ICP Test Report Certification Packet

Company name: Littelfuse, Inc.

Product Series: Power Safe 'Dead Front' Fuse Holder

Product #: LPSMxxx, LPSCxxx, LPSMxxxID, LPSCxxxID

Issue Date: July 2, 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 Power Safe Dead Front Fuse Holder series products manufactured by Littelfuse, Inc. RoHS-Compliant

＜ Raw Materials Used

Please see Table 1

(2) The ICP data on all measurable substances

Please see appropriate pages as identifed in Table 1

Remarks : .

Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material Part Number	Raw Material Description	Page(s)
1	N/A	DIN Adapter	3-12
2	N/A	Pressure Plate	3-12
3	N/A	Box Lug	3-12
4	N/A	Screw	3-12
5	N/A	Reinforcing Clip	3-12
6	N/A	Clip	3-12
7	N/A	Holder Main Side	3-12
8	N/A	Door	3-12
9	N/A	Solder Terminal	3-12
10	N/A	Spring	3-12
11	N/A	Resistor	3-12
12	N/A	Neon Lamps	3-12
13	N/A	Indicator Carrier	3-12
14	N/A	Solder Wire	3-12
15	N/A	Lens	3-12
15	N/A	Carrier Top	3-12
17	N/A	Holder cap	3-12
18	N/A	Connector Pincer	3-12
19	N/A	Handle Pin	3-12
20	N/A	Ink	3-12
21	N/A	DIN Adapter (including RoHS 2 & halogens)	13-21
22	N/A	Housing,Cover,Indicator Carrier,Carrier Top,Door (including RoHS 2 & halogens)	22-30
23	N/A	Colorant (including RoHS 2 & halogens)	31-39
24	N/A	Connector Pincer (including RoHS 2 & halogens)	40-48

CTI 华测检测
CENTRE TESTING INTERNATIONAL

Integration Report

Report No.:RSNB1109081343104001

Client :Zhejiang Mingrong Electrical Protection Co.,Ltd
Address :Wei 11 Road 261, Ecnomic Develping zone, Yueqing Zhejiang China

Integrated Samples Description:

Sample Name	:Fuse holder
Sample Model	:RT18M-32(X)、RT18M-32(X)-2P、RT18M-32(X)-3P RT18T-32(X)、RT18T-32(X)-2P、RT18T-32(X)-3P
Sample Received Date	:Sep. 08, 2011
Completed Date	:Sep. 08, 2011 to Sep. 21, 2011
Requirement	:According to the client request, to combine the components test reports, the client should be responsible for the authenticity and validity of reports.

Conclusion :**Pass**

According to the reports submitted by clients, the contents of hazardous substances in sample is below the required limit of EU RoHS Directive 2002/95/EC and its amending Directive 2005/618/EC.

Tested by _____

Approved by _____
Technical Manager

Inspected by _____

Date Sep. 21, 2011

No. 48692283

CONTENTS

Except marked as "CTI", the following test reports are submitted by other third-party test organizations:

No.		Report No.	Report Completed Date	Report Applicant
CTI				
1		RLNBD000046080001C	2011.09.14	Zhejiang Mingrong Electrical Protection Co.,Ltd
2		RLNBD000046080006C	2011.09.14	Zhejiang Mingrong Electrical Protection Co.,Ltd
3		RSNB1108301343104001C	2011.09.02	Yueqing Oriental Electroplating Co., Ltd
4		RLNBD000043280001C	2011.08.12	Wenzhou Changshun Standard Parts Co., Ltd
5		RLNBD000042850001C	2011.08.09	Yueqing Weiqiang Spring Co., Ltd
6		RLSHD000692220001C	2011.08.03	Yueqing Jinhui Surface Treatment Factory
9.1		RLNBD000046080008C	2011.09.14	Zhejiang Mingrong Electrical Protection Co.,Ltd
9.3	9.3.1	RLNBD000046080005C	2011.09.14	Zhejiang Mingrong Electrical Protection Co.,Ltd
	9.3.2			
9.4	9.4.1	RLNBD000046390001	2011.09.15	Shanghai Chuangde Optoelectronic Technology Co., Ltd.
	9.4.2	RLNBD000046390002		
10		RLNBD000046080003C	2011.09.14	Zhejiang Mingrong Electrical Protection Co.,Ltd
13		RLNBD000046080002C	2011.09.14	Zhejiang Mingrong Electrical Protection Co.,Ltd
15		RLNBD000046080004C	2011.09.14	Zhejiang Mingrong Electrical Protection Co.,Ltd

No.	Report No.	Report Completed Date	Report Applicant
Other third-party organizations			
7	SHAEC1105813501	2011.04.29	DSM Engineering Plastics Jiangsu Co., Ltd
8	SHAEC1105813501	2011.04.29	DSM Engineering Plastics Jiangsu Co., Ltd
9.2	GZ1101009298/CHEM	2011.01.26	Foshan City Shunde District Chencun Town Delifeng Precision Strip Steel Factory
9.5	SHAEC1105813501	2011.04.29	DSM Engineering Plastics Jiangsu Co., Ltd
9.6	SHAEC1101984403	2011.02.28	Yueqing Yunxi Solder Co.,Ltd
11	SHAEC1105813501	2011.04.29	DSM Engineering Plastics Jiangsu Co., Ltd
12	SHAEC1105813501	2011.04.29	DSM Engineering Plastics Jiangsu Co., Ltd
14	SHAEC1102754806	2011.03.16	Yueqing Wantai Copper Co., Ltd

According to the reports and samples submitted by clients, to summarize the components datum as follows:

No.		Test Sample Name	Integration Sample Name	Material	Sample Description
1		Polyformaldehyde resin (red)	Din Adapter	Polyformaldehyde resin	Red-dye-added polyformaldehyde resin
2		Nickel plating steel Q235-A	Pressure plate	Steel Q235-A	Nickel plating steel Q235-A
3		Terminals	Box Lug	/	Zinc plating steel Q195-L in blue white
4		Screw	Screw	/	Zinc plating 45# steel in blue white
5		RT18-32 Reinforcing Clip	Reinforcing Clip	/	Zinc plating 65 manganese steel in blue white
6		RT18M-32 Clip /RT18-QC Clip	Clip	Silver plating copper plate	Silvery white metal
7		Akulon K-FKGS6/B KN.01.74(grey)	Holder Main Side	Akulon K-FKGS6/B KN.01.74(grey)	Grey plastic pellet
8		Akulon K-FKGS6/B KN.01.74(grey)	Door	Akulon K-FKGS6/B KN.01.74(grey)	Grey plastic pellet
9.1		Silver plating Brass plate	Solder Terminal	Brass	Silver plating Brass plate
9.2		301 Stainless steel sheet	Indicator Top Spring & Indicator Bottom Spring	301 Stainless steel sheet	Silver metal
9.3	9.3.1	Resistor	Resistor	/	Resistance overall test
	9.3.2				Pin
9.4	9.4.1	Glow lamps	Neon	/	Pin
	9.4.2				Subject
9.5		Akulon K-FKGS6/B KN.01.74(grey)	Indicator Carrier	Akulon K-FKGS6/B KN.01.74(grey)	Grey plastic pellet
9.6		Lead-free solder wire	Solder wire	Stannum、Copper	Silvery solder

