




ICP Test Report Certification Packet

Company name: Littelfuse, Inc.
Product Series: CCMR Fuse with Cap and Lead
Product #: CCMR Fuse (25 and 30 amps)
Issue Date: January 28, 2013

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 CCMR 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 :
Only the 25 and 30 amps are RoHS Compliant. Lead contained in rejection cap is under RoHS exemption 6c as an alloying element not more than 4% lead by weight.



Table 1: List of Raw Materials covered by this report

| Total Parts | Raw Material Part Number | Raw Material Description | Page(s) |
|--------------------|---------------------------------|-------------------------------------------|----------------|
| 1 | 923-080 | Cap | 3-9 |
| 2 | 685xxx | Element-Pure Ag (685406) | 10-15 |
| 3 | 692532 | Solder | 16-21 |
| 4 | 090169 | Filler | 22-29 |
| 5 | 039145 | Body Melamine (used for 909-171) | 30-36 |
| 6 | 692264 | Pure Tin (same as 692276 used in 927-307) | 37-42 |
| 7 | 087244 | Adhesive (used in 927-307) | 43-52 |
| 8 | 923-088 | Rejection Fuse Cap | 53-57 |



Test Report

Number : TWNC00279924

Applicant: Littelfuse, S.A. de C.V.
Blvd. Fausto Z. Martinez #1800
Col. Magisterio Seccion 38 C.P.
26070 Piedra Negras, Coahuila,
Mexico

Date : Oct 12, 2012

Sample Description:

One (1) group of submitted samples said to be :
Part Description : CAP KLK FUSE
Part Number : 923-080
Date Sample Received : Oct 04, 2012
Date Test Started : Oct 05, 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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Number : TWNC00279924

Test Conducted

(I) Test Result Summary :

| <u>Test Item</u> | <u>Result (ppm)</u> | |
|-------------------------------------------------------------------------|----------------------------|----------------------------|
| | <u>(1)</u> | <u>(2)</u> |
| Heavy Metal | | |
| Cadmium (Cd) content | ND | ND |
| Lead (Pb) content | ND | ND |
| Mercury (Hg) content | ND | ND |
| Chromium VI (Cr ⁶⁺) content (mg/kg with 50cm ²) | 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 50cm² = milligram per kilogram with 50 square centimetre
 Negative = A negative test result indicated positive observation was not found at the time of Test.
 # = Due to the insufficient sample area, reduced total sample surface of 25 cm² was used and the dilution factor was adjusted accordingly.

Tested Components

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

Responsibility of Chemist : Irene Chiou / Kevin Liu

Date Sample Received : Oct 04, 2012
 Test Period : Oct 05, 2012 To Oct 11, 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 ⁶⁺) 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 ⁶⁺) 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 ² |

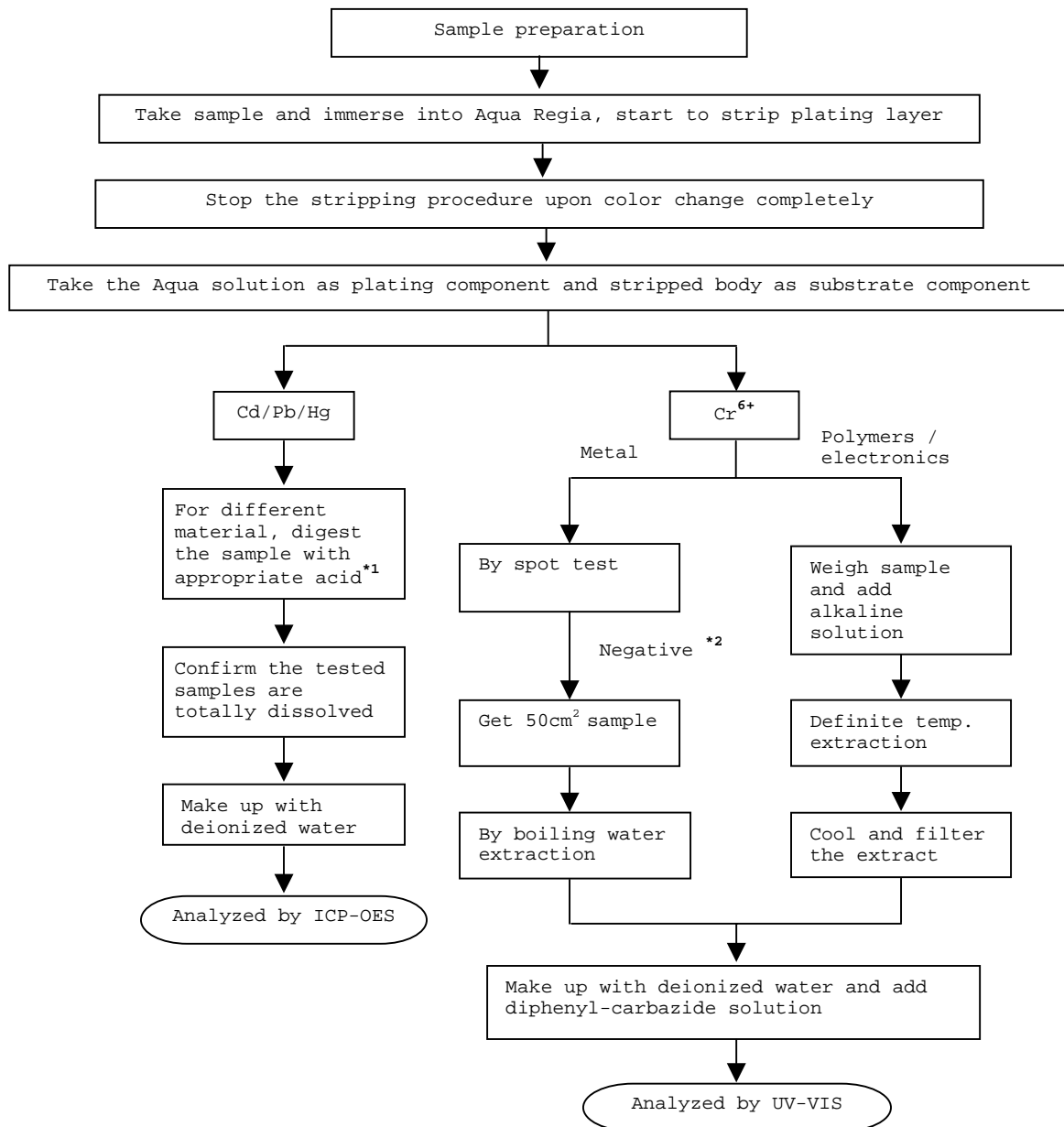
Remark: Reporting limit = Quantitation limit of analyte in sample



Test Conducted

(IV) Measurement Flowchart:

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





Number : TWNC00279924

Test Conducted



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Number : TWNC00279924

Test Conducted

Remarks:

*1: List of Appropriate Acid:

| Material | Acid Added for Digestion |
|-------------|--------------------------------------------------------------------------------------------|
| Polymers | HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃ |
| Metals | HNO ₃ , HCl, HF |
| Electronics | HNO ₃ , HCl, H ₂ O ₂ , HBF ₄ |

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

End of Report

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Test Conducted

Photo





Test Report

Number : TWNC00290370

Applicant: Littelfuse, S.A. de C.V.
Blvd. Fausto Z. Martinez #1800
Col. Magisterio Seccion 38 C.P.
26070 Piedra Negras, Coahuila,
Mexico

