

Company name:

Product Series:

Product #:

Issue Date:

ICP Test Report Certification Packet

Littelfuse, Inc.

SP3012-04UTG

October 3, 2012

Silicon Protection Array

It is hereby certified by Littelfuse, Inc. that there is neither RoHS (EU Directive_2002/95/EC &
RoHS 2_Eu Directive_2011/65/EU) -restricted substance nor such use, for materials to be used
for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing
processes.
In addition, it is hereby reported to you that the parts and sub-materials, the materials to be used
for unit parts, the packing/packaging materials, and the additives and the like in the manufacturing
processes, are all composed of the following components.
Issued by:
Simil
KRISTEEN BACILA
Global EHS Engineer
(31) Parts, sub-materials and unit parts
This document covers the Silicon Protection Array RoHS-Compliant series products
manufactured by Littelfuse, Inc.
< Raw Materials Used
Please see Table 1
(31) The ICP data on all measurable substances
Please see appropriate 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	N/A	Leadframe	3-16
2	8006NS	Adhesive – RoHS & Halogen	17-21
3	N/A	Au Bonding Wire	22-34
4	CEL-9220	Epoxy Molding Compound	35-42
5	N/A	IC Wafer	43-46
6	N/A	Finished product – RoHS 2	47-51





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

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

Sample Description

: AYAU12-01584 (LEAD FRAME)

Style/Item No.

: C194-uPPF

Buyer/Order No.

: LF_RoHS_1203-001

Sample Receiving Date

: 2012/03/28

: 2012/03/28 TO 2012/04/05 **Testing Period**

Test Result(s)

: Please refer to next page(s)



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Test Report

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SAMSUNG TECHWIN CO., LTD 42, SUNGJU-DONG, CHANGWON, KOREA ALLEGE MENT OF REAL PROPERTY.

Test Result(s)

PART NAME No.1

: SILVER COLORED METAL SHEET

	120.045	130.0.16	MDL	Result
Test Item(s)	Unit	Method	MDL	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)		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)	%	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	0.01	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.

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

Test Item(s)	Unit	Method	MDL	Result No.1
Perfluorooctane sulfonates	mg/kg	With reference to US EPA 3540C: 1996	10	n.d.
(PFOS-Acid, Metal Salt, Amide)		method for PFOS Content. Analysis was performed by LC/MS.		
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3540C: 1996 method for PFOA Content. 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.	*	Negative
Organic-tin compounds				-
Tributyl Tin (TBT)	mg/kg	With reference to DIN 38407-13. Analysis was performed by GC/FPD.	0.03	n.d.
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	With reference to DIN 38407-13. Analysis was performed by GC/FPD.	9	n.d.
Halons				-
Halon-1211 (CAS No.: 353-59-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Halon-1301 (CAS No.: 75-63-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Halon-2402 (CAS No.: 124-73-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	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	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
Halogen-lodine (I) (CAS No.: 14362-44-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA ULIE DE MILITAGE DE LA COMPE

		\$4.0000	aan.	Result
Test Item(s)	Unit	Method	MDL	No.1
Sum of PBBs	-			n.d.
Monobromobiphenyl	-		5	n.d.
ADD OL GILLO FILLES A COMPANY	-		5	n.d.
Dibromobiphenyl	-		5	n.d.
Tribromobiphenyl	_		5	n.d.
Tetrabromobiphenyl			5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl	_		5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl	_1		5	n.d.
Nonabromobiphenyl		The state of the s		n.d.
Decabromobiphenyl	malka	g/kg With reference to IEC 62321: 2008 and performed by GC/MS.	5	
Sum of PBDEs	nigrikg		7	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			5	n.d.
Pentabromodiphenyl ether		10	5	n.d.
Hexabromodiphenyl ether		(I)	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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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA CHEROSCHIST MARKET

				Result
Test Item(s)	Unit	Method	MDL	No.1
Asbestos				
Actinolite (CAS No.: 77536-66-4)	%	With reference to EPA 600/R-93/116 method. Analysis was performed by SM, PLM and XRD.	1	Negative
Amosite (CAS No.: 12172-73-5)	%	With reference to EPA 600/R-93/116 method. Analysis was performed by SM, PLM and XRD.	1	Negative
Anthophyllite (CAS No.: 77536-67- 5)	%	With reference to EPA 600/R-93/116 method. Analysis was performed by SM, PLM and XRD.	1	Negative
Chrysotile (CAS No.: 12001-29-5)	%	With reference to EPA 600/R-93/116 method. Analysis was performed by SM, PLM and XRD.	1	Negative
Crocidolite (CAS No.: 12001-28-4)	%	With reference to EPA 600/R-93/116 method. Analysis was performed by SM, PLM and XRD.	1	Negative
Tremolite (CAS No.: 77536-68-6)	%	With reference to EPA 600/R-93/116 method. Analysis was performed by SM, PLM and XRD.	1	Negative
AZO				
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.

