

ICP Test Report Certification Packet

Company name:	Littelfuse, Inc.					
Product Series:	Ultra-low Capacitance Protection Array, with zener					
Product #:	SP3003-02JTG					
Issue Date:	February 7, 2012					
2002/95/EC)-restricted s packing/packaging mater In addition, it is hereby re for unit parts, the packing/	by Littelfuse, Inc. that there is neither RoHS (EU Directive substance nor such use, for materials to be used for unit parts, for ials, and for additives and the like in the manufacturing processes. ported to you that the parts and sub-materials, the materials to be used /packaging materials, and the additives and the like in the manufacturing sed of the following components.					
	Issued by: KRISTEEN BACILA <global ehs="" engineer=""></global>					
(1) Parts, sub-materials a	and unit parts					
This document cover by Littelfuse, Inc.	ers the SP3003-02JTG RoHS-Compliant series products manufactured					
< Raw Materials U						
(2) The ICP data on all I	measurable substances propriate pages as identifed in Table 1					
Remarks : .						



Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material Part Number	Raw Material Description	Page(s)
1	2200D	Adhesive (RoHS)	3-8
2	2200D	Adhesive (Halogen)	9-12
3	EME-G600	Epoxy Molding Compound (RoHS, Halogen, RoHS 2)	13-20
4	A194 Alloy	Leadframe	21-25
5	N/A	Au Bonding Wire	26-37
6	N/A	Wafer	38-41
7	N/A	Tin Plating	42-49



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Test Report

No.: CE/2011/A3053

Date: 2011/10/24

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HENKEL CORPORATION

HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE,

CALIFORNIA, 92606 U.S.A.

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

Sample Description

: ADHESIVE

Style/Item No.

2200D

Sample Receiving Date

2011/10/18

Testing Period

2011/10/18 TO 2011/10/24

Test Requested

: In accordance with the RoHS Directive 2011/65/EU Annex II.

Test Result(s)

: Please refer to next page(s).



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Date: 2011/10/24

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HENKEL CORPORATION

HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE,

CALIFORNIA, 92606 U.S.A.

Test Result(s)

: SILVER COLORED PASTE PART NAME No.1

	The said	1.00	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)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.	
Sum of PBBs	mg/kg			n.d.	
Monobromobiphenyl	mg/kg	1 [5	n.d.	
Dibromobiphenyl	mg/kg		5	n.d.	
Tribromobiphenyl	mg/kg		5	n.d.	
Tetrabromobiphenyl	mg/kg		5	n.d.	
Pentabromobiphenyl	mg/kg		5	n.d.	
Hexabromobiphenyl	mg/kg		5	n.d.	
Heptabromobiphenyl	mg/kg		5	n.d.	
Octabromobiphenyl	mg/kg		5	n.d.	
Nonabromobiphenyl	mg/kg		5	n.d.	
Decabromobiphenyl	mg/kg	With reference to IEC 62321: 2008 and	5	n.d.	
Sum of PBDEs	mg/kg	performed by GC/MS.	1-	n.d.	
Monobromodiphenyl ether	mg/kg		5	n.d.	
Dibromodiphenyl ether	mg/kg		5	n.d.	
Tribromodiphenyl ether	mg/kg		5	n.d.	
Tetrabromodiphenyl ether	mg/kg		5	n.d.	
Pentabromodiphenyl ether	mg/kg		5	n.d.	
Hexabromodiphenyl ether	mg/kg		5	n.d.	
Heptabromodiphenyl ether	mg/kg		5	n.d.	
Octabromodiphenyl ether	mg/kg	1	5	n.d.	
Nonabromodiphenyl ether	mg/kg	→ .	5	n.d.	
Decabromodiphenyl ether	mg/kg		5	n.d.	

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Date: 2011/10/24

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Note:

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

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. " - " = Not Regulated

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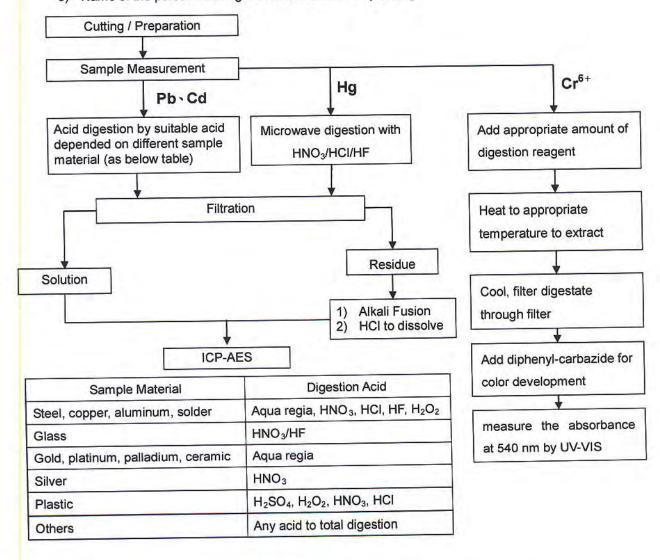
HENKEL CORPORATION

(Cr6+ test method excluded)

HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE, CALIFORNIA, 92606 U.S.A.

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



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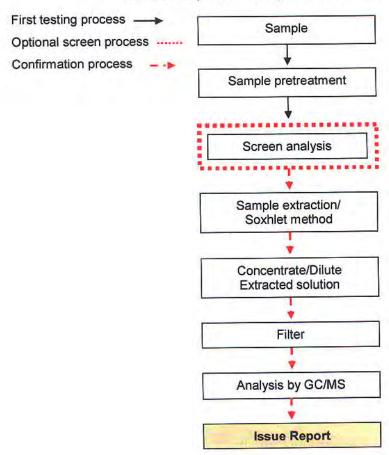
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HENKEL CORPORATION HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE, CALIFORNIA, 92606 U.S.A.

