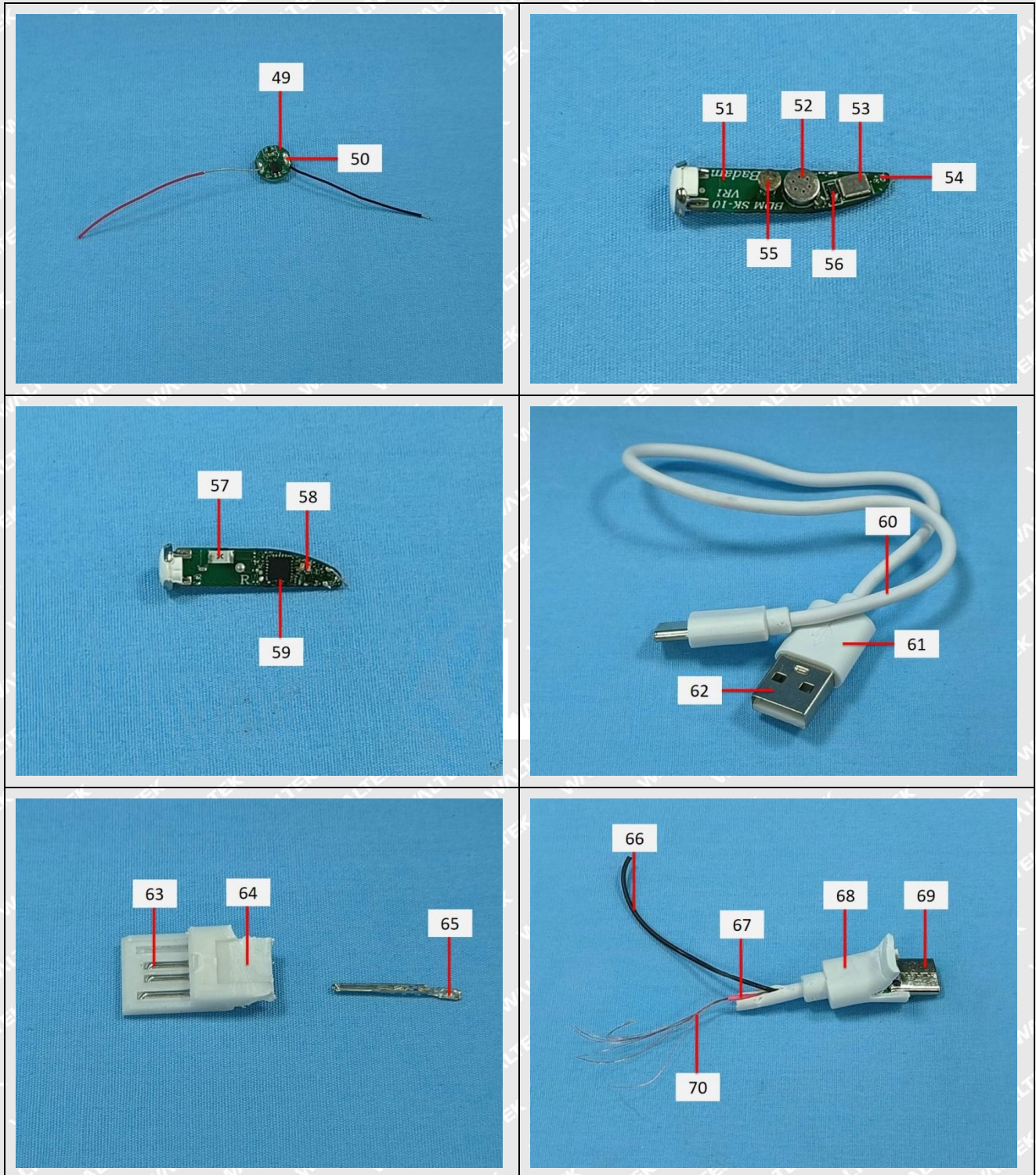
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