LIGITEK

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LED ARRAY

Lead-Free Parts

LA44B/2Y-S2-PF

DATA SHEET

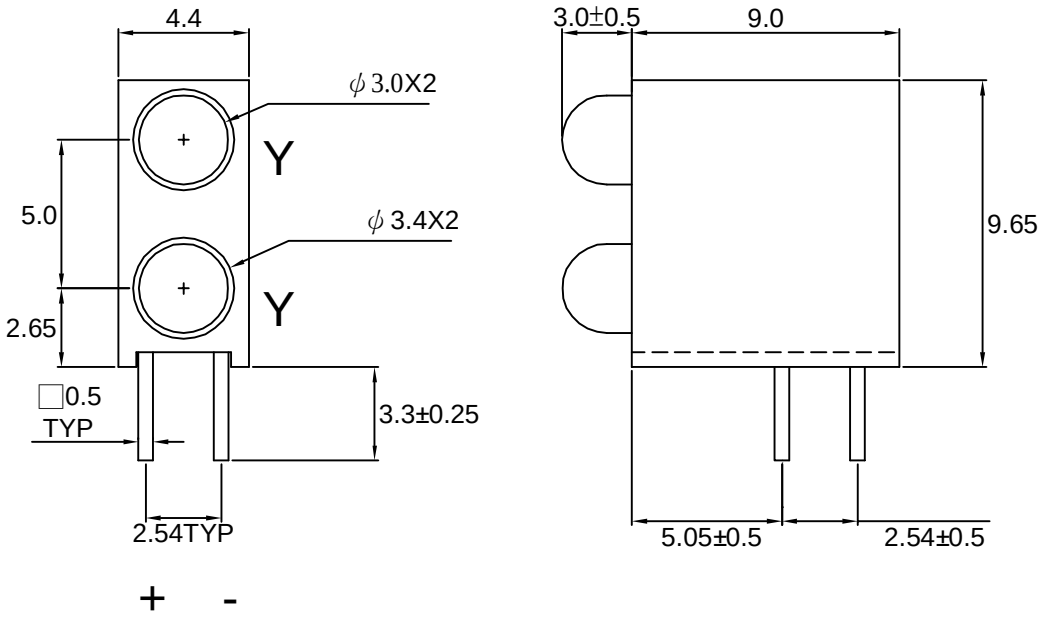
DOC. NO : QW0905-LA44B/2Y-S2-PF

REV. : A

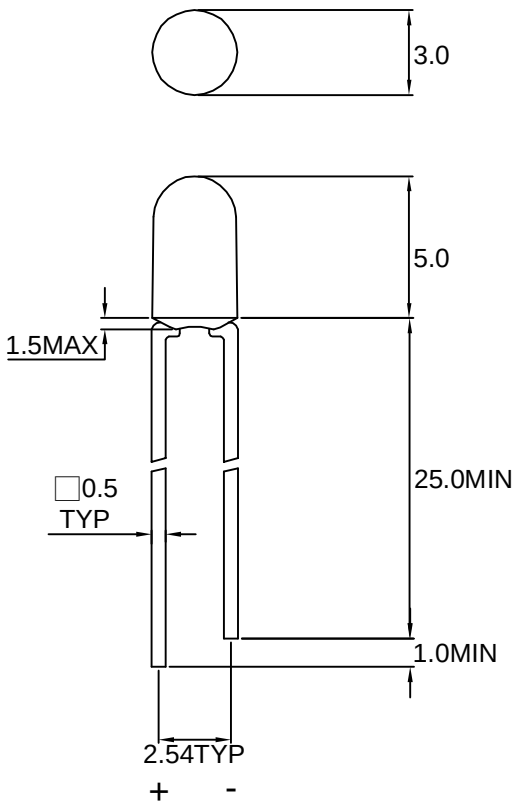
DATE : 01 - Apr.- 2006

PART NO. LA44B/2Y-S2-PF

Package Dimensions



LY2340-1-PF



Note : 1.All dimension are in millimeter tolerance is ±0.25mm unless otherwise noted.
2.Specifications are subject to change without notice.

Absolute Maximum Ratings at Ta=25 ℃

Parameter	Symbol	Ratings	UNIT
		Y	
Forward Current	IF	20	mA
Peak Forward Current Duty 1/10@10KHz	IFP	80	mA
Power Dissipation	PD	60	mW
Reverse Current @5V	Ir	10	μA
Operating Temperature	Topr	-40 ~ +85	℃
Storage Temperature	Tstg	-40 ~ +100	℃

Typical Electrical & Optical Characteristics (Ta=25 ℃)

PART NO	MATERIAL	COLOR		Peak wave length λ Pnm	Spectral halfwidth △λ nm	Forward voltage @20mA(V)		Luminous intensity @10mA(mcd)		Viewing angle 2θ 1/2 (deg)
		Emitted	Lens			Min.	Max.	Min.	Typ.	
LA44B/2Y-S2-PF	GaAsP/GaP	Yellow	Yellow Diffused	585	35	1.7	2.6	8.0	20	80

Note : 1.The forward voltage data did not including ±0.1V testing tolerance.
2. The luminous intensity data did not including ±15% testing tolerance.