PBB/PBDE analytical FLOW CHART

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



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HENKEL CORPORATION HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE,

CALIFORNIA, 92606 U.S.A.

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



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

Sample Description

: ADHESIVE

Style/Item No.

2200D

Sample Receiving Date

: 2011/10/18

Testing Period

: 2011/10/18 TO 2011/10/24

Test Result(s)

Please refer to next page(s).



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HENKEL CORPORATION

HENKEL ADHESIVES-ELECTRONICS MAIN OFFICE: 14000 JAMBOREE ROAD, IRVINE,

CALIFORNIA, 92606 U.S.A.

Test Result(s)

PART NAME No.1

: SILVER COLORED PASTE

24 9 A Con wile	111	Unit Method		Result No.1	
Test Item (s):	Unit				
Halogen			1)		
Halogen-Fluorine (F) (CAS No.: 14762-94-8)			50	n.d.	
Halogen-Chlorine (CI) (CAS No.: 22537-15-1)		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		50	n.d.	
Halogen-lodine (I) (CAS No.: 14362-44-8)			50	n.d.	

Note:

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

2. n.d. = Not Detected

3. MDL = Method Detection Limit



No.: CE/2011/A3050

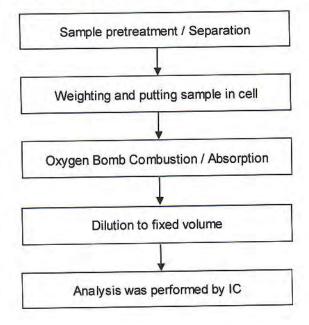
Date: 2011/10/24

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Analytical flow chart of halogen content

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



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* Œ/ 2011/ A3050*

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



** End of Report **



No. SHAEC1110406121

Date: 05 Jul 2011

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SUMITOMO BAKELITE (SUZHOU) CO., LTD.

140JINJIHU ROAD, START-UP AREA, CHINA-SINGAPORE SUZHOU INDUSTRIAL PARK

The following sample(s) was/were submitted and identified on behalf of the clients as: EME-G600F SERIES

SGS Job No.: SP11-020560 - SH

Date of Sample Received: 01 Jul 2011

Testing Period : 01 Jul 2011 - 05 Jul 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).

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1110406121

Date: 05 Jul 2011

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Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 SHA11-104061.012 Dark grey solid grain

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2002/95/EC

- Test Method: (1) With reference to IEC 62321:2008 (Section 8) for Cadmium content. Analysis was performed by ICP-OES and AAS.
 - (2) With reference to IEC 62321:2008 (Section 8) for Lead content. Analysis was performed by ICP-OES and AAS.
 - (3) With reference to IEC 62321:2008 (Section 7) for Mercury content. Analysis was performed by ICP-OES.
 - (4) With reference to IEC 62321:2008 (ANNEX C) for Hexavalent Chromium by Spot test / Colorimetric Method.

Analysis was performed by UV/Vis Spectrophotometer.

(5) With reference to IEC 62321:2008 (ANNEX A) for PBBs / PBDEs content. Analysis was performed by GC/MS.

Test Item(s)	Limit	Unit	MDL	012
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	2	ND
Sum of PBBs	1,000	mg/kg	100	ND
Monobromobiphenyl	4	mg/kg	5	ND
Dibromobiphenyl	191	mg/kg	5	ND
Tribromobiphenyl	12	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	4	mg/kg	5	ND
Hexabromobiphenyl		mg/kg	5	ND
Heptabromobiphenyl	- -	mg/kg	5	ND

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Test Report	No. SHAEC111040612	21	Date: 05	Jul 2011	Page 3 of 8
Test Item(s)	Limit	<u>Unit</u>	MDL	012	
Octabromobiphenyl	8	mg/kg	5	ND	
Nonabromobiphenyl	(4)	mg/kg	5	ND	
Decabromobiphenyl	, <u>, , , , , , , , , , , , , , , , , , </u>	mg/kg	5	ND	
Sum of PBDEs	1,000	mg/kg	-	ND	
Monobromodiphenyl ether	1971	mg/kg	5	ND	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether		mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether	2	mg/kg	5	ND	
Hexabromodiphenyl ether	4	mg/kg	5	ND	
Heptabromodiphenyl ether	C 2 6	mg/kg	5	ND	
Octabromodiphenyl ether	2	mg/kg	5	ND	
Nonabromodiphenyl ether	+	mg/kg	5	ND	
Decabromodiphenyl ether	C 2	mg/kg	5	ND	

Notes:

(1) The maximum permissible limit is quoted from the document 2005/618/EC amending RoHS directive 2002/95/EC

<u>Halogen</u>

Test Method: With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

Test Item(s)	<u>Unit</u>	MDL	012
Bromine (Br)	mg/kg	50	ND
Fluorine (F)	mg/kg	50	ND
Chlorine (CI)	mg/kg	50	ND
lodine (I)	mg/kg	50	ND

Phthalates

Test Method: With reference to EN14372: 2004, analysis was performed by GC-MS.

Test Item(s)	<u>Unit</u>	MDL	012
Dibutyl Phthalate (DBP)	%	0.003	ND
Benzylbutyl Phthalate (BBP)	%	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	ND
Diisononyl Phthalate (DINP)	%	0.010	ND

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Test Report	No. SHAEC1110406121		Date: 05	Jul 2011	Page 4 of 8
Test Item(s)		Unit	MDL	012	
Di-n-octyl Phthalate (DNOP)		%	0.003	ND	
Diisodecyl Phthalate (DIDP)		%	0.010	ND	

Notes:

- (1) DBP,BBP,DEHP Reference information: Entry 51 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC):
 - i) Shall not be used as substances or in mixtures, in concentrations greater than 0,1 % by weight of the plasticised material, in toys and childcare articles.
 - ii) Toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.

Please refer to Regulation (EC) No 552/2009 to get more detail information DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC).

