



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: F&G, 23/F., Technology Building, Quanzhi Science and Technology Innovation Park,
Industrial Building, Maozhoushan Industrial Park, Houting, Shajing Street, Bao'an District,
Shenzhen, Guangdong, China

Tel: (86)755-23353209

Internet: [Http://www.LCS-cert.com](http://www.LCS-cert.com)

Report No.: LCS190725060ARR

TEST REPORT

Client company :

Client address :

Manufacturer :

Address :

Report on the submitted samples said to be:

Sample Name : True Wireless Earbuds In Charging case

Trade Mark : N/A

Test Item No. :

Style/ Item No. :

Sample Receiving Date : August 01, 2019

Testing Period : August 01, 2019 ~ August 09, 2019

Results : Please refer to next page(s).

Summary of Test Results:

TEST REQUEST

According to the customer's request, based on the performed tests on submitted sample, the results of lead(Pb), mercury(Hg), cadmium(Cd), hexavalent chromium(Cr^{6+}), polybrominated biphenyls(PBBs), polybrominated diphenyl(PBDEs), (BBP), (DBP), (DEHP), (DIBP), comply with the limits as set by EU RoHS Directive 2011/65/EU and its amendment Directive 2015/863/EU

Signed for and on behalf of LCS

Written By:

Fairy Zhang

Fairy Zhang

Checked by:

Suez Su

Suez Su

Approved by:



Lily Dan



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Results: _____ A.

EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results						Date of sample submission/r esubmission
		Cd	Pb	Hg	Cr(Cr ⁶⁺) [▼]	Br [▼]		
						PBBs	PBDEs	
1	White plastic sheet (shell)	BL	BL	BL	BL	BL	BL	2019-08-09
2	Yellow gel	BL	BL	BL	BL	BL	BL	2019-08-09
3	Black foam	BL	BL	BL	BL	BL	BL	2019-08-09
4	Grey Coating	BL	BL	BL	BL	BL	BL	2019-08-09
5	Silver metal needle	BL	BL	BL	BL	/	/	2019-08-09
6	Silver metal spring	BL	BL	BL	BL	/	/	2019-08-09
7	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
8	Silver Metal Sheet	BL	BL	BL	BL	/	/	2019-08-09
9	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
10	Silver Metal Needle	BL	BL	BL	BL	/	/	2019-08-09
11	Black Ceramic Sheet	BL	BL	BL	BL	/	/	2019-08-09
12	Gold wire	BL	BL	BL	BL	/	/	2019-08-09
13	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
14	Silver Metal Needle	BL	BL	BL	BL	/	/	2019-08-09
15	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
16	Black IC	BL	BL	BL	X	BL	BL	2019-08-09
17	chip resistor	BL	BL	BL	BL	BL	BL	2019-08-09
18	White LED	BL	BL	BL	BL	BL	BL	2019-08-09
19	Tin solder	BL	BL	BL	BL	BL	BL	2019-08-09
20	Brown patch capacitor	BL	BL	BL	BL	BL	BL	2019-08-09
21	Black IC	BL	BL	BL	BL	BL	BL	2019-08-09
22	PCB board	BL	BL	BL	BL	BL	BL	2019-08-09
23	Silver metal screw	BL	BL	BL	BL	/	/	2019-08-09
24	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
25	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
26	Silver plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09



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Seq. No.	Tested Part(s)	Results						Date of sample submission/r esubmission
		Cd	Pb	Hg	Cr(Cr ⁶⁺) [▼]	Br [▼]		
						PBBs	PBDEs	
27	Blue Plastic Wire	BL	BL	BL	BL	BL	BL	2019-08-09
28	White Plastic Wire	BL	BL	BL	BL	BL	BL	2019-08-09
29	Silver Metal Wire	BL	BL	BL	BL	/	/	2019-08-09
30	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
31	Transparent plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
32	Red metal coil	BL	BL	BL	BL	/	/	2019-08-09
33	Silver magnet	BL	BL	BL	BL	/	/	2019-08-09
34	White foam rubber	BL	BL	BL	BL	BL	BL	2019-08-09
35	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
36	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
37	Gold metal sheet	BL	BL	BL	BL	/	/	2019-08-09
38	Red Plastic Wire	BL	BL	BL	BL	BL	BL	2019-08-09
39	Black Plastic Wire	BL	BL	BL	BL	BL	BL	2019-08-09
40	Silver Metal Wire	BL	BL	BL	BL	/	/	2019-08-09
41	Black IC	BL	BL	BL	X	BL	BL	2019-08-09
42	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
43	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
44	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
45	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
46	Silver metal ring	BL	BL	BL	BL	/	/	2019-08-09
47	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
48	Silver metal ring	BL	BL	BL	BL	/	/	2019-08-09
49	Black plastic ring	BL	BL	BL	BL	BL	BL	2019-08-09
50	Patch triode	BL	BL	BL	BL	BL	BL	2019-08-09
51	Silver crystal oscillator	BL	BL	BL	BL	BL	BL	2019-08-09
52	PCB board	BL	BL	BL	X	BL	BL	2019-08-09
53	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
54	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
55	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
56	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09