Date : Dec 18, 2012

Sample Description:

One (1) group of submitted samples said to be :
Part Description : Element, silver strip
Part Number : 685406
Date Sample Received : Dec 11, 2012
Date Test Started : Dec 12, 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> |
| Heavy Metal | |
| Cadmium (Cd) content | ND |
| Lead (Pb) content | ND |
| Mercury (Hg) content | ND |
| Chromium VI (Cr ⁶⁺) content (mg/kg with 50cm ²) | Negative (< 0.02) |

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg
ND = Not detected
< = Less than
mg/kg with 50cm² = 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

Date Sample Received : Dec 11, 2012

Test Period : Dec 12, 2012 To Dec 13, 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 ⁶⁺) Content | 0.1% (1000ppm) |

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



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 B, by boiling water extraction and determined by UV-Vis Spectrophotometer. | 0.02 mg/kg with 50cm ² |

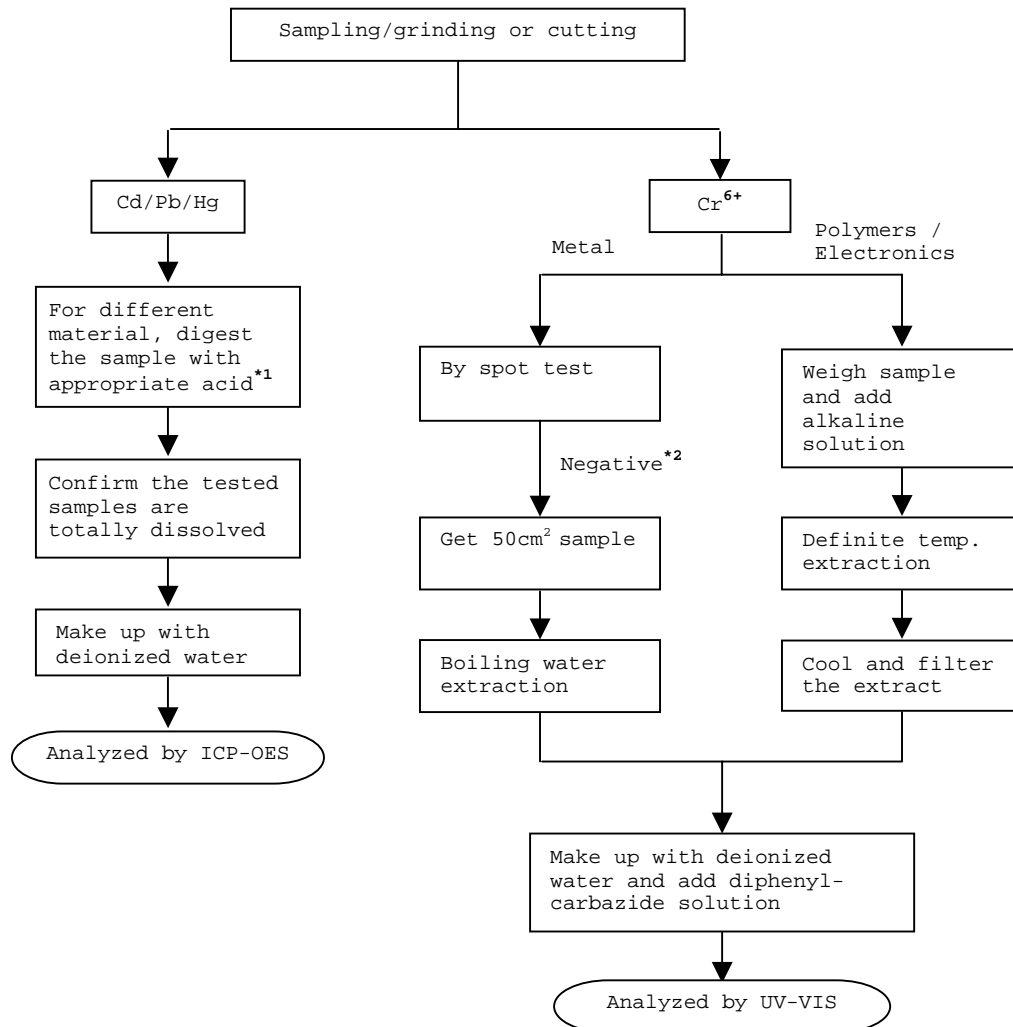
Remark: Reporting limit = Quantitation limit of analyte in sample



Test Conducted

(IV) Measurement Flowchart:

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





Number : TWNC00290370

Test Conducted

Remarks:

*1: List of Appropriate Acid:

| Material | Acid Added for Digestion |
|-------------|--------------------------------------------------------------------------------------------|
| Polymers | HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃ |
| Metals | HNO ₃ , HCl, HF |
| Electronics | HNO ₃ , HCl, H ₂ O ₂ , HBF ₄ |

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

End of Report

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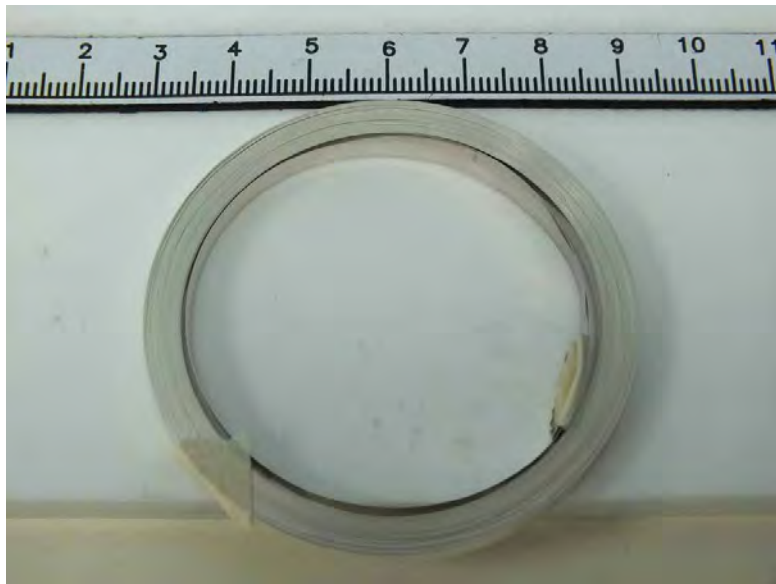
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Test Conducted

Photo





Test Report

Number : TWNC00279926

Applicant: Littelfuse, S.A. de C.V.
Blvd. Fausto Z. Martinez #1800
Col. Magisterio Seccion 38 C.P.
26070 Piedra Negras, Coahuila,
Mexico

Date : Oct 26, 2012

Sample Description:

One (1) group of submitted samples said to be :
Part Description : SOLDER WIRE
Part Number : 692532
Date Sample Received : Oct 04, 2012
Date Test Started : Oct 24, 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> |
| Heavy Metal | |
| Cadmium (Cd) content | ND |
| Lead (Pb) content | 284 |
| Mercury (Hg) content | ND |
| Chromium VI (Cr ⁶⁺) content (mg/kg with 50cm ²) | Negative (< 0.02) |

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg
ND = Not detected
< = Less than
mg/kg with 50cm² = 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

Date Sample Received : Oct 04, 2012

Test Period : Oct 24, 2012 To Oct 25, 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 ⁶⁺) 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 ⁶⁺) 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 ² |