- i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles which can be placed in the mouth by children.
- ii) Such toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.

Please refer to Regulation (EC) No 552/2009 to get more detail information

Polynuclear Aromatic Hydrocarbons (PAH)

Test Method: With reference to ZEK 01.2-08 of German ZLS and its amendments, analysis was performed by GC-MS.

Test Item(s)	<u>Unit</u>	MDL	012
Sum of 16 PAH	mg/kg	-	2.1
Naphthalene(NAP)	mg/kg	0.2	ND
Acenaphthylene(ANY)	mg/kg	0.2	ND
Acenaphthene(ANA)	mg/kg	0.2	ND
Fluorene(FLU)	mg/kg	0.2	ND
Phenanthrene(PHE)	mg/kg	0.2	ND
Anthracene(ANT)	mg/kg	0.2	ND
Fluoranthene(FLT)	mg/kg	0.2	ND
Pyrene(PYR)	mg/kg	0.2	2.1
Benzo(a)anthracene(BaA)	mg/kg	0.2	ND
Chrysene(CHR)	mg/kg	0.2	ND
Benzo(b)fluoranthene(BbF)	mg/kg	0.2	ND
Benzo(k)fluoranthene(BkF)	mg/kg	0.2	ND
Benzo(a)pyrene(BaP)	mg/kg	0.2	ND

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Test Report	No. SHAEC1110406121		Date: 05	Jul 2011	Page 5 of 8
Test Item(s)		<u>Unit</u>	MDL	012	
Indeno(1,2,3-c,d)pyrene(IPY)		mg/kg	0.2	ND	
Dibenzo(a,h)anthracene(DBA)		mg/kg	0.2	ND	
Benzo(g,h,i)perylene(BPE)		mg/kg	0.2	ND	

ZEK 01.2-08: Restraining maximum values for products

Parameter	Category 1	Category 2	Category 3	
	Material indented to be put in the mouth or material for toys with normal skin contact for children aged < 36 months	Materials which are not included in Category 1, with predictable contact with the skin longer than 30 s. (long-term skin contact)	Materials which are not included in Category 1 or 2, with predictable skin contact up to 30 s (short-term skin contact).	
Benzo[a]pyrene (mg/kg)	<mdl (<0.2)***<="" td=""><td>1</td><td>20</td></mdl>	1	20	
Sum of 16 PAH(US EPA) (mg/kg)**	<mdl (<0.2)***<="" td=""><td>10</td><td>200</td></mdl>	10	200	

Remark: ** = Only PAH substances >0.2 mg/kg are taken into account while calculating the sum of PAH

*** = In case that the maximum values exceed the limits of category 1, but are within the limits of category 2, one may confirm the suitability of the tested material which is indented to be put in the mouth by additional specific migration tests of PAH components based on DIN EN 1186ff and §64 LFGB 80.30-1. The conclusion of the migration test results must be made based on food law criteria.

Tetrabromobisphenol A (TBBP-A)

Test Method: With reference to US EPA 3550C: 2007, analysis was performed by GC-MS.

 Test Item(s)
 Unit
 MDL
 012

 Tetrabromobisphenol A (TBBP-A)
 mg/kg
 10
 ND

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

Test Method: With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

 Test Item(s)
 Unit
 MDL
 012

 Perfluorooctane Sulfonates (PFOS) and related
 mg/kg
 10
 ND

 Acid,Metal Salt and Amide
 mg/kg
 10
 ND

 Perfluorooctyl Acid (PFOA)
 mg/kg
 10
 ND

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No. SHAEC1110406121

Date: 05 Jul 2011

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Notes:

- (1) PFOS Reference Information: 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)
 - (i) 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.
 - (ii) 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. Please refer to Regulation (EC) No 552/2009 to get more detail information

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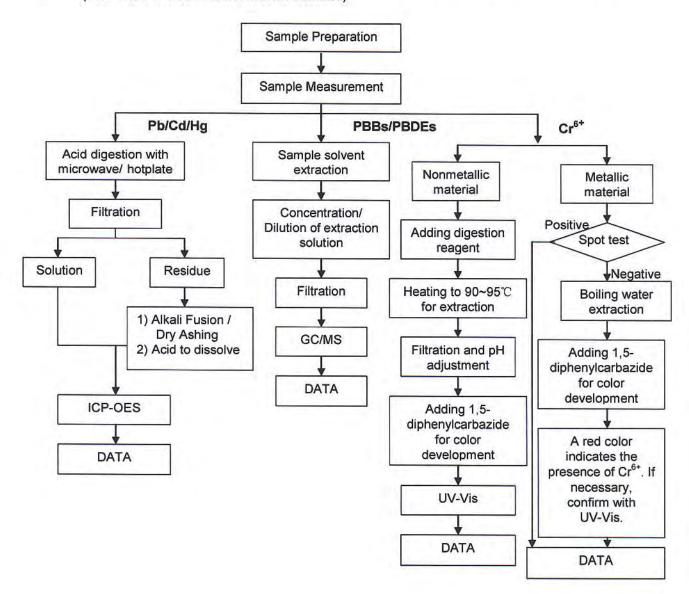
Date: 05 Jul 2011

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ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Elim Lin
- 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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Sample photo:



SGS authenticate the photo on original report only

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Test Report No. 1997551 Date: 18-Apr-2011

Client : Sumiko Leadframe (Thailand) Co., Ltd.

1/49 moo 5 Rojana Industrial Park

Tambol Kanham,Amphur Uthai Phra Nakhon Si Ayutthaya 13210 Thailand

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

Sample Description

: A 194 with Ni, Pd, Au (PPF Plating)

Sample No.