No.	Test Sample Name	Integration Sample Name	Material	Sample Description
10	Methacrylate-butadiene-styrene resin(Transparent Red)	ID Lens	Methacrylate-butadiene-styrene resin	Transparent Red-dye-added MBS resin
11	Akulon K-FKGS6/B KN.01.74(grey)	Carrier Top	Akulon K-FKGS6/B KN.01.74(grey)	Grey plastic pellet
12	Akulon K-FKGS6/B KN.01.74(grey)	Holder Cap Side	Akulon K-FKGS6/B KN.01.74(grey)	Grey plastic pellet
13	Polycarbonate resin((Fire Red)	Connector Pincer	Polycarbonate resin	Fire Red-dye-added polycarbonate resin
14	H62 brass band (plate)	Handle Pin	H62 brass band (plate)	Copper metal
15	Printing Ink	Printing Ink	Printing Ink	Printing Ink(green)

Test Result(s):

No.	Sample Description	Test Item (Unit: mg/kg)						Conclusion
		Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	
1	Red-dye-added polyformaldehyde resin	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
2	Nickel plating steel Q235-A	N.D.	N.D.	N.D.	Negative	/	/	Pass
3	Zinc plating steel Q195-L in blue white	N.D.	N.D.	N.D.	Negative	/	/	Pass
4	Zinc plating 45# steel in blue white	N.D.	N.D.	N.D.	Negative	/	/	Pass
5	Zinc plating 65 manganese steel in blue white	N.D.	N.D.	N.D.	Negative	/	/	Pass
6	Silvery white metal	25	N.D.	N.D.	Negative	/	/	Pass
7	Grey plastic pellet	10	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
8	Grey plastic pellet	10	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
9.1	Silver plating Brass plate	271	N.D.	N.D.	Negative	/	/	Pass

No.		Sample Description	Test Item (Unit: mg/kg)						Conclusion
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	
9.2		Silver metal	N.D.	N.D.	N.D.	Negative	N.D.	N.D.	Pass
9.3	9.3.1	Resistance overall test	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
	9.3.2	Pin	N.D.	N.D.	N.D.	Negative	/	/	Pass
9.4	9.4.1	Pin	N.D.	N.D.	N.D.	Negative	/	/	Pass
	9.4.2	Subject	125	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
9.5		Grey plastic pellet	10	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
9.6		Silvery solder	23	N.D.	N.D.	Negative	N.D.	N.D.	Pass
10		Transparent Red-dye-added MBS resin	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
11		Grey plastic pellet	10	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
12		Grey plastic pellet	10	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
13		Fire Red-dye-added polycarbonate resin	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
14		Copper metal	246	N.D.	N.D.	Negative	/	/	Pass
15		Printing Ink(green)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	Pass
limit		**Pb ≤1000 mg/kg Cd≤100 mg/kg Hg≤1000 mg/kg Cr(VI)≤1000 mg/kg PBBs≤1000 mg/kg PBDEs≤1000 mg/kg**							

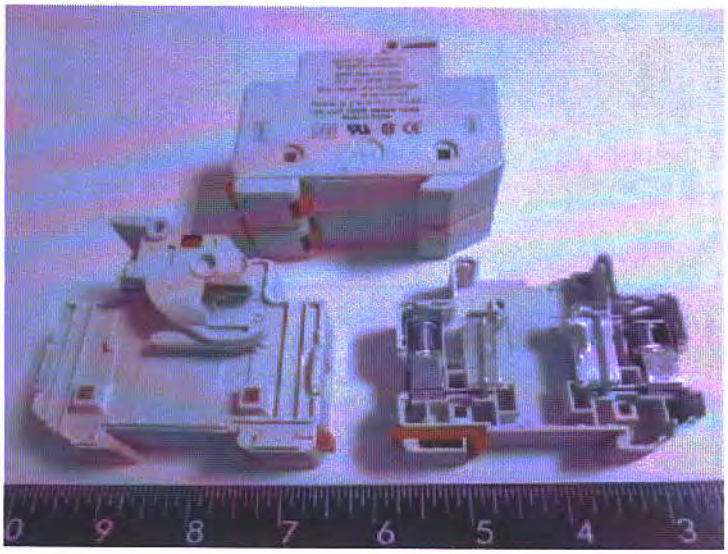
Note : -MDL = Method Detection Limit -N.D. = Not Detected (<MDL)

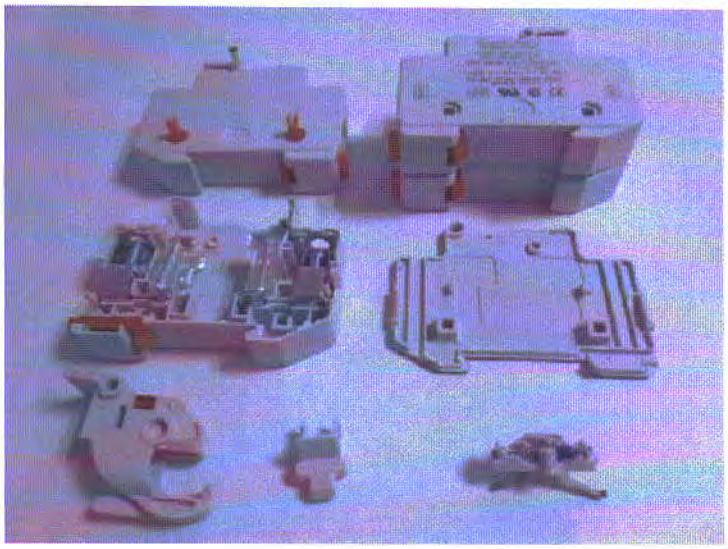
-mg/kg = ppm = parts per million

-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^2 sample surface area used

1. The integration report should not be equal to the testing report
2. Datum from integration report are completely provided by the applicant, Applicant is responsible for the legal obligation caused by the integration report.
3. If there is any discrepancy, CTI has the final explanation right.

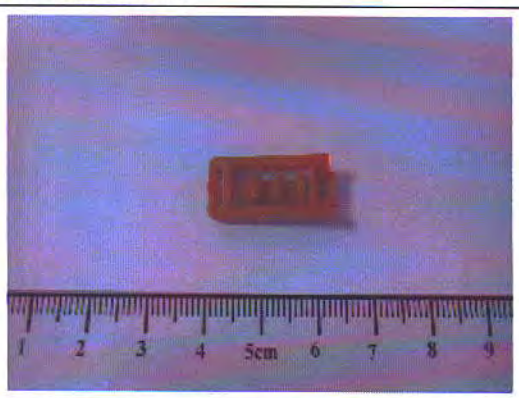
Photo(s) of the sample(s)





Test components' photos

CTi Test Photos:



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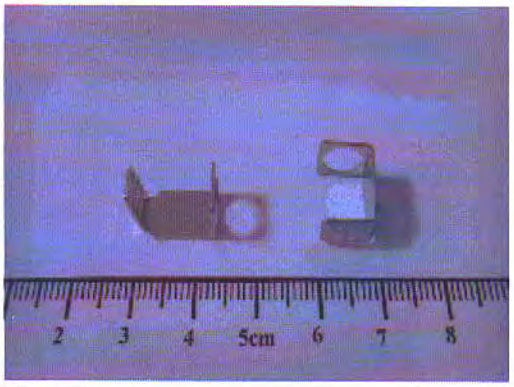

