

Test Report

No. : CE/2016/43921

Date : 2016/04/22

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MITSUI CHEMICALS TOHCELLO, INC.

7, KANDA MITOSHIRO-CHO, CHIYODA-KU, TOKYO 101-8485 JAPAN



The following samples was/were submitted and identified by/on behalf of the applicant as :

Sample Description : OPULENT MULTI-LAYERED FILM (TPX FILM)
 Style/Item No. : CR2040R
 Sample Receiving Date : 2016/04/20
 Testing Period : 2016/04/20 TO 2016/04/22

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).


Troy Chang, Manager – Tech
 Signed for and on behalf of
SGS TAIWAN LTD.
 Chemical Laboratory – Taipei

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Test Result(s)

PART NAME No.1 : TRANSPARENT PLASTIC FILM

Test Item(s)	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321 (2008) and performed by UV-VIS.	2	n.d.
Antimony (Sb)	mg/kg	With reference to US EPA 3050B (1996). Analysis was performed by ICP-AES.	2	n.d.
Phosphorus (P)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	With reference to IEC 62321-8/CD (2013). Analysis was performed by GC/MS.	50	n.d.
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.
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.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.
DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg		50	n.d.

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Test Item(s)	Unit	Method	MDL	Result No.1
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - 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). Analysis was performed by GC/MS.	5	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
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.
Sum of PBDEs	mg/kg		-	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
				No.1
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582 (2007). Analysis was performed by IC.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
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.

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated

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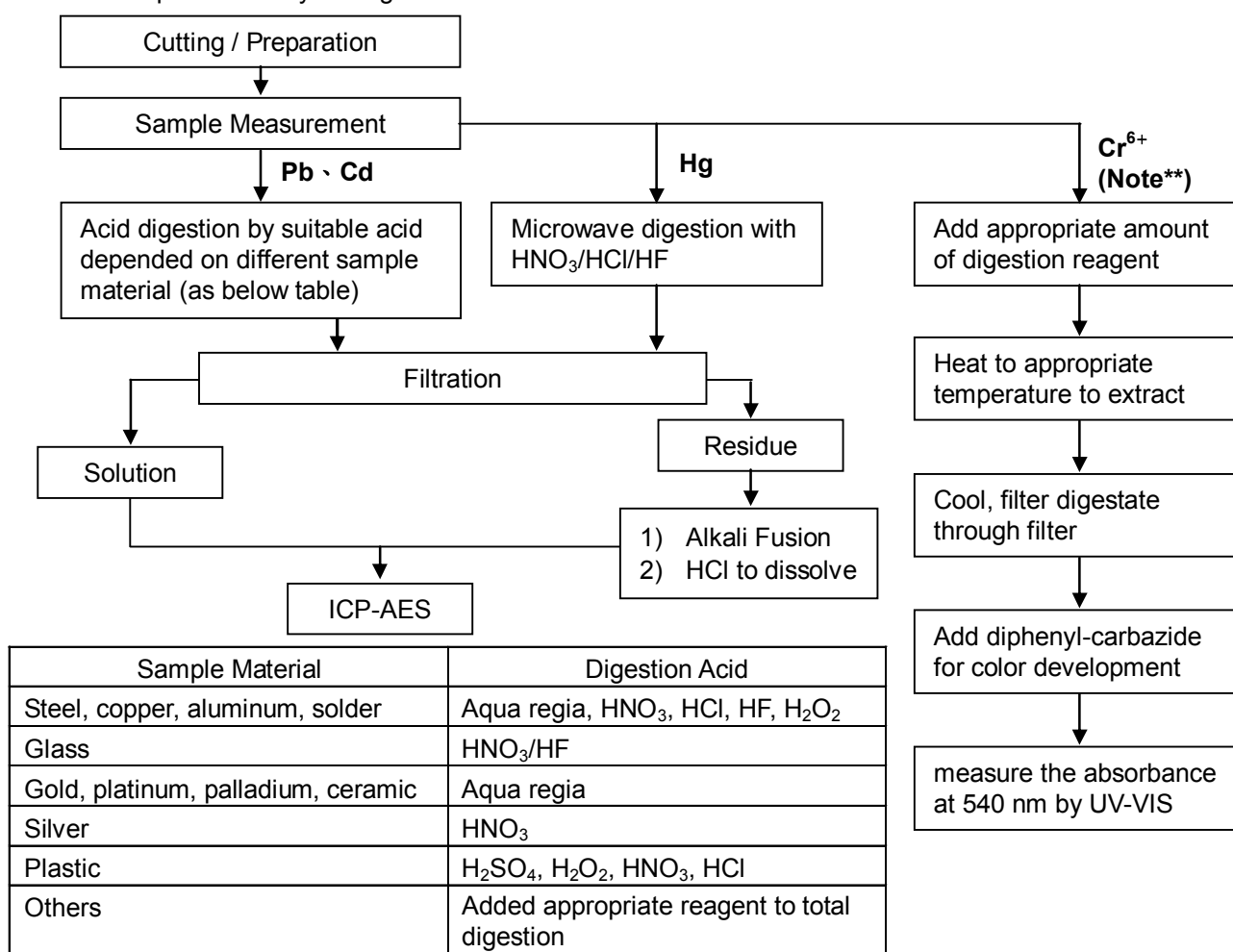


