



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No...... : WTF23F10222495A1C
Applicant..... : Mid Ocean Brands B.V.
Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer..... : 114276
Sample Name..... : Aluminium cork base speaker
Sample Model..... : MO2205
Date of Receipt sample..... : 2023-10-18 & 2023-11-07
Testing period..... : 2023-10-18 to 2023-10-27 & 2023-11-07 to 2023-11-10
Date of Issue..... : 2023-11-10
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)

Prepared By:

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

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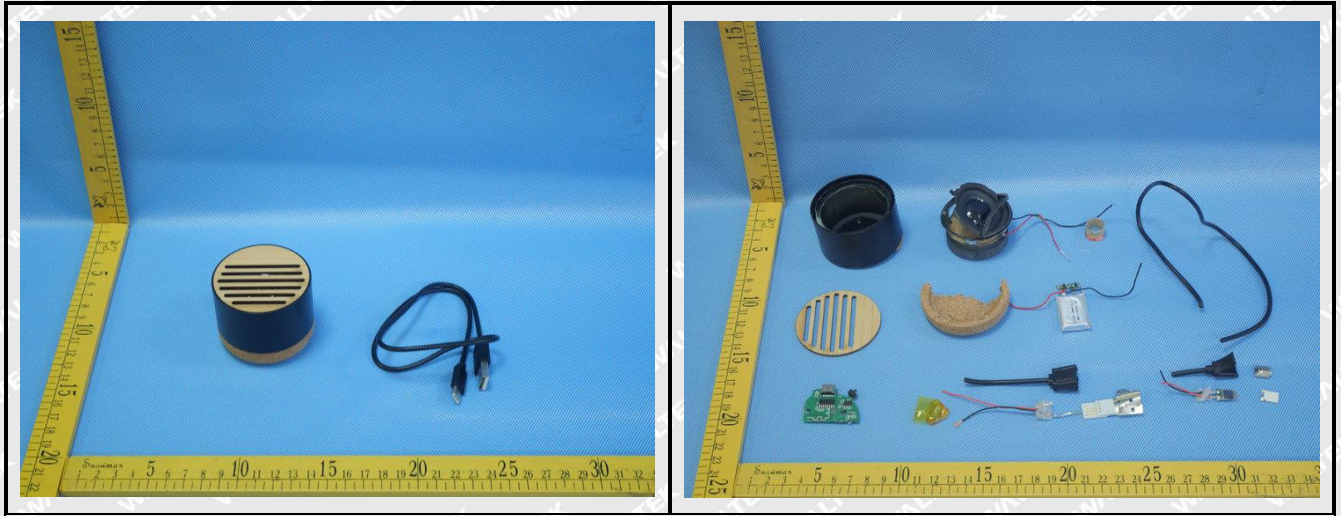
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- Test Requested** : In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863.
- Test Method**..... : 1) With reference to IEC 62321-2:2021, disassembly, disjunction and mechanical sample preparation
2) With reference to 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):