Typical Electro-Optical Characteristics Curve

Y CHIP

Fig.1 Forward current vs. Forward Voltage

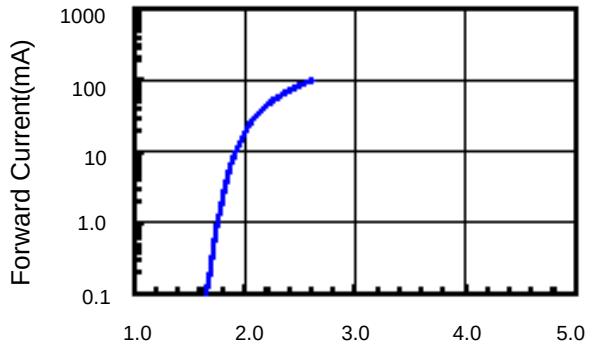


Fig.2 Relative Intensity vs. Forward Current

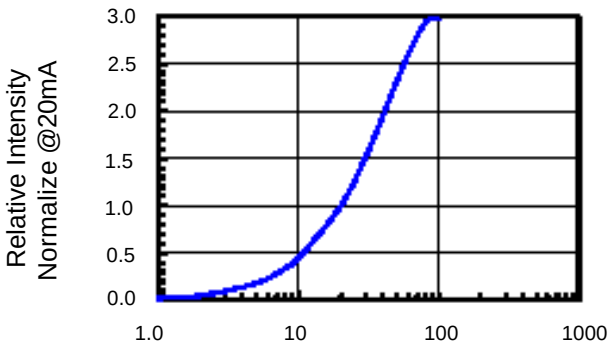


Fig.3 Forward Voltage vs. Temperature

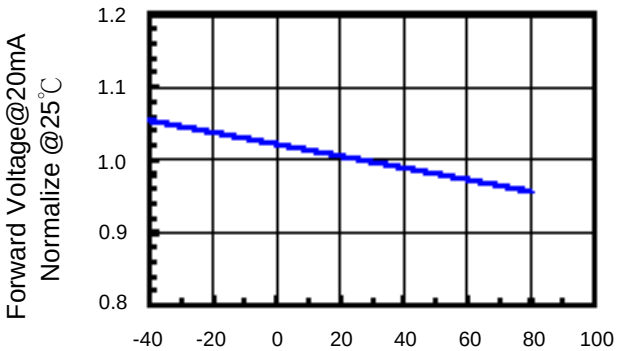


Fig.4 Relative Intensity vs. Temperature

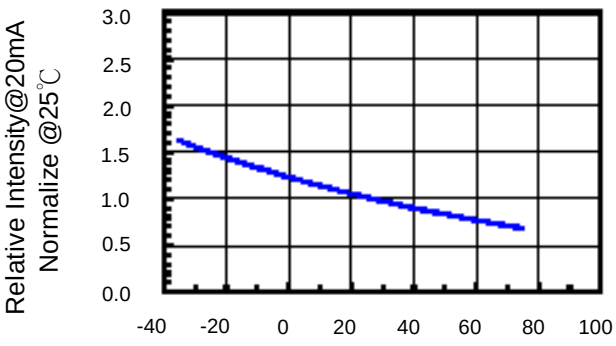
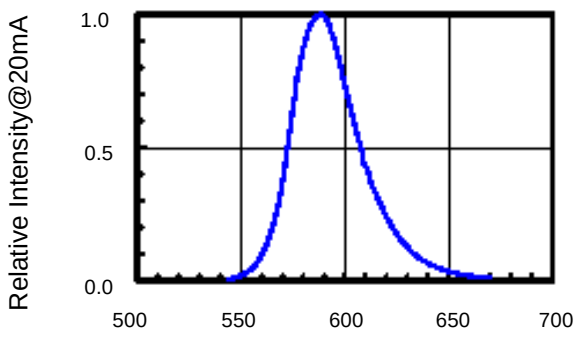


Fig.5 Relative Intensity vs. Wavelength



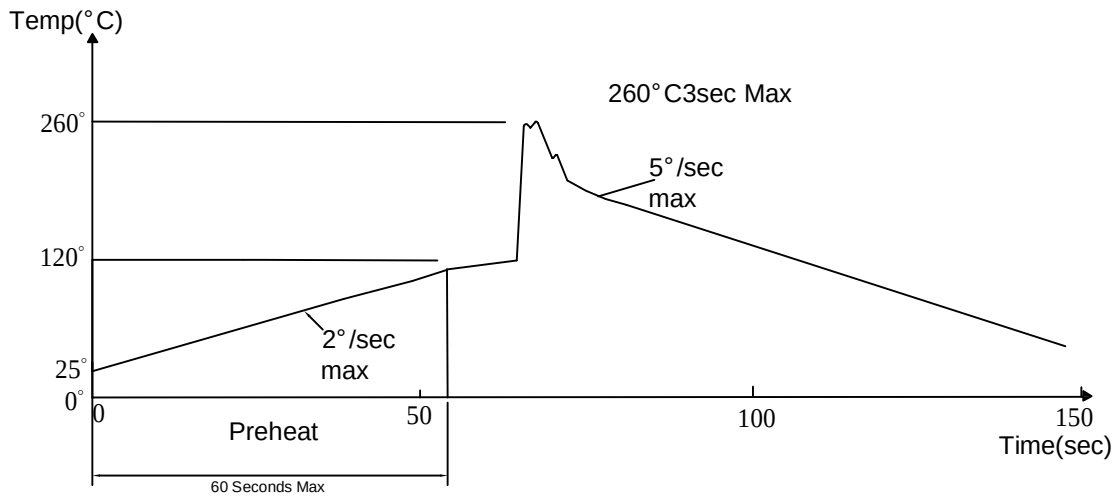
Soldering Condition(Pb-Free)

1.Iron:

Soldering Iron:30W Max
Temperature 350°C Max
Soldering Time:3 Seconds Max(One Time)
Distance:2mm Min(From solder joint to case)

2.Wave Soldering Profile

Dip Soldering
Preheat: 120°C Max
Preheat time: 60seconds Max
Ramp-up
2°C/sec(max)
Ramp-Down:-5°C/sec(max)
Solder Bath:260°C Max
Dipping Time:3 seconds Max
Distance:2mm Min(From solder joint to case)



Reliability Test:

Test Item	Test Condition	Description	Reference Standard
Operating Life Test	1.Under Room Temperature 2.If=20mA 3.t=1000 hrs (-24hrs, +72hrs)	This test is conducted for the purpose of detemining the resistance of a part in electrical and themal stressed.	MIL-STD-750: 1026 MIL-STD-883: 1005 JIS C 7021: B-1
High Temperature Storage Test	1.Ta=105℃±5℃ 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of high temperature for hours.	MIL-STD-883:1008 JIS C 7021: B-10
Low Temperature Storage Test	1.Ta=-40℃±5℃ 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of low temperature for hours.	JIS C 7021: B-12
High Temperature High Humidity Test	1.Ta=65℃±5℃ 2.RH=90%~95% 3.t=240hrs ±2hrs	The purpose of this test is the resistance of the device under tropical for hours.	MIL-STD-202:103B JIS C 7021: B-11
Thermal Shock Test	1.Ta=105℃±5℃&-40℃±5℃ (10min) (10min) 2.total 10 cycles	The purpose of this is the resistance of the device to sudden extreme changes in high and low temperature.	MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1011
Solder Resistance Test	1.T.Sol=260℃±5℃ 2.Dwell time= 10 ±1sec.	This test intended to determine the thermal characteristic resistance of the device to sudden exposures at extreme changes in temperature when soldering the lead wire.	MIL-STD-202: 210A MIL-STD-750: 2031 JIS C 7021: A-1
Solderability Test	1.T.Sol=230℃±5℃ 2.Dwell time=5 ±1sec	This test intended to see soldering well performed or not.	MIL-STD-202: 208D MIL-STD-750: 2026 MIL-STD-883: 2003 JIS C 7021: A-2

Test Report

LIGITEK ELECTRONICS CO.,LTD.
NO.238,BO'AI ST.,SHULIN CITY,TAIPEI COUNTY
TAIWAN

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

SGS Job No.	:	12975921 - GZ
Date of Sample Received	:	21 Feb 2011
Testing Period	:	21 Feb 2011 - 25 Feb 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.

Annie Liang
Approved Signatory

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Test Results:

ID for specimen 1 : CAN11-004273.001
Description for specimen 1 : Green body w/ silvery metal pin (mixed)

Elementary Analysis

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Cadmium (Cd)	mg/kg	IEC 62321:2008, ICP-OES	N.D.	2
Lead (Pb)	mg/kg	IEC 62321:2008, ICP-OES	N.D.	2
Mercury (Hg)	mg/kg	IEC 62321:2008, ICP-OES	N.D.	2
Hexavalent Chromium (CrVI) by alkaline extraction	mg/kg	IEC 62321:2008, UV-Vis	N.D.	2

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

Flame Retardants

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Sum of PBBs	mg/kg	-	N.D.	-
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.	-
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

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

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) PFOS Acid PFOS Metal Salt PFOS Amide	mg/kg	EPA 3550C: 2007, LC-MS	N.D.	10

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.

