



**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	155004-1	Body-Housing (RoHS 4)	3-11
2	155004-4	Knob	12-20
3	155004-3	Knob Insert	21-25
4	912-065	Spring	26-30
5	904-216-001	Rivet	31-35
6	912-067	Spring	36-40
7	878-112	Wire-Plastic Insulated	41-47



**Test Report**

Number : TWNC00241009

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

Date : Jan 20, 2012

**Sample Description:**

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

Part Description : BODY  
Part Number : 155004-1  
Date Sample Received : Jan 16, 2012  
Date Test Started : Jan 17, 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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except in full, without the written  
approval of the laboratory.

## Test Conducted

## (I) Test Result Summary :

Test Item	Result (ppm)
	Black Plastic
<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)	121
Bromine (Br)	ND
Iodine (I)	ND



Number : TWNC00241009

Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>
	<u>Black Plastic</u>
<b>Phthalates</b>	
Di(2-ethylhexyl) Phthalate (DEHP)	ND
Dibutyl Phthalate (DBP)	ND
Benzyl Butyl Phthalate (BBP)	ND
<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 : Jan 16, 2012

Test Period : Jan 17, 2012 To Jan 20, 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.

## 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 ( $\text{Cr}^{6+}$ ) 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 ASTM D3421-75, by solvent extraction and determined by GC-MSD or GC-FID	10 ppm
Hexabromocyclododecane (HBCDD)	With reference to USEPA 3540C, by solvent extraction and determined by GC-MSD	10 ppm

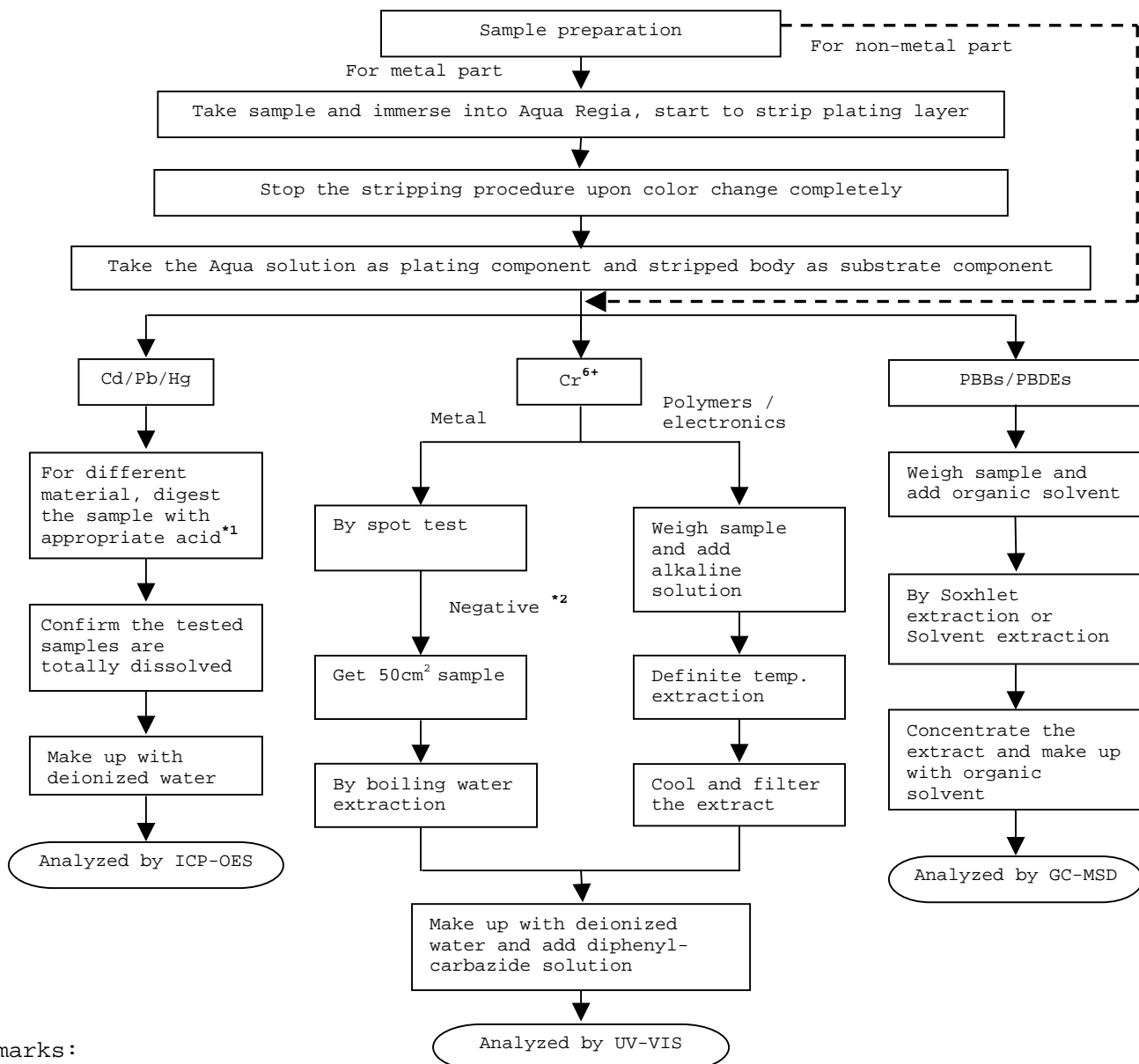
Remark: Reporting limit = Quantitation limit of analyte in sample

## 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:

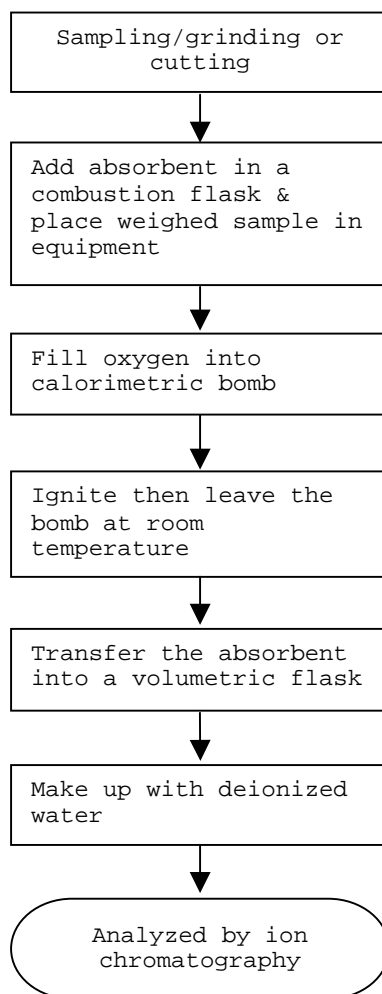
Material	Acid Added for Digestion
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

