



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No...... : WTF22F12246934A1R1C

Applicant..... : Mid Ocean Brands B.V.

Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

Manufacturer..... : 118102

Sample Name..... : Wireless multi speaker

Sample Model..... : MO6887

Date of Receipt sample..... : 2022-12-07 & 2023-03-07 & 2023-11-07

Testing period..... : 2022-12-07 to 2023-03-02 & 2023-03-07 to 2023-03-10 & 2023-11-07 to 2023-11-13

Date of Issue..... : 2023-11-14

Test Result..... : Refer to next page (s)

Test Conclusion..... : **Pass** (Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863)

Note..... : As per client's requirement, the results from No.1 to No.104 were quoted from report No. WTF22F12246934A1C

Prepared By:

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Signed for and on behalf of
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Swing Liang

Swing.Liang



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Test Requested : In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863.

Test Method..... : 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
7) With reference to IEC 62321-8:2017, determination of Phthalates content by GC-MS.

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Sample Photo(s):



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

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
1	Black fibrous net	BL	BL	BL	BL	BL	NA
2	Black plastic shell	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 287
3	White soft plastic sheet	BL	BL	BL	BL	BL	NA
4	Black soft plastic sheet	BL	BL	BL	BL	BL	NA
5	Black plastic shell	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 418
6	Transparent adhesive tape	BL	BL	BL	BL	BL	NA
7	Dark grey magnetic ring	BL	BL	BL	BL	--	NA
8	Yellow transparent adhesive tape	BL	BL	BL	BL	BL	NA
9	White fibrous tube	BL	BL	BL	BL	BL	NA
10	Coppery varnished wire	BL	BL	BL	BL	BL	NA
11	Black plastic shell	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 352
12	Black soft plastic sheet	BL	BL	BL	BL	BL	NA
13	White plastic sheet	BL	BL	BL	BL	BL	NA
14	Yellow wood sheet	BL	BL	BL	BL	BL	NA
15	Black sponge adhesive tape	BL	BL	BL	BL	BL	NA
16	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
17	Chip LED	BL	BL	BL	BL	BL	NA
18	White FPC	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
19	Black plastic sheet	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
20	White plastic shell	BL	BL	BL	BL	BL	NA
21	Silvery metal sheet	BL	BL	BL	BL	--	NA
22	Red plastic wire covering	BL	BL	BL	BL	BL	NA
23	Silvery metal wire	BL	BL	BL	BL	--	NA
24	Black sponge adhesive tape	BL	BL	BL	BL	BL	NA
25	Black plastic wire covering	BL	BL	BL	BL	BL	NA
26	Green PCB (microphone)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
27	Black plastic ring (microphone)	BL	BL	BL	BL	BL	NA
28	Silvery plastic film (microphone)	BL	BL	BL	IN	BL	Cr ⁶⁺ : ND
29	Silvery metal ring (microphone)	BL	BL	BL	BL	--	NA
30	Golden metal shell (microphone)	BL	BL	BL	BL	--	NA
31	Yellow semi-transparent plastic sheet (microphone)	BL	BL	BL	BL	BL	NA
32	Black EC	BL	BL	BL	BL	BL	NA
33	Red varnished wire	BL	BL	BL	BL	BL	NA
34	Black plastic shell (socket)	BL	BL	BL	BL	BL	NA
35	Silvery metal sheet (socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
36	Silvery metal shell (USB socket)	BL	BL	BL	BL	--	NA
37	Black plastic core (USB socket)	BL	BL	BL	BL	BL	NA
38	Silvery metal pin (USB socket)	BL	BL	BL	BL	--	NA
39	Silvery metal shell (socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
40	Black plastic core (socket)	BL	BL	BL	BL	BL	NA
41	Silvery metal pin (socket)	BL	BL	BL	BL	--	NA
42	Chip IC	BL	BL	BL	BL	BL	NA
43	Silvery plastic cap (button)	BL	BL	BL	BL	BL	NA
44	Silvery metal sheet (button)	BL	BL	BL	BL	--	NA
45	Silvery metal sheet (button)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
46	Black plastic base (button)	BL	BL	BL	BL	BL	NA
47	Chip capacitor	BL	BL	BL	BL	BL	NA
48	Solder	BL	BL	BL	BL	--	NA
49	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
50	Chip audion	BL	BL	BL	BL	BL	NA
51	Chip diode	BL	BL	BL	BL	BL	NA
52	Chip IC	BL	BL	BL	BL	BL	NA
53	Silvery-black plastic film (electrolytic capacitor)	BL	BL	BL	BL	BL	NA
54	Black rubber stopper (electrolytic capacitor)	BL	BL	BL	BL	BL	NA
55	Brown paper (electrolytic capacitor)	BL	BL	BL	BL	BL	NA
56	Silvery metal shell (electrolytic capacitor)	BL	BL	BL	BL	--	NA
57	Grey metal foil (electrolytic capacitor)	BL	BL	BL	BL	--	NA
58	Silvery-grey metal foil (electrolytic capacitor)	BL	BL	BL	BL	--	NA
59	Red capacitor	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
60	Chip IC	BL	BL	BL	BL	BL	NA
61	Silvery metal shell (crystal oscillator)	BL	BL	BL	BL	--	NA
62	Black plastic base (crystal oscillator)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
63	Chip resistor	BL	BL	BL	BL	BL	NA
64	Chip inductor	BL	BL	BL	IN	BL	Cr ⁶⁺ : ND
65	Green paper sheet with adhesive	BL	BL	BL	BL	BL	NA
66	White paper sheet with adhesive	BL	BL	BL	BL	BL	NA
67	Purple plastic film	BL	BL	BL	BL	BL	NA
68	Blue plastic film	BL	BL	BL	BL	BL	NA
69	Black sponge adhesive tape	BL	BL	BL	BL	BL	NA
70	White plastic sheet	BL	BL	BL	BL	BL	NA
71	Black hard plastic ring (horn)	BL	BL	BL	BL	BL	NA
72	Black fibrous net (horn)	BL	BL	BL	BL	BL	NA
73	Yellow paper tube (horn)	BL	BL	BL	BL	BL	NA
74	Red varnished wire (horn)	BL	BL	BL	BL	BL	NA
75	Black plastic film (horn)	BL	BL	BL	BL	BL	NA
76	Black plastic film (horn)	BL	BL	BL	BL	BL	NA
77	Black paper sheet (horn)	BL	BL	BL	BL	BL	NA
78	Yellow glue	BL	BL	BL	BL	BL	NA
79	Silvery magnetic sheet	BL	BL	BL	BL	--	NA



