



Certificate of non-use of The Controlled Substances

Company name Littelfuse, Inc.

Product Covered SIDACTor[®], QFN Package
 PLED, QFN Package

Issue Date June 1, 2011

It is hereby certified by Littelfuse, Inc., that there is neither RoHS (EU Directive 2002/95/EC)-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.

It is also certified by Littelfuse, Inc., that the products listed in this report do not contain Halogens and their compounds judged per widely accepted industrial guidelines.

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

Koichiro Yoshimoto, Senior Product Engineer, Littelfuse, Inc.

(1) Parts, sub-materials and unit parts

This document covers SIDACTor & PLED QFN Package supplied by Littelfuse, Inc.
Please see page 2-4 for the complete list of part number covered by this report.

< Homogeneous Materials used >

Please see figure and table 1 on page 5 and table 2 on page 6 of this document.

(2) The analytical data on all measurable substances

Please see annex 1 through 7, attached to this document.

Remarks :

1. Pb (lead) contained in die bonding solder (item 8 on page 6) and passivation glass (item 7) to be categorized as exempt in RoHS Annex 5 and 7.

Please refer to Annex 8 of this report for the extract of the applicable exemptions of RoHS (EU Directive 2002/95/EC)



Littelfuse Part Number covered by this report

SIDACtor® QFN package products supplied by Littelfuse are categorized into three groups by Pb (lead) contents due to their design.

All products use the same raw materials and all products listed in this report meet RoHS requirement by using lead (Pb) exemptions.

Please follow table below to locate specific part number and its material breakdown.

Group #	Package	Generic Description	P/N table
1	QFN 3mm x 3mm x 1mm (2-leaded)	SIDACtor® PxxxxQ12ALRP PxxxxQ12BLRP SDP0242Q12FLRP PLED PLEDxxQ12	See page 3
2	QFN 3.3mm x 3.3mm x 1mm (2-leaded)	SIDACtor® PxxxxQ22CLRP	See page 3
3	QFN 5mm x 6mm x 1.5mm (8-leaded)	SIDACtor® SDPxxxxQ38B SDPxxxxQ38CB SEPxxxxQ38CB	See page 4



GROUP 1: QFN 3mm x 3mm x 1mm

Standard (Catalog) Part Number			SPECIAL DEVICE P/N
PLED6Q12	P1800Q12ALRP	P1200Q12BLRP	Any Special P/N that has base standard P/N listed in this table.
PLED9Q12	P2000Q12ALRP	P1300Q12BLRP	
PLED13Q12	P2300Q12ALRP	P1500Q12BLRP	
PLED18Q12	P2500Q12ALRP	P1800Q12BLRP	
	P2600Q12ALRP	P2000Q12BLRP	
P0080Q12ALRP	P3100Q12ALRP	P2300Q12BLRP	
P0300Q12ALRP	P3500Q12ALRP	P2500Q12BLRP	
P0640Q12ALRP		P2600Q12BLRP	
P0720Q12ALRP	P0080Q12BLRP	P3100Q12BLRP	
P0900Q12ALRP	P0300Q12BLRP	P3500Q12BLRP	
P1100Q12ALRP	P0640Q12BLRP		
P1200Q12ALRP	P0720Q12BLRP	SDP0242Q12FLRP	
P1300Q12ALRP	P0900Q12BLRP		
P1500Q12ALRP	P1100Q12BLRP		

GROUP 2: QFN 3.3mm x 3.3mm x 1mm

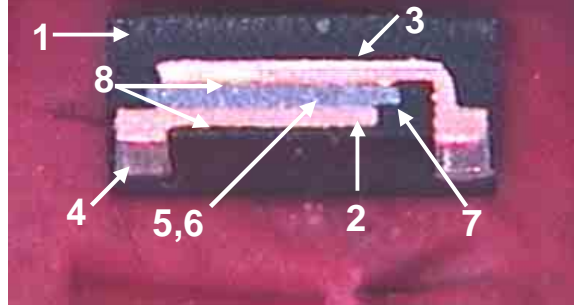
Standard (Catalog) Part Number			SPECIAL DEVICE P/N
P0080Q22CLRP	P1101Q22CLRP	P2500Q22CLRP	Any Special P/N that has base standard P/N listed in this table.
P0300Q22CLRP	P1200Q22CLRP	P2600Q22CLRP	
P0640Q22CLRP	P1300Q22CLRP	P3100Q22CLRP	
P0641Q22CLRP	P1301Q22CLRP	P3500Q22CLRP	
P0720Q22CLRP	P1500Q22CLRP		
P0721Q22CLRP	P1701Q22CLRP		
P0900Q22CLRP	P1800Q22CLRP		
P0901Q22CLRP	P2000Q22CLRP		
P1100Q22CLRP	P2300Q22CLRP		



GROUP 3: QFN 5mm x 6mm x 1.5mm

Standard (Catalog) Part Number			SPECIAL DEVICE P/N
SDP0080Q38B	SDP0080Q38CB	SEP0080Q38CB	Any Special P/N that has base standard P/N listed in this table.
SDP0640Q38B	SDP0640Q38CB	SEP0640Q38CB	
SDP0720Q38B	SDP0720Q38CB	SEP0720Q38CB	
SDP0900Q38B	SDP0900Q38CB	SEP0900Q38CB	
SDP1100Q38B	SDP1100Q38CB		
SDP1300Q38B	SDP1300Q38CB		
SDP1800Q38B	SDP1800Q38CB		
SDP2600Q38B	SDP2600Q38CB		
SDP3100Q38B	SDP3100Q38CB		
SDP3500Q38B	SDP3500Q38CB		

Part construction (cross section)



Material Used (where used)

Table 1: Homogeneous Material Used

#	Description	Name of Material	Type	Analysis data
1	Molding compound	epoxy resin	plastic	annex 1
2	Lead frame	copper alloy	metal	annex 2
3	Preform (clip)	copper alloy	metal	annex 3
4	Matte-Tin plating	Tin	metal	annex 4, tested as plating cathode (Tin ball)
5	Silicon die	silicon	metal	annex 5, tested as Nickel-plated wafer.
6	Nickel electrode	nickel	metal	
7	Passivation glass	glass	glass	annex 6. Pb in this glass is exempted by RoHS Annex 7.
8	Die bonding solder	solder	metal	annex 7. Pb in this solder is exempted by RoHS Annex 5.

Table 2: RoHS-regulated substance in raw materials

Components	Analysis Result						
	Cd Cadmium	Cr Chromium	Hg Mercury	Pb Lead	PBB	PBDE	Total Halogen
As Component Total	< 2ppm	< 2ppm	< 5ppm	< 2 ppm* ¹ (7.0%* ²)	< 5 ppm	< 5 ppm	<50ppm
Epoxy Resin compound (mixture of phenolix resin, epoxy resin, filler and non-Brominated fire retardant) See Annex 1 for the detail.	< 2ppm	< 2ppm	< 2ppm	< 2ppm	< 5ppm	<5 ppm	< 50ppm
Lead frame / Clip (Copper Alloy, CDA194) See Annex 2 & 3 for the detail.	< 2ppm	< 2ppm	< 2ppm	< 2ppm	< 5ppm	< 5ppm	< 50ppm
Outside lead finish (Matte-Tin plated, Sn 100%) See Annex 4 for the detail.	< 2ppm	< 2ppm	< 2ppm	< 2ppm	< 5ppm	< 5ppm	< 50ppm
Silicon Die (Silicon + Ni electrode) See Annex 5 for the detail.	< 2ppm	< 2ppm	< 2ppm	< 2ppm	< 5ppm	< 5ppm	< 50ppm
Passivation Glass See Annex 6 for the detail.	< 2ppm	< 2ppm	< 2ppm	40% * ³	< 5ppm	< 5ppm	< 50ppm
Die Bonding Solder (Pb/Sn=95/5) See Annex 7 for the detail.	< 2ppm	< 2ppm	< 2ppm	95% * ⁴	< 5ppm	< 5ppm	---

- *1 Less than 10ppm Pb content overall, excluding Pb from the die bonding solder and the passivation glass on the silicon die.
- *2 Group 1 products: 7.0wt% or 2.0mg, Group 2 products: 6.8wt% or 2.3mg , Group 3 products: 5.6wt% or 8.0mg of Pb (lead) content overall including the RoHS-exempted use of Pb (lead)
- *3 Pb (lead) contained in passivation glass is exempted from restriction by RoHS Annex 5.
- *4 Pb (lead) contained in die bonding solder is exempted from restriction by RoHS Annex 7, first item.

