

ICP Test Report Certification Packet

Company name:	Littelfuse, Inc.
Product Series:	TVS Array for ESD Protection
Product #:	SP3003-02UTG
Issue Date:	May 29, 2013
Directive 2002/95/EC)-refor packing/packaging m In addition, it is hereby refor unit parts, the packing	Littelfuse, Inc. that there is neither RoHS (2011/65/EU – recast of Extricted substance nor such use, for materials to be used for unit part laterials, and for additives and the like in the manufacturing processes. eported to you that the parts and sub-materials, the materials to be used/packaging materials, and the additives and the like in the manufacturing osed of the following components.
	Issued by: JENNY DINGLASAN <global ehs="" specialist=""></global>
(1) Parts, sub-materials This document manufactured by I < Raw Materials Please see Ta	covers the SP3003-02UTG RoHS-Compliant series produc Littelfuse, Inc.
	measurable substances propriate pages as identifed in Table 1
Remarks : .	



Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material Part Number	Raw Material Description	Page(s)
1	CEL-9220HF	Molding Compound	3-19
2	A194	Leadframe	20-45
3	N/A	Au Bonding Wire	46-58
4	N/A	Ni-Pd-Au plating	59-94
5	8006NS	Ероху	95-104
6	N/A	IC Wafer	105-111



No.: CE/2013/41591 Date: 2013/04/22 Page: 1 of 8

HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN MANUAL CARACTERISTICS OF THE RESIDENCE

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

Sample Description

: EPOXY MOLDING COMPOUND

Style/Item No.

: CEL-9220HF

Sample Receiving Date

: 2013/04/09

Testing Period

: 2013/04/09 TO 2013/04/22

Test Result(s)

: Please refer to next page(s).





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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN

Test Result(s)

PART NAME No.1

: DARK GRAY LUMP

The second second	100000	88-45-44	MDL	Result	
Test Item(s)	Unit	Method		No.1	
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 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 Method 3052. Analysis was performed by ICP- AES.	2	n.d.	
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 (CI) (CAS No.: 22537-15-1)	mg/kg		50	n.d.	
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.	
Halogen-lodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.	
Sum of PBBs	mg/kg		-	n.d.	
Monobromobiphenyl	mg/kg		5	n.d.	
Dibromobiphenyl	mg/kg	performed by ICP-AES. /kg With reference to IEC 62321: 2008 and performed by ICP-AES. /kg With reference to IEC 62321: 2008 and performed by ICP-AES. /kg With reference to IEC 62321: 2008 and performed by UV-VIS. /kg With reference to US EPA Method 3052. Analysis was performed by ICP-AES. /kg With reference to BS EN 14582:2007. Analysis was performed by IC. /kg With reference to BS EN 14582:2007. Analysis was performed by IC. /kg With reference to IEC 62321: 2008 and performed by ICS. /kg IVIT Reference to IEC 62321: 2008 and performed by ICS. /kg IVIT Reference to IEC 62321: 2008 and performed by ICS. /kg IVIT Reference to IEC 62321: 2008 and performed by ICS. /kg IVIT Reference to IEC 62321: 2008 and performed by ICS.	5	n.d.	
Tribromobiphenyl	mg/kg		5	n.d.	
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321, 2009 and	5	n.d.	
Pentabromobiphenyl	mg/kg		5	n.d.	
Hexabromobiphenyl	mg/kg	periorited by control	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.	

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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



Stranger	1		MDL	Result
Test Item(s)	Unit	Method	MIDL	No.1
Sum of PBDEs	mg/kg		-	n.d.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321: 2008 and	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	performed by GC/MS.	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.

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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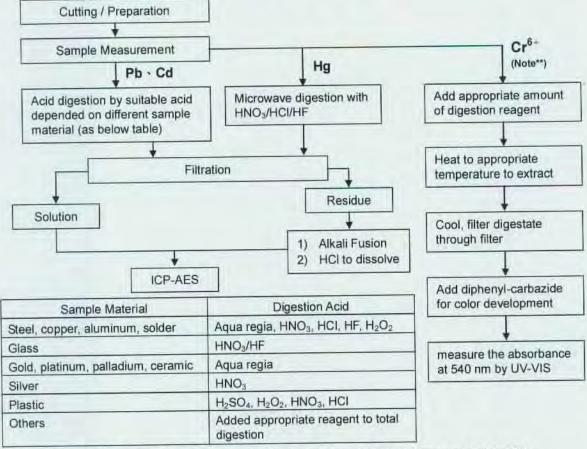


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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr5+ test method excluded)
- Name of the person who made measurement: Climbgreat Yang
- Name of the person in charge of measurement: Troy Chang



Note** : (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95 ℃.

(2) For metallic material, add pure water and heat to boiling.

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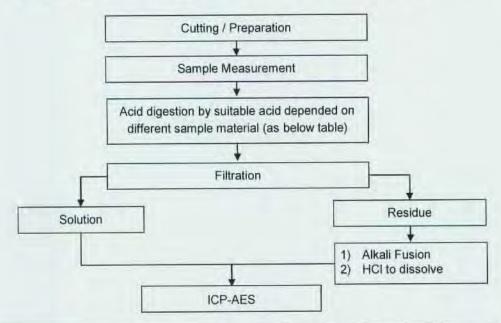
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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



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

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



Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCI, 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 , HCI
Others	Added appropriate reagent to total digestion

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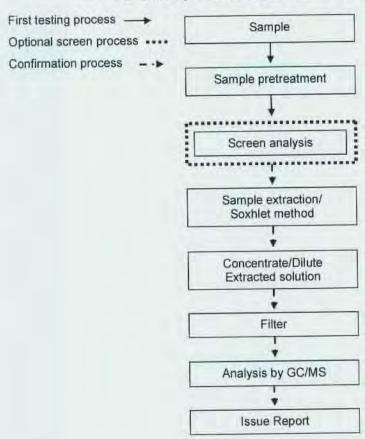
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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



PBB/PBDE analytical FLOW CHART

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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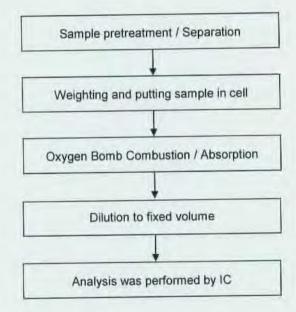
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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



Analytical flow chart of halogen content

- Name of the person who made measurement: Rita Chen
- Name of the person in charge of measurement: Troy Chang



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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



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

CE/2013/41591



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Test Report

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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Description

: EPOXY MOLDING COMPOUND

Style/Item No.
Sample Receiving Date

: CEL-9220HF : 2013/04/09

Testing Period

: 2013/04/09 TO 2013/04/22

Test Result(s)

: Please refer to next page(s).



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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN

Test Result(s)

PART NAME No.1

: DARK GRAY LUMP

W - 1/2	11 11	Method	MDL	Result	
Test Item(s)	Unit	Method	MDL	No.1	
Perfluorooctane sulfonates PFOS-Acid, Metal Salt, Amide)	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.	
PVC	##	Analysis was performed by FTIR and FLAME Test.	-	Negative	
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 US EPA 3540C method. Analysis was performed by GC/MS.	5	n.d.	
BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	
DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	
DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	

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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



Test Item(s)	Unit	Method	MDL	Result No.1
Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7)	mg/kg	With reference to Global SOP RSTS- E&E-121. Analysis was performed by LC/MS.	10	n.d.

Note:

1. mg/kg = ppm : 0.1wt% = 1000ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. " - " = Not Regulated

5. ** = Qualitative analysis (No Unit)

6. Negative = Undetectable / Positive = Detectable

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/m².

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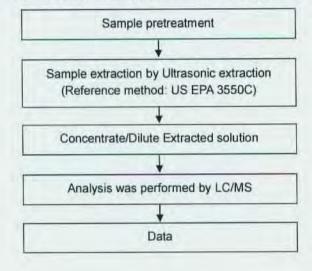
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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



PFOA/PFOS analytical flow chart of Ultrasonic extraction (LC/MS) procedure

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang





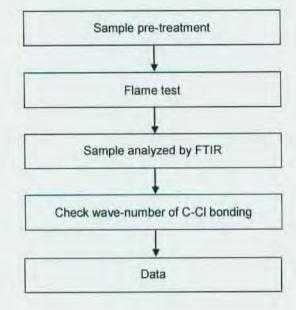
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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



Analysis flow chart for determination of PVC in material

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang



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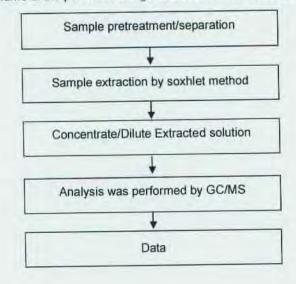


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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN

HBCDD analytical flow chart

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



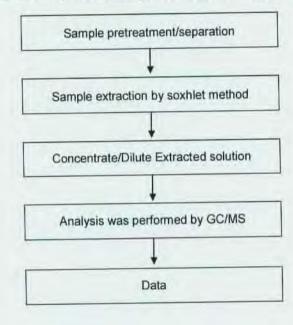


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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN

Analytical flow chart of phthalate content

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



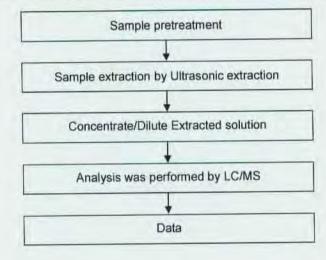


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HITACHI CHEMICAL CO., LTD. 1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN

TBBP-A analytical flow chart

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang



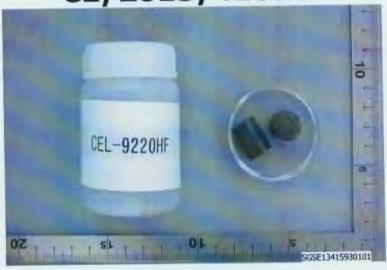


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* The tested sample / part is marked by an arrow if it's shown on the photo. *

CE/2013/41593



** End of Report **

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No.: CE/2012/73176 Date: 2012/07/26 Page : 1 of 26

SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



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

: AYAU12-03482 (ONE SAMPLE OF LEAD FRAME) Sample Description

Style/Item No. : C7025-UPG RT Order No. : LF_RoHS_1206-003 Material : METAL ALLOY

Sample Receiving Date : 2012/07/16

Testing Period : 2012/07/16 TO 2012/07/26

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





No.: CE/2012/73176 Date: 2012/07/26 Page : 2 of 26

SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Result(s)

