

Test Report

No. BCTC-FYC20061910R

Date: Jun. 19, 2020

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Applicant :

Address :

The submitted sample and sample information was/were submitted and identified by/on the behalf of the client

Sample name :

Sample received date : Jun. 12, 2020

Testing period : Jun. 12, 2020 - Jun. 19, 2020

Test requested :

1. As specified by client, to screen Lead(Pb), Cadmium(Cd), Mercury(Hg), Chromium(Cr) and Bromine(Br) in the submitted sample(s) by XRF.
2. As specified by client, when screening results exceed the XRF screening limit in IEC 62321-3-1:2013, further use of chemical methods are required to test the Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs) in the submitted samples.
3. As specified by client, to test the Di-isobutyl phthalate(DIBP), Dibutyl phthalate(DBP), Benzyl butyl phthalate(BBP), Bis(2-ethyl(hexyl) phthalate)(DEHP)in the submitted sample(s).

According to the RoHS Directive 2011/65/EU and amendment Commission Delegated Directive (EU) 2015/863

*****For more detailed information, please refer to the next page*****

Tested by Xingping Li



Approved by Hanyao Chen

Lab:Shenzhen BCTC Testing Co.,Ltd.

Add:BCTC Building & 1-2F,East of B Building,pengzhou Industrial,Fuyuan 1st Road,
Qiaotou Community,Fuyong Street, Bao 'an District,Shenzhen,China
Tel : (86)0755-33229357 Fax : 0755-33229357

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400 -788 -9558
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Test Method:

A. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC 62321-3-1:2013.

Element	Limit of IEC 62321-3-1:2013. Unit (mg/kg)		MDL	
	Polymers and metals	Composite material	Polymers	Other material
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma)$ $\leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma)$ $\leq OL$	10 mg/kg	50 mg/kg
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma)$ $\leq OL$	$LOD \leq (50-3\sigma) < X < (150+3\sigma)$ $\leq OL$	10 mg/kg	50 mg/kg
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma)$ $\leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma)$ $\leq OL$	10 mg/kg	50 mg/kg
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$	10 mg/kg	50 mg/kg
Br	$BL \leq (300-3\sigma) < X$	$BL \leq (250-3\sigma) < X$	10 mg/kg	50 mg/kg

Note:

-BL = Under the XRF screening limit

-OL = Further chemical test will be conducted while result is above the screening limit

-X= The symbol "X" marks the region where further investigation is necessary

-3σ= The reproducibility of analytical instruments

-LOD= Detection limit

-“--” = Not regulated.

B. Chemical Test

Test Item(s)	Test Method	Measured Equipment(s)	MDL	Limit
Lead (Pb)	IEC 62321-5:2013 Ed.1.0	ICP-OES	2 mg/kg	1000 mg/kg
Cadmium (Cd)	IEC 62321-5:2013 Ed.1.0	ICP-OES	2 mg/kg	100 mg/kg
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017	ICP-OES	2 mg/kg	1000 mg/kg
Hexavalent Chromium Cr(VI)	IEC 62321-7-1:2015 Ed.1.0	UV-VIS	--	1000 mg/kg
	IEC 62321-7-2:2017 Ed.1.0		8 mg/kg	1000 mg/kg
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015 Ed.1.0	GC-MS	5 mg/kg	1000 mg/kg
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015 Ed.1.0	GC-MS	5 mg/kg	1000 mg/kg
Phthalates	IEC 62321-8:2017 Ed.1.0	GC-MS	50 mg/kg	1000 mg/kg

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Test Results:

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
1	Black plastic covering	BL	BL	BL	BL	BL	NA
2	Silver small aluminum sheet	BL	BL	BL	BL	BL	NA
3	silver Large sheet	BL	BL	BL	BL	BL	NA
4	Yellow copper wire	BL	BL	BL	BL	BL	NA
5	Black plastic covering	BL	BL	BL	BL	BL	NA
6	Red copper wire	BL	BL	BL	BL	BL	NA
7	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
8	White plastic sheet of socket	BL	BL	BL	BL	BL	NA
9	Silvery metal shell of socket	BL	BL	BL	BL	BL	NA
10	Chip IC	BL	BL	BL	BL	BL	NA
11	Chip capacitor	BL	BL	BL	BL	BL	NA
12	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
13	Black plastic core of socket	BL	BL	BL	BL	BL	NA
14	Silvery metal shell of socket	BL	BL	BL	BL	BL	NA
15	Silvery metal shell of USB	BL	BL	BL	BL	BL	NA
16	Black plastic core of USB	BL	BL	BL	BL	BL	NA
17	Silvery metal pin of USB	BL	BL	BL	IN	BL	NA
18	Chip MOS	BL	BL	BL	BL	BL	NA

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Test Results:

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
19	Green PCB	BL	BL	BL	BL	BL	NA

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Tested Item(s)	Results		
	Unit (mg/kg)		
	1-6	7-14	15-19
Di-isobutyl phthalate(DIBP) CAS #:84-69-5	N.D.	N.D.	N.D.
Dibutyl phthalate(DBP) CAS #:84-74-2	N.D.	N.D.	N.D.
Benzylbutyl phthalate(BBP) CAS #:85-68-7	N.D.	N.D.	N.D.
Bis(2-ethyl(hexyl) phthalate)(DEHP) CAS #:117-81-7	N.D.	N.D.	N.D.

Note:

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

-“ / ”= Not conducted.

-Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.1µg/cm² with 50cm² sample surface area used.-Positive = Presence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is equal to or greater than 0.13µg/cm² with 50cm² sample surface area used.**Remark:**

- The screening results are only used for reference.

- When conducting the test for PBBs&PBDEs, XRF was introduced to screen Br Exclusively; When conducting the test for Hexavalent Chromium, XRF was introduced to screen Chromium exclusively.