Please refer to Annex 8 of this report for the applicable exemptions of RoHS (EU Directive 2002/95/EC)

Annex 1: Analysis Result of Molding Compound (Page 1 of 8)**SGS**

Validity unknown

For Question
Please Contact with SGS
www.tw.sgs.com**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 client as:

Sample Description : EPOXY MOLDING COMPOUND
Style/Item No. : CEL-9220HF
Sample Receiving Date : 2011/04/14
Testing Period : 2011/04/14 TO 2011/04/27

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



Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

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Annex 1: Analysis Result of Molding Compound (Page 2 of 8)



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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

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) by alkaline extraction	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 3050B 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 (Cl) (CAS No.: 22537-15-1)			50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)			50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.
Monobromobiphenyl			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			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl	5	n.d.		

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Annex 1: Analysis Result of Molding Compound (Page 3 of 8)



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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

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Annex 1: Analysis Result of Molding Compound (Page 4 of 8)

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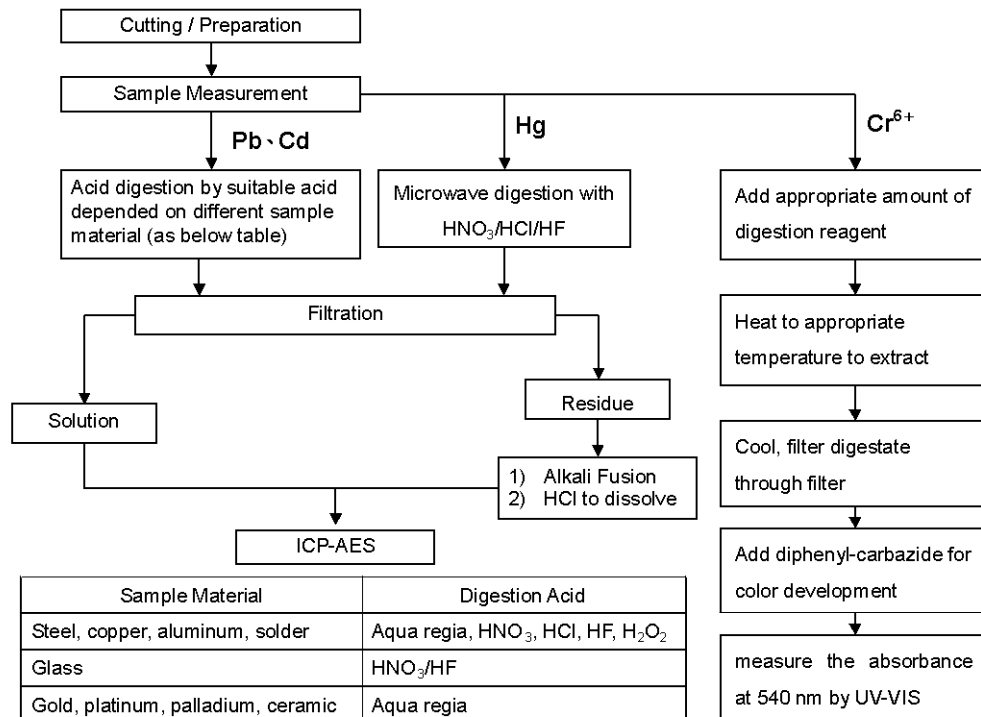
Test Report

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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. (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



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

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Annex 1: Analysis Result of Molding Compound (Page 5 of 8)



Test Report

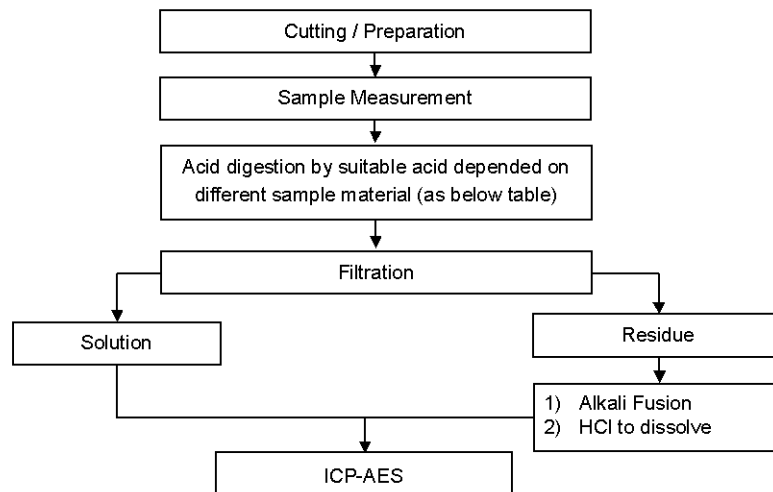
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HITACHI CHEMICAL CO., LTD.
1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 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 , HCl, HF, H ₂ O ₂
Glass	HNO ₃ /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
Others	Any acid to total digestion

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Annex 1: Analysis Result of Molding Compound (Page 6 of 8)



Test Report

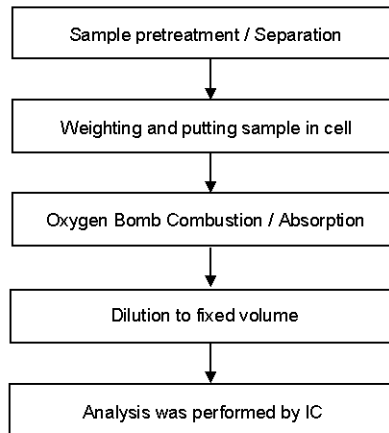
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HITACHI CHEMICAL CO., LTD.
1772-1 KANAKUBO YUUKI-SHI IBARAKI, 307-0015, JAPAN



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



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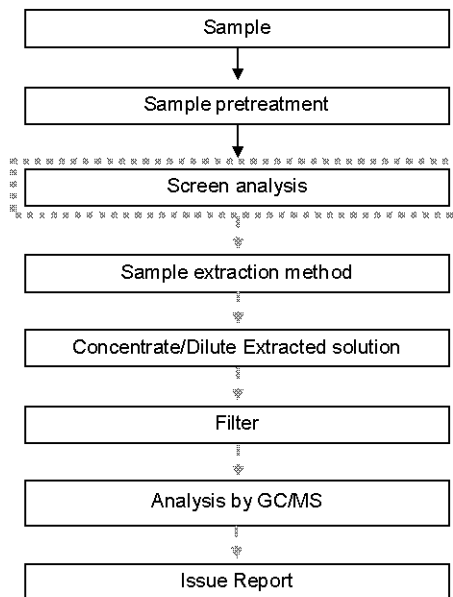


Analytical flow chart

- 1) Name of the person who made measurement: Roman Wong
- 2) 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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Annex 1: Analysis Result of Molding Compound (Page 8 of 8)**SGS****Test Report**

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

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Annex 2: Analysis Result of Lead frame (Page 1 of 9)



Test Report

No.: GZ1101010693/CHEM

Date: FEB 09, 2011

Page 1 of 9

QPL LIMITED

NO.1, PIN ZHI ROAD, XIN AN INDUSTRIAL PARK, CHANG AN TOWN, DONGGUAN, GUANGDONG, CHINA

The following sample(s) was/were submitted and identified on behalf of the applicant as C194

SGS Job No. : SZ12959189

SGS Internal Reference No. : 25.8

Client Reference Information : Sample may cover: QFN, DFN, SOP, HD-BU, SBP, SOIC, DUAL,
QFP, PLCC, PDIP, TQFP

Date of Sample Received : JAN 26, 2011

Testing Period : JAN 26, 2011 TO FEB 09, 2011

Test Requested : Selected test (s) as requested by client.

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

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

Conclusion : A: Based on the performed tests on submitted sample(s), the results **comply with the RoHS Directive 2002/95/EC and its subsequent amendments.**

Signed for and on behalf of
SGS-CSTC Ltd.