\*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

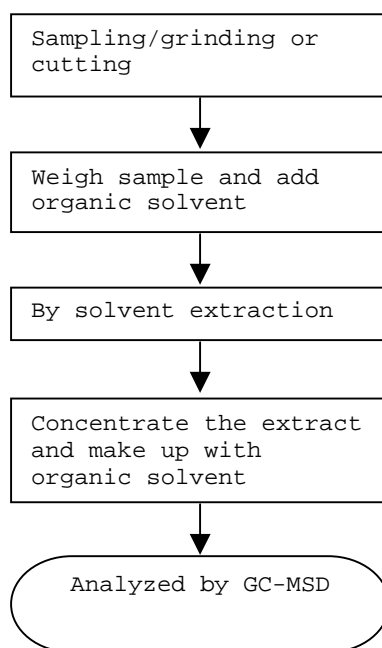




## Test Conducted

## (IV) Measurement Flowchart:

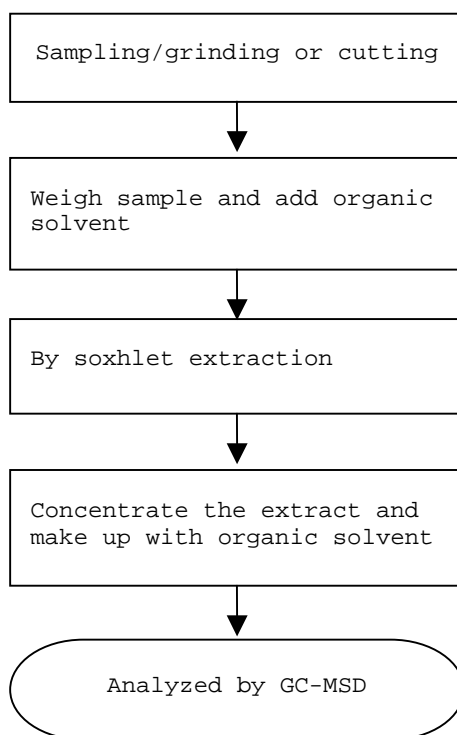
Test For Phthalates Contents  
Reference Method: EN 14372: 2004



## Test Conducted

## (IV) Measurement Flowchart:

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



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End of Report

Number : TWNC00241009

Test Conducted

Photo





**Test Report**

Number : TWNC00241011

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

Date : Jan 30, 2012

**Sample Description:**

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

Part Description : KNOB  
Part Number : 155004-4  
Date Sample Received : Jan 16, 2012  
Date Test Started : Jan 17, 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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## Test Conducted

## (I) Test Result Summary :

Test Item	Result (ppm)
	Black Plastic
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	6
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

Number : TWNC00241011

Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>
	<u>Black Plastic</u>
<b>Halogen Content</b>	
Fluorine (F)	ND
Chlorine (Cl)	169
Bromine (Br)	ND
Iodine (I)	ND
<b>Phthalates</b>	
Di(2-ethylhexyl) Phthalate (DEHP)	ND
Dibutyl Phthalate (DBP)	ND
Benzyl Butyl Phthalate (BBP)	ND
<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 : Jan 16, 2012

Test Period : Jan 17, 2012 To Jan 20, 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.

## 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 <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 ASTM D3421-75, by solvent extraction and determined by GC-MSD or GC-FID	10 ppm
Hexabromocyclododecane (HBCDD)	With reference to USEPA 3540C, by solvent extraction and determined by GC-MSD	10 ppm

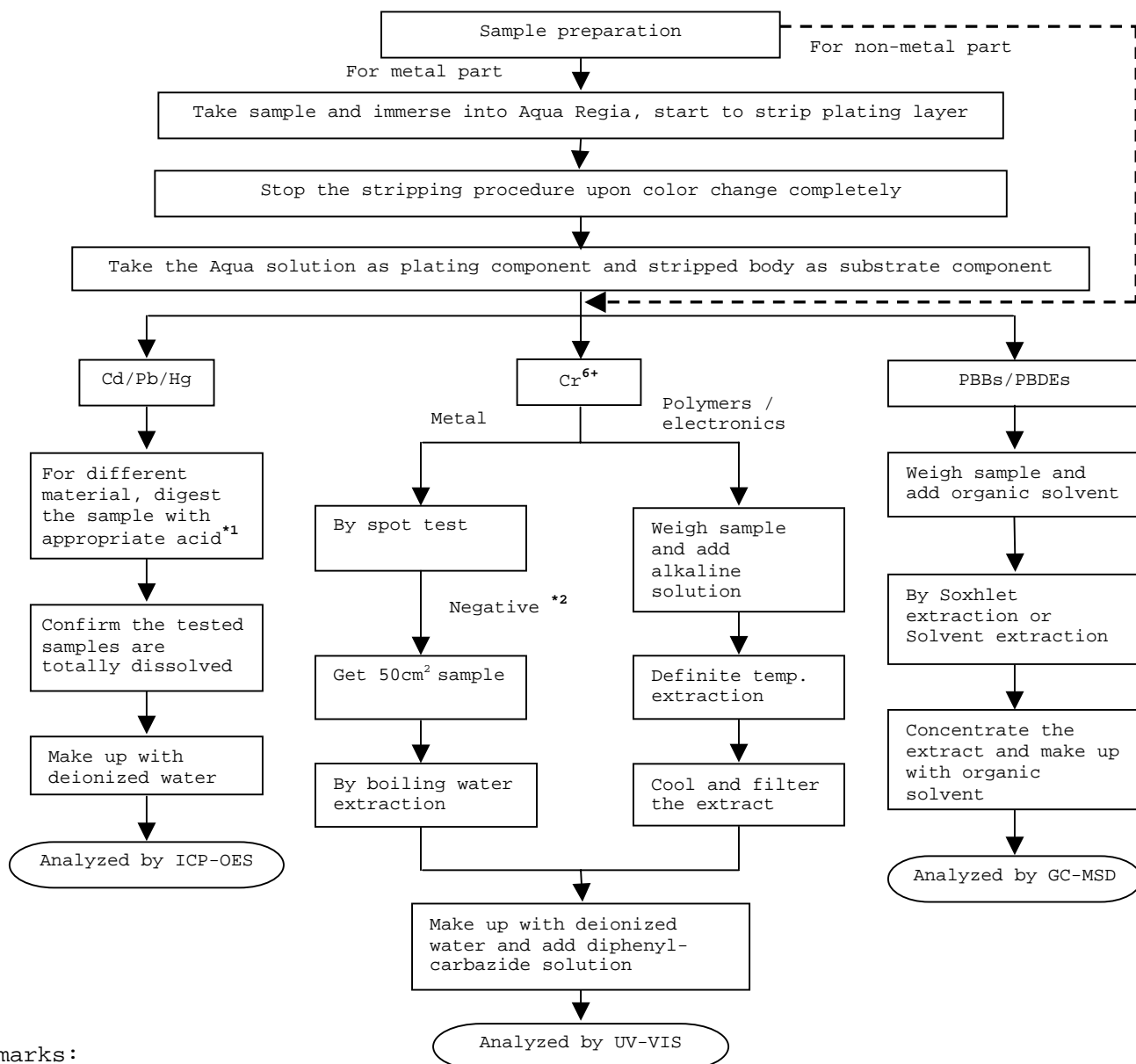
Remark: Reporting limit = Quantitation limit of analyte in sample

## 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>

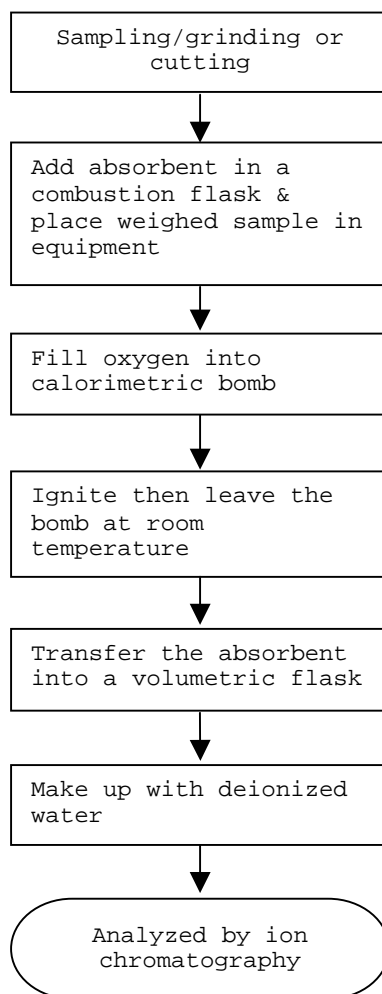
\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