PART NAME No.1

: ONE SIDE:SILVER COLORED / ANOTHER SIDE:SILVER-GRAY METAL

SHEET

Test Item(s)	Unit	Method	MDL	Result
SECTION SECTIO			WIDL	No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	16
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)	**	With reference to IEC 62321: 2008 and performed by Boiling water extraction Method.#	#	Negative
Antimony (Sb)	mg/kg	With reference to US EPA Method 3050B for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.
Beryllium (Be)	mg/kg	With reference to US EPA Method 3050B for Beryllium Content. Analysis was performed by ICP-AES.	2	n.d.
Polychlorinated Biphenyls (PCBs) (CAS No.: 1336-36-3)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	0.5	n.d.
Polychlorinated Terphenyls (PCTs)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	0.5	n.d.
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	100	n.d.
Polychlorinated Naphthalene (PCNs)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	5	n.d.
Bromomethane (CAS No.: 74-83-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Bromochloromethane (CAS No.: 74- 97-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Sulfur Hexafluoride (SF6) (CAS No.: 2551-62-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Perfluorooctane sulfonates (PFOS- Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3540C: 1996. Analysis was performed by LC/MS.	10	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result No.1
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3540C: 1996. Analysis was performed by LC/MS.	10	n.d.
2- (3,5-di-tert-butyl-2- hydroxyphenyl)-2H-benzotriazole (CAS No.: 3846-71-7)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	5	n.d.
PVC	**	Analysis was performed by FTIR and FLAME Test.	4	Negative
Organic-tin compounds				
Tributyl Tin (TBT)	mg/kg		0.03	
Triphenyl Tin (TphT)	mg/kg	With reference to DIN 38407-13. Analysis was performed by GC/FPD.	0.03	n.d.
Tributyl Tin Oxide (TBTO)*** (CAS No.: 56-35-9)	mg/kg		-	n.d.
Sum of PBBs	mg/kg			nd
Monobromobiphenyl	mg/kg		5	n.d.
Dibromobiphenyl	mg/kg		5	n.d.
Tribromobiphenyl	mg/kg		5	n.d.
Tetrabromobiphenyl	mg/kg	1	5	n.d.
Pentabromobiphenyl	mg/kg	1	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	With reference to IEC 62321: 2008 and	5	
Sum of PBDEs	mg/kg	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.
etrabromodiphenyl ether	mg/kg		5	n.d.
Pentabromodiphenyl ether	mg/kg	-	5	n.d.
dexabromodiphenyl ether	mg/kg	+	5	n.d.
Heptabromodiphenyl ether	mg/kg		5	n.d.
Octabromodiphenyl ether	mg/kg	-	5	n.d.
Vonabromodiphenyl ether	mg/kg		5	n.d.
Decabromodiphenyl ether	mg/kg		5	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result
Asbestos				No.1
Actinolite (CAS No.: 77536-66-4)	%		-	110
Amosite (CAS No.: 12172-73-5)	%		1	Negative
Anthophyllite (CAS No.: 77536-67-5)	%	With reference to EPA 600/R-93/116 method.	1	Negative
Chrysotile (CAS No.: 12001-29-5)	%	Analysis was performed by SM, PLM and	1	Negative
Crocidolite (CAS No.: 12001-28-4)	%	XRD.		Negative
Tremolite (CAS No.: 77536-68-6)	%	-	1	Negative
AZO	70		1	Negative
1): 4-AMINODIPHENYL (CAS No.: 92-67-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
2): BENZIDINE (CAS No.: 92-87-5)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
3): 4-CHLORO-O-TOLUIDINE (CAS No.: 95-69-2)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
4): 2-NAPHTHYLAMINE (CAS No.: 91-59-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
5): O-AMINOAZOTOLUENE (CAS No.: 97-56-3)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
6): 2-AMINO-4-NITROTOLUENE (CAS No.: 99-55-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
7): P-CHLOROANILINE (CAS No.: 106-47-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
8): 2,4-DIAMINOANISOLE (CAS No.: 615-05-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
9): 4,4'- DIAMINODIPHENYLMETHANE CAS No.: 101-77-9)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
0): 3,3'-DICHLOROBENZIDINE CAS No.: 91-94-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
1): 3,3'-DIMETHOXYBENZIDINE CAS No.: 119-90-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
2): 3,3'-DIMETHYLBENZIDINE CAS No.: 119-93-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
3): 3,3'-DIMETHYL-4,4'- DIAMINODIPHENYLMETHANE CAS No.: 838-88-0)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.



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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result
14), D ODECIDINE (O METUO)			WIDL	No.1
14): P-CRESIDINE (2-METHOXY-5- METHYLANILINE) (CAS No.: 120- 71-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
15): 4,4'-METHYLENE-BIS- (2- CHLOROANILINE) (CAS No.: 101- 14-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
16): 4,4'-OXYDIANILINE (CAS No.: 101-80-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
17): 4,4'-THIODIANILINE (CAS No.: 139-65-1)	mg/kg	With reference to LFGB 82,02-2. Analysis was performed by GC/MS.	3	n.d.
18): O-TOLUIDINE (CAS No.: 95-53- 4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
19): 2,4-TOLUYLENEDIAMINE (CAS No.: 95-80-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
20): 2,4,5-TRIMETHYLANILINE (CAS No.: 137-17-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
21): O-ANISIDINE (CAS No.: 90-04- 0)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
22): P-AMINOAZOBENZENE (CAS No.: 60-09-3)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
23): 2,4-XYLIDINE (CAS No.: 95-68- 1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
24): 2,6-XYLIDINE (CAS No.: 87-62- 7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.
falogen		The same of the sa		
Halogen-Fluorine (F) (CAS No.: 4762-94-8)	mg/kg		50	n.d.
dalogen-Chlorine (CI) (CAS No.: 2537-15-1)	mg/kg	With reference to BS EN 11500 cons	50	n.d.
Halogen-Bromine (Br) (CAS No.: 0097-32-2)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
falogen-lodine (I) (CAS No.: 14362- 4-8)	mg/kg		50	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result
CEC's (Chlorofficeron)	10000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	WIDE	No.1
CFC's (Chlorofluorocarbons) Group I				
Chlorofluorocarbon-11 (CAS No.: 75-69-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-12 (CAS No.: 75-71-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-113 (CAS No.: 76-13-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-114 (CAS No.: 76-14-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-115 (CAS No.: 76-15-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Group III				
Chlorofluorocarbon-13 (CAS No.: 75- 72-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-111 (CAS No.: 354-56-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-112 (CAS No.: 76-12-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS	1	n.d.
Chlorofluorocarbon-211 (CAS No.: 122-78-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-212 (CAS No.; 3182-26-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-213 (CAS No.: 2354-06-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-214 (CAS No.: 19255-31-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-215 (CAS No.: 259-43-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-216 (CAS No.: 61-97-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-217 (CAS No.: 22-86-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result No.1
HCFCs (Hydrochlorofluorocarbons)				140.1
HCFC-21 (CAS No.: 75-43-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-22 (CAS No.: 75-45-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-31 (CAS No.: 593-70-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-121 (CAS No.: 354-14-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-122 (CAS No.: 354-21-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-123 (CAS No.: 306-83-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-124 (CAS No.: 2837-89-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-131 (CAS No.: 359-28-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-132b (CAS No.: 1649-08-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-133a (CAS No.: 75-88-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-141b (CAS No.: 1717-00-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
ICFC-142b (CAS No.: 75-68-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CFC-221 (CAS No.: 422-26-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CFC-222 (CAS No.: 422-49-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CFC-223 (CAS No.: 422-52-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CFC-224 (CAS No.: 422-54-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.



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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result No.1
HCFC-225ca (CAS No.: 422-56-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-225cb (CAS No.: 507-55-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-226 (CAS No.: 431-87-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-231 (CAS No.: 421-94-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-232 (CAS No.: 460-89-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-233 (CAS No.: 7125-84-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-234 (CAS No.: 425-94-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-235 (CAS No.: 460-92-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-241 (CAS No.: 666-27-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-242 (CAS No.: 460-63-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-243 (CAS No.: 460-69-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-244	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-251 (CAS No.: 421-41-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
ICFC-252 (CAS No.: 819-00-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CFC-253 (CAS No.: 460-35-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CFC-261 (CAS No.: 420-97-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CFC-262 (CAS No.: 421-02-03)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.



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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result No.1
HCFC-271 (CAS No.: 430-55-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Halons				
Halon-1211 (CAS No.: 353-59-3)	mg/kg		1	2.3
Halon-1301 (CAS No.: 75-63-8)	mg/kg	With reference to US EPA 5021 method.	1	n.d.
Halon-2402 (CAS No.: 124-73-2)	mg/kg	Analysis was performed by GC/MS.	1	n.d.
HBFCs (Hydrobromofluorocarbons)			1	n.d.
HBFC-21B2 (CHFBr2) (CAS No.: 1868-53-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-22B1 (CHF2Br) (CAS No.: 1511-62-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-31B1 (CH2FBr) (CAS No.: 373-52-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-121B4 (C2HFBr4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-122B3 (C2HF2Br3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-123B2 (C2HF3Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-124B1 (C2HF4Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-131B3 (C2H2FBr3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
IBFC-132B2 (C2H2F2Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
BFC-133B1 (C2H2F3Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
BFC-141B2 (C2H3FBr2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
BFC-142B1 (C2H3F2Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
BFC-151B1 (C2H4FBr)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result
LIDEO COLOR			WIDL	No.1
HBFC-221B6 (C3HFBr6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-222B5 (C3HF2Br5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-223B4 (C3HF3Br4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-224B3 (C3HF4Br3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-225B2 (C3HF5Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-226B1 (C3HF6Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-231B5 (C3H2FBr5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-232B4 (C3H2F2Br4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-233B3 (C3H2F3Br3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-234B2 (C3H2F4Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-235B1 (C3H2F5Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-241B4 (C3H3FBr4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-242B3 (C3H3F2Br3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-243B2 (C3H3F3Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
BFC-244B1 (C3H3F4Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
BFC-251B3 (C3H4FBr3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
BFC-252B2 (C3H4F2Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA

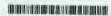


Test Item(s)	Unit	Method	MDL	Result
HPEC 253B4 (C2) ME2B			WIDL	No.1
HBFC-253B1 (C3H4F3Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-261B2 (C3H5FBr2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-262B1 (C3H5F2Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n,d.
HBFC-271B1 (C3H6FBr)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFCs (Hydrofluorocarbon)			+	
HFC-23 (CHF3) (CAS No.: 75-46-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-32 (CH2F2) (CAS No.: 75-10-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-41 (CH3F) (CAS No.: 593-53-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-43-10mee (C5H2F10)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n,d,
HFC-125 (C2HF5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-134 (C2H2F4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-134a (CH2FCF3) (CAS No.: 311-97-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-143 (CH3F3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-143a (CH3F3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-152a (C2H4F2) (CAS No.: 75- 17-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
FC-227ea (C3HF7) (CAS No.: 431- 9-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
FC-236fa (C3H2F6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
FC-236ea (C3H2F6) (CAS No.: 31-63-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n,d,



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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result
			MDL	No.1
HFC-245ca (C3H3F5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-245fa (C3H3F5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-365mfc (C4H5F5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
PFCs (Perfluorocarbon)			1	
F14 (CAS No.: 75-73-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Fluorocarbon 116 (CAS No.: 76-16- 4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Freon 218 (CAS No.: 76-19-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Decafluorobutane (CAS No.: 355-25- 9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Freon C318 (CAS No.: 115-25-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Perfluor-1-butene (CAS No.: 357-26- 8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
perfluorisobutene (CAS No.: 382-21-	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
,4-dihydrooctafluorobutane (CAS No.: 377-36-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Nonafluor-2- (trifluoromethyl) butane CAS No.: 594-91-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Perfluoro-n-pentane (CAS No.: 678- 6-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
-perfluoromethylpentane (CAS No.: 55-04-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
erfluorohexane (CAS No.; 355-42-	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCs (Chlorinate hydrocarbon)				
,1,1,2-Tetrachioroethane (CAS No.: 30-20-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result
1 1 1 Triphlessothers (CACA)	10000		MUL	No.1
1.1,1-Trichloroethane (CAS No.: 71- 55-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,1,2,2-Tetrachloroethane (CAS No.: 79-34-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,1,2-Trichloroethane (CAS No.: 79- 00-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,1-Dichloroethane (CAS No.: 75-34- 3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,1-Dichloroethene (CAS No.: 75-35-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,1-Dichloropropene (CAS No.: 563- 58-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,2,3-Trichloropropane (CAS No.: 96-18-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,2-Dichloroethane (CAS No.: 107- 06-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,2-Dichloropropane (CAS No.: 78- 87-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,3-Dichloropropane (CAS No.: 142- 28-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
2,2-Dichloropropane (CAS No.: 594- 20-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Carbon tetrachloride (CAS No.: 56- 23-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chloroethane (CAS No.: 75-00-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chloroform (CAS No.: 67-66-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chloromethane (CAS No.: 74-87-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
is-1,2-Dichloroethene (CAS No.: 56-59-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
is-1,3-Dichloropropene (CAS No.: 0061-01-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.



