



# TEST REPORT

**BUREAU  
VERITAS**

**Report No. (8219)350-0370-003**

Date Issued : 2019. 12. 23

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Company Name : IL-KWANG ELECTRONIC MATERIALS CO., LTD.

Address : 223, Sandan-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Korea

## Sample Description

Name / Type of Product : TPCS (Fe/Cu/Sn)  
Item No. / Part No. : -  
Material/Color : ETPCS, CPSW  
Manufacturer/Vendor : IL-KWANG ELECTRONIC MATERIALS CO., LTD.

Date Received : 2019. 12. 16  
Test Period : 2019. 12. 16 ~ 2019. 12. 23

Test Type : Wet chemical analysis for restricted substances.  
Test Method(s) : For the detail, please the following page(s).  
Test Results(s) : For the detail, please the following page(s).

## REMARK

The test results presented in this report relate only to the object tested.  
If there are questions or concerns on this report, please contact:

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boyoung.oh@kr.bureauveritas.com

Approved by

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Consumer Product Services

**JIN KIM**  
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Authorized by

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Consumer Product Services

**HOON SONG**  
Lab Manager / Bureau Veritas Korea CPS

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## TEST RESULT

Test Item	Test Method	Unit	MDL	Result
Lead (Pb)	With reference to International Standard IEC 62321-5: 2013, Determined by ICP-OES.	mg/kg	2	ND
Cadmium (Cd)		mg/kg	2	ND
Mercury (Hg)	With reference to International Standard IEC 62321-4: 2013, Determined by ICP-OES.	mg/kg	2	ND
Chromium VI (Cr VI)*	With reference to International Standard IEC 62321-7-1 2015, Determined by UV-Vis.	-	-	Negative
<b>PBBs</b>				
MonoBB	With reference to International Standard IEC 62321-6: 2015, Determined by GC-MS.	mg/kg	5	ND
DiBB		mg/kg	5	ND
TriBB		mg/kg	5	ND
TetraBB		mg/kg	5	ND
PentaBB		mg/kg	5	ND
HexaBB		mg/kg	5	ND
HeptaBB		mg/kg	5	ND
OctaBB		mg/kg	5	ND
NonaBB		mg/kg	5	ND
DecaBB		mg/kg	5	ND
<b>PBDEs</b>				
MonoBDE	With reference to International Standard IEC 62321-6: 2015, Determined by GC-MS.	mg/kg	5	ND
DiBDE		mg/kg	5	ND
TriBDE		mg/kg	5	ND
TetraBDE		mg/kg	5	ND
PentaBDE		mg/kg	5	ND
HexaBDE		mg/kg	5	ND
HeptaBDE		mg/kg	5	ND
OctaBDE		mg/kg	5	ND
NonaBDE		mg/kg	5	ND
DecaBDE		mg/kg	5	ND

Note / Key :

mg/kg = milligram(s) per kilogram = ppm = part(s) per million  
 MDL = Method detection limit  
 ND = Not detected  
 ">" = Greater than  
 NA = Not applicable

- \* a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 ug/cm<sup>2</sup>.  
 The sample coating is considered to contain CrVI.  
 b. The sample is negative for CrVI if CrVI is N.D. (concentration less than 0.10ug/cm<sup>2</sup>).  
 The coating is considered a non-CrVI based coating.  
 C. The result between 0.10ug/cm<sup>2</sup> and 0.13 ug/cm<sup>2</sup> is considered to be inconclusive – unavoidable coating variations may influence the determination.



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## TEST RESULT

Test Item	Test Method	Unit	MDL	Result
Bromine (Br)	With reference to EN14582, Determined by IC / AQF.	mg/kg	30	ND
Chlorine (Cl)		mg/kg	30	ND
Antimony (Sb)	With reference to US EPA3052, Determined by ICP-OES.	mg/kg	2	ND

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Name / Type of Product : TPCS (Fe/Cu/Sn)

## TEST RESULT

Test Item	Test Method	Unit	MDL	Result
DBP	With reference to IEC 62321-8: 2017, Determined by GC-MS & LC-MS.	mg/kg	50	ND
DEHP		mg/kg	50	ND
DIBP		mg/kg	50	ND
BBP		mg/kg	50	ND
DnHP		mg/kg	50	ND
DINP		mg/kg	50	ND
DIDP		mg/kg	50	ND
DnOP		mg/kg	50	ND

Note / Key :

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Name / Type of Product : TPCS (Fe/Cu/Sn)

**List of Phthalates [ European Parliament and Council Directive 2011/65/EU ] :**

No.	Name of Analyte(s)	CAS-No.
1	Di-n-butyl phthalate(Dibutyl phthalate) (DBP)	84-74-2
2.	Di-2-ethylhexyl phthalate(Bis (2-ethylhexyl) phthalate) (DEHP)	117-81-7
3	Diisobutyl phthalate (DIBP)	84-69-5
4	Butyl benzyl phthalate (BBP)	85-68-7
5	Di-n-hexyl phthalate (DHP)	84-75-3
6	Di-isononyl phthalate (DINP)	28553-12-0 / 68515-48-0
7	Di-iso-decyl phthalate (DIDP)	26761-40-0 / 68515-49-1
8	Di-n-octyl phthalate (DnOP)	117-84-0

CAS-No. = Chemical Abstracts Service registry number

**Remark:**

Denotes as this maximum allowable limit applies to :

- a - Medical devices and monitoring and control instruments placed on the market on or after July 22, 2021.
- Other products placed on the market on or after July 22, 2019.