## Test Conducted

## (IV) Measurement Flowchart:

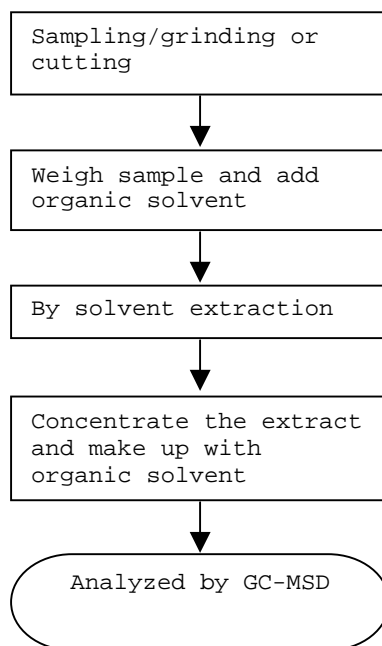
Test for Halogen Content  
Reference Standard : EN 14582



## Test Conducted

## (IV) Measurement Flowchart:

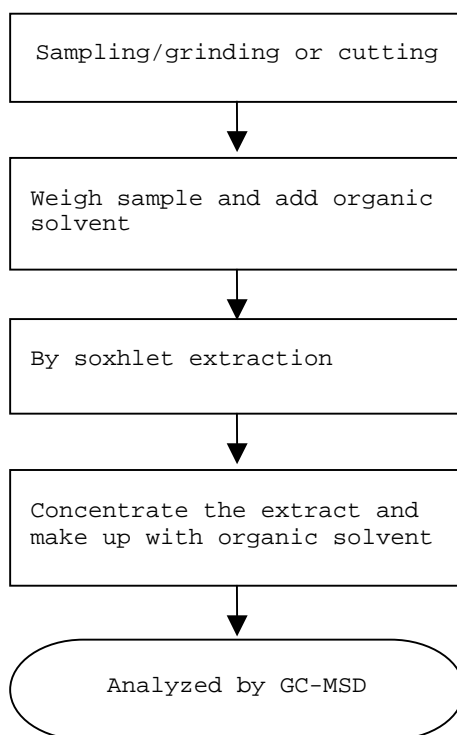
Test For Phthalates Contents  
Reference Method: EN 14372: 2004



## Test Conducted

## (IV) Measurement Flowchart:

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



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End of Report

Number : TWNC00241011

Test Conducted

Photo





**Test Report**

Number : TWNC00241010

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

Date : Jan 20, 2012

**Sample Description:**

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

Part Description : INSERT  
Part Number : 155004-3  
Date Sample Received : Jan 16, 2012  
Date Test Started : Jan 17, 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 : TWNC00241010

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	861
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.  
# = Due to the insufficient sample area, reduced total sample  
surface of 10 cm<sup>2</sup> was used and the dilution factor was  
adjusted accordingly.

Tested Components

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

Responsibility of Chemist : Irene Chiou / Kevin Liu

Date Sample Received : Jan 16, 2012

Test Period : Jan 17, 2012 To Jan 20, 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.

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 ( $\text{Cr}^{6+}$ ) content (mg/kg with $50\text{cm}^2$ )	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 $50\text{cm}^2$

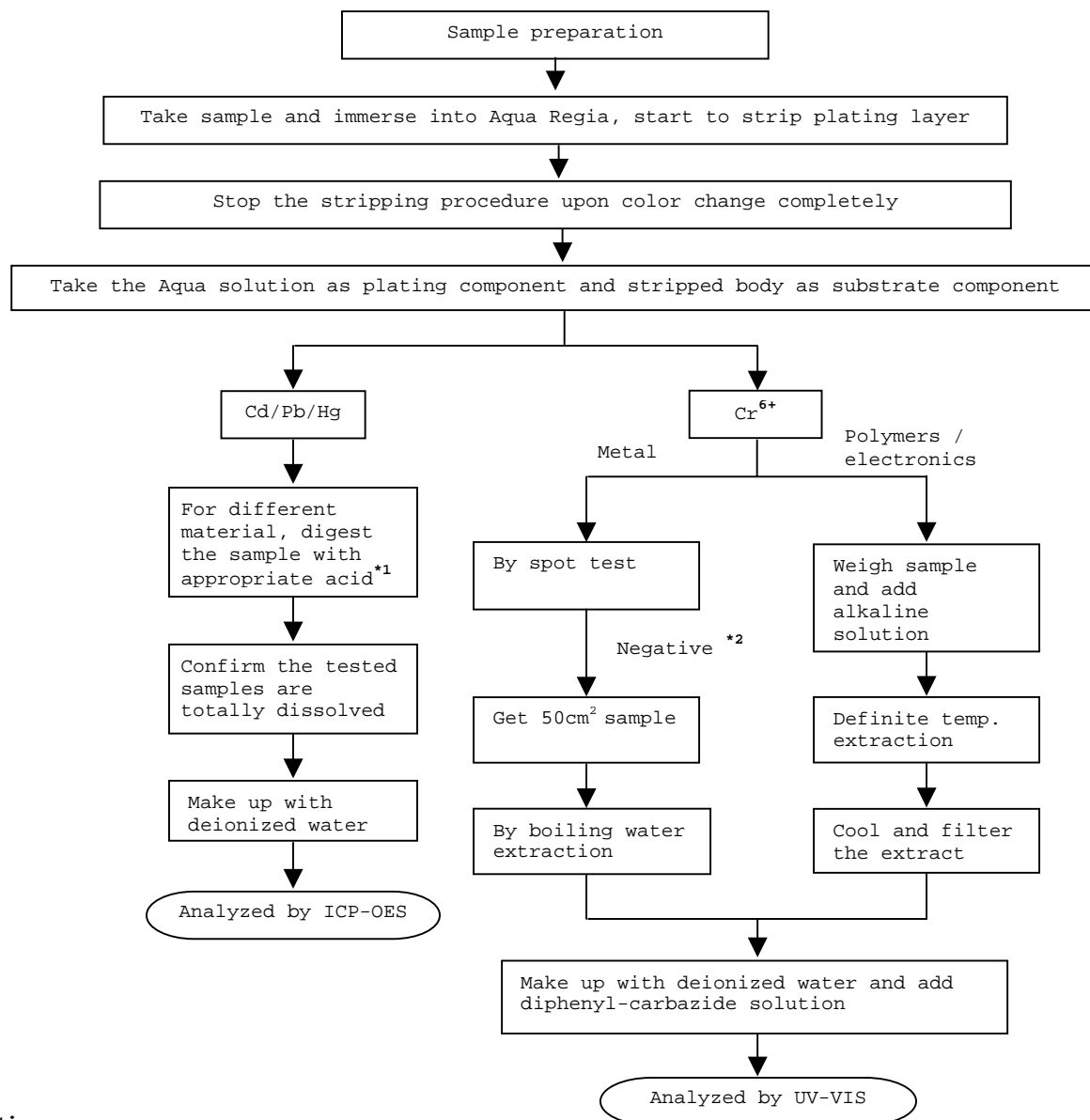
Remark: Reporting limit = Quantitation limit of analyte in sample

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 <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.

