



## ICP Test Report Certification Packet

Company name: Littelfuse, Inc.  
Product Series: LFJ – Class J Series Fuseblocks  
Product #: LFJ104501CST, LFJ102001CST, LFJ104001CST  
Issue Date: December 3, 2012

It is hereby certified by Littelfuse, Inc. that there is neither RoHS (EU Directive 2002/95/EC, 2011/65/EU)-restricted substance nor such use, for materials to be used for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing processes. In addition, it is hereby reported to you that the parts and sub-materials, the materials to be used for unit parts, the packing/packaging materials, and the additives and the like in the manufacturing processes, are all composed of the following components.

Issued by:   
KRISTEEN BACILA

\_\_\_\_\_  
<Global EHS Engineer>

(1) Parts, sub-materials and unit parts

This document covers the JLS RoHS-Compliant series products manufactured by Littelfuse, Inc.

< Raw Materials Used

Please see Table 1

(2) The ICP data on all measurable substances

Please see appropriate pages as identified in Table 1

Remarks :



**Table 1: List of Raw Materials covered by this report**

<b>Total Parts</b>	<b>Raw Material Part Number</b>	<b>Raw Material Description</b>	<b>Page(s)</b>
1	NA	Epoxy – BMC FTI400	3-8
2	NA	FR-4	9-20
3	NA	Connector - Aluminum	21-26
4	NA	Reinforcing Clip - 65 Mn Steel	27-31
5	NA	Fuse Clip – T3 Copper	32-37
6	NA	Spacer, Screw, Bolts, Nuts - Steel	38-41
7	NA	Zinc Plating of steel	42-45
8	NA	Tin plating of Copper & Aluminum	46-49
9	NA	Magnetite Plating	50-53

Test Report

Number : TWNC00256917

Applicant: Littelfuse Philippines Inc.  
LIMA Technology Center, Lipa City,  
Malvar, Batangas

Date : May 15, 2012

Sample Description:

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

Part Description : Compound  
Part Number : BMC-FTI400  
Date Sample Received : May 10, 2012  
Date Test Started : May 10, 2012

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Test Conducted :

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

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Authorized By:  
On Behalf Of Intertek Testing Services  
Taiwan Limited



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K. Y. Liang  
Director

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approval of the laboratory.

Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>
	<u>Black Material</u>
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
<b>Polybrominated Biphenyls (PBBs)</b>	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
<b>Polybrominated Diphenyl Ethers (PBDEs)</b>	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
<b>Halogen Content</b>	
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND
<b>Phthalates</b>	
Di(2-ethylhexyl) Phthalate (DEHP)	ND
Dibutyl Phthalate (DBP)	ND
Benzyl Butyl Phthalate (BBP)	ND

Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>
	<u>Black Material</u>
<b>Others</b>	
Hexabromocyclododecane (HBCDD)	ND

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg  
ND = Not detected

Responsibility of Chemist : Irene Chiou / Kevin Liu / Cathy Chen

Date Sample Received : May 10, 2012

Test Period : May 11, 2012 To May 15, 2012

( II ) RoHS Requirement:

<u>Restricted Substances</u>	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ehters (PBDEs)	0.1% (1000ppm)

The above limits were quoted from 2002/95/EC and amendment 2005/618/EC for homogeneous material.

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Test Conducted

(III) Test Method:

<u>Test Item</u>	<u>Test Method</u>	<u>Reporting Limit</u>
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by calorimetric bomb with oxygen and determined by Ion Chromatograph.	50 ppm
Phthalates	With reference to EN 14372: 2004, by solvent extraction and determined by GC-MS.	50 ppm
Hexabromocyclododecane (HBCDD)	With reference to USEPA 3540C, by solvent extraction and determined by GC-MSD.	10 ppm

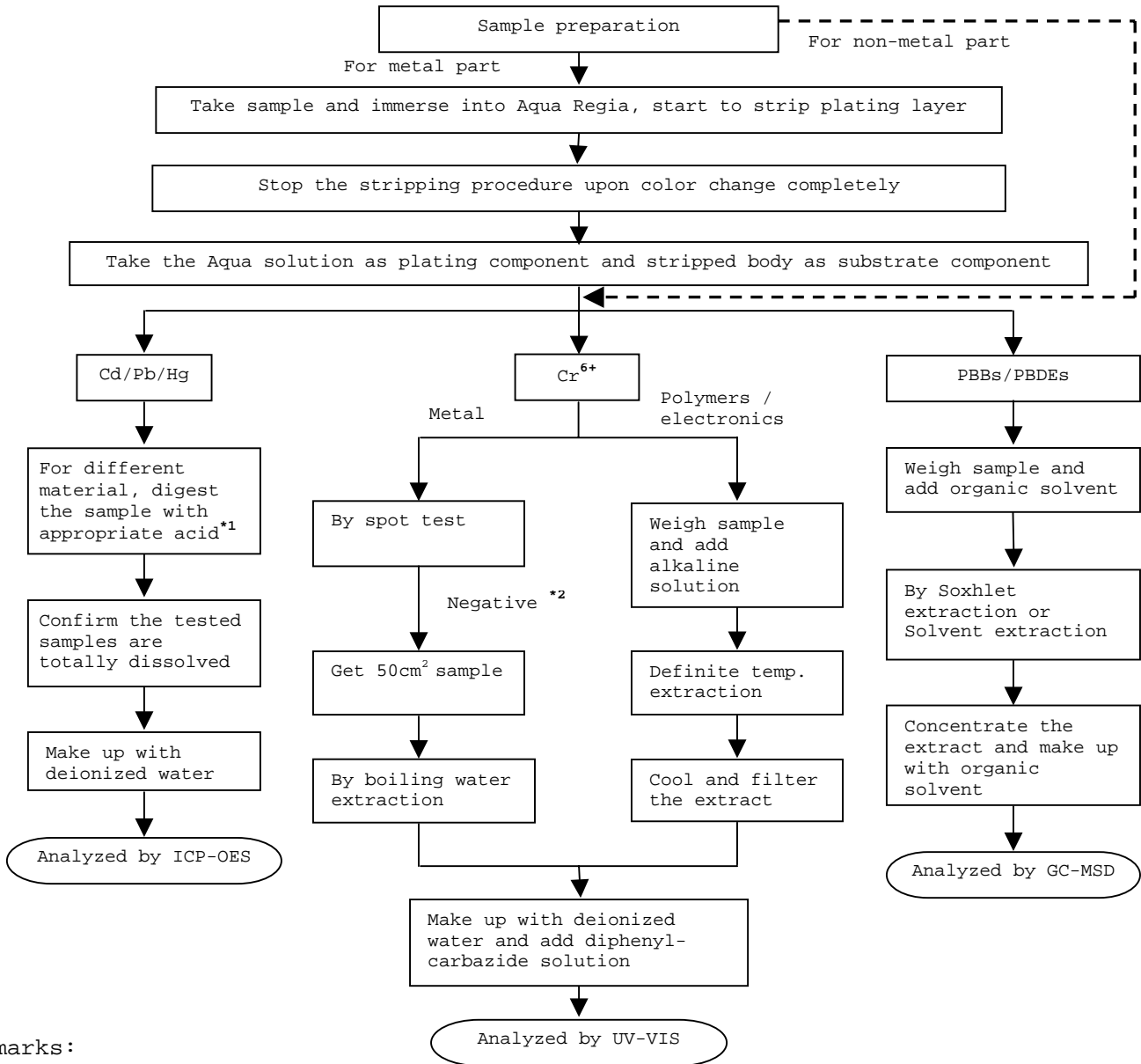
Remark: Reporting limit = Quantitation limit of analyte in sample

Test Conducted

(IV) Measurement Flowchart:

Test for Cd/Pb/Hg/Chromium (VI)/PBBS/PBDES Contents

Reference Standard: IEC 62321 edition 1.0:2008



Remarks:

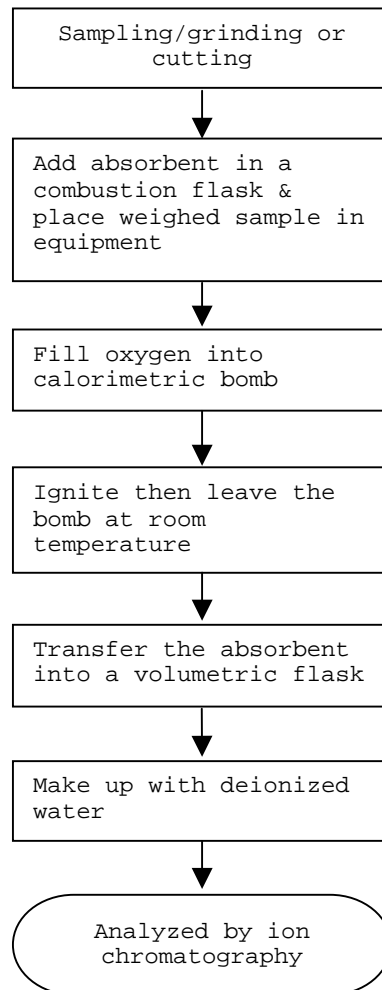
\*1: List of Appropriate Acid:

Material	Acid Added for Digestion
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.