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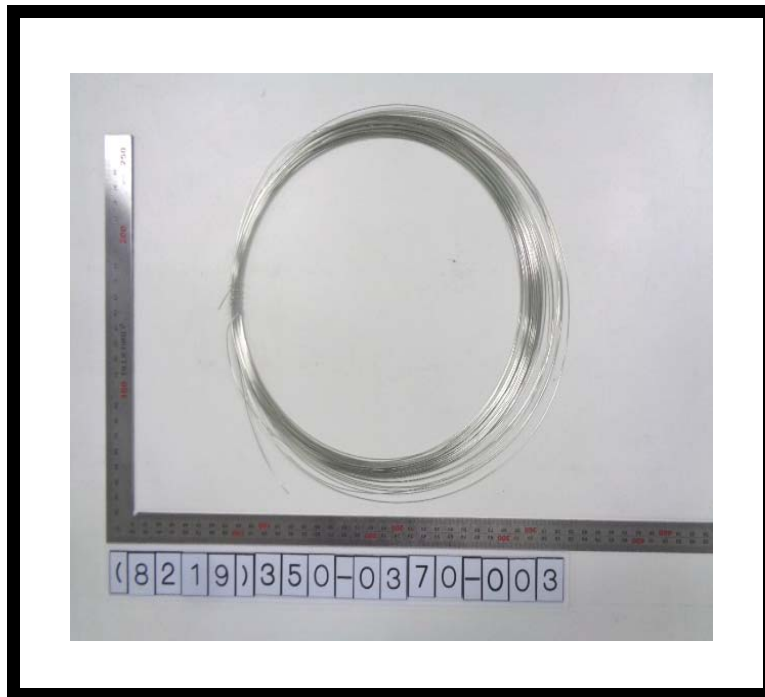
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## Photo of the Submitted Sample



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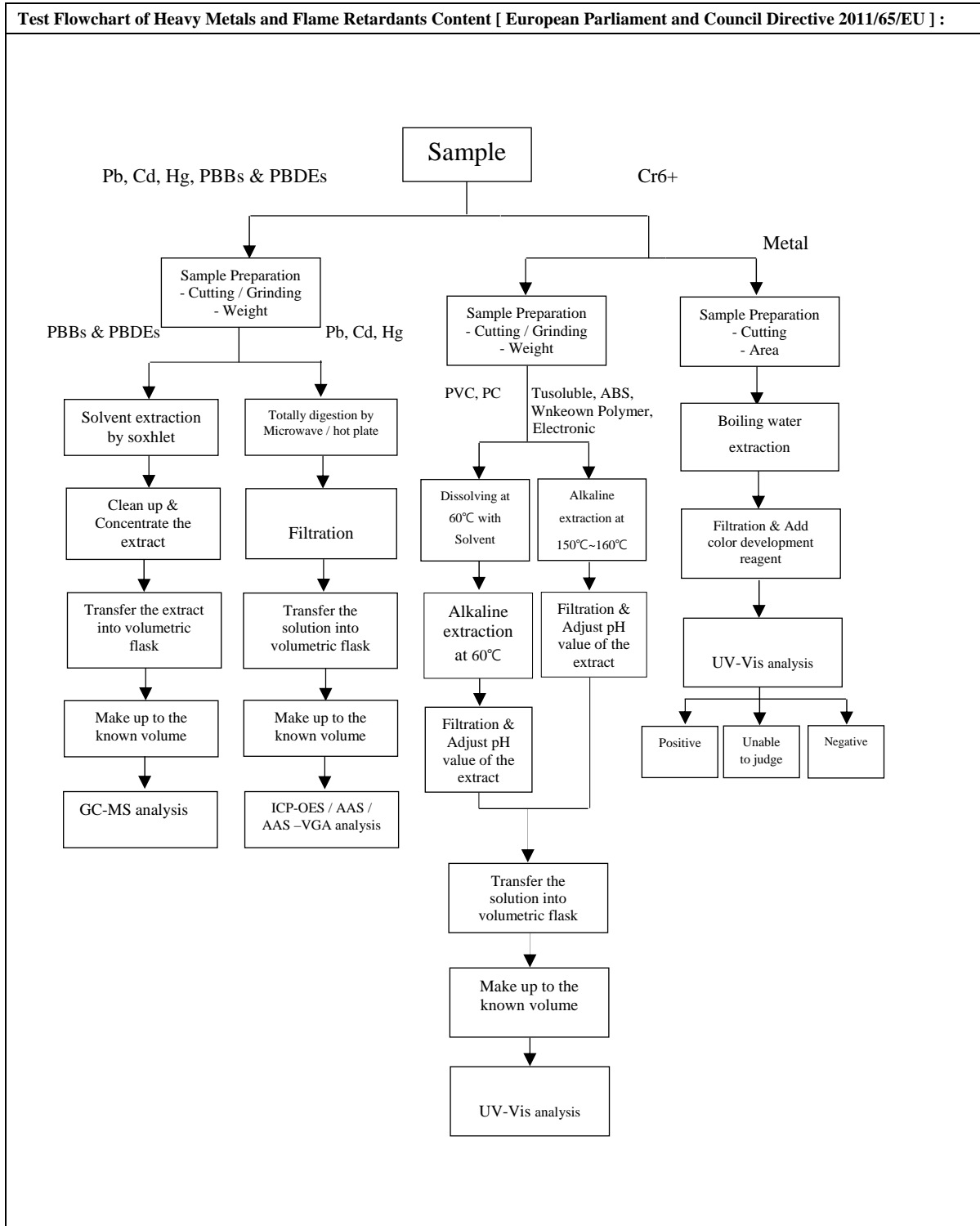
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**Test Flowchart of Heavy Metals and Flame Retardants Content [ European Parliament and Council Directive 2011/65/EU ] :**