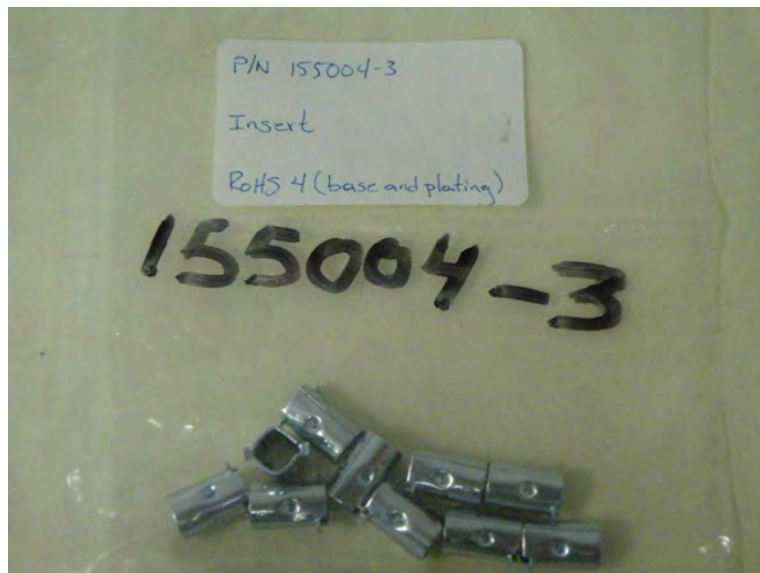
End of Report



Test Conducted

Number : TWNC00241010

Photo



## TEST REPORT

### APPLICANT

Littelfuse, S.A. de C.V.  
Blvd. Fausto Z. Martínez 1800, Col. Magisterio Sección 38, Piedras Negras, Coahuila  
Ing. María Valdez

### SAMPLE DESCRIPTION

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

Sample Description NP  
Item No. 7) N/P 912-065 Spring  
Country of Origin NP  
Buyer's Name NP  
Supplier's Name NP  
Date sample received 2011-06-08  
Testing period 2011-06-09 to 2011-06-16

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### TEST CONDUCTED

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

\*\*\*\*\*

### CONCLUSION

<u>Sample Number</u>	<u>Testing item</u>	<u>Conclusion</u>	<u>Failed component</u>	<u>Failed result</u>
7 (Base)	N/P 912-065 Spring	Pass See Result summary	----	----
7 (Plated)	N/P 912-065 Spring	Pass See Result summary	----	----

\*\*\*\*\*

000002

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1ª. Emisión Junio 2005, 1ª Revisión Junio 26, 2009.

ILTA/003/GENS-F8

**Intertek Testing Services de México, S.A. de C.V.**

Poniente 134 No. 660, Col. Industrial Vallejo  
C.P. 02300, Del. Azcapotzalco, México, D.F. Tel.: 50912150

[www.intertek.com](http://www.intertek.com)



## TEST CONDUCTED

Samples:

7) Base N/P 912-065 Spring

7) Plated N/P 912-065 Spring

## TEST RESULT SUMMARY FOR RoHS DIRECTIVE :

TESTING ITEM	Ω RESULT (ppm)		Limit
	(7) Base	(7) Plated	
Cadmium (Cd) content	83,78	25,71	0,01% (100 ppm)
Lead (Pb) content	36,26	614,6	0,1% (1000 ppm)
Mercury (Hg) content	ND	ND	0,1% (1000 ppm)
Chromium (VI) (Cr <sup>6+</sup> )	ND	ND	0,1% (1000 ppm)

ppm = parts per million based on dry weight of sample.

µg/cm<sup>2</sup> = microgram per square centimeter.

mg/kg WITH 50cm<sup>2</sup> = milligram per kilogram with 50 square centimeter.

< = less than.

ND = Not detected.

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

These Accreditations only apply for the methods listed in such. Not accredited under EMA Ω.

Prepared and checked by :

For Intertek

*Irma López*  
*[Signature]*  
Laboratory Manager

The Official Mexican Standard NOM-008-SCFI-1993 establishes like separator decimal the comma (,).

NOTE : DecaBDE IN POLYMERIC APPLICATIONS IS EXEMPTED ACCORDING TO ROHS DIRECTIVE AMENDMENT 2005/717/EC.

# =ACCORDING TO IEC 62321, A POSITIVE RESULT INDICATES THE PRESENCE OF Cr(VI) COATING. IT IS THE Cr(VI) CONCENTRATION DETECTED IN THE BOILING-WATER-EXTRACTION SOLUTION AND SHOULD NOT BE INTERPRETED AS THE Cr(VI) CONCENTRATION IN THE COATING LAYER OF THE SAMPLE.

REMARK : AS REQUESTED BY THE APPLICANT, COATING WITH BASE MATERIAL OF TESTED COMPONENTS OF THE SAMPLE MX11-1223-07 WERE TESTED SEPARATED.

000003

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The results that appear in this report belong solely to (s) shows (s) analyzed (s).

1\*. Emisión Junio 2005, 1\* Revisión Junio 26, 2009.

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**Intertek Testing Services de México, S.A. de C.V.**

Poniente 134 No. 660, Col. Industrial Vallejo  
C.P. 02300, Del. Azcapotzalco, México, D.F. Tel.: 50912150

[www.intertek.com](http://www.intertek.com)

**Test method :**

Sample Number	Testing item	Ω Testing method	Quality control Batch:	Analysis Date:	Analyzed By:	Reporting limit ppm
7	Chromium VI (Cr <sup>6+</sup> ) content	With reference to USEPA 3060, by EPA 7196	QHU2010-45p23	2011-06-16	MELA	20,0

Sample Number	Testing item	Ω Testing method	Quality control Batch:	Analysis Date:	Analyzed By:	Reporting limit ppm
7 (Base)	Lead (Pb) content	With reference to USEPA 3050MOD, by EPA 7420	MET2011-12p11,12	2011-06-14	MARY	20,0
7 (Plated)	Lead (Pb) content	With reference to USEPA 3050MOD, by EPA 6010	MET2010-21p06	2011-06-13	MARY	62,5

Sample Number	Testing item	Ω Testing method	Quality control Batch:	Analysis Date:	Analyzed By:	Reporting limit ppm
7 (Base)	Cadmium (Cd) content	With reference to USEPA 3050MOD, by EPA 6010	MET2011-12p11	2011-06-13	MARY	2,0
7 (Plated)	Cadmium (Cd) content	With reference to USEPA 3050MOD, by EPA 6010	MET2010-21p06	2011-06-13	MARY	25,0

Sample Number	Testing item	Ω Testing method	Quality control Batch:	Analysis Date:	Analyzed By:	Reporting limit ppm
7 (Base)	Mercury (Hg) content	With reference to USEPA 7471 by USEPA 7471	MET2010-12p06	2011-06-09	RNC	0,25
7 (Plated)	Mercury (Hg) content	With reference to USEPA 7471 by USEPA 7471	MET2010-22p05	2011-06-10	RNC	2,5

000004

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The results that appear in this report belong solely to (s) shows (s) analyzed (s).

1\*. Emisión Junio 2005, 1\* Revisión Junio 26, 2009.