These samples were dissolved totally by pre-conditioning method according to below flow chart.

(Cr⁶⁺ test method excluded)

■ Technician: Climbgreat Yang

■ Supervisor: Troy Chang



Note** (For IEC 62321)

- (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95°C.
- (2) For metallic material, add pure water and heat to boiling.

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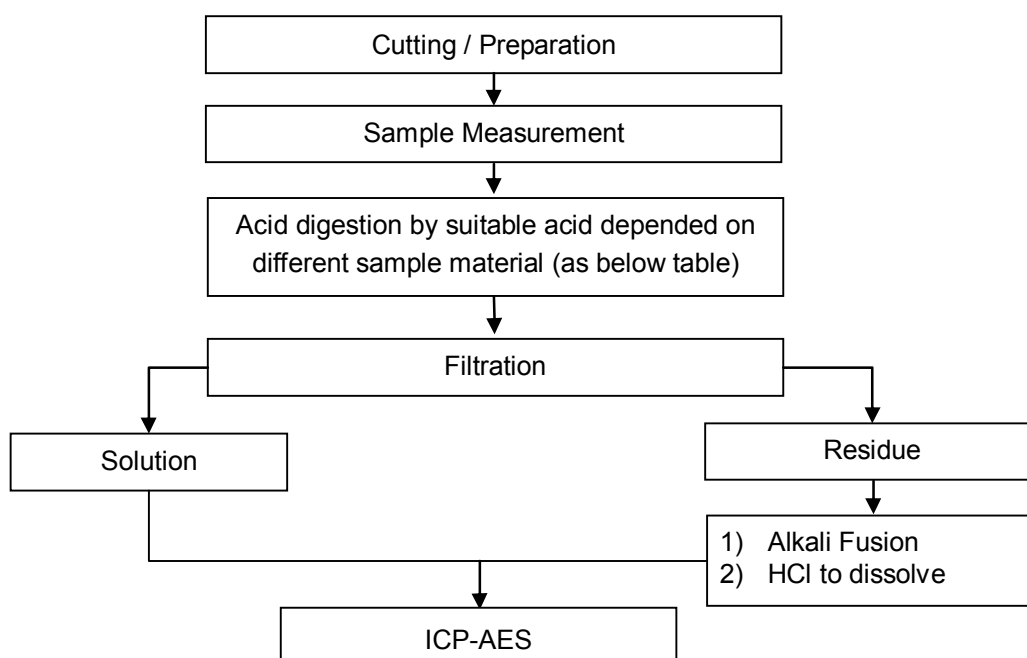
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These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Climbgreat Yang
- Supervisor: Troy Chang

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



Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
Glass	HNO ₃ /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
Others	Added appropriate reagent to total digestion