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

		- A6-87 II	MDI	Result	
Test item(s)	Unit	Method	MDL	No.1	
B): 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.	
10): 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.	
11): 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.	
12): 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.	
13): 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.	
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	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	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	performed by GC/MS.	3	n.d.	
21): O-ANISIDINE (CAS No.: 90- 04-0)	mg/kg	performed by GC/MS.	3	n.d	
22): P-AMINOAZOBENZENE (CAS No.: 60-09-3)	mg/kg		3	n.d	

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

		EV a second	MDL	Result
Test Item(s)	Unit	Method	MDL	No.1
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.
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.: 422-78-6)	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.: 29255-31-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-215 (CAS No.: 4259-43-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Chlorofluorocarbon-216 (CAS No.: 661-97-2)	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 *********

	44.44	Markad	MDL	Result	
Test Item(s)	Unit	Method	MDL	No.1	
Chlorofluorocarbon-217 (CAS No.: 422-86-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFCs (Hydrochlorofluorocarbons)				-	
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		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.	
HCFC-142b (CAS No.: 75-68-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-221 (CAS No.: 422-26-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-222 (CAS No.: 422-49-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-223 (CAS No.: 422-52-6)	mg/kg		1	n.d.	

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

- 1	100.00	12.V/4	MDL	Result
Test Item(s)	Unit	Method	MDL	No.1
HCFC-224 (CAS No.: 422-54-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
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.
HCFC-252 (CAS No.: 819-00-1)	mg/kg	With reference to US EPA 5021 method, Analysis was performed by GC/MS.	1	n.d.
HCFC-253 (CAS No.: 460-35-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HCFC-261 (CAS No.: 420-97-3)	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 CHARLES NO. 12 E. M. S.

2 30 37	Unit	Method	MDL	Result
Test Item(s)	Unit		mor	No.1
HCFC-262 (CAS No.: 421-02-03)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
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.
HBFCs (Hydrobromofluorocarbons)				
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.
HBFC-132B2 (C2H2F2Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-133B1 (C2H2F3Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-141B2 (C2H3FBr2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-142B1 (C2H3F2Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-151B1 (C2H4FBr)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-221B6 (C3HFBr6)	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 DIRECTOR AND ADDRESS OF

- 77 107	1	150/4	MDL	Result
Test Item(s)	Unit	Method	MDL	No.1
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.
HBFC-244B1 (C3H3F4Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-251B3 (C3H4FBr3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-252B2 (C3H4F2Br2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HBFC-253B1 (C3H4F3Br)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.

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Test Report

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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA 1111 TO 101 TO 1

	9000	100000	MDL	Result
Test Item(s)	Unit	Method	MIDE	No.1
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.: 811-97-2)	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.: 75-37-6)	mg/kg	Analysis was performed by GC/MS.	1	n.d.
HFC-227ea (C3HF7) (CAS No.: 431-89-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
HFC-236fa (C3H2F6)	mg/kg		1	n.d.
HFC-236ea (C3H2F6) (CAS No.: 431-63-0)	mg/kg	110 -011 -011 -011 -011 -01	1	n.d.
HFC-245ca (C3H3F5)	mg/kg		1	n.d.

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

Contract of	Tank I	14.40.4	MDL	Result
Test Item(s)	Unit	Method	MUL	No.1
HFC-245fa (C3H3F5) mg/k		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)				-
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- 26-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
perfluorisobutene (CAS No.: 382- 21-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
1,4-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.: 678-26-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
2-perfluoromethylpentane (CAS No.: 355-04-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
Perfluorohexane (CAS No.: 355- 42-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
CHCs (Chlorinate hydrocarbon)				
1,1,1,2-Tetrachloroethane (CAS No.: 630-20-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.
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.

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

Test (tem/s)	Unit	Method	MDL	Result	
Test Item(s)	15000	The state of the s	71100	No.1	
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-	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n,d.	
cis-1,2-Dichloroethene (CAS No.: 156-59-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n,d.	
cis-1,3-Dichloropropene (CAS No.: 10061-01-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Hexachlorobutadiene (CAS No.: 87-68-3)	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 BILLIAN HOUSE ON HER

T. V. T. D. D. T.	05.4	1 2000 0	MDL	Result
Test Item(s)	Unit	Method	MDL	No.1
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.
Trichloroethylene (CAS No.: 79- 01-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	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
- 7. Asbestos : Negative = "< 1.0 %", Positive = "> 1.0 %"
- 8. # = 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

areas.

9. ***: The substance was calculated by the test result of Tributyl Tin. The MDL was evaluated for Tributyl Tin.

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.