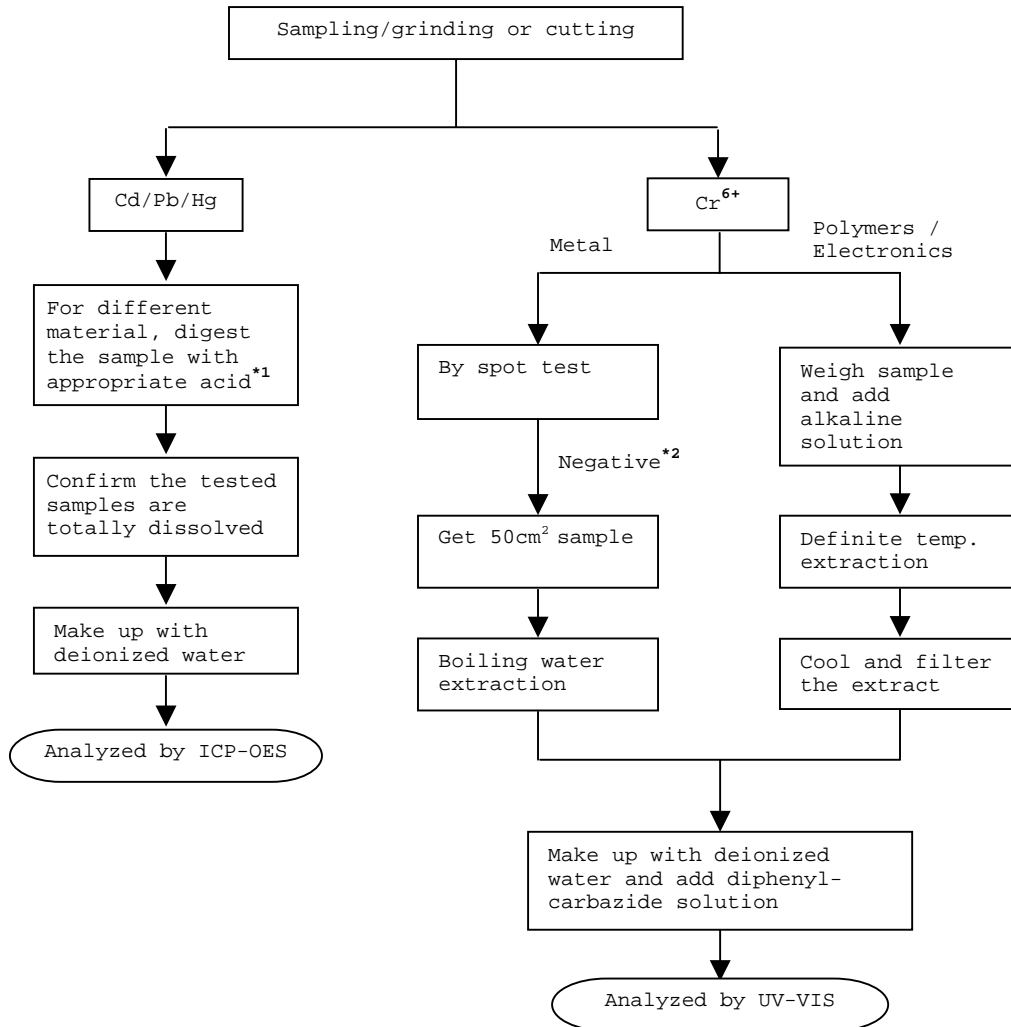
Remark: Reporting limit = Quantitation limit of analyte in sample



Test Conducted

(IV) Measurement Flowchart:

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





Number : TWNC00279926

Test Conducted

Remarks:

*1: List Of Appropriate Acid:

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

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

End of Report

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Test Conducted

Photo





Test Report

Number : TWNC00279928

Applicant: Littelfuse, S.A. de C.V.
Blvd. Fausto Z. Martinez #1800
Col. Magisterio Seccion 38 C.P.
26070 Piedra Negras, Coahuila, Mexico

Date : Oct 12, 2012

Sample Description:

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

Part Description : SILICA SAND
Part Number : 090169
Date Sample Received : Oct 04, 2012
Date Test Started : Oct 05, 2012

Test Conducted :

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

Authorized By:
On Behalf Of Intertek Testing Services
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K. Y. Liang
Director

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Number : TWNC00279928

Test Conducted

(I) Test Result Summary :

| Test Item | Result (ppm) |
|-----------------------------------------------|-------------------|
| | Submitted Samples |
| 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 |

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 : Oct 04, 2012
Test Period : Oct 05, 2012 To Oct 11, 2012



Page 2 of 8



Number : TWNC00279928

Test Conducted

(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 ⁶⁺) Content | 0.1% (1000ppm) |
| Polybrominated Biphenyls (PBBs) | 0.1% (1000ppm) |
| Polybrominated Diphenyl Ehters (PBDEs) | 0.1% (1000ppm) |

The above limits were quoted from Annex II of 2011/65/EU 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 |

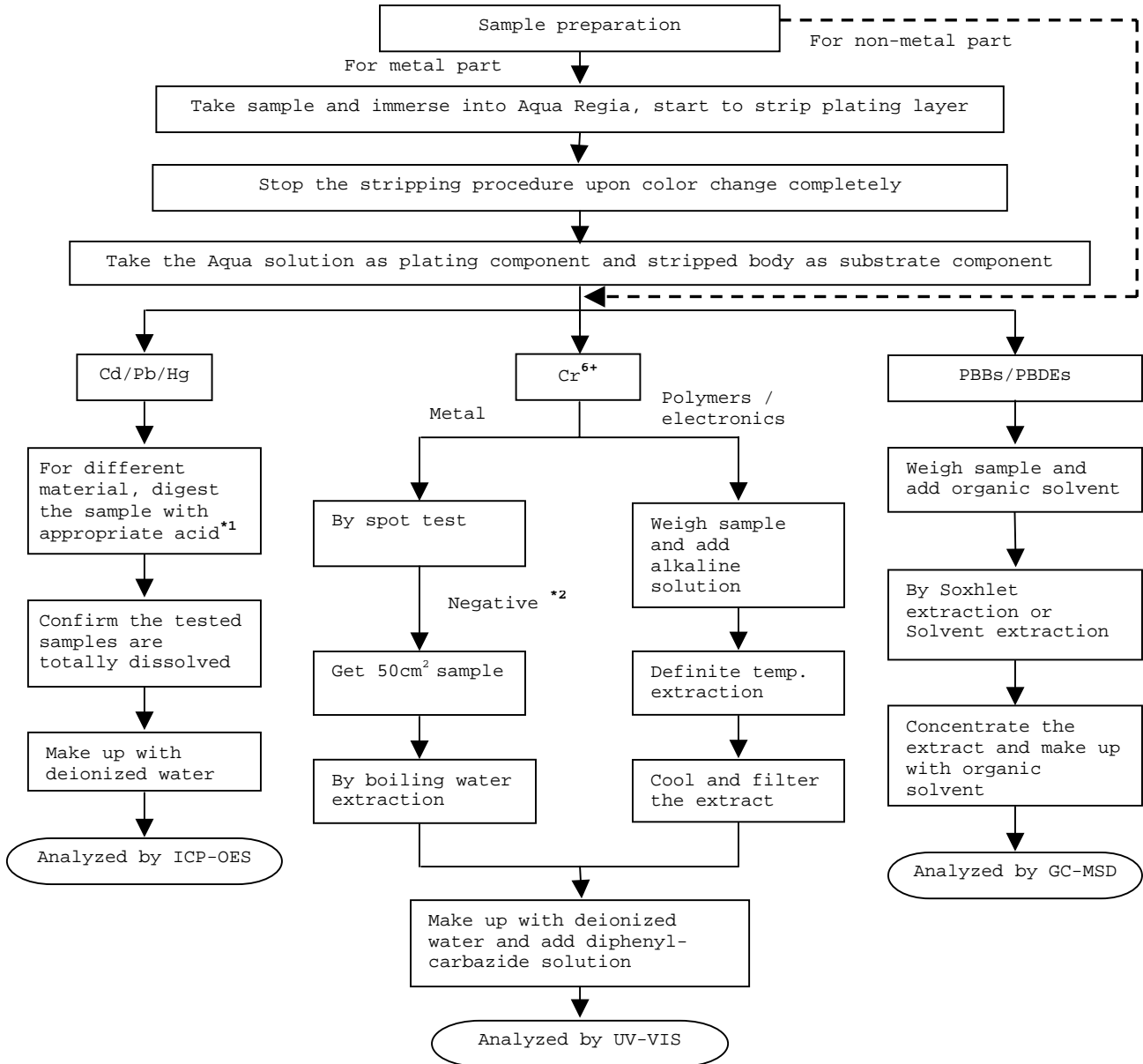
Remark: Reporting limit = Quantitation limit of analyte in sample