Halogen

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Fluorine (F)	mg/kg	BS EN 14582:2007, IC	N.D.	50
Chlorine (Cl)	mg/kg	BS EN 14582:2007, IC	101	50
Bromine (Br)	mg/kg	BS EN 14582:2007, IC	N.D.	50
Iodine (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

TBBP-A (Tetrabromobisphenol-A)

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Tetrabromobisphenol-A (TBBP-A)	mg/kg	EPA 3550C: 2007, GC-MS	N.D.	10

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

Phthalate(s)

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Dimethyl Phthalate (DMP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Diethyl Phthalate (DEP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Dibutyl Phthalate (DBP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Benzylbutyl Phthalate (BBP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Di-(2-ethylhexyl) Phthalate (DEHP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Diisononyl Phthalate (DINP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.01
Di-n-octyl Phthalate (DNOP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Diisodecyl Phthalate (DIDP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.01
Diiso butyl Phthalate (DIBP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Dinonyl Phthalate (DNP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Diisooctyl Phthalate (DIOP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.01
Dipropyl Phthalate (DPrP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Dicyclohexyl Phthalate (DCHP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Dipentyl Phthalate (DPP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Dibenzyl Phthalate (DBzP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003
Diphenyl Phthalate (DPhP)	% (w/w)	EN14372: 2004, GC-MS	N.D.	0.003

Note :
1. mg/kg = ppm; 0.1% = 1000ppm
2. N.D. = Not detected (< MDL)
3. MDL = Method Detection Limit

For reference:
Entry 51/52 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC):
For DBP, BBP, DEHP
(1)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.
(2) 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.
For DINP, DNOP, DIDP
(1) 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.
(2) 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.

PAHs (Polynuclear Aromatic Hydrocarbons)

Test Item(s)	Unit	Test Method	Result	MDL
Naphthalene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Acenaphthylene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Acenaphthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Fluorene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Phenanthrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Pyrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benz(a)anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Chrysene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(b)fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(k)fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(a)pyrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Dibenzo(a,h)anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(g,h,i)perylene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Sum of 16 PAHs acc. US EPA	mg/kg	-	N.D.	-

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

ZEK 01.2-08 : Restraining maximum values for products

Parameter	Category 1 Material indented to be put in the mouth or material for toys with normal skin contact for children aged < 36 months	Category 2 Materials those are not included in Category 1, with predictable contact with the skin longer than 30 s. (long-term skin contact).	Category 3 Materials those 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)***	1	20
Sum 16 PAH (US EPA) (mg/kg)**	<MDL (<0.2)***	10	200

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

Remark: The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value and only for reference.

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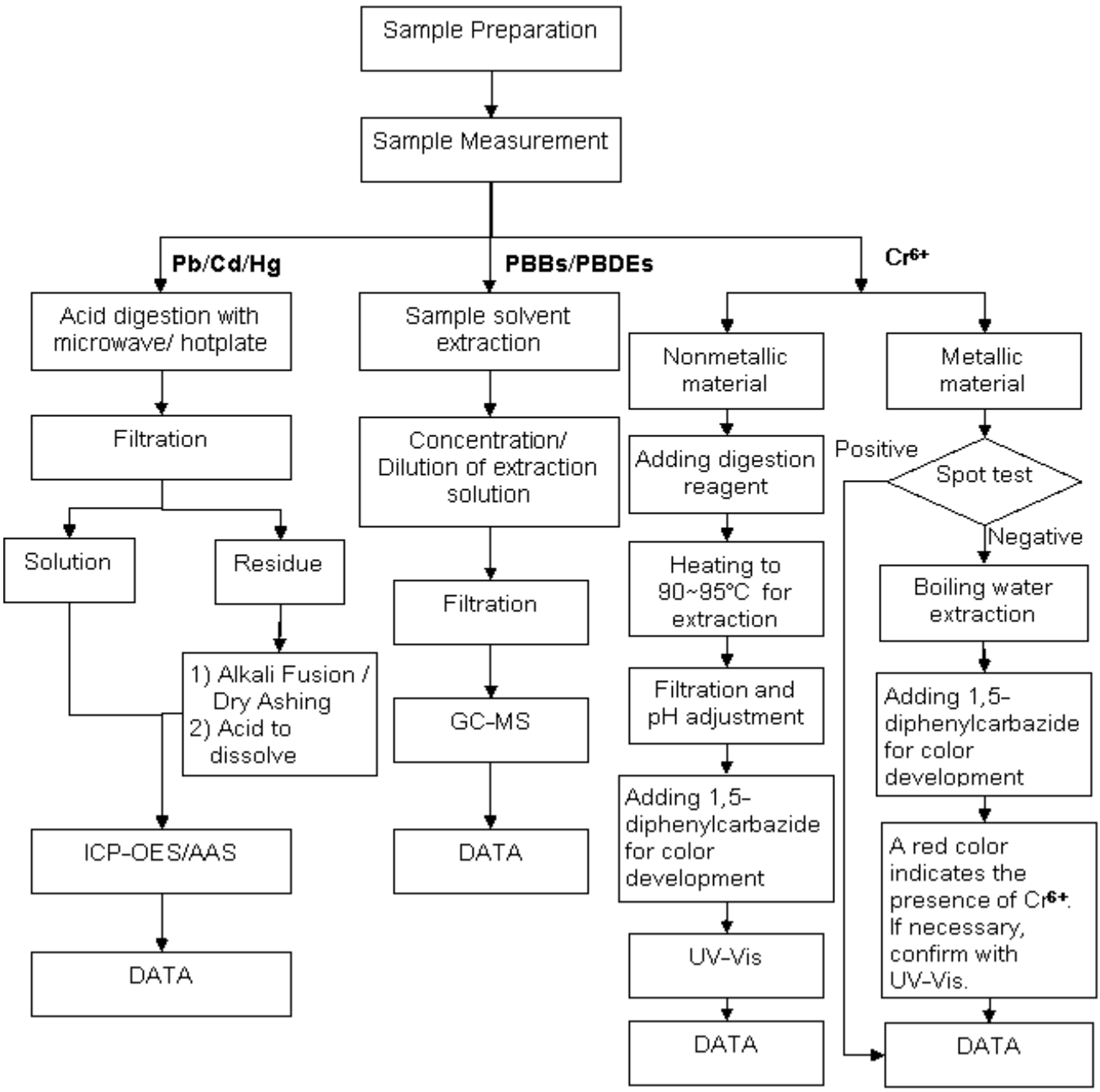
ATTACHMENTS