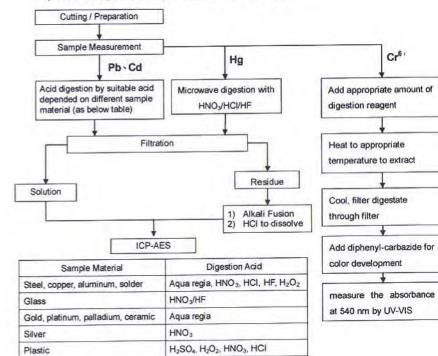
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SAMSUNG TECHWIN CO., LTD. 42. SUNGJU-DONG, CHANGWON, KOREA PROPERTY OF STREET

- 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



Any acid to total digestion

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Others



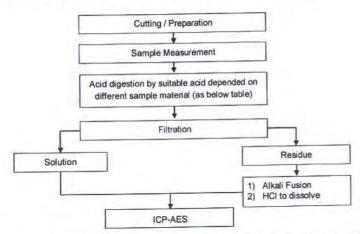
No.: CE/2012/37265 Date: 2012/04/05 Page: 17 of 27

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



- 1) These samples were dissolved totally by pre-conditioning method according to below flow
- 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



Aqua regia, HNO ₃ , HCI, HF, H ₂ O ₂
HNO ₃ /HF
Aqua regia
HNO ₃
H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
Any acid to total digestion



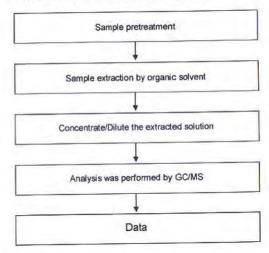
Test Report

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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
- 2) 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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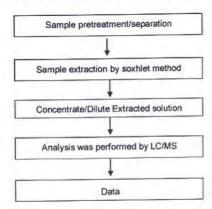
SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA



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

[Test Items: PFOS/PFOA · Benzotriazole]



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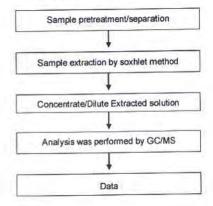
No.: CE/2012/37265 Date: 2012/04/05 Page: 20 of 27

SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA 1140日 | BEN | BEN

Analytical flow chart of Soxhlet extraction (GC/MS) procedure

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

[Test Items: Phthalate · Benzotriazole · HBCDD · NP · DBBT · Organic phosphorus compounds]



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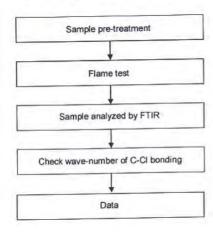


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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA ELERSON IDDOMNAD

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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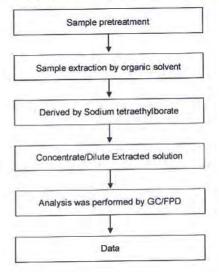
Test Report

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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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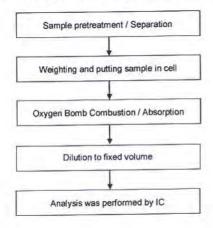


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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA CHARREST STREET

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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Test Report

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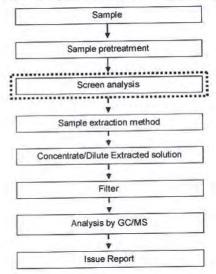
SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA THE RESERVE THE PERSON NAMED IN

Analytical flow chart

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

[Test Items: PBB/PBDE, TBBP-A-bis]

First testing process → Optional screen process · · · • Confirmation process - · ▶



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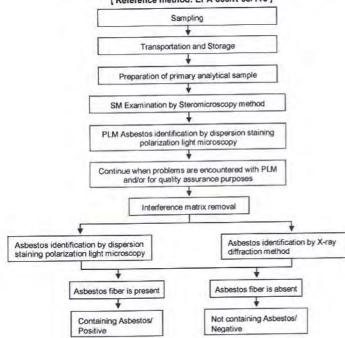


No.: CE/2012/37265 Date: 2012/04/05 Page: 25 of 27

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

Analysis flow chart for determination of Asbestos

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



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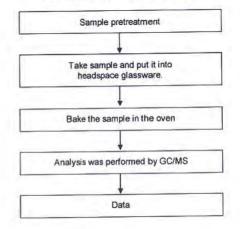
Test Report

No.: CE/2012/37265 Date: 2012/04/05 Page: 26 of 27

SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA A PRINCIPAL DECEMBER OF THE PARTY.

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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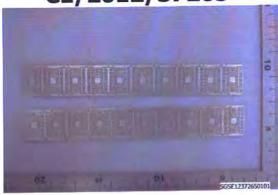
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SAMSUNG TECHWIN CO., LTD. 42, SUNGJU-DONG, CHANGWON, KOREA * The tested sample / part is marked by an arrow if it's shown on the photo. *

CE/2012/37265



** End of Report **



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

To: HENKEL TECHNOLOGIES

6th Fl. Daeryung techno town II

569-21, Gasan-dong

Geumcheon-gu

Seoul Korea

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

SGS File No.