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Seq. No.	Tested Part(s)	Results						Date of sample submission/r esubmission
		Cd	Pb	Hg	Cr(Cr ⁶⁺) [▼]	Br [▼]		
						PBBs	PBDEs	
57	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
58	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
59	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
60	Silver metal needle	BL	BL	BL	BL	/	/	2019-08-09
61	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
62	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
63	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
64	Silver metal needle	BL	BL	BL	BL	/	/	2019-08-09
65	Silver metal needle	BL	BL	BL	BL	/	/	2019-08-09
66	Black plastic thread	BL	BL	BL	BL	BL	BL	2019-08-09
67	Red plastic thread	BL	BL	BL	BL	BL	BL	2019-08-09
68	White plastic thread	BL	BL	BL	BL	BL	BL	2019-08-09
69	Gold wire	BL	BL	BL	BL	/	/	2019-08-09
70	White Plastic Sheet	BL	BL	BL	BL	BL	BL	2019-08-09
71	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
72	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
73	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
74	Silver metal needle	BL	BL	BL	BL	/	/	2019-08-09
75	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
76	Silver metal sheet	BL	BL	BL	BL	/	/	2019-08-09
77	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-08-09
78	Silver metal needle	BL	BL	BL	BL	/	/	2019-08-09
79	Golden metal needle	BL	BL	BL	BL	/	/	2019-08-09
80	White plastic thread	BL	BL	BL	BL	BL	BL	2019-08-09
81	Pink plastic thread	BL	BL	BL	BL	BL	BL	2019-08-09
82	White plastic thread	BL	BL	BL	BL	BL	BL	2019-08-09
83	Gold wire	BL	BL	BL	BL	/	/	2019-08-09
84	Blue PCB board	BL	BL	BL	BL	BL	BL	2019-09-02



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Note:

- (1) Results were obtained by XRF for primary screening, 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 below warning value according to IEC 62321-3-1:2013.

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	$BL \leq 300 - 3\sigma < X$	--	$BL \leq 250 - 3\sigma < X$



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Note:

BL = Below Limit
OL = Over Limit
X = Inconclusive

- (2) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the document 2015/863/EC amending RoHS directive 2011/65/EU:
- (4) ▼ =For restricted substances PBBs and PBDEs, the results show the total Br content; The restricted substance was Cr(VI), and the results showed the total Cr content

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
Polybrominated diphenylethers (PBDEs)	1000
Dibutyl Phthalate(DBP)	1000
Benzylbutyl Phthalate(BBP)	1000
Bis(2-ethylhexyl) Phthalate(DEHP)	1000
Diisobutyl phthalate(DIBP)	1000

Disclaimers:

This XRF Screening 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 screening 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.

B. EU RoHS Directive 2011/65/EU and its amendment Directives 2015/863/EU on Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content.

Test method:

Lead & Cadmium Content:

Version: V1.0



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With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Mercury Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Hexavalent Chromium Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

BBP DBP DEHP & DIBP Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

1) The test results of Hexavalent Chromium (Cr⁶⁺)(for nonmetal)

Item	Unit	MDL	Results			Limit
			(16)	(41)	(52)	
Hexavalent Chromium (Cr ⁶⁺)	mg/kg	2	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	/	/	Pass	Pass	Pass	/

Note:

- MDL = Method Detection Limit
- /= Not apply
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 µg/cm²
- mg/kg = ppm=parts per million
- N.D.=Not Detected(<MDL or LOQ)
- *The sample is negative for Cr(VI)-The Cr(VI) concentration is below 0.10ug/cm²
The coating is considered a non-Cr(VI) based coating.

#1 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.

#2 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).



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- #3 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #4 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
- #5 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.
- #6 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Cadmium and its compounds in electrical contact is exempted.
- Flow chart appendix is included.
- Photo appendix is included.

2) The test results of DBP、BBP、DEHP & DIBP

Item	Unit	MDL	Results	Limit
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			1+15+16	2+3+4	9+49+50	
Dibutyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diisobutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	/	/	Pass	Pass	Pass	/

Item	Unit	MDL	Results			Limit
			17+18+22	19+20+21	24+25+26	
Dibutyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diisobutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	/	/	Pass	Pass	Pass	/

Item	Unit	MDL	Results			Limit
			27+35+38	28+31+34	39+53+56	
Dibutyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diisobutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	/	/	Pass	Pass	Pass	/

Item	Unit	MDL	Results	Limit
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			41+42+51	52+54+55	57+59+63	
Dibutyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diisobutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	/	/	Pass	Pass	Pass	/

Item	Unit	MDL	Results			Limit
			61+66+57	68+72+73	70+75+77	
Dibutyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diisobutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	/	/	Pass	Pass	Pass	/



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Item	Unit	MDL	Results				Limit
			80	81	82	84	
Dibutyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	N.D.	1000 mg/kg
Diisobutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	/	/	Pass	Pass	Pass	Pass	/



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Appendix

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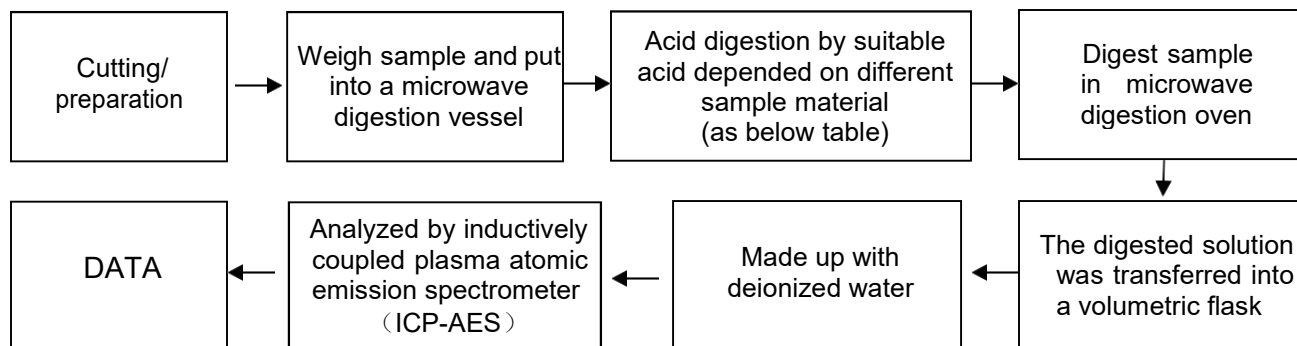
Internet: [Http://www.LCS-cert.com](http://www.LCS-cert.com)

