

Test Report

Report No.: 200826041GZU-019

Date: Sep 19, 2020

Applicant: AILUN ELECTRONIC TECHNOLOGY (H.K) LIMITED

Flat/RM 01 21/F Prosper Commercial Building 9 Yin
Chong Street

Sample Description:

The following submitted sample(s) said to be:

Item Name : **Cement resistors**
Model No. : NA
Date of Sample Received : Aug 26, 2020
Testing Period : Aug 26, 2020 to Sep 11, 2020

Tests conducted:

As requested by the applicant, refer to following page(s) for details.

Conclusion:

Tested Sample	Standard	Result
Tested components of submitted sample	Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2011/65/EU and (EU) 2015/863)	Pass

Intertek Testing Services Shenzhen Ltd. Guangzhou Branch:

Prepared by:



Martin He
Senior Project Engineer



Reviewed by:



Michael Pang
Assistant Technical Supervisor



Tests conducted:

RoHS Chemical Test

(A) Test Result Summary:

Test Item	Result (mg/kg)		
	(1)	(2)	(3)
Cadmium (Cd) Content	ND	ND	ND
Lead (Pb) Content	ND	ND	ND
Mercury (Hg) Content	ND	ND	ND
Chromium (VI)(Cr ⁶⁺) Content	ND	ND	-
Chromium (VI)(Cr ⁶⁺) Result (By Boiling Water Extraction on Metal)($\mu\text{g}/\text{cm}^2$)	-	-	Negative
Sum of Polybrominated Biphenyls (PBBs)	ND	ND	ND
Monobromobiphenyl (MonoBB)	ND	ND	ND
Dibromobiphenyl (DiBB)	ND	ND	ND
Tribromobiphenyl (TriBB)	ND	ND	ND
Tetrabromobiphenyl (TetraBB)	ND	ND	ND
Pentabromobiphenyl (PentaBB)	ND	ND	ND
Hexabromobiphenyl (HexaBB)	ND	ND	ND
Heptabromobiphenyl (HeptaBB)	ND	ND	ND
Octabromobiphenyl (OctaBB)	ND	ND	ND
Nonabromobiphenyl (NonaBB)	ND	ND	ND
Decabromobiphenyl (DecaBB)	ND	ND	ND
Sum of Polybrominated Diphenyl Ethers (PBDEs)	ND	ND	ND
Monobromodiphenyl Ether (MonoBDE)	ND	ND	ND
Dibromodiphenyl Ether (DiBDE)	ND	ND	ND
Tribromodiphenyl Ether (TriBDE)	ND	ND	ND
Tetrabromodiphenyl Ether (TetraBDE)	ND	ND	ND
Pentabromodiphenyl Ether (PentaBDE)	ND	ND	ND
Hexabromodiphenyl Ether (HexaBDE)	ND	ND	ND
Heptabromodiphenyl Ether (HeptaBDE)	ND	ND	ND
Octabromodiphenyl Ether (OctaBDE)	ND	ND	ND
Nonabromodiphenyl Ether (NonaBDE)	ND	ND	ND
Decabromodiphenyl Ether (DecaBDE)	ND	ND	ND
Phthalates			
Bis(2-ethylhexyl) phthalate (DEHP)	ND	ND	ND
Butyl benzyl phthalate (BBP)	ND	ND	ND
Dibutyl phthalate (DBP)	ND	ND	ND
Diisobutyl phthalate (DIBP)	ND	ND	ND