: AYAA12-29109

Product Name

: 8006NS

Item No./Part No.

: N/A

Received Date

: 2012, 08, 03

recoursed But

: 2012. 08. 06 to 2012. 08. 10

Test Period Test Results

F052 Version5

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

Test Performed

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

SGS Korea Co. Ltd.

Timothy Jeon Jinhee Kim Cindy Park

Jerry Jung/ Testing Person

Jeff Jang / Chemical Lab Mgr

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Test Report No. F690101/LF-CTSAYAA12-29109

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

Sample No.

: AYAA12-29109.001 : 8006NS

Sample Description Item No./Part No.

o. : N/A

: Paste

Heavy Metals

Materials

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

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

: AYAA12-29109.001 Sample No.

: 8006NS Sample Description

Item No./Part No. : N/A : Paste Materials

Flame Retardants-PBBs/PBDEs

Unit	Test Method	MDL	Results
ma/ka	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 C-MS C-	mg/kg

Phthalates

Test Items	Unit	Test Method	MDL	Results
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 (DRP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
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.
Di-methyl phthalate (DMP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.
Di-ethyl phthalate(DEP)	mg/kg	US EPA 8061A, GC/MS	50	N.D.

Halogen Contents

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

Flame Retardants

Test Items	Unit	Test Method	MDL	Results

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 No. F690101/LF-CTSAYAA12-29109

: AYAA12-29109.001

:8006NS Sample Description

: N/A Item No./Part No. : Paste Materials

Flame Retardants

Sample No.

Test Items	Unit	Test Method	MDL	Result
Hexabromocyclododecane	mg/kg	USEPA 3540C, LC/MS	5	N.D.
Hexabibiliocyclododecane	mgmg		THE STATE OF THE S	SUMMINOR OF A SECOND

Test Method	MDL	Resul
US EPA 3540C/3550C, LC/MS	1	N.D.
US EPA 3540C/3550C, LC/MS	1	N.D
	US EPA 3540C/3550C, LC/MS	US EPA 3540C/3550C, LC/MS 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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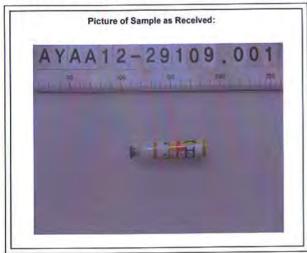
Issued Date: 2012. 08. 10 Page 4 of 10

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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.

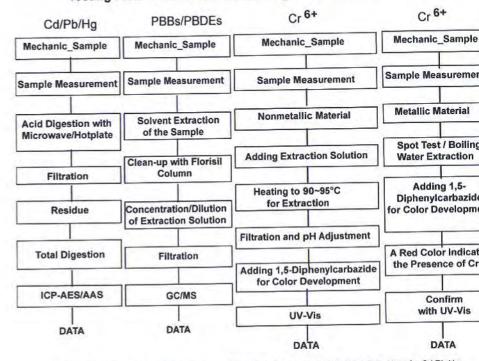
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Test Report No. F690101/LF-CTSAYAA12-29109

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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

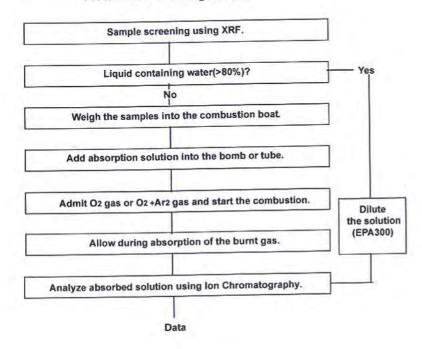
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

F052 Version5



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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.

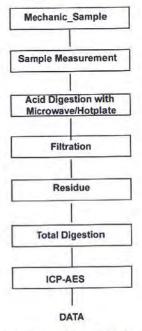
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Test Report No. F690101/LF-CTSAYAA12-29109

Issued Date: 2012. 08. 10 Page 8 of 10

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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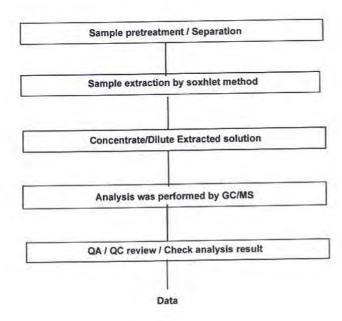
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Flow Chart for Phthalate Test



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.

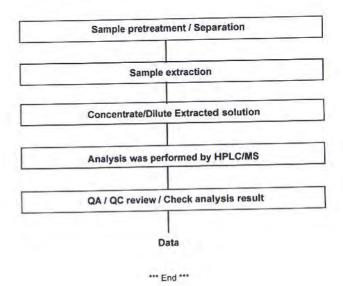
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Test Report No. F690101/LF-CTSAYAA12-29109

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Flow Chart for PFOS/PFOA Test



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

F052 Version5

(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.