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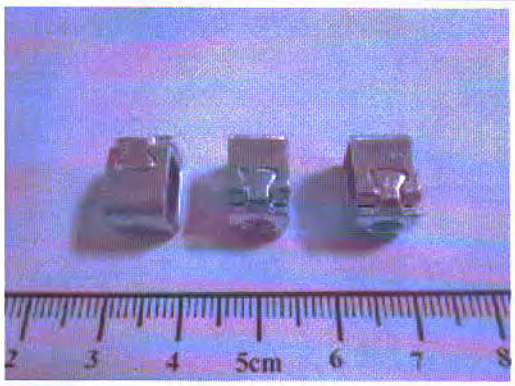

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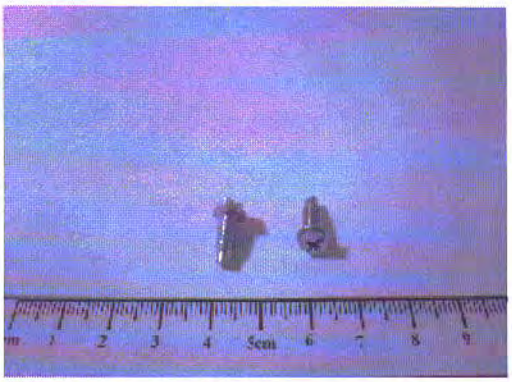

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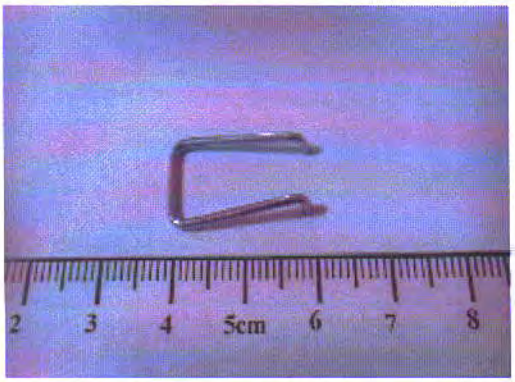

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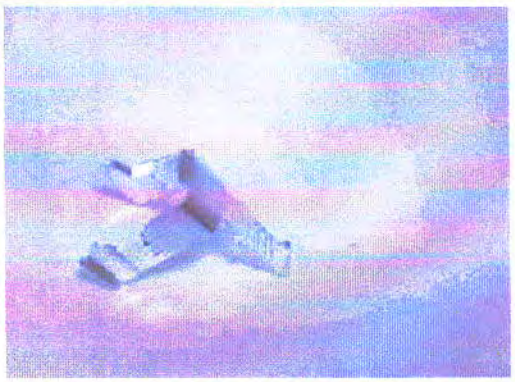

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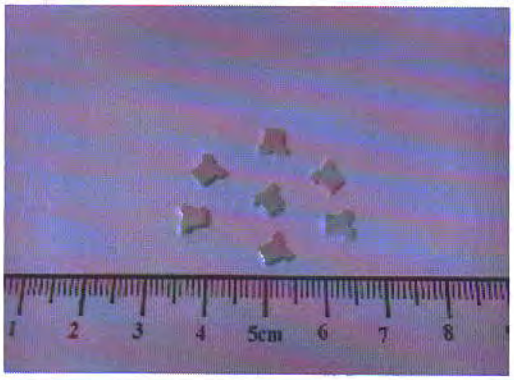

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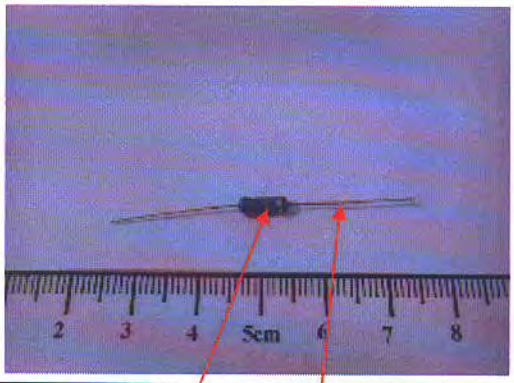
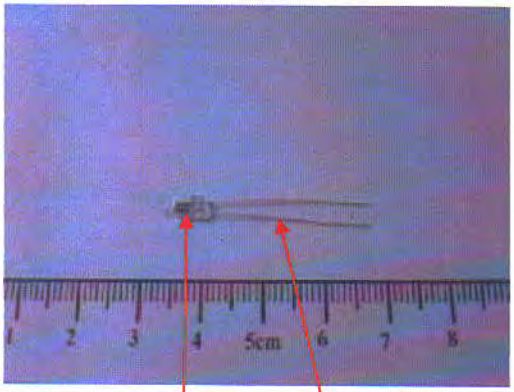


9.3.1 9.3.2



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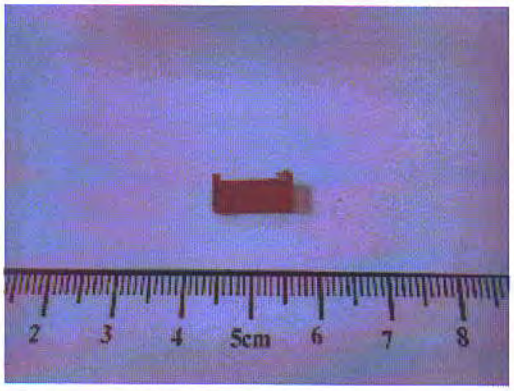

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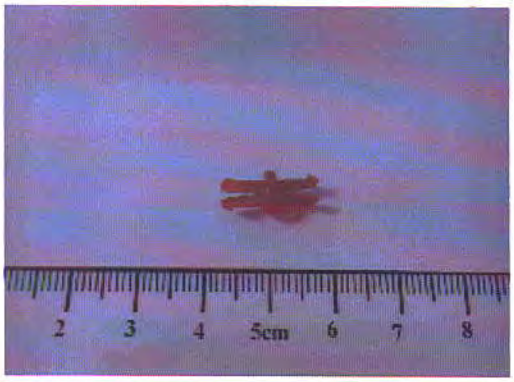

13

15

Test Report Number : TWNC00260716

Applicant: Littelfuse Philippines Inc. Date : Jun 12, 2012
LIMA Technology Center, Lipa City,
Malvar, Batangas

Sample Description:
One (1) group of submitted samples said to be :
Part Description : DIN Adapter
Part Number : POMF 30-03
Date Sample Received : Jun 04, 2012
Date Test Started : Jun 06, 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

Intertek Testing Services Taiwan Ltd.
8F., No. 423, Ruiguang Rd., Neihu District, Taipei 114, Taiwan, R.O.C.
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Number : TWNC00260716

Test Conducted

(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	White Plastic Pellets
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr^{6+}) content	ND
Polybrominated Biphenyls (PBBs)	
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
Polybrominated Diphenyl Ethers (PBDEs)	
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
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

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Number : TWNC00260716

Test Conducted

(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	White Plastic Pellets
Phthalates	
Di(2-ethylhexyl) Phthalate (DEHP)	ND
Dibutyl Phthalate (DBP)	ND
Benzyl Butyl Phthalate (BBP)	ND
Others	
Hexabromocyclododecane (HBCDD)	ND

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

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

Date Sample Received : Jun 04, 2012
Test Period : Jun 06, 2012 To Jun 11, 2012

(Ⅱ) RoHS Requirement:

Restricted Substances	Limits
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr^{6+}) 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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Number : TWNC00260716

Test Conducted

(Ⅲ) Test Method:

Test Item	Test Method	Reporting Limit
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^{6+}) 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