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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Test Item(s)	Unit	Method	MDL	Result
Hexachlorobutadiene (CAS No.: 87-				No.1
68-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Methylene Chloride (CAS No.: 75-09- 2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Tetrachloroethene (CAS No.: 127- 18-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
trans-1,2-Dichloroethene (CAS No.: 156-60-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
trans-1,3-Dichloropropene (CAS No.: 10061-02-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Frichloroethylene (CAS No.: 79-01-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.

Note:

- mg/kg = ppm : 0.1wt% = 1000ppm
- 2. n.d. = Not Detected
- 3. MDL = Method Detection Limit
- 4. " " = Not Regulated
- 5. ** = Qualitative analysis (No Unit)
- 6. Negative = Undetectable / Positive = Detectable
- 7. Asbestos : Negative = "< 1.0 %", Positive = "> 1.0 %"
- 8. ***: The substance was calculated by the test result of Tributyl Tin. The MDL was evaluated for Tributyl Tin.
- 9, #= a. Positive means the presence of CrVI on the tested areas
 - b. Negative means the absence of CrVI on the tested areas

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested

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/m².

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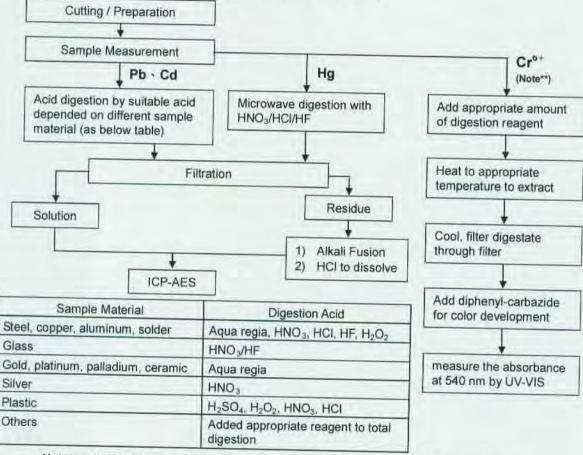


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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ test method excluded)
- Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang

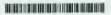


Note** : (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95 ℃. (2) For metallic material, add pure water and heat to boiling.



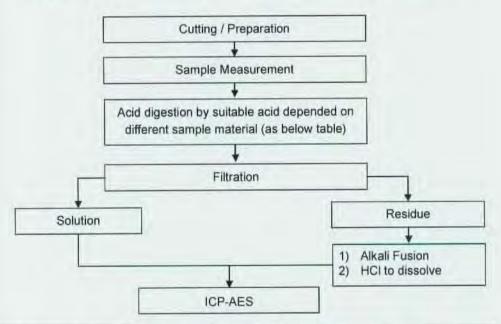
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SAMSUNG TECHWIN CO., LTD. 42. SUNGJU-DONG, CHANGWON, KOREA



- 1) These samples were dissolved totally by pre-conditioning method according to below flow
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang

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



Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCI, 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



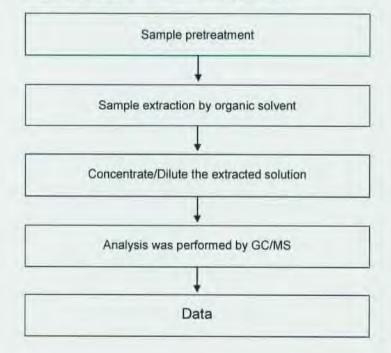
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Chlorinated Flame retardant analytical flow chart

- 1) Name of the person who made measurement: Barry Tseng
- Name of the person in charge of measurement: Troy Chang
- Reference method: US EPA 8270D, US EPA 3540
- Test Items: PCBs, PCNs, PCTs, Mirex, CP, MCCP



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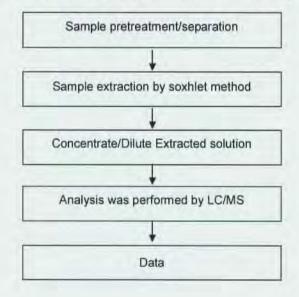
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



PFOS/PFOA analytical flow chart of Soxhlet extraction (LC/MS) procedure

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang





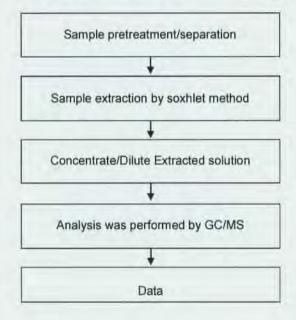
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Benzotriazole analytical flow chart

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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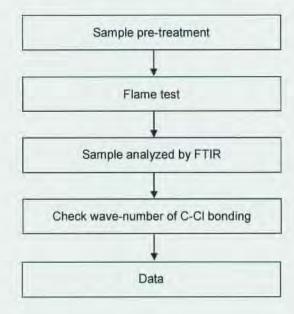
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Analysis flow chart for determination of PVC in material

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang





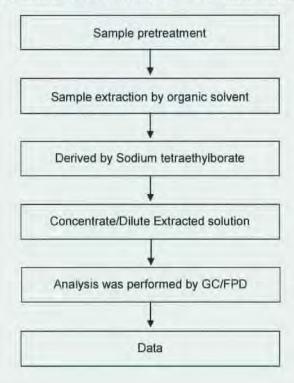
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Analytical flow chart of Organic-Tin content

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang



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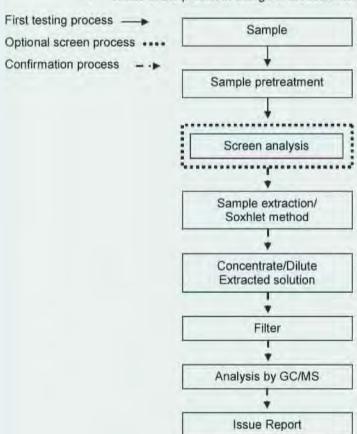
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



PBB/PBDE analytical FLOW CHART

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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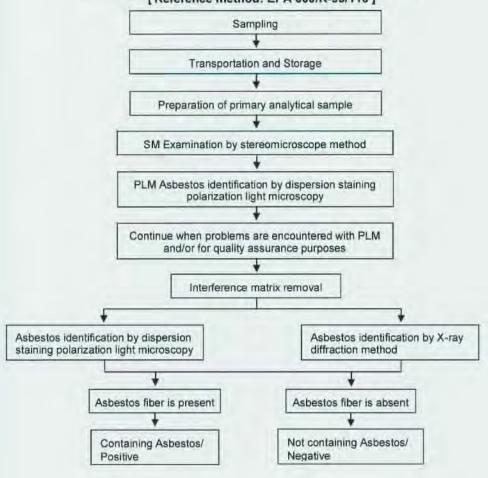
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SAMSUNG TECHWIN CO., LTD 42. SUNGJU-DONG, CHANGWON, KOREA



Analysis flow chart for determination of Asbestos

- 1) Name of the person who made measurement: Victor Kao
- 2) Name of the person in charge of measurement: Wendy Wei [Reference method: EPA 600/R-93/116]



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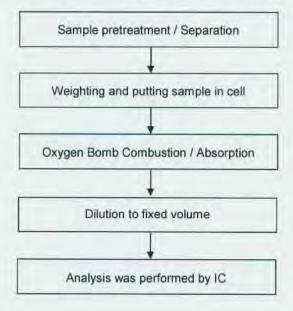
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



Analytical flow chart of halogen content

- Name of the person who made measurement: Rita Chen
- Name of the person in charge of measurement: Troy Chang





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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA

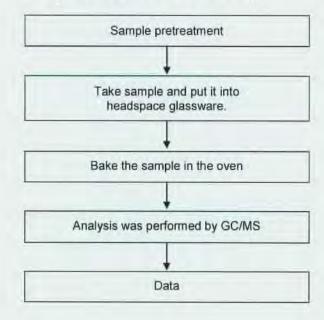


Analytical flow chart of volatile organic compounds (VOCs)

Name of the person who made measurement : Chun Wu

Name of the person in charge of measurement : Shinjyh Chen

Reference method : US EPA 5021



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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



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

CE/2012/73176



** End of Report **

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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 1 of 13

CTS Ref. CTSSA/12/3702/Tanaka

TANAKA ELECTRONICS (M) SDN BHD
PLOT 11, PHASE IV, BAYAN LEPAS FREE INDUSTRIAL ZONE
11900 PENANG, MALAYSIA

The following merchandise was (were) submitted and identified by the client as:

Sample Description

Au BONDING WIRE

Sample Receiving Date

16/10/2012

Testing Period

16/10/2012 to 19/11/2012

Test Requested

Selected test(s) as requested by client

Test Method

Please refer to next page(s).

Test Results

: Please refer to next page(s).

