



# Test Report

Report No. A223028914910101

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**Company Name** TAK CHEONG ELECTRONICS SHANWEI CO., LTD.

**shown on Report**

**Address** TAK CHEONG INDUSTRIAL ZONE, BUBIAN, SHANWEI, GUANGDONG, PRC

**The following sample(s) and sample information was/were submitted and identified by/on the behalf of the applicant**

Sample Name	TO-220 Plastic Package
Part No.	TO-220ABDG
Item No.	D/C 2321
Material	Epoxy molding compound、 Tin、 Copper
Sample Received Date	Jun. 15, 2023
Testing Period	Jun. 15, 2023 to Jun. 19, 2023

**Test Requested** As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)), Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs), Phthalates (DBP, BBP, DEHP, DIBP) in the submitted sample(s).

**Test Method/Test Result(s)** Please refer to the following page(s).



Approved by

Date

Jun. 19, 2023

Hill Zheng  
Technical Manager

No. R338851935

Centre Testing International Group Co.,Ltd.

CI Testing Building, Xing Dong Community, Xin'an Sub-district, Bao'an District, Shenzhen City, Guangdong Province, P.R. China

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**Test Method**

Tested Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	IEC 62321-5:2013	ICP-OES
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium (Cr(VI))	IEC 62321-7-1:2015	UV-Vis
	IEC 62321-7-2:2017 and/or determination of Total Chromium by IEC 62321-5:2013	UV-Vis/ICP-OES
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS

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## Test Result(s)

Tested Item(s)	Result		MDL
	002	003	
Lead (Pb)	1798 mg/kg	13 mg/kg	2 mg/kg
Cadmium (Cd)	N.D.	N.D.	2 mg/kg
Mercury (Hg)	N.D.	N.D.	2 mg/kg
Hexavalent Chromium (Cr(VI))	N.D.	--	8 mg/kg
	--	N.D.▼	0.10 µg/cm <sup>2</sup> (LOQ)

Tested Item(s)	Result		MDL
	002		
<b>Polybrominated Biphenyls (PBBs)</b>			
Monobromobiphenyl	N.D.		5 mg/kg
Dibromobiphenyl	N.D.		5 mg/kg
Tribromobiphenyl	N.D.		5 mg/kg
Tetrabromobiphenyl	N.D.		5 mg/kg
Pentabromobiphenyl	N.D.		5 mg/kg
Hexabromobiphenyl	N.D.		5 mg/kg
Heptabromobiphenyl	N.D.		5 mg/kg
Octabromobiphenyl	N.D.		5 mg/kg
Nonabromobiphenyl	N.D.		5 mg/kg
Decabromobiphenyl	N.D.		5 mg/kg

Tested Item(s)	Result		MDL
	002		
<b>Polybrominated Diphenyl Ethers (PBDEs)</b>			
Monobromodiphenyl ether	N.D.		5 mg/kg
Dibromodiphenyl ether	N.D.		5 mg/kg
Tribromodiphenyl ether	N.D.		5 mg/kg
Tetrabromodiphenyl ether	N.D.		5 mg/kg
Pentabromodiphenyl ether	N.D.		5 mg/kg
Hexabromodiphenyl ether	N.D.		5 mg/kg
Heptabromodiphenyl ether	N.D.		5 mg/kg
Octabromodiphenyl ether	N.D.		5 mg/kg
Nonabromodiphenyl ether	N.D.		5 mg/kg
Decabromodiphenyl ether	N.D.		5 mg/kg

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Tested Item(s)	Result	MDL
	002	
<b>Phthalates (DBP, BBP, DEHP, DIBP)</b>		
Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg
Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	50 mg/kg
Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg

## Sample/Part Description

No.	CTI Sample ID	Description
1	002	Black body(Tested as a whole)*
2	003	Metal pin with silver-white plating

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

-\*The sample(s) was tested as a whole, because it's impossible to disassemble or separate it by current equipment and technology. The result(s) shown on this report may be different from the content of any homogeneous material.

-MDL = Method Detection Limit

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

-mg/kg = ppm = parts per million

-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10  $\mu\text{g}/\text{cm}^2$

-▼The sample is negative for Cr(VI) – The Cr(VI) concentration is below 0.10  $\mu\text{g}/\text{cm}^2$ . The coating is considered a non-Cr(VI) based coating.