Manson Yang
Approved Signatory

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Annex 2: Analysis Result of Lead frame (Page 3 of 9)



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Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. ◇ = Spot test:
 - Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;
 - (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:
 - 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.
 - Storage conditions and production date of the tested sample are unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.
5. # = Positive indicates the presence of CrVI on the tested area.
Negative indicates the absence of CrVI on the tested area.
6. "-" = Not regulated

B: PFOA & PFOS (Perfluorooctanoic acid & Perfluorooctane sulfonates)

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Perfluorooctanoic acid (PFOA)	µg/m ²	EPA 3550C: 2007, LC-MS	N.D.	1
Perfluorooctane sulfonates (PFOS)				
PFOS – Acid	µg/m ²	EPA 3550C: 2007, LC-MS	N.D.	1
PFOS – Metal Salt				
PFOS – Amide				

Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit

For reference: Entry 53 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under 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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Annex 2: Analysis Result of Lead frame (Page 5 of 9)



Test Report

No.: GZ1101010693/CHEM

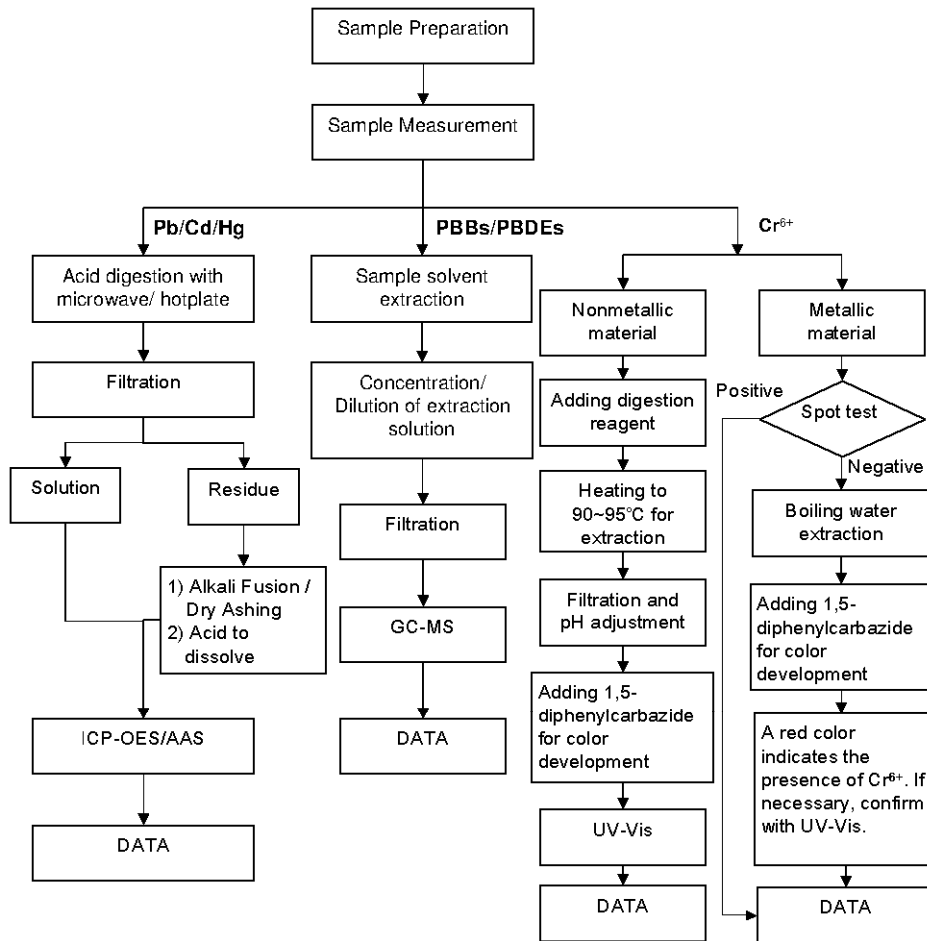
Date: FEB 09, 2011

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ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Bella Wang / Cutey Yu / Ross Zhan
- 2) Name of the person in charge of testing: Adams Yu / Ryan Yang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr⁶⁺ and PBBs/PBDEs test method excluded).



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Test Report

No.: GZ1101010693/CHEM

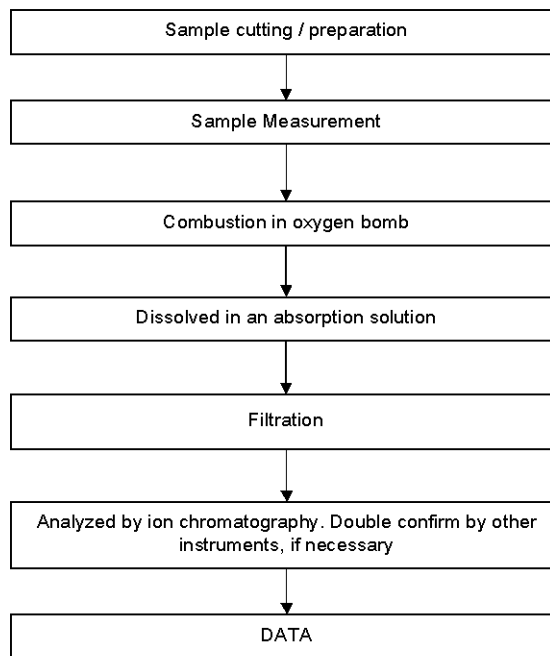
Date: FEB 09, 2011

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ATTACHMENTS

Halogen Testing Flow Chart

- 1) Name of the person who made testing: Liang Wang
- 2) Name of the person in charge of testing: Michelle Song



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Annex 3: Analysis Result of Clip (Page 1 of 4)



Test Report

No. LPCI/01097(AD)/11 Date: 17/01/2011
 CTS Ref. CTS/11/0199/Ryoshindoh

Page: 1 of 4

RYOSHINDOH MANUFACTURING SDN BHD
 PLO 620, JALAN KELULI 3
 81100 PASIR GUDANG, JOHOR

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

Sample Description : Copper – Tamac4 (30g)
 Sample Receiving Date : 14/01/2011
 Testing Period : 14/01/2011 to 17/01/2011

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.
 Test Method : Please refer to next page(s).
 Test Results : Please refer to next page(s).
 Analyst : Ng Mei Kheng

SGS LABORATORY SERVICES (M) SDN. BHD.



CHONG KIEN LEN
 B.Sc.(HONS) AMIC
 LAB MANAGER

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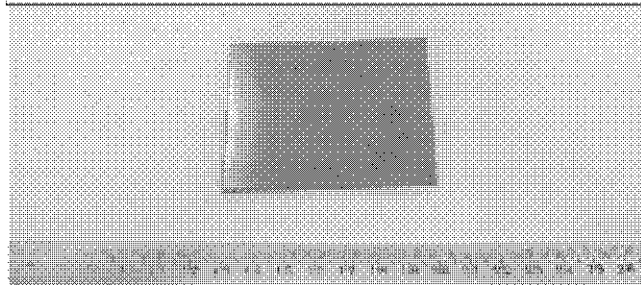
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Annex 3: Analysis Result of Clip (Page 3 of 4)**Test Report**No. LPCI/01097(AD)/11 Date: 17/01/2011
CTS Ref. CTS/11/0199/Ryoshindoh

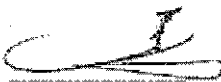
Page: 3 of 4

Test Part Description:

Sample Description : Copper – Tamac4 (30g)

RYOSHINDOH MANUFACTURING SDN BHD
LPCI/01097(AD)/11

SGS LABORATORY SERVICES (M) SDN. BHD.

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LAB MANAGER

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Annex 4: Analysis Result of Matte-Tin plating (page 1 of 9)**SGS**

Validity unknown

For Question
Please Contact with SGS
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Test Report**

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 1 of 9

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桃園縣觀音工業區工業二路12-1號

NO. 12-1, GONGYE 2ND RD., GUANYIN INDUSTRIAL AREA, TAoyUAN COUNTY 328, TAIWAN



以下測試樣品係由客戶送樣，且由客戶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)	:	PURE TIN
樣品型號(Style/Item No.)	:	H99.99S
收件日期(Sample Receiving Date)	:	2010/12/08
測試期間(Testing Period)	:	2010/12/08 TO 2010/12/13

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).



Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

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Annex 4: Analysis Result of Matte-Tin plating (page 2 of 9)



測試報告 Test Report

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 2 of 9

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測試結果(Test Results)

測試部位(PART NAME) No.1 : 銀色金屬 (SILVER COLORED METAL)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
				No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321: 2008 - Clause 9方法, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321: 2008 - Clause 9 and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321: 2008 - Clause 9方法, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321: 2008 - Clause 9 and performed by ICP-AES.	2	22
汞 / Mercury (Hg)	mg/kg	參考IEC 62321: 2008 - Clause 7方法, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321: 2008 - Clause 7 and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI) by boiling water extraction	**	參考IEC 62321: 2008 - Annex B方法, 以boiling water extraction檢測。 / With reference to IEC 62321: 2008 - Annex B and performed by boiling water extraction Method. (See Note 6)	0.02mg/kg with 50 cm ² surface area	Negative
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS) PFOS - Acid PFOS - Metal Salt PFOS - Amide	mg/kg	參考US EPA 3540C: 1996方法, 以液相層析質譜儀檢測全氟辛烷磺酸含量。 / With reference to US EPA 3540C: 1996 method for PFOS Content. Analysis was performed by LC/MS.	10	n.d.
全氟辛酸(鉍) / PFOA (CAS No.: 000335-67-1)	mg/kg	參考US EPA 3540C: 1996方法, 以液相層析質譜儀檢測全氟辛酸(鉍)含量。 / With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.	10	n.d.

