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检测  
TESTING  
CNAS L5772

# Test Report

Report No.: PTC19011401701C-EN01

Issue Date: Jan. 23, 2018

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**Applicant:** RAY-TECH International Limited

**Address:** Block A,2013 Culture Maker Park,Henggang,Shenzhen,China

The following merchandise was (were) submitted and identified by client as:

**Sample Name:** Battery Spirit

**Style No.:** Battery Spirit

**Manufacturer:** RAY-TECH International Limited

**Address:** Block A,2013 Culture Maker Park,Henggang,Shenzhen,China

**Sample Received Date:** Jan. 17, 2018

**Completed Date:** Jan. 23, 2018

**Test Requested and Conclusion(s):**

No.	Test Sample	Standard and Requirement	Conclusion(s)
1	Submitted sample	RoHS Directive 2011/65/EU and its subsequent amendments regulation EU No.2015/863. - Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr <sup>6+</sup> ), PBBs and PBDEs, Phthalates (DBP, BBP,DEHP,DIBP)	PASS

**Test Result(s):** Please refer to next page(s).

Signed for and on Behalf of PTC



Raul Cheng / P & C Department General Manager  
DongGuan Precise Testing and Certification Corp. Ltd.

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## Test Result(s):

RoHS - Lead (Pb)/Cadmium(Cd)/Mercury(Hg)/Hexavalent Chromium(Cr<sup>6+</sup>)/PBBs/PBDEs

Test Method: IEC62321-3-1: 2013, IEC62321-5: 2013, IEC62321-4: 2013, IEC 62321-7-1:2015, IEC 62321-7-2: 2017, analyzed by EDXRF & AAS & ICP-AES & GC-MS & UV-Vis.

No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	White plastic(shell)	BL	BL	BL	BL	BL	--	PASS
2	Black plastic with white printing(wire jacket)	BL	BL	BL	BL	BL	--	PASS
3	Coppery metal(wire)	BL	BL	BL	BL	--	--	PASS
4	Silvery metal(plug)	BL	BL	BL	BL	--	--	PASS
5	Blue PCB (PCB"Rev03 1850")	BL	BL	BL	BL	OL	PBBs:N.D. PBDEs:N.D.	PASS
6	Gray body(inductor)	BL	BL	BL	BL	BL	--	PASS
7	Black body(diode)	BL	BL	BL	BL	BL	--	PASS
8	Black plastic with white printing (capacitor sleeve)	BL	BL	BL	BL	BL	--	PASS
9	Silvery metal (capacitor shell)	BL	BL	BL	BL	--	--	PASS
10	Black rubber(capacitor)	BL	BL	BL	BL	BL	--	PASS
11	Transparent soft plastic (capacitor)	BL	BL	BL	BL	BL	--	PASS
12	Brown paper with liquid (capacitor film)	BL	BL	BL	BL	BL	--	PASS
13	Silvery metal (capacitor foil)	BL	BL	BL	BL	--	--	PASS
14	Dull silvery metal (capacitor foil)	BL	BL	BL	BL	--	--	PASS
15	Silvery metal (capacitor connector)	BL	BL	BL	BL	--	--	PASS
16	Silvery metal (capacitor pin)	BL	BL	BL	BL	--	--	PASS
17	Silvery metal (USBsocket)	BL	BL	BL	BL	--	--	PASS
18	White plastic(pin fixture)	BL	BL	BL	BL	BL	--	PASS
19	Silvery metal(pin)	BL	BL	BL	BL	--	--	PASS
20	Black body(IC)	BL	BL	BL	BL	BL	--	PASS

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No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
21	Transparent body(LED)	BL	BL	BL	BL	BL	--	PASS
22	Brown body (chip capacitor)	BL	BL	BL	BL	BL	--	PASS
23	Black body with white printing(chip resistor)	BL	BL	BL	BL	BL	--	PASS
24	Black body(audion)	BL	BL	BL	BL	BL	--	PASS
25	Silvery metal (PCB"Rev03 1850")	BL	BL	BL	BL	--	--	PASS
26	Black plastic(plug)	BL	BL	BL	BL	BL	--	PASS
27	Red plastic with black printng(wire)	BL	BL	BL	BL	BL	--	PASS
28	Black plastic with white printing(wire)	BL	BL	BL	BL	BL	--	PASS
29	Silvery metal (amphenol connector)	BL	BL	BL	BL	--	--	PASS

- Note:**
1. mg/kg = milligram per kilogram (ppm).
  2. N.D. = Not Detected (<RL).
  3. Negative = Absence of Cr<sup>6+</sup>.
  4. Positive = Presence of Cr<sup>6+</sup>: the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.
  5. The result are obtained by EDXRF for primary screening, if the result exceeds the below limit (BL), and further chemical testing.