2046120

Sample Condition

: As per attached photograph

Sample Receiving Date

8-Apr-2011

Testing Period

08-Apr-2011 to 18-Apr-2011

Test Requested

In accordance with the RoHS Directive 2002/95/EC and its amendment directives

Test Method

- (1) With reference to IEC 62321:2008 for Lead content, Analysis was performed by ICP-OES.
- (2) With reference to IEC 62321:2008 for Cadmium content, Analysis was performed by ICP-OES.
- (3) With reference to IEC 62321:2008 for Mercury content, Analysis was performed by ICP-OES.
- (4) With reference to IEC 62321:2008 for Hexavalent Chromium by Colorless and Colored Chromate Coating on Metals/ Colorimetric Method, Analysis was performed by UV-Vis spectrometry.
- (5) With reference to IEC 62321:2008 for PBB/PBDE content, Analysis was performed by GC/MS.

Test Results

Please refer to next page.

CONCLUSION

Based on the performed tests on submitted samples, the result comply with the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of SGS (Thailand) Limited

Tomme

Pornpana Lirathpong Hardlines Testing Manager

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only."

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

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Test Report No. **TEST RESULTS**

1997551

Date: 18-Apr-2011

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Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result (1)	MDL	RoHS Limit
Lead (Pb)	(1)	n.d.	2	1000
Cadmium (Cd)	(2)	n.d.	2	100
Mercury (Hg)	(3)	n.d.	2	1000
Hexavalent Chromium (CrVI) by Spot test / boiling water extraction (optional)	(4)	Negative	÷	#
sum of PBBs	(5)*	n.d.	1217	1000
Monobromobiphenyl		n.d.	5	-
Dibromobiphenyl		n.d.	5	-
Tribromobiphenyl		n.d.	5	3
Tetrabromobiphenyl		n.d.	5	2-
Pentabromobiphenyl		n.d.	5	-
Hexabromobipheny		n.d.	5	-
Heptabromobiphenyl		n.d.	5	
Octabromobiphenyl		n.d.	5	-
Nonabromobiphenyl		n.d.	5	-
Decabromobiphenyl		n.d.	5	2





Test Report No. **TEST RESULTS**

1997551

Date: 18-Apr-2011

Page 3 of 5

Test results by chemical method (Unit: mg/kg)

The state of the s				
Test Item (s):	Method (Refer to)	Result (1)	MDL	RoHS Limit
Sum of PBDEs	(5)*	n.d.	141	1000
Monobromodiphenyl ether		n.d.	5	-
Dibromodiphenyl ether		n.d.	5	9.
Tribromodiphenyl ether		n.d.	5	
Tetrabromodiphenyl ether		n.d.	5	-
Pentabromodiphenyl ether		n.d.	5	-
Hexabromodiphenyl ether		n.d.	5	-
Heptabromodiphenyl ether		n.d.	5	-
Octabromodiphenyl ether		n.d.	5	-
Nonabromodiphenyl ether		n.d.	5	-
Decabromodiphenyl ether		n.d.	5	_

Test Part Description Result (1) metal with plating

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

(b) The results shown are based on the total weight of dry sample

(c) n.d. = Not Detected

(d) MDL = Method Detection Limit

(e) The exemption of DecaBDE in polymeric application according 2005/17/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

(f) "-" = Not regulated

"Test(s) marked * on this Report are not included in the TISI Accreditation Schedule for our Laboratory"

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Test Report No.

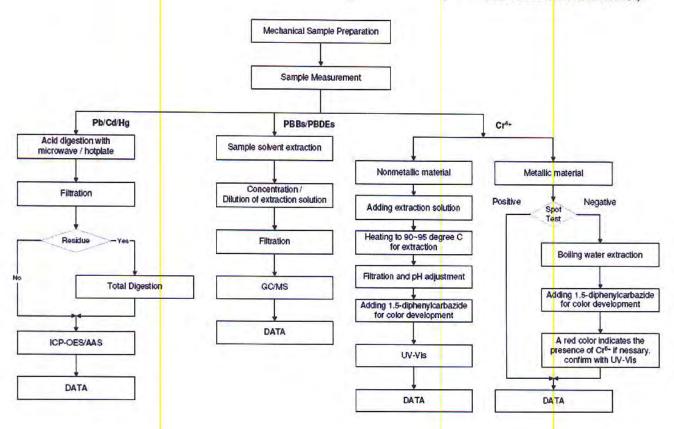
1997551

Date: 18-Apr-2011

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Flow Chart for RoHS: Pb/Cd/Hg/Cr6+/PBBs/PBDEs Testing

- 1. Operator : Siam Polarwut
- 2. Section Chief : Laddawan Uranpitr
- 3. The sample was dissolved totally by pre-conditioning method according to below flowchart. (Cr6+ and PBBs PBDEs test method excluded)



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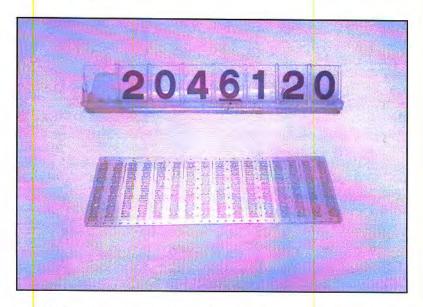
Test Report No.

1997551

Date: 18-Apr-2011

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SAMPLE/ATTACHMENT PICTURE



vise stated the results shown in th<mark>i</mark>s test report refer only to the sample(s) tested and such sample(s) are retained for 90 days o<mark>n</mark>ly."

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Test Report No. F690501/LF-CTSAYAA11-15562 Issued Date: May 30, 2011

Page 1 of 16

To: HERAEUS ORIENTAL HITEC CO.,LTD.

587-122 Hakik-dong Nam-gu Incheon

Korea

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

Product Name

: Au wire

SGS File No.

: AYAA11-15562

Item No./Part No.

: 4N

Client Reference Date

HD2 (Be), HD3, HD5 (Ce), HD6 (Ca), HA5, HA6, HA9, HA11, AW7, AW13, AW14,

AW25, AW29, AW66X

Received Date

: May 12, 2011

Test Performing Date

May 13. 2011 to May 30, 2011

Test Performed

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

This test report contains result performed by subcontracted laboratory in agreement

with the applicant. The result is marked with crosshatch(#) in this report.