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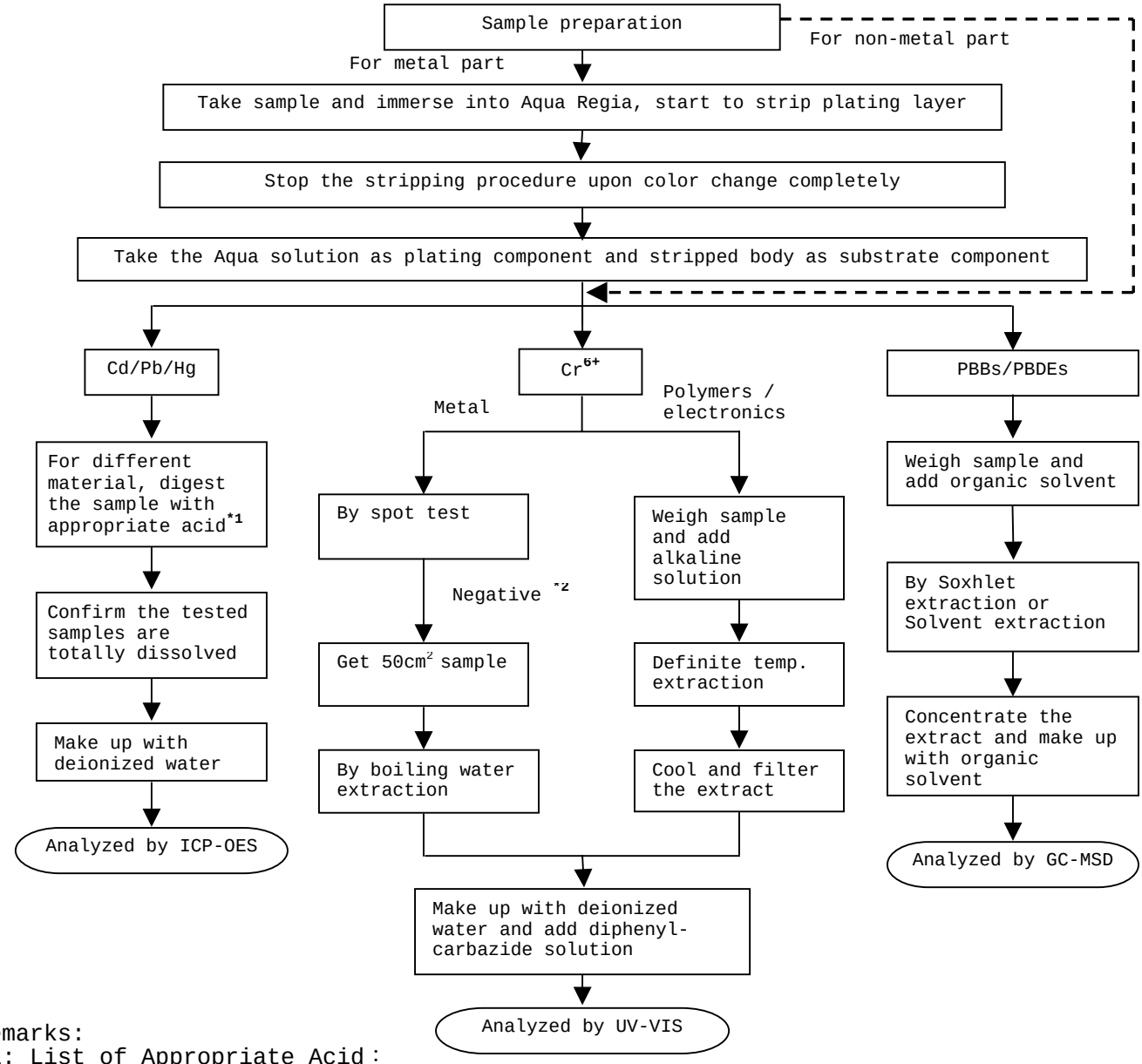
Number : TWNC00260716

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_3, HCl, HF, H_2O_2, H_3BO_3
Metals	HNO_3, HCl, HF
Electronics	HNO_3, HCl, H_2O_2, HBF_4

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

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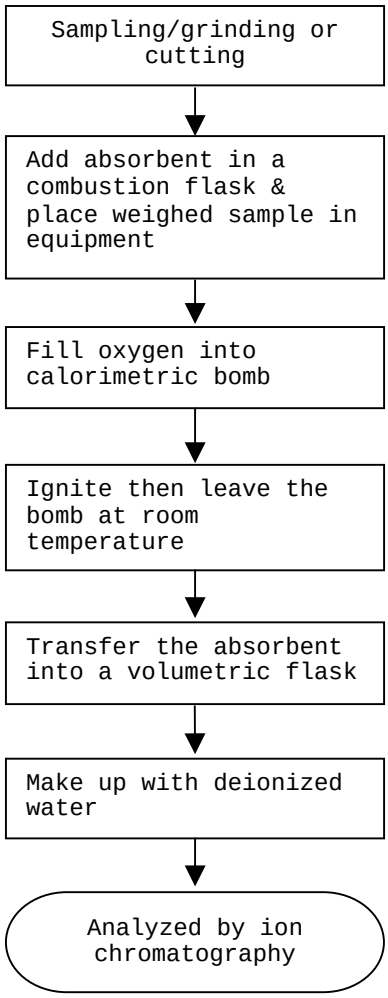
Test Conducted

(Ⅳ) Measurement Flowchart:

Test for Halogen Content
Reference Standard：EN 14582



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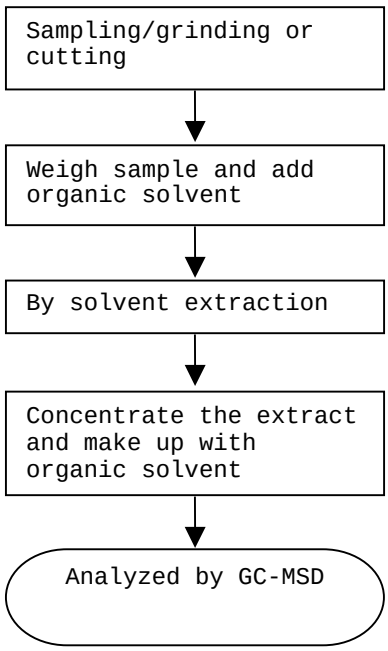
Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2400 · 6602-2401

Test Conducted

(Ⅳ) Measurement Flowchart:

Test For Phthalates Contents
Reference Method: EN 14372: 2004



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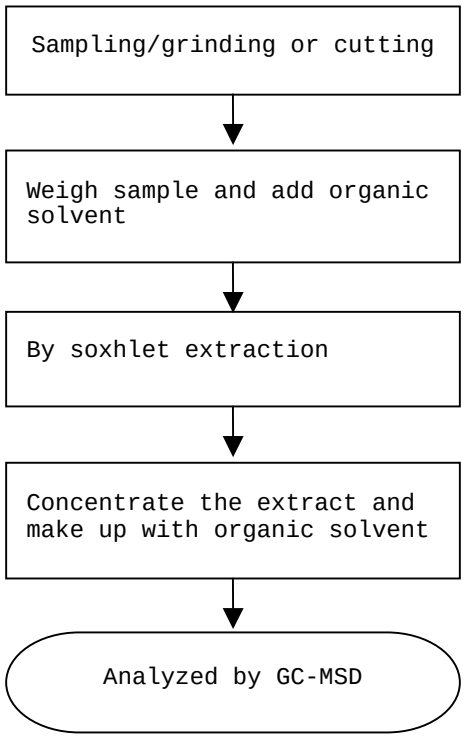
Test Conducted