No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 1 of 13

CTS Ref. CTS/11/4539/Tanaka

TANAKA ELECTRONICS (MALAYSIA) SDN BHD PLOT 11, PHASE IV, BAYAN LEPAS FIZ 11900 PENANG, MALAYSIA

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

Sample Description : Au Bonding Wire

Sample Receiving Date : 21/11/2011

Testing Period : 21/11/2011 to 02/12/2011

Date Completed : 02/12/2011
Reporting Date : 02/12/2011

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, Eileen Tan Yi Pin, Yee Sook Wai

& Lim Meng Hoe

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No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 2 of 13

CTS Ref. CTS/11/4539/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) by Spot test / boiling water extraction (optional) #		With reference to IEC 62321:2008	Negative	
Hexavalent Chromium (CrVI)	mg/kg	With reference to JIS H 8625, and performed by UV-VIS Spectrophotometry	N.D.	2
Sum of PBBs	mg/kg	With reference to IEC 62321:2008, and performed by GC-MS	N.D.	1.
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
Hexabromobiphenyl	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
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. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 3 of 13 CTS Ref. CTS/11/4539/Tanaka

Sum 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. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 4 of 13 CTS Ref. CTS/11/4539/Tanaka

Test results by chemical method:

Test Item (s):	Unit	Method	Result	MDL
Antimony (Sb)	ppm	With reference to EPA Method 3052, and performed by ICP-OES	N.D.	2
Polyvinylchloride (PVC)	**	Analysis was performed by FT-IR/ATR	Negative	
Halogen	- 220			
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. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 5 of 13

CTS Ref. CTS/11/4539/Tanaka

Test result:

Test Part Description:

Sample Description

Au Bonding Wire

Optional: RoHS Directive 2011/65/EU, priority substances

Test Item(s):	Unit	Test Method	Results	MDL
Hexabromocyclododecane (HBCDD)	mg/kg	Based on IEC 62321:2008, and performed by GC-MS	N.D.	10
Phthalates	***	-		***
DBP (Di-butyl phthalate) (CAS No.: 000084-74-2)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
DEHP(Di-(2-ethylhexyl phthalate) (CAS No.: 000117-81-7)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
BBP (Benzyl Butyl phthalate) (CAS NO.: 000085-68-7)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
DINP (Di-isononyl phthalate) (CAS No.: 028553-12-0)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.01
DIDP (Di-isodecyl phthalate) (CAS No.: 026761-40-0)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.01
DNOP (Di-n-octyl phthalate) (CAS No.: 000117-84-0)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003
DNHP (Di-n-hexyl phthalate) (CAS No.: 000084-75-3)	%	With reference to Chromatographia Vol.47, No.784, 1998. Analysis was performed by GC/MS.	N.D.	0.003

Note: (a) mg/kg = ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) --- = Not Conducted

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No. LPCI/25132(B)/11+KA/2011/B1388 Date : 02/12/2011 Page: 6 of 13 CTS Ref. CTS/11/4539/Tanaka

Test Item(s):	Unit	Test Method	Results	MDL
*Phosphorus (P)	mg/kg	With reference to US EPA Method 3052 for Phosphorus Content. Analysis was performed by ICP-AES.	N.D.	2
*Beryllium (Be)	mg/kg	With reference to US EPA Method 3052 for Beryllium Content. Analysis was performed by ICP-AES.	6.64	2
*Magnesium (Mg)	mg/kg	With reference to US EPA Method 3052 for Magnesium Content. Analysis was performed by ICP-AES.	N.D.	2
*Perfluorooctane sulfonates (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.: 335-67-1)	mg/kg	With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.	N.D.	10
*Dimethyl Fumarate (CAS No.: 624-49-7)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	N.D.	0.1
*DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	%	With reference to EN 14372.Analysis was performed by GC/MS	N.D.	0.003

Note: (a) mg/kg = ppm; (0.1wt% = 1000ppm)

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) *The above tests were subcontracted to SGS Taiwan based on report no. KA/2011/B1388

PFOS Reference Information : Directive 2006/122/EC

- (1) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.
- (2) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1µg/m² of the coated material.