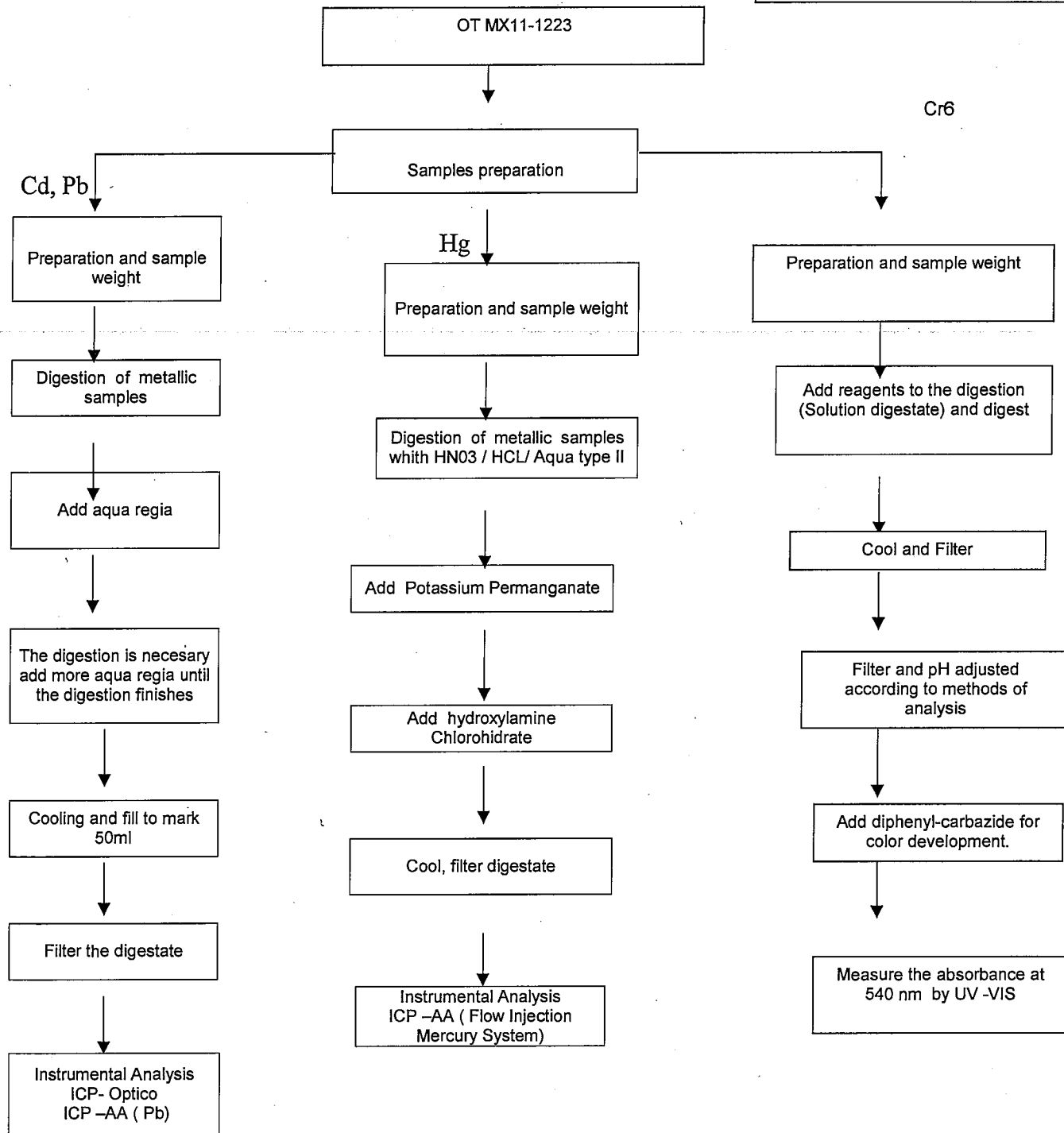
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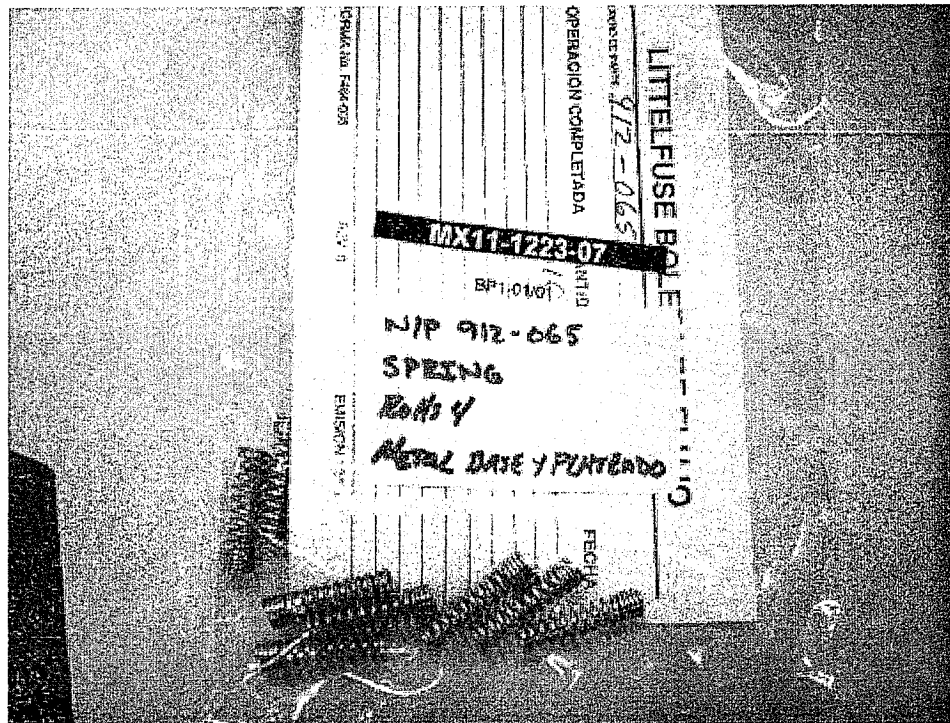
000005

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000006

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**TEST REPORT****APPLICANT**

Littelfuse, S.A. de C.V.

Blvd. Fausto Z. Martínez 1800, Col. Magisterio Sección 38, Piedras Negras, Coahuila

Ing. María Valdez

**SAMPLE DESCRIPTION**

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

Sample Description NP

Item No. 6) N/P 904-216-001 Rivet

Country of Origin NP

Buyer's Name NP

Supplier's Name NP

Date sample received 2011-06-08

Testing period 2011-06-09 to 2011-06-16

\*\*\*\*\*

**TEST CONDUCTED**

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

\*\*\*\*\*

**CONCLUSION**

<u>Sample Number</u>	<u>Testing item</u>	<u>Conclusion</u>	<u>Failed component</u>	<u>Failed result</u>
6 (Base)	N/P 904-216-001 Rivet	Pass See Result summary	---	---
6 (Plated)	N/P 904-216-001 Rivet	Pass See Result summary	---	---

\*\*\*\*\*

000002



**TEST CONDUCTED**

## Samples:

6) Base N/P 904-216-001 Rivet

6) Plated N/P 904-216-001 Rivet

**TEST RESULT SUMMARY FOR RoHS DIRECTIVE :**

TESTING ITEM	$\Omega$ RESULT (ppm)		Limit
	(6) Base	(6) Plated	
Cadmium (Cd) content	ND	ND	0,01% (100 ppm)
Lead (Pb) content	31,33	ND	0,1% (1000 ppm)
Mercury (Hg) content	ND	ND	0,1% (1000 ppm)
Chromium (VI) (Cr <sup>6+</sup> )	ND	ND	0,1% (1000 ppm)

ppm = parts per million based on dry weight of sample.

 $\mu\text{g}/\text{cm}^2$  = microgram per square centimeter.mg/kg WITH 50cm<sup>2</sup> = milligram per kilogram with 50 square centimeter.

&lt; = less than.