RoHS Testing Flow Chart

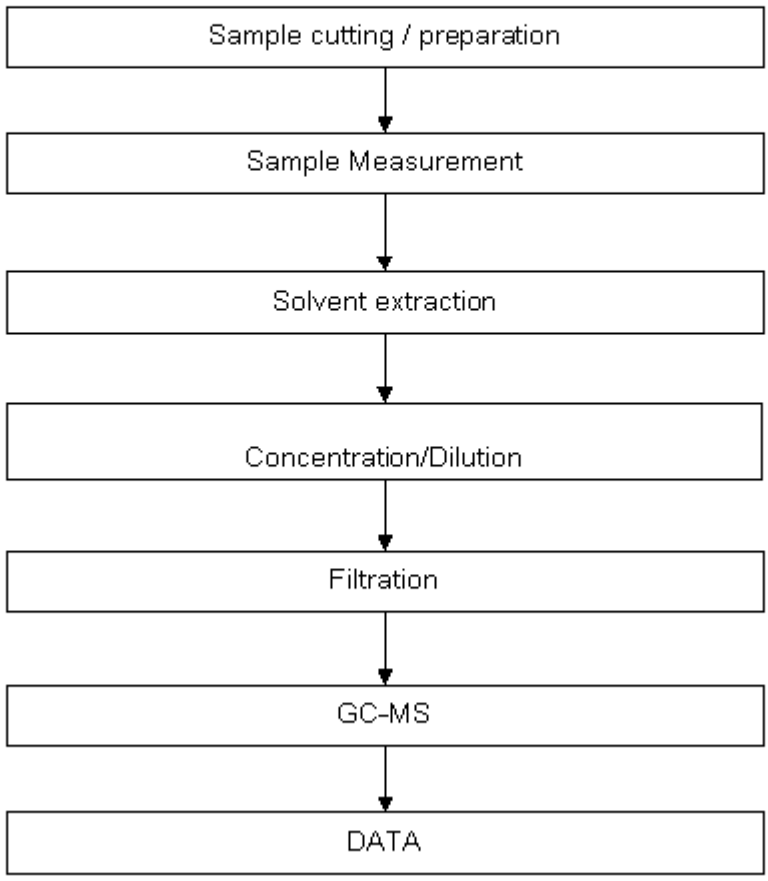
1) Name of the person who made testing: Bella Wang / Cutey Yu / Ross Zhan
2) Name of the person in charge of testing: Adams Yu / Ryan Yang



ATTACHMENTS

Phthalates Testing Flow Chart

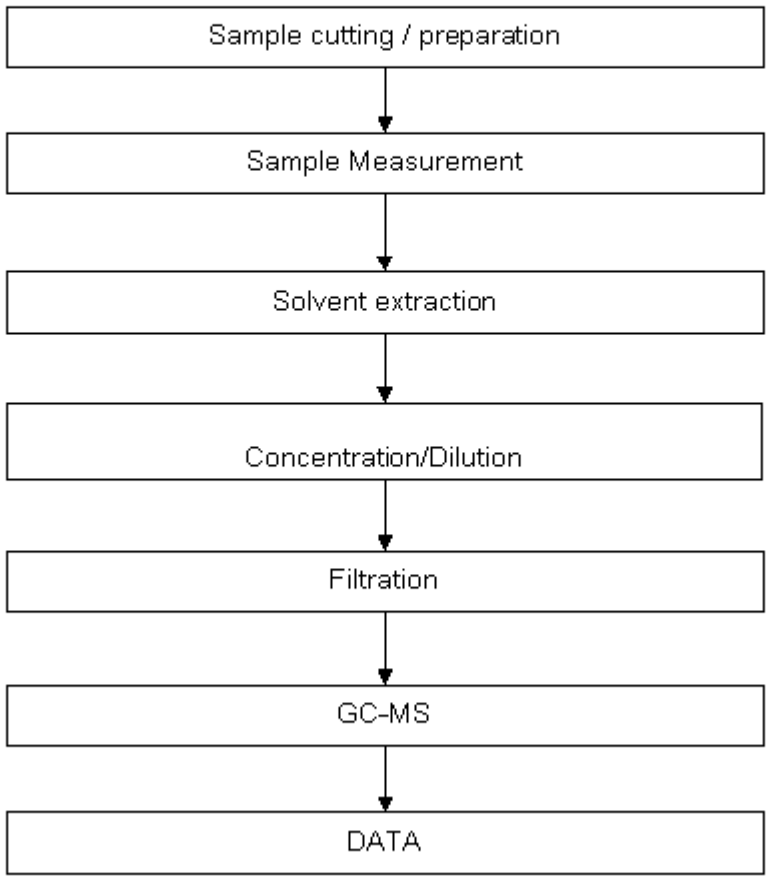
1) Name of the person who made testing: Tina Zhao
2) Name of the person in charge of testing: Ryan Yang



ATTACHMENTS

PAHs Testing Flow Chart

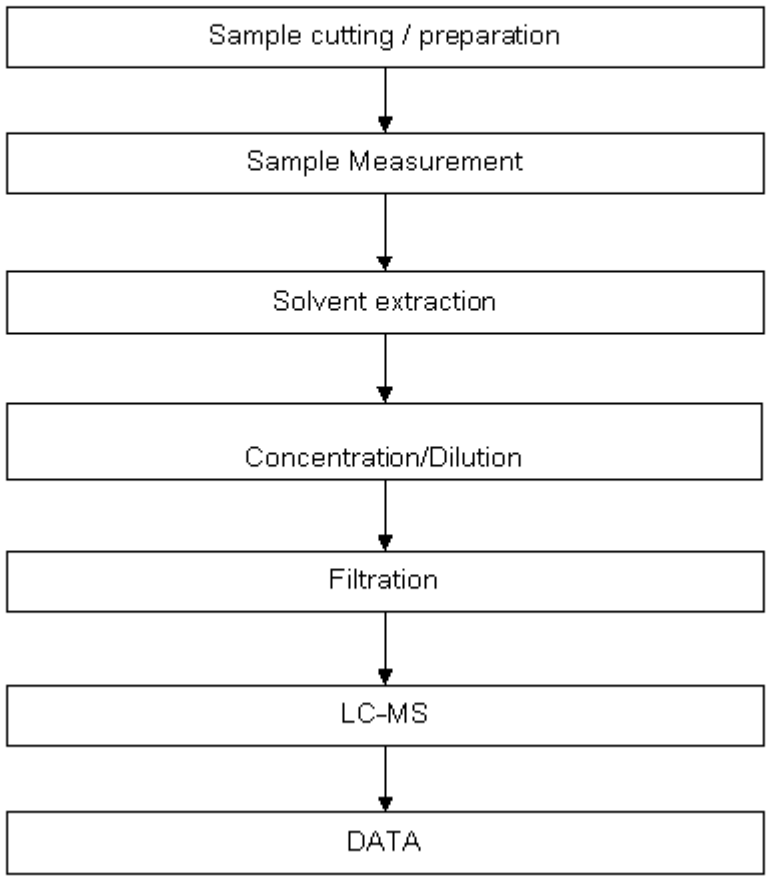
1) Name of the person who made testing: Cutey Yu
2) Name of the person in charge of testing: Ryan Yang