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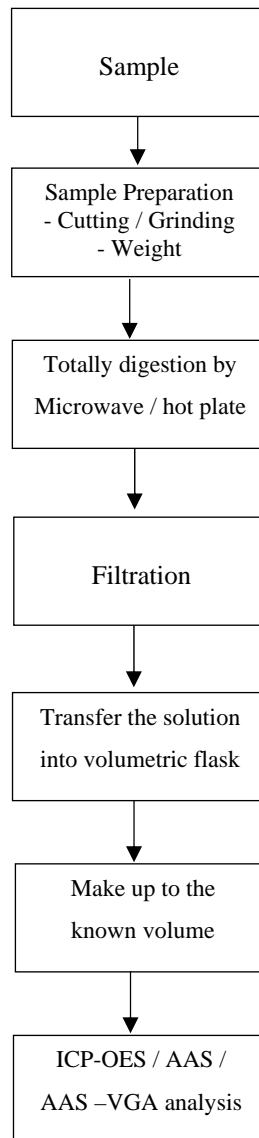
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## Test Flowchart of Element Content







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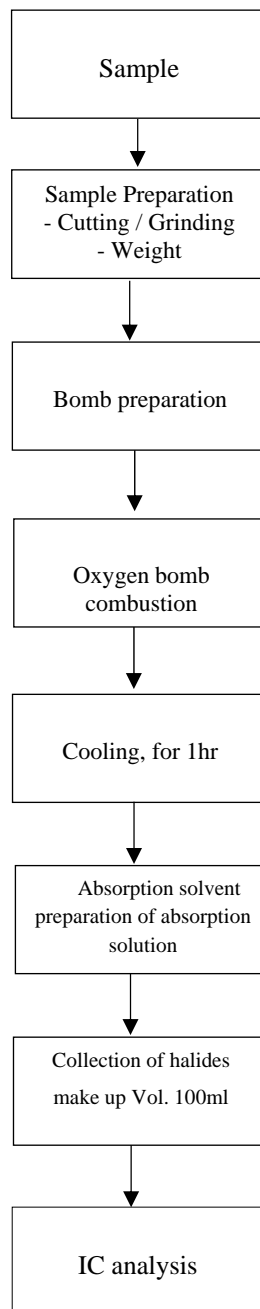
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## Test Flowchart of Halogen Content





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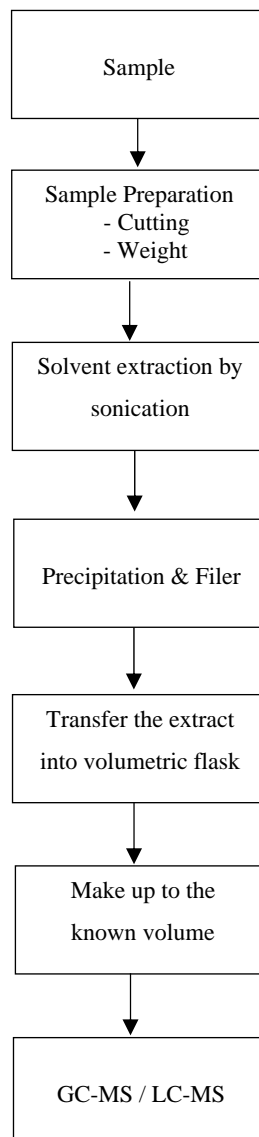
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**Test Flowchart of Phthalates Content [ European Parliament and Council Directive 2015/863/EU ] :**



- End of Report -