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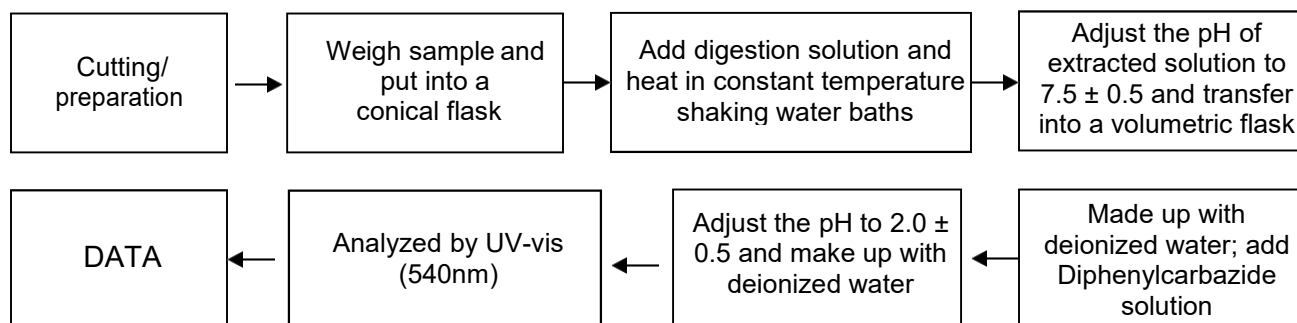
Test Flow chart

1. Test Flow chart for Cd / Pb /Hg content

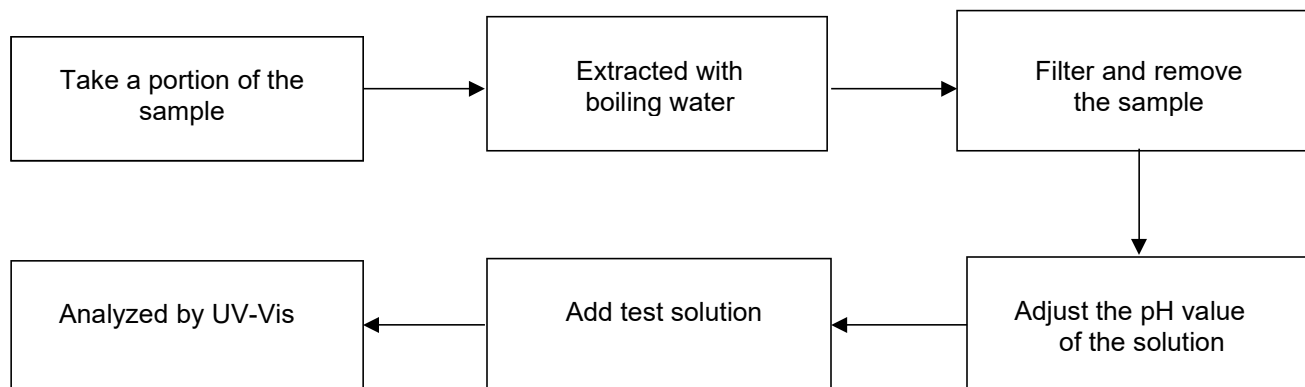
These samples were dissolved totally by pre-conditioning method according to below flow chart.



2. Test Flowchart for Cr⁶⁺ content (For non-metal material)



Test Flowchart for Cr⁶⁺ content (For metal material)



3. Test Flow chart for PBBs & PBDEs & DBP & BBP & DEHP & DIBP content

THIS DOCUMENT WAS REDACTED WITH THE PRODUCTIP REDACTION TOOL ON 2019-09-16. AT THE TIME OF GENERATING THE DOCUMENT THE ORIGINAL DOCUMENT WAS AVAILABLE ALSO. THE ORIGINAL CAN ONLY BE MADE AVAILABLE BY THE DOCUMENT OWNER.



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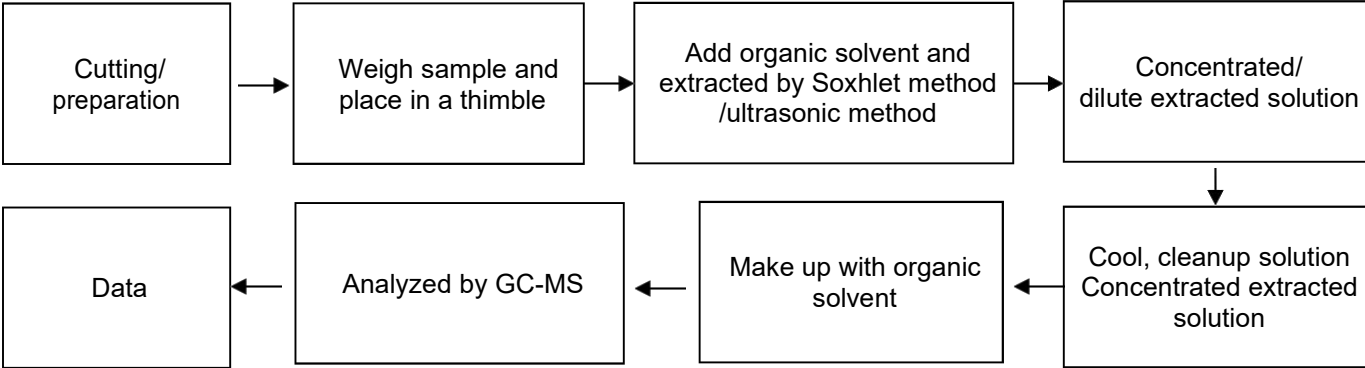


Table:

Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
Glass	HNO ₃ /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
Others	Any acid to total digestion