Test Conducted

(IV) Measurement Flowchart:

Test for Cd/Pb/Hg/Chromium (VI)/PBBS/PBDES Contents
 Reference Standard: IEC 62321 edition 1.0:2008





Number : TWNC00279928

Test Conducted

Remarks:

*1: List of Appropriate Acid:

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

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



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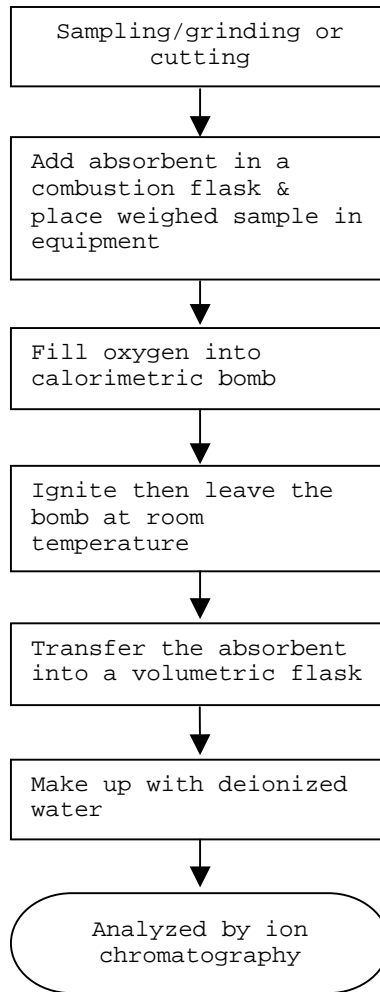
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Test Conducted

(IV) Measurement Flowchart:

Test for Halogen Content
Reference Standard : EN 14582



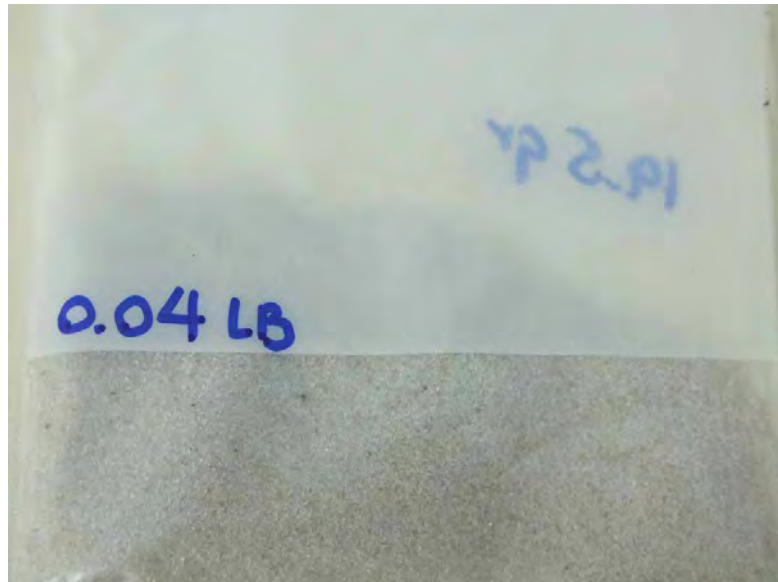
End of Report

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Test Conducted

Photo





Test Report

Number : TWNC00269229

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

Date : Aug 06, 2012

Sample Description:

One (1) group of submitted samples said to be :
Part Description : Body (Melamine)
Part Number : 039144
Date Sample Received : Jul 30, 2012
Date Test Started : Jul 30, 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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except in full, without the written
approval of the laboratory.

Test Conducted

(I) Test Result Summary :

| Test Item | Result (ppm) |
|-----------------------------------------------|---------------|
| | White Plastic |
| 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) | 264 |
| Chlorine (Cl) | ND |
| Bromine (Br) | ND |
| Iodine (I) | 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 : Jul 30, 2012

Test Period : Jul 30, 2012 To Aug 03, 2012

Test Conducted

(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 ⁶⁺) Content | 0.1% (1000ppm) |
| Polybrominated Biphenyls (PBBs) | 0.1% (1000ppm) |
| Polybrominated Diphenyl Ehters (PBDEs) | 0.1% (1000ppm) |

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

(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 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 |



Number : TWNC00269229

Test Conducted

(III) Test Method:

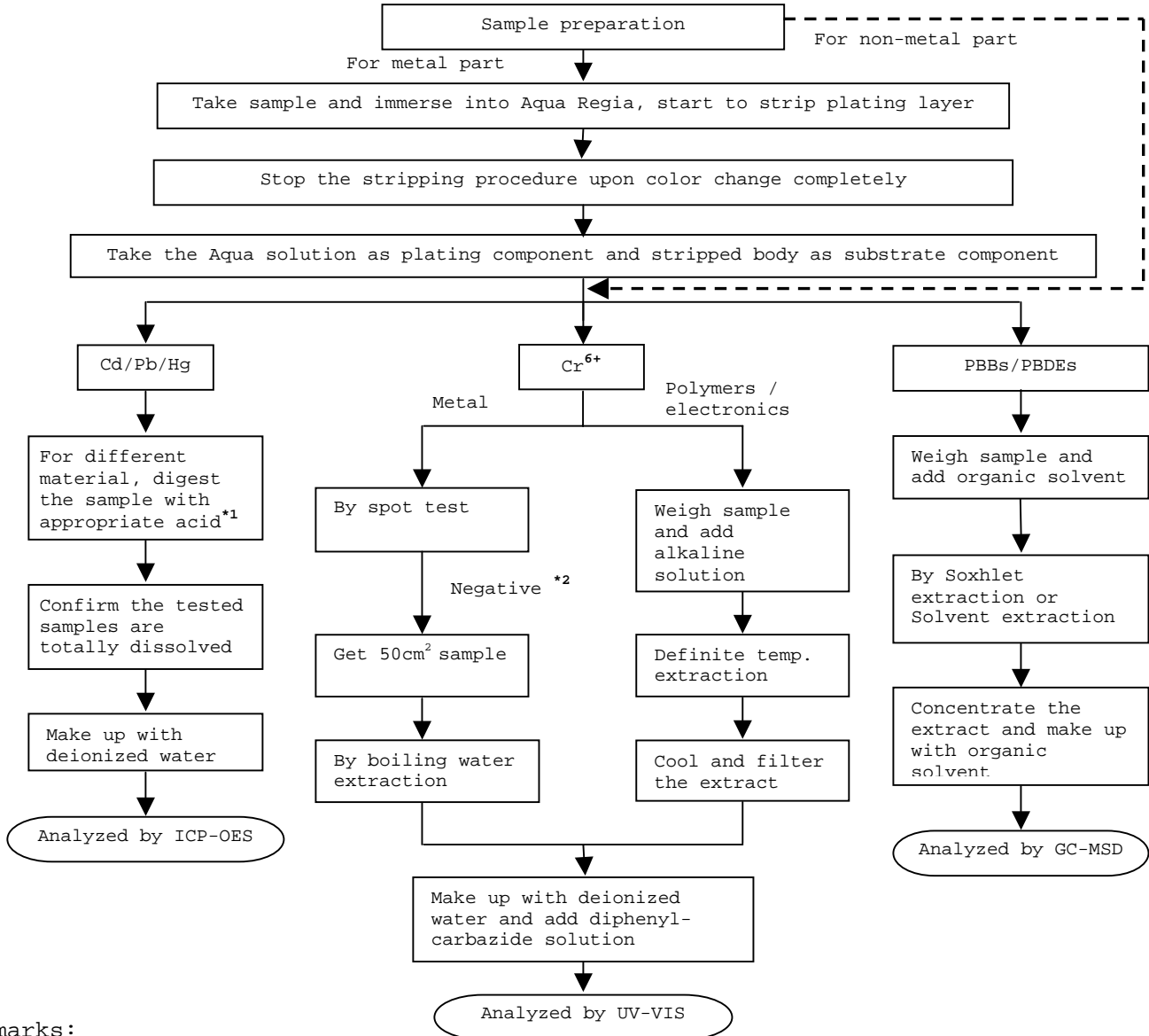
| <u>Test Item</u> | <u>Test Method</u> | <u>Reporting Limit</u> |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Polybrominated 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 |

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:

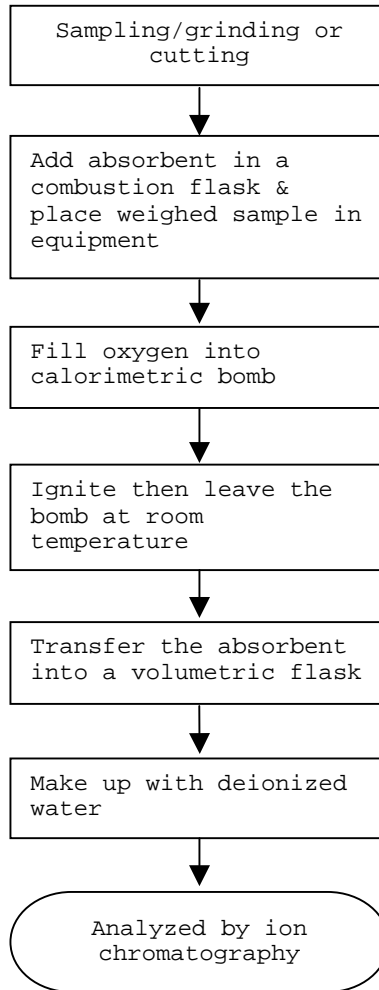
| Material | Acid Added for Digestion |
|-------------|--------------------------------------------------------------------------------------------|
| Polymers | HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃ |
| Metals | HNO ₃ , HCl, HF |
| Electronics | HNO ₃ , HCl, H ₂ O ₂ , HBF ₄ |

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

Test Conducted

(IV) Measurement Flowchart:

Test for Halogen Content
Reference Standard : EN 14582

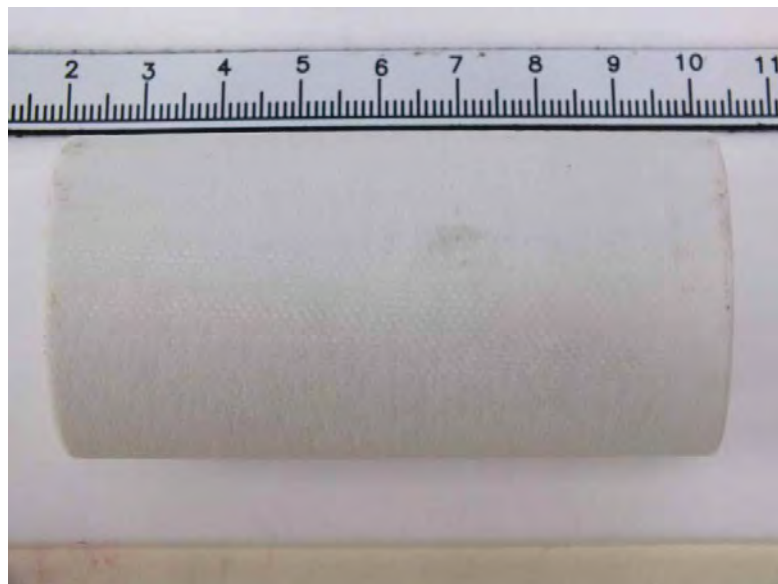


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Test Conducted

Photo





Test Report

Number : TWNC00269232

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

Date : Aug 07, 2012

Sample Description:

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

Part Description : Overlay
Part Number : 692264
Date Sample Received : Jul 30, 2012
Date Test Started : Jul 30, 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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Number : TWNC00269232

Test Conducted

(I) Test Result Summary :

| <u>Test Item</u> | <u>Result (ppm)</u> |
|-------------------------------------------------------------------------|----------------------|
| | <u>Silvery Metal</u> |
| Heavy Metal | |
| Cadmium (Cd) content | ND |
| Lead (Pb) content | 102 |
| Mercury (Hg) content | ND |
| Chromium VI (Cr ⁶⁺) content (mg/kg with 50cm ²) | Negative (<0.02) |

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg
ND = Not detected
< = Less than
mg/kg with 50cm² = 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 30, 2012
Test Period : Jul 30, 2012 To Aug 07, 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 ⁶⁺) Content | 0.1% (1000ppm) |

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

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 B, by boiling water extraction and determined by UV-Vis Spectrophotometer. | 0.02 mg/kg with 50cm ² |

