

# Test Report

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Date : 2018/07/27

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SUMITOMO BAKELITE SINGAPORE PTE CO., LTD.  
NO. 1 SENOKO SOUTH ROAD, SINGAPORE 758069

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

Sample Description : EPOXY MOLDING COMPOUND  
Style/Item No. : EME-G760 TYPE L  
Sample Receiving Date : 2018/07/23  
Testing Period : 2018/07/23 TO 2018/07/27  
Sample Submitted By : SUMITOMO BAKELITE SINGAPORE PTE CO., LTD.

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**Test Requested** :

- (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample.
- (2) Please refer to next pages for the other item(s).

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

**Conclusion** :

- (1) Based on the performed tests on submitted samples, the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS and amending Directive (EU) 2015/863.

  
  
Ray Chang Ph.D. Manager - tech  
Signed for and on behalf of  
SGS Taiwan Limited

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SUMITOMO BAKELITE SINGAPORE PTE CO., LTD.  
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PART NAME No.1 : BLACK EPOXY MOLDING COMPOUND

Test Item(s)	Unit	Method	MDL	Result	Limit
				No.1	
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n.d.	1000
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321-7-2:2017 and performed by UV-VIS.	8	n.d.	1000
<b>Sum of PBBs</b>	mg/kg	With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.	1000
Monobromobiphenyl	mg/kg		5	n.d.	-
Dibromobiphenyl	mg/kg		5	n.d.	-
Tribromobiphenyl	mg/kg		5	n.d.	-
Tetrabromobiphenyl	mg/kg		5	n.d.	-
Pentabromobiphenyl	mg/kg		5	n.d.	-
Hexabromobiphenyl	mg/kg		5	n.d.	-
Heptabromobiphenyl	mg/kg		5	n.d.	-
Octabromobiphenyl	mg/kg		5	n.d.	-
Nonabromobiphenyl	mg/kg		5	n.d.	-
Decabromobiphenyl	mg/kg		5	n.d.	-
<b>Sum of PBDEs</b>	mg/kg		With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.
Monobromodiphenyl ether	mg/kg	5		n.d.	-
Dibromodiphenyl ether	mg/kg	5		n.d.	-
Tribromodiphenyl ether	mg/kg	5		n.d.	-
Tetrabromodiphenyl ether	mg/kg	5		n.d.	-
Pentabromodiphenyl ether	mg/kg	5		n.d.	-
Hexabromodiphenyl ether	mg/kg	5		n.d.	-
Heptabromodiphenyl ether	mg/kg	5		n.d.	-
Octabromodiphenyl ether	mg/kg	5		n.d.	-
Nonabromodiphenyl ether	mg/kg	5		n.d.	-
Decabromodiphenyl ether	mg/kg	5	n.d.	-	

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Test Item(s)	Unit	Method	MDL	Result	Limit
				No.1	
Antimony (Sb)	mg/kg	With reference to US EPA Method 3052 for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.	-
Beryllium (Be)	mg/kg	With reference to US EPA Method 3052 for Beryllium Content. Analysis was performed by ICP-AES.	2	n.d.	-
Arsenic (As)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-AES.	2	n.d.	-
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified ( $\alpha$ - HBCDD, $\beta$ - HBCDD, $\gamma$ - HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	With reference to IEC 62321: 2008 method. Analysis was performed by GC/MS.	5	n.d.	-
Perfluorooctane sulfonates (PFOS)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
<b>Halogen</b>					
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	72.6	-
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.	-
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.	-

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Test Item(s)	Unit	Method	MDL	Result	Limit
				No.1	
<b>Phthalates</b>					
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.	1000
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.	1000
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.	1000
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg		50	n.d.	-
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg		50	n.d.	-
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n.d.	-

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## Note :

1. mg/kg = ppm : 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. This is the additional test report of KA/2018/71702 which was issued on 2018/07/27. Please refer to KA/2018/71702 for original information.

## PFOS Reference Information : POPs - (EU) 757/2010

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m<sup>2</sup>.

PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.

