

TEST REPORT

The report shall not be reproduced without written approval from Intertek
The results relate only to the item tested.

Number: BKKH19001762

Applicant: CYPRESS SEMICONDUCTOR (THAILAND) LIMITED
229 MOO 4, CHANGWATTANA ROAD, PAKKRED,
NONTHABURI 11120 THAILAND
ATTN: K.SOMBOON

Date: Feb 13, 2019

Sample Submitted:

Quantity of sample: One (1) bag
Sample description: Plated film
Date sample received: February 07, 2019

Client Information:

Item Name: Plated Film
Item No.: mc5



Test conducted:

As requested by the applicant, for details please refer to attached page(s)
Type of test: RoHS wet chemical analysis

For and on behalf of :
Intertek Testing Services (Thailand) Ltd.,
Hardlines Laboratory

Ladtaka Wongwiboonporn

Ladtaka Wongwiboonporn
Laboratory Manager
Hardlines Department



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Test conducted:

(A) Test Result Summary:

Testing item	Result	LOD	LOQ
	Submitted samples		
Lead (Pb) Content (mg/kg)	82,280*	2	13
Cadmium (Cd) Content (mg/kg)	ND	1	5
Mercury (Hg) Content (mg/kg)	ND	3	13
Chromium (VI) (Cr ⁶⁺) Content (mg/kg)	ND	1	10
Polybrominated Biphenyls (PBBs) (mg/kg)			
Monobromobiphenyl (MonoBB)	ND	1	5
Dibromobiphenyl (DiBB)	ND	1	5
Tribromobiphenyl (TriBB)	ND	1	5
Tetrabromobiphenyl (TetraBB)	ND	1	5
Pentabromobiphenyl (PentaBB)	ND	1	5
Hexabromobiphenyl (HexaBB)	ND	1	5
Heptabromobiphenyl (HeptaBB)	ND	1	5
Octabromobiphenyl (OctaBB)	ND	1	5
Nonabromobiphenyl (NonaBB)	ND	1	5
Decabromobiphenyl (DecaBB)	ND	1	5
Sum. of Polybrominated Biphenyls (PBBs) (mg/kg)	ND	1	5
Polybrominated Diphenyl Ethers (PBDEs) (mg/kg)			
Monobromodiphenyl Ether (MonoBDE)	ND	1	5
Dibromodiphenyl Ether (DiBDE)	ND	1	5
Tribromodiphenyl Ether (TriBDE)	ND	1	5
Tetrabromodiphenyl Ether (TetraBDE)	ND	1	5
Pentabromodiphenyl Ether (PentaBDE)	ND	1	5
Hexabromodiphenyl Ether (HexaBDE)	ND	1	5
Heptabromodiphenyl Ether (HeptaBDE)	ND	1	5
Octabromodiphenyl Ether (OctaBDE)	ND	1	5
Nonabromodiphenyl Ether (NonaBDE)	ND	1	5
Decabromodiphenyl Ether (DecaBDE)	ND	1	5
Sum. of Polybrominated Diphenyl Ethers (PBDEs) (mg/kg)	ND	1	5
Phthalate Content (mg/kg)			
Diethyl hexyl phthalate (DEHP)	ND	15	25
Benzyl butyl phthalate (BBP)	ND	15	25
Dibutyl phthalate (DBP)	ND	15	25
Di-isobutyl phthalate (DIBP)	ND	15	25
Antimony (Sb) Content (mg/kg)	<13	-	13

Remark: mg/kg = Milligram per kilogram based on weight of sample = ppm
 LOD = Limit of detection
 LOQ = Limit of quantitation
 ND = Not detected (Less than LOD)
 < = Less than
 * = Fail Item

Tested component: Plated Film

Testing period: February 07, 2019 to February 13, 2019



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(B) RoHS Requirement:

Restricted substances	Limits
Lead (Pb)	0.1% (1000 mg/kg)
Cadmium (Cd)	0.01% (100 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)
Diethyl hexyl phthalate (DEHP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Di-isobutyl phthalate (DIBP)	0.1% (1000 mg/kg)

The above limits were quoted from RoHS Directive (EU) 2015/863 for homogeneous material.