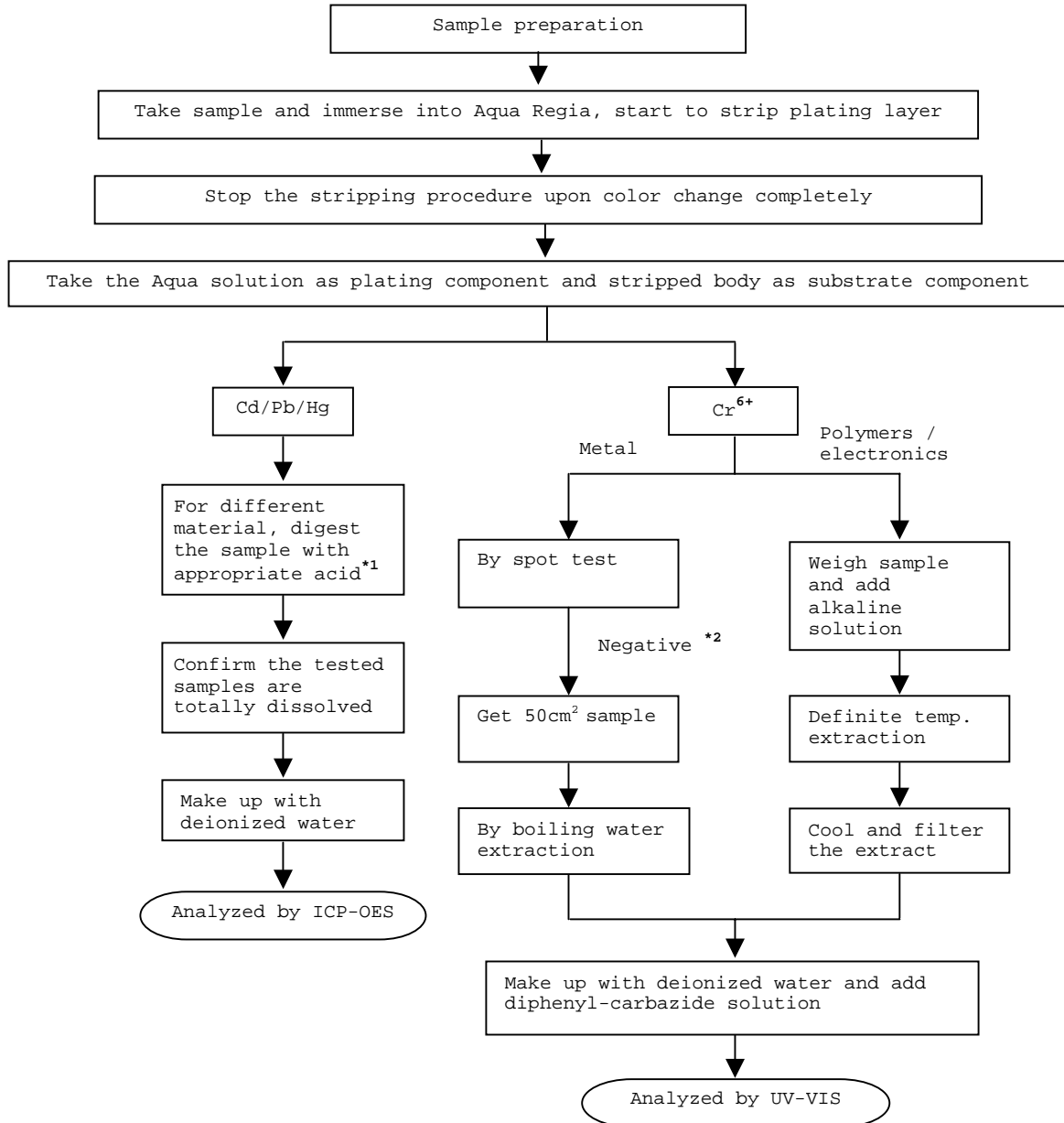
Remark: Reporting limit = Quantitation limit of analyte in sample

Test Conducted

(IV) Measurement Flowchart:

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

Reference Standard : IEC 62321 edition 1.0:2008





Number : TWNC00269232

Test Conducted

Remarks:

*1: List of Appropriate Acid:

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

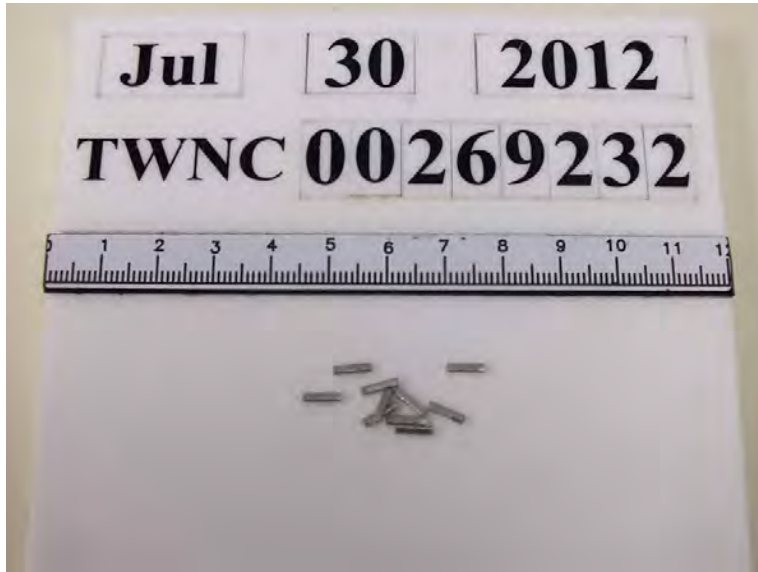
*2: If the result of spot test is positive, Chromium VI would be determined as detected.

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Test Conducted

Photo





Test Report

Number : TWNC00290371

Applicant: Littelfuse, S.A. de C.V.
Blvd. Fausto Z. Martinez #1800
Col. Magisterio Seccion 38 C.P.
26070 Piedra Negras, Coahuila, Mexico

Date : Dec 18, 2012

Sample Description:

One (1) group of submitted samples said to be :
Part Description : Anaerobic adhesive
Part Number : 087244
Date Sample Received : Dec 11, 2012
Date Test Started : Dec 12, 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



Page 1 of 10

Intertek Testing Services Taiwan Ltd.

8F., No. 423, Ruiguang Rd., Neihu District, Taipei 11492, Taiwan, R.O.C.

全國公證檢驗股份有限公司

11492 台北市內湖區瑞光路 423 號 8 樓

Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2410



Number : TWNC00290371

Test Conducted

(I) Test Result Summary :

| <u>Test Item</u> | <u>Result (ppm)</u> |
|-----------------------------------------------|------------------------------|
| | <u>Light yellow adhesive</u> |
| 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 |
| Phthalates | |
| Di(2-ethylhexyl) Phthalate (DEHP) | ND |
| Dibutyl Phthalate (DBP) | ND |
| Benzyl Butyl Phthalate (BBP) | ND |



Page 2 of 10

Intertek Testing Services Taiwan Ltd.

8F., No. 423, Ruiguang Rd., Neihu District, Taipei 11492, Taiwan, R.O.C.