Test Conducted  
(IV) Measurement Flowchart:

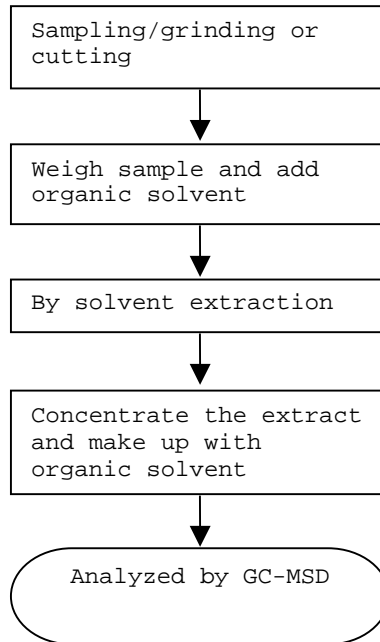
Test for Halogen Content  
Reference Standard : EN 14582





Test Conducted  
(IV) Measurement Flowchart:

Test For Phthalates Contents  
Reference Method: EN 14372: 2004

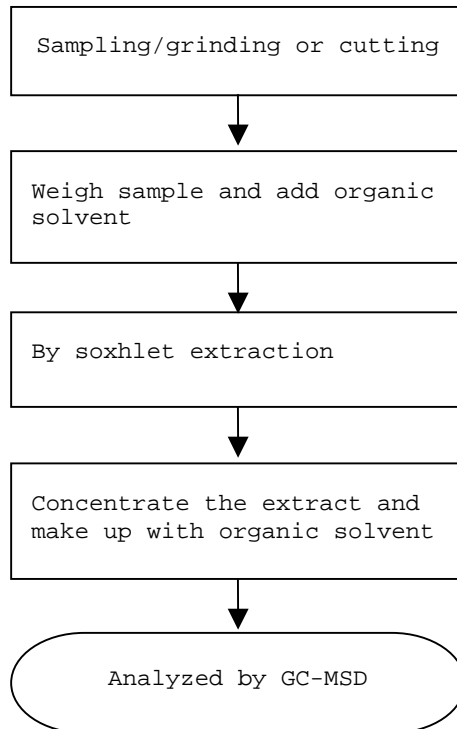


Test Conducted

(IV) Measurement Flowchart:

Test For Hexabromocyclododecane (HBCDD)

Reference Standard : USEPA 3540C



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End of Report

Test Conducted

Photo





**Test Report**

No. CANEC1112441702

Date: 04 Jan 2012

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ZHUHAI SEZ HARBOUR INDUSTRIAL LAMINATE LTD  
4,XINGGUO STREET,NANKENG INDUSTRIAL ZONE,ZHUHAI CITY  
CHINA

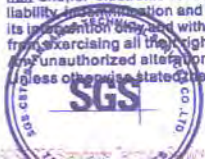
The following sample(s) was/were submitted and identified on behalf of the clients as : FR-4(BLACK)

SGS Job No. : CP11-015380 - SZ  
Date of Sample Received : 27 Dec 2011  
Testing Period : 27 Dec 2011 - 04 Jan 2012  
Test Requested : Selected test(s) as requested by client.  
Test Method : Please refer to next page(s).  
Test Results : Please refer to next page(s).

Signed for and on behalf of  
SGS-CSTC Ltd.

Trophy Zhang  
Approved Signatory

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## Test Report

No. CANEC1112441702

Date: 04 Jan 2012

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Test Results :

### Test Part Description :

Specimen No.	SGS Sample ID	Description
1	CAN11-124417.002	Black sheet

Remarks :

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected ( < MDL )
- (4) "-" = Not Regulated

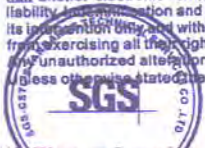
### Elementary Analysis & Flame Retardants

Test Method : With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES.
- (2) Determination of Lead by ICP-OES.
- (3) Determination of Mercury by ICP-OES.
- (4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
- (5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	Unit	MDL	002
Cadmium (Cd)	mg/kg	2	ND
Lead (Pb)	mg/kg	2	4
Mercury (Hg)	mg/kg	2	ND
Hexavalent Chromium (CrVI)	mg/kg	2	ND
Sum of PBBs	mg/kg	-	ND
Monobromobiphenyl	mg/kg	5	ND
Dibromobiphenyl	mg/kg	5	ND
Tribromobiphenyl	mg/kg	5	ND
Tetrabromobiphenyl	mg/kg	5	ND
Pentabromobiphenyl	mg/kg	5	ND
Hexabromobiphenyl	mg/kg	5	ND
Heptabromobiphenyl	mg/kg	5	ND
Octabromobiphenyl	mg/kg	5	ND
Nonabromobiphenyl	mg/kg	5	ND
Decabromobiphenyl	mg/kg	5	ND
Sum of PBDEs	mg/kg	-	ND
Monobromodiphenyl ether	mg/kg	5	ND

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## Test Report

No. CANEC1112441702

Date: 04 Jan 2012

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<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Dibromodiphenyl ether	mg/kg	5	ND
Tribromodiphenyl ether	mg/kg	5	ND
Tetrabromodiphenyl ether	mg/kg	5	ND
Pentabromodiphenyl ether	mg/kg	5	ND
Hexabromodiphenyl ether	mg/kg	5	ND
Heptabromodiphenyl ether	mg/kg	5	ND
Octabromodiphenyl ether	mg/kg	5	ND
Nonabromodiphenyl ether	mg/kg	5	ND
Decabromodiphenyl ether	mg/kg	5	ND

### Phthalates

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

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Dibutyl Phthalate (DBP)	% (w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	% (w/w)	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	% (w/w)	0.003	ND
Diisononyl Phthalate (DINP)	% (w/w)	0.010	ND
Di-n-octyl Phthalate (DNOP)	% (w/w)	0.003	ND
Diisodecyl Phthalate (DIDP)	% (w/w)	0.010	ND
Dimethyl Phthalate (DMP)	% (w/w)	0.003	ND
Diethyl Phthalate (DEP)	% (w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	% (w/w)	0.003	ND
Dinonyl Phthalate (DNP)	% (w/w)	0.003	ND
Diisooctyl Phthalate (DiOP)	% (w/w)	0.010	ND
Dipropyl Phthalate (DPrP)	% (w/w)	0.003	ND
Dicyclohexyl Phthalate (DCHP)	% (w/w)	0.003	ND
Dipentyl Phthalate (DPP)	% (w/w)	0.003	ND
Dibenzyl Phthalate (DBzP)	% (w/w)	0.003	ND
Diphenyl Phthalate (DPhP)	% (w/w)	0.003	ND
Di-n-hexyl Phthalate (DnHP)	% (w/w)	0.003	ND

Notes :

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- (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

**Tetrabromobisphenol A (TBBP-A)**

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

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Tetrabromobisphenol A (TBBP-A)	mg/kg	10	ND

**PFOS (Perfluorooctane Sulfonates)**

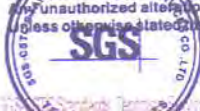
Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Perfluorooctane Sulfonates (PFOS) and related Acid,Metal Salt and Amide	mg/kg	10	ND

**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 /m<sup>2</sup> of the coated material.
- Please refer to Regulation (EC) No 552/2009 to get more detail information