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Annex 4: Analysis Result of Matte-Tin plating (page 3 of 9)



測試報告 Test Report

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 3 of 9

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
				No.1
多溴聯苯總和 / Sum of PBBs			-	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			5	n.d.
五溴聯苯 / Pentabromobiphenyl			5	n.d.
六溴聯苯 / Hexabromobiphenyl			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			5	n.d.
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			5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether			5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether			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.
鹵素 / Halogen				
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg		50	n.d.
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN	50	n.d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 010097-32-2)	mg/kg	14582:2007. Analysis was performed by IC.	50	n.d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 014362-44-8)	mg/kg		50	n.d.

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Annex 4: Analysis Result of Matte-Tin plating (page 4 of 9)

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測試報告 Test Report

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 4 of 9

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NO. 12-1, GONGYE 2ND RD., GUANYIN INDUSTRIAL AREA, TAOYUAN COUNTY 328, TAIWAN



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. ** = Qualitative analysis (No Unit) 定性分析(無單位)
6. Boiling-water-extraction:
Negative = Absence of Cr(VI) coating / surface layer(鍍層中偵測不到六價鉻),
Positive = Presence of Cr(VI) coating / surface layer(鍍層中偵測到六價鉻);
The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area. 該溶液濃度 \geq 0.02 mg/kg with 50 cm² (sample surface area)

PFOS參考資訊(Reference Information) : 指令 2006/122/EC (Directive 2006/122/EC)

- (1) 該物質不可置於市場上或使用於特殊物質或配置成分重量濃度等於或大於0.005%。
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(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 1 μ g/m² of the coated material.)

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Annex 4: Analysis Result of Matte-Tin plating (page 5 of 9)

SGS

測試報告 Test Report

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 5 of 9

昇貿科技股份有限公司

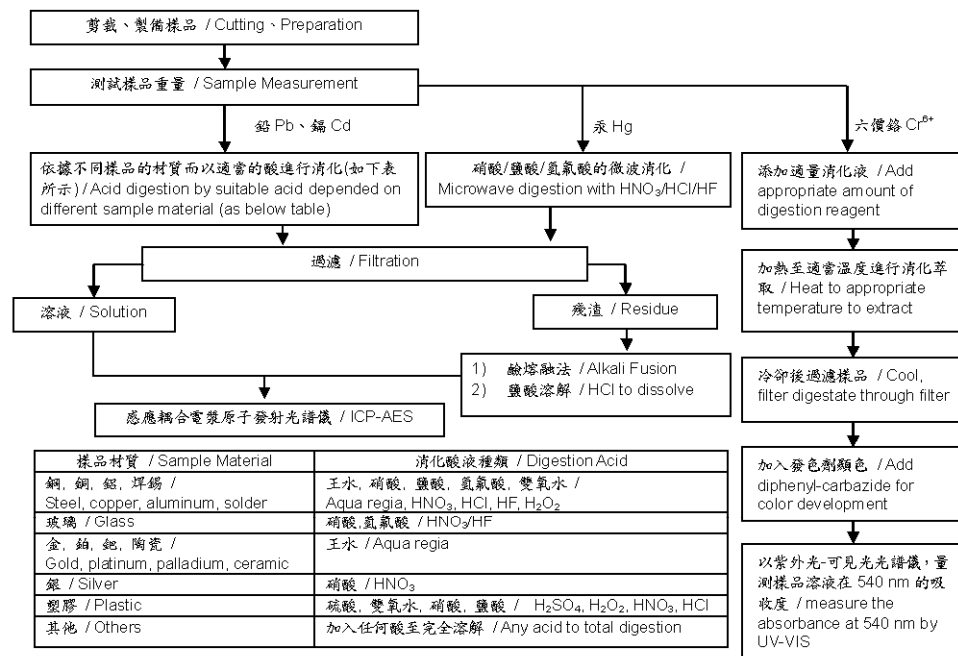
SHENMAO TECHNOLOGY INC.

桃園縣觀音工業區工業二路12-1號

NO. 12-1, GONGYE 2ND RD., GUANYIN INDUSTRIAL AREA, TAoyUAN COUNTY 328, TAIWAN



- 1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)
- 2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



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Annex 4: Analysis Result of Matte-Tin plating (page 6 of 9)



測試報告 Test Report

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 6 of 9

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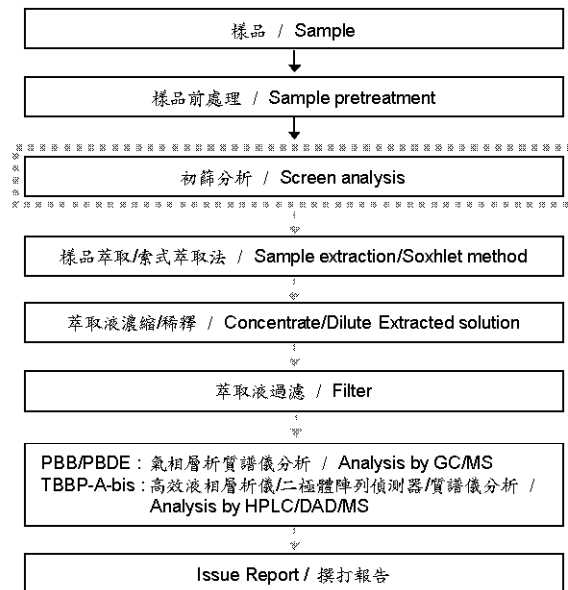
NO. 12-1, GONGYE 2ND RD., GUANYIN INDUSTRIAL AREA, TAoyUAN COUNTY 328, TAIWAN



分析流程圖 / Analytical flow chart

- 1) 測試人員: 翁賜彬 / Name of the person who made measurement: Roman Wong
- 2) 測試負責人: 張啓興 / Name of the person in charge of measurement: Troy Chang
- 測試項目 (Test Items): 多溴聯苯/多溴聯苯醚, 四溴雙酚-A 雙 / PBB/PBDE, TBBP-A-bis

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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Annex 4: Analysis Result of Matte-Tin plating (page 7 of 9)



測試報告 Test Report

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 7 of 9

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SHENMAO TECHNOLOGY INC.

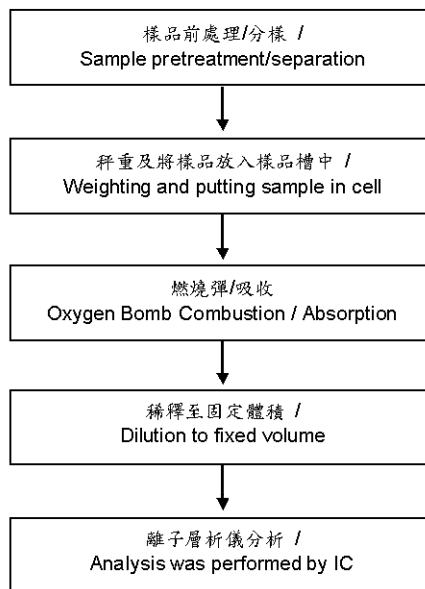
桃園縣觀音工業區工業二路12-1號

NO. 12-1, GONGYE 2ND RD., GUANYIN INDUSTRIAL AREA, TAoyUAN COUNTY 328, TAIWAN



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

- 1) 測試人員：陳恩臻 / Name of the person who made measurement: Rita Chen
- 2) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



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Annex 4: Analysis Result of Matte-Tin plating (page 8 of 9)



測試報告 Test Report

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 8 of 9

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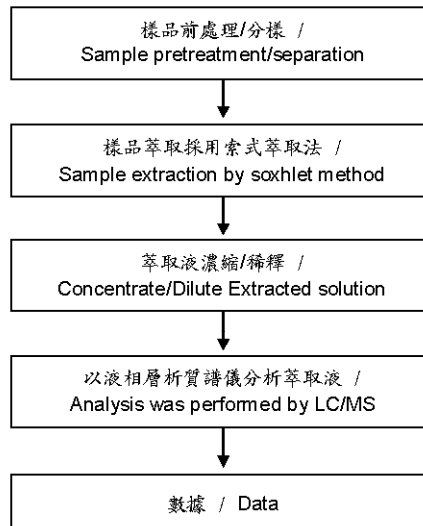


索式萃取(LC/MS)分析流程圖 /

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

- 1) 測試人員：傅莉雅 / Name of the person who made measurement: Lydia Fu
- 2) 測試負責人：陳新智 / Name of the person in charge of measurement: Shinjyh Chen

■ 測試項目(Test Items): 全氟辛烷磺酸/全氟辛酸(銨)、苯並三唑類化合物 /
PFOS/PFOA、Benzotriazole



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Annex 4: Analysis Result of Matte-Tin plating (page 9 of 9)**SGS****測試報告
Test Report**