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
80	Silvery metal shell	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
81	Silvery metal bracket	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
82	Solder	BL	BL	BL	BL	--	NA
83	White paper sheet	BL	BL	BL	BL	BL	NA
84	Silvery metal rivet	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
85	Silvery metal sheet	BL	BL	BL	BL	--	NA
86	Chip capacitor	BL	BL	BL	BL	BL	NA
87	Chip resistor	BL	BL	BL	BL	BL	NA
88	Chip IC	BL	BL	BL	BL	BL	NA
89	Golden metal pin (USB)	BL	BL	BL	BL	--	NA
90	Solder (USB)	BL	BL	BL	BL	--	NA
91	White plastic core (USB)	BL	BL	BL	BL	BL	NA
92	Black plastic jacket (USB)	BL	BL	BL	BL	BL	NA
93	Silvery metal sheet (USB)	BL	BL	BL	BL	--	NA
94	Black plastic jacket (plug)	BL	BL	BL	BL	BL	NA
95	Silvery metal shell (plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
96	Black plastic core (plug)	BL	BL	BL	BL	BL	NA
97	Silvery metal pin (plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
98	Solder (plug)	BL	BL	BL	BL	--	NA
99	Black plastic wire jacket	BL	BL	BL	BL	BL	NA



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
100	Light green plastic wire covering	BL	BL	BL	BL	BL	NA
101	White plastic wire covering	BL	BL	BL	BL	BL	NA
102	Red plastic wire covering	BL	BL	BL	BL	BL	NA
103	Black plastic wire covering	BL	BL	BL	BL	BL	NA
104	Silvery metal screw	BL	BL	BL	BL	--	NA
105	Silvery metal shell (socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
106	Black plastic core (socket)	BL	BL	BL	BL	BL	NA
107	Silvery metal pin (socket)	BL	BL	BL	BL	--	NA
108	Silvery metal shell (type-c plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
109	Green PCB (type-c plug)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
110	Chip resistor (type-c plug)	BL	BL	BL	BL	BL	NA
111	Solder (type-c plug)	BL	BL	BL	BL	--	NA
112	Black plastic core (type-c plug)	BL	BL	BL	BL	BL	NA
113	Silvery metal pin (type-c plug)	BL	BL	BL	BL	--	NA



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Remark:

- (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)

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

-- = Not Regulated

- (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 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) LOQ = Limit of quantitation.

Test Items	Pb	Cd	Hg	Cr^{6+}		PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	$\mu\text{g}/\text{cm}^2$	mg/kg	mg/kg
LOQ	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 $0.1\mu\text{g}/\text{cm}^2$.