## Screening limits in mg/kg for regulated elements in various matrices

Elements	Polymer	Metal	Composite Materials
Pb	BL≤(700-3σ)<X<(1300+3σ)≤ OL	BL≤(700-3σ)<X<(1300+3σ)≤ OL	BL≤(500-3σ)<X<(1500+3σ)≤ OL
Cd	BL≤(70-3σ)<X<(130+3σ)≤ OL	BL≤(70-3σ)<X<(130+3σ)≤ OL	LOD<X<(150+3σ)≤OL
Hg	BL≤(700-3σ)<X<(1300+3σ)≤ OL	BL≤(700-3σ)<X<(1300+3σ)≤ OL	BL≤(500-3σ)<X<(1500+3σ)≤ OL
Cr	BL≤(700-3σ)<X	BL≤(700-3σ)<X	BL≤(500-3σ)<X
Br	BL≤(300-3σ)<X	--	BL≤(250-3σ)<X

BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection

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## Chemical Testing - Detection Limit & 2011/65/EU Limit:

No	Name of Chemicals	Detection Limit (mg/kg)	2011/65/EU Limit (mg/kg)
1	Lead (Pb)	5	1000
2	Cadmium (Cd)	5	100
3	Mercury (Hg)	5	1000
4	Chromium VI (Cr VI)	Non-metal: 10 Metal: Negative	Non-metal: 1000 Metal: Negative
5	Polybromobiphenyls (PBBs) -Bromobiphenyl (MonoBB) -Dibromobiphenyl (DiBB) -Tribromobiphenyl (TriBB) -Tetrabromobiphenyl (TetraBB) -Pentabromobiphenyl (PentaBB) -Hexabromobiphenyl (HexaBB) -Heptabromobiphenyl (HeptaBB) -Octabromobiphenyl (OctaBB) -Nonabromobiphenyl (NonaBB) -Decabromobiphenyl (DecaBB)	Each 5	Sum: 1 000
6	Polybromodiphenyl ethers (PBDEs) -Bromodiphenyl ether (MonoBDE) -Dibromodiphenyl ether (DiBDE) -Tribromodiphenyl ether (TriBDE) -Tetrabromodiphenyl ether (TetraBDE) -Pentabromodiphenyl ether (PentaBDE) -Hexabromodiphenyl ether (HexaBDE) -Heptabromodiphenyl ether (HeptaBDE) -Octabromodiphenyl ether (OctaBDE) -Nonabromodiphenyl ether (NonaBDE) -Decabromodiphenyl ether (DecaBDE)	Each 5	Sum: 1 000

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## Test Result(s):

ROHS - Phthalates DIBP, DBP, BBP, DEHP

Method: IEC 62321-8: 2017, analyzed by Gas Chromatograph-Mass Spectrometry (GC-MS).

Substances	DBP	BBP	DEHP	DIBP	Conclusion
CAS No.	84-74-2	85-68-7	117-81-7	84-69-5	
Limit (mg/kg)	1000	1000	1000	1000	
RL (mg/kg)	50	50	50	50	
Material No.	Result (mg/kg)				
1+2+18	N.D.	N.D.	N.D.	N.D.	PASS
5	N.D.	N.D.	N.D.	N.D.	PASS
8	N.D.	N.D.	N.D.	N.D.	PASS
12	N.D.	N.D.	N.D.	N.D.	PASS
10	N.D.	N.D.	N.D.	N.D.	PASS
26+27+28	N.D.	N.D.	N.D.	N.D.	PASS

- Note:**
1. mg/kg = milligram per kilogram (ppm).
  2. N.D. = Not Detected (<RL).
  3. RL=Reporting Limit.

## Test Material List

The following materials apply only to the samples submitted for chemical testing.