號碼(No.) : CE/2010/C1468 日期(Date) : 2010/12/13 頁數(Page) : 9 of 9

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桃園縣觀音工業區工業二路12-1號
NO. 12-1, GONGYE 2ND RD., GUANYIN INDUSTRIAL AREA, TAoyUAN COUNTY 328, TAIWAN

** 報告結尾(End of Report) **

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Annex 5: Analysis Result of Ni-plated Wafer (Page 1 of 7)



TEST REPORT

NUMBER: WUXH00002719

APPLICANT: CONCORD SEMICONDUCTOR(WUXI) CO., LTD.
 EAST 1#, ZHENFA 6 ROAD, SHUO FANG INDUSTRIAL PARK WUXI NATIONAL HIGH-TECH DEVELOPMENT ZONE, WUXI, JIANGSU, CHINA
 ATTN: ZHANG XIAOPENG

DATE: AUG 06, 2010

SAMPLE DESCRIPTION:

ONE(1)PIECE OF SUBMITTED SAMPLE SAID TO BE :**SILVER GREY METAL**.
 ITEM NAME : SILICON WAFER WITH NICKEL PLATING.
 VENDOR : CONCORD.
 COMPONENT OR PART NO. : SILICON+NICKEL.
 TEST ITEM : Pb, Cd, Hg, CrVI, PBB, PBDE, F, Cl, Br, I.

TESTS CONDUCTED:

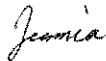
AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

SUMMARY:

<u>TESTED SAMPLE</u>	<u>STANDARD</u>	<u>RESULT</u>
SUBMITTED SAMPLE	WITH REFERENCE TO TEST METHOD OF IEC 62321 EDITION 1.0: 2008 AND MAXIMUM CONCENTRATION LIMITS QUOTED FROM ROHS DIRECTIVES 2002/95/EC AND AMENDMENT 2005/618/EC	PASS

TO BE CONTINUED

PREPARED AND CHECKED BY:
 FOR INTERTEK TESTING SERVICES WUXI LTD.



JESSICA LU
 GENERAL MANAGER

Annex 5: Analysis Result of Ni-plated Wafer (Page 2 of 7)

Intertek

TEST REPORT

NUMBER: WUXH00002719

TESTS CONDUCTED

(A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT
CADMIUM (Cd) CONTENT (mg/kg)	ND
LEAD (Pb) CONTENT (mg/kg)	ND
MERCURY (Hg) CONTENT (mg/kg)	ND
CHROMIUM (VI) (Cr ⁶⁺) RESULT (BY BOILING WATER EXTRACTION ON METAL) (mg/kg WITH 50cm ²)	ND
POLYBROMINATED BIPHENYLS (PBBs) (mg/kg)	
MONOBROMO BIPHENYLS (MonoBB)	ND
DIBROMO BIPHENYLS (DiBB)	ND
TRIBROMO BIPHENYLS (TriBB)	ND
TETRABROMO BIPHENYLS (TetraBB)	ND
PENTABROMO BIPHENYLS (PentaBB)	ND
HEXABROMO BIPHENYLS (HexaBB)	ND
HEPTABROMO BIPHENYLS (HeptaBB)	ND
OCTABROMO BIPHENYLS (OctaBB)	ND
NONABROMO BIPHENYLS (NonaBB)	ND
DECABROMO BIPHENYL (DecaBB)	ND
POLYBROMINATED DIPHENYL ETHERS (PBDEs) (mg/kg)	
MONOBROMO DIPHENYL ETHERS (MonoBDE)	ND
DIBROMO DIPHENYL ETHERS (DiBDE)	ND
TRIBROMO DIPHENYL ETHERS (TriBDE)	ND
TETRABROMO DIPHENYL ETHERS (TetraBDE)	ND
PENTABROMO DIPHENYL ETHERS (PentaBDE)	ND
HEXABROMO DIPHENYL ETHERS (HexaBDE)	ND
HEPTABROMO DIPHENYL ETHERS (HeptaBDE)	ND
OCTABROMO DIPHENYL ETHERS (OctaBDE)	ND
NONABROMO DIPHENYL ETHERS (NonaBDE)	ND
DECABROMO DIPHENYL ETHER (DecaBDE)	ND

REMARK:

mg/kg = MILLIGRAM PER KILOGRAM BASED ON DRY WEIGHT= ppm

ND = NOT DETECTED

mg/kg WITH 50cm² = MILLIGRAM PER KILOGRAM WITH 50 SQUARE CENTIMETER

TO BE CONTINUED

PAGE 2 OF 7

Intertek Testing Services Wuxi Ltd.

No.8 Fubei Road, Xishan Economic Development Zone,
Wuxi 214101, Jiangsu, China
Tel: +86 510 8821 4567 Fax: +86 510 8820 0428 E-mail: consumergoods.wuxi@intertek.com

Annex 5: Analysis Result of Ni-plated Wafer (Page 3 of 7)

Intertek

TEST REPORT

NUMBER: WUXH00002719

TESTS CONDUCTED

(B) RoHS REQUIREMENT:

RESTRICTED SUBSTANCES	LIMITS
CADMIUM (Cd)	0.01% (100 mg/kg)
LEAD (Pb)	0.1% (1000 mg/kg)
MERCURY (Hg)	0.1% (1000 mg/kg)
CHROMIUM (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000 mg/kg)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000 mg/kg)

THE ABOVE LIMITS WERE QUOTED FROM 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

(c) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY ACID DIGESTION AND DETERMINED BY ICP-OES	2 mg/kg
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY ACID DIGESTION AND DETERMINED BY ICP-OES	2 mg/kg
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY ACID DIGESTION AND DETERMINED BY ICP-OES	2 mg/kg
CHROMIUM (VI) (Cr ⁶⁺) CONTENT (FOR METAL)	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY BOILING WATER EXTRACTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	0.02mg/kg WITH 50cm ² (IN TESTING SOLUTION)
POLYBROMINATED BIPHENYLS (PBBs) & POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC IEC 62321 EDITION 1.0: 2008, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 mg/kg

DATE SAMPLE RECEIVED:AUG 02, 2010

TESTING PERIOD:AUG 02, 2010 TO AUG 05, 2010

TO BE CONTINUED

PAGE 3 OF 7

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No.8 Fubei Road, Xishan Economic Development Zone,
Wuxi 214101, Jiangsu, China

Tel: +86 510 8821 4567 Fax: +86 510 8820 0428 E-mail: consumergoods.wuxi@intertek.com

Annex 5: Analysis Result of Ni-plated Wafer (Page 4 of 7)

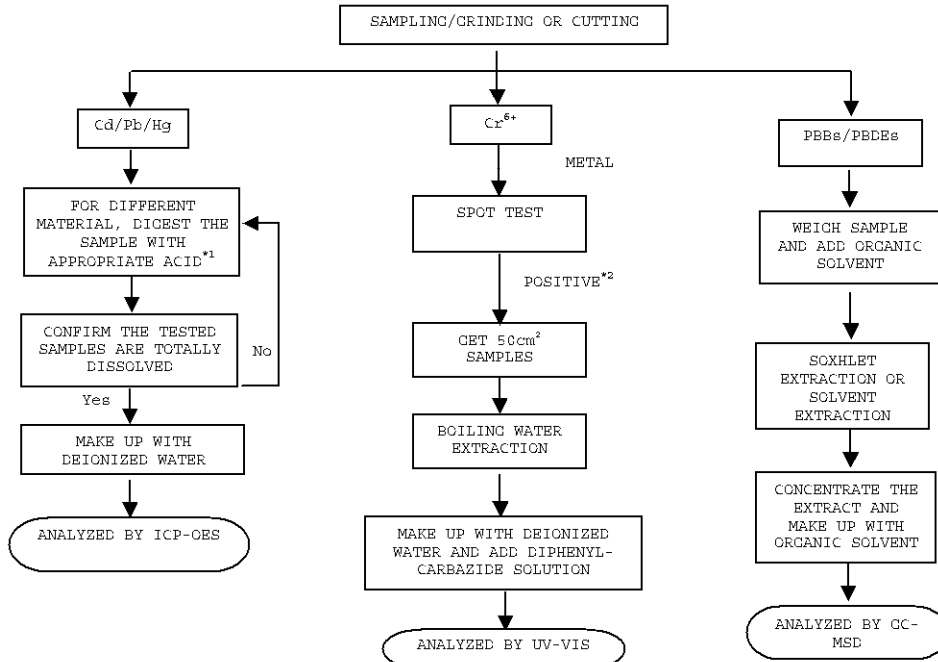
Intertek

TEST REPORT

NUMBER: WUXH00002719

TESTS CONDUCTED

(D) MEASUREMENT FLOWCHART:
 TEST FOR Cd/Pb/Hg/Cr (VI)/PBBs/PBDEs CONTENTS
 REFERENCE STANDARD: IEC 62321 EDITION 1.0: 2008



CHEMIST: INORGANIC (ANN LUO/FRED WANG/ALLY WAN)
 ORGANIC (JENNY XU/CHERRY SUN)

REMARKS:

*1: LIST OF APPROPRIATE ACID:

MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS	HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃
METALS	HNO ₃ , HCl, HF
ELECTRONICS	HNO ₃ , HCl, H ₂ O ₂ , HBF ₄

*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM VI WOULD BE DETERMINED AS DETECTED.