Analysts

Teh Pui Sean, Tay Siam Pine, Lim Meng Hoe, Eileen Tan Yi Pin

& Yee Sook Wai

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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 2 of 13

CTS Ref. CTSSA/12/3702/Tanaka

Test results:

Test Part Description :

Sample Description : Au BONDING WIRE

RoHS Directive 2011/65/EU Annex II

Test Item(s):	Unit	Test Method	Results	MDL
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, and performed by ICP-OES	N.D.	2
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, and performed by ICP-OES	N.D.	2
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, and performed by ICP-OES	N.D.	2
Hexavalent Chromium (CrVI)	mg/kg	With reference to JIS H 8625, and performed by UV-VIS Spectrophotometry	N.D.	2
Hexavalent Chromium (CrVI) by Spot test / boiling water extraction (optional) #		With reference to IEC 62321:2008	Negative	
Sum of PBBs	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	14.
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5

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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 3 of 13 CTS Ref. CTSSA/12/3702/Tanaka

um of PBDEs mg/kg		With reference to IEC 62321:2008, and performed by GC-MS	N.D.	
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	5

- Note: (a) mg/kg = ppm; (0.1wt% = 1000ppm)
 - (b) N.D. = Not Detected
 - (c) MDL = Method Detection Limit
 - (d) # = Spot-Test:
 - a. Negative means the absence of Cr(VI) on the tested areas
 - b. Positive means the presence of Cr(VI) on the tested areas

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is negative or cannot be confirmed)

Boiling water extraction:

- a. Negative means the absence of Cr(VI) on the tested areas
- b. Positive means the presence of Cr(VI) on the tested areas; The detected concentration in 50 mL boiling water extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

(e) - = Not regulated

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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 4 of 13 CTS Ref. CTSSA/12/3702/Tanaka

Test results by chemical method:

Test Item (s): Unit		Method	Result	MDL	
Antimony (Sb)	mg/kg	With reference to EPA Method 3051A, and performed by ICP-OES	N.D.	2	
Magnesium (Mg)	mg/kg	With reference to EPA Method 3051A, and performed by ICP-OES	N.D.	2	
Beryllium (Be)	mg/kg	With reference to EPA Method 3051A, and performed by ICP-OES	N.D.	2	
Polyvinylchloride (PVC)	**	Analysis was performed by FT-IR/ATR	Negative	Q.	
Halogen					
Halogen-Fluorine (F)	mg/kg	With reference to BS EN 14582. Analysis was performed by IC method for Fluorine content.	N.D.	50	
Halogen-Chlorine (CI)	mg/kg	With reference to BS EN 14582. Analysis was performed by IC method for Chlorine content.	N.D.	50	
Halogen-Bromine (Br)	mg/kg	With reference to BS EN 14582. Analysis was performed by IC method for Bromine content.	N.D.	50	
Halogen-lodine (I)	mg/kg	With reference to BS EN 14582. Analysis was performed by IC method for lodine content.	N.D.	50	

Test Part Description:

Sample Description : Au BONDING WIRE

Note: (a) mg/kg = ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) --- = Not Conducted

(e) ** = Qualitative analysis (no unit)

(f) Negative = Undetectable / Positive = Detectable

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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 5 of 13 CTS Ref. CTSSA/12/3702/Tanaka

Test results by chemical method:

Test Item (s):	Unit	Method	Result	MDL
Hexabromocyclododecane (HBCDD)	mg/kg	Based on EPA 3540C, and performed by GC-MS	N.D.	10
Phthalates				
DBP (Di-butyl phthalate)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
DEHP (Di-(2-ethylhexyl phthalate)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
BBP (Benzyl Butyl phthalate)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
DINP (Di-isononyl phthalate)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.01
DIDP (Di-isodecyl phthalate	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.01
DNOP (Di-n-octyl phthalate)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
DNHP (Di-n-hexyl phthalate)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
DMEP (Bis(2-methoxyethyl)phthalate)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003

Test Part Description:

Sample Description : Au BONDING WIRE

Note: (a) mg/kg = ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) --- = Not Conducted

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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 6 of 13

CTS Ref. CTSSA/12/3702/Tanaka

Test Part Description:

Sample Description Au BONDING WIRE

Test results:

Test Item (s):	Unit	Method	Result	MDL
Dimethyl Furnarate (CAS No. 624-49-7)	mg/kg	With reference to US EPA 3550C method. Analysis was performed by GC/MS.	N.D.	0.1
Perfluorooctane sulfonates (PFOS) PFOS – Acid, Metal Salt, Amide	mg/kg	With reference to US EPA 3540C: 1996 method for PFOS content. Analysis was performed by LC/MS.	N.D.	10
PFOA (CAS No.: 000335-67-1)	mg/kg	With reference to US EPA 3540C: 1996 method for PFOA content. Analysis was performed by LC/MS.	N.D.	10
*Phosphorus (P)	mg/kg	With reference to US EPA Method 3052 for Phosphorus Content. Analysis was performed by ICP-AES.	N.D.	2

Note: (a) mg/kg = ppm

- (b) N.D. = Not Detected
- (c) MDL = Method Detection Limit
- (d) --- = Not Conducted
- (e) The sample(s) was/were analysed on behalf of the applicant as mixing sample in one testing.
- (f) *The above tests were subcontracted to SGS Taiwan based on report no. KA/2012/A1244

<u>PFOS Reference Information : POPs – (EU) 757/2010</u>
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/m².

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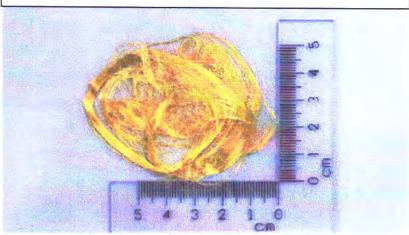
CTS Ref. CTSSA/12/3702/Tanaka

Test Part Description:

Sample Description

Au BONDING WIRE

TANAKA ELECTRONICS (M) SDN BHD CTSSA/22961(B)/12+KA/2012/A1244



SGS authenticate the photo on original report only

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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 8 of 13 CTS Ref. CTSSA/12/3702/Tanaka

1. DETERMINATION OF CADMIUM CONTENT BY IEC 62321 2008

Sample Receiving and Registration

Cut sample in small pieces

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion (Microwave)

"Totally Dissolved"

Filtration

Analyses by ICP

3. DETERMINATION OF MERCURY CONTENT BY IEC 62321 2008

Sample Receiving and Registration

Cut sample in small pieces

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion (Microwave)

"Totally Dissolved"

Filtration

Analyses by ICP

5. DETERMINATION OF PBB/PBDE WITH GC-MS BY IEC 62321 2008

Cut sample in small pieces

Weight sample (0.5-4.0g) into extraction thimble

Soxhlet Extraction with Toluene

Filter through 0.45 um membrane filter

Analyses by GC-MS (with appropriate dilution)

2. DETERMINATION OF LEAD CONTENT BY IEC 62321 2008

Sample Receiving and Registration

Cut sample in small pieces

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion (Microwave)

"Totally Dissolved"

Filtration

Analyses by ICP

4. MICROWAVE ASSISTED ACID DIGESTION OF ORGANICALLY BASED METRICES (US EPA 3051A)

Cut sample in small pieces

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion (HNO₃) - Microwave

"Totally Dissolved"

Filtration

Analyses by ICP

6. DETERMINATION OF HEXAVALENT CHROMIUM

BY IEC 62321 2008
Sample Receiving and Registration

1

Sample Preparation

Spot-test (Qualitative)

Boiling-water-extraction

Analyses by UV- Spectrophotometer

Test Report

SGS LABORATORY SERVICES (M) SDN. BHD.

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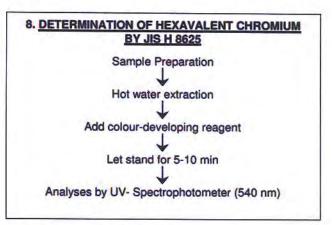
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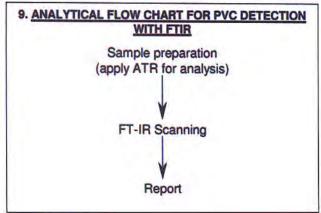
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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 9 of 13 CTS Ref. CTSSA/12/3702/Tanaka

7. DETERMINATION OF HALOGEN CONTENT Sample pretreatment Weighting and putting sample in cell Combustion / Absorption Dilution to fixed volume Analyses by IC





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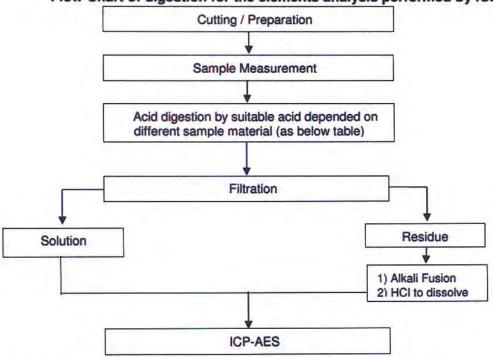
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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 10 of 13 CTS Ref. CTSSA/12/3702/Tanaka

- These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) Name of the person who made measurement: Alex Chang
- 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, aluminium, solder	Aqua regia, HNO ₃ , HCI, HF, H ₂ O ₂
Glass	HNO₃/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCI
Others	Any acid to total digestion

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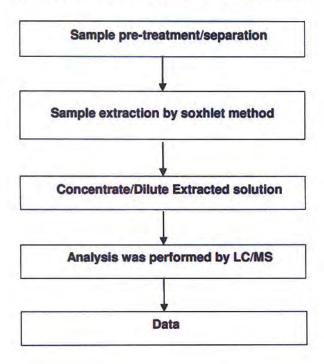
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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 11 of 13 CTS Ref. CTSSA/12/3702/Tanaka

Analytical Flow Chart of PFOS & PFOA Content



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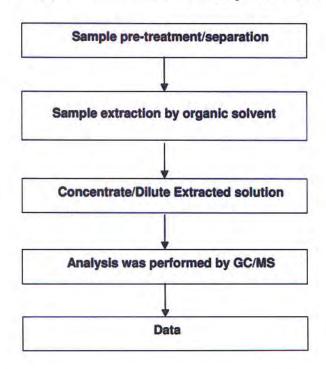
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Analytical Flow Chart for Dimethyl Fumarate



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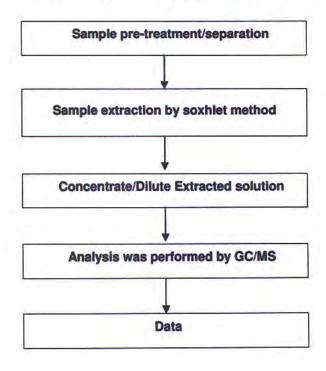
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No. CTSSA/22961(B)/12+KA/2012/A1244 Date: 19/11/2012 Page: 13 of 13 CTS Ref. CTSSA/12/3702/Tanaka

Analytical flow chart of Phthalates Content



**** End of Report ****

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測試報告 **Test Report**

號碼(No.): KA/2012/C2130 日期(Date): 2013/01/04 頁数(Page): 1 of 12

ASM HK

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG. HONG KONG(ASM HK)

以下測試樣品係由客户送樣,且由客户聲稱並經客户確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

: Ni PLATING MATERIAL 樣品名稱(Sample Description)

收件日期(Sample Receiving Date) : 2012/12/25

: 2012/12/25 TO 2013/01/04 测試期間(Testing Period)

送樣廠商(Sample Submitted By) : ASM HK

測試結果(Test Results)

: 請見下一頁 (Please refer to next pages).

Ray Chang / Asst. Manage Signed for and on behalf of **SGS Taiwan Limited**



號碼(No.): KA/2012/C2130 日期(Date): 2013/01/04 頁數(Page): 2 of 12

銀色 Ni PLATING MATERIAL (SILVER Ni PLATING MATERIAL)

ASM HK

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG. HONG KONG(ASM HK)

測試結果(Test Results)

測試部位(PART NAME) NO.1

三溴聯苯 / Tribromobiphenyl

四溴聯苯 / Tetrabromobiphenyl

五溴聯苯 / Pentabromobiphenyl

六溴聯苯 / Hexabromobiphenyl

七溴聯苯 / Heptabromobiphenyl

八溴聯苯 / Octabromobiphenyl

九溴聯苯 / Nonabromobiphenyl

十溴聯苯 / Decabromobiphenyl

方法偵測 單位 測試方法 測試項目 (Result) 極限值 (Test Items) (Unit) (Method) (MDL) NO.1 酸洗脱鍍層, 参考IEC 62321: 2008方法 n.d. 鎬 / Cadmium (Cd) mg/kg 以感應耦合電漿原子發射光譜儀檢測./ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES. 酸洗脱鍍層, 參考IEC 62321: 2008方法 n.d. 鉛 / Lead (Pb) mg/kg 以感應耦合電漿原子發射光譜儀檢測./ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES. 酸洗脱鍍層, 参考IEC 62321: 2008方法, n.d. mg/kg 乘 / Mercury (Hg) 以感應耦合電漿原子發射光譜儀檢測./ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES. 參考IEC 62321: 2008方法, 用Boiling 0.02mg/kg Negative 六價鉻 / Hexavalent Chromium Cr(VI) water extraction方法檢測. / With with 50 cm by boiling water extraction# reference to IEC 62321: 2008 and 2 surface area performed by boiling water extraction Method. n.d. 多溴聯苯總和 / Sum of PBBs 5 n.d. 一溴聯苯 / Monobromobiphenyl 5 n.d. 二溴聯苯 / Dibromobiphenyl n.d.

mg/kg

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GC/MS.