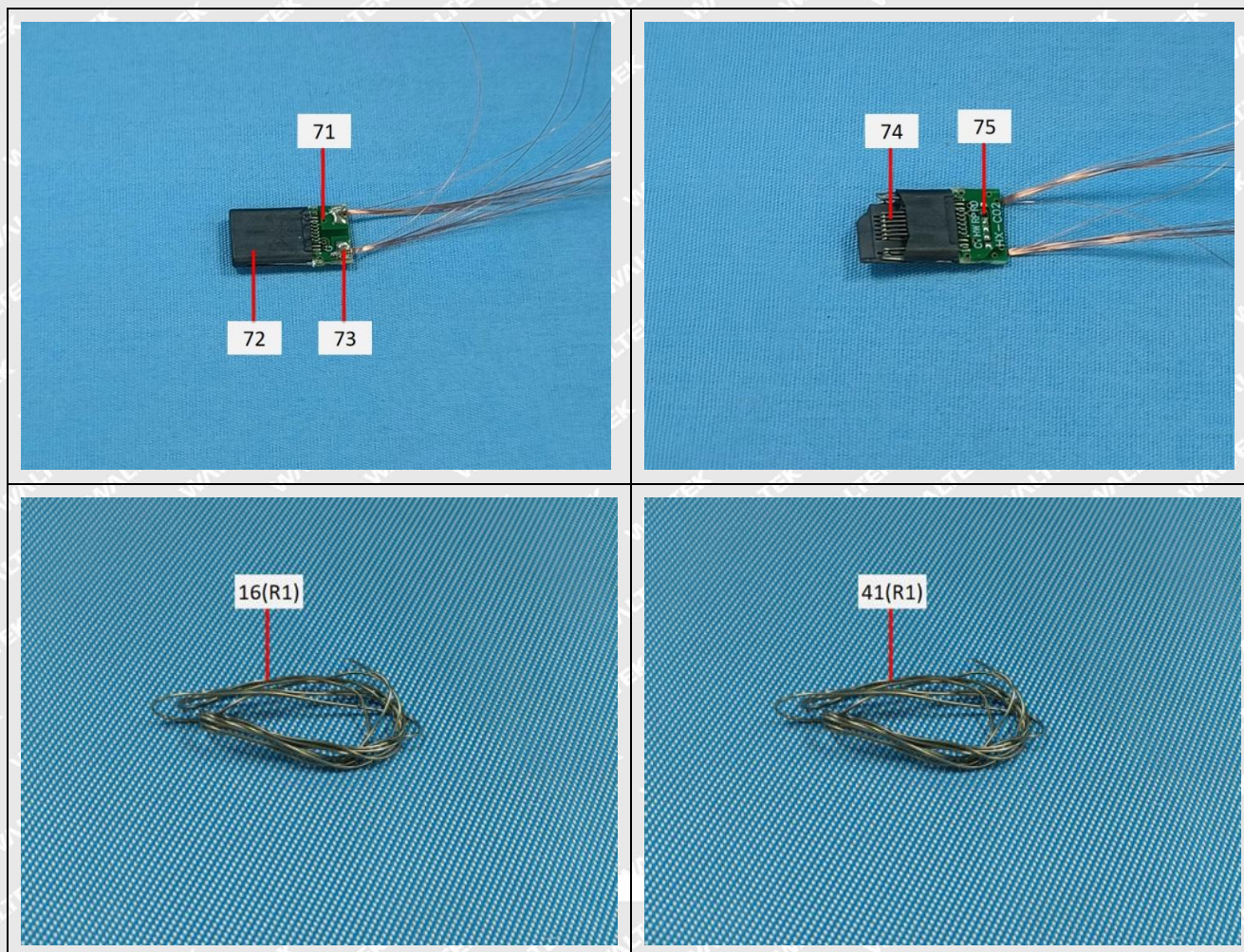
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===== End of Report =====