TO BE CONTINUED

Annex 5: Analysis Result of Ni-plated Wafer (Page 5 of 7)

TEST REPORT

NUMBER: WUXH00002719

TESTS CONDUCTED

(I) TEST RESULT SUMMARY :

HALOGEN CONTENT :

TESTING ITEM	RESULT (ppm)
FLUORINE (F) CONTENT	ND
CHLORINE (Cl) CONTENT	ND
BROMINE (Br) CONTENT	ND
IODINE (I) CONTENT	ND

REMARKS : ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

DATE SAMPLE RECEIVE: AUG 02, 2010

TEST PERIOD: AUG 02, 2010 TO AUG 05, 2010

(II) TEST METHOD :

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
HALOGEN (F, Cl, Br, I) CONTENT	WITH REFERENCE TO IEC 61189-2:2006 BY COMBUSTION FLASK AND DETERMINED BY ION CHROMATOGRAPHY	50 ppm

REMARKS : REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE

 TO BE CONTINUED

PAGE 5 OF 7

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 Wuxi 214101, Jiangsu, China

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Annex 5: Analysis Result of Ni-plated Wafer (Page 6 of 7)



TEST REPORT

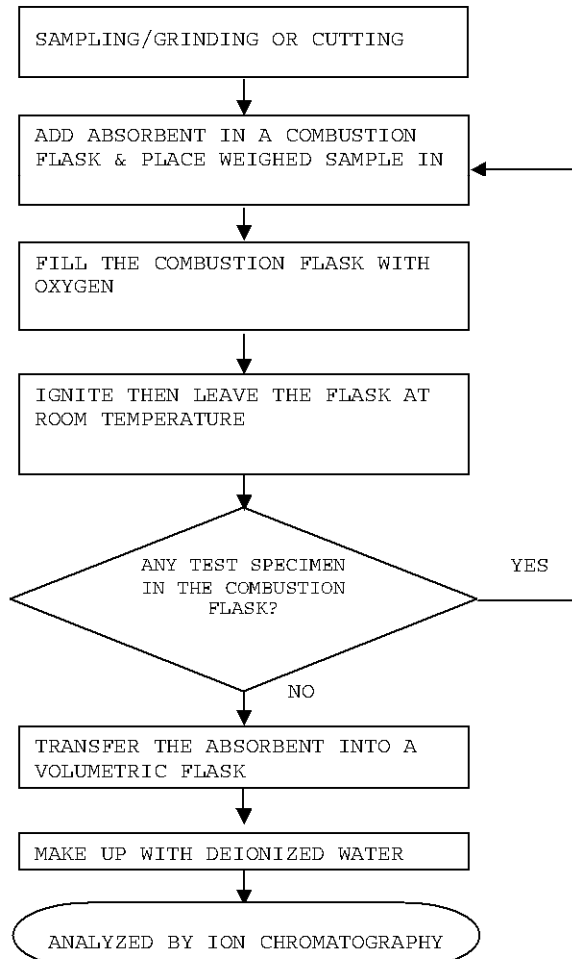
NUMBER: WUXH00002719

TESTS CONDUCTED

(III) MEASUREMENT FLOWCHART:

TEST FOR HALOGEN CONTENT

REFERENCE METHOD: IEC 61189-2 TEST 2C12



CHEMIST: FRED WANG/ ALLY WAN

TO BE CONTINUED

PAGE 6 OF 7

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Annex 5: Analysis Result of Ni-plated Wafer (Page 7 of 7)



TEST REPORT

NUMBER: WUXH00002719

TESTS CONDUCTED

PHOTO



END OF REPORT

PAGE 7 OF 7

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Annex 6: Analysis Result of Passivation Glass (Page 1 of 7)**TEST REPORT**

NUMBER: WUXH00002721

APPLICANT: CONCORD SEMICONDUCTOR(WUXI) CO., LTD.
DATE: AUG 06, 2010
EAST 1#, ZHENFA 6 ROAD, SHUO FANG
INDUSTRIAL PARK WUXI NATIONAL HIGH-
TECH DEVELOPMENT ZONE,
WUXI, JIANGSU, CHINA
ATTN: ZHANG XIAOPENG

SAMPLE DESCRIPTION:ONE (1) PIECE OF SUBMITTED SAMPLE SAID TO BE : **WHITE POWDER.**

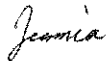
ITEM NAME : WAFER PASSIVATION.
VENDOR : PROPRIETY.
COMPONENT OR PART NO. : PROPRIETY.
TEST ITEM : Pb, Cd, Hg, CrVI, PBB, PBDE, F, Cl, Br, I.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY:
FOR INTERTEK TESTING SERVICES WUXI LTD.



JESSICA LU
GENERAL MANAGER

PAGE 1 OF 7

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No.8 Fubei Road, Xishan Economic Development Zone,
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Tel: +86 510 8821 4567 Fax: +86 510 8820 0428 E-mail: consumergoods.wuxi@intertek.com

Annex 6: Analysis Result of Passivation Glass (Page 2 of 7)

Intertek

TEST REPORT

NUMBER: WUXH00002721

TESTS CONDUCTED

(A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT
CADMIUM (Cd) CONTENT (mg/kg)	ND
LEAD (Pb) CONTENT (mg/kg)	207400
MERCURY (Hg) CONTENT (mg/kg)	ND
CHROMIUM (VI) (Cr ⁶⁺) CONTENT (mg/kg) (FOR NON-METAL)	ND
POLYBROMINATED BIPHENYLS (PBBs) (mg/kg)	
MONOBROMO BIPHENYLS (MonoBB)	ND
DIBROMO BIPHENYLS (DiBB)	ND
TRIBROMO BIPHENYLS (TriBB)	ND
TETRABROMO BIPHENYLS (TetraBB)	ND
PENTABROMO BIPHENYLS (PentaBB)	ND
HEXABROMO BIPHENYLS (HexaBB)	ND
HEPTABROMO BIPHENYLS (HeptaBB)	ND
OCTABROMO BIPHENYLS (OctaBB)	ND
NONABROMO BIPHENYLS (NonaBB)	ND
DECABROMO BIPHENYL (DecaBB)	ND
POLYBROMINATED DIPHENYL ETHERS (PBDEs) (mg/kg)	
MONOBROMO DIPHENYL ETHERS (MonoBDE)	ND
DIBROMO DIPHENYL ETHERS (DiBDE)	ND
TRIBROMO DIPHENYL ETHERS (TriBDE)	ND
TETRABROMO DIPHENYL ETHERS (TetraBDE)	ND
PENTABROMO DIPHENYL ETHERS (PentaBDE)	ND
HEXABROMO DIPHENYL ETHERS (HexaBDE)	ND
HEPTABROMO DIPHENYL ETHERS (HeptaBDE)	ND
OCTABROMO DIPHENYL ETHERS (OctaBDE)	ND
NONABROMO DIPHENYL ETHERS (NonaBDE)	ND
DECABROMO DIPHENYL ETHER (DecaBDE)	ND

REMARK:

mg/kg = MILLIGRAM PER KILOGRAM BASED ON DRY WEIGHT= ppm

ND = NOT DETECTED

= THE RESULT IS FOR REFERENCE ONLY

TO BE CONTINUED

PAGE 2 OF 7

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Annex 6: Analysis Result of Passivation Glass (Page 3 of 7)

Intertek

TEST REPORT

NUMBER: WUXH00002721

TESTS CONDUCTED

(B) RoHS REQUIREMENT:

RESTRICTED SUBSTANCES	LIMITS
CADMIUM (Cd)	0.01% (100 mg/kg)
LEAD (Pb)	0.1% (1000 mg/kg)
MERCURY (Hg)	0.1% (1000 mg/kg)
CHROMIUM (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000 mg/kg)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000 mg/kg)

THE ABOVE LIMITS WERE QUOTED FROM 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