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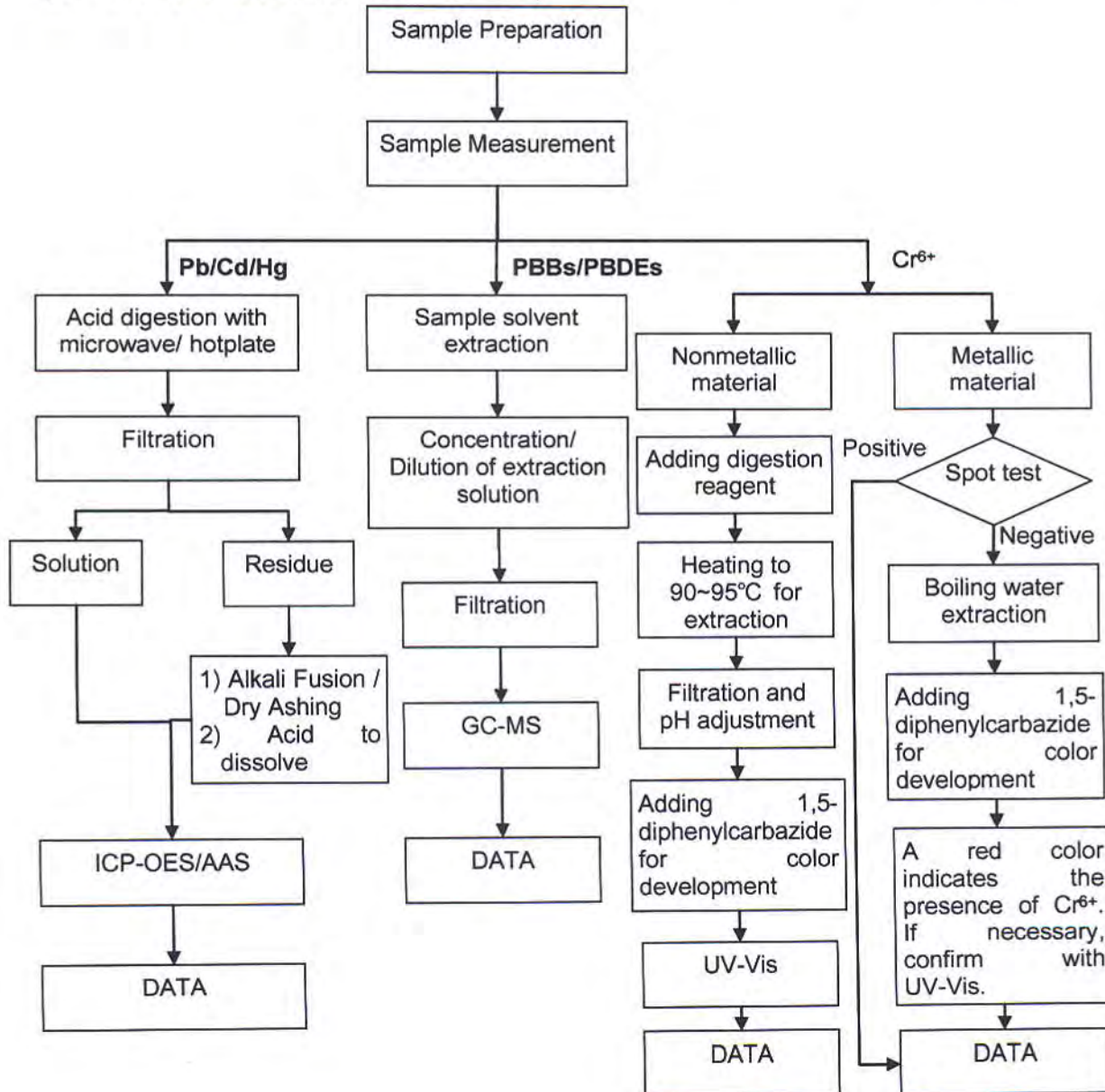




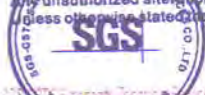
ATTACHMENTS

**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 (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded).



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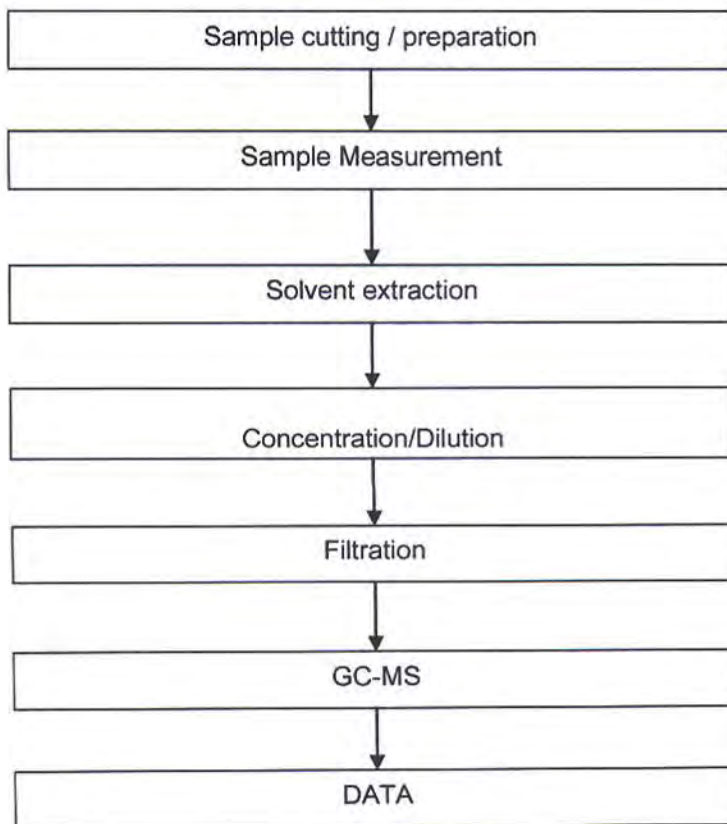




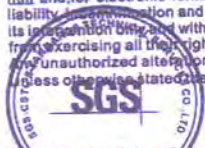
ATTACHMENTS

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



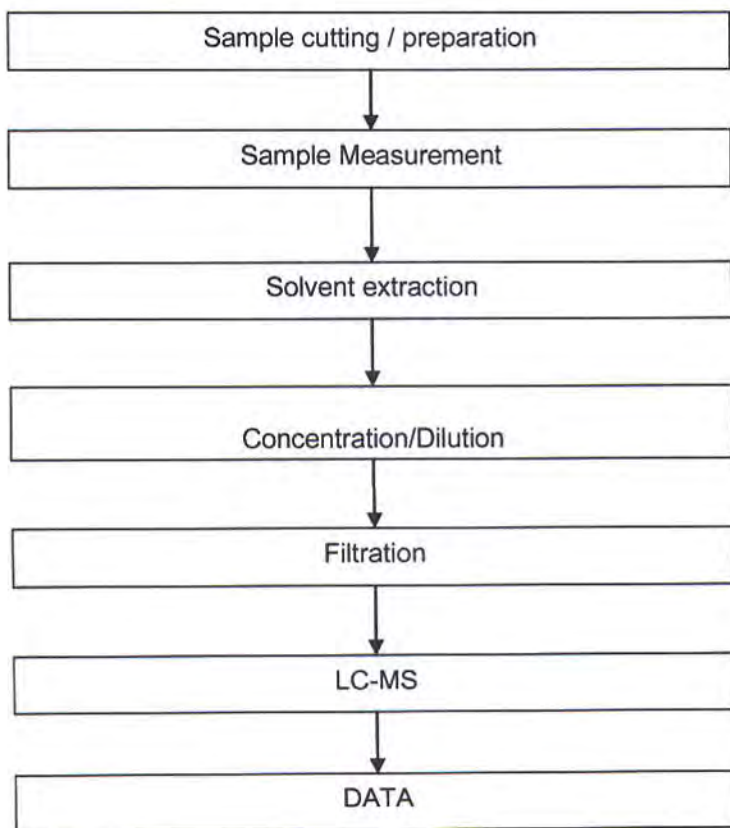
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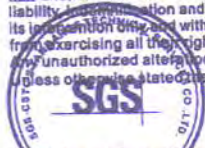
ATTACHMENTS

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



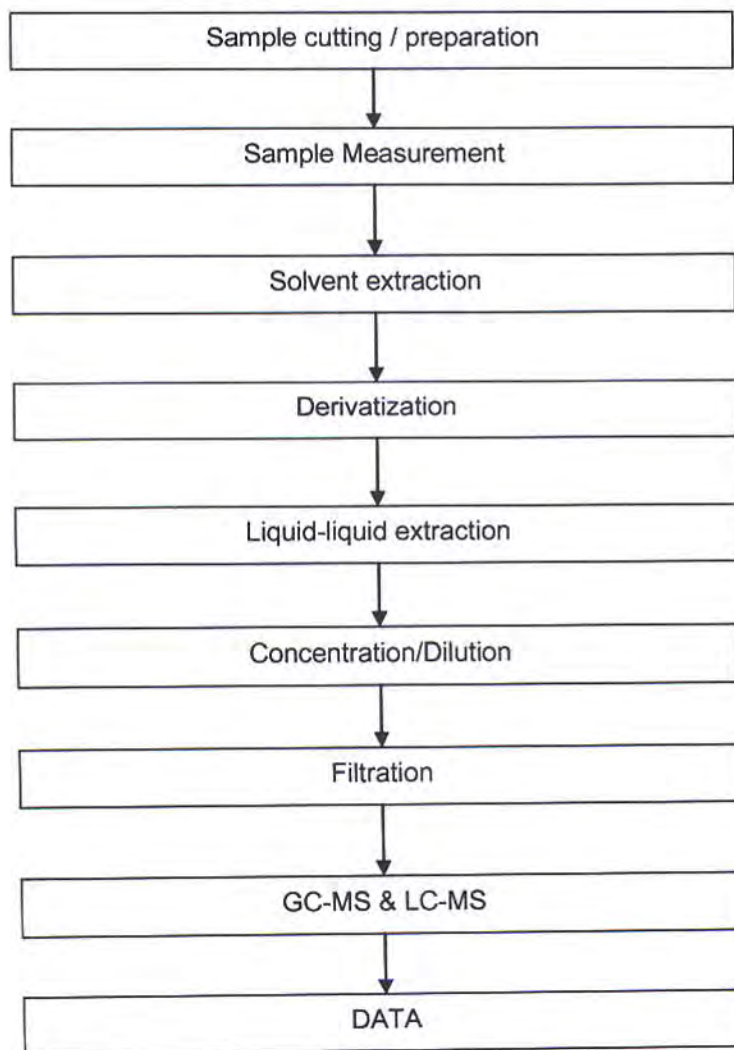
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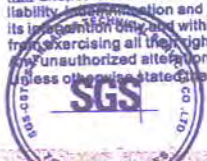
## ATTACHMENTS