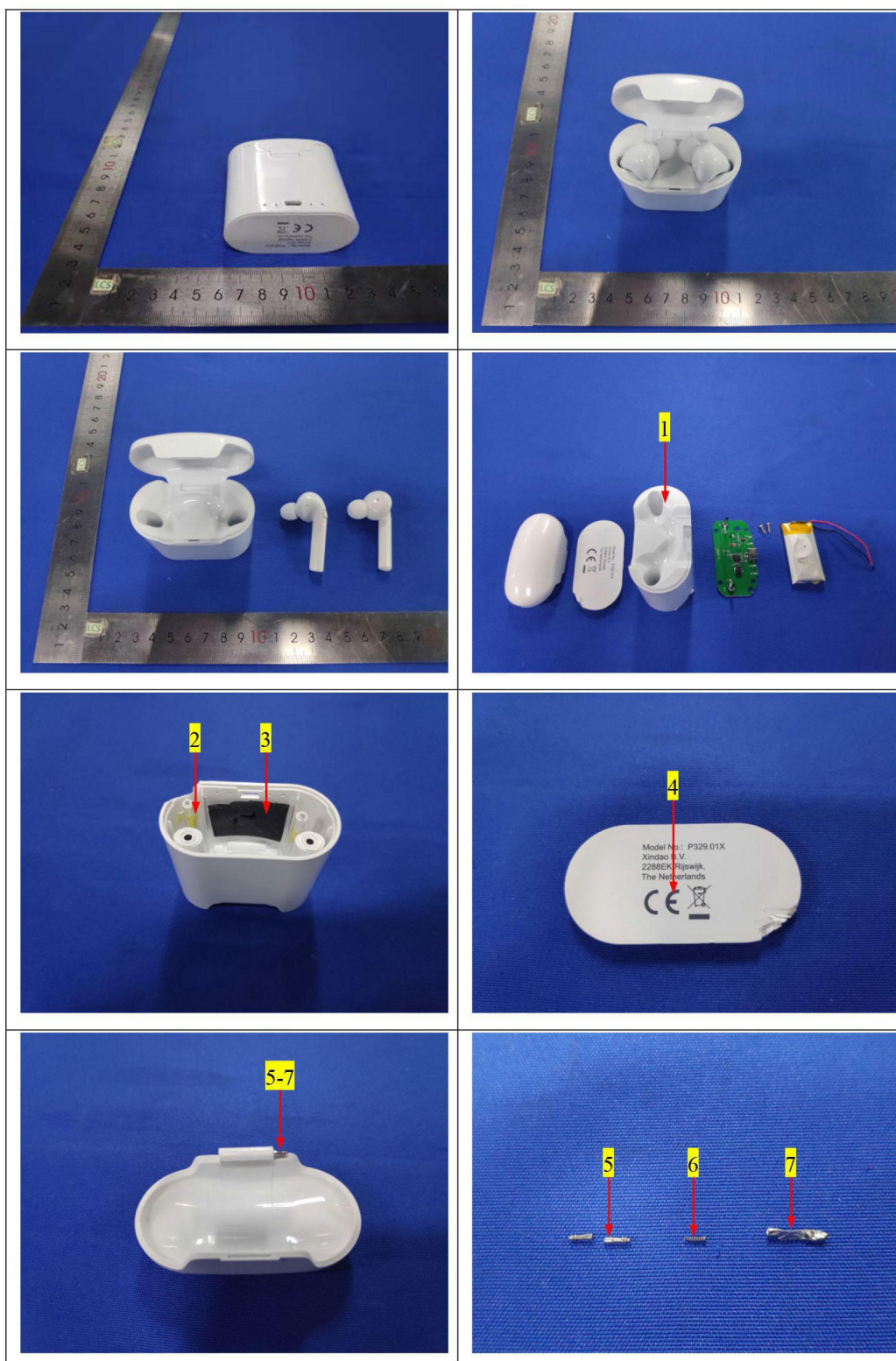
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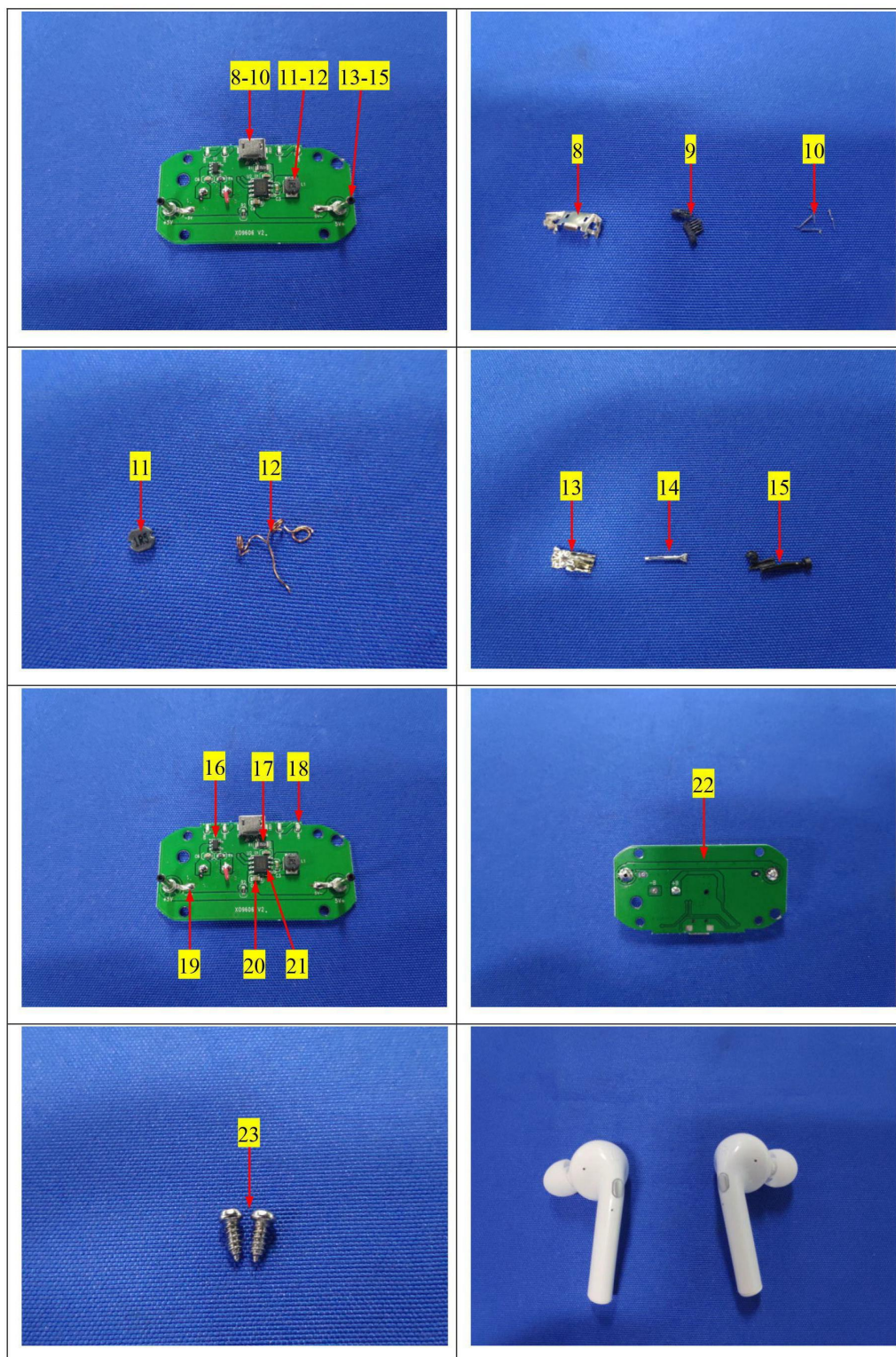
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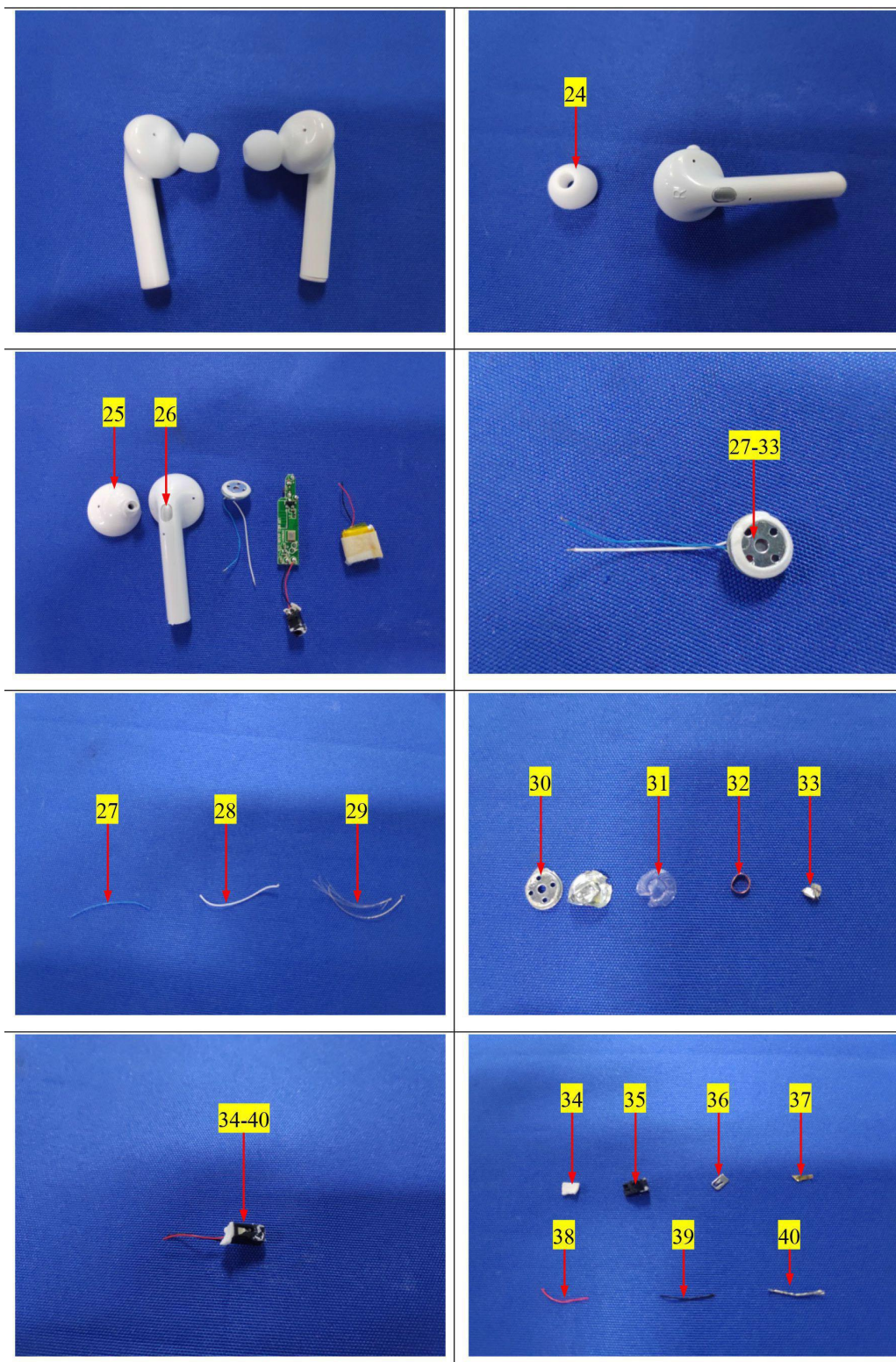