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參考IEC 62321: 2008方法, 以氣相層析

儀/質譜儀檢測. / With reference to

IEC 62321: 2008 and performed by

n.d.

n.d.

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結果



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ASM HK

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値	結果 (Result)
(rest reas)	(onic)	(me thod)	(MDL)	NO.1
多溴聯苯醚總和 / Sum of PBDEs				n.d.
一溴聯苯醚 / Monobromodiphenyl ether			5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether			5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether		A STATE OF THE STA	5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether		參考IEC 62321: 2008方法,以氣相層析	5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg	儀/質譜儀檢測. / With reference to IEC 62321: 2008 and performed by	5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether		GC/MS.	5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether		GC/MS.	5	n.d.
八溴聯苯醚 / Octabromodiphenyl ether			5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether			5	n.d.
十溴聯苯醚 / Decabromodiphenyl ether			5	n.d.
绨 / Antimony (Sb)	mg/kg	參考US EPA 3052方法,用感應藕合電漿原子發射光譜儀檢測締含量./With reference to US EPA Method 3052 for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.
六溴環十二烷 / Hexabromocyclododecane (HBCDD) (CAS No.: 25637-99-4)	mg/kg	參考US EPA 3540C: 1996方法, 以氣相層 析質譜儀檢測. / With reference to US EPA 3540C: 1996 method. Analysis was performed by GC/MS.	5	n.d.
全氣辛烷磺酸 / Perfluorooctane sulfonates (PFOS - Acid, Metal Salt, Amide)	mg/kg	參考US EPA 3550C: 2007方法,以液相層析/質譜儀檢測./ With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.
全氟辛酸(銨) / PFOA (CAS No.: 335-67- 1)	mg/kg	參考US EPA 3550C: 2007方法, 以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.

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3 - 31 - 41 - ml

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
可塑劑定量分析 / Phthalates 鄰苯二甲酸甲苯基丁酯 / BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7)	%	本測試參考EN 14372, 以氣相層析儀/質 譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.; 84-74-2)	%	本測試參考EN 14372, 以氣相層析儀/質譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	本測試參考EN 14372, 以氣相層析儀/質 譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0)	%	本測試參考EN 14372, 以氣相層析儀/質譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
鄰苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0)	%	本測試參考EN 14372, 以氣相層析儀/質 譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	%	本測試參考EN 14372, 以氣相層析儀/質 譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
鹵素 / Halogen 鹵素 (氣) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(氣)/ Halogen-Chlorine (C1) (CAS No.: 22537-15-1)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.

備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 1000ppm
- 2. n.d. = Not Detected (未檢出)
- 3. MDL = Method Detection Limit (方法偵測極限值)
- 4. "-" = Not Regulated (無規格值)
- 5. # = a. Positive means the presence of CrVI on the tested areas (Positive表示測試區域偵測到六價絡)
 - b. Negative means the absence of CrVI on the tested areas (Negative表示測試區域未偵測到六價絡)

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested areas . / 該溶液濃度≧0.02 mg/kg with 50 cm² (tested areas)

PFOS参考資訊(Reference Information): 持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物質或製備中不得超過0.001%(10ppm),在半成品、成品或零部件中不得超過0.1%(1000ppm),在紡織品或塗層材料中不得 超過1µg/m2 · (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/m².)

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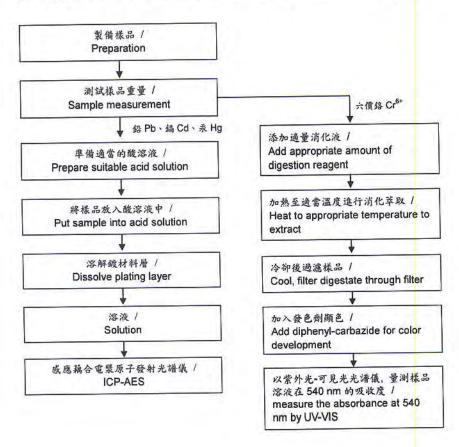
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鍍層重金屬測試流程圖 /

Flow Chart of Stripping method for metal analysis

- 1) 根據以下的流程圖之條件,樣品之外部鍍層已完全溶解已完全溶解。(六價鉻測試方注 除外)/The plating layer of samples were dissolved totally by pre-conditioning metho according to below flow chart. (Cr6+ test method excluded)
- 2) 測試人員:張俊雄 / Name of the person who made measurement: Alex Chang
- 3) 測試負責人:張伯睿 / Name of the person in charge of measurement: Ray Chang



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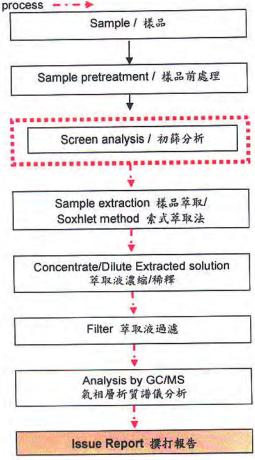
多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART

1)測試人員:曹嘉琪 / Name of the person who made measurement: Anson Tsao 2)测试負責人:張伯睿 / Name of the person in charge of measurement: Ray Chang

初次測試程序 / First testing process —

選擇性篩檢程序 / Optional screen process

確認程序 / Confirmation process --->



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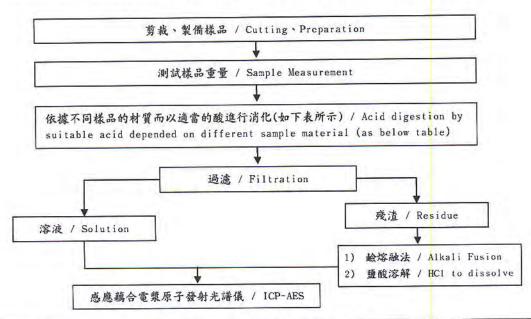
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- 1) 根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) 測試人員:張俊雄 / Name of the person who made measurement: Alex Chang
- 3) 測試負責人:張伯睿 / Name of the person in charge of measurement: Ray Chang

元素以 ICP-AES 分析的消化流程圖

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



鋼,銅,銘,焊錫 / Steel, copper, aluminum, solder	王水,硝酸、鹽酸、氫氣酸、變氧水 / Aqua regia, HNO ₃ , HC1, HF, H ₂ O ₅			
玻璃 / Glass	硝酸,氫氟酸 / HNO ₃ /HF			
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia			
銀 / Silver	硝酸 / HNO3			
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / HaSOa, HaOa, HNOa, HCl			
其他 / Others	加入任何酸至完全溶解 / Any acid to total digestion			

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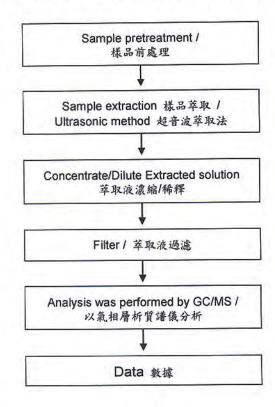
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六溴環十二烷分析流程圖 / HBCDD Analytical FLOW CHART

- 1) 測試人員: 曹嘉琪/ Name of the person who made measurement: Anson Tsao
- 2) 測試負責人:張伯睿/ Name of the person in charge of measurement: Ray Chang



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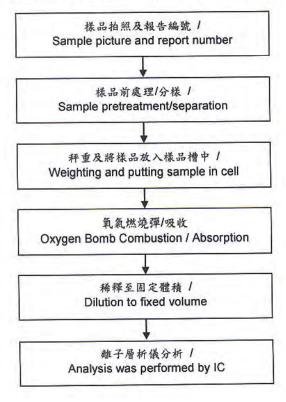
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鹵素分析流程圖 / Analytical flow chart of halogen content

- 1) 测試人員:洪秀眞/ Name of the person who made measurement: Jean Hung
- 2) 測試負責人:張伯睿/ Name of the person in charge of measurement: Ray Chang



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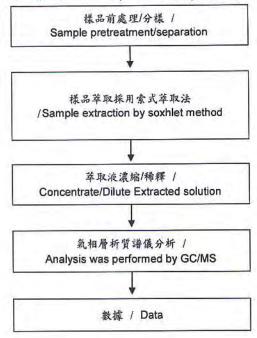
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

1)测试人员:曹嘉琪 / Name of the person who made measurement: Anson Tsao

2)测試負責人:張伯睿 / Name of the person in charge of measurement: Ray Chang



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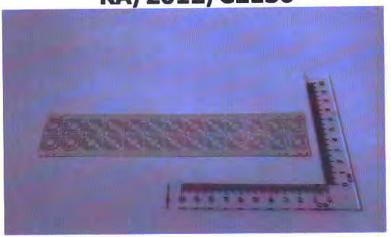
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* 照片中如有箭頭標示,則表示爲實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

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測試報告 **Test Report**

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以下測試樣品係由客户送樣,且由客户聲稱並經客户確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

樣品名稱(Sample Description)

: Pd PLATING MATERIAL

收件日期(Sample Receiving Date)

: 2012/12/25

測試期間(Testing Period)

: 2012/12/25 TO 2013/01/04

送樣廠商(Sample Submitted By)

: ASM HK

測試結果(Test Results)

: 請見下一頁 (Please refer to next pages).

Ray Chang / Asst. Manage Signed for and on behalf of SGS Taiwan Limited

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測試結果(Test Results)

測試部位(PART NAME) NO.1

銀色 Pd PLATING MATERIAL (SILVER Pd PLATING MATERIAL)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
鍋 / Cadmium (Cd)	mg/kg	酸洗脫鍍層,參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測. / IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	酸洗脱鍍層,參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測。/ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
乘 / Mercury (Hg)	mg/kg	酸洗脱鍍層,參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測./ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
六價络 / Hexavalent Chromium Cr(VI) by boiling water extraction#	**	参考IEC 62321: 2008方法、用Boiling water extraction方法檢測. / With reference to IEC 62321: 2008 and performed by boiling water extraction Method.	0.02mg/kg with 50 cm ² surface area	
多溴聯苯總和 / Sum of PBBs			2	n.d.
一溴聯苯 / Monobromobiphenyl			5	n.d.
二溴聯苯 / Dibromobiphenyl			5	n.d.
三溴聯苯 / Tribromobiphenyl			5	n.d.
四溴聯苯 / Tetrabromobiphenyl		参考IEC 62321: 2008方法,以氣相層析儀		n.d.
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n.d.
六溴聯苯 / Hexabromobiphenyl		62321: 2008 and performed by GC/MS.	5	n.d.
七溴聯苯 / Heptabromobiphenyl			5	n.d.
八溴聯苯 / Octabromobiphenyl			5	n.d.
九溴聯苯 / Nonabromobiphenyl			5	n.d.
十溴聯苯 / Decabromobiphenyl			3	n.u.