- (8) 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)



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

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

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) 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.

2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1	ND	ND	ND	ND
T02	2+5+11+13+19 [△]	ND	ND	83	ND
T03	3	ND	ND	ND	ND
T04	4	ND	ND	ND	ND
T05	6	ND	ND	ND	ND
T06	7	--	--	--	--
T07	8	ND	ND	ND	ND
T08	9	ND	ND	ND	ND
T09	10+33+74 [△]	ND	ND	ND	ND
T10	12	ND	ND	ND	ND
T11	14	ND	ND	ND	ND
T12	15	ND	ND	ND	ND
T13	16+49 [△]	ND	ND	ND	ND
T14	17+32+42+47+50 [△]	ND	ND	ND	ND
T15	18	ND	ND	ND	ND
T16	20+27+34+37+40 [△]	ND	ND	ND	ND
T17	21	--	--	--	--
T18	22	ND	ND	ND	ND
T19	23	--	--	--	--
T20	24	ND	ND	ND	ND
T21	25	ND	ND	86	ND
T22	26	ND	ND	ND	ND
T23	28	ND	ND	ND	ND
T24	29	--	--	--	--
T25	30	--	--	--	--
T26	31	ND	ND	ND	ND
T27	35	--	--	--	--



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Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T28	36	--	--	--	--
T29	38	--	--	--	--
T30	39	--	--	--	--
T31	41	--	--	--	--
T32	43+46+62+70+71 [△]	ND	ND	ND	ND
T33	44	--	--	--	--
T34	45	--	--	--	--
T35	48	--	--	--	--
T36	51+52+59+60+63 [△]	ND	ND	ND	ND
T37	53+67+68 [△]	ND	ND	264	ND
T38	54	ND	ND	ND	ND
T39	55	ND	ND	ND	ND
T40	56	--	--	--	--
T41	57	--	--	--	--
T42	58	--	--	--	--
T43	61	--	--	--	--
T44	64+86+87+88 [△]	ND	ND	ND	ND
T45	65	ND	ND	ND	ND
T46	66	ND	ND	ND	ND
T47	69	ND	ND	ND	ND
T48	72	ND	ND	ND	ND
T49	73	ND	ND	ND	ND
T50	75	ND	ND	ND	ND
T51	76	ND	ND	ND	ND
T52	77+83 [△]	ND	ND	ND	ND
T53	78	ND	ND	ND	ND
T54	79	--	--	--	--
T55	80	--	--	--	--
T56	81	--	--	--	--
T57	82	--	--	--	--
T58	84	--	--	--	--
T59	85	--	--	--	--
T60	89	--	--	--	--
T61	90	--	--	--	--
T62	91+96 [△]	ND	ND	ND	ND
T63	92	ND	ND	ND	ND
T64	93	--	--	--	--
T65	94	ND	ND	ND	ND
T66	95	--	--	--	--
T67	97	--	--	--	--
T68	98	--	--	--	--
T69	99	ND	ND	ND	ND
T70	100	ND	ND	ND	ND
T71	101	ND	ND	ND	ND



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Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T72	102	ND	ND	ND	ND
T73	103	ND	ND	ND	ND
T74	104	--	--	--	--
T75	105	--	--	--	--
T76	106	ND	ND	ND	ND
T77	107	--	--	--	--
T78	108	--	--	--	--
T79	109	ND	ND	ND	ND
T80	110	ND	ND	ND	ND
T81	111	--	--	--	--
T82	112	ND	ND	ND	ND
T83	113	--	--	--	--

Note:

- (1) mg/kg = milligram per kilogram= ppm
- (2) ND = Not Detected or lower than limit of quantitation.
- (3) -- = Not Regulated.
- (4) LOQ = Limit of quantitation.