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**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	Brown wooden plate	BL	BL	BL	BL	BL	NA
2	Black coating	BL	BL	BL	BL	BL	NA
3	Silvery metal shell without black coating	BL	BL	BL	BL	--	NA
4	Brown cork shell	BL	BL	BL	BL	BL	NA
5	Black paper gasket	BL	BL	BL	BL	BL	NA
6	Black synthetic leather	BL	BL	BL	BL	BL	NA
7	Black paper sheet	BL	BL	BL	BL	BL	NA
8	Black plastic sheet	BL	BL	BL	BL	BL	NA
9	Brown dry glue	BL	BL	BL	BL	BL	NA
10	White plastic shell without black coating	BL	BL	BL	BL	BL	NA
11	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
12	Transparent dry glue	BL	BL	BL	BL	BL	NA
13	Brown plastic adhesive tape	BL	BL	BL	BL	BL	NA
14	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
15	Solder	BL	BL	BL	BL	--	NA
16	Chip IC	BL	BL	BL	BL	BL	NA
17	Chip IC	BL	BL	BL	BL	BL	NA
18	Black plastic part(button)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
19	Silvery metal shell(button)	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	Black plastic shell(button)	BL	BL	BL	BL	BL	NA
21	Silvery metal sheet(button)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
22	Silvery metal pin(button)	BL	BL	BL	BL	--	NA
23	Silvery metal shell(Type-C socket)	BL	BL	BL	BL	--	NA
24	Black plastic core(Type-C socket)	BL	BL	BL	BL	BL	NA
25	Silvery metal pin(Type-C socket)	BL	BL	BL	BL	--	NA
26	Chip capacitor	BL	BL	BL	BL	BL	NA
27	Chip capacitor	BL	BL	BL	BL	BL	NA
28	Chip resistor	BL	BL	BL	BL	BL	NA
29	Chip diode	BL	BL	BL	BL	BL	NA
30	Black plastic wire covering	BL	BL	BL	BL	BL	NA
31	Chip capacitor	BL	BL	BL	BL	BL	NA
32	Red plastic wire covering	BL	BL	BL	BL	BL	NA
33	Chip IC	BL	BL	BL	BL	BL	NA
34	Chip resistor	BL	BL	BL	BL	BL	NA
35	Coppery metal wire	BL	BL	BL	BL	--	NA
36	Solder	BL	BL	BL	BL	--	NA
37	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
38	Black coating	BL	BL	BL	BL	BL	NA
39	Solder	BL	BL	BL	BL	--	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
40	Silvery metal rivet	BL	BL	BL	BL	--	NA
41	White paper sheet	BL	BL	BL	BL	BL	NA
42	Silvery metal shell	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
43	Black magnetic ring	BL	BL	BL	BL	--	NA
44	Silvery metal shell	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
45	Black paper sheet	BL	BL	BL	BL	BL	NA
46	Coppery metal wire	BL	BL	BL	BL	--	NA
47	Coppery varnished wire	BL	BL	BL	BL	BL	NA
48	Brown paper tube	BL	BL	BL	BL	BL	NA
49	Brown net fabric	BL	BL	BL	BL	BL	NA
50	Black plastic wire covering	BL	BL	BL	BL	BL	NA
51	Red plastic wire covering	BL	BL	BL	BL	BL	NA
52	Silvery metal wire	BL	BL	BL	BL	--	NA
53	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
54	Black plastic jacket(Type-C plug)	BL	BL	BL	BL	BL	NA
55	Black plastic jacket(USB plug)	BL	BL	BL	BL	BL	NA
56	Silvery metal shell(Type-C plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
57	Silvery metal shell(USB plug)	BL	BL	BL	BL	--	NA
58	Red plastic wire covering	BL	BL	BL	BL	BL	NA
59	Transparent dry glue(USB plug)	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	White plastic core(USB plug)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
61	Coppery metal wire	BL	BL	BL	BL	--	NA
62	Black plastic wire covering	BL	BL	BL	BL	BL	NA
63	Solder(USB plug)	BL	BL	BL	BL	--	NA
64	Golden metal pin(USB plug)	BL	BL	BL	BL	--	NA
65	Transparent dry glue(Type-C plug)	BL	BL	BL	BL	BL	NA
66	Silvery metal pin(Type-C plug)	BL	BL	BL	BL	--	NA
67	White plastic core(Type-C plug)	BL	BL	BL	BL	BL	NA
68	Black plastic core(Type-C plug)	BL	BL	BL	BL	BL	NA
69	Solder(Type-C plug)	BL	BL	BL	BL	--	NA
70	Green PCB(Type-C plug)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
71	Chip capacitor	BL	BL	BL	BL	BL	NA

Remark:

(1) Results are obtained by EDXRF 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 -- = Not Regulated

(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) 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 5 mg/kg, LOQ of Cr⁶⁺ for polymer and composite sample is 8 mg/kg and LOQ of Cr⁶⁺ 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)

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

Positive = Presence of Cr⁶⁺ 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 Cr⁶⁺ 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	ND	ND	ND	ND
T03	3	--	--	--	--
T04	4	ND	ND	ND	ND
T05	5+7+41 [△]	ND	ND	118	ND
T06	6	ND	ND	ND	ND



Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T07	8+10 [△]	ND	ND	ND	ND
T08	9	ND	ND	ND	ND
T09	10	ND	ND	ND	ND
T10	11+37+70 [△]	ND	ND	ND	ND
T11	12	ND	ND	ND	ND
T12	13	87	ND	ND	ND
T13	14+16+17+26+27 [△]	ND	ND	ND	ND
T14	15	--	--	--	--
T15	18	ND	ND	ND	ND
T16	19	--	--	--	--
T17	20	ND	ND	ND	ND
T18	21	--	--	--	--
T19	22	--	--	--	--
T20	23	--	--	--	--
T21	24+60 [△]	ND	ND	ND	ND
T22	25	--	--	--	--
T23	28+29+31+33+34 [△]	ND	ND	ND	ND
T24	30	338	ND	ND	ND
T25	32	144	ND	ND	ND
T26	35	--	--	--	--
T27	36	--	--	--	--
T28	38	ND	ND	ND	ND
T29	39	--	--	--	--
T30	40	--	--	--	--
T31	42	--	--	--	--
T32	43	--	--	--	--
T33	44	--	--	--	--
T34	45	ND	ND	ND	ND
T35	46	--	--	--	--
T36	47	ND	ND	ND	ND
T37	48	ND	ND	ND	ND
T38	49	ND	ND	ND	ND
T39	50	80	ND	ND	ND
T40	51	ND	ND	ND	ND
T41	52	--	--	--	--
T42	53	66	ND	ND	ND
T43	54	ND	ND	112	ND
T44	55	ND	ND	120	ND
T45	56	--	--	--	--
T46	57	--	--	--	--
T47	58	ND	ND	ND	ND
T48	59	ND	ND	ND	ND
T49	61	--	--	--	--
T50	62	ND	ND	ND	ND



Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T51	63	--	--	--	--
T52	64	--	--	--	--
T53	65	ND	ND	ND	ND
T54	66	--	--	--	--
T55	67+68 [△]	ND	ND	ND	ND
T56	69	--	--	--	--
T57	71	ND	ND	ND	ND

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.