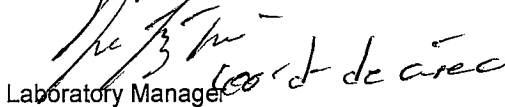
ND = Not detected.

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

These Accreditations only apply for the methods listed in such. Not accredited under EMA  $\Omega$ .

Prepared and checked by :

For Intertek

  
  
Laboratory Manager

The Official Mexican Standard NOM-008-SCFI-1993 establishes like separator decimal the comma (,).

NOTE : DecaBDE IN POLYMERIC APPLICATIONS IS EXEMPTED ACCORDING TO  
ROHS DIRECTIVE AMENDMENT 2005/717/EC.

# =ACCORDING TO IEC 62321, A POSITIVE RESULT INDICATES THE PRESENCE OF Cr(VI) COATING. IT IS THE Cr(VI) CONCENTRATION DETECTED IN THE BOILING-WATER-EXTRACTION SOLUTION AND SHOULD NOT BE INTERPRETED AS THE Cr(VI) CONCENTRATION IN THE COATING LAYER OF THE SAMPLE.

REMARK : AS REQUESTED BY THE APPLICANT, COATING WITH BASE MATERIAL OF TESTED COMPONENTS OF THE SAMPLE MX11-1223-06 WERE TESTED SEPARATED.

000003

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**Test method :**

<u>Sample Number</u>	<u>Testing item</u>	<u>Ω Testing method</u>	<u>Quality control Batch:</u>	<u>Analysis Date:</u>	<u>Analyzed By:</u>	<u>Reporting limit ppm</u>
6	Chromium VI (Cr <sup>6+</sup> ) content	With reference to USEPA 3060, by EPA 7196	QHU2010-45p23	2011-06-16	MELA	20,0

<u>Sample Number</u>	<u>Testing item</u>	<u>Ω Testing method</u>	<u>Quality control Batch:</u>	<u>Analysis Date:</u>	<u>Analyzed By:</u>	<u>Reporting limit ppm</u>
6 (Base)	Lead (Pb) content	With reference to USEPA 3050MOD, by EPA 6010	MET2011-12p11	2011-06-13	MARY	5,0
6 (Plated)	Lead (Pb) content	With reference to USEPA 3050MOD, by EPA 6010	MET2010-21p06	2011-06-13	MARY	250,0

<u>Sample Number</u>	<u>Testing item</u>	<u>Ω Testing method</u>	<u>Quality control Batch:</u>	<u>Analysis Date:</u>	<u>Analyzed By:</u>	<u>Reporting limit ppm</u>
6 (Base)	Cadmium (Cd) content	With reference to USEPA 3050MOD, by EPA 6010	MET2011-12p11	2011-06-13	MARY	2,0
6 (Plated)	Cadmium (Cd) content	With reference to USEPA 3050MOD, by EPA 6010	MET2010-21p06	2011-06-13	MARY	100,0

<u>Sample Number</u>	<u>Testing item</u>	<u>Ω Testing method</u>	<u>Quality control Batch:</u>	<u>Analysis Date:</u>	<u>Analyzed By:</u>	<u>Reporting limit ppm</u>
6 (Base)	Mercury (Hg) content	With reference to USEPA 7471 by USEPA 7471	MET2011-12p06	2011-06-10	RNC	0,25
6 (Plated)	Mercury (Hg) content	With reference to USEPA 7471 by USEPA 7471	MET2010-22p05	2011-06-10	RNC	2,5

000004

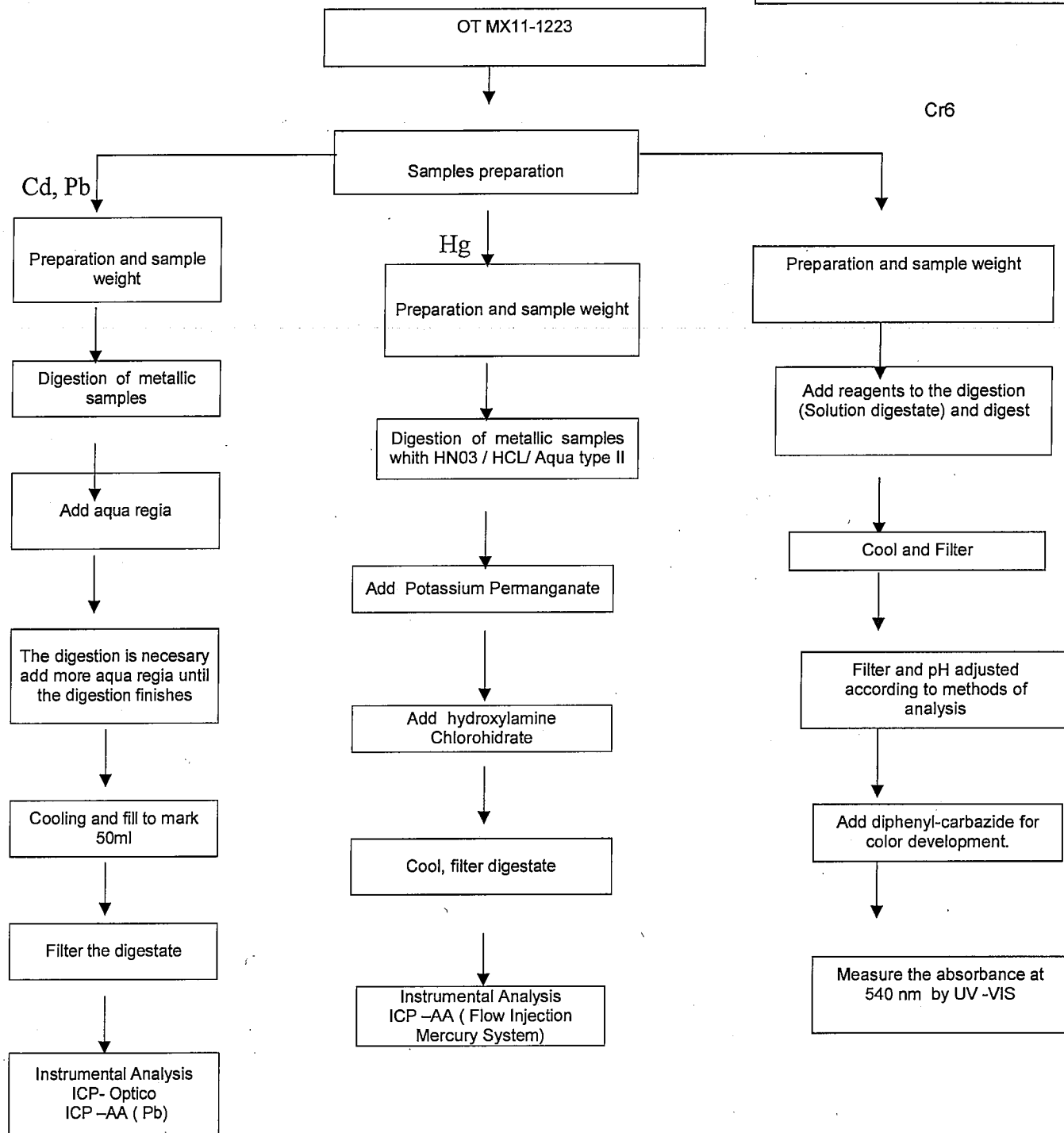
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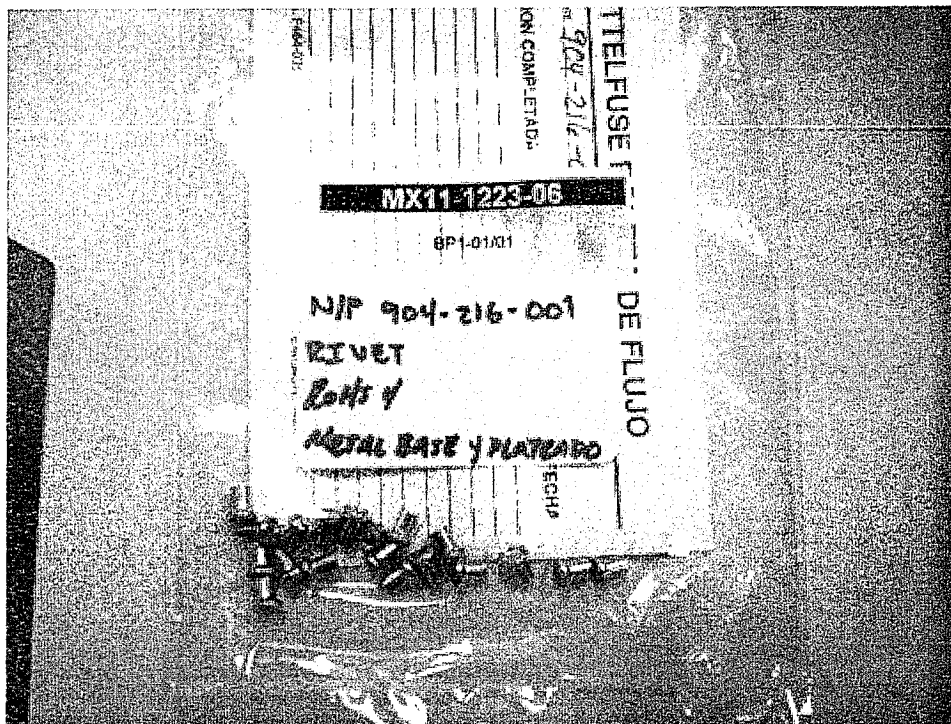
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000006