Test Items	DBP	BBP	DEHP	DIBP
Units	mg/kg	mg/kg	mg/kg	mg/kg
LOQ	50	50	50	50

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

- (6) RoHS requirement

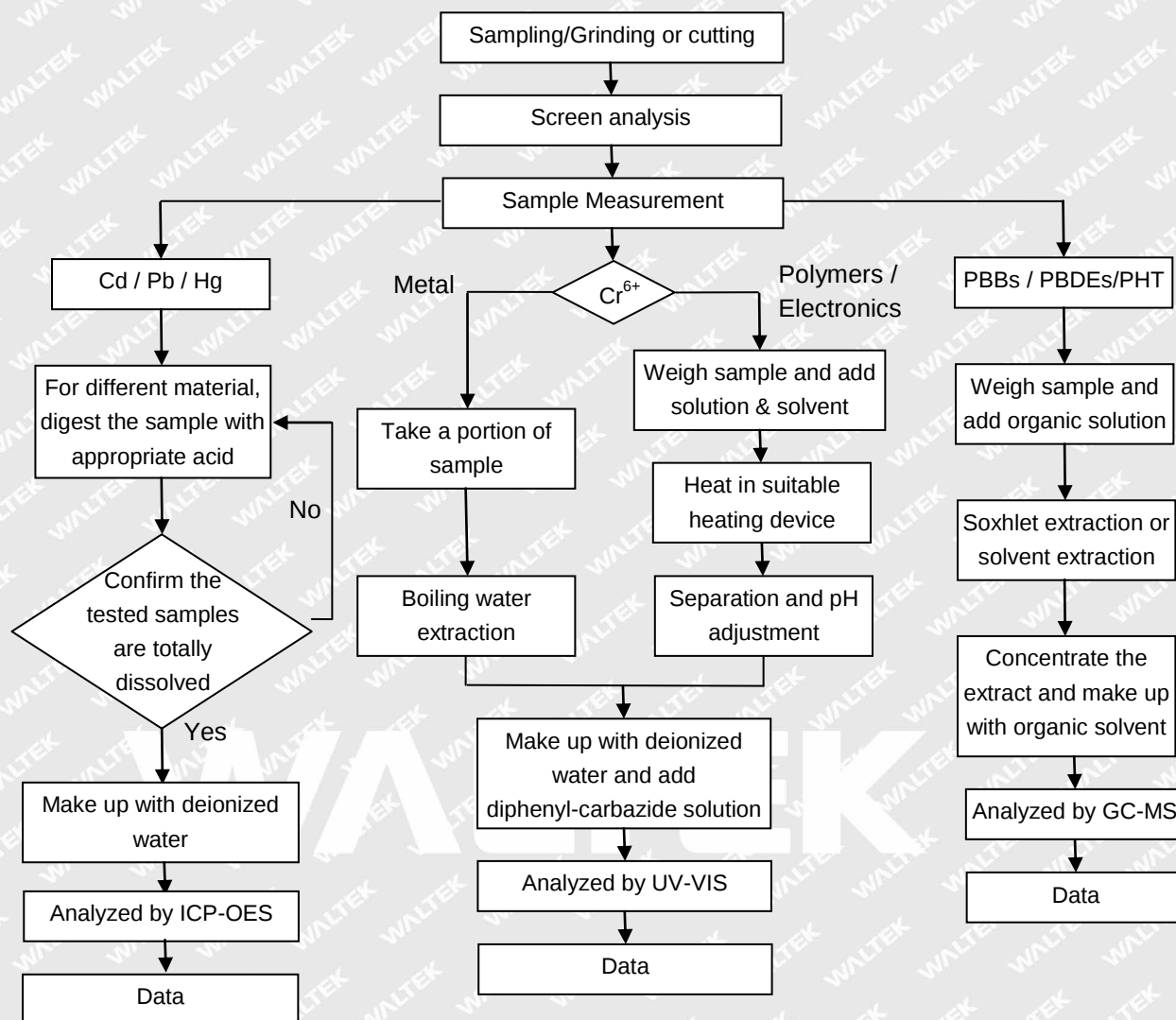
Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