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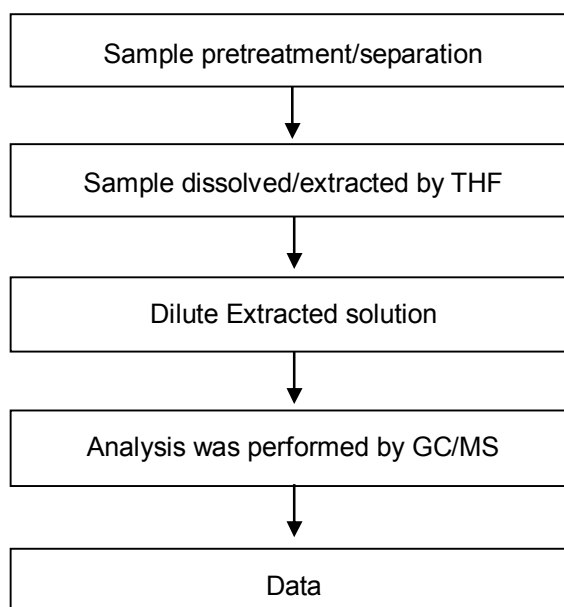
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Analytical flow chart - Phthalate

- Technician: Andy Shu
- Supervisor: Troy Chang

【Test method: IEC 62321-8】



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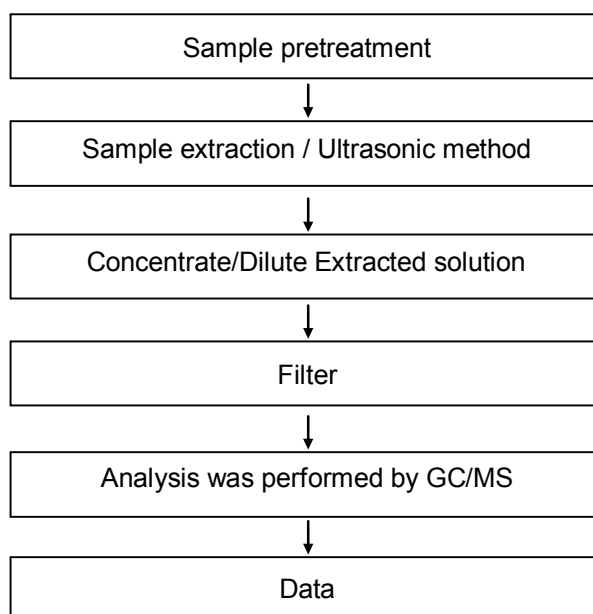
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Analytical flow chart - HBCDD

- Technician: Roman Wong
- Supervisor: Troy Chang



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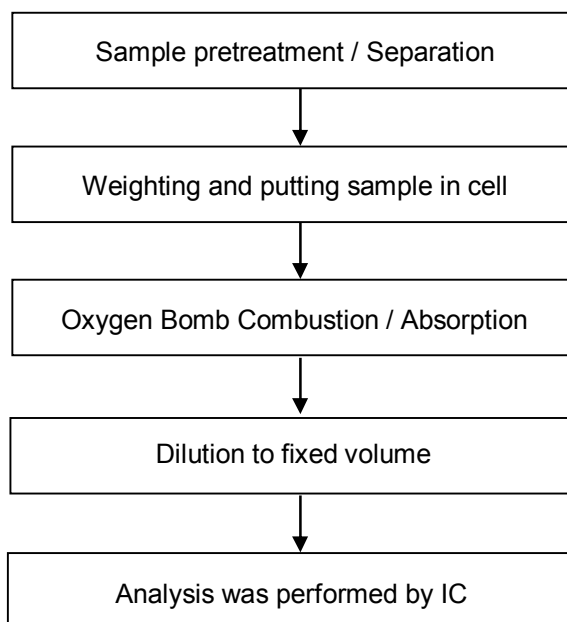
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Analytical flow chart - Halogen