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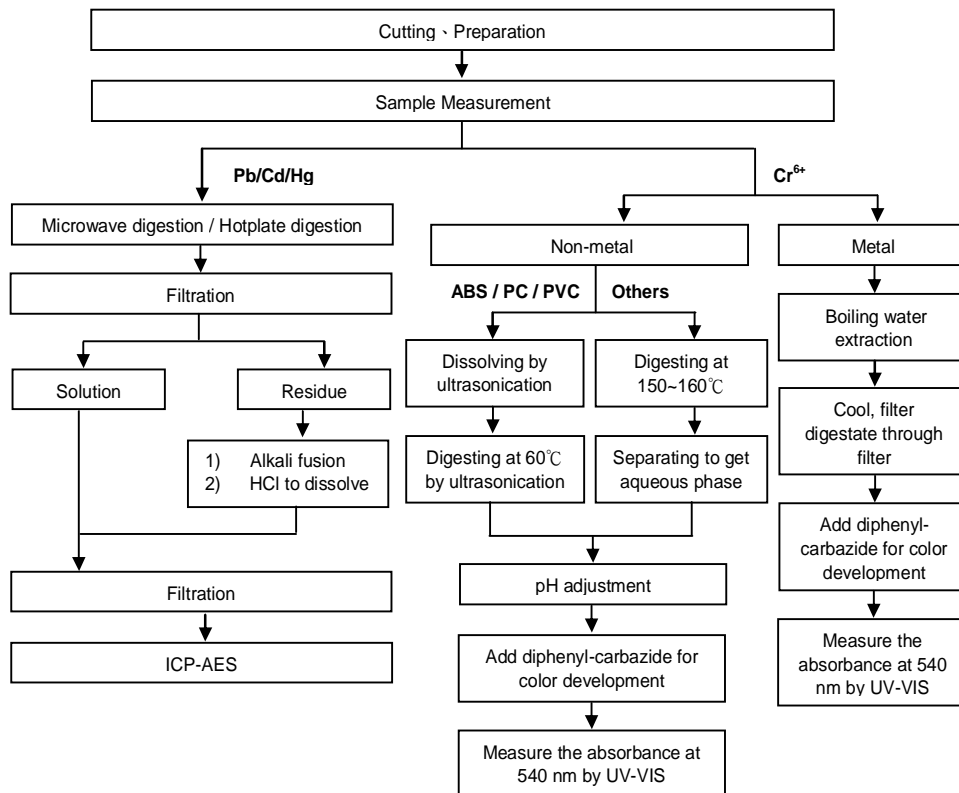
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## Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)

- Technician : Jony Liu
- Supervisor: Ray Chang



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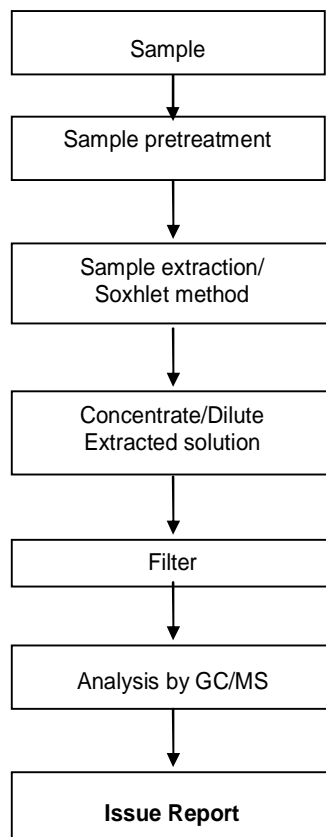
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## PBB/PBDE analytical FLOW CHART

1) Name of the person who made measurement: Dorothy Chen

2) Name of the person in charge of measurement: Ray Chang



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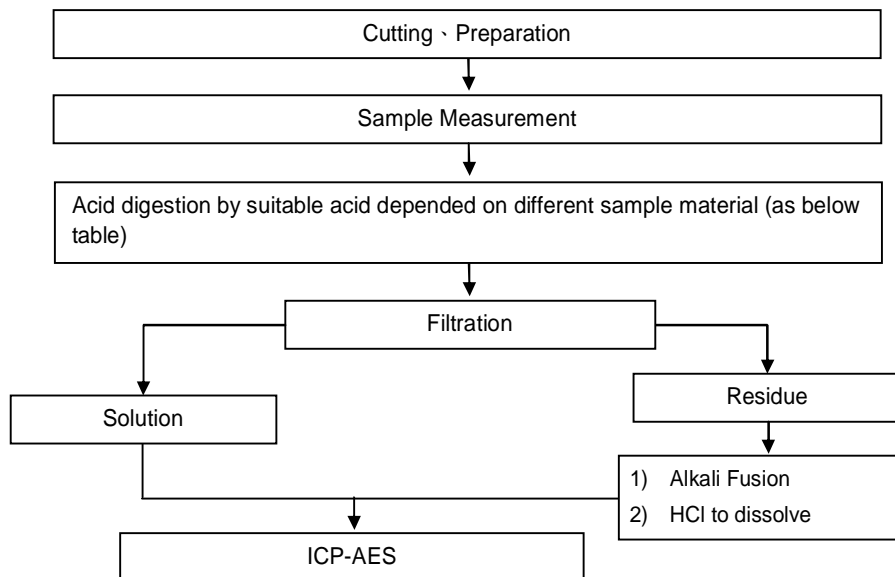
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- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) Name of the person who made measurement: Jony Liu
- 3) Name of the person in charge of measurement: Ray Chang

## Flow Chart of digestion for the elements analysis performed by ICP-AES



Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion



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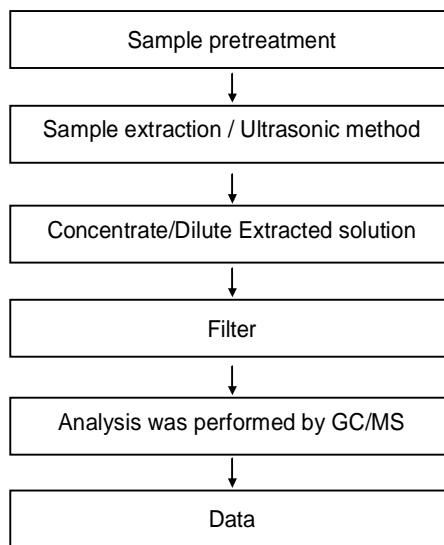
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## HBCDD analytical flow chart