(C) Test method:

Testing item	Testing method
Lead (Pb) Content	With reference to IEC 62321-5 Edition 1.0 : 2013, by microwave digestion and determined by ICP-OES
Cadmium (Cd) Content	With reference to IEC 62321-5 Edition 1.0 : 2013, by microwave digestion and determined by ICP-OES
Mercury (Hg) Content	With reference to IEC 62321-4 Edition 1.0 : 2013, by microwave digestion and determined by ICP-OES
Chromium (VI) (Cr ⁶⁺) Content	With reference to IEC 62321-7-2 Edition 1.0 : 2017, by digestion solution and determined by UV-VIS spectrophotometer
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
Phthalate Content	With reference to IEC 62321-8 Edition 1.0 : 2017, by solvent extraction and determined by GC/MS
Antimony (Sb) Content	In-house method based on USEPA 3052:1996, by microwave digestion and determined by ICP-OES



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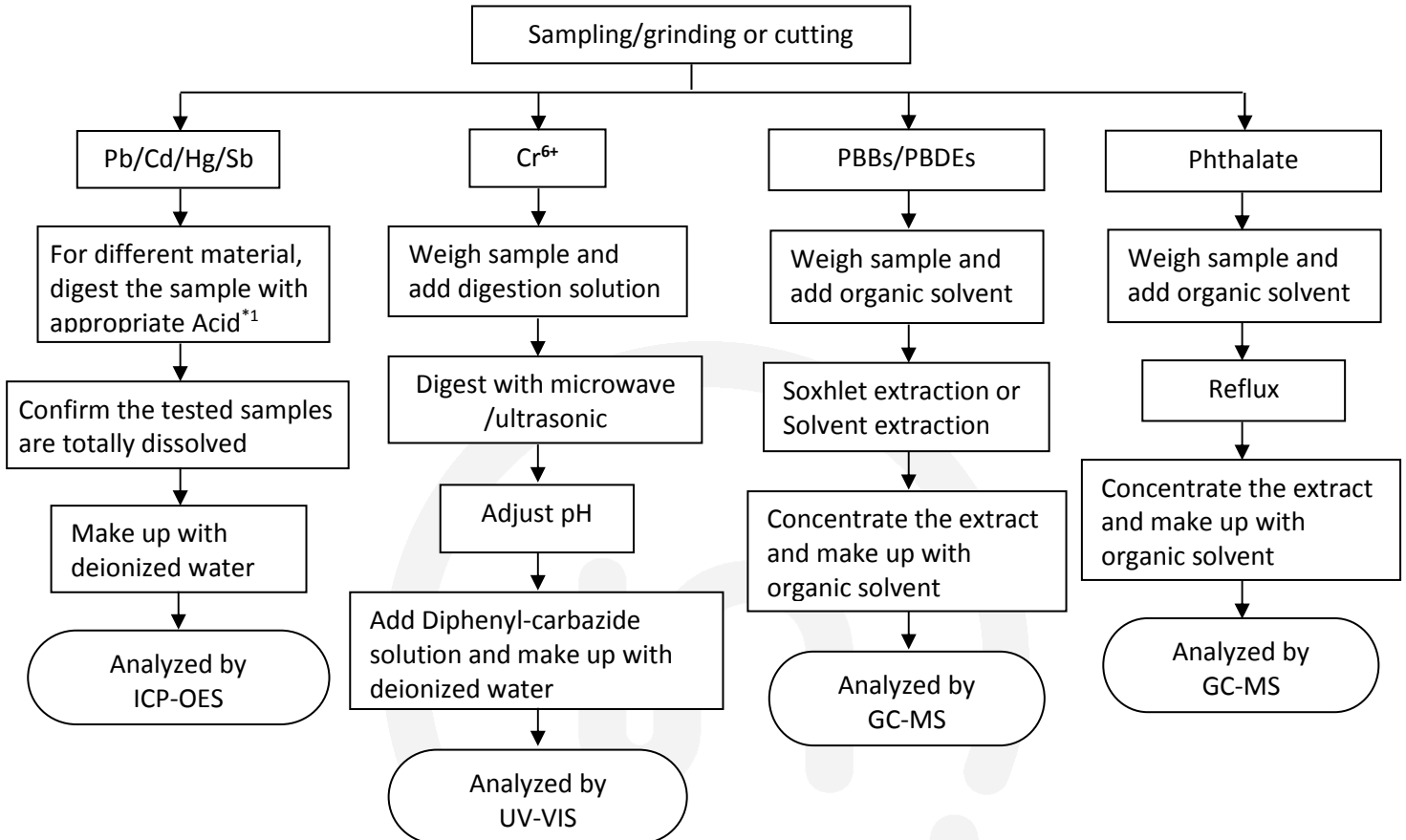
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Test conducted:

(D) Measurement Flowchart

Test for Pb/Cd/Hg/Chromium (VI)/PBBs/PBDEs/Phthalate/Sb Contents



Remark:

*1: List of appropriate Acid:

Material	Acid added for digestion
Polymers	HNO ₃ , HCl

***** E N D *****/NS

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