Test Result(s)

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

Buyer(s)

: AMKOR, HYNIX, ASAHI KASEI, ASE KR, SCK, FUJITSU, NIGATA SEIMITSU

Comments

: The client has confirmed that the described client reference data are the same with the

sample submitted.

SGS Korea Co., Ltd.

Timothy Jeon
Jinhee Kim
Cindy Park
Jerry Jung /Testing Person

Jeff Jang / Technical Mgr

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Test Report No. F690501/LF-CTSAYAA11-15562 Issued Date: May 30, 2011

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Sample No.

: AYAA11-15562

Sample Description

: Au wire

Item / Part No.

: 4N

Heavy Metals				
Test Items	Unit	Test Method	MDL	Results
Cadmium(Cd)	mg/kg	With reference to IEC 62321:2008,ICP	0.5	N.D
Lead (Pb)	mg/kg	With reference to IEC 62321:2008,ICP	5	N.D
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008,ICP	2	N.D
Hexavalent Chromium(CrVI) By boiling water extraction*	**	With reference to IEC 62321;2008	-	Negative
Beryllium (Be)	mg/kg	US EPA 3050B (1996),US EPA 6010B(1996),ICP	0.5	N.D
Phosphorous (P)	mg/kg	US EPA 3050B (1996),US EPA 6010B(1996),ICP	10	N.D
Antimony (Sb)	mg/kg	US EPA 3050B (1996),US EPA 6010B(1996),ICP	10	N.D
Flame Retardants-PBBs/P	BDEs			
Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N.D
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N.D
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N.D
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N.D
Hexabromobiphenyl	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
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
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N.D
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N,D
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N.D
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008,GC-MS	5	N.D

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Test Report No. F690501/LF-CTSAYAA11-15562 Issued Date: May 30, 2011 Page 3 of 16

Sample No. : AYAA11-15562

Sample Description : Au wire Item / Part No. : 4N

Formaldehyde Contents			1.	
Test Items	Unit	Test Method	MDL	Results
Formaldehyde	mg/kg	ISO 14184-1, UV-vis	20	N.D

<u>Phthalates</u>					
Test Items	Unit	Test Method	MDL	Results	
Di-n-octyl phthalate (DNOP)	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	
Di-cyclohexyl phthalate (DCHP)	mg/kg	US EPA 8061A,GC/MS	50	N.D	
Di-n-hexyl phthalate (DNHP)	mg/kg	US EPA 8061A,GC/MS	50	N.D	
Di-pentyl phthalate(DPP)	mg/kg	US EPA 8061A,GC/MS	50	N.D	
Di-propyl phthalate(DPrP)	mg/kg	US EPA 8061A,GC/MS	50	N.D	
Di-isooctyl phthalate (DIOP)	mg/kg	US EPA 8061A,GC/MS	50	N.D	
Di-n-nonyl phthalate (DNP)	mg/kg	US EPA 8061A,GC/MS	50	N.D	
Di-(2-ethylhexyl) adipate (DEHA)	mg/kg	US EPA 8061A,GC/MS	50	N.D	

Halogen Contents				
Test Items	Unit	Test Method	MDL	Results
Brom <mark>i</mark> ne(Br)	mg/kg	BS EN 14582:2007,IC	30	N.D
Chlorine(CI)	mg/kg	BS EN 14582:2007,IC	30	N.D
Fluorine(F)	mg/kg	BS EN 14582:2007,IC	30	N.D
lodine(I)	mg/kg	BS EN 14582:2007,IC	50	N.D



Test Report No. F690501/LF-CTSAYAA11-15562 Issued Date: May 30, 2011

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Sample No. AYAA11-15562

Sample Description : Au wire Item / Part No. : 4N

Asbestos						
Test Items	Unit	Test Method	MDL	Results		
Anthrophylite	**	With reference to EPA/600/R-93/116 and USP, PLM and FT-IR	-	Negative		
Crocodolite	**	With reference to EPA/600/R-93/116 and USP, PLM and FT-IR	-	Negative		
Amosite	**	With reference to EPA/600/R-93/116 and USP, PLM and FT-IR	1,40	Negative		
Tremolite	**	With reference to EPA/600/R-93/116 and USP, PLM and FT-IR	Α.	Negative		
Chrysotile	**	With reference to EPA/600/R-93/116 and USP, PLM and FT-IR	4	Negative		
Actinolite	**	With reference to EPA/600/R-93/116 and USP, PLM and FT-IR	-	Negative		

Chlorinated Organic Substances					
Test Items	Unit	Test Method	MDL	Results	
Polychlorinated Biphenyls (PCBs)	mg/kg	USEPA 8082, GC/MS	3	N.D	
Polychlorinated terphenyls (PCTs)	mg/kg	USEPA 8082, GC/MS	3	N.D	
Polychlorinated Naphthalene (PCN)	mg/kg	EPA 8081 A, GC/MS	5	N.D	

Polymer Identification				
Test Items	Unit	Test Method	MDL	Results
PVC free	**	FT-IR		Negative

Organotin Compounds					
Test Items	Unit	Test Method	MDL	Results	
Tributyltin (TBT)	mg/kg	DIN 38407-13, GC/MS	0.1	N.D	
Bis (tributyltin)oxide (TBTO)	mg/kg	DIN 38407-13, GC/MS	0.1	N.D	
Triphenyltin (TPhT)	mg/kg	DIN 38407-13, GC/MS	0.1	N.D	

Test Items	Unit	Test Method	MDL	Results
Trichlorofluoromethane (CFC-11)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Dichlorodifluoromethane (CFC-12)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Dichlorotetrafluoroethane (CFC-114)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Chloropentafluoroethane (CFC-115)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Chlorotrifluoromethane (CFC-13)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Pentachlorofluoroethane (CFC-111)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Tetrachlorodifluoroethane (CFC-112)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Heptachlorofluoropropane (CFC-211)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D