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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
多溴聯苯醚總和 / Sum of PBDEs			-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether			5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether			5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether			5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether		参考IEC 62321: 2008方法, 以氣相層析儀	5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg	/質譜儀檢測. / With reference to IEC	5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether		62321: 2008 and performed by GC/MS.	5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether			5	n.d.
八溴聯苯醚 / Octabromodiphenyl ether			5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether			5	n.d.
十溴聯苯醚 / Decabromodiphenyl ether			5	n.d.
绨 / Antimony (Sb)	mg/kg	參考US EPA 3052方法,用感應藕合電漿原子發射光譜儀檢測錦含量。/ With reference to US EPA Method 3052 for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.
六溴環十二烷 / Hexabromocyclododecane (HBCDD) (CAS No.: 25637-99-4)	mg/kg	參考US EPA 3540C: 1996方法,以氣相層 析質譜儀檢測. / With reference to US EPA 3540C: 1996 method. Analysis was performed by GC/MS.	5	n.d.
全氣辛烷磺酸 / Perfluorooctane sulfonates (PFOS - Acid, Metal Salt, Amide)	mg/kg	參考US EPA 3550C: 2007方法,以液相層析/質譜儀檢測。/ With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.
全氟辛酸(銨) / PFOA (CAS No.: 335-67- 1)	mg/kg	參考US EPA 3550C: 2007方法,以液相層析/質譜儀檢測。/ With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.

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测試項目	單位 (Unit)	測試方法 (Method)	方法偵測極限値	結果 (Result)
(Test Items)	(Unit)	(Mernod)	(MDL)	NO.1
可塑劑定量分析 / Phthalates			Ar	
鄰苯二甲酸甲苯基丁酯 / BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
鄭苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀絵測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
鹵素 / Halogen 鹵素 (氣) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(氣)/ Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(碘)/ Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.

備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 1000ppm
- 2. n.d. = Not Detected (未檢出)
- 3. MDL = Method Detection Limit (方法偵測極限值)
- 4. "-" = Not Regulated (無規格值)
- 5. # = a. Positive means the presence of CrVI on the tested areas

(Positive表示測試區域偵測到六價鉻)

b. Negative means the absence of CrVI on the tested areas

(Negative表示測試區域未偵測到六價絡)

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested areas . / 該溶液濃度≧0.02 mg/kg with 50 cm² (tested areas)

PFOS参考資訊(Reference Information): 持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物質或製備中不得超過0.001%(10ppm),在半成品、成品或零部件中不得超過0.1%(1000ppm),在紡織品或塗層材料中不得超 過 $1\mu g/m^2$ 。(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 lµg/m².)

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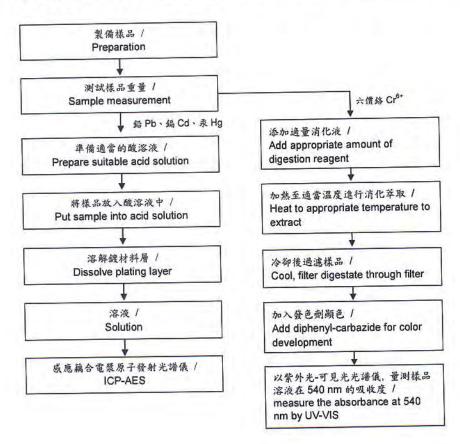
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鍍層重金屬測試流程圖 /

Flow Chart of Stripping method for metal analysis

- 1) 根據以下的流程圖之條件,樣品之外部鍍層已完全溶解已完全溶解。(六價鉻測試方注 除外)/The plating layer of samples were dissolved totally by pre-conditioning metho according to below flow chart. (Cr6+ test method excluded)
- 2) 測試人員:張俊雄 / Name of the person who made measurement: Alex Chang
- 3) 測試負責人: 張伯容 / Name of the person in charge of measurement: Ray Chang



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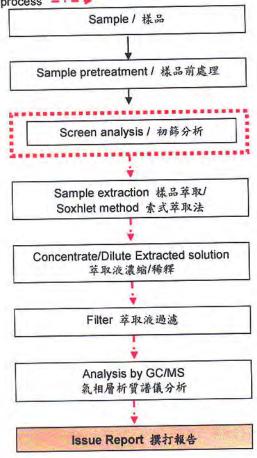
多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART

1)測試人員: 曹嘉琪 / Name of the person who made measurement: Anson Tsao 2)测試負責人: 張伯睿 / Name of the person in charge of measurement: Ray Chang

初次測試程序 / First testing process —

選擇性篩檢程序 / Optional screen process

確認程序 / Confirmation process - - - >



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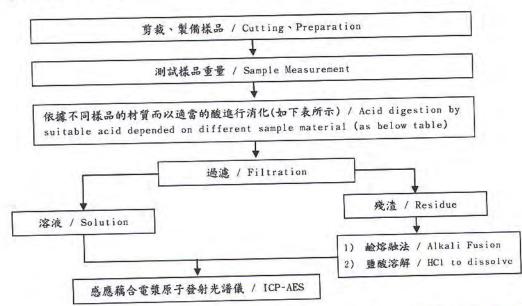
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- 1) 根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) 測試人員:張俊雄 / Name of the person who made measurement: Alex Chang
- 3) 測試負責人:張伯睿 / Name of the person in charge of measurement: Ray Chang

元素以 ICP-AES 分析的消化流程圖

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



纲,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNOs, HCl, HF, H2Os
玻璃 / Glass	硝酸,氫氯酸 / HNO:/HF
金, 鉅, 鲍, 陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNOs
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H ₁ SO ₁ , H ₂ O ₂ , HNO ₃ , HCI
其他 / Others	加入任何酸至完全溶解 / Any acid to total digestion



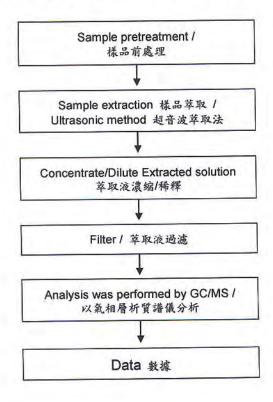
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六溴環十二烷分析流程圖 / HBCDD Analytical FLOW CHART

- 1) 测试人員: 曹嘉琪/ Name of the person who made measurement: Anson Tsao
- 2) 測試負責人:張伯睿/ Name of the person in charge of measurement: Ray Chang



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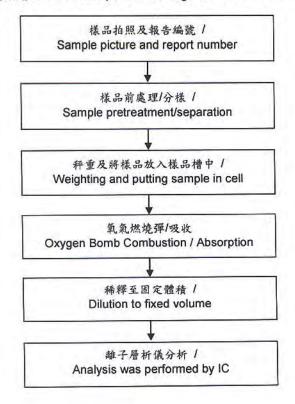
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鹵素分析流程圖 / Analytical flow chart of halogen content

- 1) 測試人員: 洪秀真/ Name of the person who made measurement: Jean Hung
- 2) 測試負責人:張伯睿/ Name of the person in charge of measurement: Ray Chang



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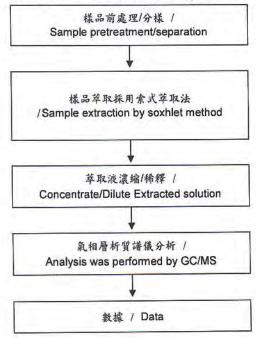
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

1)测試人員: 曹嘉琪 / Name of the person who made measurement: Anson Tsao

2)测試負責人:張伯容 / Name of the person in charge of measurement: Ray Chang



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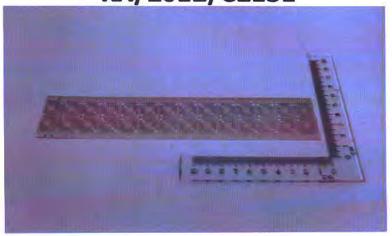
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

KA/2012/C2131



** 報告結尾(End of Report) **

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測試報告 **Test Report**

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以下測試樣品係由客户送樣,且由客户聲稱並經客戶確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

樣品名稱(Sample Description)

: Au PLATING MATERIAL

收件日期(Sample Receiving Date)

2012/12/25

測試期間(Testing Period)

: 2012/12/25 TO 2013/01/04

送樣廠商(Sample Submitted By)

: ASM HK

測試結果(Test Results)

: 請見下一頁 (Please refer to next pages).

Ray Chang / Asst. Manage Signed for and on behalf of SGS Taiwan Limited

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測試結果(Test Results)

測試部位(PART NAME) NO.1

紅銅色 Au PLATING MATERIAL (RED COPPERY Au PLATING MATERIAL)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
鎬 / Cadmium (Cd)	mg/kg	酸洗脱镀層,多考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測。/ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	酸洗脱鍍層,參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測./ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
汞 / Mercury (Hg)	mg/kg	酸洗脱鍍層,參考IEC 62321: 2008方法、 以感應耦合電漿原子發射光譜儀檢測./ IEC 62321: 2008 application of modified digestion by surface etching and performed by ICP-AES.	2	n.d.
六價絡 / Hexavalent Chromium Cr(VI) by boiling water extraction#	**	参考IEC 62321: 2008方法、用Boiling water extraction方法检測. / With reference to IEC 62321: 2008 and performed by boiling water extraction Method.	0.02mg/kg with 50 cm ² surface area	Negative
多溴聯苯總和 / Sum of PBBs	1			n.d.
一溴聯苯 / Monobromobiphenyl			5	n.d.
二溴聯苯 / Dibromobiphenyl	1		5	n,d.
三溴聯苯 / Tribromobiphenyl			5	n.d.
四溴聯苯 / Tetrabromobiphenyl		参考IEC 62321: 2008方法, 以氣相層析儀		n.d.
五溴聯苯 / Pentabromobiphenyl	mg/kg	/質譜儀檢測. / With reference to IEC	5	n.d.
六溴聯苯 / Hexabromobiphenyl		62321; 2008 and performed by GC/MS.	5	n.d.
七溴聯苯 / Heptabromobiphenyl	1	N	5	n.d.
八溴聯苯 / Octabromobiphenyl	1		5	n.d.
九溴聯苯 / Nonabromobiphenyl			5	n.d.
十溴聯苯 / Decabromobiphenyl			5	n.d.

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ASM HK

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG. HONG KONG (ASM HK)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
多溴聯苯醚總和 / Sum of PBDEs				n.d.
一溴聯苯醚 / Monobromodiphenyl ether			5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether			5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether			5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether		參考IEC 62321: 2008方法, 以氣相層析儀	5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg	/質譜儀檢測. / With reference to IEC	5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether		62321: 2008 and performed by GC/MS.	5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether			5	n.d.
八溴聯苯醚 / Octabromodiphenyl ether			5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether			5	n.d.
十溴聯苯醚 / Decabromodiphenyl ether			5	n.d.
绨 / Antimony (Sb)	mg/kg	參考US EPA 3052方法,用感應藕合電漿原子發射光譜儀檢測錦含量./With reference to US EPA Method 3052 for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.
六溴環十二烷 / Hexabromocyclododecane (HBCDD) (CAS No.: 25637-99-4)	mg/kg	參考US EPA 3540C: 1996方法,以氣相層 析質譜儀檢測. / With reference to US EPA 3540C: 1996 method. Analysis was performed by GC/MS.	5	n.d.
全氯辛烷磺酸 / Perfluorooctane sulfonates (PFOS - Acid, Metal Salt, Amide)	mg/kg	参考US EPA 3550C: 2007方法,以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.
全氟辛酸(銨) / PFOA (CAS No.: 335-67- 1)	mg/kg	参考US EPA 3550C: 2007方法,以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.