### 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



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Sample photo:



SGS authenticate the photo on original report only

\*\*\* End of Report \*\*\*





Test Report

Number : TWNC00268059

Applicant: Littelfuse Philippines Inc.  
LIMA Technology Center, Lipa City,  
Malvar, Batangas

Date : Jul 27, 2012

Sample Description:

One (1) group of submitted samples said to be :  
Part Description : Aluminum Material  
Date Sample Received : Jul 20, 2012  
Date Test Started : Jul 21, 2012

Test Conducted :

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

Authorized By:  
On Behalf Of Intertek Testing Services  
Taiwan Limited



K. Y. Liang  
Director

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Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>
	<u>Silvery Metal</u>
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	14
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content (mg/kg with 50cm <sup>2</sup> )	Negative (< 0.02)

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg  
 ND = Not detected  
 < = Less than  
 mg/kg with 50cm<sup>2</sup> = milligram per kilogram with 50 square centimetre  
 Negative = A negative test result indicated positive observation was not found at the time of Test.

Responsibility of Chemist : Irene Chiou / Kevin Liu / Cathy Chen

Date Sample Received : Jul 20, 2012  
 Test Period : Jul 21, 2012 To Jul 27, 2012

( II ) RoHS Limits:

<u>Restricted Substances</u>	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)

The above limits were quoted from Annex II of 2011/65/EU for homogeneous material.

## Test Conducted

## ( III ) Test Method:

<u>Test Item</u>	<u>Test Method</u>	<u>Reporting Limit</u>
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex B, by boiling water extraction and determined by UV-Vis Spectrophotometer.	0.02 mg/kg with 50cm <sup>2</sup>

Remark: Reporting limit = Quantitation limit of analyte in sample

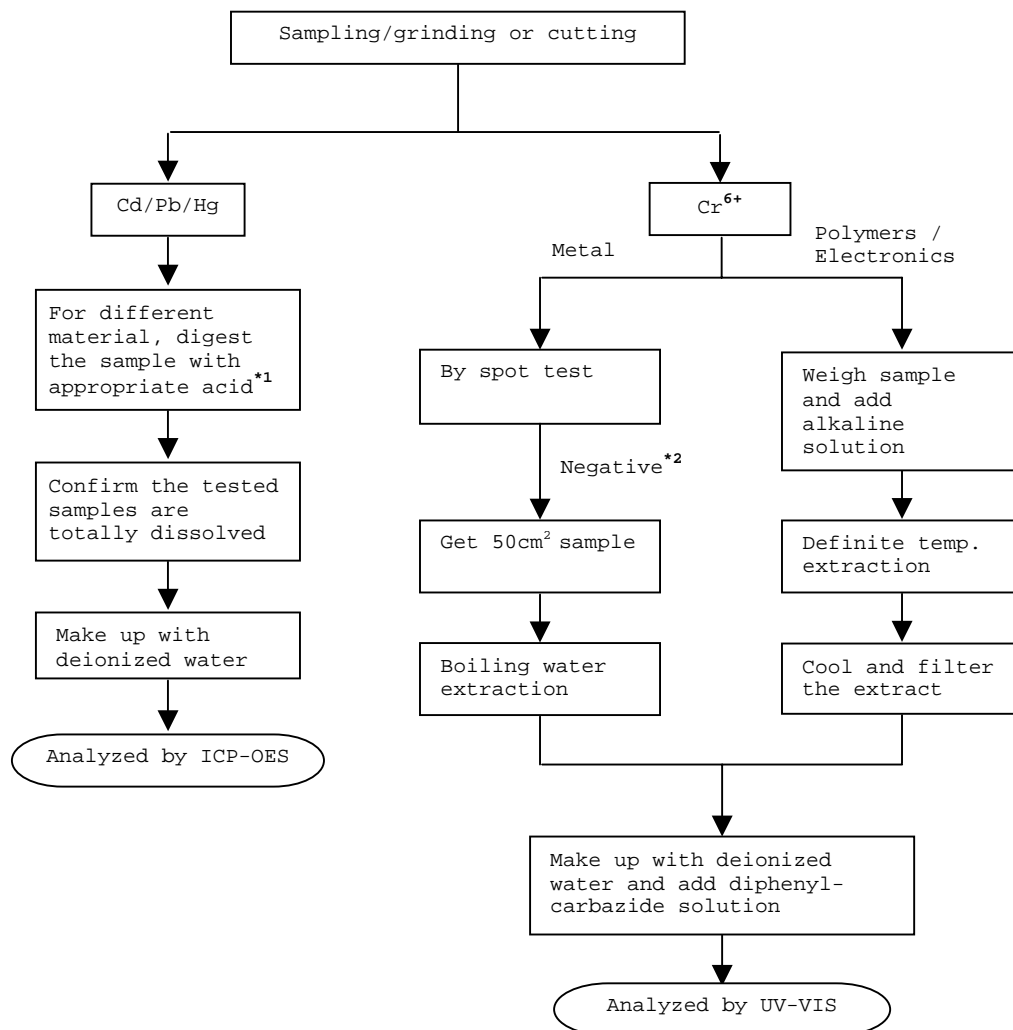
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Test Conducted

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)

Reference Standard : IEC 62321 edition 1.0:2008







Number : TWNC00268059

Test Conducted

Remarks:

\*1: List Of Appropriate Acid:

<u>Material</u>	<u>Acid Added For Digestion</u>
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.

End of Report

*This report is made solely on the basis of your instructions and/or information and materials supplied by you. It is not intended to be a recommendation for any particular course of action. Intertek does not accept a duty of care or any other responsibility to any person other than the Client in respect of this report and only accepts liability to the Client insofar as is expressly contained in the terms and conditions governing Intertek's provision of services to you. Intertek makes no warranties or representations either express or implied with respect to this report save as provided for in those terms and conditions. We have aimed to conduct the Review on a diligent and careful basis and we do not accept any liability to you for any loss arising out of or in connection with this report, in contract, tort, by statute or otherwise, except in the event of our gross negligence or wilful misconduct.*

Test Conducted

Photo





**Test Report**

Number : TWNC00238069

Applicant: Littelfuse, Philippines Inc.  
LIMA Technology Center, Lipa City,  
Malvar, Batangas

Date : Dec 27, 2011

Sample Description:

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

Part Description : Metal  
Part Number : 65Mn  
Date Sample Received : Dec 22, 2011  
Date Test Started : Dec 23, 2011

Test Conducted :

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

Authorized By:  
On Behalf Of Intertek Testing Services  
Taiwan Limited



K. Y. Liang  
Director

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approval of the laboratory.



Number : TWNC00238069

Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>	
	<u>(1)</u>	<u>(2)</u>
<b>Heavy Metal</b>		
Cadmium (Cd) content	ND	ND
Lead (Pb) content	ND	ND
Mercury (Hg) content	ND	ND
Chromium VI (Cr <sup>6+</sup> ) content (mg/kg with 50cm <sup>2</sup> )	Negative ( < 0.02 )	Negative ( < 0.02 )

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg  
ND = Not detected  
< = Less than  
mg/kg with 50cm<sup>2</sup> = milligram per kilogram with 50 square centimetre  
Negative = A negative test result indicated positive observation was not found at the time of Test.

Tested Components

- (1) Silvery Metal Base Material
- (2) Silvery Plating Layer

Responsibility of Chemist : Irene Chiou / Kevin Liu

Date Sample Received : Dec 22, 2011

Test Period : Dec 23, 2011 To Dec 26, 2011

( II ) RoHS Requirement:

<u>Restricted Substances</u>	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)

The above limits were quoted from 2002/95/EC and amendment 2005/618/EC for homogeneous material.