Test Report No. F690501/LF-CTSAYAA11-15562 Issued Date: May 30, 2011

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Sample No. : AYAA11-15562

Sample Description : Au wire Item / Part No. 4N

Ozone Depleting Substances				
Test Items	Unit	Test Method	MDL	Results
Hexachlorodifluoropropane (CFC-212)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Pentachlorotrifluoropropane (CFC-213)	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Tetrachlorotetrafluoropropane (CFC-214)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Trichloropentafluoropropane (CFC-215)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Trichlorohexafluoropropane (CFC- 216)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Chloroheptafluoropropane (CFC-217)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1,1,2-Tetrachloroethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1,1-Trichloroethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1,2,2-Tetrachloroethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1,2-Trichloroethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1-Dichloroethene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1-Dichloroethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,1-Dichloropropene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,2,3-Trichloropropane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,2-Dichloroethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,2-Dichloropropane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,3-Dichloropropane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
2,2-Dichloropropane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Carbon tetrachloride	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Chloroethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Chloroform	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Chloromethane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
cis-1,2-Dichloroethene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
cis-1,3-Dichloropropene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hexachlorobutadiene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Methylene Chloride	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Tetrachloroethene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
trans-1,2-Dichloroethene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
trans-1,2-Dichloropropene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Trichloroethylene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Bromochlorodifluoromethane (Halon-1211)	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Bromotrifluoromethane (Halon-1301)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Dibromotetrafluoroethane (Halon- 2402)	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Methyl bromide (Halon 1001)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Bromochloromethane (Halon 1011)	mg/kg	US EPA 8260B, GC/MS	0.1	N.D



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Sample No. : AYAA11-15562

Sample Description Au wire Item / Part No. 4N

Test Items	Unit	Test Method	MDL	Results
Dibromodifloromethane (Halon-1202)	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-21b2	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-22b1	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-31b1	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-121b4	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-122b3	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-123b2	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-124b1	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-131b3	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-132b2	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-123b1	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-141b2	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-142b1	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-151b1	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-221b6	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-222b5	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-223b4	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-224b3	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-225b2	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-226b1	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-231b5	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-232b4	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-233b3	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-234b2	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-235b5	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-241b4	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-241b3	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-243b2	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-244b1	mg/kg	US EPA 8260B , GC/MS	0.1	N,D
HBFC-251b2	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-252b2	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-253b1	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
HBFC-261b2	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-262b1	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
HBFC-271b1	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-21	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-22	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Hydrochlorofluorocarbon-31	mg/kg	US EPA 8260B, GC/MS	0.1	N.D



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Sample No.

: AYAA11-15562

Sample Description

: Au wire

Item / Part No.

4N

Test Items	Unit	Test Method	MDL	Results
Hydrochlorofluorocarbon-121	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Hydrochlorofluorocarbon-122	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Hydrochlorofluorocarbon-123	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Hydrochlorofluorocarbon-124	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-131	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Hydrochlorofluorocarbon-132b	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-133a	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-141b	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-221	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-222	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-223	mg/kg	US EPA 8260B , GC/MS	0.1	N.D
Hydrochlorofluorocarbon-224	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-225ca	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-225cb	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-226	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-231	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-232	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-233	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-234	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-235	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-241	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-242	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-243	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-244	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-251	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-252	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-253	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-261	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-262	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrochlorofluorocarbon-271	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-23	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-41	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-43-10mee	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-125	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-134	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-134a	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-143	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-143a	mg/kg	US EPA 8260B, GC/MS	0.1	N.D



Test Report No. F690501/LF-CTSAYAA11-15562 Issued Date: May 30, 2011

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Sample No. : AYAA11-15562

Sample Description Au wire Item / Part No. **4N**

Test Items	Unit	Test Method	MDL	Results
Hydrofluorocarbon-152a	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-227ea	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-236fa	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-236ea	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-245ca	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-245fa	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Hydrofluorocarbon-365mfc	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Freon 14	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Fluorocarbon 116	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Freon 218	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Decafluorobutane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Freon 318	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Perfluoro-1-butane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Perfluoroisobutene	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
1,4-Dihydrooctafluorobutane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Nonafluro-2-(trifluoromethyl)butane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Perfluoro-n-pentane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
2-Perfluoromethylpentane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D
Perfluorohexane	mg/kg	US EPA 8260B, GC/MS	0.1	N.D

Test Items	Unit	Test Method	MDL	Results
4-Aminodiphenyl	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
Benzidine	mg/kg	LFGB 64 BVL B 82.02.2, GC/MS &HPLC	5	N.D
4-Chloro-o-Toluidine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
2-Naphtylamine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
o-Aminoazotoluene	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
2-Amino-4-Nitrotoluene	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
p-Chloroaniline	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
2,4-Diaminoanisole	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
4,4'-Diaminodiphenylmethane	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
3,3'-Dichlorobenzidine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
3,3-Dimethoxybenzidine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
3,3-Dimethylbenzidine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
3,3-Dimethyl-4.4'-diaminodiphenyl Methane	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
p-Cresidine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D
4,4'-Methylen-bis-(2-chloroaniline)	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D



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Sample No. AYAA11-15562

Sample Description Au wire Item / Part No. 4N

Azo Dyes					
Test Items	Unit	Test Method	MDL	Results	
4,4'-Oxydianiline	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
4-Am <mark>i</mark> nodiphenyl	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
o-Tol <mark>uidine</mark>	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
2,4-T <mark>oluenediamine</mark>	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
2,4,5-Trimethylaniline	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
o-Ani <mark>sidine</mark>	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
4-Am <mark>i</mark> noazobenzene	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
2,4-Xylidine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	
2,6-Xylidine	mg/kg	LFGB 64 BVL B 82.02.2 , GC/MS &HPLC	5	N.D	