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No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 7 of 13

CTS Ref. CTS/11/4539/Tanaka

Test Part Description:

Sample Description

Au Bonding Wire



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No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 8 of 13 CTS Ref. CTS/11/4539/Tanaka

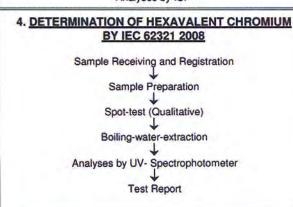
1. DETERMINATION OF CADMIUM CONTENT BY IEC 62321 2008 Sample Receiving and Registration Cut sample in small pieces Weight sample (0.2-0.5g) into digestion vessel Acid digestion (Microwave) "Totally Dissolved"

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

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



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

Analyses by ICP

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)

7. DETERMINATION OF HEXAVALENT CHROMIUM **BY JIS H 8625** Sample Preparation Hot water extraction Add colour-developing reagent Let stand for 5-10 min Analyses by UV- Spectrophotometer (540 nm)

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No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 9 of 13 CTS Ref. CTS/11/4539/Tanaka

8. MICROWAVE ASSISTED ACID DIGESTION OF SILICEOUS AND ORGANICALLY BASED METRICES (US EPA 3052)

Cut sample in small pieces

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion (HF and HNO₃) – Microwave

"Totally Dissolved"

Filtration

Analyses by ICP

9. DETERMINATION OF HALOGEN CONTENT

Sample pretreatment

Weighting and putting sample in cell

Combustion / Absorption

Dilution to fixed volume

Analyses by IC

10. ANALYSIS FLOW CHART FOR DETERMINATION OF PVC

Cut sample in small pieces

Sample analysed by FTIR

Data

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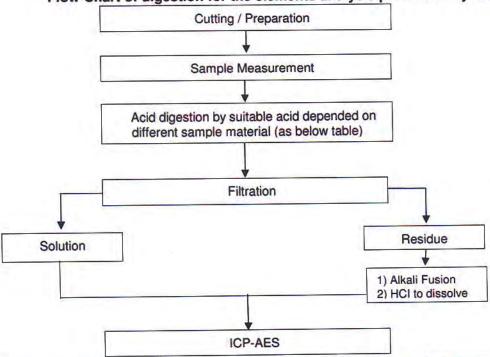
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No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 10 of 13 CTS Ref. CTS/11/4539/Tanaka

- 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	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	Any acid to total digestion		

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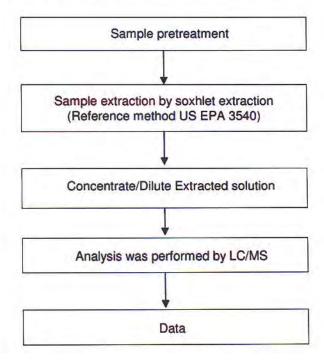
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No. LPCI/25132(B)/11+KA/2011/B1388 Date : 02/12/2011 Page: 11 of 13 CTS Ref. CTS/11/4539/Tanaka

Analytical flow chart of PFOA/PFOS content

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



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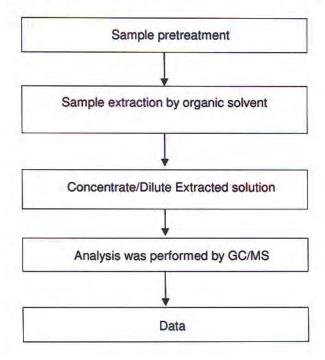
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No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 12 of 13 CTS Ref. CTS/11/4539/Tanaka

Analytical flow chart of Dimethyl Fumarate content

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



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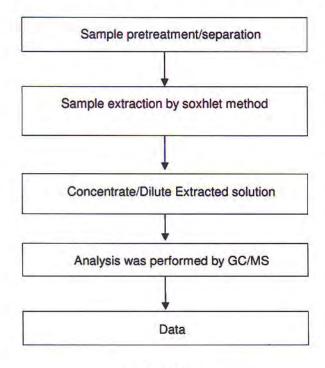
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No. LPCI/25132(B)/11+KA/2011/B1388 Date: 02/12/2011 Page: 13 of 13 CTS Ref. CTS/11/4539/Tanaka

Analytical flow chart of phthalate content

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



****End of Report****

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No.: CE/2012/42804 Date: 2012/04/25 Page: 1 of 8

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 client as:

Sample Description

: EPOXY MOLDING COMPOUND

Style/Item No.

CEL-9220HF

Sample Receiving Date

: 2012/04/16

Testing Period

: 2012/04/16 TO 2012/04/25

Test Result(s)

: Please refer to next page(s).



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Date: 2012/04/25 Page: 2 of 8 No.: CE/2012/42804

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



Test Result(s)

PART NAME No.1

: DARK GRAY LUMP

Total Manufal	Unit	Method	MDL	Result
Test Item(s)	Unit		1 2 2 2 2	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 for Antimony Content. 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			7	n.d.
Monobromobiphenyl			5	n.d.
Dibromobiphenyl			5	n.d.
Tribromobiphenyl			5	n.d.
Tetrabromobiphenyl	1.0	With reference to IEC 62321: 2008 and	5	n.d.
Pentabromobiphenyl	mg/kg	performed by GC/MS.	5	n.d.
Hexabromobiphenyl			5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl	7		5	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
Sum of PBDEs	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.		n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			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.