(c) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY ACID DIGESTION AND DETERMINED BY ICP-OES	2 mg/kg
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY ACID DIGESTION AND DETERMINED BY ICP-OES	2 mg/kg
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY ACID DIGESTION AND DETERMINED BY ICP-OES	2 mg/kg
CHROMIUM (VI) (Cr ⁶⁺) CONTENT (FOR NON-METAL)	WITH REFERENCE TO IEC 62321 EDITION 1.0: 2008, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	1 mg/kg
POLYBROMINATED BIPHENYLS (PBBs) & POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC IEC 62321 EDITION 1.0: 2008, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 mg/kg

DATE SAMPLE RECEIVED:AUG 02, 2010

TESTING PERIOD:AUG 02, 2010 TO AUG 05, 2010

TO BE CONTINUED

PAGE 3 OF 7

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Annex 6: Analysis Result of Passivation Glass (Page 4 of 7)

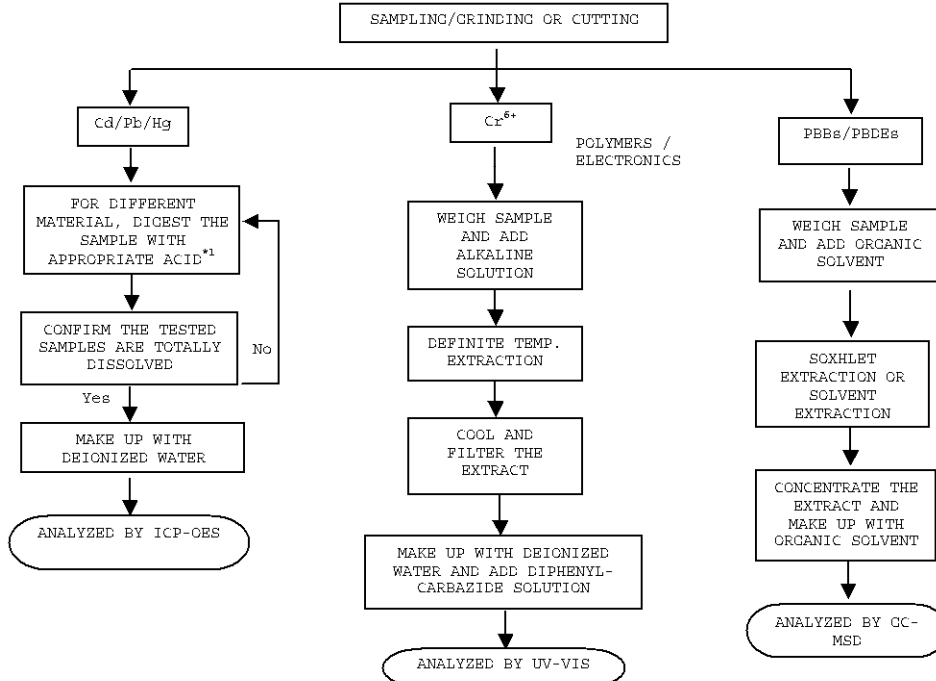
Intertek

TEST REPORT

NUMBER: WUXH00002721

TESTS CONDUCTED

(D) MEASUREMENT FLOWCHART:
 TEST FOR Cd/Pb/Hg/Cr (VI)/PBBs/PBDEs CONTENTS
 REFERENCE STANDARD: IEC 62321 EDITION 1.0: 2008



CHEMIST: INORGANIC (ANN LUO/FRED WANG/ALLY WAN)
 ORGANIC (JENNY XU/CHERRY SUN)

REMARKS:

*1: LIST OF APPROPRIATE ACID:

MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS	HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃
METALS	HNO ₃ , HCl, HF
ELECTRONICS	HNO ₃ , HCl, H ₂ O ₂ , HBF ₄

*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM VI WOULD BE DETERMINED AS DETECTED.

TO BE CONTINUED

PAGE 4 OF 7

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Annex 6: Analysis Result of Passivation Glass (Page 5 of 7)

TEST REPORT

NUMBER: WUXH00002721

TESTS CONDUCTED

(I) TEST RESULT SUMMARY :

HALOGEN CONTENT :

<u>TESTING ITEM</u>	<u>RESULT (ppm)</u>
FLUORINE (F) CONTENT	ND
CHLORINE (Cl) CONTENT	ND
BROMINE (Br) CONTENT	ND
IODINE (I) CONTENT	ND

REMARKS : ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

DATE SAMPLE RECEIVE: AUG 02, 2010

TEST PERIOD: AUG 02, 2010 TO AUG 05, 2010

(II) TEST METHOD :

<u>TESTING ITEM</u>	<u>TESTING METHOD</u>	<u>REPORTING LIMIT</u>
HALOGEN (F,Cl, Br,I) CONTENT	WITH REFERENCE TO IEC 61189-2:2006 BY COMBUSTION FLASK AND DETERMINED BY ION CHROMATOGRAPHY	50 ppm

REMARKS : REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE

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PAGE 5 OF 7

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Annex 6: Analysis Result of Passivation Glass (Page 6 of 7)

Intertek

TEST REPORT

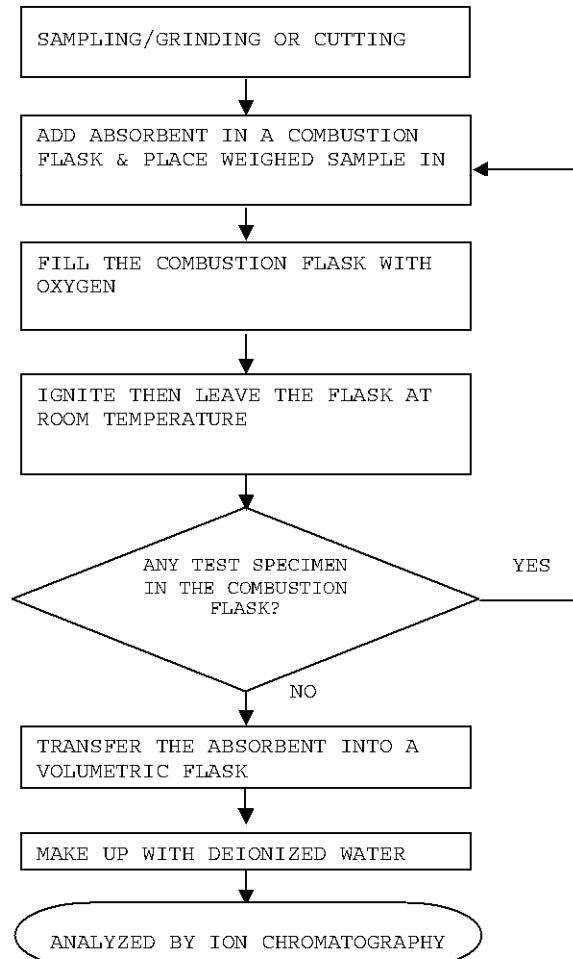
NUMBER: WUXH00002721

TESTS CONDUCTED

(III) MEASUREMENT FLOWCHART:

TEST FOR HALOGEN CONTENT

REFERENCE METHOD: IEC 61189-2 TEST 2C12



CHEMIST: FRED WANG/ ALLY WAN

TO BE CONTINUED

PAGE 6 OF 7

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Annex 6: Analysis Result of Passivation Glass (Page 7 of 7)



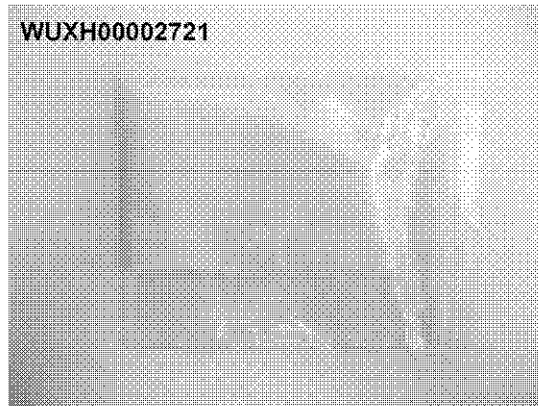
TEST REPORT

NUMBER: WUXH00002721

TESTS CONDUCTED

PHOTO

WUXH00002721



END OF REPORT

PAGE 7 OF 7

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Annex 7: Analysis Result of Die Bonding Solder (Page 1 of 5)**Test Report**

No: 10211878(11) R1

Date: 02-Nov10

Page 1 of 5

Heraeus Materials Singapore Pte Ltd
No. 2 Corporation Road, #06-15/16/17 Corporation Place, Singapore 618494

THIS REPORT IS TO SUPERSEDE TEST REPORT NO. 10211878(11) DATED 14-OCT-2010

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

Sample Description : PbSn5 Solder Paste

Sample Receiving Date : 05-Oct-10
Testing Period : 07-Oct-10 to 13-Oct-10

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

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

Conclusion : Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of
SGS Testing & Control Services Singapore Pte Ltd