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**Test Report**

Number : TWNC00241008

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

Date : Jan 20, 2012

**Sample Description:**

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

Part Description : SPRING

Part Number : 912-067

Date Sample Received : Jan 16, 2012

Date Test Started : Jan 17, 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 : TWNC00241008

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	394
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 : Jan 16, 2012

Test Period : Jan 17, 2012 To Jan 20, 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.

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 (mg/kg with 50cm <sup>2</sup> )	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>

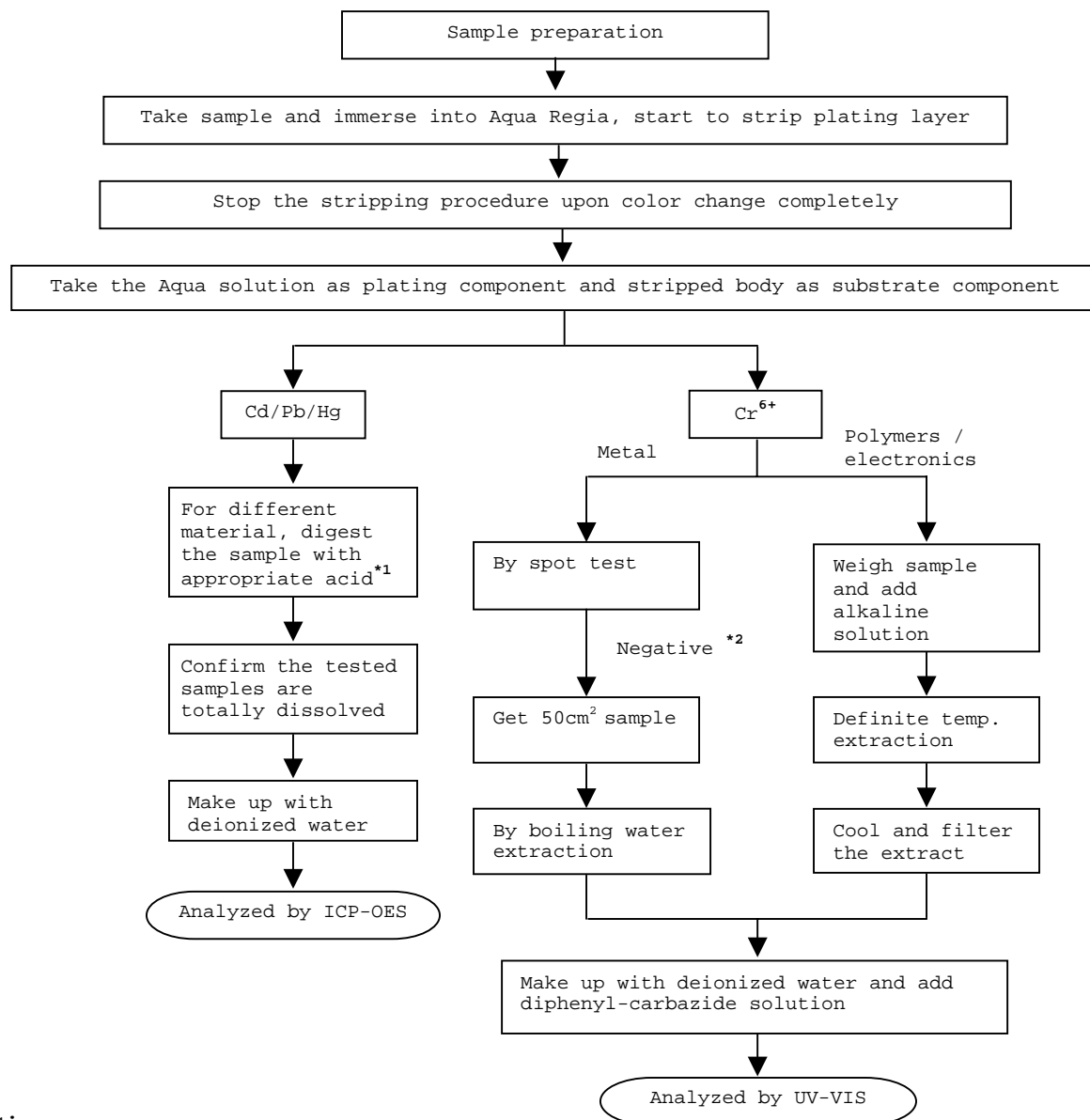
Remark: Reporting limit = Quantitation limit of analyte in sample

## 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

Number : TWNC00241008

Photo







**Test Report**

Number : TWNC00224370

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

Date : Sep 23, 2011

**Sample Description:**

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

Part Description : Lead wire  
Part Number : 878-112  
Date Sample Received : Sep 16, 2011  
Date Test Started : Sep 19, 2011

---

**Test Conducted :**

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

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On Behalf Of Intertek Testing Services  
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---

K. Y. Liang  
Director

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Number : TWNC00224370

Test Conducted

( I ) Test Result Summary :

Test Item	Result (ppm)	
	(A)	(B)
<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 (for non-metal material)	ND	--
Chromium VI (Cr <sup>6+</sup> ) content (by boiling water extraction on metal)(mg/kg with 50cm <sup>2</sup> )	--	Negative (< 0.02)
<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	--



Number : TWNC00224370

Test Conducted

( I ) Test Result Summary :

<u>Test Item</u>	<u>Result (ppm)</u>	
	<u>(A)</u>	<u>(B)</u>
<b>Halogen Content</b>		
Fluorine (F)	ND	--
Chlorine (Cl)	285219	--
Bromine (Br)	ND	--
Iodine (I)	ND	--

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) Red Cable Jacket
- (2) Coppery Metal Wire

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

Date Sample Received : Sep 16, 2011

Test Period : Sep 19, 2011 To Sep 23, 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)
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.