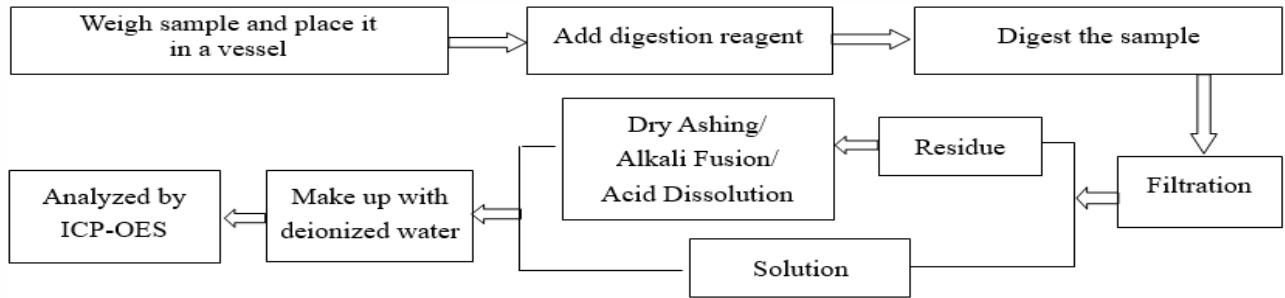
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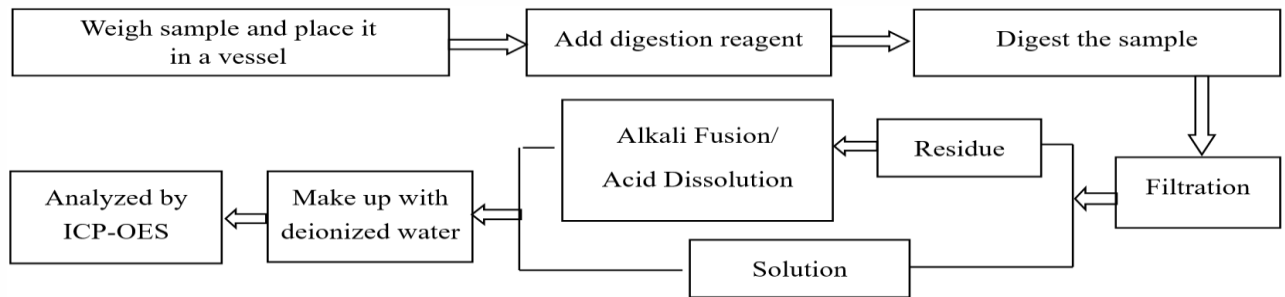
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## Test Process