Y.C. Tham
Laboratory Manager

Test Location: 26 Ayer Rajah Crescent, #07-08, Singapore 139944
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Annex 7: Analysis Result of Die Bonding Solder (Page 2 of 5)

SGS

Test Report

No: 10211878(11) R1

Date: 02-Nov10

Page 2 of 5

Test Result(s):

Sample Description : PbSn5 Solder Paste

Test Item(s):	Unit	Method	Results	MDL	RoHS Limit
Cadmium(Cd)	mg/kg	With reference to IEC62321, Ed1:2008. Analysis was performed by ICP/AES	n.d.	2	100
Lead (Pb)	mg/kg	With reference to IEC62321, Ed1:2008. Analysis was performed by ICP/AES	935538.5*	2	1000
Mercury (Hg)	mg/kg	With reference to IEC62321, Ed1:2008. Analysis was performed by ICP/AES	n.d.	2	1000
Hexavalent Chromium (CrVI)	mg/kg	With reference to IEC62321, Ed1:2008. Analysis was performed by UVA/vis Spectrometry	n.d.	2	1000
Sum of PBBs	mg/kg		n.d.	-	1000
Monobromobiphenyl	mg/kg		n.d.	5	-
Dibromobiphenyl	mg/kg		n.d.	5	-
Tribromobiphenyl	mg/kg		n.d.	5	-
Tetrabromobiphenyl	mg/kg		n.d.	5	-
Hexabromobiphenyl	mg/kg		n.d.	5	-
Pentabromobiphenyl	mg/kg		n.d.	5	-
Heptabromobiphenyl	mg/kg		n.d.	5	-
Octabromobiphenyl	mg/kg		n.d.	5	-
Nonabromobiphenyl	mg/kg		n.d.	5	-
Decabromobiphenyl	mg/kg		n.d.	5	-
Sum of PBDEs	mg/kg		n.d.	-	1000
Monobromodiphenyl ether	mg/kg	With reference to IEC62321, Ed1:2008. Analysis was performed by GC/MS	n.d.	5	-
Dibromodiphenyl ether	mg/kg		n.d.	5	-
Tribromodiphenyl ether	mg/kg		n.d.	5	-
Tetrabromodiphenyl ether	mg/kg		n.d.	5	-
Pentabromodiphenyl ether	mg/kg		n.d.	5	-
Hexabromodiphenyl ether	mg/kg		n.d.	5	-
Heptabromodiphenyl ether	mg/kg		n.d.	5	-
Octabromodiphenyl ether	mg/kg		n.d.	5	-
Nonabromodiphenyl ether	mg/kg		n.d.	5	-
Decabromodiphenyl ether ##	mg/kg		n.d.	5	-

Test Location: 26 Ayer Rajah Crescent, #07-08, Singapore 139944

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Annex 7: Analysis Result of Die Bonding Solder (Page 3 of 5)**SGS****Test Report**

No: 10211878(11) R1

Date: 02-Nov10

Page 3 of 5

Note:

- (1) mg/kg = ppm ; 0.1wt% = 1000ppm
- (2) n.d.= Not Detected
- (3) MDL = Method Detection Limit
- (4) ## = The exemption of DecaBDE in polymeric application according 2005/717/EC was overruled by the European Court of Justice by its decision of 01.04.2008. Subsequently DecaBDE will be included in the sum of PBDE after 01.07.2008.
- (5) “-“ = Not regulated
- (6) * : Exceeds limit

Remarks: Sample received was totally dissolved by preconditioning method.
Lab Analyst(s): Jay, Jojo and Eleine

***Exemption: The received sample is exempted under directive 2002/95/EC Annex Article 7: lead in high melting temperature solder type solders (i.e. tin-lead solder alloys containing more than 85% of lead).**

Sample photo:

Sample Description : PbSn5 Solder Paste

SGS authenticate the photo on original report only



Test Location: 26 Ayer Rajah Crescent, #07-08, Singapore 139944

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Annex 7: Analysis Result of Die Bonding Solder (Page 4 of 5)

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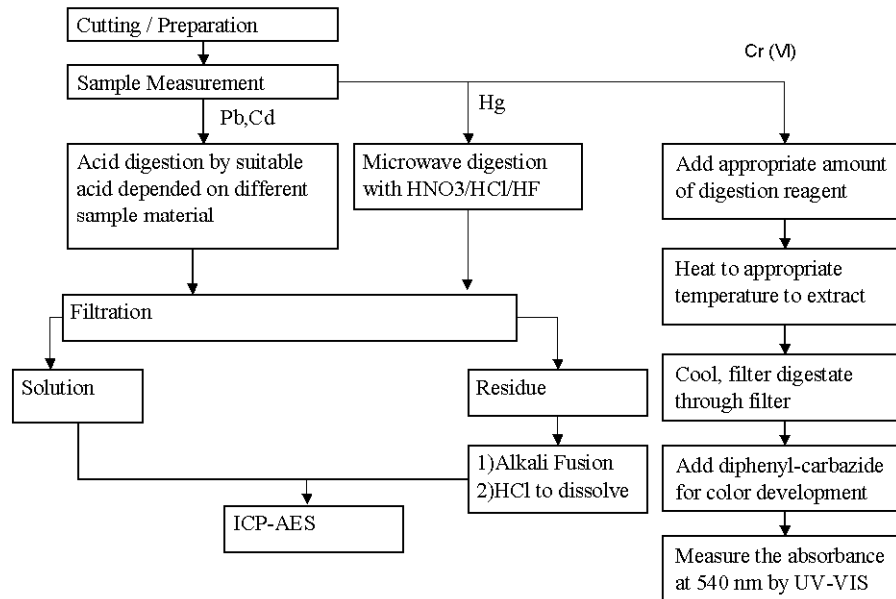
Test Report

No: 10211878(11) R1

Date: 02-Nov10

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Process Flow of IEC 62321 (Pb, Cd, Hg & Cr⁶⁺)



Remarks: Sample received was totally dissolved by preconditioning method.(CrVI method excluded)

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Annex 7: Analysis Result of Die Bonding Solder (Page 5 of 5)**SGS****Test Report**

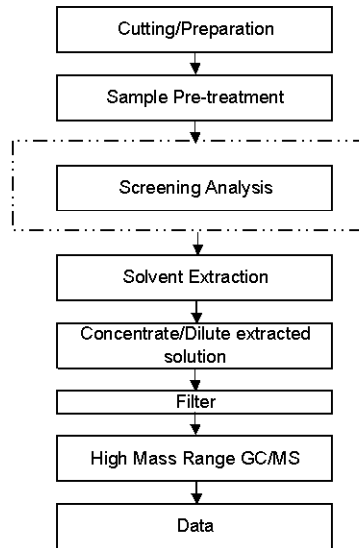
No: 10211878(11) R1

Date: 02-Nov10

Page 5 of 5

Process Flow of PBBs and PBDEs by GC/MS (IEC 62321)

First Testing Process → Optional screen process Confirmation process ...→



End of Report

Test Location: 26 Ayer Rajah Crescent, #07-08, Singapore 139944

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Annex 8: Applicable RoHS exemptions

13.2.2003 EN Official Journal of the European Union L 37/19

DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 27 January 2003
on the restriction of the use of certain hazardous substances in electrical and electronic equipment

13.2.2003 EN Official Journal of the European Union

Article 4

Prevention

1. Member States shall ensure that, from 1 July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE). National measures restricting or prohibiting the use of these substances in electrical and electronic equipment which were adopted in line with Community legislation before the adoption of this Directive may be maintained until 1 July 2006.

to be protected and an overall strategy that in particular restricts the use of cadmium and stimulates research into substitutes should therefore be implemented. The Reso-

13.2.2003 EN Official Journal of the European Union L 37/23

2. Paragraph 1 shall not apply to the applications listed in the Annex.

ANNEX

Applications of lead, mercury, cadmium and hexavalent chromium, which are exempted from the requirements of Article 4(1)

1. Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.
2. Mercury in straight fluorescent lamps for general purposes not exceeding:

— halophosphate	10 mg
— triphosphate with normal lifetime	5 mg
— triphosphate with long lifetime	8 mg.
3. Mercury in straight fluorescent lamps for special purposes.
4. Mercury in other lamps not specifically mentioned in this Annex.
5. Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
6. Lead as an alloying element in steel containing up to 0,35 % lead by weight, aluminium containing up to 0,4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.
7. — Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing more than 85 % lead),
 - lead in solders for servers, storage and storage array systems (exemption granted until 2010),
 - lead in solders for network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunication,
 - lead in electronic ceramic parts (e.g. piezoelectronic devices).
8. Cadmium plating except for applications banned under Directive 91/338/EEC (*) amending Directive 76/769/EEC (2) relating to restrictions on the marketing and use of certain dangerous substances and preparations.