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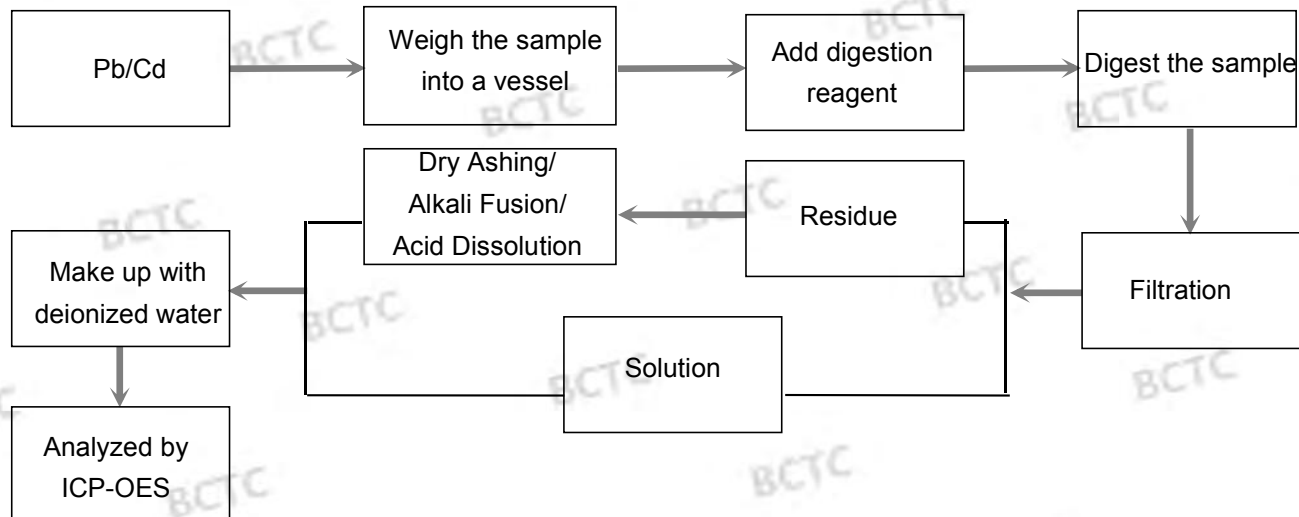
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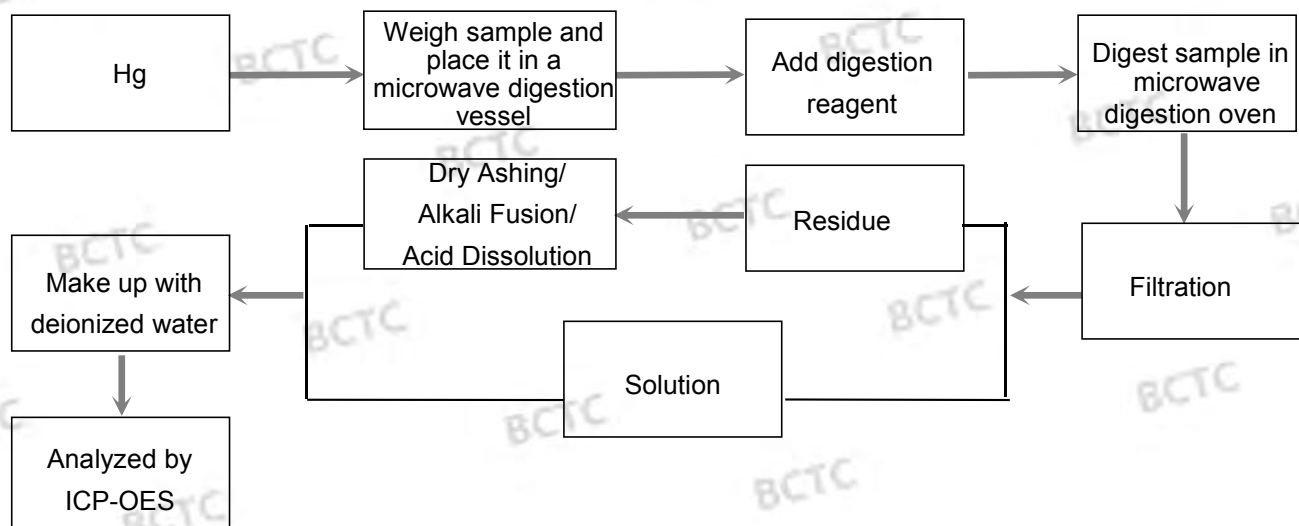
Test Process:

The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.