Test Item	Result (mg/kg)	
	(4)	(5)
Cadmium (Cd) Content	ND	ND
Lead (Pb) Content	ND	ND
Mercury (Hg) Content	ND	ND
Chromium (VI)(Cr ⁶⁺) Content	-	-
Chromium (VI)(Cr ⁶⁺) Result (By Boiling Water Extraction on Metal)(µg/cm ²)	Negative	Negative
Sum of Polybrominated Biphenyls (PBBs)	ND	ND
Monobromobiphenyl (MonoBB)	ND	ND
Dibromobiphenyl (DiBB)	ND	ND
Tribromobiphenyl (TriBB)	ND	ND
Tetrabromobiphenyl (TetraBB)	ND	ND
Pentabromobiphenyl (PentaBB)	ND	ND
Hexabromobiphenyl (HexaBB)	ND	ND
Heptabromobiphenyl (HeptaBB)	ND	ND
Octabromobiphenyl (OctaBB)	ND	ND
Nonabromobiphenyl (NonaBB)	ND	ND
Decabromobiphenyl (DecaBB)	ND	ND
Sum of Polybrominated Diphenyl Ethers (PBDEs)	ND	ND
Monobromodiphenyl Ether (MonoBDE)	ND	ND
Dibromodiphenyl Ether (DiBDE)	ND	ND
Tribromodiphenyl Ether (TriBDE)	ND	ND
Tetrabromodiphenyl Ether (TetraBDE)	ND	ND
Pentabromodiphenyl Ether (PentaBDE)	ND	ND
Hexabromodiphenyl Ether (HexaBDE)	ND	ND
Heptabromodiphenyl Ether (HeptaBDE)	ND	ND
Octabromodiphenyl Ether (OctaBDE)	ND	ND
Nonabromodiphenyl Ether (NonaBDE)	ND	ND
Decabromodiphenyl Ether (DecaBDE)	ND	ND
Phthalates		
Bis(2-ethylhexyl) phthalate (DEHP)	ND	ND
Butyl benzyl phthalate (BBP)	ND	ND
Dibutyl phthalate (DBP)	ND	ND
Diisobutyl phthalate (DIBP)	ND	ND

Tested samples:

- (1) White ceramic with black printing (19-1)
- (2) White ceramic (19-2)
- (3) Silver color metal (19-3)
- (4) Copper color metal (19-4)
- (5) Silver color metal (19-5)



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ND = Not detected

mg/kg = milligram per kilogram

Negative = The Cr (VI) concentration is less than 0.10 µg/cm². The sample is negative for Cr (VI).

(B) RoHS Requirement:

Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)
Phthalates (DEHP, BBP, DBP, DIBP)	0.1% (1000 mg/kg)

The above limits were quoted from 2011/65/EU and (EU) 2015/863 for homogeneous material.

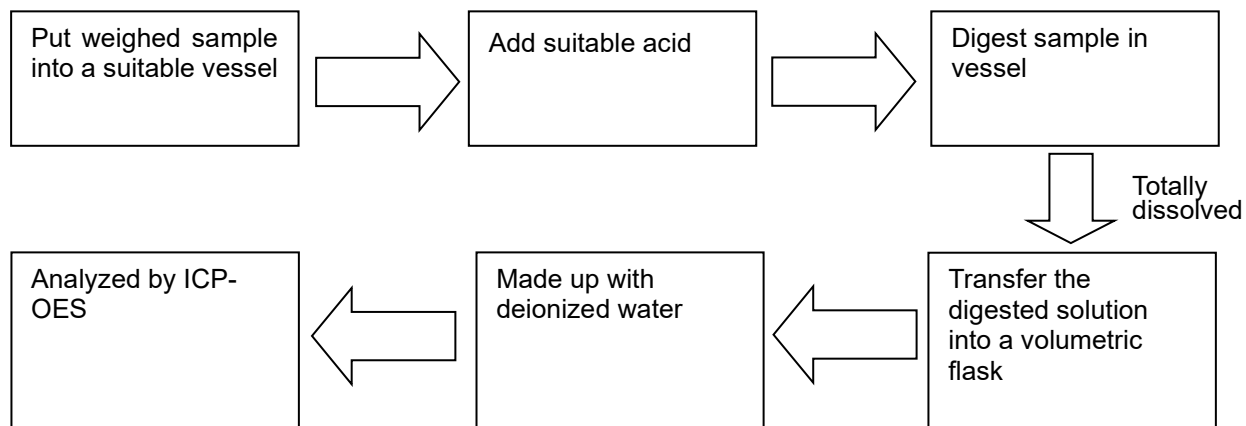
(C) Test Method:

Test Item	Test Method	Detection Limit
Cadmium (Cd) Content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion and determined by ICP - OES	2 mg/kg
Lead (Pb) Content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion and determined by ICP - OES	2 mg/kg
Mercury (Hg) Content	With reference to IEC 62321-4 Edition 1.1: 2017, by acid digestion and determined by ICP - OES	2 mg/kg
Chromium (VI)(Cr ⁶⁺) Content	With reference to IEC 62321-7-1 Edition 1.0: 2015, by boiling water extraction and determined by UV-VIS spectrophotometer	0.10 µg/cm ²
Chromium (VI)(Cr ⁶⁺) Content	With reference to IEC 62321-7-2 Edition 1.0: 2017, Hexavalent chromium – Determination of hexavalent chromium (Cr (VI) in polymers and electronics by the colorimetric method	10 mg/kg
Polybrominated Biphenyls (PBBs)& Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321-6 Edition 1.0: 2015, by solvent extraction and determined by GC/MS and further HPLC confirmation when necessary	5 mg/kg
Phthalates (DEHP, BBP, DBP, DIBP) Content	With reference to IEC 62321-8 Edition 1.0: 2017, by solvent extraction and determined by GC/MS	100 mg/kg

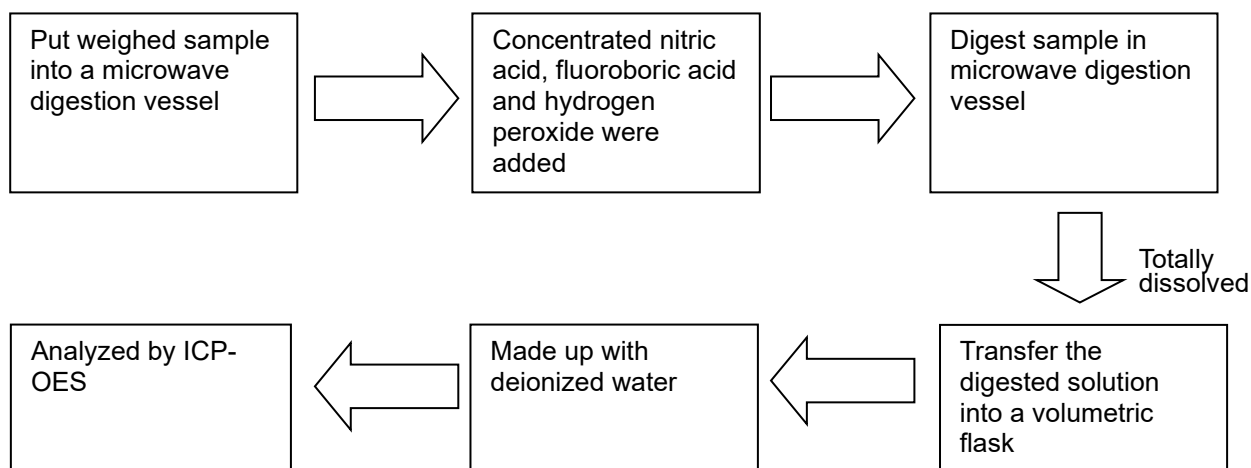


(D) Measurement Flowchart:

1. Test for Cd/Pb Contents

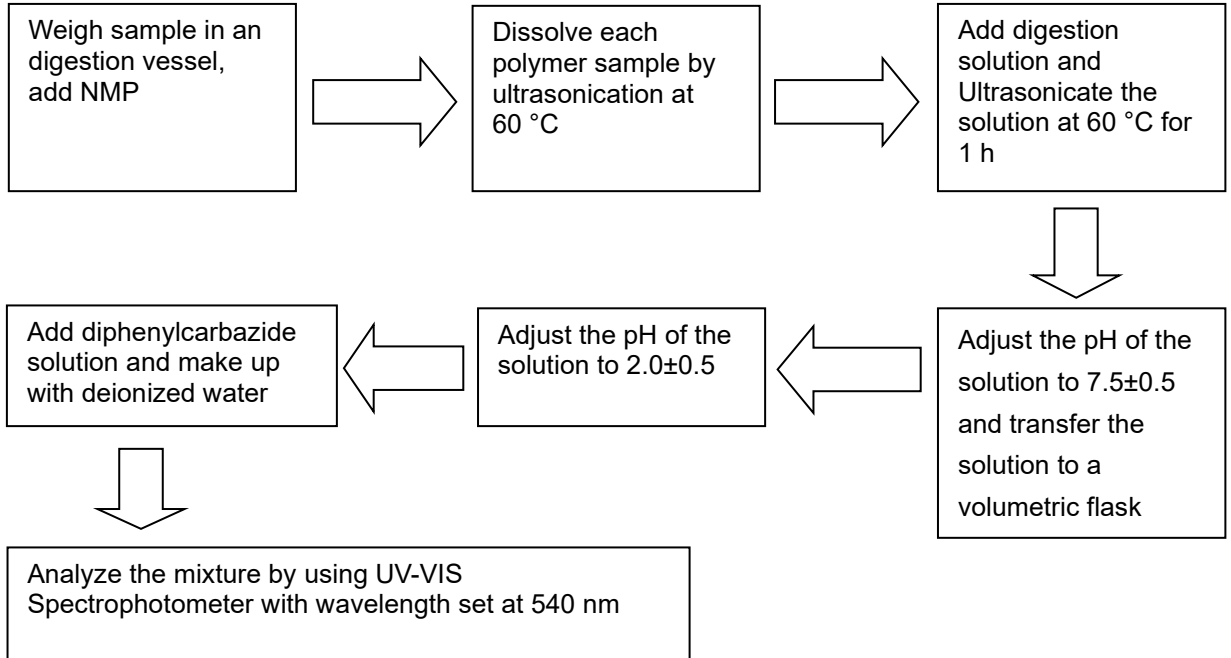


2. Test for Hg Content

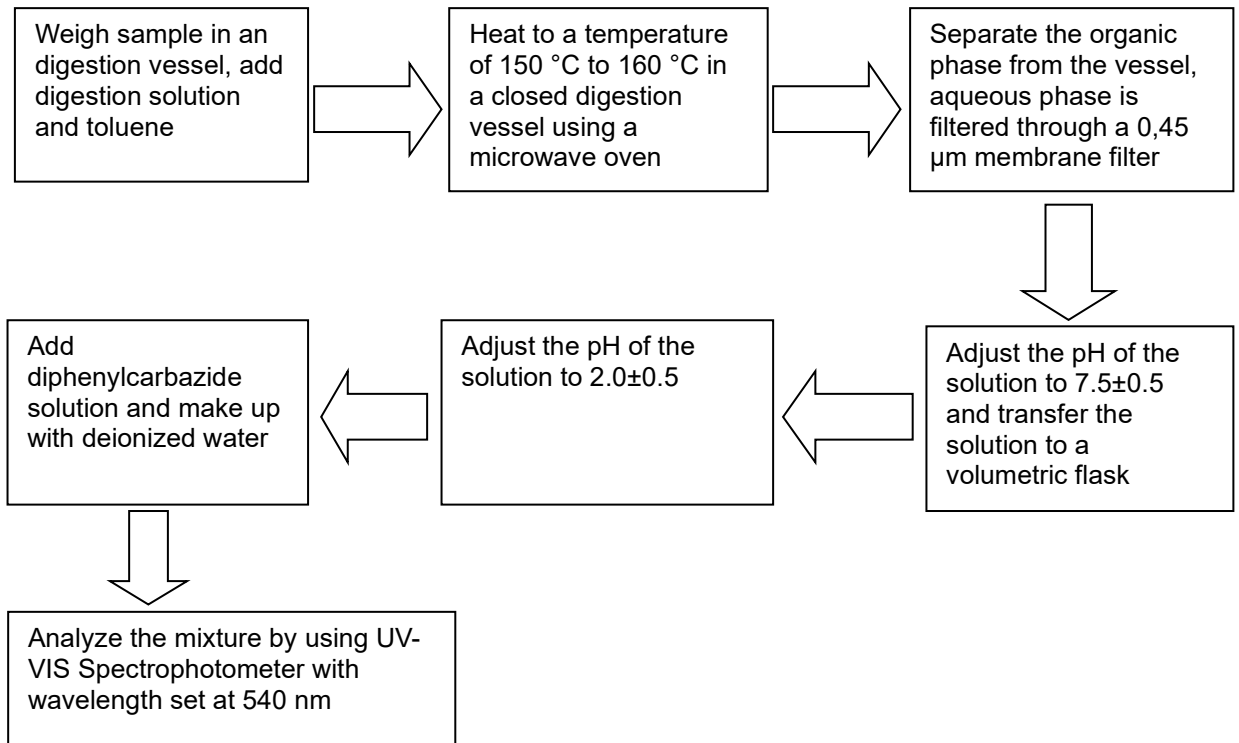