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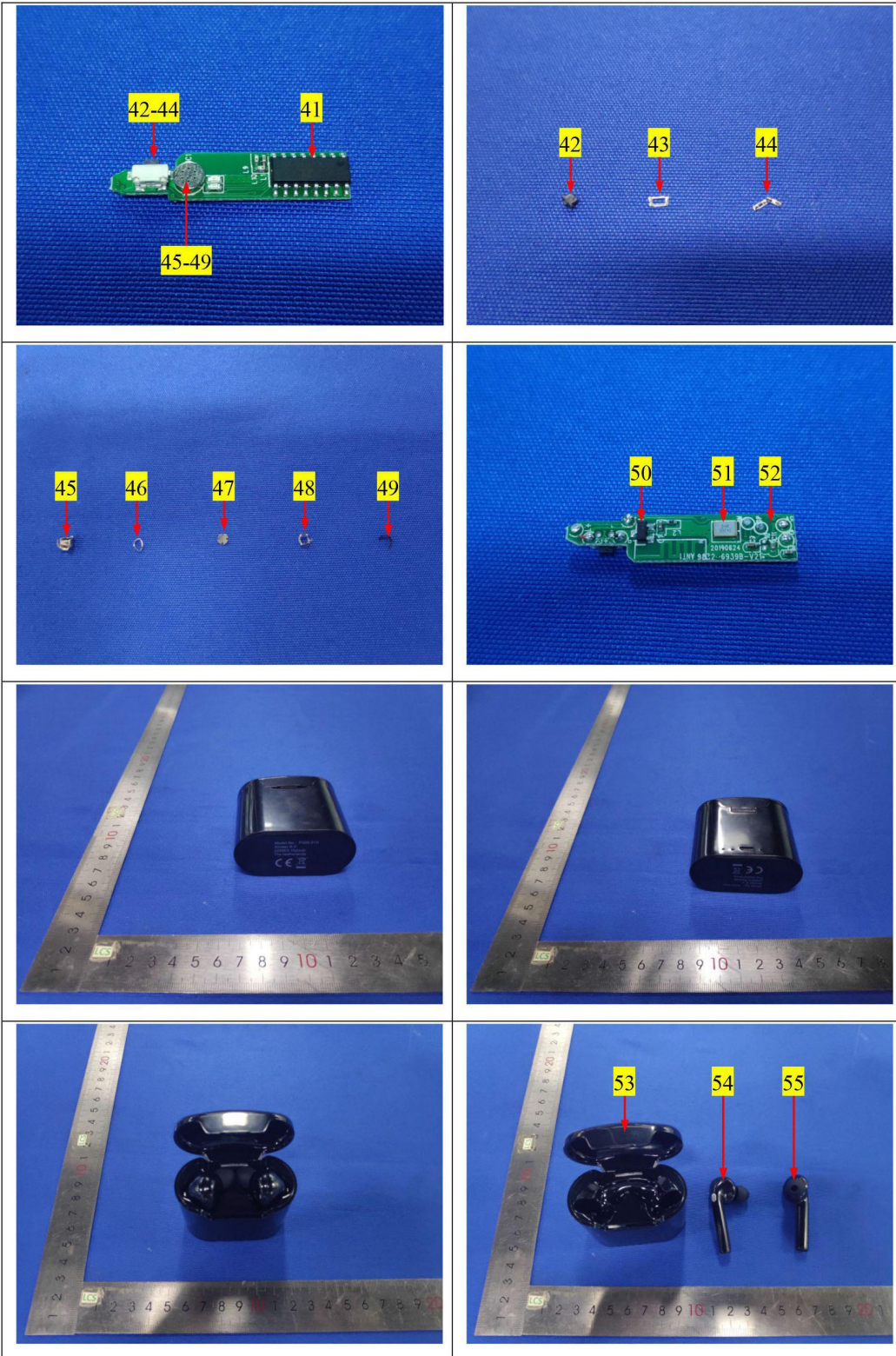
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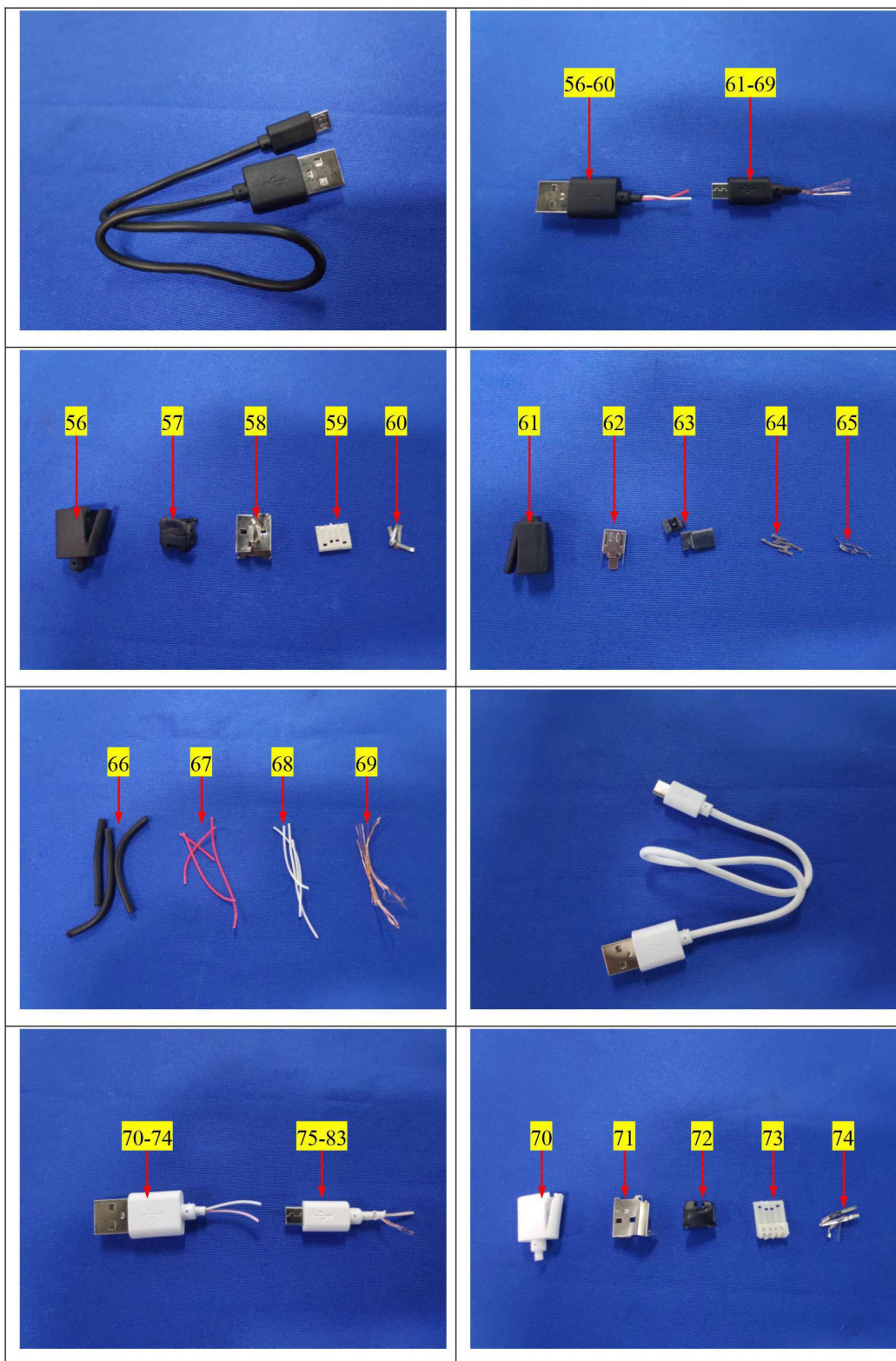