Number : TWNC00238069

Test Conducted

( III ) Test Method:

<u>Test Item</u>	<u>Test Method</u>	<u>Reporting Limit</u>
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex B, by boiling water extraction and determined by UV-Vis Spectrophotometer.	0.02 mg/kg with 50cm <sup>2</sup>

Remark: Reporting limit = Quantitation limit of analyte in sample

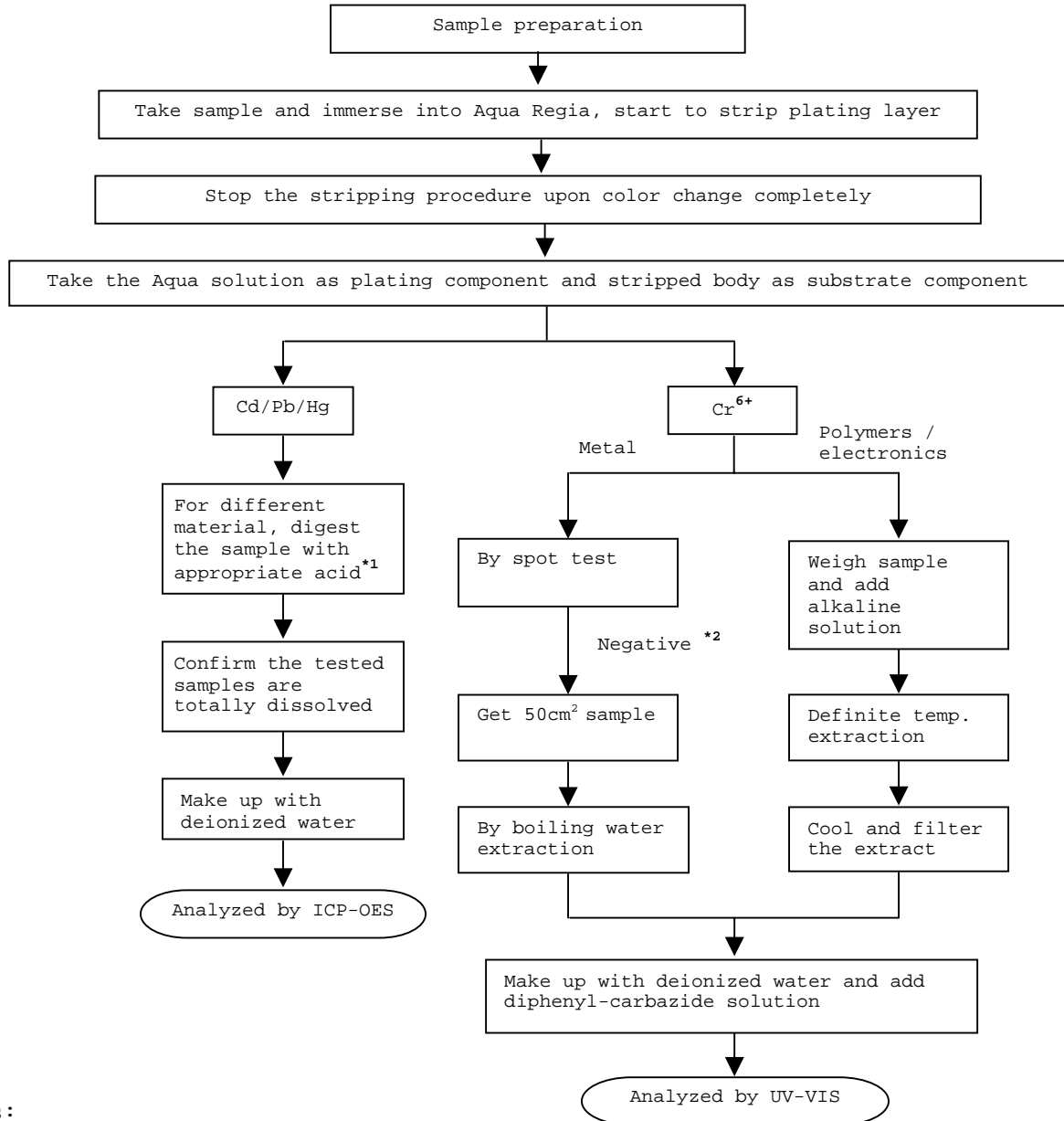
---

Test Conducted

(IV) Measurement Flowchart:

Test for Cd/Pb/Hg/Chromium (VI)

Reference Standard: IEC 62321 edition 1.0:2008



Remarks:

\*1: List of Appropriate Acid:

Material	Acid Added for Digestion
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.

End of Report

Test Conducted

Photo





Test Report

Number : TWNC00268064

Applicant: Littelfuse Philippines Inc.  
LIMA Technology Center, Lipa City,  
Malvar, Batangas

Date : Jul 27, 2012

Sample Description:

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

Part Description : Copper  
Part Number : T3  
Date Sample Received : Jul 20, 2012  
Date Test Started : Jul 21, 2012

Test Conducted :

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

Authorized By:  
On Behalf Of Intertek Testing Services  
Taiwan Limited



K. Y. Liang  
Director

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Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>
	<u>Coppery Metal</u>
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	32
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content (mg/kg with 50cm <sup>2</sup> )	Negative (< 0.02)

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg  
 ND = Not detected  
 < = Less than  
 mg/kg with 50cm<sup>2</sup> = milligram per kilogram with 50 square centimetre  
 Negative = A negative test result indicated positive observation was not found at the time of Test.

Responsibility of Chemist : Irene Chiou / Kevin Liu / Cathy Chen

Date Sample Received : Jul 20, 2012  
 Test Period : Jul 21, 2012 To Jul 27, 2012

( II ) RoHS Limits:

<u>Restricted Substances</u>	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)

The above limits were quoted from Annex II of 2011/65/EU for homogeneous material.

## Test Conducted

## ( III ) Test Method:

<u>Test Item</u>	<u>Test Method</u>	<u>Reporting Limit</u>
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex B, by boiling water extraction and determined by UV-Vis Spectrophotometer.	0.02 mg/kg with 50cm <sup>2</sup>

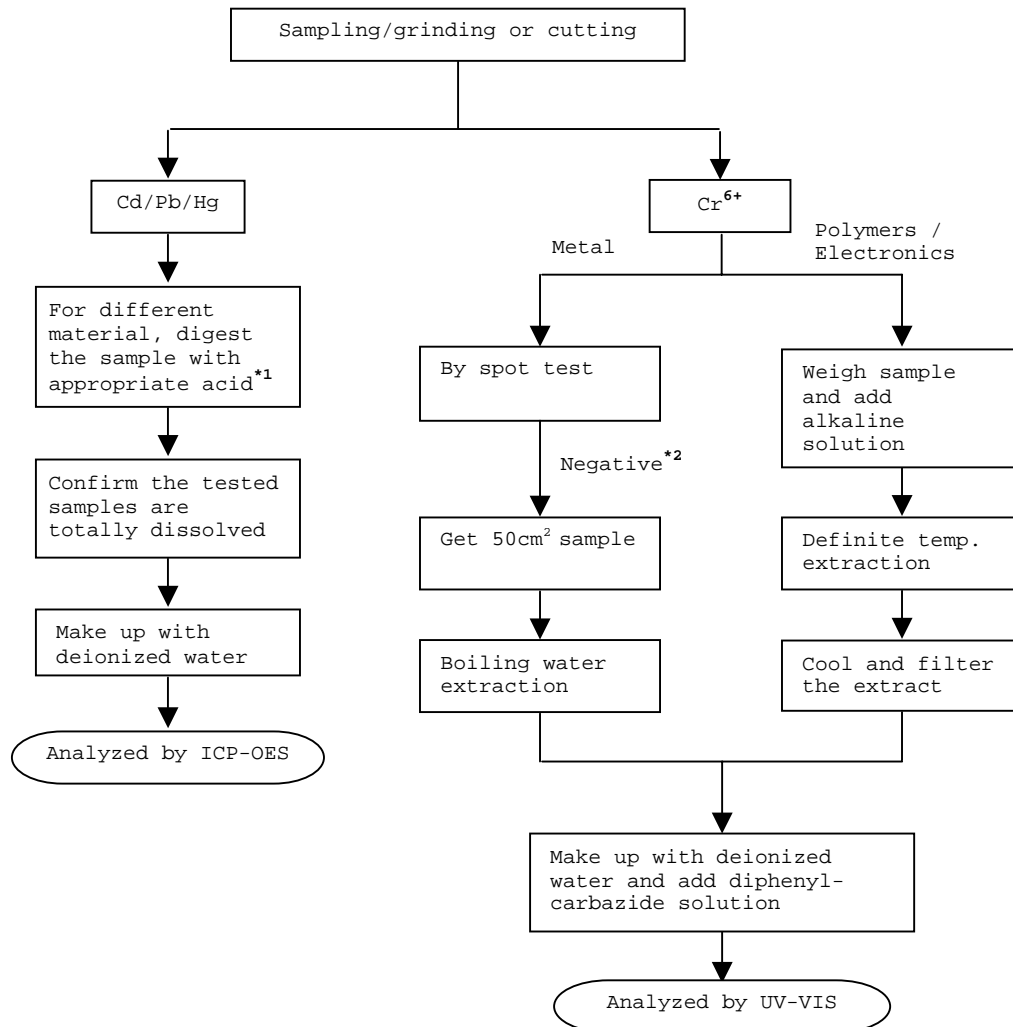
Remark: Reporting limit = Quantitation limit of analyte in sample

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Test Conducted

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)  
Reference Standard : IEC 62321 edition 1.0:2008





Number : TWNC00268064

Test Conducted

Remarks:

\*1: List Of Appropriate Acid:

<u>Material</u>	<u>Acid Added For Digestion</u>
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.