3. Test for Chromium (VI) (Cr⁶⁺) Content

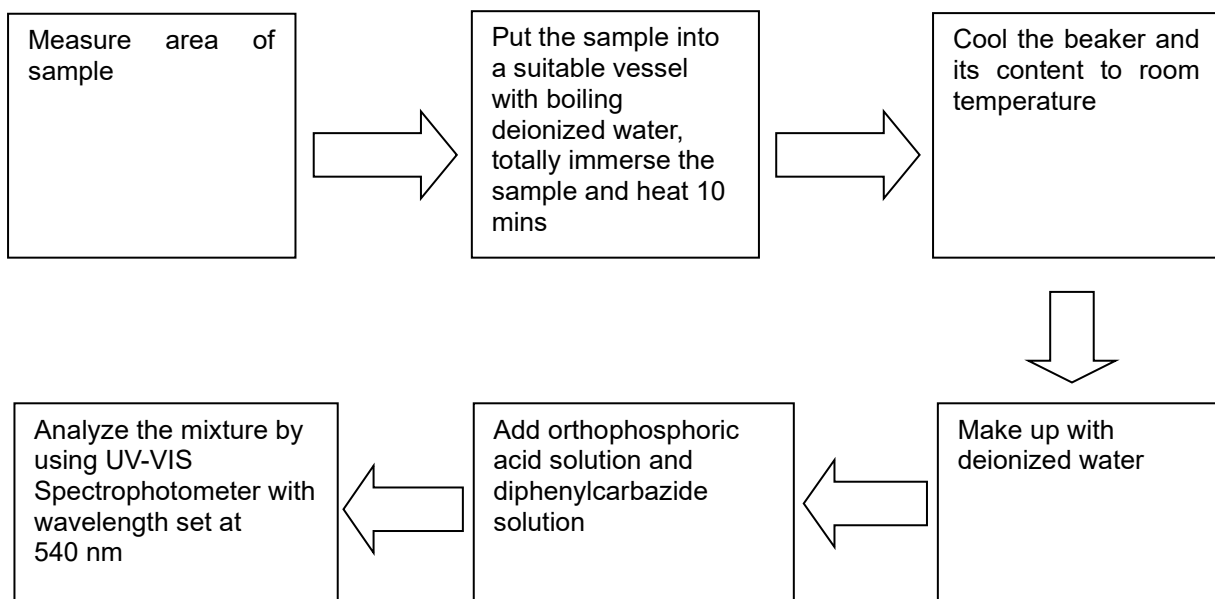
Soluble polymers:



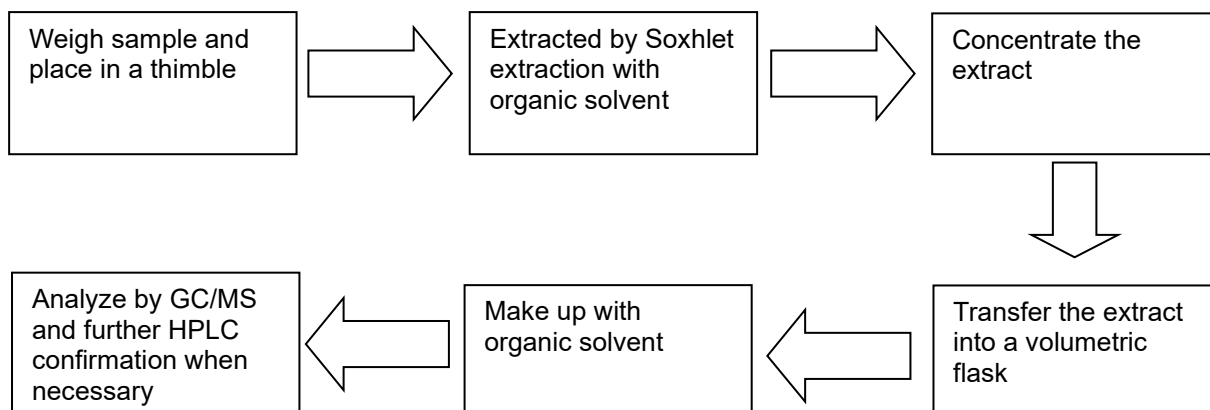
Insoluble/unknown polymers and electronics without Sb:



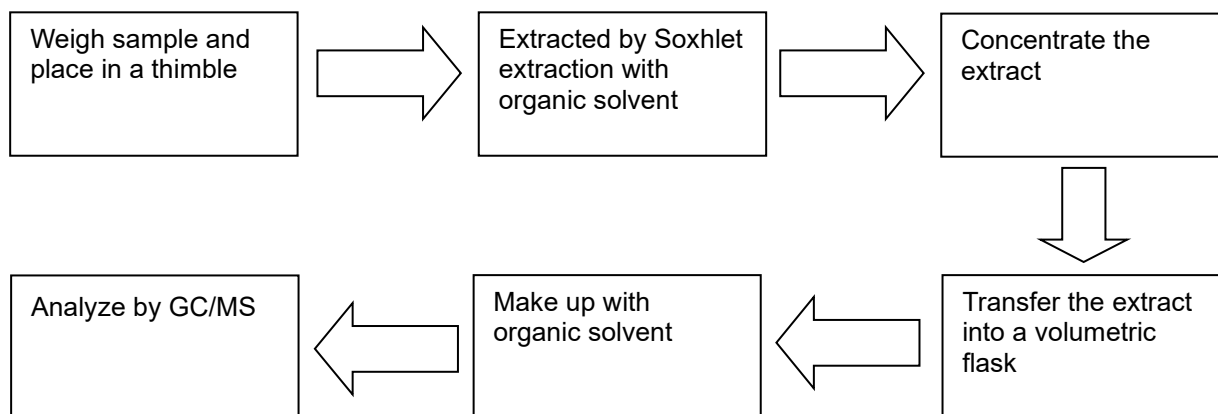
4. Test for Chromium (VI) (Cr^{6+}) Content (Boiling Water Extraction)



5. Test for PBBs/PBDEs Contents

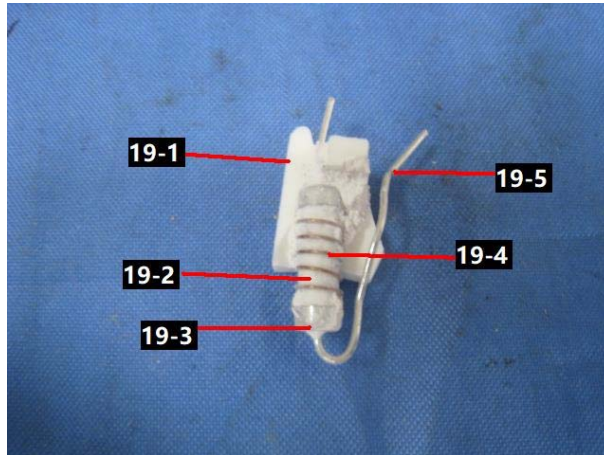


6. Test for Phthalate Contents



Sample photo





End of report

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