Other(s)				
Test Items	Unit	Test Method	MDL	Results
PFOA(Perfluorooctanioc acid)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D
PFOS(Perfluorooctane Sulfonates-Acid/Metal Salt/Amide)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D
Benzotriazole (UV-320)	mg/kg	US EPA 3540C, GC/MS	5	N.D

Note:

- (1) n.d.= not detected
- (2) mg/kg = ppm
- (3) MDL = Method Detection Limit
- (4) _ = No regulation (5) ** = Qualitative analysis (No Unit)
- (6) * = Boiling-water-extraction:

Negative = Absence of CrVI coating

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

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



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Sample No. AYAA11-15562

Sample Description : Au wire Item / Part No. : 4N

Test Item(s)	Unit	Method	Result
Radioactive Substances (#)	μSv/ hour	Geiger counter	Negative*

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

(2) mg/kg= ppm : 0.1wt% = 1000ppm (3) MDL = Method Detection Limit

- (4) -= No regulation
- (5) **=Qualitative analysis (No Unite)
- (6) Negative*/Positive*: The test result of Geiger counter is from comparison between test outcome and environment background . In general ,there is little radiation dose existing in environment.

(Radiation dose from environment background usually less than or equal to 0.10±0.05

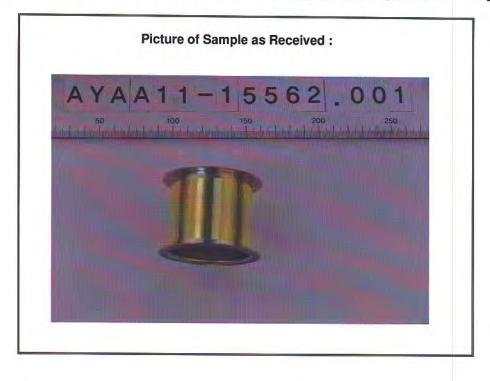
µSv/ hour)

The test result less than environment background was shown as Negative *, the result greater than environment background was shown as Positive*.



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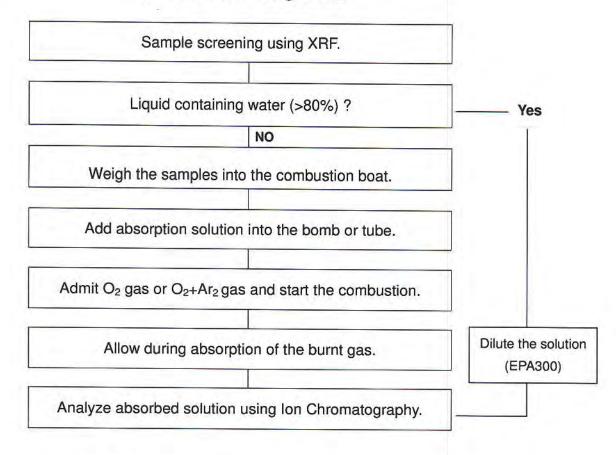




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Flow Chart for Halogen Test



*** End ***



No.: CE/2012/12342

Date: 2012/01/18

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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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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.

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

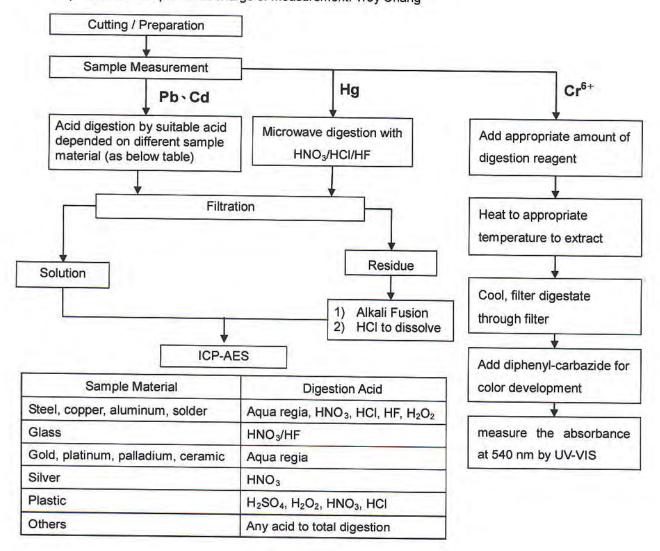
Date: 2012/01/18

Page: 3 of 4

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

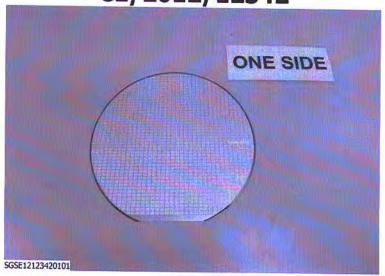
Page: 4 of 4

EPISIL TECHNOLOGIES INC.

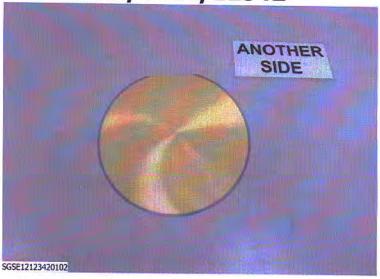
NO. 3, INNOVATION ROAD 1, SCIENCE BASED INDUSTRIAL PARK, HSINCHU, TAIWAN, R. O. C.

* 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 **



No. CANEC1103340401

Date: 01 Sep 2011

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GEJIU ZILI MINING&SMEL TING CO.,LTD HUOGUDU,JIJIE TOWN,GEJIU CITY,HONGHE ZHOU,YUNNAN PROVINCE CHINA

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

TIN

SGS Job No. : 13332781 - GZ Model No. : Sn 99.90

SGS Internal Reference No. : 2.1

Date of Sample Received : 26 Aug 2011

Testing Period : 26 Aug 2011 - 01 Sep 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).