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



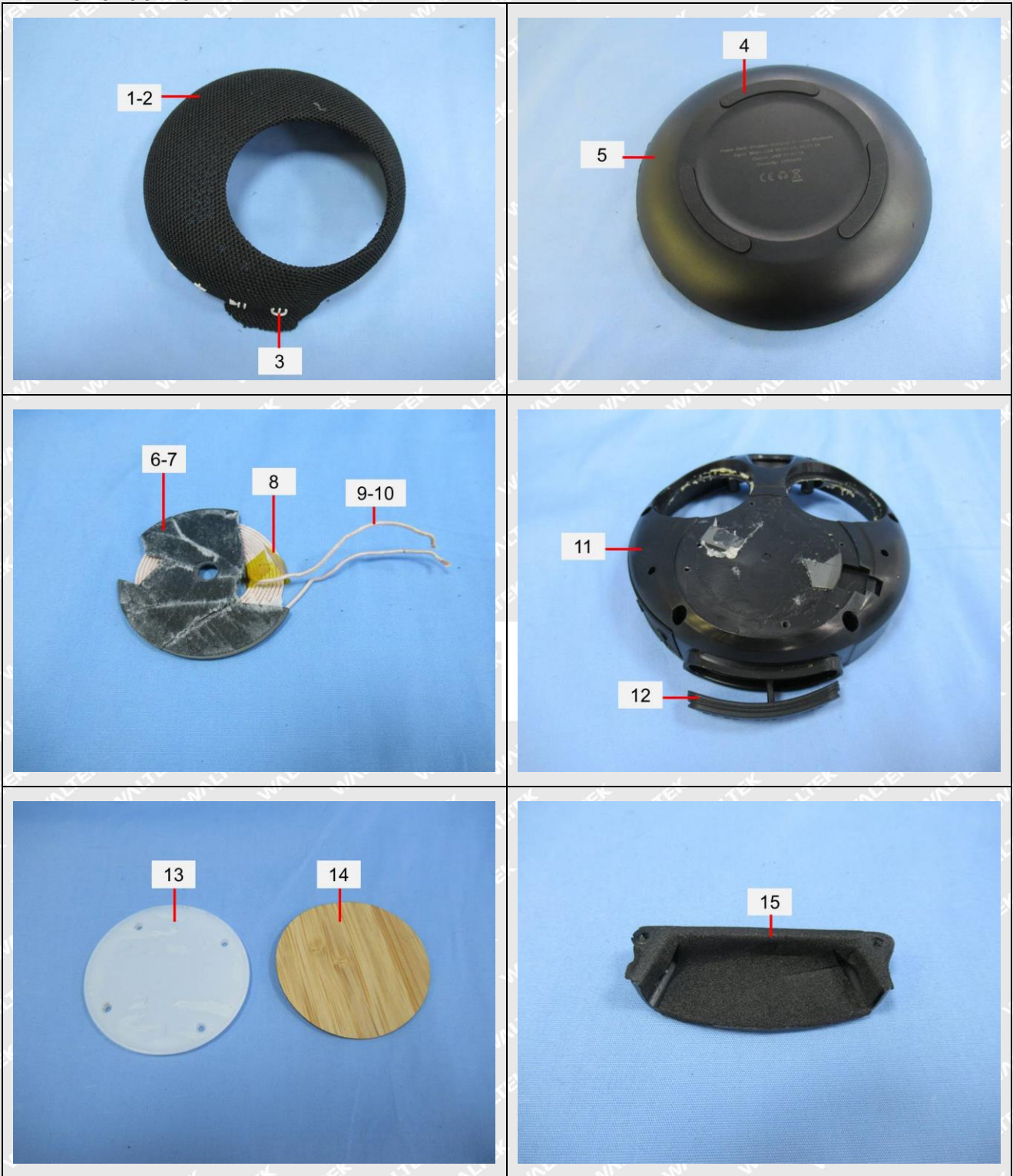
Report No.: WTF22F12246934A1R1C