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ASM HK

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG. HONG KONG (ASM HK)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) NO.1
可塑劑定量分析 / Phthalates			(MDL)	NO.1
鄰苯二甲酸甲苯基丁酯 / BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
鄰苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	%	本測試參考EN 14372, 以氣相層析儀/質譜 儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.

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ASM HK

4/F, WATSON CENTRE, 16 KUNG YIP ST., KWAI CHUNG. HONG KONG (ASM HK)

测試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法侦测 極限値 (MDL)	結果 (Result) NO.1
鹵素 / Halogen 鹵素 (氣) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	参考BS EN 14582:2007、以離子層析儀分析、/ With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(氣)/ Halogen-Chlorine (C1) (CAS No.: 22537-15-1)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(碘)/ Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.

備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 1000ppm
- 2. n.d. = Not Detected (未檢出)
- 3. MDL = Method Detection Limit (方法偵測極限値)
- 4. "-" = Not Regulated (無規格值)
- 5. # = a. Positive means the presence of CrVI on the tested areas

(Positive表示測試區域偵測到六價鉻)

b. Negative means the absence of CrVI on the tested areas

(Negative表示測試區域未偵測到六價鉻)

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested areas . / 該溶液濃度≧0.02 mg/kg with 50 cm² (tested areas)

PFOS参考資訊(Reference Information): 持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物質或製備中不得超過0.001%(10ppm),在半成品、成品或零部件中不得超過0.1%(1000ppm),在紡織品或塗層材料中不得超 過1µg/m2 · (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/m².)

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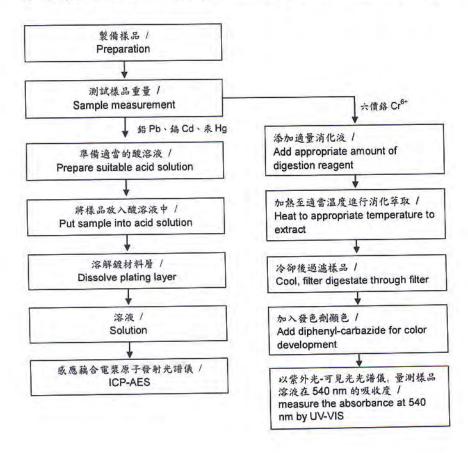
ASM HK

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鍍層重金屬測試流程圖 /

Flow Chart of Stripping method for metal analysis

- 1) 根據以下的流程圖之條件,樣品之外部鍍層已完全溶解已完全溶解。(六價鉻測試方治 除外) / The plating layer of samples were dissolved totally by pre-conditioning metho according to below flow chart. (Cr6+ test method excluded)
- 2) 測試人員: 張俊雄 / Name of the person who made measurement: Alex Chang
- 3) 測試負責人: 張伯睿 / Name of the person in charge of measurement: Ray Chang



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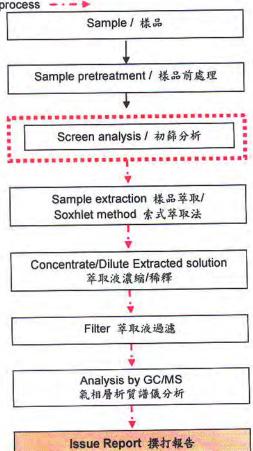
多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART

1)測試人員:曹嘉琪 / Name of the person who made measurement: Anson Tsao 2)测试負責人: 張伯睿 / Name of the person in charge of measurement: Ray Chang

初次测試程序 / First testing process -

選擇性篩檢程序 / Optional screen process

確認程序 / Confirmation process - - - ▶



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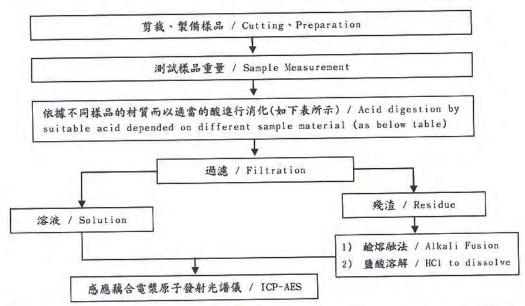
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- 1) 根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) 測試人員:張俊雄 / Name of the person who made measurement: Alex Chang
- 3) 測試負責人:張伯睿 / Name of the person in charge of measurement: Ray Chang

元素以 ICP-AES 分析的消化流程圖

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



鋼.銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氯酸,雙氧水 /
	Aqua regia, HNO2, HC1, HF, H2O2
玻璃 / Glass	硝酸、氫氟酸 / HNOs/HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO:
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H:SO4, H:O2, HNOa, HC1
其他 / Others	加入任何酸至完全溶解 / Any acid to total digestion

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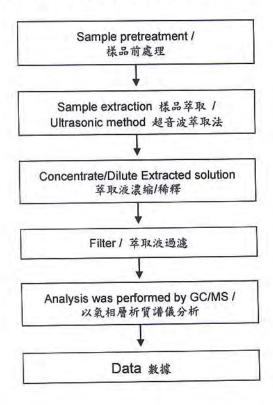
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六溴環十二烷分析流程圖 / HBCDD Analytical FLOW CHART

- 1) 測試人員: 曹嘉琪/ Name of the person who made measurement: Anson Tsao
- 2) 測試負責人:張伯睿/ Name of the person in charge of measurement: Ray Chang



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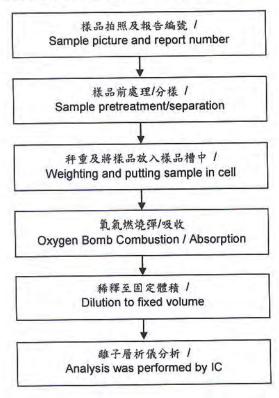
號碼(No.): KA/2012/C2132 日期(Date): 2013/01/04 頁數(Page): 10 of 12

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鹵素分析流程圖 / Analytical flow chart of halogen content

- 1) 测試人員: 洪秀真/ Name of the person who made measurement: Jean Hung
- 2) 測試負責人:張伯睿/ Name of the person in charge of measurement: Ray Chang





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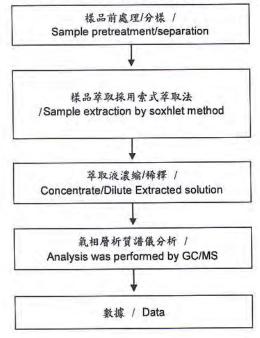
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

1)测試人員: 曹嘉琪 / Name of the person who made measurement: Anson Tsao

2)测試負責人: 張伯容 / Name of the person in charge of measurement: Ray Chang





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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

KA/2012/C2132



** 報告結尾(End of Report) **

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HENKEL TECHNOLOGIES

6th Fl. Daeryung techno town II 569-21, Gasan-dong

Geumcheon-gu

Seoul Korea

To:

The following merchandise was submitted and identified by the client as :

: AYAA12-29109 SGS File No.

: 8006NS **Product Name**

: N/A Item No./Part No.

: 2012. 08. 03 **Received Date**

: 2012. 08. 06 to 2012. 08. 10 **Test Period**

: For further details, please refer to following page(s) **Test Results**

: SGS Korea tested the sample(s) selected by applicant with following results. **Test Performed**

SGS Korea Co. Ltd.

Issued Date: 2012. 08. 10 Page 1 of 10

Timothy Jeon Jinhee Kim Cindy Park

Jerry Jung/ Testing Person

Jeff Jang / Chemical Lab Mgr



Issued Date: 2012. 08. 10 Page 2 of 10

Sample No.

: AYAA12-29109.001

Sample Description

: 8006NS

Item No./Part No.

: N/A

Materials

: Paste

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.
Phosphorous (P)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.
Antimony (Sb)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

NOTE:

- (1) N.D. = Not detected.(<MDL)
- (2) mg/kg = ppm
- (3) MDL = Method Detection Limit
- (4) = No regulation
- (5) Negative = Undetectable / Positive = Detectable
- (6) ** = Qualitative analysis (No Unit)
- (7) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

SGS Korea Co., Ltd.

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Issued Date: 2012. 08. 10 Page 3 of 10

Sample No.

: AYAA12-29109.001

Sample Description

: 8006NS

Item No./Part No.

: N/A

Materials

: Paste

Flame Retardants-PBBs/PBDEs

Unit	Test Method	MDL	Results
	With reference to IEC 62321:2008, GC-MS	5	N.D.
		5	N.D.
		5	N.D.
		5	N.D.
	Unit mg/kg mg/kg mg/kg mg/kg	mg/kg With reference to IEC 62321:2008, GC-MS mg/kg With reference to IEC 62321:2008, GC-MS mg/kg With reference to IEC 62321:2008, GC-MS	mg/kg With reference to IEC 62321:2008, GC-MS 5 mg/kg With reference to IEC 62321:2008, GC-MS 5 mg/kg With reference to IEC 62321:2008, GC-MS 5

Phthalates

Test Items	Unit	Test Method	MDL	Results
111111111111111111111111111111111111111	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Di-n-octyl phthalate (DNOP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Dibutyl phthalate (DBP) Benzyl butyl phthalate (BBP)	mg/kg	US EPA 8061A , GC/MS	50	N.D.
Di-isononyl phthalate (DINP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Di-isodecyl phthalate (DIDP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Di-methyl phthalate (DMP) Di-ethyl phthalate(DEP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.

Halogen Contents

Unit	Test Method	MDL	Results
	BS EN 14582:2007, IC	30	N.D.
		30	305
		30	N.D.
		50	N.D.
	Unit mg/kg mg/kg mg/kg mg/kg	mg/kg BS EN 14582:2007 , IC	mg/kg BS EN 14582:2007 , IC 30 mg/kg BS EN 14582:2007 , IC 30 mg/kg BS EN 14582:2007 , IC 30 mg/kg BS EN 14582:2007 , IC 30

Flame Retardants

Test Items	Unit	Test Method	MDL	Results	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					

- NOTE: (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) = No regulation
 - (5) Negative = Undetectable / Positive = Detectable
 - (6) ** = Qualitative analysis (No Unit)
 - (7) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.



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Sample No.

: AYAA12-29109.001

Sample Description

: 8006NS

Item No./Part No.

: N/A

Materials

: Paste

Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Hexabromocyclododecane	mg/kg	USEPA 3540C, LC/MS	5	N.D.

Other(s)

Test Items	Unit	Test Method	MDL	Results
PFOA(Perfluorooctanoic acid)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.
PFOS(Perfluorooctane Sulfonates-Acid/Metal Salt/Amide)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.