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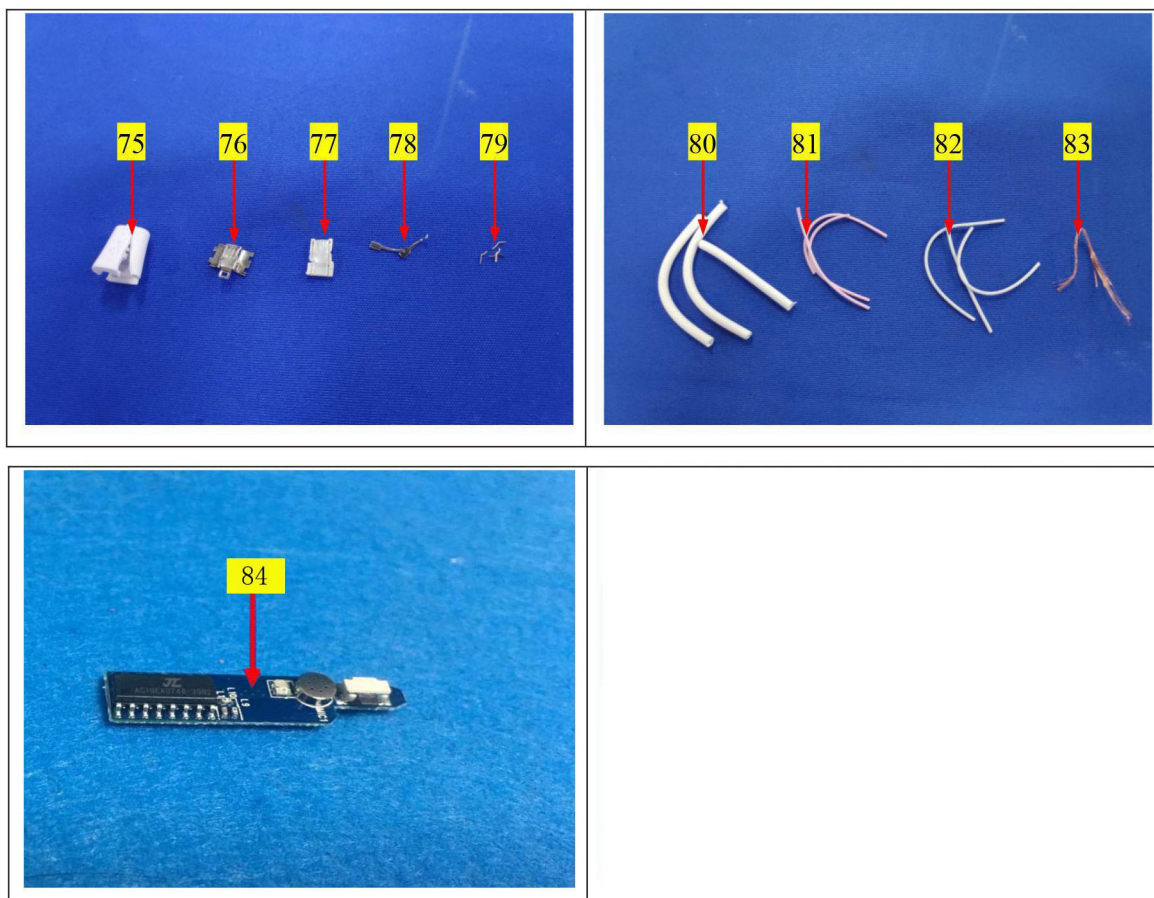
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Exempted Items of RoHS Directive