ATTACHMENTS

PFOA / PFOS Testing Flow Chart

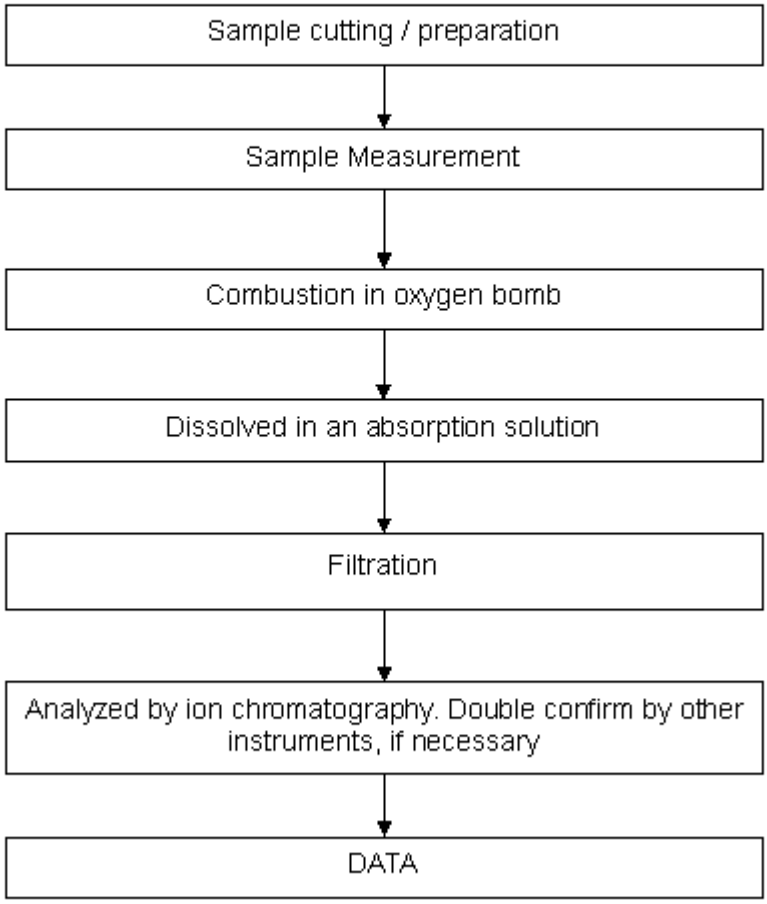
1) Name of the person who made testing: Cindy Huang
2) Name of the person in charge of testing: Ryan Yang



ATTACHMENTS

Halogen Testing Flow Chart

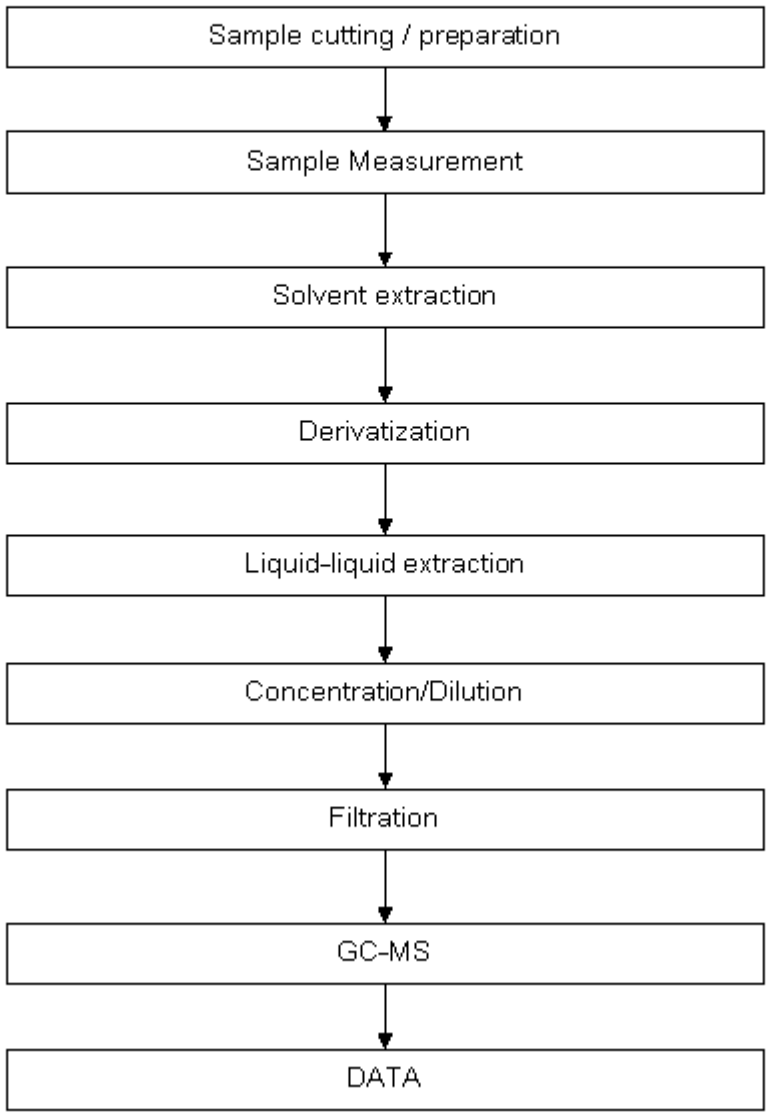
1) Name of the person who made testing: Liang Wang
2) Name of the person in charge of testing: Michelle Song



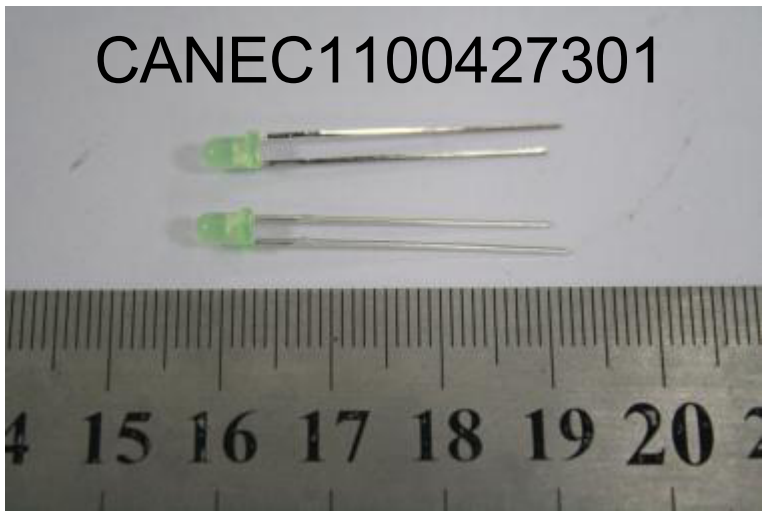
ATTACHMENTS

TBBP-A Testing Flow Chart

1) Name of the person who made testing: Cutey Yu
2) Name of the person in charge of testing: Ryan Yang



Sample photo:



CAN11-004273.001

SGS authenticate the photo on original report only

*** End of Report ***

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Member of the SGS Group (SGS SA)

Test Report

No. CANEC1100338103 Date: 09 Feb 2011 Page 1 of 11

GUANGDONG HONGLEIDA OPTOELECTRONICS TECHNOLOGY CO.,LTD.
NO.78,DONGQU ROAD,XIANGXI INDUSTRIAL ZONE,LIAOBU TOWN,DONGGUAN CITY,GUANGDONG PROVINCE
CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as :
N661300S+黑色母

SGS Job No.	:	12962319 - GZ
SGS Internal Reference No.	:	6.5
Date of Sample Received	:	28 Jan 2011
Testing Period	:	28 Jan 2011 - 09 Feb 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 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.