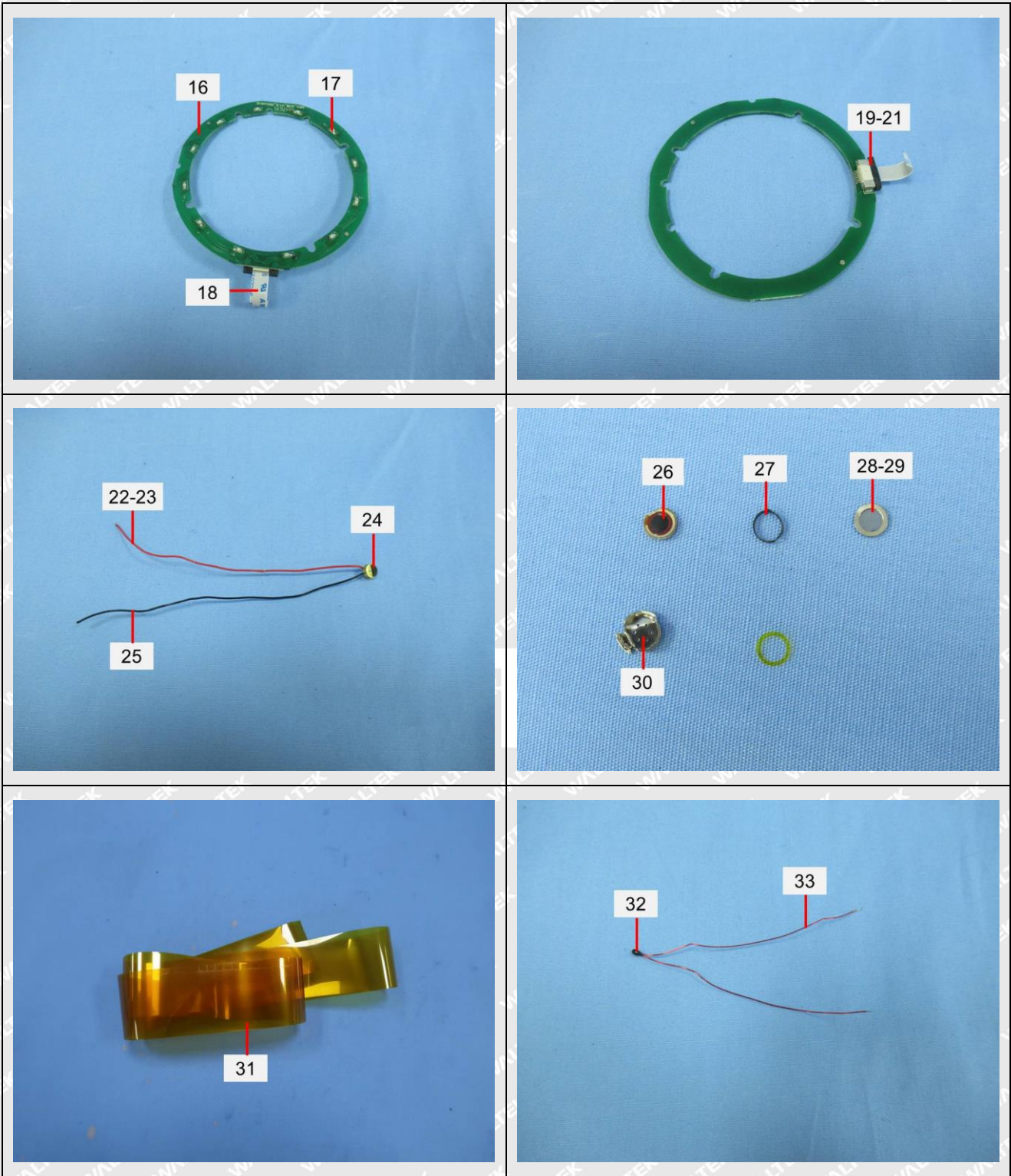
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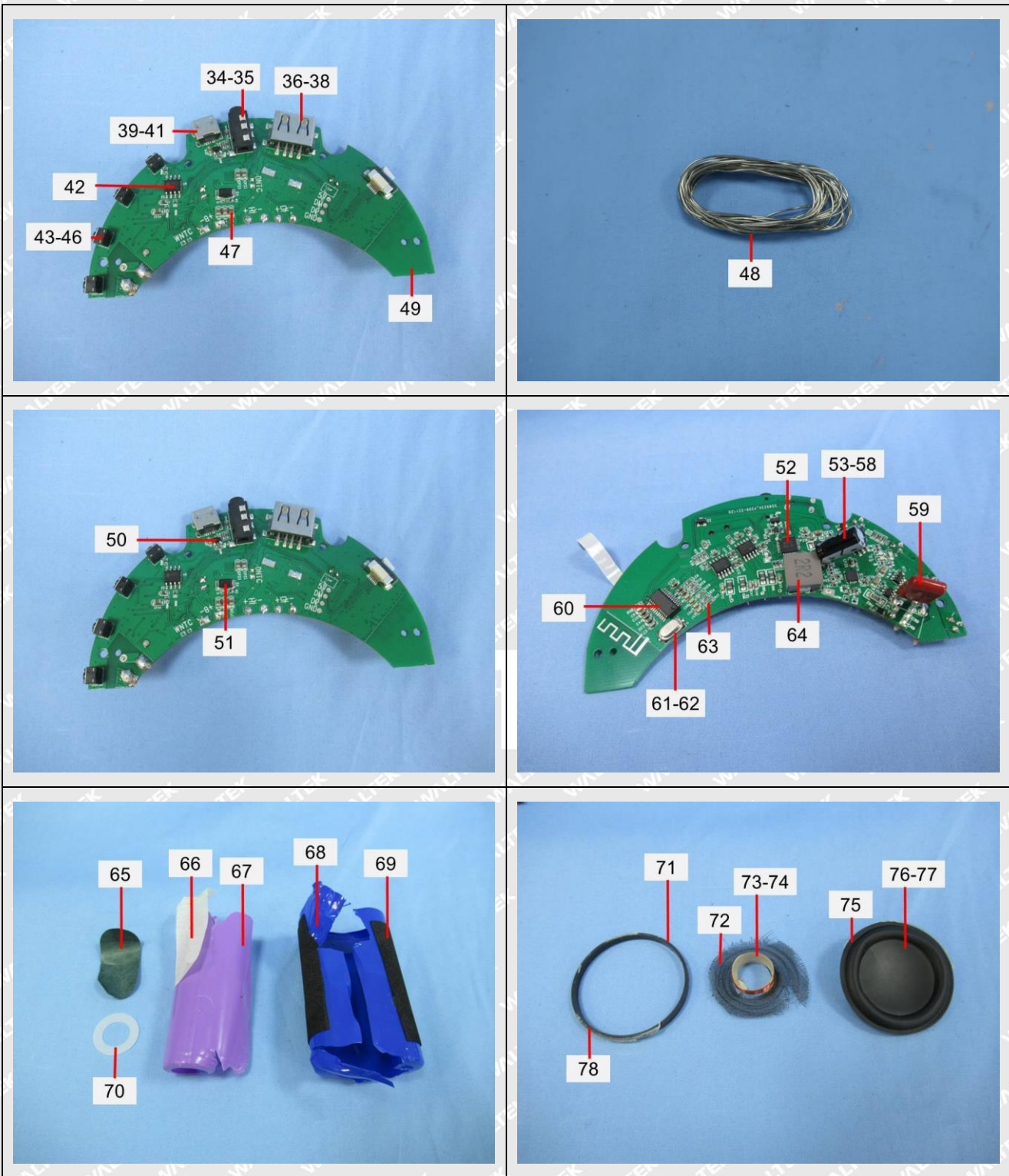