Note:

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

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. " - " = Not Regulated

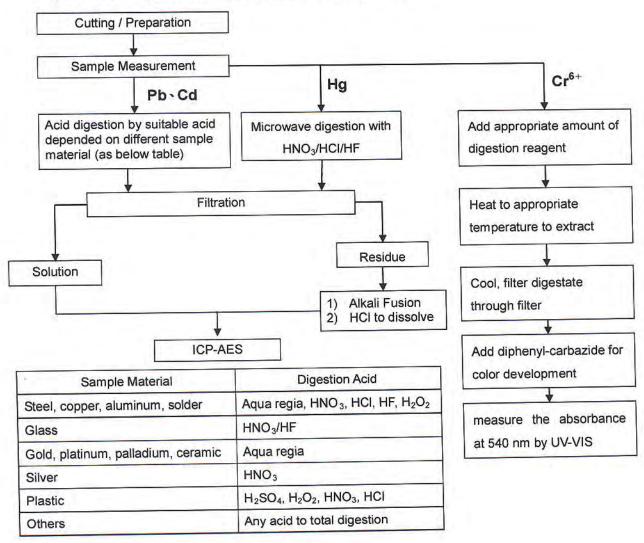


No.: CE/2012/42804 Date: 2012/04/25 Page: 4 of 8

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. (Cr6+ test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



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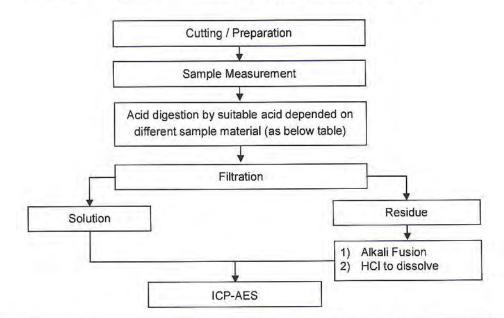
Date: 2012/04/25 No.: CE/2012/42804 Page: 5 of 8

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.
- 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	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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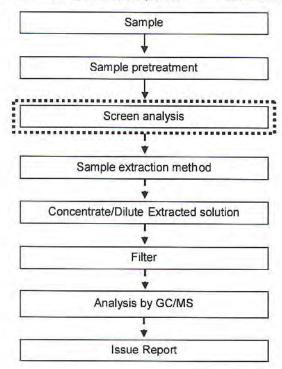


Analytical flow chart

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

[Test Items: PBB/PBDE, TBBP-A-bis]

First testing process -→ Optional screen process - · ► Confirmation process - · ►



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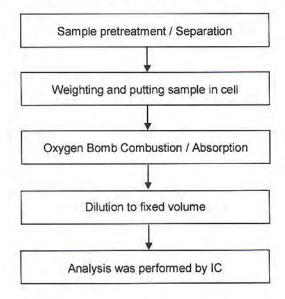
No.: CE/2012/42804 Date: 2012/04/25 Page: 7 of 8

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



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





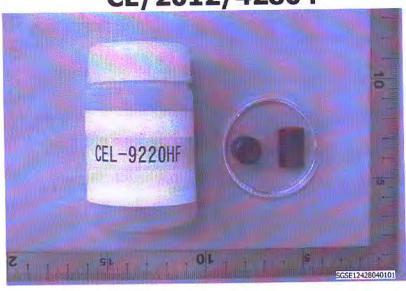
Page: 8 of 8 Date: 2012/04/25 No.: CE/2012/42804

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/2012/42804



** End of Report **



No.: CE/2012/12342

Date: 2012/01/18

Page: 1 of 4

EPISIL TECHNOLOGIES INC.

THE REPORT OF THE PARTY OF THE

NO. 3, INNOVATION ROAD 1, SCIENCE BASED INDUSTRIAL PARK, HSINCHU, 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.

: ALUMINUM PROCESS

Sample Receiving Date

: 2012/01/11

Testing Period

: 2012/01/11 TO 2012/01/18

Test Requested

: As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI) contents in the submitted sample.

Test Result(s)

: Please refer to next page(s).



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full without prior written permission of the Company is 1000 上极音化双位针形式已经高度。本语各工程本公司高面中,不可能交通。
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Date: 2012/01/18

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EPISIL TECHNOLOGIES INC.

NO. 3, INNOVATION ROAD 1, SCIENCE BASED INDUSTRIAL PARK, HSINCHU, 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.