- Technician: Rita Chen
- Supervisor: Troy Chang



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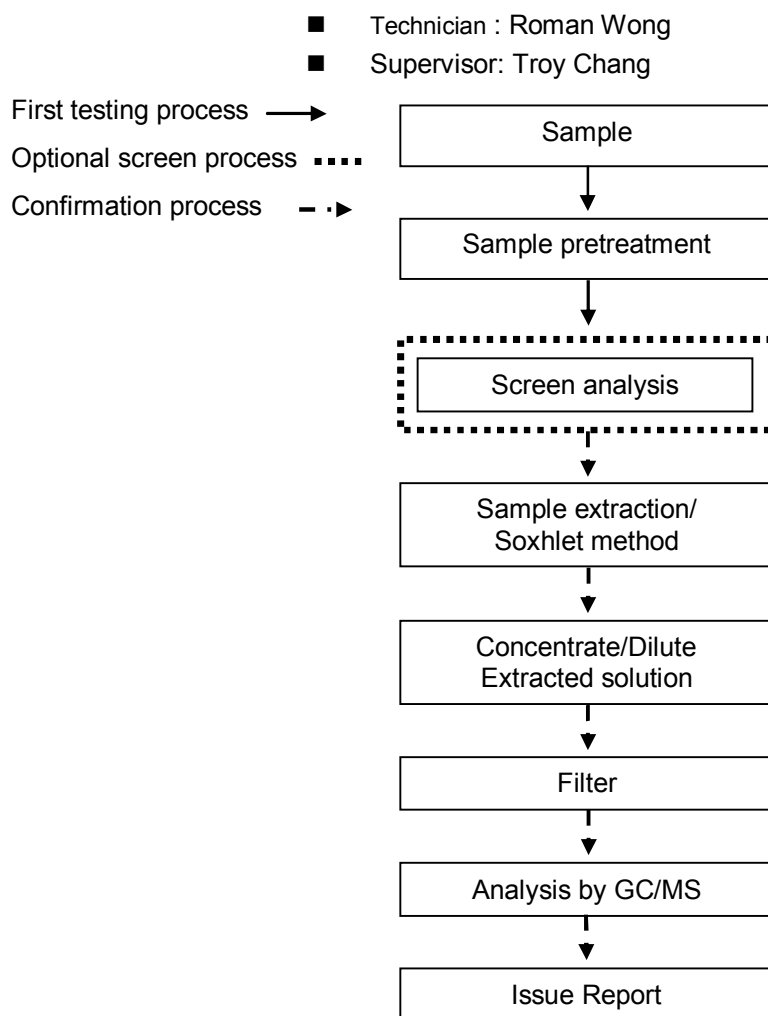
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Analytical flow chart - PBB/PBDE



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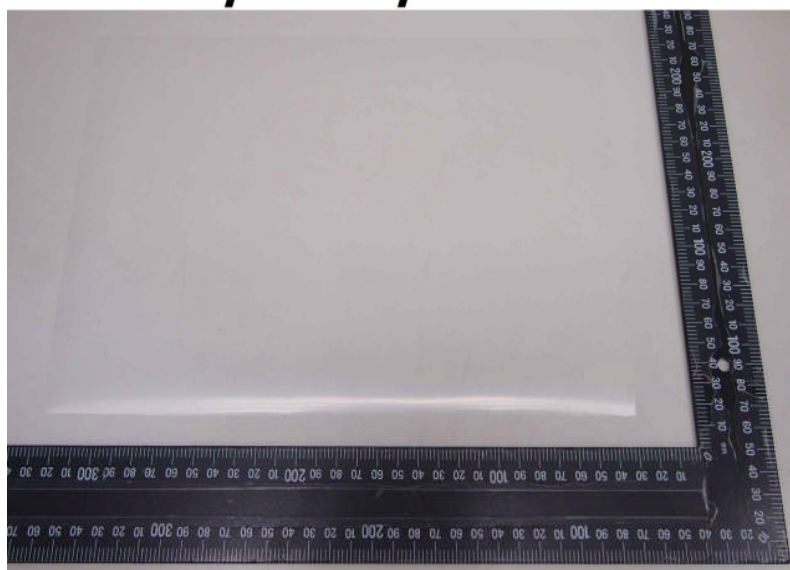
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

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** End of Report **

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