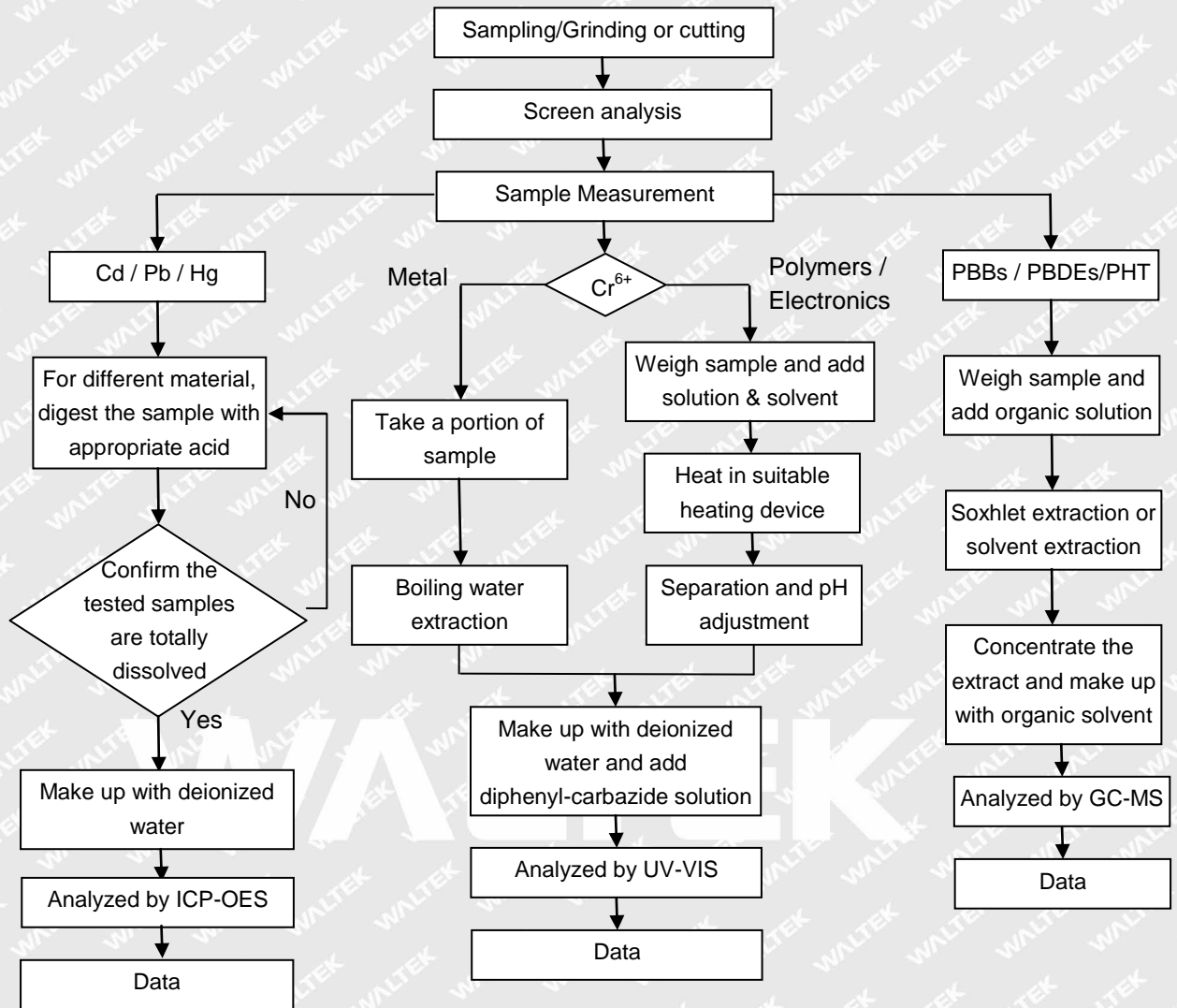
- (6) RoHS requirement

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.