Note:

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

2. n.d. = Not Detected

3. MDL = Method Detection Limit

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company kill 为有规则,此份未是的自己。在现代,这个是一个工作的问题。 1 中间的问题 1



No.: CE/2012/12342

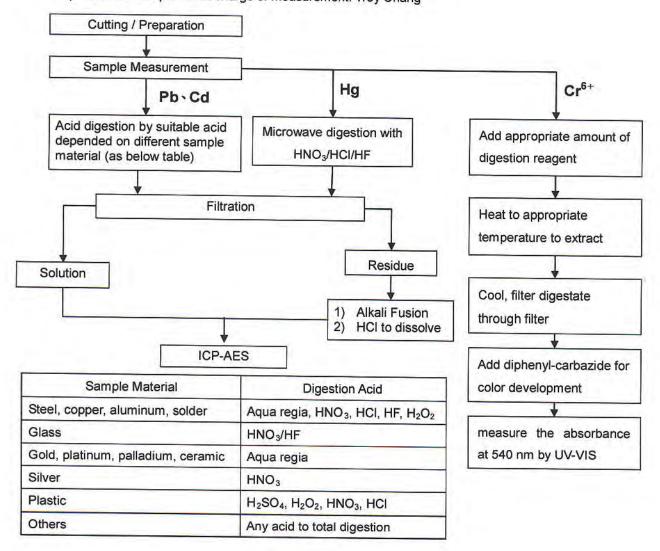
Date: 2012/01/18

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EPISIL TECHNOLOGIES INC.

NO. 3, INNOVATION ROAD 1, SCIENCE BASED INDUSTRIAL PARK, HSINCHU, TAIWAN, R. O. C.

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





No.: CE/2012/12342

Date: 2012/01/18

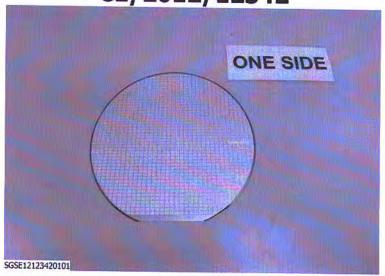
Page: 4 of 4

EPISIL TECHNOLOGIES INC.

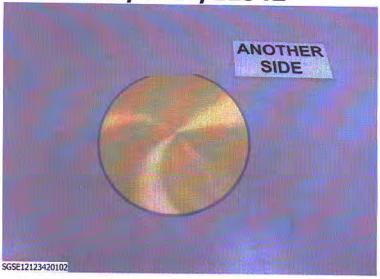
NO. 3, INNOVATION ROAD 1, SCIENCE BASED INDUSTRIAL PARK, HSINCHU, TAIWAN, R. O. C.

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

CE/2012/12342



CE/2012/12342



** End of Report **



Test Report Number: TWNC00253298

Applicant: Littelfuse Philippines Inc. Date : Apr 25, 2012

LIMA Technology Center, Lipa City,

Malvar, Batangas

Sample Description:

One (1) group of submitted samples said to be :

Sample Description : UDFN (SP3000 series product)

Date Sample Received : Apr 17, 2012
Date Test Started : Apr 18, 2012

Test Conducted:

As requested by the applicant, for details please refer to attached pages.

Authorized By: On Behalf Of Intertek Testing Services Taiwan Limited



K. Y. Liang
Director

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Test Conducted

(I) Test Result Summary:

<u>-</u>				
	Result (ppm)			
Test Item	Black Electronic			
icse icem	Component (Mixed			
	All Parts)			
Phthalates				
Di(2-ethylhexyl) Phthalate (DEHP)	ND			
Dibutyl Phthalate (DBP)	ND			
Benzyl Butyl Phthalate (BBP)	ND			
Others				
Hexabromocyclododecane (HBCDD)	ND			

Remarks : ppm = Parts per million based on weight of tested sample

ND = Not detected

Responsibility of Chemist: Irene Chiou / Cathy Chen

Date Sample Received : Apr 17, 2012

Test Period : Apr 18, 2012 To Apr 19, 2012

Test Item	Test method	Reporting Limit
Phthalates	With reference to EN 14372: 2004, by solvent extraction and determined by GC-MS.	
(HRCDD)	With reference to USEPA 3540C, by solvent extraction and determined by GC-MSD	10 ppm

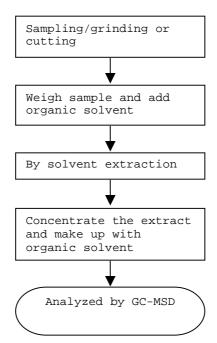
Remark: Reporting Limit = Quantitation limit of analyte in sample



Test Conducted

(Ⅲ) Measurement Flowchart:

Test For Phthalates Contents Reference Method: EN 14372: 2004

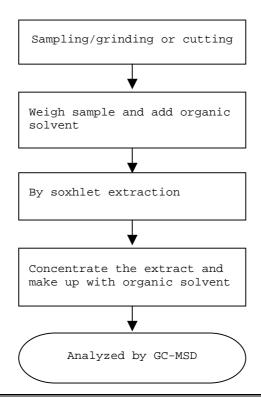




Test Conducted

(Ⅲ) Measurement Flowchart:

Test For Hexabromocyclododecane (HBCDD) Reference Standard: USEPA 3540C



End of Report



Test Conducted

Photo