End of Report

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Test Conducted

Photo



# Test Report

Report No. RLNBE000088420001

Page 1 of 4

**Applicant** YUEQING DONGFENG FASTENERS COMPANY

**Address** NO528,SOUTH STREET,BEIBAIXIANG TOWN,YUEQING CITY, ZHEJIANG PROVINCE,CHINA.

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

Sample Name Steel  
Sample Received Date Jul. 2, 2012  
Testing Period Jul. 2, 2012 to Jul. 5, 2012

**Test Requested** As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)) in the submitted sample(s).

**Test Method**

Test Item(s)	Test Method	Measured Equipment(s)	MDL
Lead(Pb)	IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Cadmium(Cd)	IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Mercury(Hg)	IEC 62321:2008 Ed.1 Sec.7	ICP-OES	2 mg/kg
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis	/

**Test Result(s)** Please refer to the following page(s).

Tested by

*Sha Chen*

Reviewed by

*Wei Miao*

Approved by

*Chen Qian*

Date

Jul. 5, 2012

Chen Qian

Approved Signatory

No. 13431686

Centre Testing International(Ningbo)Co.,Ltd. 7-8/F.,Building A,No.750.Chuangyuan Road,Gaoxin District,Ningbo,Zhengjiang,China

# Test Report

Report No. RLNBE000088420001

Page 2 of 4

**Test Result(s)**

Tested Item(s)	Content
Lead(Pb)	N.D.
Cadmium(Cd)	N.D.
Mercury(Hg)	N.D.
Tested Item(s)	Conclusion
Hexavalent Chromium(Cr(VI))	Negative

**Tested Sample/Part Description** Metal with silver-grey cover layer

**Note:** The sample had been dissolved totally tested for Lead, Cadmium, Mercury.  
 -MDL = Method Detection Limit  
 -N.D. = Not Detected (<MDL )  
 -mg/kg = ppm = parts per million  
 -Negative = Absence of Cr(VI) , the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.



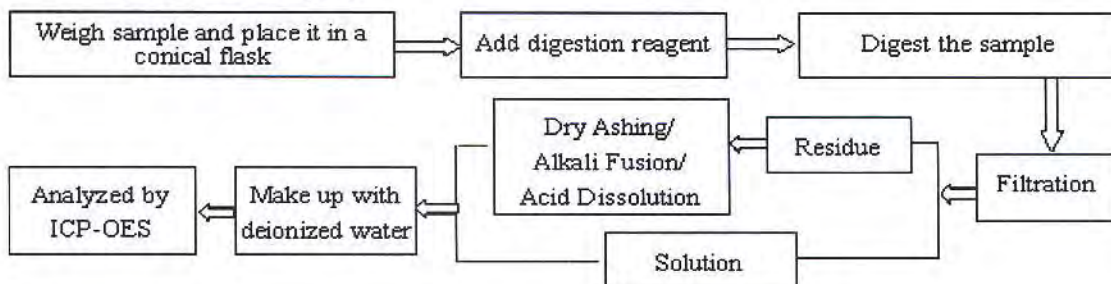
# Test Report

Report No. RLNBE000088420001

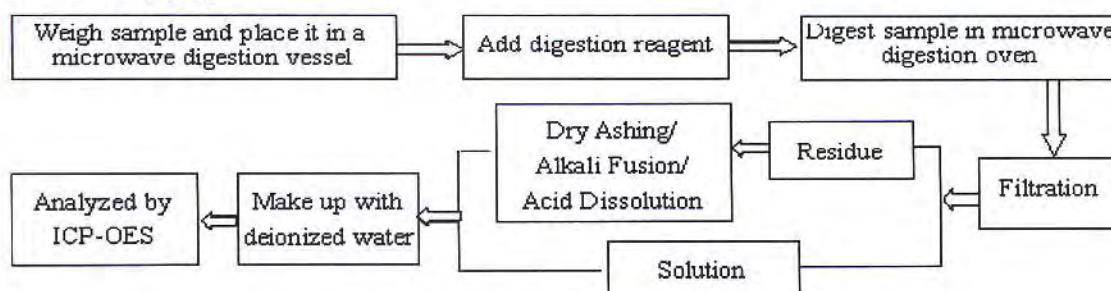
Page 3 of 4

## Test Process

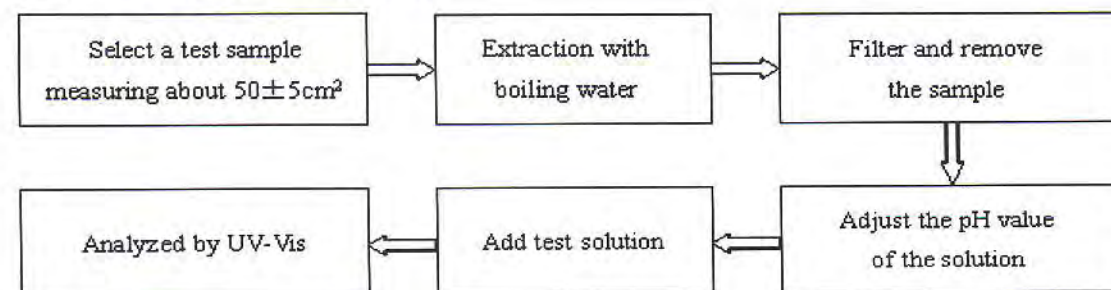
### 1. Lead(Pb), Cadmium(Cd)



### 2. Mercury(Hg)



### 3. Hexavalent Chromium(Cr(VI))



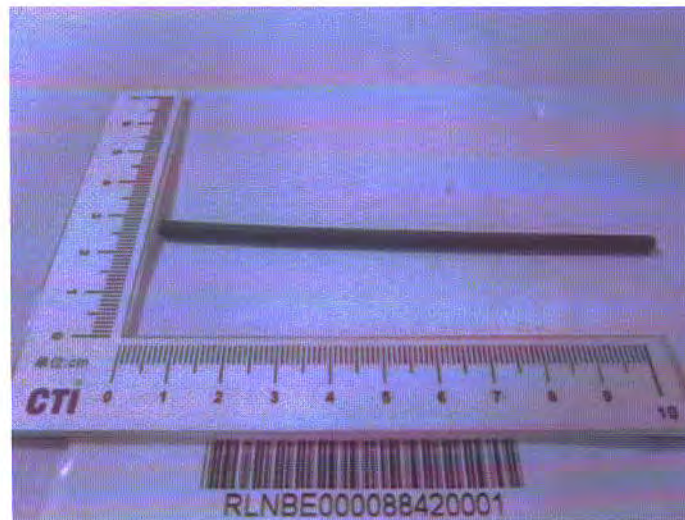


# Test Report

Report No. RLNBE000088420001

Page 4 of 4

## Photo(s) of the sample(s)



\*\*\* End of report \*\*\*

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# Test Report

Report No. RLNBE000088420002

Page 1 of 4

**Applicant** YUEQING DONGFENG FASTENERS COMPANY  
**Address** NO528,SOUTH STREET,BEIBAIXIANG TOWN,YUEQING CITY. ZHEJIANG PROVINCE,CHINA.

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

Sample Name Zinc Plating  
Sample Received Date Jul. 2, 2012  
Testing Period Jul. 2, 2012 to Jul. 5, 2012

**Test Requested** As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)) in the plating of submitted sample(s).

**Test Method**

Test Item(s)	Test Method	Measured Equipment(s)	MDL
Lead(Pb)	Plating layer test method (In-house method) and IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Cadmium(Cd)	Plating layer test method (In-house method) and IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Mercury(Hg)	Plating layer test method (In-house method) and IEC 62321:2008 Ed.1 Sec.7	ICP-OES	2 mg/kg
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis	/

**Test Result(s)** Please refer to the following page(s).

Tested by

*Sha Chen*

Reviewed by

*Wei Miao*

Approved by

*Chen Qian*

Date

Jul. 5, 2012

Chen Qian

Approved Signatory

No. 13431686

Centre Testing International(Ningbo)Co.,ltd. 7-8/F.,Building A,No.750.Chuangyuan Road,Gaoxin District,Ningbo,Zhejiang,China

# Test Report

Report No. RLNBE000088420002

Page 2 of 4

## Test Result(s)

Tested Item(s)	Content
Lead(Pb)	N.D.
Cadmium(Cd)	N.D.
Mercury(Hg)	N.D.