- 1) Name of the person who made measurement: Dorothy Chen
- 2) Name of the person in charge of measurement: Ray Chang



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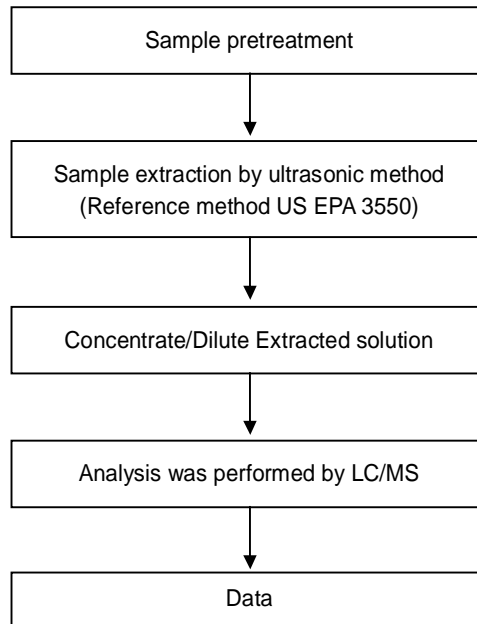
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## Analytical flow chart of PFOA/PFOS content

- 1) Name of the person who made measurement: Ginny Huang
- 2) Name of the person in charge of measurement: Ray Chang



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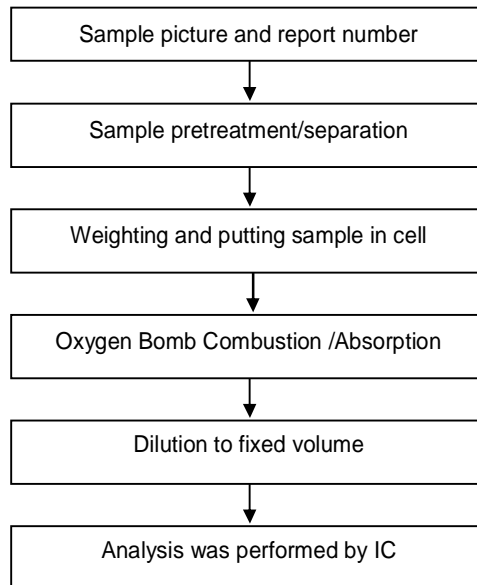
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## Analytical flow chart of halogen content

- 1) Name of the person who made measurement: Jean Hung
- 2) Name of the person in charge of measurement: Ray Chang



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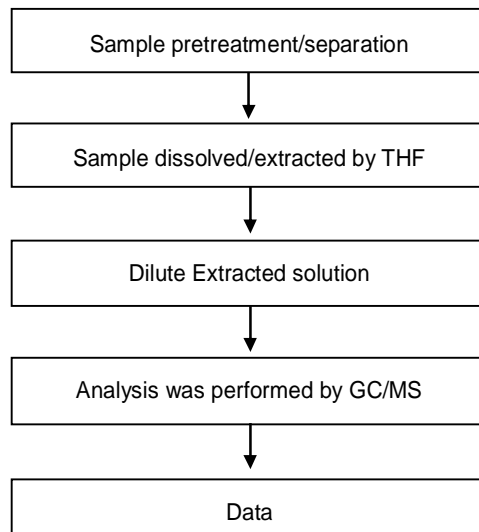
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## Analytical flow chart of phthalate content

- Name of the person who made measurement: Dorothy Chen
- Name of the person in charge of measurement: Ray Chang

**【Test method: IEC 62321-8】**



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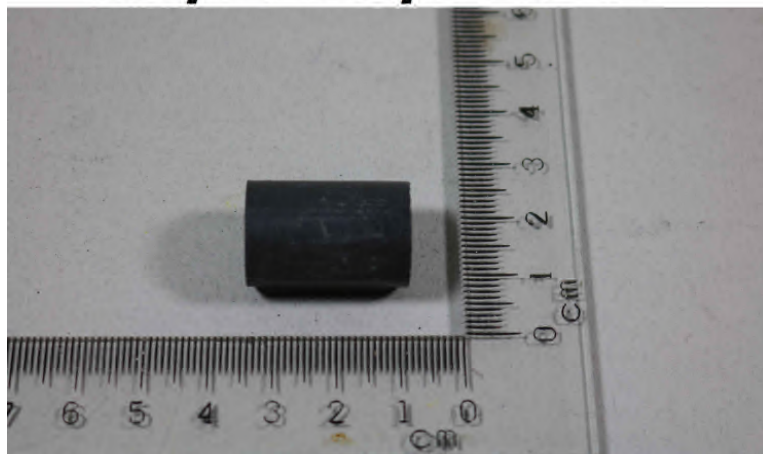
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\* The tested sample / part is marked by an arrow if it's shown on the photo. \*

## KA/2018/71702



\*\* End of Report \*\*