Material No.	Description	Location
1	White plastic	shell
2	Black plastic with white printing	wire jacket
5	Blue PCB	PCB"Rev03 1850"
8	Black plastic with white printing	capacitor sleeve
10	Black rubber	capacitor
12	Brown paper with liquid	capacitor film
18	White plastic	pin fixture
26	Black plastic	plug
27	Red plastic with black printing	wire
28	Black plastic with white printing	wire

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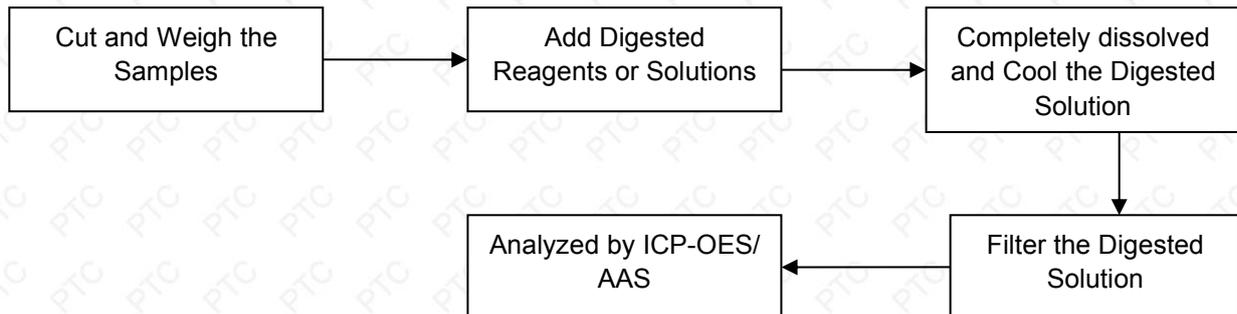
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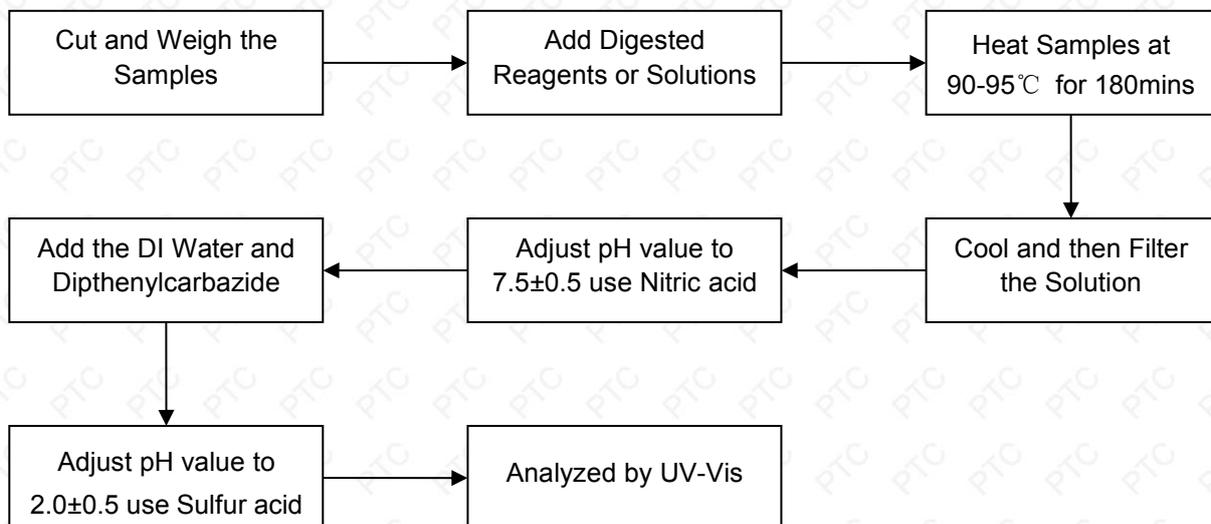
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## Test Process Flow:

### 1. Lead, Cadmium, Mercury



### 2. Hexavalent Chromium (Non-metal)



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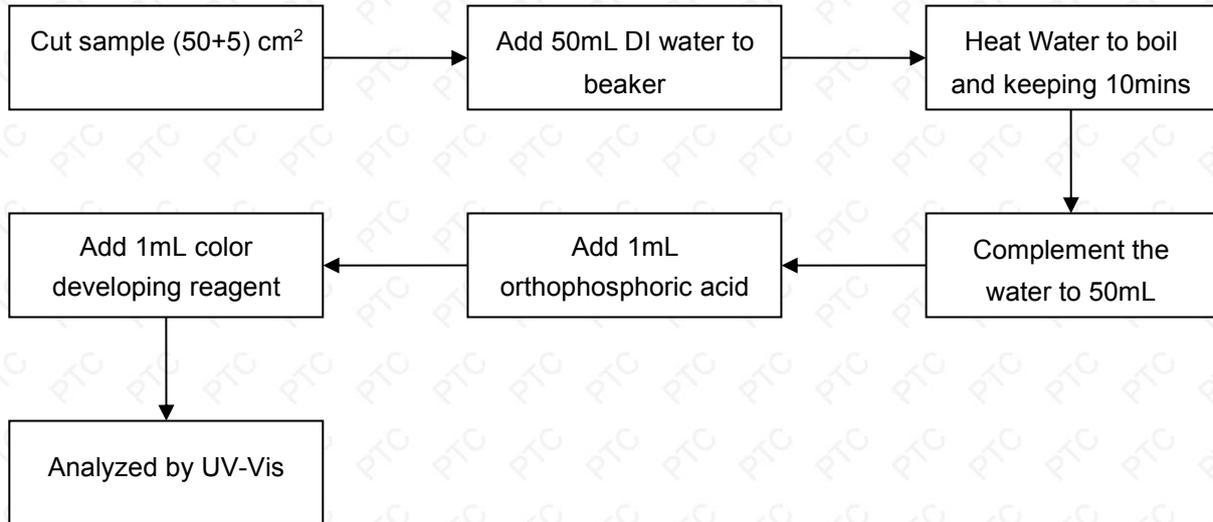
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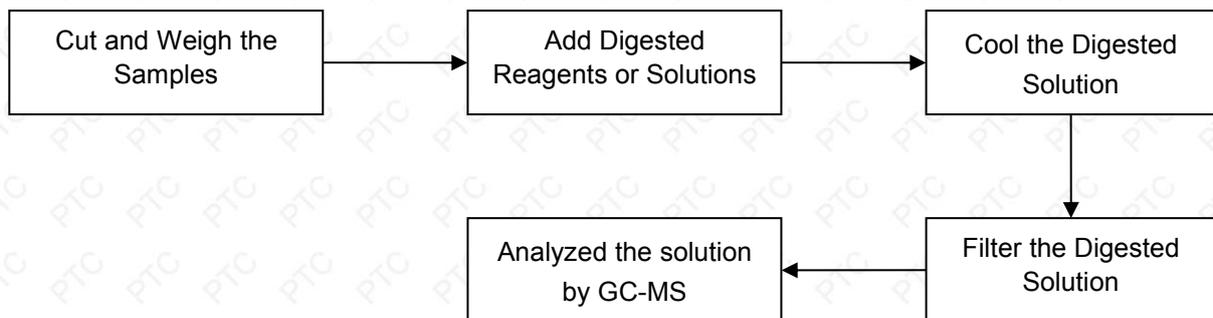
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## Hexavalent Chromium (Metal)



## 3. PBBs & PBDEs, Phthalates



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Photo(s) of Sample:



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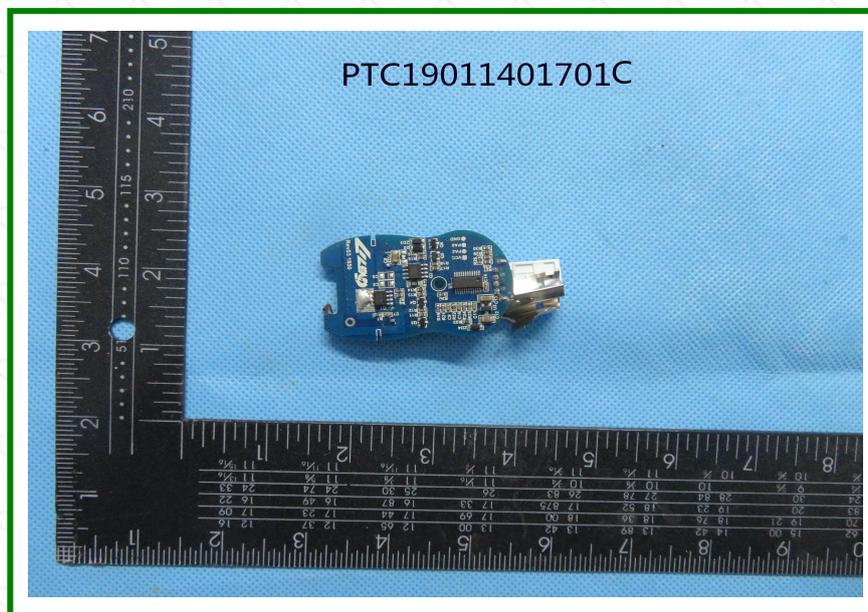


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\*\*\*End of Report\*\*\*

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