(Ⅳ) Measurement Flowchart:

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



End of Report

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Number : TWNC00260716

Test Conducted

Photo

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Test Report Number : TWNC00260719

Applicant: Littelfuse Philippines Inc. Date : Jun 12, 2012
LIMA Technology Center, Lipa City,
Malvar, Batangas

Sample Description:
One (1) group of submitted samples said to be :
Part Description : Housing,Cover,Indicator Carrier,Carrier Top,Door
Part Number : DSM K-FKGSG
Date Sample Received : Jun 04, 2012
Date Test Started : Jun 06, 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

Intertek Testing Services Taiwan Ltd.
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Number : TWNC00260719

Test Conducted

(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	White Plastic Pellets
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	20
Mercury (Hg) content	ND
Chromium VI (Cr^{6+}) content	ND
Polybrominated Biphenyls (PBBs)	
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
Polybrominated Diphenyl Ethers (PBDEs)	
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
Halogen Content	
Fluorine (F)	864
Chlorine (Cl)	59
Bromine (Br)	41450
Iodine (I)	ND

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Number : TWNC00260719

Test Conducted

(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	White Plastic Pellets
Phthalates	
Di(2-ethylhexyl) Phthalate (DEHP)	ND
Dibutyl Phthalate (DBP)	ND
Benzyl Butyl Phthalate (BBP)	ND
Others	
Hexabromocyclododecane (HBCDD)	ND

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

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

Date Sample Received : Jun 04, 2012
Test Period : Jun 06, 2012 To Jun 11, 2012

(Ⅱ) RoHS Requirement:

Restricted Substances	Limits
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr^{6+}) 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:

Test Item	Test Method	Reporting Limit
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^{6+}) 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

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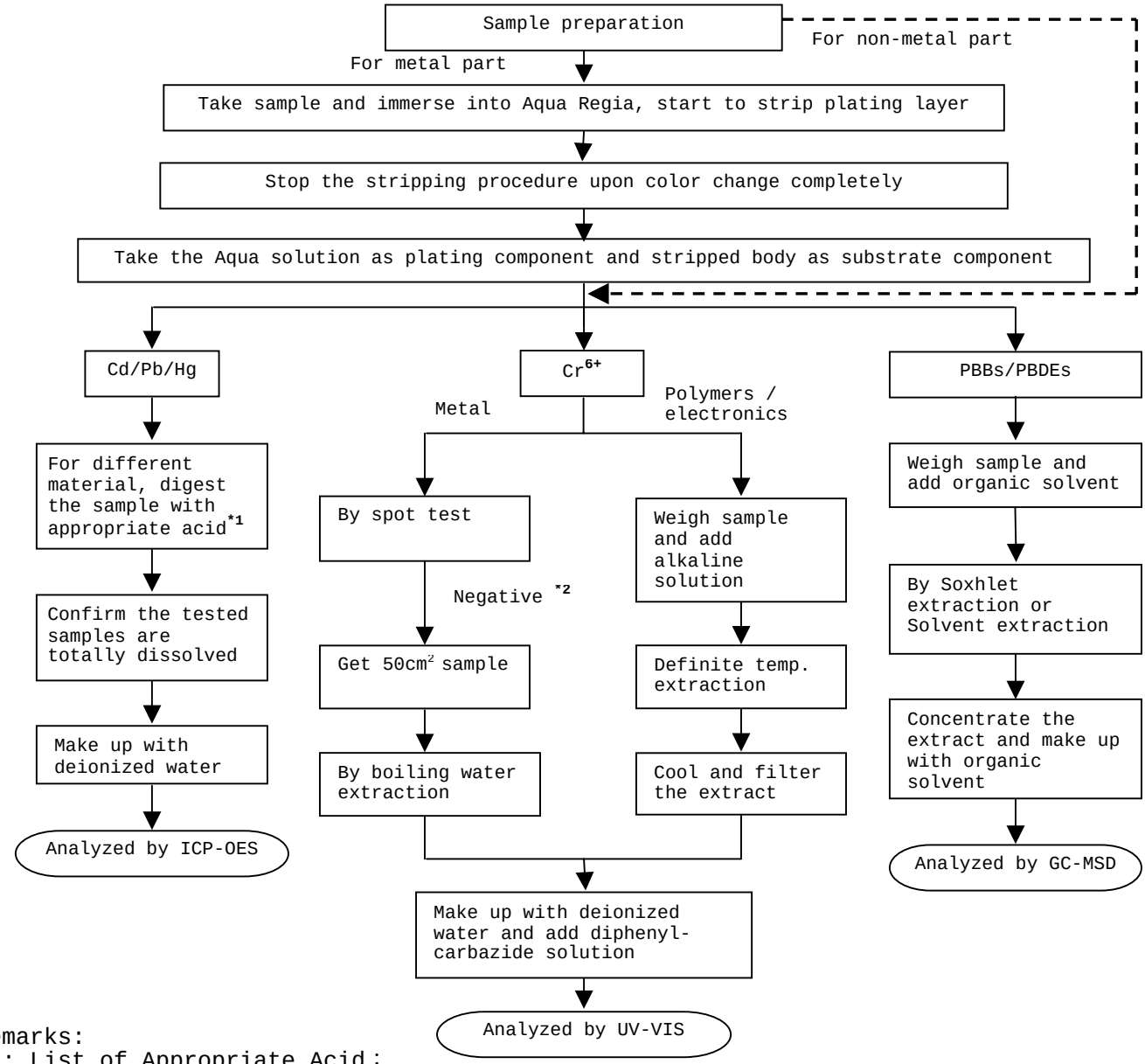
Number : TWNC00260719

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	$HNO_3, HCl, HF, H_2O_2, H_3BO_3$
Metals	HNO_3, HCl, HF
Electronics	$HNO_3, HCl, H_2O_2, HBF_4$

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

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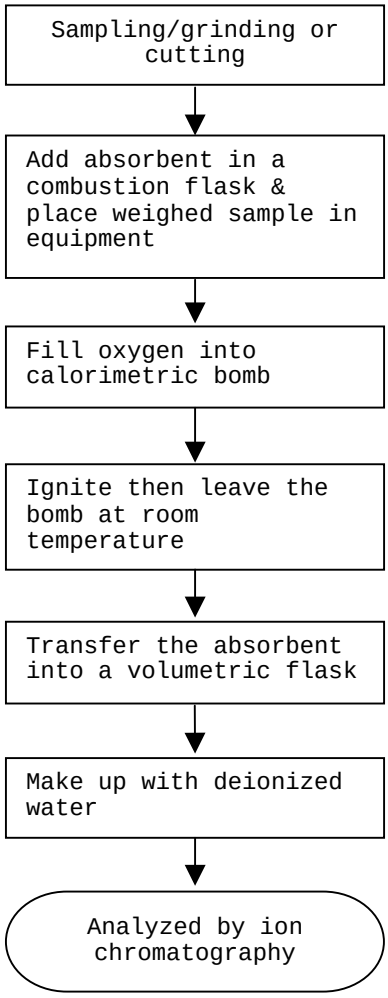
Test Conducted

(Ⅳ) Measurement Flowchart:

Test for Halogen Content
Reference Standard：EN 14582



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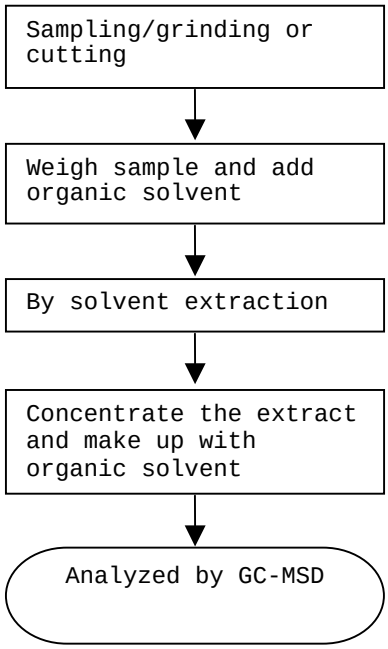
Test Conducted

(Ⅳ) Measurement Flowchart:

Test For Phthalates Contents
Reference Method: EN 14372: 2004



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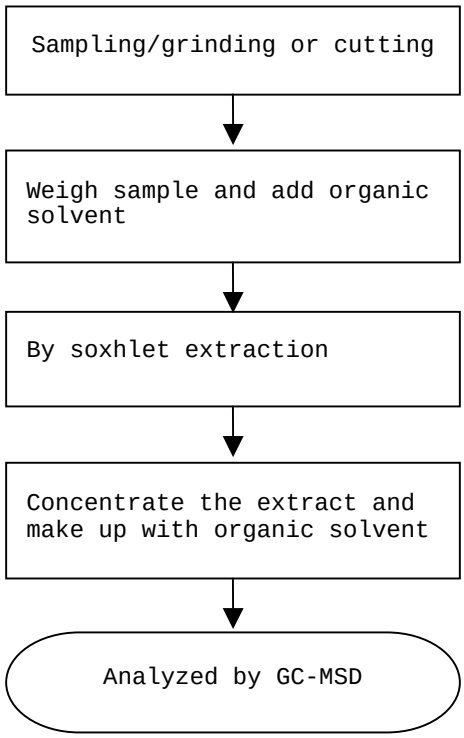
Test Conducted

(Ⅳ) Measurement Flowchart:

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



End of Report

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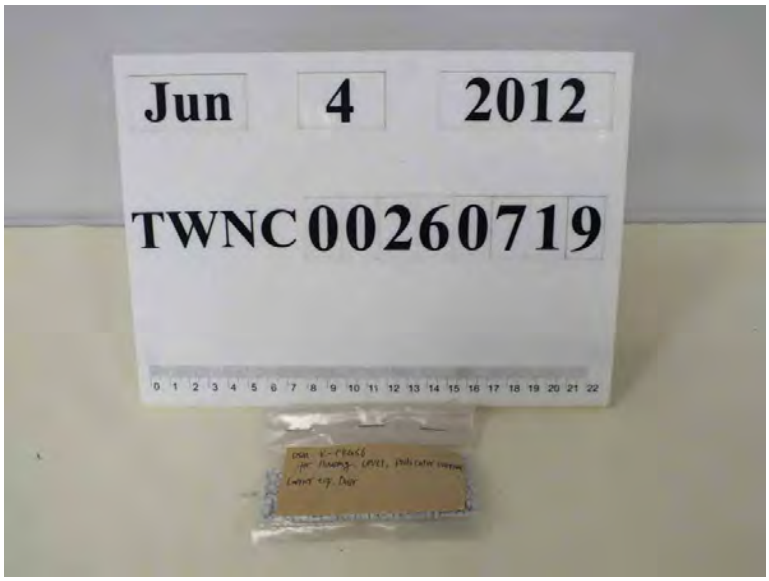
Number : TWNC00260719

Test Conducted

Photo



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Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2400 · 6602-2401

Test Report Number : TWNC00260717

Applicant: Littelfuse Philippines Inc. Date : Jun 12, 2012
LIMA Technology Center, Lipa City,
Malvar, Batangas

Sample Description:
One (1) group of submitted samples said to be :
Part Description : Colorant
Date Sample Received : Jun 04, 2012
Date Test Started : Jun 06, 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

Intertek Testing Services Taiwan Ltd.
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Number : TWNC00260717

Test Conducted

(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	Red Plastic Pellets
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr^{6+}) content	ND
Polybrominated Biphenyls (PBBs)	
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
Polybrominated Diphenyl Ethers (PBDEs)	
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
Halogen Content	
Fluorine (F)	59
Chlorine (Cl)	3480
Bromine (Br)	249
Iodine (I)	ND

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Number : TWNC00260717

Test Conducted

(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	Red Plastic Pellets
Phthalates	
Di(2-ethylhexyl) Phthalate (DEHP)	ND
Dibutyl Phthalate (DBP)	ND
Benzyl Butyl Phthalate (BBP)	ND
Others	
Hexabromocyclododecane (HBCDD)	ND

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

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

Date Sample Received : Jun 04, 2012
Test Period : Jun 06, 2012 To Jun 11, 2012

(Ⅱ) RoHS Requirement:

Restricted Substances	Limits
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr^{6+}) 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:

Test Item	Test Method	Reporting Limit
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^{6+}) 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

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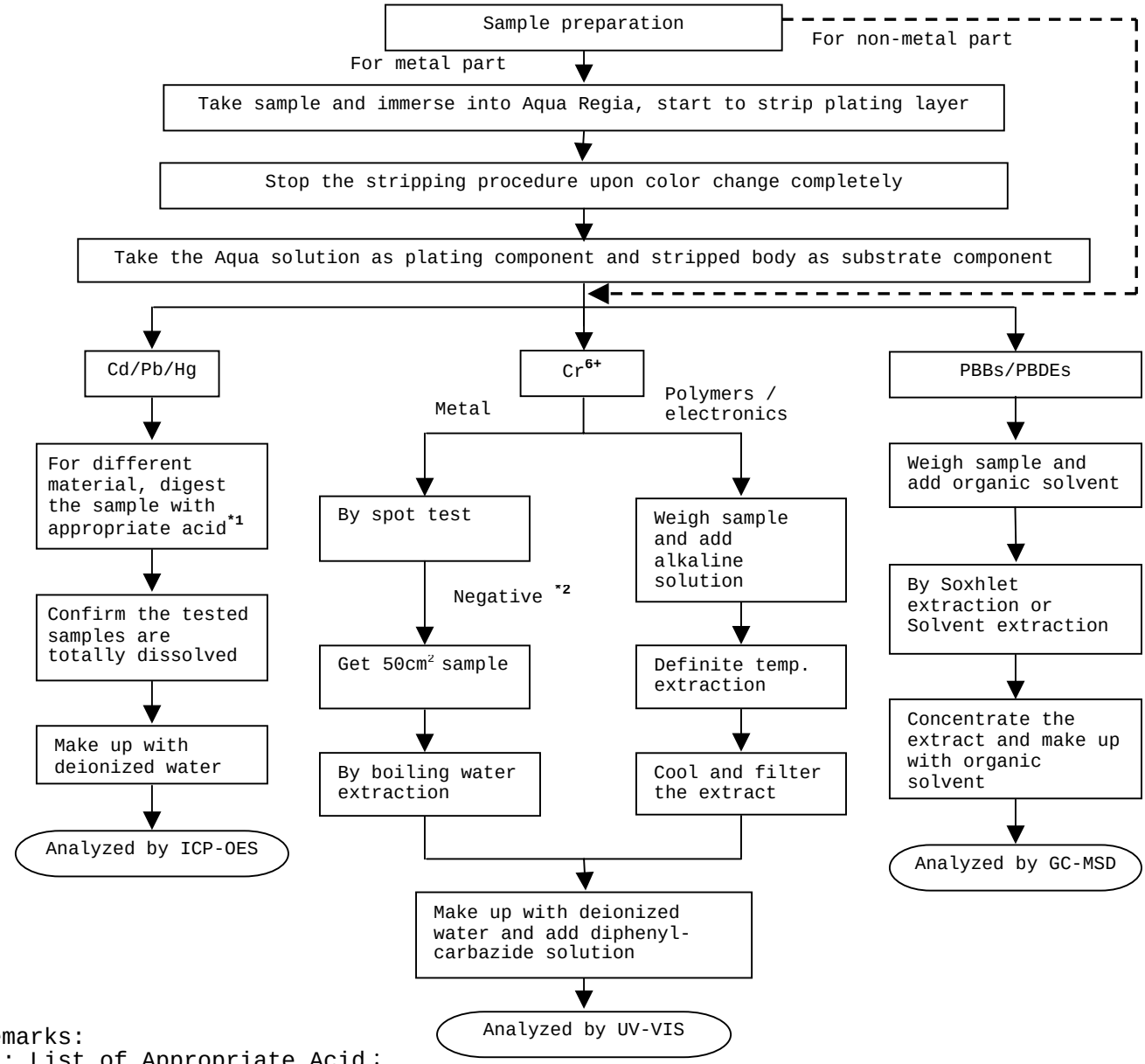
Number : TWNC00260717