- NOTE: (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) = No regulation
 - (5) Negative = Undetectable / Positive = Detectable
 - (6) ** = Qualitative analysis (No Unit)
 - (7) * = Boiling-water-extraction:

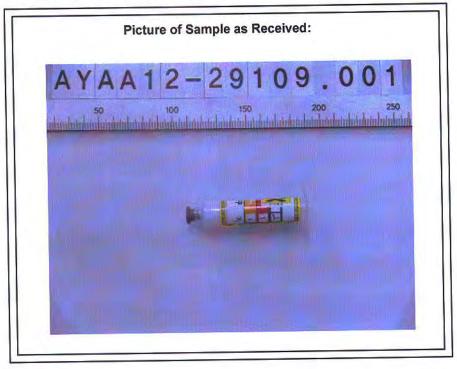
Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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- NOTE: (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
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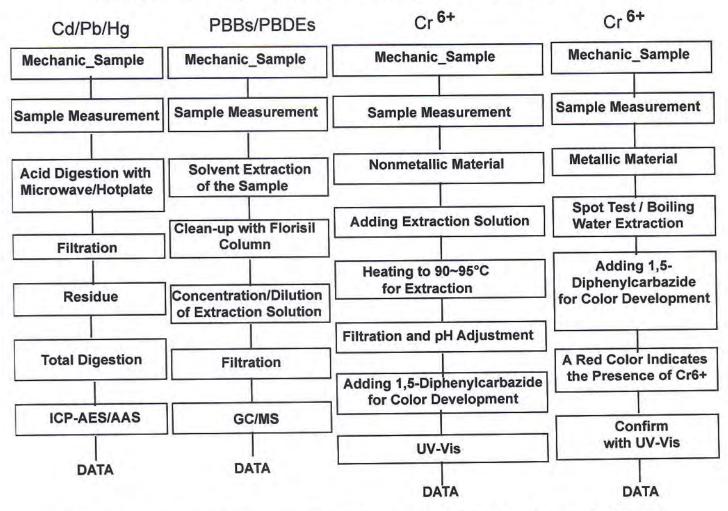
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Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr6+ /PBBs&PBDEs Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg. Section Chief: Gilsae Yi

- NOTE: (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) = No regulation
 - (5) Negative = Undetectable / Positive = Detectable
 - (6) ** = Qualitative analysis (No Unit)
 - (7) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

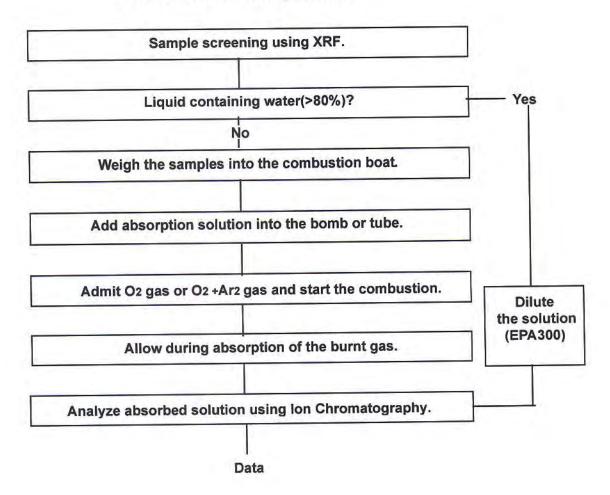
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Flow Chart for Halogen Test



NOTE: (1) N.D. = Not detected.(<MDL)

(2) mg/kg = ppm

(3) MDL = Method Detection Limit

(4) - = No regulation

(5) Negative = Undetectable / Positive = Detectable

(6) ** = Qualitative analysis (No Unit)

(7) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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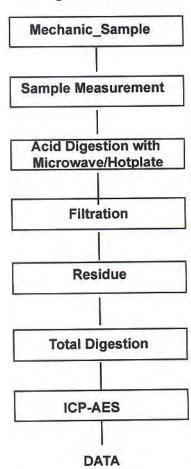
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Flow Chart for Inorganic Elements Testing

Inorganic Elements



The samples were dissolved totally by pre-conditioning method according to above flow chart for Inorganic Elements.

Section Chief: Gilsae Yi

- NOTE: (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) = No regulation
 - (5) Negative = Undetectable / Positive = Detectable
 - (6) ** = Qualitative analysis (No Unit)
 - (7) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

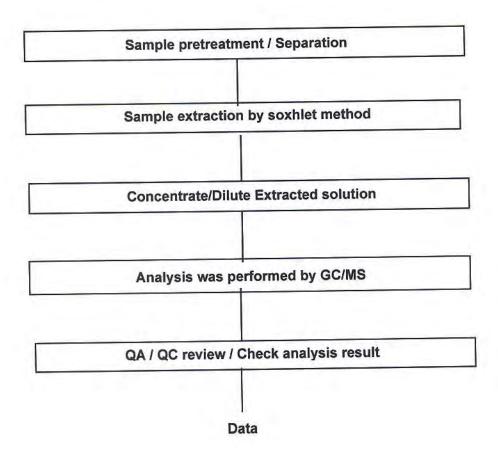
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Flow Chart for Phthalate Test



NOTE: (1) N.D. = Not detected.(<MDL)

(2) mg/kg = ppm

(3) MDL = Method Detection Limit

(4) - = No regulation

(5) Negative = Undetectable / Positive = Detectable

(6) ** = Qualitative analysis (No Unit)

(7) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction

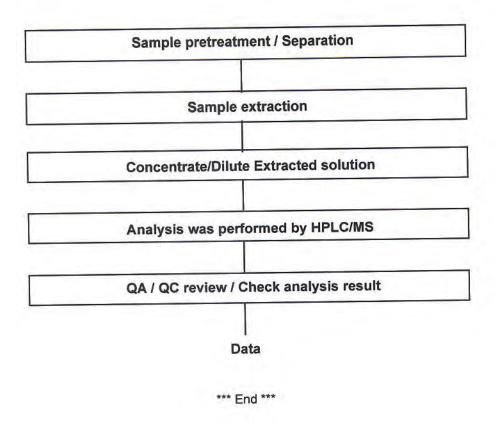
solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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Flow Chart for PFOS/PFOA Test



NOTE: (1) N.D. = Not detected.(<MDL)

(2) mg/kg = ppm

(3) MDL = Method Detection Limit

(4) - = No regulation

(5) Negative = Undetectable / Positive = Detectable

(6) ** = Qualitative analysis (No Unit)

(7) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction

solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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Test Report

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Date: 2013/01/18

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EPISIL TECHNOLOGIES INC.

NO. 3, INNOVATION RD 1, SCIENCE BASED INDUSTRIAL PARK, HSIN-CHU, TAIWAN, R. O. C.

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

Sample Description

: IC WAFER

Style/Item No.

AI PROCESS

Sample Receiving Date

2012/12/07

Testing Period

2012/12/07 TO 2012/12/18

Test Requested

: (1) As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to

determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the

submitted sample.

(2) As specified by client, to test Halogen-Fluorine, Chlorine, Bromine, Iodine

contents in the submitted sample.

Test Method

Please refer to next page(s).

Test Result(s)

Please refer to next page(s).



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Date: 2013/01/18

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NO. 3, INNOVATION RD 1, SCIENCE BASED INDUSTRIAL PARK, HSIN-CHU, TAIWAN, R. O. C.

Test Result(s)

PART NAME No.1

MULTICOLOR WAFER

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 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.
Sum of PBBs				n.d.
Monobromobiphenyl	1		5	n.d.
Dibromobiphenyl		1	5	n.d.
Tribromobiphenyl	-	With reference to IEC 62321: 2008 and performed by GC/MS.	5	n.d.
Tetrabromobiphenyl	-		5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl	-		5	n.d.
Heptabromobiphenyl	_		5	n.d.
Octabromobiphenyl	-		5	n.d.
Nonabromobiphenyl	-		5	n.d.
Decabromobiphenyl			5	n.d.
Sum of PBDEs	mg/kg		*	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether	71		5	n.d.
Pentabromodiphenyl ether			5	n.d.
Hexabromodiphenyl ether			5	n.d
Heptabromodiphenyl ether			5	n.d
Octabromodiphenyl ether			5	n.d
Nonabromodiphenyl ether			5	n.d
Decabromodiphenyl ether			5	n.d



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EPISIL TECHNOLOGIES INC.

NO. 3, INNOVATION RD 1, SCIENCE BASED INDUSTRIAL PARK, HSIN-CHU, TAIWAN, R. O. C.

Test Item(s)		n n n n		Result	
	Unit	Method	MDL	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 (CI) (CAS No.: 22537-15-1)			50	n.d.	
Halogen-Bromine (Br) (CAS No.: 10097-32-2)			50	n.d.	
Halogen-lodine (I) (CAS No.: 14362-44-8)			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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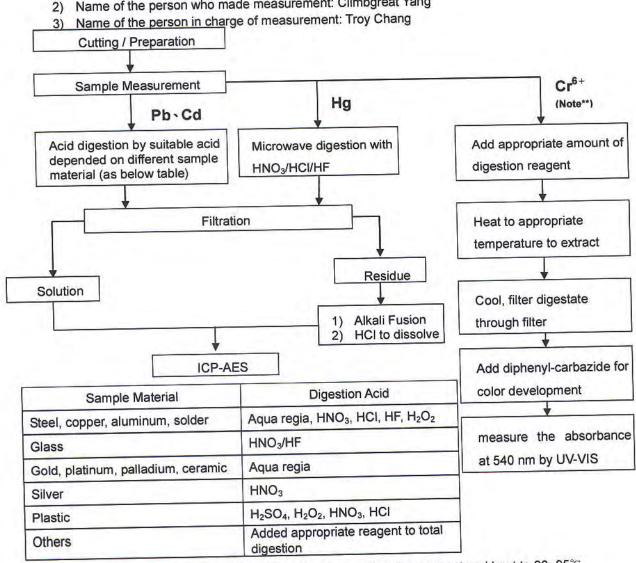
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NO. 3, INNOVATION RD 1, SCIENCE BASED INDUSTRIAL PARK, HSIN-CHU, TAIWAN, R. O. C.

 These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ test method excluded)

Name of the person who made measurement: Climbgreat Yang



Note**: (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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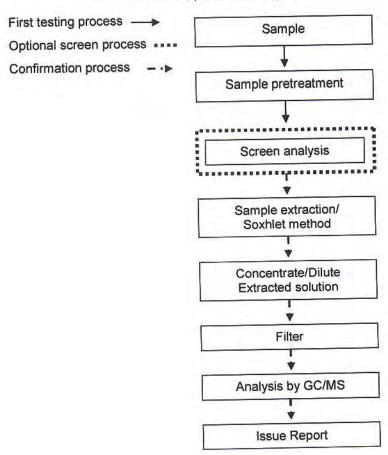
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NO. 3, INNOVATION RD 1, SCIENCE BASED INDUSTRIAL PARK, HSIN-CHU, TAIWAN, R. O. C.

PBB/PBDE analytical FLOW CHART

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang





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Date: 2013/01/18

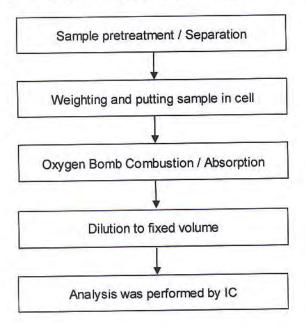
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NO. 3, INNOVATION RD 1, SCIENCE BASED INDUSTRIAL PARK, HSIN-CHU, TAIWAN, R. O. C.

Analytical flow chart of halogen content

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



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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 **