全國公證檢驗股份有限公司

11492 台北市內湖區瑞光路 423 號 8 樓

Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2410

Test Conducted

(I) Test Result Summary :

| <u>Test Item</u> | <u>Result (ppm)</u> |
|--------------------------------|------------------------------|
| | <u>Light yellow adhesive</u> |
| 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 : Dec 11, 2012

Test Period : Dec 12, 2012 to Dec 14, 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 ⁶⁺) Content | 0.1% (1000ppm) |
| Polybrominated Biphenyls (PBBs) | 0.1% (1000ppm) |
| Polybrominated Diphenyl Ehters (PBDEs) | 0.1% (1000ppm) |

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



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-MS. | 10 ppm |

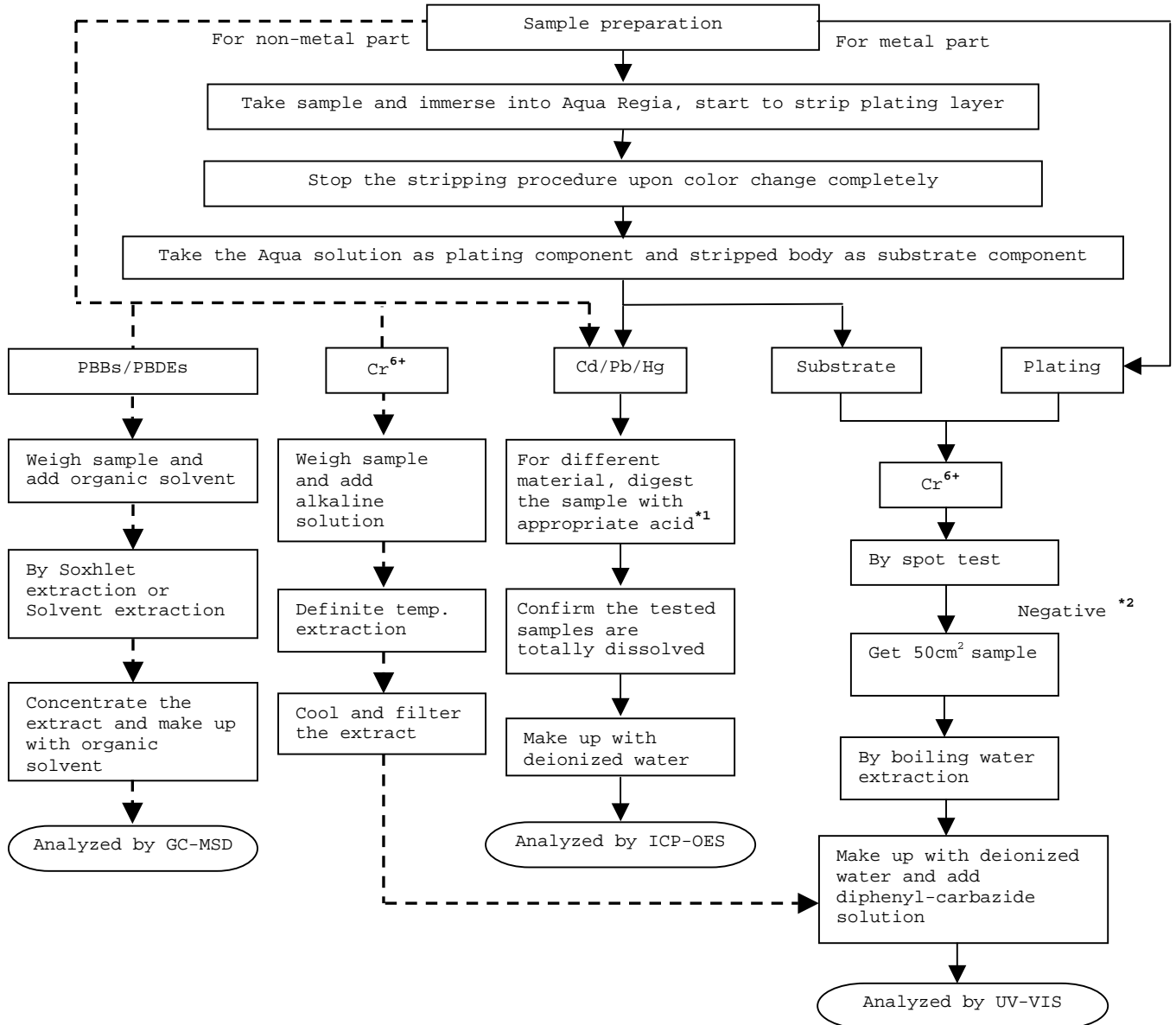
Remark: Reporting limit = Quantitation limit of analyte in sample



Test Conducted

(IV) Measurement Flowchart:

Test for Cd/Pb/Hg/Chromium (VI)/PBBS/PBDES Contents
 Reference Standard: IEC 62321 edition 1.0:2008





Number : TWNC00290371

Test Conducted

Remarks:

*1: List of Appropriate Acid:

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

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



Page 6 of 10

Intertek Testing Services Taiwan Ltd.

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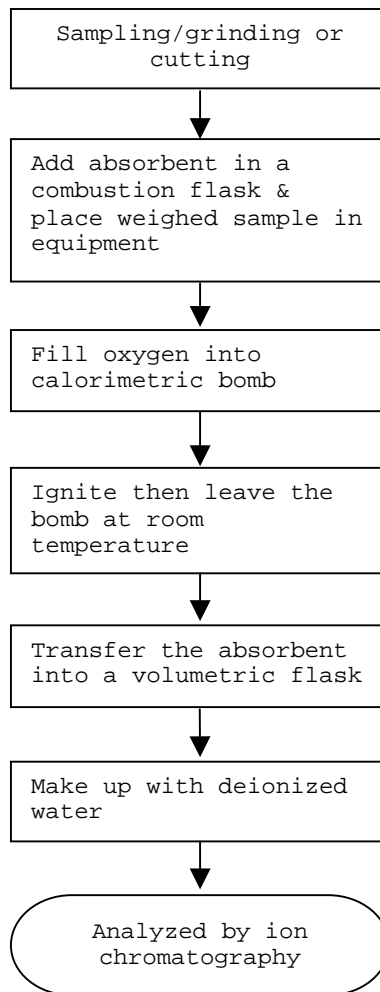
11492 台北市內湖區瑞光路 423 號 8 樓

Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2410

Test Conducted

(IV) Measurement Flowchart:

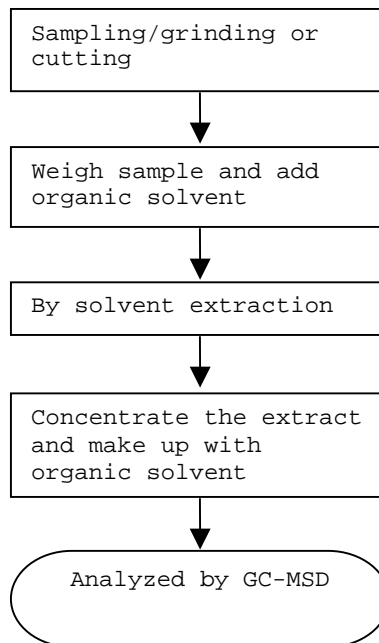
Test for Halogen Content
Reference Standard : EN 14582



Test Conducted

(IV) Measurement Flowchart:

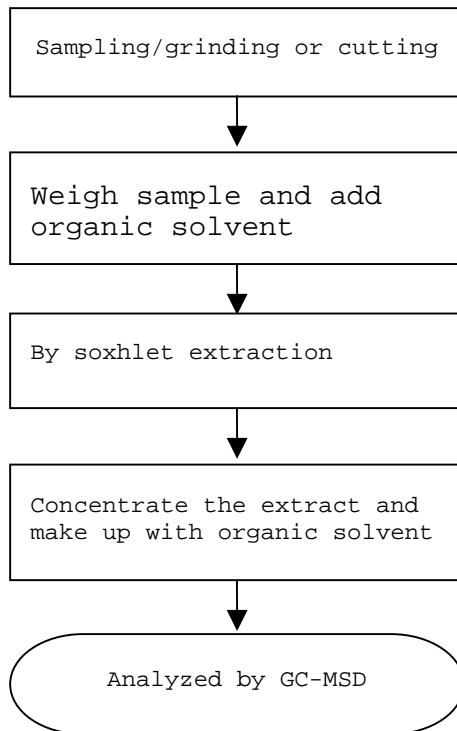
Test For Phthalates Contents
Reference Method: EN 14372: 2004