Conclusion : A:Based on the performed tests on submitted samples, the results of Lead,

Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by

RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

1

Merry Lv

Approved Signatory



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Test Results:

ID for specimen 1 : CAN11-033404.001
Description for specimen 1 : Silvery metal block

A:RoHS Directive 2011/65/EU

Test Item(s)	Unit	Test Method (Reference)	Result	MDL	Limit
Cadmium (Cd)	mg/kg	IEC 62321:2008, ICP-OES	N.D.	2	100
Lead (Pb)	mg/kg	IEC 62321:2008, ICP-OES	46	2	1000
Mercury (Hg)	mg/kg	IEC 62321:2008, ICP-OES	N.D.	2	1000
Hexavalent Chromium (CrVI) by	-	IEC 62321:2008, UV-Vis	Negative	♦	#
boiling water extraction					
Sum of PBBs	mg/kg	** *** *** *** *** *** *** *** *** ***	N.D.	-	1000
Monobromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Dibromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Tribromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Tetrabromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Pentabromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Hexabromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Heptabromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Octabromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Nonabromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Decabromobiphenyl	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Sum of PBDEs	mg/kg		N.D.	9	1000
Monobromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Dibromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Tribromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Tetrabromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Pentabromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Hexabromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Heptabromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Octabromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Nonabromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	
Decabromodiphenyl ether	mg/kg	IEC 62321:2008, GC-MS	N.D.	5	

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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 areas.

Negative indicates the absence of CrVI on the tested areas.

6. "- " = Not regulated

B:Halogen

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Fluorine (F)	mg/kg	BS EN 14582:2007, IC	N.D.	50
Chlorine (CI)	mg/kg	BS EN 14582:2007, IC	N.D.	50
Bromine (Br)	mg/kg	BS EN 14582:2007, IC	N.D.	50
lodine (I)	mg/kg	BS EN 14582:2007, IC	N.D.	50

Note:

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

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

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Perfluorooctanoic acid (PFOA)	mg/kg	EPA 3550C: 2007, LC-MS	N.D.	10
Perfluorooctane sulfonates (PFOS)	mg/kg	EPA 3550C: 2007, LC-MS	N.D.	10
PFOS Acid				

PFOS Metal Salt

PFOS Amide

Note:

1. mg/kg = ppm

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N.D. = Not Detected (< MDL)
 MDL = Method Detection Limit

For reference: commission regulation (EU) No 757/2010 amending regulation (EC) No 850/2004:

- (1) For the purposes of this entry, Article 4(1) (b) shall apply to concentrations of PFOS equal to or below 10 mg/kg (0,001 % by weight) when it occurs in substances or in preparations.
- (2) For the purposes of this entry, Article 4(1) (b) shall apply to concentrations of PFOS in semi-finished products or articles, or parts thereof, if the concentration of PFOS is lower than 0,1 % by weight calculated with reference to the mass of structurally or micro-structurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is lower than 1µg /m² of the coated material.

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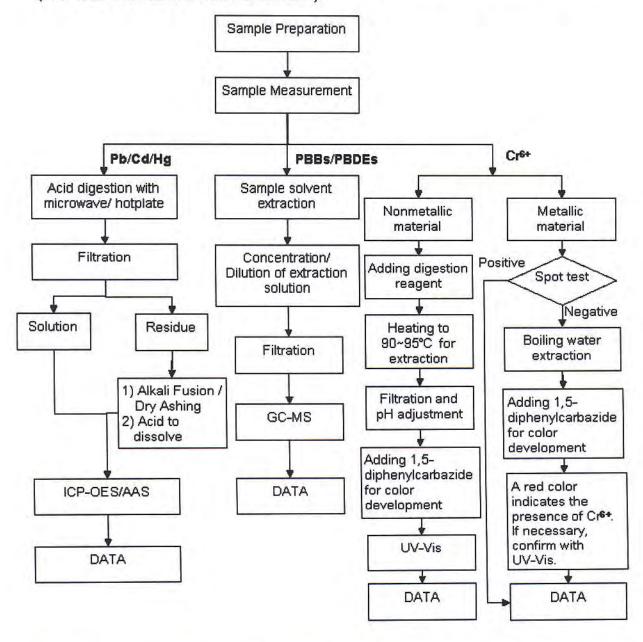
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ATTACHMENTS

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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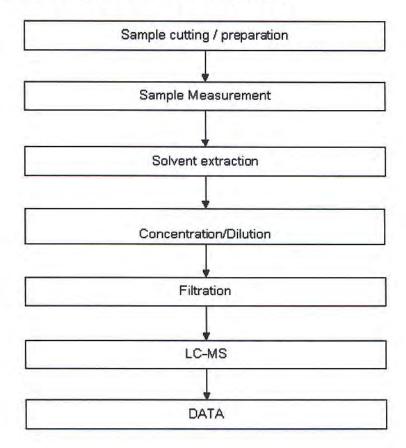
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ATTACHMENTS

PFOA / PFOS Testing Flow Chart

- 1) Name of the person who made testing: Cindy Huang
- 2) Name of the person in charge of testing: Ryan Yang



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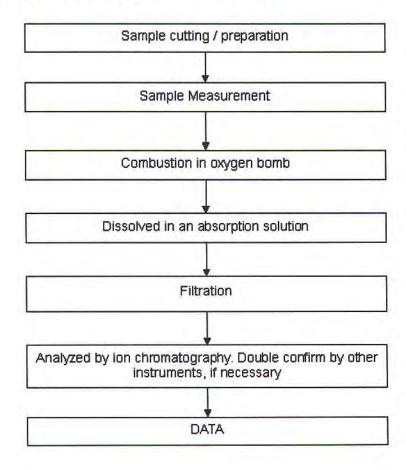
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Halogen Testing Flow Chart

- 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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