Almay Gao
Approved Signatory

Test Results:

ID for specimen 1 : CAN11-003381.005
Description for specimen 1 : Black plastic

A: RoHS Directive 2002/95/EC

Test Item(s)	Unit	Test Method (Reference)	Result	MDL	Limit
Cadmium (Cd)	mg/kg	IEC 62321:2008, ICP-OES	5	2	100
Lead (Pb)	mg/kg	IEC 62321:2008, ICP-OES	N.D.	2	1000
Mercury (Hg)	mg/kg	IEC 62321:2008, ICP-OES	N.D.	2	1000
Hexavalent Chromium (CrVI) by alkaline extraction	mg/kg	IEC 62321:2008, UV-Vis	N.D.	2	1000
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.	-	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	

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

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B: TBBPA

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
TetraBromoBisphenol A (TBBP-A)	mg/kg	EPA 3550C: 2007, GC-MS	N.D.	10

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
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.

D: Halogen

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Fluorine (F)	mg/kg	BS EN 14582:2007, IC	N.D.	50
Chlorine (Cl)	mg/kg	BS EN 14582:2007, IC	87	50
Bromine (Br)	mg/kg	BS EN 14582:2007, IC	69	50
Iodine (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

E: PAHs (Polynuclear Aromatic Hydrocarbons)

Test Item(s)	Unit	Test Method	Result	MDL
Naphthalene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Acenaphthylene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Acenaphthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Fluorene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Phenanthrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Pyrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benz(a)anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Chrysene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(b)fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(k)fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(a)pyrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Dibenzo(a,h)anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(g,h,i)perylene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Sum of 16 PAHs acc. US EPA	mg/kg	-	N.D.	-

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

ZEK 01.2-08 : Restraining maximum values for products

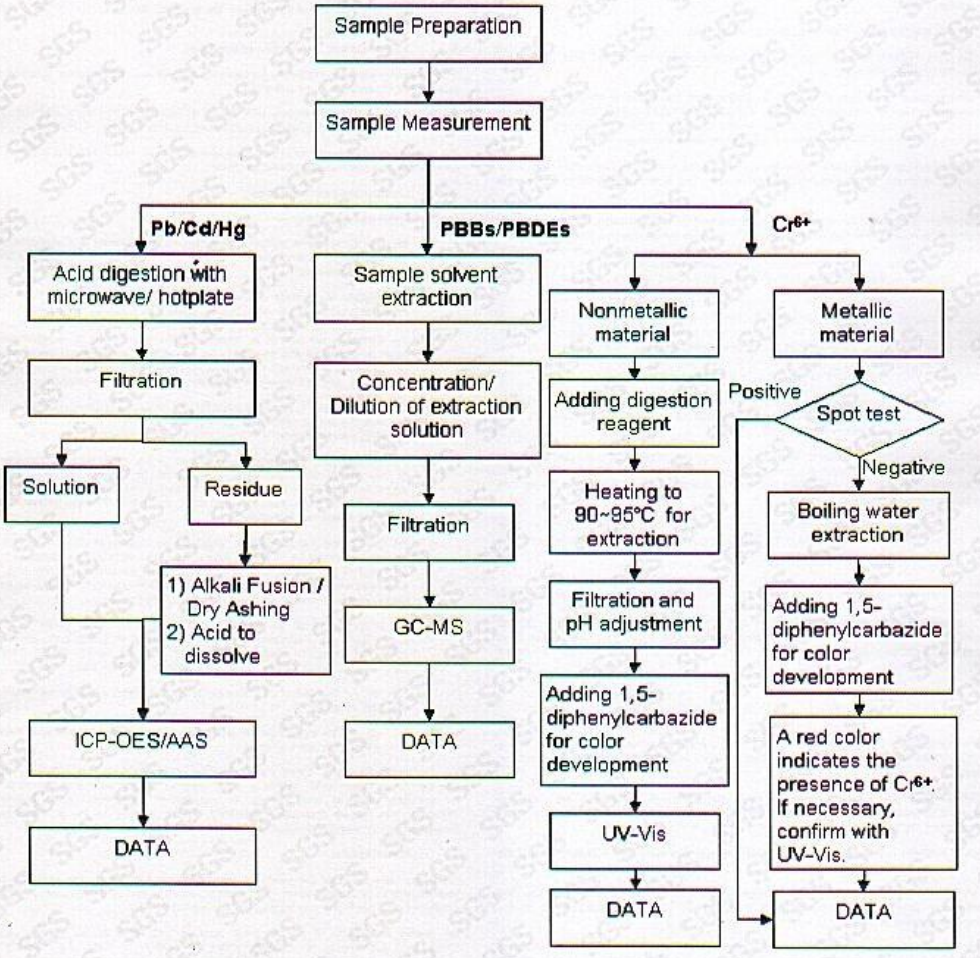
Parameter	Category 1 Material indented to be put in the mouth or material for toys with normal skin contact for children aged < 36 months	Category 2 Materials those are not included in Category 1, with predictable contact with the skin longer than 30 s. (long-term skin contact).	Category 3 Materials those 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)***	1	20
Sum 16 PAH (US EPA) (mg/kg)**	<MDL (<0.2)***	10	200

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

ATTACHMENTS

RoHS Testing Flow Chart

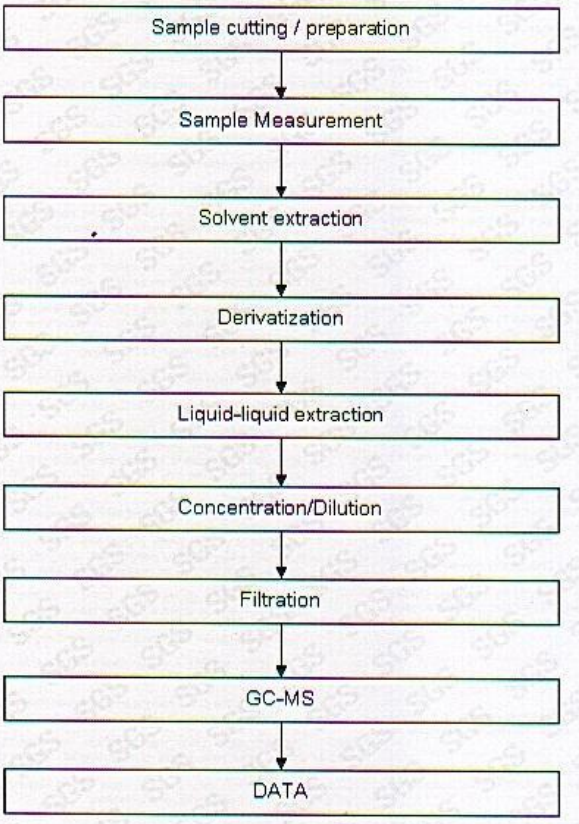
1) Name of the person who made testing: Bella Wang / Cutey Yu / Ross Zhan
2) Name of the person in charge of testing: Adams Yu / Ryan Yang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr6+ and PBBs/PBDEs test method excluded).