Test Conducted

(IV) Measurement Flowchart:

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



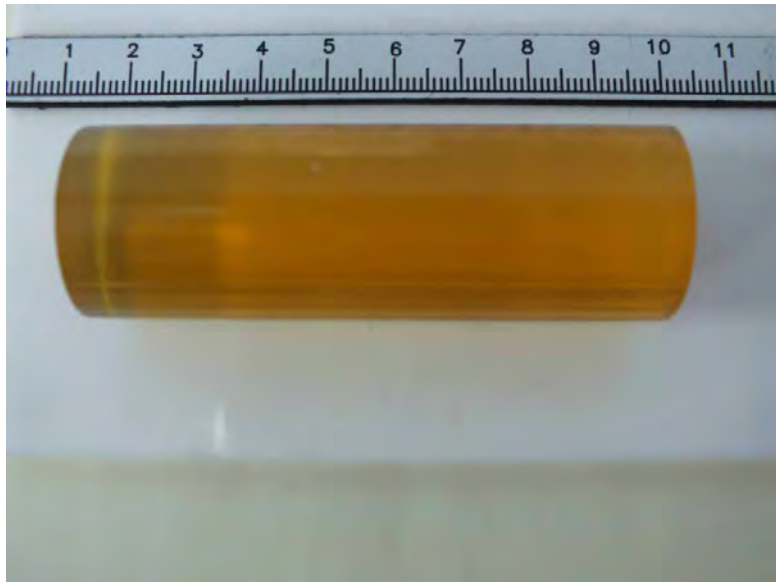
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Test Conducted

Photo





Test Report

Number : TWNC00228752

Applicant: Littelfuse, S.A. de C.V.
Blvd. Fausto Z. Martinez #1800
Col. Magisterio Seccion 38 C.P.
26070 Piedra Negras, Coahuila,
Mexico

Date : Nov 16, 2011

Sample Description:

One (1) group of submitted samples said to be :
Part Description : Cap
Part Number : 923-088
Date Sample Received : Oct 18, 2011
Date Test Started : Oct 18, 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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Number : TWNC00228752

Test Conducted

(I) Test Result Summary :

| <u>Test Item</u> | <u>Result (ppm)</u> | |
|-------------------------------------------------------------------------|---------------------|-------------------|
| | <u>(1)</u> | <u>(2)</u> |
| Heavy Metal | | |
| Cadmium (Cd) content | 7 | ND |
| Lead (Pb) content | 20626 | ND |
| Mercury (Hg) content | ND | ND |
| Chromium VI (Cr ⁶⁺) content (mg/kg with 50cm ²) | 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 50cm² = 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) Coppery Metal Base Material
- (2) Silvery Plating Layer

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

Date Sample Received : Oct 18, 2011
 Test Period : Oct 18, 2011 To Oct 20, 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 ⁶⁺) Content | 0.1% (1000ppm) |

The above limits were quoted from 2002/95/EC and amendment 2005/618/EC 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 ⁶⁺) 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 ² |

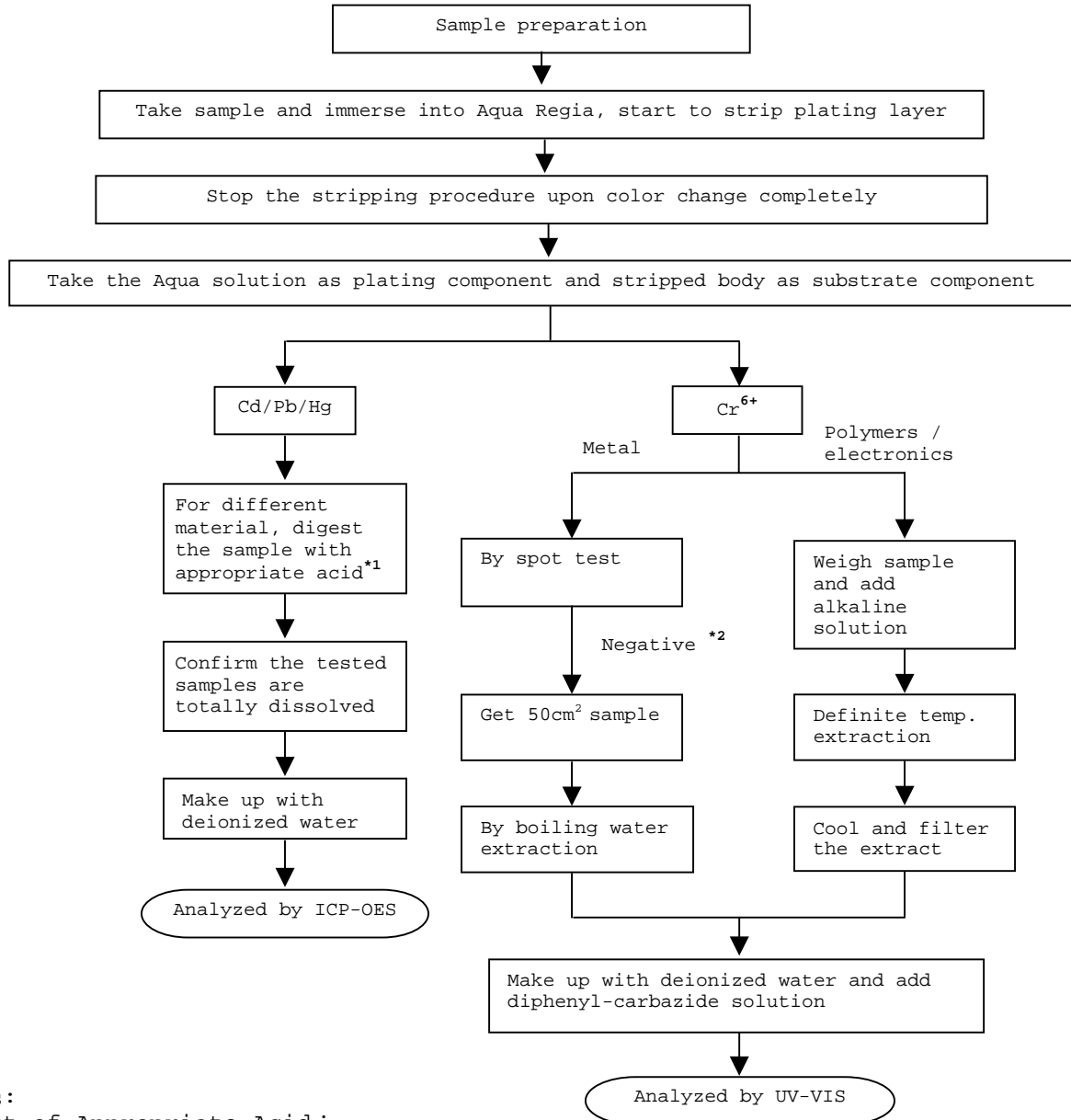
Remark: Reporting limit = Quantitation limit of analyte in sample

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 ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃ |
| Metals | HNO ₃ , HCl, HF |
| Electronics | HNO ₃ , HCl, H ₂ O ₂ , HBF ₄ |

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

End of Report

Test Conducted

Photo