Tested Item(s)	Conclusion
Hexavalent Chromium(Cr(VI))	Negative

Tested Sample/Part Description Light blue plating

**Note:** The washed plating had been dissolved totally tested for Lead, Cadmium, Mercury.  
-MDL = Method Detection Limit  
-N.D. = Not Detected (<MDL )  
-mg/kg = ppm = parts per million  
-Negative = Absence of Cr(VI) , the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.



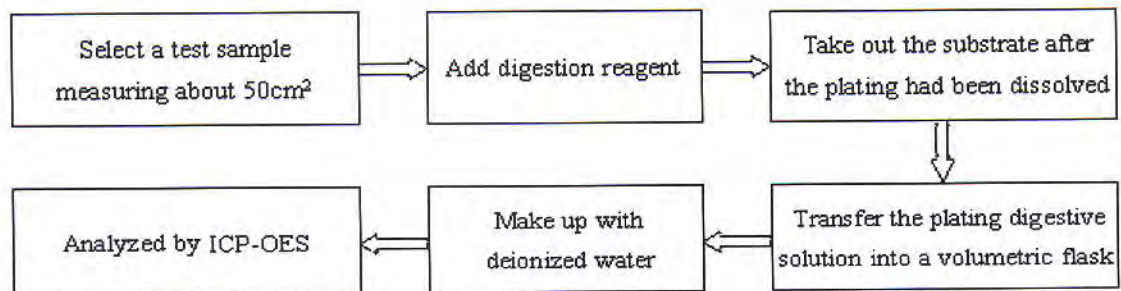
# Test Report

Report No. RLNBE000088420002

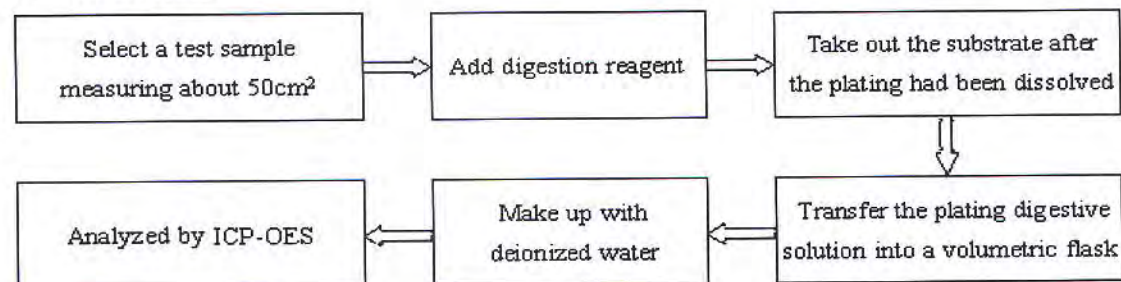
Page 3 of 4

## Test Process

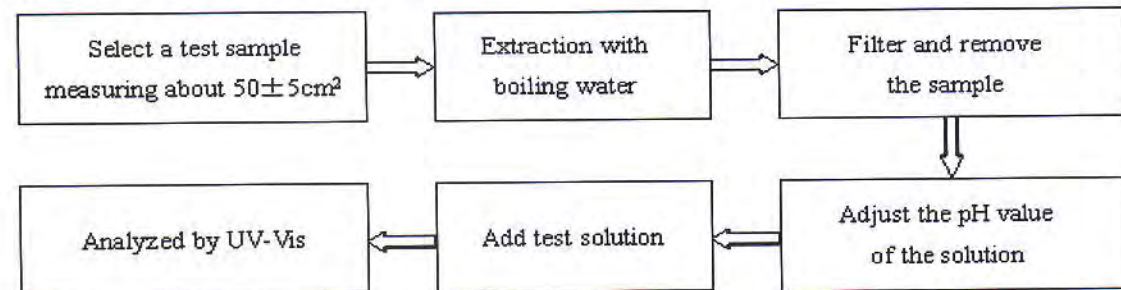
### 1. Lead(Pb), Cadmium(Cd)



### 2. Mercury(Hg)



### 3. Hexavalent Chromium(Cr(VI))



# Test Report

Report No. RLNBE000088420002

Page 4 of 4

## Photo(s) of the sample(s)



\*\*\* End of report \*\*\*

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# Test Report

Report No. RLNBE000090170001

Page 1 of 4

**Applicant** YUEQING HUIFENG ELECTROPLATE FACTORY

**Address** NO528,XIANGTA WEST ROAD,BEIBAIXIANG TOWN,YUEQING CITY.  
ZHEJIANG PROVINCE,CHINA.

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

Sample Name Tin Plating  
Sample Received Date Jul. 12, 2012  
Testing Period Jul. 12, 2012 to Jul. 14, 2012

**Test Requested** As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)) in the plating of submitted sample(s).

**Test Method**

Test Item(s)	Test Method	Measured Equipment(s)	MDL
Lead(Pb)	Plating layer test method (In-house method) and IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Cadmium(Cd)	Plating layer test method (In-house method) and IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Mercury(Hg)	IEC 62321:2008 Ed.1 Sec.7	ICP-OES	2 mg/kg
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis	/

**Test Result(s)** Please refer to the following page(s).

Tested by

*Sha Chen*

Reviewed by

*Wei Miao*

Approved by

*Chen Qian*

Date

Jul. 14, 2012

Chen Qian

Approved Signatory

No. 13431669

Centre Testing International(Ningbo)Co.,ltd. 7-8/F.,Building A,No.750.Chuangyuan Road,Gaoxin District,Ningbo,Zhengjiang,China



# Test Report

Report No. RLNBE000090170001

Page 2 of 4

**Test Result(s)**

Tested Item(s)	Content
Lead(Pb)	258 mg/kg
Cadmium(Cd)	N.D.
Mercury(Hg)	N.D.

Tested Item(s)	Conclusion
Hexavalent Chromium(Cr(VI))	Negative

**Tested Sample/Part Description** Silvery plating

**Note:** The washed plating had been dissolved totally tested for Lead, Cadmium, Mercury.  
-MDL = Method Detection Limit  
-N.D. = Not Detected (<MDL )  
-mg/kg = ppm = parts per million  
-Negative = Absence of Cr(VI) , the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.

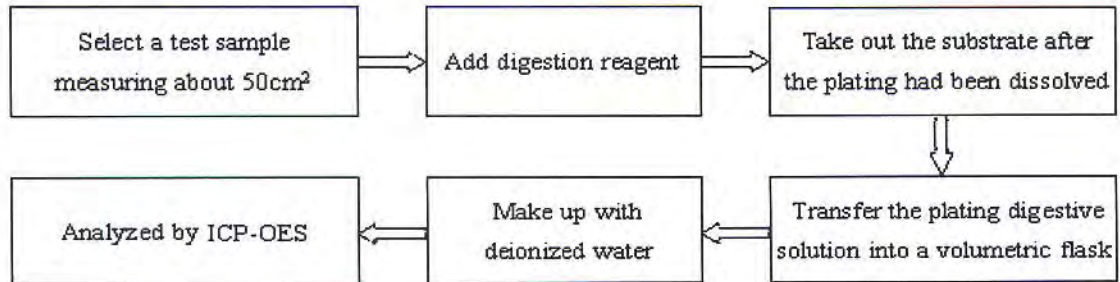
# Test Report

Report No. RLNBE000090170001

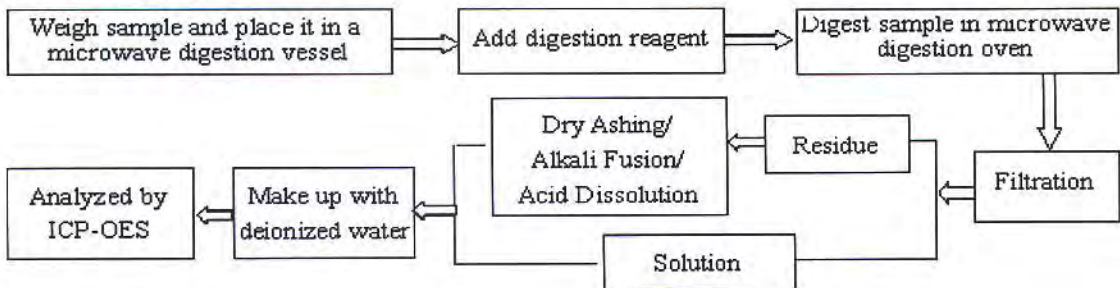
Page 3 of 4

## Test Process

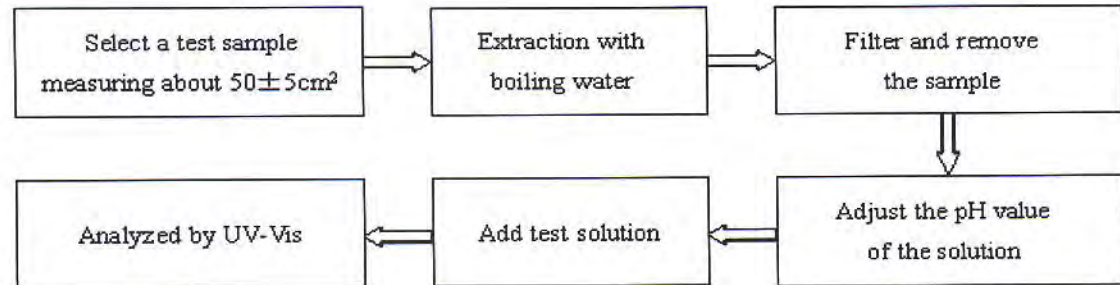
### 1. Lead(Pb), Cadmium(Cd)