ATTACHMENTS

TBBP-A Testing Flow Chart

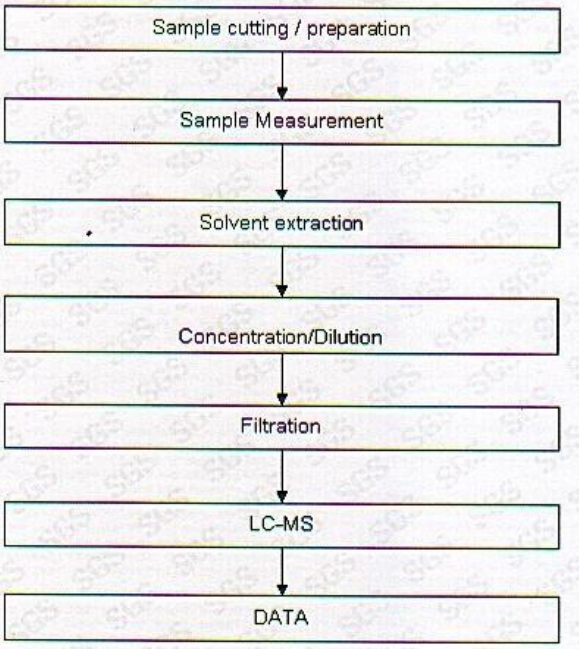
1) Name of the person who made testing: Cutey Yu
2) Name of the person in charge of testing: Ryan Yang



ATTACHMENTS

PFOA / PFOS Testing Flow Chart

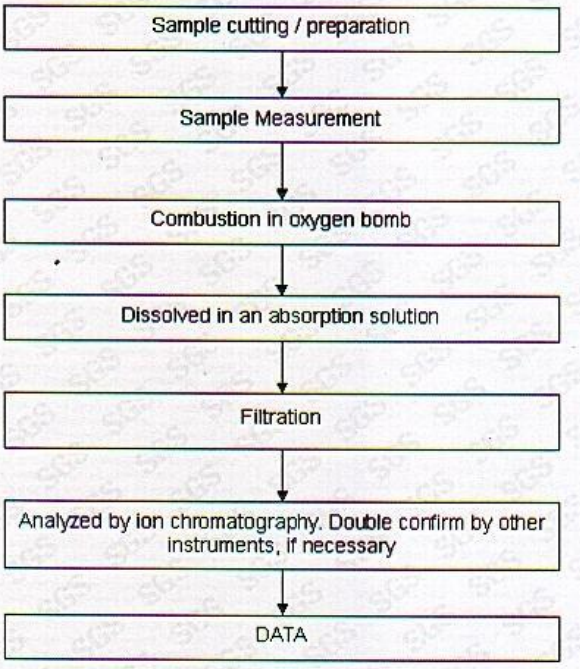
1) Name of the person who made testing: Cindy Huang
2) Name of the person in charge of testing: Ryan Yang



ATTACHMENTS

Halogen Testing Flow Chart

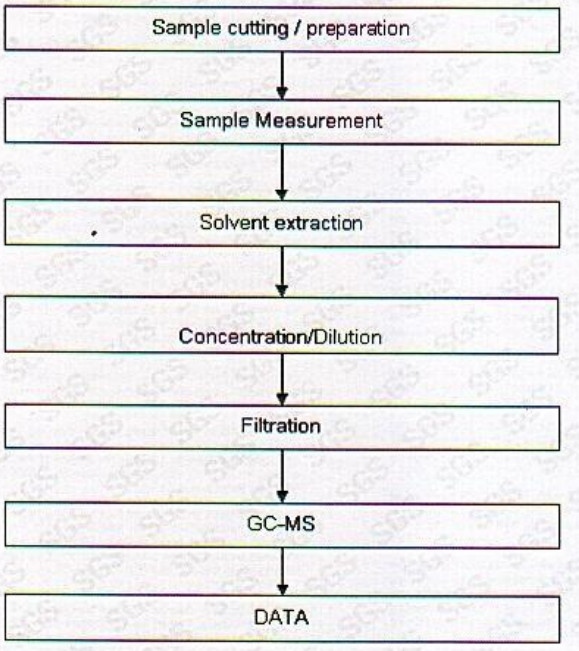
1) Name of the person who made testing: Liang Wang
2) Name of the person in charge of testing: Michelle Song



ATTACHMENTS

PAHs Testing Flow Chart

1) Name of the person who made testing: Cutey Yu
2) Name of the person in charge of testing: Ryan Yang



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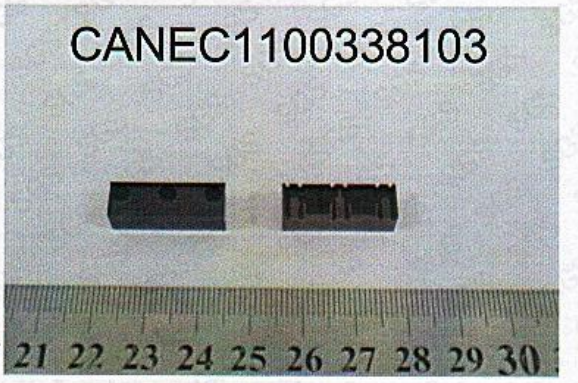
Sample photo:



CAN11-003381.005

SGS authenticate the photo on original report only

*** End of Report ***

LIGITEK ELECTRONICS CO., LTD.
NO.238, BO' AI ST., SHULIN CITY, TAIPEI COUNTY 238, TAIWAN

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

SGS Job No.	: GZ12975851EC
SGS Internal Reference No.	: 2.1
Date of Sample Received	: FEB 18, 2011
Testing Period	: FEB 18, 2011 TO FEB 24, 2011

Test Requested : As requested by client, SVHC screening is performed according to:
Forty six (46) substances in the Candidate List of Substances of Very High Concern (SVHC) for authorization published by European Chemicals Agency (ECHA) on and before Dec 15, 2010 regarding Regulation (EC) No 1907/2006 concerning the REACH.

Test Result(s) :

Summary : Please refer to next page(s).