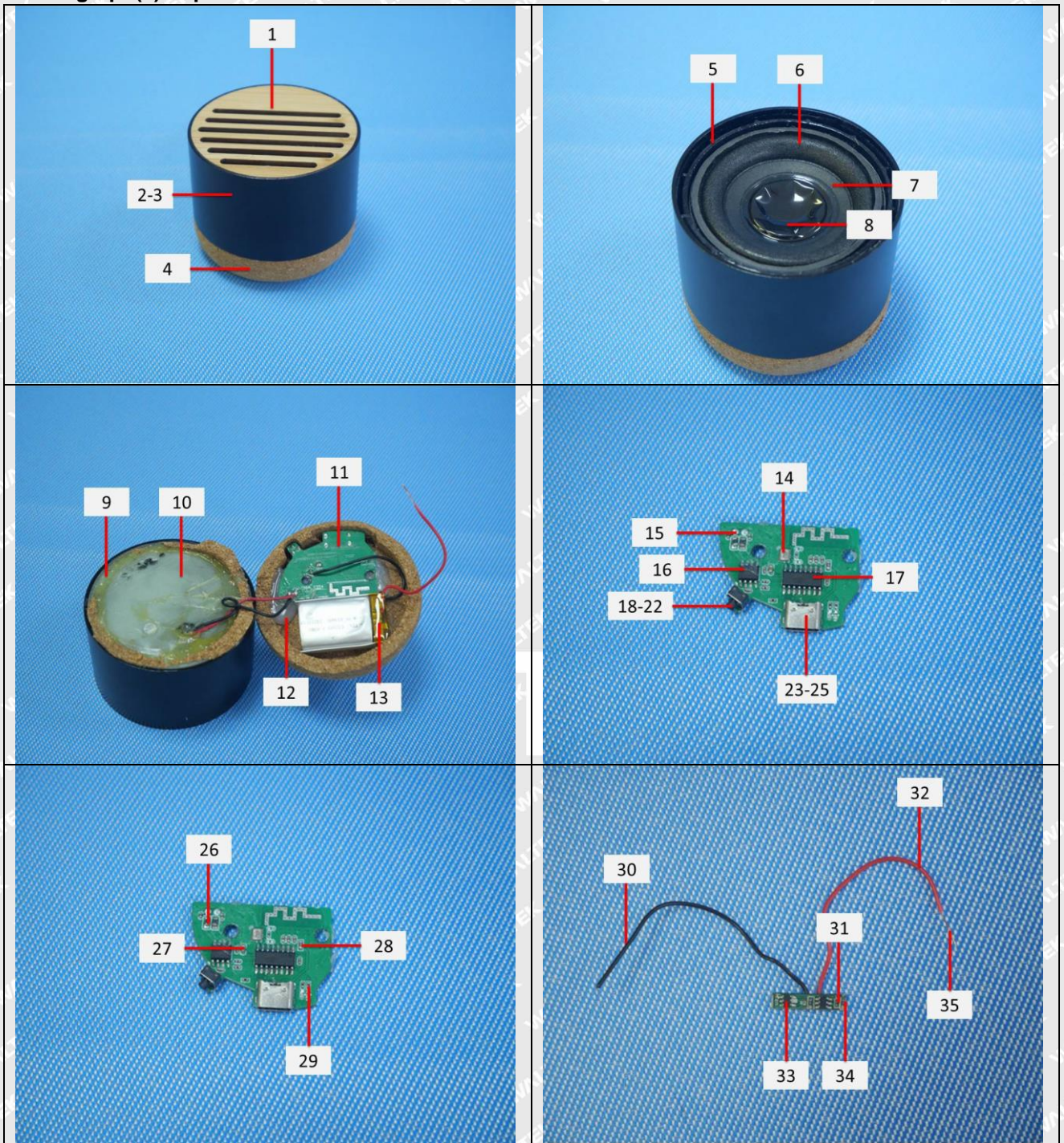


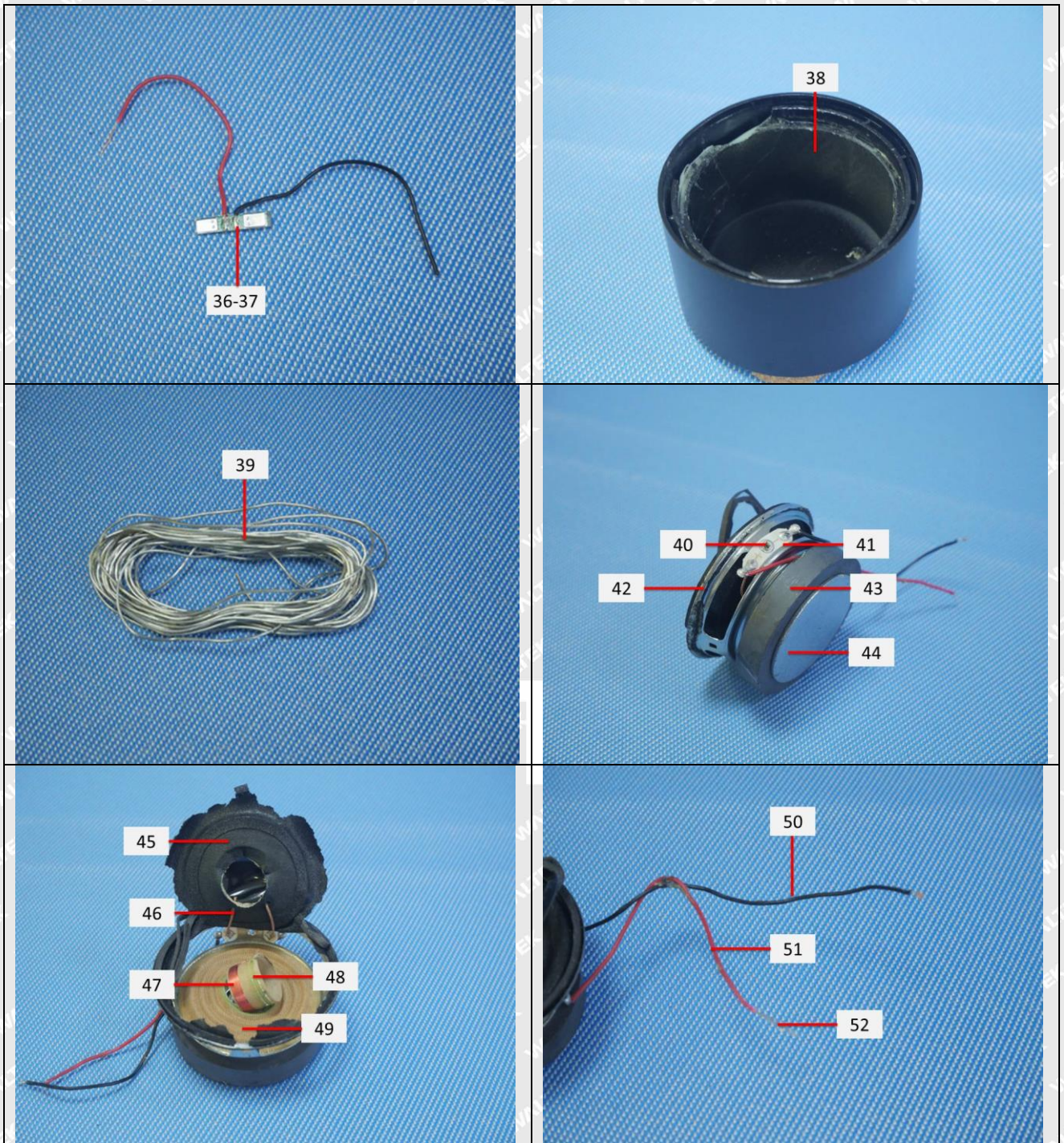
Measurement Flowchart:

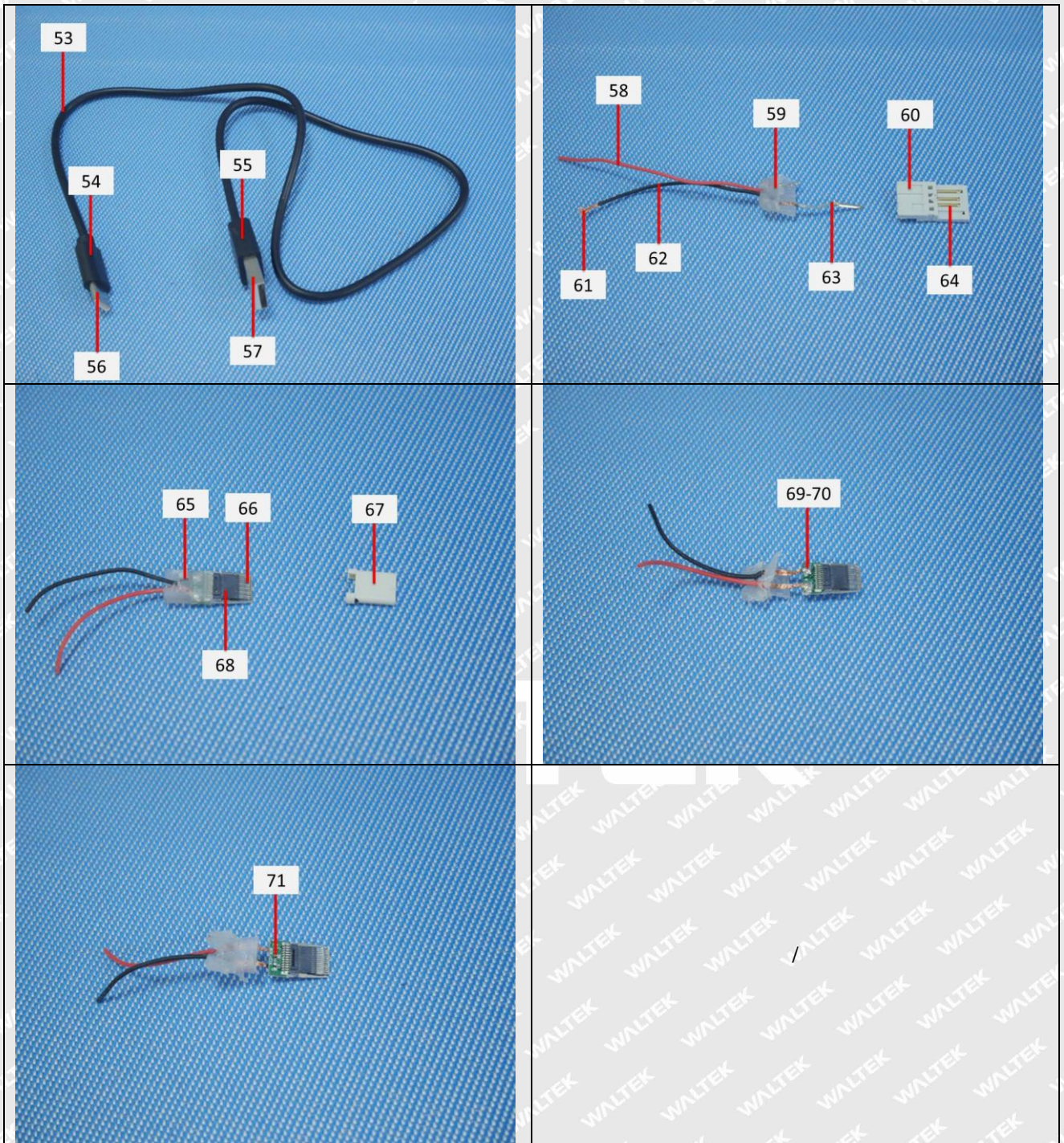




Photograph(s) of parts tested:









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Remarks:

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

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