### 2. Mercury(Hg)



### 3. Hexavalent Chromium(Cr(VI))



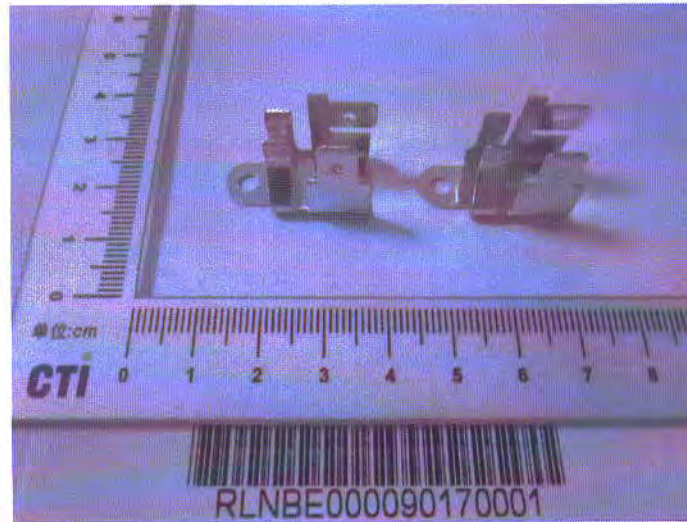


# Test Report

Report No. RLNBE000090170001

Page 4 of 4

## Photo(s) of the sample(s)



\*\*\* End of report \*\*\*

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# Test Report

Report No. RLNBE000111880001

Page 1 of 4

**Applicant** WENZHOU JANDA ELECTRONIC CO.,LTD  
**Address** NO2,WANGLIN INDUSTRY ZONE,BEIBAIXIANG TOWN,YUEQING CITY.  
ZHEJIANG PROVINCE,CHINA.325603

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

Sample Name reinforcing clip  
Sample Received Date Nov. 21, 2012  
Testing Period Nov. 21, 2012 to Nov. 23, 2012

**Test Requested** As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)) in the submitted sample(s).

**Test Method**

Test Item(s)	Test Method	Measured Equipment(s)	MDL
Lead(Pb)	IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Cadmium(Cd)	IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Mercury(Hg)	IEC 62321:2008 Ed.1 Sec.7	ICP-OES	2 mg/kg
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis	/

**Test Result(s)** Please refer to the following page(s).

**Conclusion:**

Tested Sample	According to directive	Result
Submitted Sample	2011/65/EU*	Pass

\*=July 1, 2011, the EU Official Journal (OJ) released the directive 2011/65/EU which as a new version of RoHS Directive (2002/95/EC). The revised directive has entered into force on the twentieth day after its publication in the OJ.

Tested by Sha Chen Reviewed by Wei Miao  
Approved by Chen Qian Date Nov. 23, 2012  
Chen Qian  
Approved Signatory

No. 13431153

Centre Testing International(Ningbo)Co.,ltd. 7-8/F.,Building A,No.750.Chuangyuan Road,Gaoxin District,Ningbo,Zhengjiang,China

# Test Report

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## Test Result(s)

Tested Item	Result	Directive Limit
Lead (Pb)	N.D.	1000 mg/kg
Cadmium (Cd)	N.D.	100 mg/kg
Mercury (Hg)	N.D.	1000 mg/kg
Hexavalent Chromium (Cr(VI))	Negative	1000 mg/kg

Tested Sample/Part Description      Black metal

**Note:**      **The sample had been dissolved totally tested for Lead, Cadmium, Mercury.**  
-MDL = Method Detection Limit  
-N.D. = Not Detected (<MDL)  
-mg/kg = ppm = parts per million  
-Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.



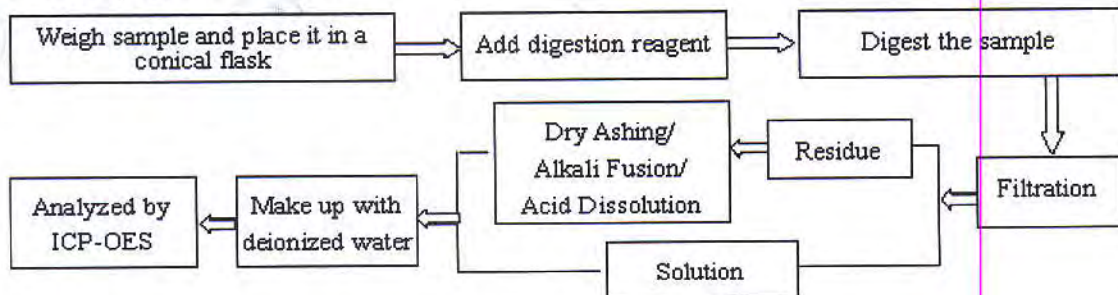
# Test Report

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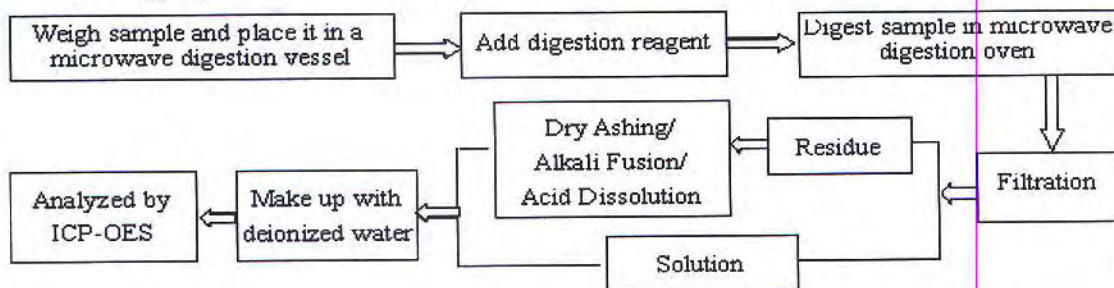
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## Test Process

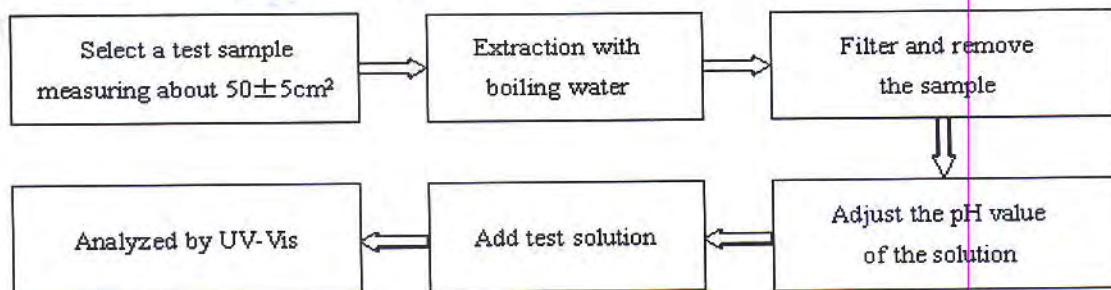
### 1. Lead(Pb), Cadmium(Cd)



### 2. Mercury(Hg)



### 3. Hexavalent Chromium(Cr(VI))

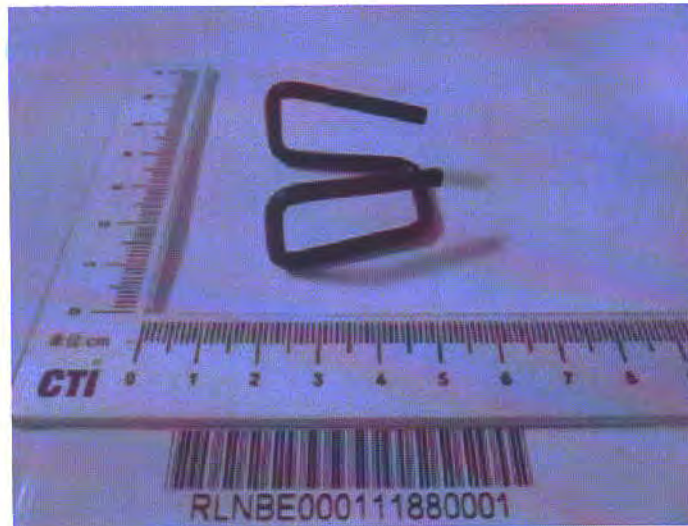


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## Photo(s) of the sample(s)



\*\*\* End of report \*\*\*

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