◆IEC 62321-5:2013 Ed.1.0



◆IEC 62321-4:2013+AMD1:2017



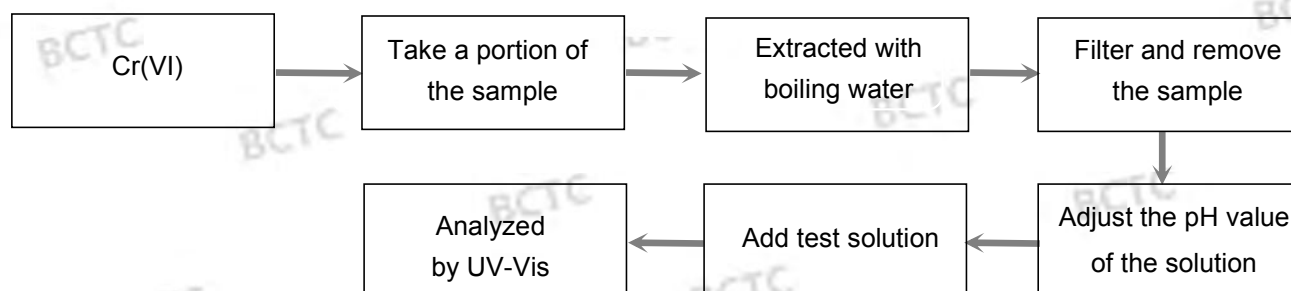
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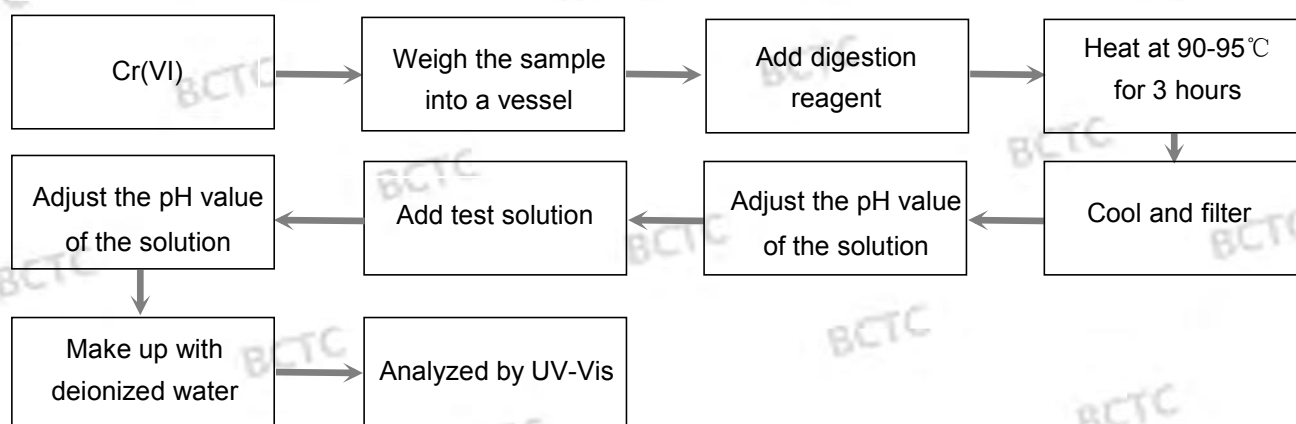
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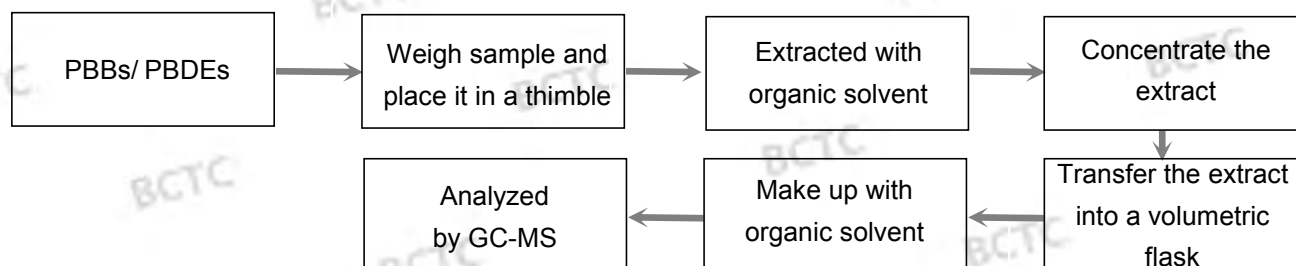
◆IEC 62321-7-1:2015 Ed.1.0



◆IEC 62321-7-2:2017 Ed.1.0



◆IEC 62321-6:2015 Ed.1.0



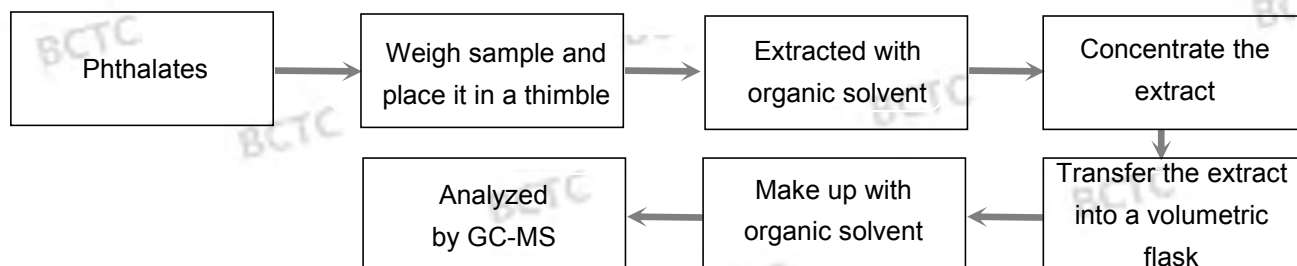
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◆IEC 62321-8:2017 Ed.1.0