### 1. Lead (Pb), Cadmium (Cd), Chromium(Cr)

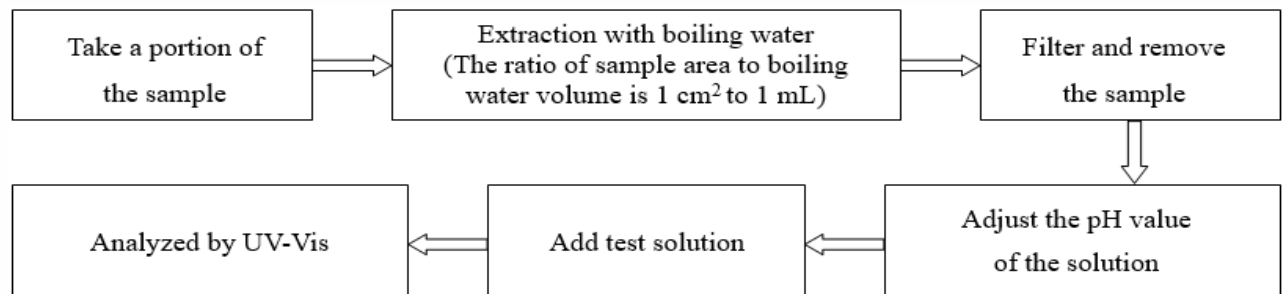


### 2. Mercury (Hg)

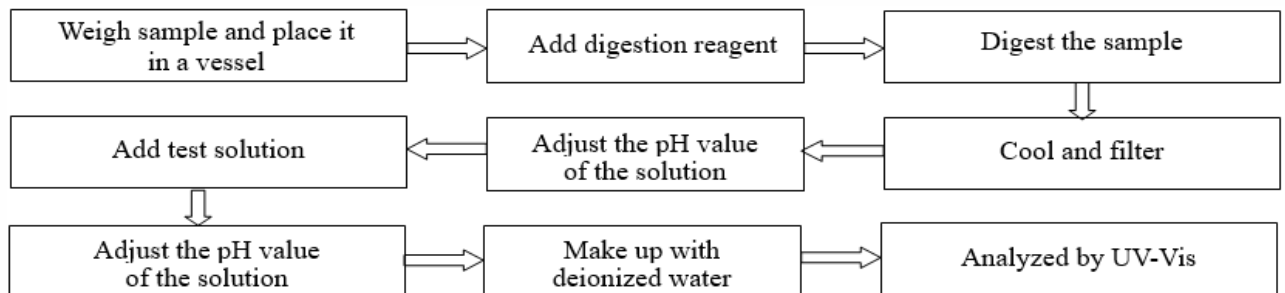


### 3. Hexavalent Chromium (Cr(VI))

#### (1) IEC 62321-7-1:2015



#### (2) IEC 62321-7-2:2017

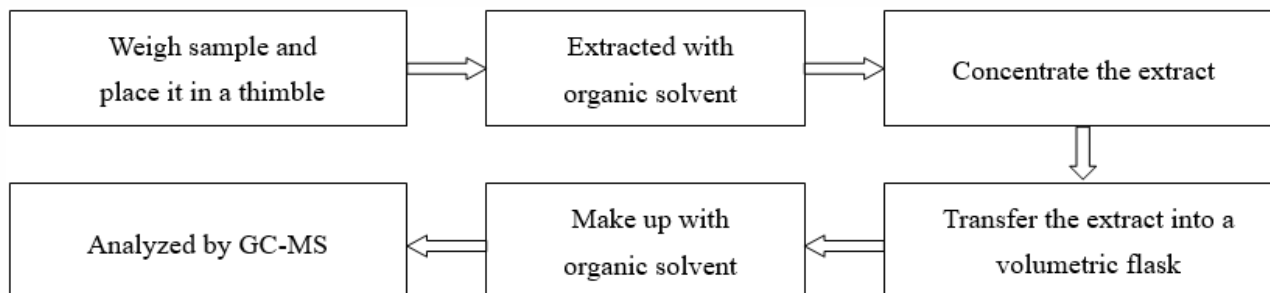


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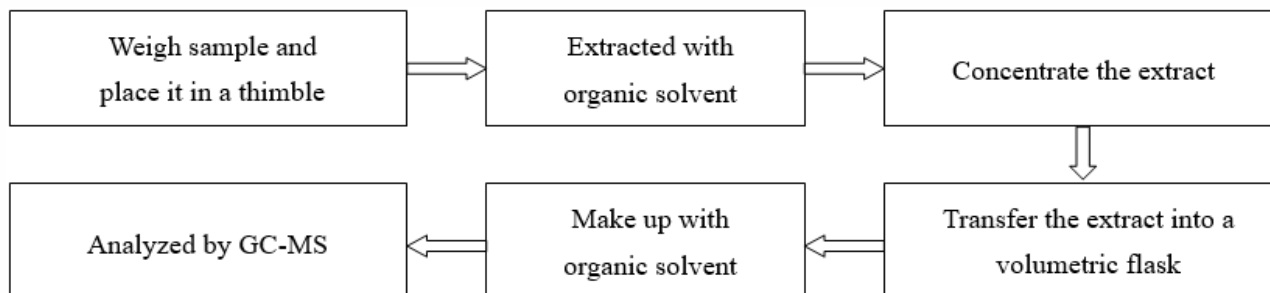
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## 4. Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)



## 5. Phthalates (DBP, BBP, DEHP, DIBP)



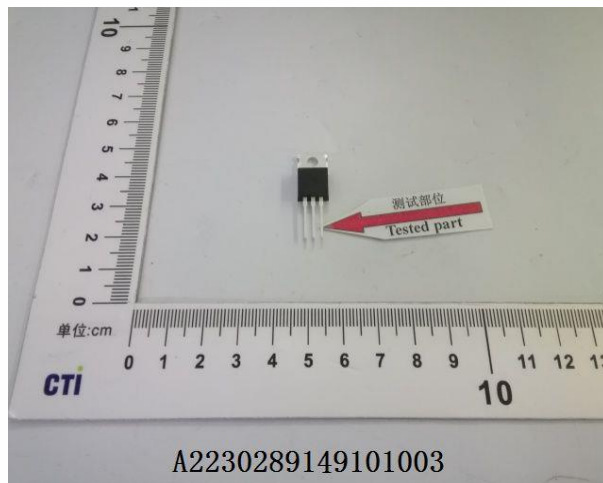
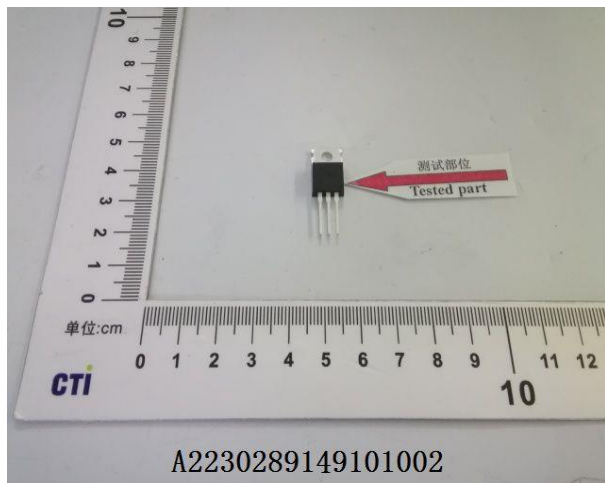
华测检测有限公司

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## Photo(s) of the sample(s)



### Statement:

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Without written approval of CTI, this report can't be reproduced except in full;
5. In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

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

CTI