In accordance with Directive 2011/65/EU as amended, there are 41 exemption items in Annex III of 2011/65/EU altogether.

	Exemption	Scope and dates of applicability
1	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):	
1(a)	For general lighting purposes < 30 W: 5 mg	Expires on 31 December 2011; 3,5 mg may be used per burner after 31 December 2011 until 31 December 2012; 2,5 mg shall be used per burner after 31 December 2012.
1(b)	For general lighting purposes \geq 30 W and < 50 W: 5 mg	Expires on 31 December 2011; 3,5 mg may be used per burner after 31 December 2011.
1(c)	For general lighting purposes \geq 50 W and < 150 W: 5 mg	
1(d)	For general lighting purposes \geq 150 W: 15 mg	
1(e)	For general lighting purposes with circular or square structural shape and tube diameter \leq 17 mm	No limitation of use until 31 December 2011; 7 mg may be used per burner after 31 December 2011.
1(f)	For special purposes: 5 mg	
1(g)	For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg	Expires on 31 December 2017.
2(a)	Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):	
2(a)(1)	Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2): 5 mg	Expires on 31 December 2011; 4 mg may be used per lamp after 31 December 2011.
2(a)(2)	Tri-band phosphor with normal lifetime and a tube diameter \geq 9 mm and \leq 17 mm (e.g. T5): 5 mg	Expires on 31 December 2011; 3 mg may be used per lamp after 31 December 2011.
2(a)(3)	Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and \leq 28 mm (e.g. T8): 5 mg	Expires on 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011.
2(a)(4)	Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 5 mg	Expires on 31 December 2012; 3,5 mg may be used per lamp after 31 December 2012.
2(a)(5)	Tri-band phosphor with long lifetime (\geq 25 000 h): 8 mg	Expires on 31 December 2011; 5 mg may be used per lamp after 31 December 2011.
2(b)	Mercury in other fluorescent lamps not exceeding (per lamp):	
2(b)(1)	Linear halophosphate lamps with tube > 28 mm (e.g. T10 and T12): 10 mg	Expires on 13 April 2012.
2(b)(2)	Non-linear halophosphate lamps (all diameters): 15 mg	Expires on 13 April 2016.