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	$HNO_3, HCl, HF, H_2O_2, H_3BO_3$
Metals	HNO_3, HCl, HF
Electronics	$HNO_3, HCl, H_2O_2, HBF_4$

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

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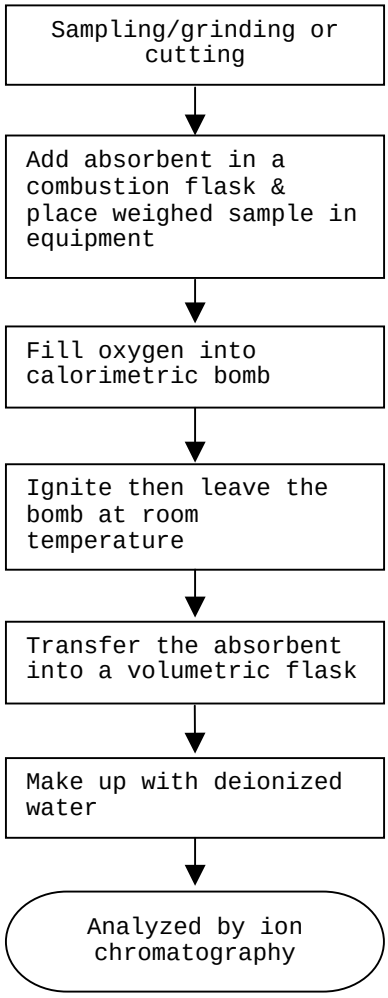
Test Conducted

(Ⅳ) Measurement Flowchart:

Test for Halogen Content
Reference Standard：EN 14582



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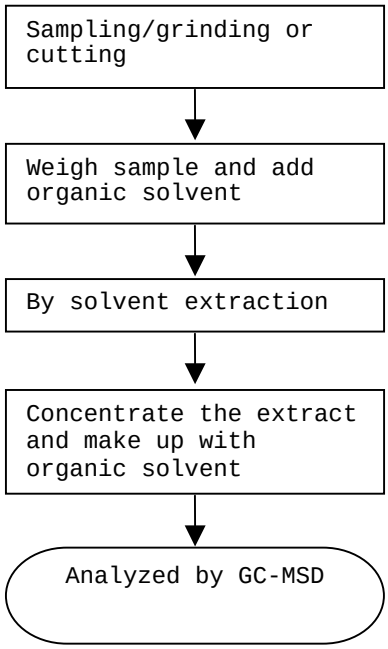
Test Conducted

(Ⅳ) Measurement Flowchart:

Test For Phthalates Contents
Reference Method: EN 14372: 2004



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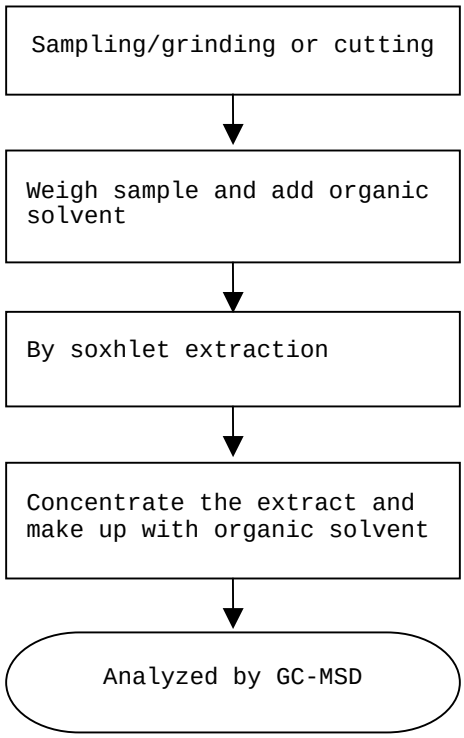
Number : TWNC00260717

Test Conducted

(Ⅳ) Measurement Flowchart:

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



End of Report

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Number : TWNC00260717

Test Conducted

Photo

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Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2400 · 6602-2401

Test Report Number : TWNC00260718

Applicant: Littelfuse Philippines Inc. Date : Jun 12, 2012
LIMA Technology Center, Lipa City,
Malvar, Batangas

Sample Description:
One (1) group of submitted samples said to be :
Part Description : Connector Pincer
Date Sample Received : Jun 04, 2012
Date Test Started : Jun 06, 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

Intertek Testing Services Taiwan Ltd.
8F., No. 423, Ruiguang Rd., Neihu District, Taipei 114, Taiwan, R.O.C.
全國公證檢驗股份有限公司
114 台北市內湖區瑞光路 423 號 8 樓
Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2400 · 6602-2401

Number : TWNC00260718

Test Conducted

(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	Red Plastic Pellets
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	20
Mercury (Hg) content	ND
Chromium VI (Cr^{6+}) content	ND
Polybrominated Biphenyls (PBBs)	
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
Polybrominated Diphenyl Ethers (PBDEs)	
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
Halogen Content	
Fluorine (F)	457
Chlorine (Cl)	627
Bromine (Br)	9902
Iodine (I)	ND

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(Ⅰ) Test Result Summary :

Test Item	Result (ppm)
	Red Plastic Pellets
Phthalates	
Di(2-ethylhexyl) Phthalate (DEHP)	ND
Dibutyl Phthalate (DBP)	ND
Benzyl Butyl Phthalate (BBP)	ND
Others	
Hexabromocyclododecane (HBCDD)	ND

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

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

Date Sample Received : Jun 04, 2012
Test Period : Jun 06, 2012 To Jun 11, 2012

(Ⅱ) RoHS Requirement:

Restricted Substances	Limits
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr^{6+}) 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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(Ⅲ) Test Method:

Test Item	Test Method	Reporting Limit
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^{6+}) 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