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 ( $\text{Cr}^{6+}$ ) content (for non-metal material)	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
Chromium VI ( $\text{Cr}^{6+}$ ) content (by boiling water extraction on metal)(mg/kg with $50\text{cm}^2$ )	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 $50\text{cm}^2$
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC 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-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by calorimetric bomb with oxygen and determined by ion chromatography	50 ppm

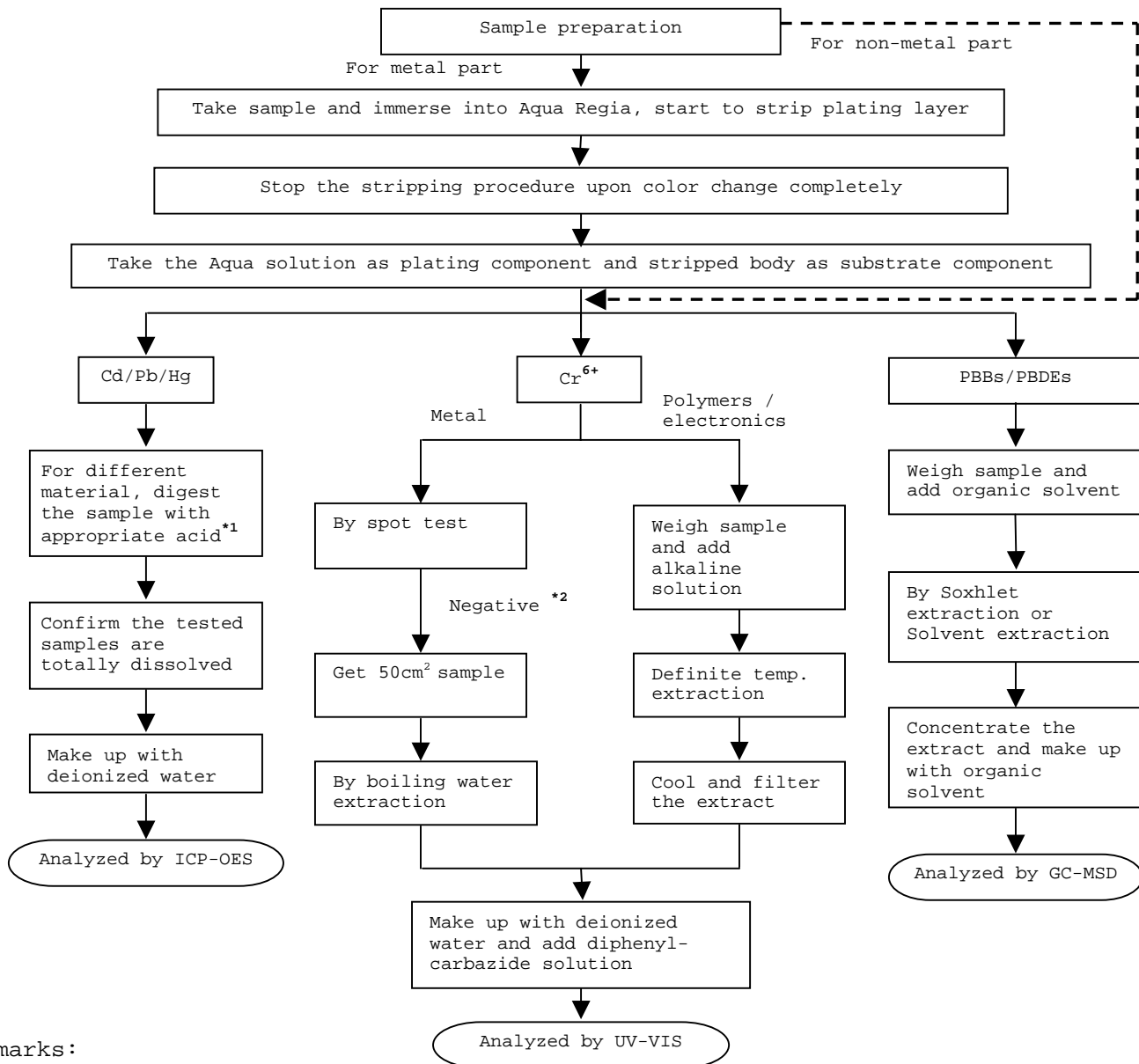
Remark: Reporting limit = Quantitation limit of analyte in sample

## 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 <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>

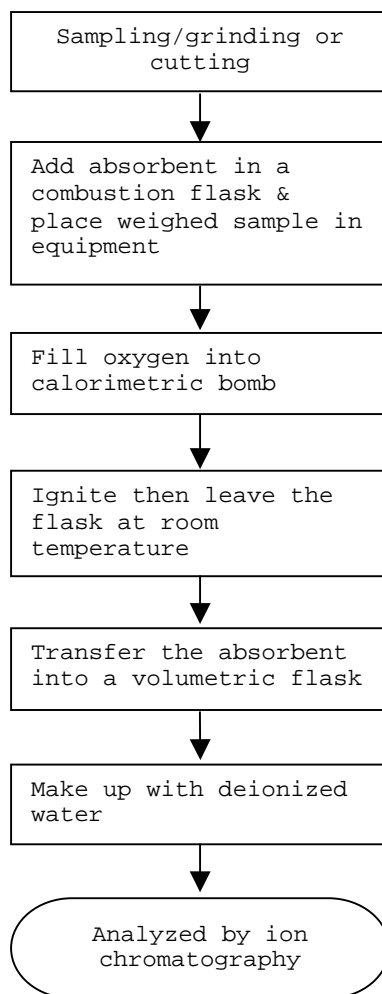
\*2: If the result of spot test is positive, Chromium VI would be determined as detected.

## Test Conducted

## (IV) Measurement Flowchart:

Test for Halogen Content

Reference Standard : EN 14582



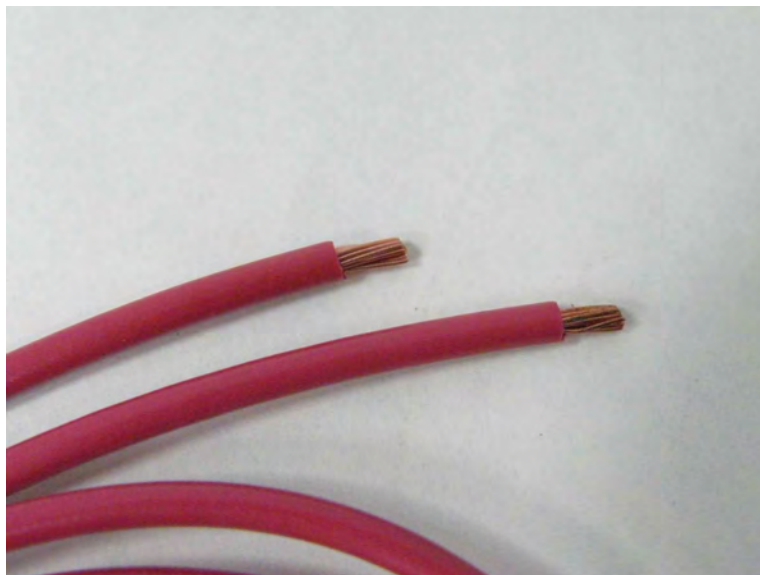
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End of Report

Test Conducted

Number : TWNC00224370

Photo





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Электрон  
Связь**

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