According to the specified scope and analytical techniques, concentrations of tested SVHC are ≤ 0.1% (w/w) in the submitted sample.	PASS

Signed for and on behalf of
SGS-CSTC Ltd.

David Zhou
Approved Signatory

Remark :

(1) The chemical analysis of specified SVHC is performed by means of currently available analytical techniques against the following SVHC related documents published by ECHA: http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp These lists are under evaluation by ECHA and may subject to change in the future.

(2) In accordance with Regulation (EC) No 1907/2006, any EU producer or importer of articles shall notify ECHA, in accordance with paragraph 4 of Article 7, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1) of the Regulation, if (a) the substance in the Candidate List is present in those articles in quantities totaling over one tonne per producer or importer per year; and (b) the substance in the Candidate List is present in those articles above a concentration of 0.1% weight by weight (w/w).

(3) Article 33 of Regulation (EC) No 1907/2006 requires supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0.1% weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance in the Candidate List.

(4) If a SVHC is found over the reporting limit, client is suggested to identify the component which contains the SVHC and the exact concentration of the SVHC by requesting further quantitative analysis from the laboratory.

Test Sample :

Sample Description :

Specimen No.	Description
001	"LAMP LED"

Test Method :

SGS In-House method-GZTC CHEM-TOP-092-01, GZTC CHEM-TOP-092-02, Analyzed by ICP-OES, GC-MS and UV-VIS.

Test Result: (Substances in the Candidate List of SVHC)

Substance Name	CAS No.	EC No.	Concentration(%)	RL(%)
			001	
2,4-Dinitrotoluene	121-14-2	204-450-0	N.D.	0.050
2-Ethoxyethanol	110-80-5	203-804-1	N.D.	0.050
2-Methoxyethanol	109-86-4	203-713-7	N.D.	0.050
4,4' -Diaminodiphenylmethane(MDA)	101-77-9	202-974-4	N.D.	0.050
5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	201-329-4	N.D.	0.050
Acrylamide	79-06-01	201-173-7	N.D.	0.050
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	287-476-5	N.D.	0.050
Aluminosilicate Refractory Ceramic Fibres*	650-017-00-8 (Index no.)	-	N.D.	0.005
Ammonium dichromate*	7789-09-5	232-143-1	N.D.	0.005
Anthracene	120-12-7	204-371-1	N.D.	0.050
Anthracene oil*	90640-80-5	292-602-7	N.D.	0.050
Anthracene oil, anthracene paste*	90640-81-6	292-603-2	N.D.	0.050
Anthracene oil, anthracene paste, anthracene fraction*	91995-15-2	295-275-9	N.D.	0.050
Anthracene oil, anthracene paste, distn. Lights*	91995-17-4	295-278-5	N.D.	0.050
Anthracene oil, anthracene-low*	90640-82-7	292-604-8	N.D.	0.050
Benzyl butyl phthalate (BBP)	85-68-7	201-622-7	N.D.	0.050
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	204-211-0	N.D.	0.050
Bis(tributyltin)oxide (TBTO)	56-35-9	200-268-0	N.D.	0.050
Boric acid*	10043-35-3 11113-50-1	233-139-2 234-343-4	N.D.	0.005
Chromic acid, Oligomers of chromic acid and dichromic acid, Dichromic acid*	7738-94-5 - 13530-68-2	231-801-5 - 236-881-5	N.D.	0.005
Chromium trioxide*	1333-82-0	215-607-8	N.D.	0.005

Substance Name	CAS No.	EC No.	Concentration(%)	RL(%)
			001	
Cobalt dichloride*	7646-79-9	231-589-4	N.D.	0.005
Cobalt(II) carbonate*	513-79-1	208-169-4	N.D.	0.005
Cobalt(II) diacetate*	71-48-7	200-755-8	N.D.	0.005
Cobalt(II) dinitrate*	10141-05-6	233-402-1	N.D.	0.005
Cobalt(II) sulphate*	10124-43-3	233-334-2	N.D.	0.005
Diarsenic pentaoxide*	1303-28-2	215-116-9	N.D.	0.005
Diarsenic trioxide*	1327-53-3	215-481-4	N.D.	0.005
Dibutyl phthalate (DBP)	84-74-2	201-557-4	N.D.	0.050
Diisobutyl phthalate	84-69-5	201-553-2	N.D.	0.050
Disodium tetraborate, anhydrous*	1303-96-4 1330-43-4 12179-04-3	215-540-4	N.D.	0.005
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β-HBCDD, γ-HBCDD) Δ	25637-99-4 and 3194- 55-6	247-148-4 and 221-695-9	N.D.	0.050
Lead chromate*	7758-97-6	231-846-0	N.D.	0.005
Lead chromate molybdate sulphate red (C.I. Pigment Red 104)*	12656-85-8	235-759-9	N.D.	0.005
Lead hydrogen arsenate*	7784-40-9	232-064-2	N.D.	0.005
Lead sulfochromate yellow (C.I. Pigment Yellow 34)*	1344-37-2	215-693-7	N.D.	0.005
Pitch, coal tar, high temp.*	65996-93-2	266-028-2	N.D.	0.050
Potassium chromate*	7789-00-6	232-140-5	N.D.	0.005
Potassium dichromate*	7778-50-9	231-906-6	N.D.	0.005
Sodium chromate*	7775-11-3	231-889-5	N.D.	0.005
Sodium dichromate*	7789-12-0 and 10588-01-9	234-190-3	N.D.	0.005
Tetraboron disodium heptaoxide, hydrate*	12267-73-1	235-541-3	N.D.	0.005
Trichloroethylene	79-01-6	201-167-4	N.D.	0.050
Triethyl arsenate*	15606-95-8	427-700-2	N.D.	0.005
Tris(2-chloroethyl)phosphate	115-96-8	204-118-5	N.D.	0.050
Zirconia Aluminosilicate Refractory Ceramic Fibres*	650-017-00-8 (Index no.)	-	N.D.	0.005

Notes:

(1). RL = Reporting Limit. All RL are based on homogenous material.
N.D. = Not detected (lower than RL), N.D. is denoted on the target compound.

(2). ∆ CAS No. of diastereoisomers identified (α-HBCDD, β-HBCDD, γ-HBCDD): 134237-50-6, 134237-51-7, 134237-52-8.

(3). * The test result is based on the calculation of selected element(s) / marker(s) and to the worst-case scenario. For detail information, please refer to the SGS REACH website: www.reach.sgs.com/substance-of-very-high-concern-analysis-information-page.htm

Calculated concentration of boric acid, disodium tetraborate, anhydrous and tetraboron disodium heptaoxide, hydrate are based on the water extractive boron and sodium by ICP-OES.

RL = 0.005% is evaluated for element (i.e. cobalt, arsenic, lead, sodium, chromium, chromium (VI), silicon, aluminum, zirconium, boron and potassium respectively), except molybdenum RL=0.0005%

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Sample photo:

GZ1102013974/CHEM

SGS authenticate the photo on original report only

*** End of Report ***

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