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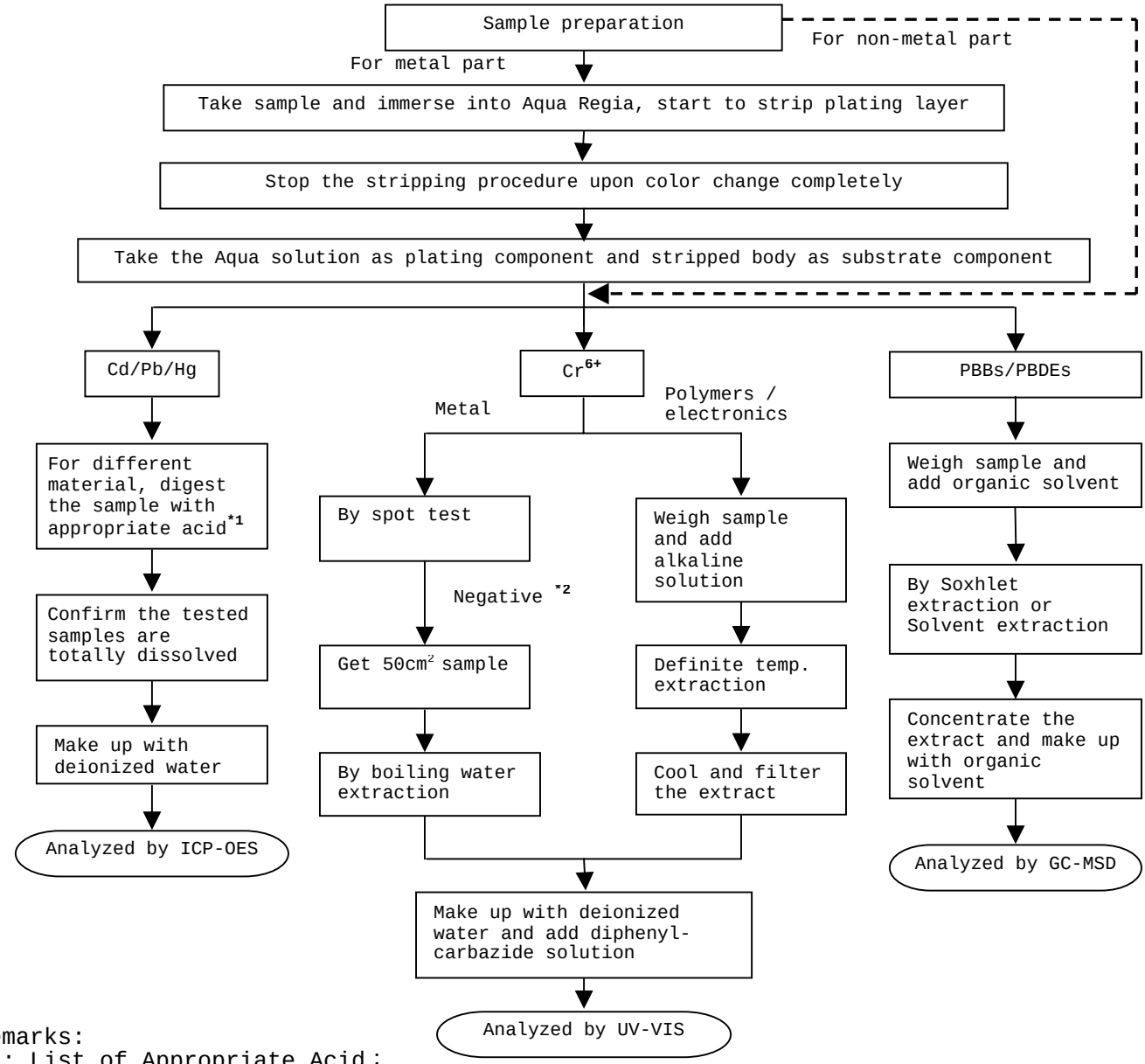
Test Conducted

(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	$HNO_3, HCl, HF, H_2O_2, H_3BO_3$
Metals	HNO_3, HCl, HF
Electronics	$HNO_3, HCl, H_2O_2, HBF_4$

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

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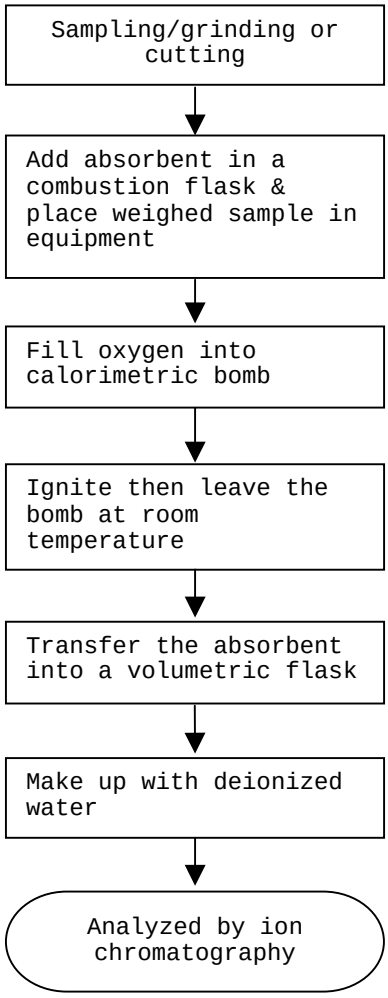
(Ⅳ) Measurement Flowchart:

Test for Halogen Content
Reference Standard：EN 14582



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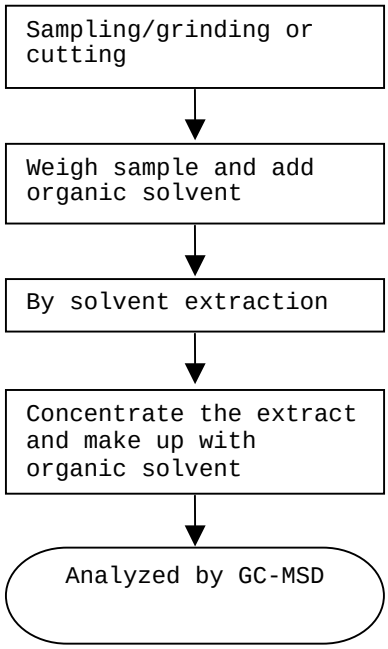
(Ⅳ) Measurement Flowchart:

Test For Phthalates Contents
Reference Method: EN 14372: 2004



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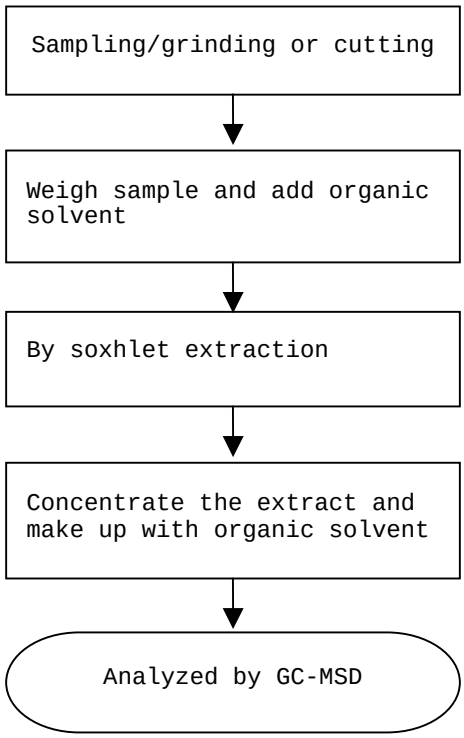
(Ⅳ) Measurement Flowchart:

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



End of Report

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