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2(b)(3)	Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011.
2(b)(4)	Lamps for other general lighting and special purposes (e.g. induction lamps).	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011.
3	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):	
3(a)	Short length (≤ 500 mm)	No limitation of use until 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011.
3(b)	Medium length (> 500 mm and ≤ 1500 mm)	No limitation of use until 31 December 2011; 5 mg may be used per lamp after 31 December 2011.
3(c)	Long length (> 1500 mm)	No limitation of use until 31 December 2011; 13 mg may be used per lamp after 31 December 2011.
4(a)	Mercury in other low pressure discharge lamps (per lamp).	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011.
4(b)	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index $R_a > 60$:	
4(b)-I	$P \leq 155$ W	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011.
4(b)-II	155 W $< P \leq 405$ W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011.
4(b)-III	$P > 405$ W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011.
4(c)	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	
4(c)-I	$P \leq 155$ W	No limitation of use until 31 December 2011; 25 mg may be used per burner after 31 December 2011.
4(c)-II	155 W $< P \leq 405$ W	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011.
4(c)-III	$P > 405$ W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011.
4(d)	Mercury in High Pressure Mercury (vapour) lamps (HPMV).	Expires on 13 April 2015.



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4(e)	Mercury in metal halide lamps (MH)	
4(f)	Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex.	
4(g)	Mercury in hand crafted luminous discharge tubes used for signs, decorative or architectural and specialist lighting and light-artwork, where the mercury content shall be limited as follows: (a) 20 mg per electrode pair + 0,3 mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20°C; (b) 15 mg per electrode pair + 0,24 mg per tube length in cm, but not more than 80 mg, for all other indoor applications.	Expires on 31 December 2018.
5(a)	Lead in glass of cathode ray tubes.	
5(b)	Lead in glass of fluorescent tubes not exceeding 0,2 % by weight.	
6(a)	Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0,35 % lead by weight.	
6(b)	Lead as an alloying element in aluminium containing up to 0,4 % lead by weight.	
6(c)	Copper alloy containing up to 4% lead by weight.	
7(a)	Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead).	
7(b)	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications.	
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.	
7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher.	
7(c)-III	Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC.	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013.



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7(c)-IV	Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors.	
8(a)	Cadmium and its compounds in one shot pellet type thermal cut-offs.	Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012.
8(b)	Cadmium and its compounds in electrical contacts.	
9	Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution.	
9(b)	Lead in bearing shells and bushes for refrigerant -containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications.	Applies to categories 8, 9 and 11; expires on: -21 July 2023 for category 8 in vitro diagnostic medical devices; -21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; -21 July 2021 for other subcategories of categories 8 and 9.
9(b)-(I)	Lead in bearing shells and bushes for refrigerant -containing hermetic scroll compressors with a stated electrical power input equal or below 9 kW for heating, ventilation, air conditioning and refrigeration (HVACR) applications.	Applies to category 1; expires on 21 July 2019.
11(a)	Lead used in C-press compliant pin connector systems.	May be used in spare parts for EEE placed on the market before 24 September 2010.
11(b)	Lead used in other than C-press compliant pin connector systems.	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013.
12	Lead as a coating material for the thermal conduction module C-ring.	May be used in spare parts for EEE placed on the market before 24 September 2010.
13(a)	Lead in white glasses used for optical applications.	Applies to all categories; expires on: -21 July 2023 for category 8 in vitro diagnostic medical devices; -21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; -21 July 2021 for all other categories and subcategories.
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards.	Applies to categories 8, 9 and 11; expires on: -21 July 2023 for category 8 in vitro diagnostic medical devices; -21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; -21 July 2021 for other subcategories of categories



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13(b)-(I)	Lead in ion coloured optical filter glass types.	Applies to categories 1 to 7 and 10; expires on 21 July 2021 for categories 1 to 7 and 10.
13(b)-(II)	Cadmium in striking optical filter glass types; excluding applications falling under point 39 of this Annex.	
13(b)-(III)	Cadmium and lead in glazes used for reflectance standards.	
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight.	Expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011.
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages.	
16	Lead in linear incandescent lamps with silicate coated tubes.	Expires on 1 September 2013.
17	Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications.	
18(a)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba) ₂ MgSi ₂ O ₇ :Pb).	Expires on 1 January 2011.
18(b)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi ₂ O ₅ :Pb).	
19	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact energy saving lamps (ESL).	Expires on 1 June 2011.
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs).	Expires on 1 June 2011.



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21	Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses.	
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0, 65 mm and less.	May be used in spare parts for EEE placed on the market before 24 September 2010.
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors.	
25	Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring.	
26	Lead oxide in the glass envelope of black light blue lamps.	Expires on 1 June 2011.
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers.	Expired on 24 September 2010.
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC.	
30	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more.	
31	Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting).	
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes.	
33	Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers.	
34	Lead in cermet-based trimmer potentiometer elements.	
36	Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display	Expired on 1 July 2010.
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body.	
38	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide.	



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39	Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm ² of light-emitting area) for use in solid state illumination or display systems.	Expires on 1 July 2014.
40	Cadmium in photoresistors for analogue optocouplers applied in professional audio equipment.	Expires on 31 December 2013.
41	Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in the crankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council.	Expires on 31 December 2018.

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Revised pages

Edition	Release Date	Revision	Amendment