Photograph of Sample



Fig.1

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Photo(s) of the tested component(s)

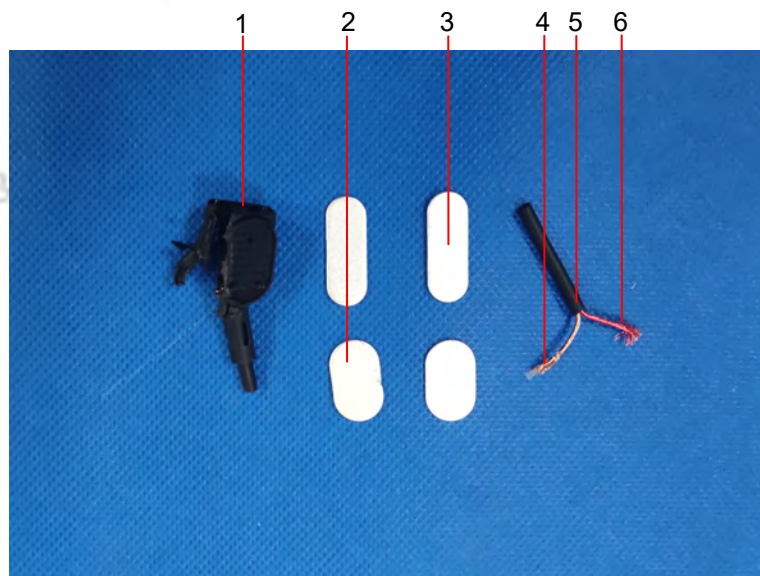


Fig.2

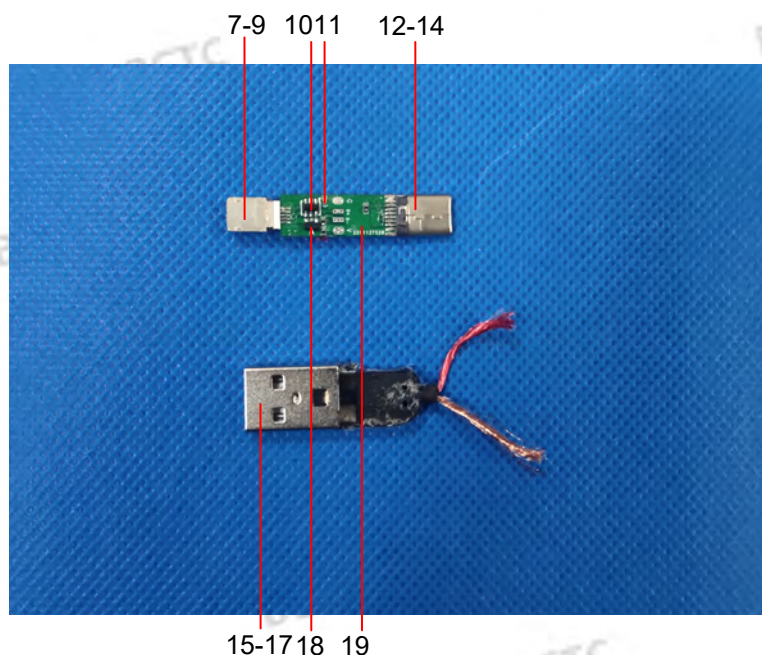



Fig.3

***** End of Report *****

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