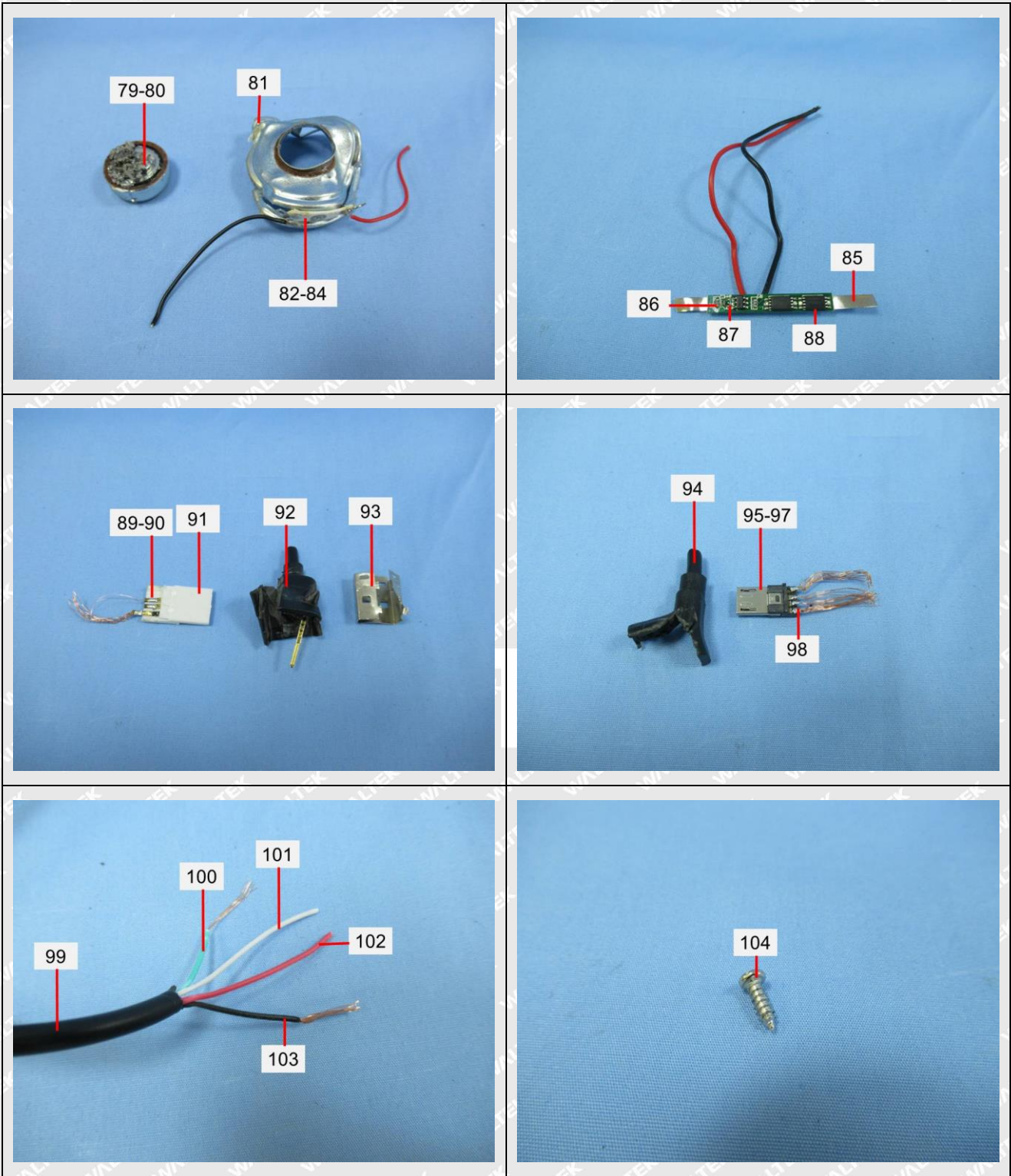


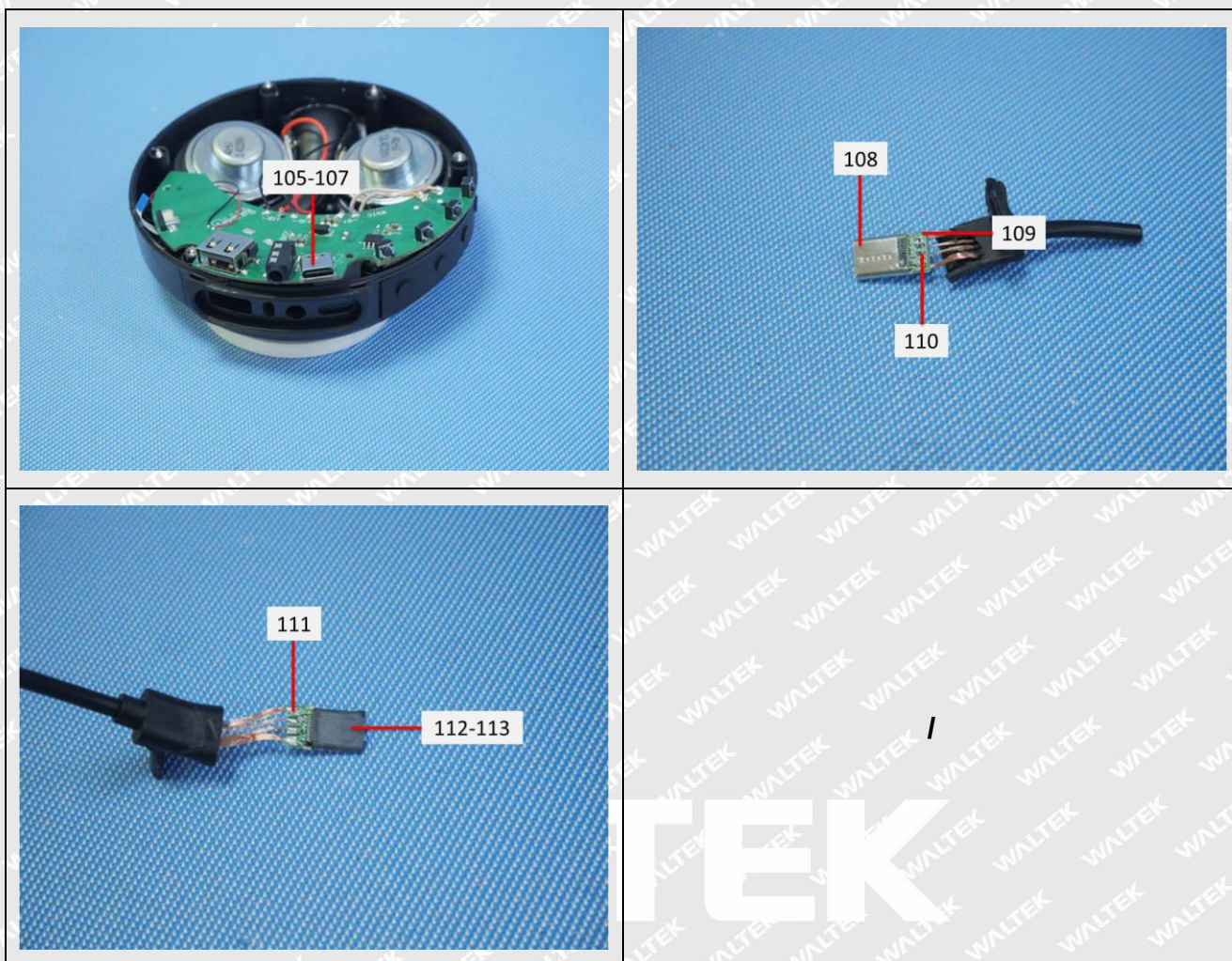
Photograph(s) of parts tested:











Remarks:

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